CANADIAN INTEROPERABILITY TECHNOLOGY INTEREST GROUP
GROUPE D'INTÉRÊT CANADIEN EN TECHNOLOGIE DE L'INTEROPÉRABILITÉ

Response To

Telecom Notice of Consultation CRTC 2012-686

Call for comments

**Appointment of an Inquiry Officer
to review matters related to 9-1-1**

File number: 8665-C12-201215781

February 28, 2013

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Executive Summary

Next Generation (NG) 9-1-1, a digital version of the existing 9-1-1 system, is an absolute priority for public safety organizations. The evolution of 9-1-1 is coming, and responder agencies must be prepared. The safety of our citizens is at stake and we must be ready. Canadians expect to receive the best possible public safety services. Responders need the right tools to protect and save lives. Public safety's voice *must* be heard.

The existing 9-1-1 system, while decades old, performs well and allows emergency calls to be made from land lines, cellular phones and Voice over IP phones. However, there are some serious weaknesses with the current system, such as the ability to consistently provide a precise location for cellular callers, which makes up the majority of 9-1-1 calls. This problem continues to be a major concern for all Public Safety Answering Points (PSAPs) across Canada.

The digital environment opens up many new capabilities – as digital communication has generally done when introduced into a service delivery model. However, 9-1-1 is a public safety facility, one that is often about life and death incidents. So steps must be taken carefully and from a position of knowledge. The implementation of these new capabilities is critical and must be done incrementally to avoid derailing the on-going provision of emergency service. Also, this new service must be affordable and based on standards.

It is clear that the big issue in NG 9-1-1 implementation will be funding. PSAPs across Canada cannot bear the costs that will be necessary to make NG 9-1-1 operational. There will be significant capital and operating costs. Therefore, a new funding model will be necessary and legislation will likely be the tool to enable that model. Funds must be designated exclusively for funding public safety interoperability efforts, including 9-1-1 and NG 9-1-1. In this report, it is strongly recommended that every Province and Territory that does not currently have legislation with respect to the collection of funds for the financial support of PSAPs begin the process of creating it. (For a complete list of recommendations please see the section *Summary of Recommendations*.)

Some issues need further discussion and resolution, such as the potential for increased liability upon PSAPS, how new capabilities will be phased in, how existing infrastructure will connect to the new digital environment, and how upgrades will be paid for, to name a few. Some provinces may wish to enact new liability and funding legislation before NG 9-1-1 is implemented to avoid major costs to the PSAPs and to avoid lawsuits for occurrences that are beyond the control of the PSAPs.

Members of the public safety sector in Canada applaud the CRTC for requesting this public consultation. Much has already been learned and documented by the process of responding to this consultation. As this process moves along, much more will be learned. This consultation has assisted the public safety sector in defining a direction and working in a cooperative way to write about this issue. This approach will serve us well during the coming phases of implementation and on-going change.

Introduction to CITIG

In 2007, the Canadian Interoperability Technology Interest Group (CITIG) was created to improve Canadian public safety communications interoperability. At the time, CITIG was a responder-driven, federally-funded activity that brought together responders, academia, industry and government stakeholders who shared a common interest in enhancing Canada's communications interoperability and are dedicated to improving the safety and security of first responders, and the people and critical infrastructure of Canada.

As of 2012, CITIG is now a Federally Incorporated Not-for-Profit Corporation governed in partnership by the Canadian Association of Chiefs of Police (CACP), the Canadian Association of Fire Chiefs (CAFC) and Paramedic Chiefs of Canada (PCC).

Today, CITIG is made up of more than 1,300 volunteer associates from the responder community, all orders of government, non-governmental organizations, associations, academia and industry.

In the development of this response, CITIG has chaired a committee of first responder professionals, government specialists and organizations representing 9-1-1 interests. In this regard, the CITIG response contains a valuable cross section of information and views with respect to the NG 9-1-1 issue.

While every province has a different 9-1-1 situation, the CITIG report has captured common themes that relate to 9-1-1 and the transition to NG 9-1-1 across Canada.

The format of this report lists each question asked in the NG 9-1-1 Notice of Consultation followed by the CITIG response to the question. For the sake of clarity the original questions from the CRTC are in green.

Questions and Responses

A. Current situation:

1. Current Situation - Views
The current 9-1-1 system supports voice communications via telephone. Provide your views with regard to the current system in terms of, but not necessarily limited to
- positive aspects of how the current system operates;
- problems that are experienced; and
- how, and to what degree of accuracy a caller's location is determined.

