



2017

Public Safety Broadband Network Request For Information



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Key Definitions

Business model	The approach to building, operating and maintaining a Canadian PSBN that is affordable, sustainable and meets evolving public safety objectives.
Communication availability	Availability can be defined in several ways including by granted priority and pre-emption rights, setup time and success rate of user access, hand-over success rate, and range of latency, data throughput and loss users would experience on the network.
Coverage	Network coverage can be established by targeting a percentage of the population that resides in the geographic coverage area, or by stating the goal for a land area or road length covered by a network. Mobile network coverage can be extended on a temporary basis by using deployables in a localized incident area and/or by roaming across multiple networks.
Governance model	The structure of a potential national and/or regional entity (ies) governing PSBN and roles and responsibilities, including national coordination of standards; holding of wireless licences; harmonization of operational procedures; and relationship with PSBN users and industry.
Interoperability	The ability of emergency personnel to communicate between jurisdictions, disciplines, and levels of government, using a variety of systems, as needed and as authorized ¹ . It includes achieving full national operability using common user credentials regardless of the network deployment method used as well as interoperability of PSBN with existing Land Mobile Radio (LMR) services in the near to medium-term.
Public Safety Broadband Network (PSBN)	A national secure high-speed wireless data communications network that would provide an enhanced, interoperable and resilient public safety communications platform across jurisdictions (federal, provincial, territorial, municipal), and potentially with the United States.
Resilience	The ability of the network to provide and maintain an acceptable level of service in the face of various faults and challenges to normal operations. A resilient PSBN infrastructure would be hardened to withstand threats such as power outages, flooding, seismic activity, and terrorism/vandalism and- should failure occur- rapidly restoring communication availability.
Security	The ability to protect and secure physical network infrastructure and to prevent malicious activities such as cyberattacks at the system and application level.

¹ As defined in the Communications Interoperability Strategy for Canada (CISC), January 2011.

1. INTRODUCTION

Effective responses to major disasters, emergencies, and day-to-day events require reliable, interoperable voice and data communication capabilities across jurisdictions and emergency responder communities. Currently, Canada's first responders do not have widespread, consistent access to these capabilities and instead rely primarily on radio-based voice and wireless commercial data services. Most public safety radios operate on different frequencies, and commercial voice and data communications could become congested during emergencies. The creation of a Public Safety Broadband Network (PSBN) would address these issues by providing Canada's emergency responders with priority access to a reliable and secure high-speed wireless data communications network.

1.1. What is a PSBN?

A PSBN is a national, secure, high-speed, wireless data communication network that is affordable and sustainable. It provides an enhanced, resilient and interoperable public safety communications platform for use across jurisdictions (e.g. federal, provincial, territorial, municipal) and public safety communities; and, if implemented in Canada, would ideally be interoperable with FirstNet in the United States (U.S.).² The platform would promote better planning, coordination and execution of daily operations as well as effective responses in times of crisis. Among other functions, users would use the PSBN to:

- Reliably access high-speed data applications to transfer data, images and related content;
- Access shared applications (e.g. records management and Computer Aided Dispatching (CAD) service);
- Obtain timely situational awareness information, and;
- Communicate across the country without interruption, via permanent or temporary infrastructure.

1.2. Recent PSBN Activities in Canada

The Government of Canada (GoC) has been pursuing several activities investigating a PSBN, including the designation of public safety broadband spectrum and consultations with stakeholders.

In March 2012, Innovation, Science and Economic Development Canada (ISED) (then Industry Canada) designated 10 MHz of the highly valued 700 MHz spectrum for public safety broadband communications. In Budget 2015, the GoC announced the designation of the additional 10 MHz of 700 MHz spectrum for public safety broadband use.

This 20 MHz of spectrum in the 700 MHz band³ can be leveraged for the deployment of a national, interoperable PSBN across Canada.