A.1.1.   **Positive** - In most areas of Canada, the 9-1-1 system has been in place for many years and is reliable. Those wishing to report an emergency can reach police, fire and paramedics with one call. In addition, the current 9-1-1 system can receive wireless calls and Voice over Internet Protocol (VoIP) calls. The most reliable location services are on land lines.

A.1.2.   **Negative** - There are issues with VoIP calls, such as incorrect locations or an intermediary service that takes information from the caller and then calls 9-1-1 from their location. Wireless can have excellent location services in some cases and almost meaningless location services in other cases. This is a serious problem and a source of frustration across Canada. The problem with finding a close location is both an operational and financial consideration. While getting a reliable "X" and "Y" indicator is a problem, we must remember that the "Z" indicator will also be vital in the future as the capability is there. With this in mind, *CITIG recommends that Canada follow the emerging U.S. wireless location standard of 50 meters at the 67th percentile and 150 meters at the 90th percentile, and include the altitude, or 'z' coordinate as soon as technology allows*.

A.1.3.   Unregistered wireless phones are a serious problem because when they are used for 9-1-1 purposes - incorrect information shows for subscriber and location. Many feel that 9-1-1 calls from unregistered phones should be disabled.

A.1.4.   In addition, with advances in technology and the significant rise in the use of social media, Canadians' expectations regarding the ability to use mobile technology during emergencies is changing. For example, a recent study by the Canadian Red Cross titled *Social Media during Emergencies*[1] reports that 63 per cent of Canadians say emergency responders should be prepared to respond to calls for help posted on social media, and one-third of respondents think emergency services would respond to a request for help posted on social media.

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[1]

http://www.redcross.ca/cmslib/general/pub_social_media_in_emergencies_survey_oct2012_en.pdf

2. Current Situation - Funding

With regard to the current funding model used to support the current 9-1-1 system, provide information, including specific dollar amounts, in relation to
- what parties apply charges or collect fees, by what means, and in what amounts;
- what parties receive funds, by what means, and in what amounts; and
- the cost to provide/maintain the current 9-1-1 network infrastructure and PSAPs.

A.2.1. **Wireless Fees** - There are different approaches to funding Public Safety Answering Points (PSAPs) in Canada - they differ from province to province. In some provinces, the PSAPs don't get funding from the money that is collected as a subscriber fee. Clarity on what the fees are for, where the fees go, and how they are used would be helpful. The PSAPs will require additional funding to implement NG 9-1-1 or it ***will not be possible to implement***. While no one is completely sure of what a particular NG 9-1-1 upgrade will cost, the American experience has shown that there are large capital and operating expenses associated with NG 9-1-1.

A.2.2. From perspective of municipal PSAPs in some regions, funding is not passed along for technical upgrades to the 9-1-1 system. Some PSAPs (let's assume the PSAP is a police service) do not receive funding for 9-1-1 upgrades. This results in a situation where, given tight budgeting, we may have to cut police needs for which we are supposed to budget for 9-1-1 upgrades, which is really an overall public safety issue. Once again, this issue is very different from region to region. Some provinces are putting a monthly charge on landlines and cellular lines so as to recoup costs for major 9-1-1 upgrades. ***CITIG strongly recommends that every Province and Territory that does not currently have such legislation immediately begin the process of creating it. We further strongly recommend that such legislation be crafted with a view to providing funding for the improvement of public safety communications, including 9-1-1 and NG 9-1-1, and that 100% of the funding received (minus any fees for collection) be set aside for the sole use of improving such public safety communications systems.***

A.2.3. **Primary Versus Secondary** - In some cases, the funds supplied to PSAPs do not cover all the necessary upgrade costs. For example, the funds to do not cover Computer Aided Dispatch (CAD) or Records Management System (RMS) upgrade costs. This situation is worse for secondary PSAPs because in all cases we researched, secondary PSAPs are not covered for 9-1-1 upgrade costs. As an example, if the municipal Fire Department is the primary PSAP, their 9-1-1 upgrade costs may be covered to some extent, but if the Police Service acts as a secondary PSAP, those upgrade costs won't be covered at all. This may result in increased costs for the municipality. Since the primary and secondary PSAPs work together in the delivery of emergency services, ***CITIG recommends that a solution for the upgrade problems faced by secondary PSAPs be addressed in the discussions following this consultation***.

A.2.4. **Voice Over IP (VoIP) Lines** - In some cases, legislation is in place to cover wireless phones for 9-1-1 costs, but VoIP phones may not be covered by such regulation. So as VoIP telephones get more popular, the available funds for 9-1-1 decreases. This should be addressed in conjunction with updates for NG 9-1-1.