In May 2016, Canadian Federal/Provincial/Territorial (F/P/T) Ministers responsible for emergency management met in Toronto and committed to accelerate stakeholder engagement on potential implementation of a PSBN.

On May 19, 2017, the GoC announced a commitment of \$3 million in 2017-18 to engage diverse stakeholders as well as to gather and analyze evidence pertaining to potential PSBN implementation models.

² On March 30th, 2017, the U.S. Government signed a contract with AT&T for the building, operating and updating of the FirstNet nationwide broadband network. FirstNet will be the U.S. implementation of a PSBN.

³ Decisions on Policy, Technical and Licensing Framework for Use of the Public Safety Broadband Spectrum in the frequency bands 758-763 MHz and 788-793 MHz (D Block) and 763-768 MHz and 793-798 MHz (PSBB Block), June 2017.

The stakeholders being engaged include provincial, territorial and municipal governments, first responders, industry, critical infrastructure operators, representatives from small and remote communities, members of the Indigenous community, academia and international public safety counterparts.

Such engagements will provide an opportunity to better understand the potential benefits of a PSBN and support decision-making. These consultations consider governance, costs, sources of revenue, coverage, public safety user requirements, efficient use of spectrum, and opportunities for innovation.

1.3. Objective of the RFI

Through this Request for Information (RFI) process, ISED is seeking ICT/telecom industry perspectives on the following topics to inform the GoC's approach to a PSBN for Canada:

- A viable business model;
- Governance model; and
- Ecosystem of applications, services and devices.

1.4. Current Operational Context

Existing Land-Mobile-Radio (LMR) systems have served as the mainstay for public safety communications for decades. However, fragmented implementation across Canada has caused challenges in communications interoperability among jurisdictions, and at the U.S. border, as these systems often operate in different segments of the radio spectrum. While positive steps have been taken to harmonize LMR systems, the technology itself has limitations.

Emergency responders currently rely on commercial wireless networks operating over the public Internet to get access to data-rich applications. These networks could become highly congested during emergency events, increasing the risk of denial-of-service for first responders.

1.5. International Approaches

Several countries are moving forward with plans for a national PSBN. Their approaches are informed by factors such as geography, dynamics within the telecommunications industry, status of national broadband coverage, spectrum management policies, and federated divisions of power. We note here three such approaches:

United States

The U.S. government moved toward the deployment of a national PSBN by using a public-private partnership approach. Under the *Middle Class Tax Relief and Job Creation Act (2012)*, the First Responder Network Authority (FirstNet) was created as an independent authority within the National Telecommunications and Information Administration (NTIA). It was mandated to provide emergency responders with the first U.S. high-speed, nationwide network dedicated to public safety. The government allocated 20 MHz of the 700 MHz spectrum for public safety use, as well as funds for the construction of FirstNet network.

The contract to build the national PSBN was awarded to AT&T in March 2017 with the stipulation that within six months the contractor will have to provide nationwide coverage using commercial bands through its existing wireless service deployments. Support for Band 14 is to be phased in over 4 years and the network is expected to be completed in 2022.

Verizon has recently expressed its intention to build and operate a private network core dedicated to its public-safety customers that will operate separately from its commercial core and provide customers with priority access to a Verizon LTE nationwide network. Verizon would deliver this service without access to the 700 MHz public safety spectrum or government funding.

United Kingdom

The United Kingdom (UK) Home Office is engaging with system integrators and commercial mobile operators to develop a replacement Emergency Services Network (ESN) by enhancing commercial Long Term Evolution (LTE) networks to meet mission-critical standards for coverage, security and availability. ESN is intended to fully replace the nationwide TETRA (LMR) network currently operated by AirWave Solutions. The replacement network will incorporate a commercial LTE network with a dedicated core for ESN. In Q3 2015, the Home Office announced that the first ESN contract had been awarded to Kellogg Brown & Root (KBR) as the delivery partner for the program. The Home Office later awarded the user services contract to Motorola solutions and the mobile services contract to the commercial wireless carrier EE. The transition from narrowband to broadband communications is scheduled to begin in summer 2018 and end in September 2020.

South Korea

The South Korean Government plans to deploy a nationwide dedicated public safety LTE network, using 20 MHz of designated spectrum in the 700 MHz Band 28. The network will support the operations of all government departments and agencies, including military offices, electricity, gas, maritime network and rail systems.

2. GUIDELINES

2.1. Nature of Request for Information

This RFI is intended to solicit feedback from ICT/telecom industry to inform the best path forward for potentially implementing a PSBN in Canada. It is not a bid solicitation and will not directly result in any subsequent request for proposal or the award of a contract. As a result, potential suppliers of goods or services described in this RFI should not reserve stock or facilities, nor allocate resources, as a result of any information contained in this RFI. Nor will this RFI result in the creation of any source list. Also, procurement of any of the goods and services described in this RFI will not necessarily follow this RFI process.

2.2. Nature and Treatment of Responses Requested

Respondents are invited to answer in writing the RFI questions and provide their comments, suggestions, and concerns and, where applicable, alternative recommendations regarding how the objectives or the outcomes described in this RFI could be satisfied. Respondents should explain any assumptions they make in their responses.

Respondents may choose to answer only a subset of the questions.

2.2.1. Response Costs

The GoC will not reimburse any respondent for expenses incurred in responding to this RFI.

2.2.2. Treatment of Responses

1. **Use of Responses:** The responses received may be used by federal, provincial, territorial and municipal levels of government to inform future procurement strategies and/or any contracting documents, clauses, terms and conditions. GoC may produce a high level anonymized report summarizing results of the RFI that may be shared publicly.
2. **Review Team:** All responses received by the closing date of the RFI will be reviewed. The GoC may, at its discretion, review responses received after the RFI closing date. The GoC reserves the right to hire any independent consultant, or use any Government resources that it considers necessary to review any response.
3. **Confidentiality:** Respondents should clearly mark any portions of their response that they consider proprietary or confidential. The GoC will handle the responses in accordance with the federal *Access to Information Act* (R.S. 1985, c.A-1) and the *Privacy Act* (R.S., 1985, c. P-21). Responses received will not be shared with other respondents or suppliers but may be shared with other levels of government as per paragraph 1.
4. **Follow-up Activity:** The GoC may, at its sole discretion, contact any respondents to follow up with additional questions or for clarification of any aspect of a response in writing and/or through bilateral meetings.

2.3. Contents of this RFI

Respondents should assume that some of the clauses or requirements may be deleted or revised. Comments regarding any aspect of the document are welcome. If respondents feel a question or key area has been missed, comments and/or information to this effect are welcomed in their response.

2.4. Format of Responses

1. **Cover Page:** The cover page of each document of the response should contain:
 - 1.1. The title of the response and the document number (if the response includes multiple documents);
 - 1.2. The full legal name of the respondent;
 - 1.3. The name, address and telephone number of the respondent's contact;
 - 1.4. The date; and
 - 1.5. The RFI number.
2. **Numbering System:** Respondents are requested to prepare their response using a numbering system corresponding to the one used in this RFI. All references to descriptive material, technical manuals and brochures included as part of the response should be referenced accordingly.

2.5. Enquiries

This is not a bid solicitation. The GoC will not necessarily respond to enquiries in writing or circulate answers to all potential respondents. Questions regarding this RFI may be directed to:

Stéphanie Cleroux

Stephanie.Cleroux2@canada.ca

Contracts and Procurement Officer, Corporate Management Sector

Innovation, Science and Economic Development Canada / Government of Canada

2.6 Submission of Responses

Time and Place for Submission of Responses: Respondents interested in providing a response should send it to the Contracting Authority identified above, by email, by January 5, 2018 at 12:00pm EDT. Respondents wishing to submit their responses via a channel other than email need to contact the authority indicated above.

Responsibility for Timely Delivery: Each respondent is solely responsible for ensuring its response is submitted on time, to the correct email address.