A.2.5.   Significant work has been done in the U.S. regarding costs incurred by NG 9-1-1. For example, the Federal Communications Commission (FCC) sponsored a white paper titled *A Next Generation 9-1-1 Cost Study: A Basis for Public Funding Essential to Bringing a Nationwide Next Generation 9-1-1 Network to America's Communications Users*. The Paper speaks to the necessity to migrate to the new NG 9-1-1 digital platform, and cited the many advantages of a digital platform (e.g., ability to accept all kinds of communications as opposed to just voice; faster and more accurate response from the 9-1-1 call centers; and the ability to regionalize communications systems).

A.2.6.   Expensive upgrades to the NG 9-1-1 platform are expected in both recurring and non-recurring costs. A sizeable capital cost to convert to the NG 9-1-1 platform and a sizable operating cost to run NG 9-1-1 is expected.

A.2.7.   The FCC study looks to a possible reduction in the number of PSAPs as a result of NG 9-1-1. But amalgamation of the small centers has already been done in many Canadian regions. While better features and better capabilities are generally delivered by larger PSAPs, amalgamation has not proven to save money in Canada, and therefore should not be viewed as a tool to cut costs. **Large capital and operating costs to implement and maintain NG 9-1-1 are expected.**

A.2.8.   In some communities, **co-location** of emergency services can be a cost saving effort if those services have outdated or unsuitable facilities and one building can hold two services. However, sharing police and fire dispatchers, for example, has not proven to be a successful approach due to very different training and skill sets.

A.2.9.   **Downstream Agencies –** While this issue may not be under the purview of the CRTC, it is an important point that should be identified in a comprehensive response regarding NG 9-1-1. With NG 9-1-1, how will primary agencies handle the process of sending a call to downstream agencies? For example, today if a Teletype call from a hearing impaired person comes into a primary PSAP and a downstream agency (e.g., EMS) is needed, the staff in the primary PSAP voice-relay the messages between the caller and EMS Call Taker. Our understanding is that under NG 9-1-1 the actual TTY "connection" could be transferred to the EMS staff once it is determined that it is a EMS call for service. The question relates to whether the downstream agencies, such as EMS, will have the ability to accept a transfer of a Text-to-9-1-1 call, or in the future, photos and/or video. CITIG recommends that the primary PSAP have the capability to transfer a digital connection, such as a text message, to the correct party.

A.2.10.   Evidence suggests the need to transfer data downstream (and the quantity of data) will increase significantly in the coming years. A Centre for Security Science technical

assessment[2] of the 700 MHz spectrum requirements for broadband mobile data communications for public safety and security shows that the amount of bandwidth required to satisfy current needs to conduct missions during routine but major emergency situations with modern tools and applications is greater than 20 MHz in the near-to-mid-term, and likely to also exceed 20 MHz in the long term, despite advances in technology. Often, the data used in the field will be flowing through PSAPs.

A.2.11.   Also, there is a concern with respect to the digital assets that may go with a given call. Will the downstream agencies be able to receive the videos, photographs, and other digital assets that may be created for that call, and have the storage, technology and people to store manage the ownership responsibilities that go with accepting the assets (storage, disclosure, Records Management, purging, and so on). These digital assets will put a strain on existing equipment and technical resources. ***CITIG recommends that the Public Safety community research Cloud Computing (including the creation of a public safety "Cloud" environment) to determine if a regionalized (or provincial or national) facility for storing these high data volumes can save money and meet security requirements***.

3. Current Situation – Data Collection
Indicate to what extent, if any, the current system is capable of collecting data, or is used to collect data, on 9-1-1 calls in relation to
- number of calls;
- type of incident;
- timing of calls;
- type of originating device (e.g. wireless phone) used to make the call; and
- proportion of false calls of any nature relative to real emergencies.

A.3.1.   **Standards** - As a standard across Canada, 9-1-1 suppliers must provide call statistics to the PSAPs, in a standard format and at no cost. In some jurisdictions, the statistical offering is quite incomplete, while in other jurisdictions, PSAPs must pay $1600 per year for data in an Excel spreadsheet format that provides Police/Fire/EMS numbers.

A.3.2.   The 9-1-1 supplier (Telco) may know more about dropped and unanswered calls than the PSAP does due to the nature of their 9-1-1 call management system. Therefore, this is viewed as an on-going matter that should be dealt with across the country.

A.3.3.   A national rationalization of such data elements and reporting requirements would allow for better comparisons of PSAP activity across Canada. There will not be time to do this by the March 1, 2013 deadline for this response. Therefore, ongoing work is required.