Identification of Response: Respondents should ensure that they are properly identified with the name and email address, the RFI number and the RFI title appearing legibly in the email.

3. QUESTIONNAIRE

3.1. A Viable Business Model

To provide a PSBN as outlined in section 1.1 of this RFI, the PSBN must: 1) support the evolving objectives of the public safety community related to communications availability, security, resilience, interoperability, and coverage; 2) ensure effective use of spectrum; and 3) deploy the network in a timely, affordable and sustainable manner.

Public safety user needs for broadband communications vary depending on their activities and the nature of the events or incidents they face. The PSBN must, at minimum, support activities in the following three categories:

- Normal day-to-day activities — such as responding to incidents that involve a limited number of public safety officers or response teams. During these periods, demand for communication services is expected to be lower, more stable and more predictable relative to other service categories.
- Planned events — such as major sporting events, music festivals or meetings involving foreign leaders (e.g. G20), which require a larger than usual number of public safety personnel. During such events, demand for communication services is expected to be relatively high, but predictable, within localized areas.
- Large scale emergency incidents — such as natural disasters, terrorist attacks or other infrequent incidents which require an immediate and substantial cross-agency emergency response. During these incidents demand for communications is expected to be very high in affected locations as well as time-critical. In some instances, the emergency incident itself may impair the communications infrastructure or capacity. A high degree of network resilience is essential to respond to such an event.

Any PSBN implementation solution must be able to accommodate future needs of public safety users.

The number of potential public safety users in Canada for a PSBN is estimated to be between 300,000 and 350,000. This includes law enforcement, first responders, and critical infrastructure operators; among others.

Q1. Considering, but not limited to, the international approaches as examples, what business model (s) do you recommend for Canada in order to meet the vision of a PSBN?

Please state your assumptions with respect to:

- a) Key cost considerations, including capital expenditures and operating expenses, funding sources (e.g. external funding) and ongoing revenue sources (users and others);
- b) Key new infrastructure needed, opportunity to leverage existing infrastructure including critical infrastructure⁴, and other assets owned by the Crown at all levels;
- c) Need to access PSBN designated spectrum and other spectrum, and under what conditions;
- d) The positive contribution to the business case of leveraging the public safety broadband spectrum for commercial traffic when it is available.
- e) Likely level of coverage in Canada, particularly within rural and remote areas, and possible deployment timelines with suggested phases and with consideration for supporting priority and pre-emption access;

⁴ As defined by Public Safety Canada, <https://www.publicsafety.gc.ca/cnt/ntnl-scrct/crtcl-nfrstrctr/index-en.aspx>

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- f) Types of services and pricing options for a PSBN compared to commercial offerings;
 - g) Number of Canadian operators involved, and if more than one, the nature of partnerships between them;
 - h) Options for giving public safety agencies direct and real time control of user access and profiles on a PSBN; and
 - i) Any other assumptions that should be presented explicitly for better understanding, including key risks and essential conditions for success.

As needed, please comment on specific cost and/or operational considerations related to:

- a) Implications for commercial users of providing priority and pre-emption access to public safety users;
- b) Objectives of achieving a full national footprint, harmonized interoperability, system hardening, and service continuity either through existing capabilities or in partnership with other firms;
- c) Any technological barriers to, or challenges associated with, achieving these objectives based on today's and expected near future technology;
- d) Integration of a PSBN with the existing land mobile radio systems used for public safety operations;
- e) Interoperability between U.S. and Canadian emergency responders along or across the international border;
- f) How 5G capabilities will enhance service and/or change the business model of a national PSBN; and
- g) Any other assumptions that should be presented explicitly for better understanding.

Q2. Are you anticipating offering broadband commercial services to the public safety communities, using existing 3GPP standards on priority and pre-emption access? If so, what would be the timeframe?

3.2. Governance Model

As a national PSBN would potentially serve a range of stakeholders across many jurisdictions and entities, a governance structure with one (or more) entities will be required. The entity could be accountable for a range of functions. For example, the entity could be responsible for alignment on common standards and applications. In addition, the entity could potentially hold spectrum licences and be fully accountable to negotiate with the private sector the deployment and ongoing operation of the network. There could be one national entity only, or a set of regional entities or both.

Q3. Taking into consideration the current legislative and regulatory framework, and considering but not limited to international approaches, which governance model do you feel would be best suited to support a Canadian PSBN?

Please state your assumptions with respect to:

- a) Existence and responsibilities of a national entity;
- b) Existence and responsibilities of regional entities;
- c) If both a) and b) are needed, the governance between the 2 layers;
- d) PSBN spectrum license holders;
- e) Supporting applications, services and device ecosystem for PSBN; and
- f) Any other obstacles/challenges and assumptions that should be presented explicitly for better understanding.

3.3. Ecosystem of Applications, Services and Devices

A key to the success of a PSBN is an ecosystem that provides innovative public safety relevant capabilities, applications and services.

Examples of such functionalities include:

- a) Video streaming and live video feed;
- b) Crowdsourcing and real time filtering of social media for situational awareness;
- c) Transmission of high resolution images, and location-based services;
- d) Voice applications, such as push-to-talk, dispatch, and group communication;
- e) Use of Identity, Credential, and Access Management (ICAM) services;
- f) Direct mode communication and proximity services; and
- g) Interoperability with LMR systems, National Public Alerting System (NPAS), current 9-1-1 and the foreseeable Next Generation 9-1-1 (NG9-1-1) systems.

Q4. What is the current and expected state of the PSBN ecosystem?

- a) What kinds of applications, services and devices are being developed for PSBNs? By what companies and in which countries?
- b) What areas of strength does Canada have (including research, academic and business) that could support the creation of applications, services and devices?

References

1. The Public Safety LTE & Mobile Broadband Market: 2016 – 2030 – Opportunities, Challenges, Strategies & Forecasts, SNS Telecom Research, 2016. <http://www.reportsnreports.com/reports/560702-the-public-safety-lte-mobile-broadband-market-2016-2030-opportunities-challenges-strategies-forecasts.html>
2. The Los Angeles Regional Interoperable Communications System (LA-RICS), Request for Information for Public Safety Broadband Network (PSBN) Devices, RFI No. LA-RICS 009, September 2014. http://www.la-rics.org/wp-content/uploads/2014/02/RFI_LARICS_009_PSBN_DEVICES_090214.pdf
3. Public Safety Mobile Broadband, Productivity Commission Issues Paper, Australian Government, April 2015. <http://www.pc.gov.au/inquiries/completed/public-safety-mobile-broadband/issues/public-safety-mobile-broadband-issues.pdf>
4. Public Safety Mobile Broadband, Productivity Commission Research Report, Australian Government, December 2015. <http://www.pc.gov.au/inquiries/completed/public-safety-mobile-broadband/report/public-safety-mobile-broadband.pdf>
5. FirstNet Request for Information for Comprehensive Network Solution(s), September 2014. <https://www.fbo.gov/utills/view?id=1ef697f901b1c4b347bb17ae77c5a485>
6. FirstNet’s Request for Information (RFI) with a draft Statement of Objectives (SOO) for Comprehensive Network Solution(s), September 2015. <https://www.firstnet.gov/sites/default/files/rfi-draft-soo-comp-network-solution-faqs.pdf>
7. Public Safety LTE Market Analysis and Forecasts 2016 – 2020, Mind Commerce Publishing, 2016. https://mindcommerce.com/public_safety_lte_market_analysis_and_forecasts_2016_2020.php
8. Decisions on Policy, Technical and Licensing Framework for Use of the Public Safety Broadband Spectrum in the frequency bands 758-763 MHz and 788-793 MHz (D Block) and 763-768 MHz and 793-798 MHz (PSBB Block), June 2017.