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[2] *700MHz Spectrum Requirements for Canadian Public Safety Interoperable Mobile Broadband Data Communications*, Defence R&D Canada – Centre for Security Science (DRDC CSS CR 2011-01), February 2011

B. Next-generation (NG) 9-1-1:

1.   Next-generation - Vision

With NG 9-1-1, there is an opportunity to build a system that could provide new and enhanced features and capabilities. Provide your vision of an NG 9-1-1 system in terms of, but not necessarily limited to

- how Canadians could communicate with PSAPs and emergency response teams, for example using what types of devices and methods of communications, how specific needs and concerns of Canadians with disabilities could be met, etc.;
- the types of information and data, such as pictures, videos, medical records, etc., that could be transmitted to, and possibly shared between PSAPs;
- how, and to what degree of accuracy a caller's location could be determined; and
- how the implementation and ongoing operation of an NG 9-1-1 system could be funded.

B.1.1.   **Governance of 9-1-1 Services in Canada** - The term Next Generation would appear to imply that there was a standardized *first* generation of 9-1-1 in Canada, but that is not the case. The implementations of 9-1-1 across Canada vary greatly, providing very different levels of service to the Citizens of Canada. The majority of Canadian children are taught that 9-1-1 is the one number with which to access the standard emergency services (police, fire, paramedics).

B.1.2.   We might say that "9-1-1" has become a "brand" in Canada: a standard product that people have come to rely on. It is advertised as a service, it is distributed on fridge magnets, and it is touted as a service to which Canadians have access. But at the same time, this brand behaves quite differently in various provinces, regions and territories due to the lack of a national standard. The telecommunications companies who supply 9-1-1 services in Canada do not have a standard interface to allow the simplified connection of PSAPs to 9-1-1 services. With the evolution to NG9-1-1, the time has certainly come to formulate a national standard for 9-1-1 services in Canada.

B.1.3.   This new standard would speak to a standard set of services, a standard interfacing mechanism, and standard statistical reporting on 9-1-1 activity, and performance metrics that would allow PSAP operations to be compared for the level of service they are providing.

B.1.4.   A new institution is needed that has as its focus the issues surrounding the governance of 9-1-1 services in Canada. Section 7 of *Canada's Telecommunications Act* states, in part, relative to the purpose of telecommunications services: "(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." Certainly it can be agreed that 9-1-1 services "safeguard" the social fabric of Canada and its regions. However, it must be admitted that the 9-1-1 process has not had an "orderly development" up to this point. There are no standards in the delivery of service or in the technical requirements to interface to a 9-1-1 system.

B.1.5.   With the forgoing in mind, *CITIG strongly recommends that a new institution be established to provide governance to the 9-1-1 brand in Canada*. It is further

recommended *that this institution's mandate would cover 9-1-1 issues such as a standard set of 9-1-1 services, a standard technical interface across the country, and a standard set of statistical reports that would allow cross-country comparison of services levels provided by PSAPs*.

B.1.6.　This new institution would include, but not be limited to, representatives from PSAPs, telecommunications companies, the appropriate federal, provincial and territorial governments, CITIG, the National Emergency Number Association (NENA), the Association of Public-Safety Communications Officials (APCO) and the Federation of Canadian Municipalities (FCM). Other organizations, such as the Strategic Planning section of Public Safety Canada, may wish to be involved in this process. This new institution, with a correctly crafted mandate would "facilitate the orderly development throughout Canada" of a 9-1-1 system that protects Canadians and safeguards the "social fabric" of Canada, as stated in the *Telecommunications Act*.

B.1.7.　While it is difficult to say where this organization should be positioned, it must have strong ties to the CRTC because they are the administrators of the *Telecommunications Act*. It could also have strong ties to the Senior Officials Responsible for Emergency Management (SOREM), which already has an Interoperability Working Group that reports to it. However, the correct configuration and location of this organization must be studied and recommendations made. With this in mind, *CITIG strongly recommends that a national workshop be funded and scheduled to take the high level recommendations from the national submission to the CRTC and further develop them into a draft national framework, or strategy, and develop a set of detailed action plans designed to further the strategy over the next three to five years.* Equally important, many operational and budget issues are of concern to those facing the implementation of NG9-1-1.

B.1.8.　**Increased Resources: Text to 9-1-1** - The first new service to be provided under NG9-1-1 is the replacement of the aged Teletype for the Deaf (TDD) with a texting facility that would be linked to the phone number of the hearing impaired citizen. This would give the hearing impaired the ability to speak with 9-1-1 operators by way of texting. It is believed that there will be an immediate increase in the number of calls from the hearing impaired for two reasons. First, the Teletype devices are seldom used today because they have been obsolete for years. Second, the Teletype is not a portable device, but rather is installed in the home of the hearing impaired person. The new texting facility will be viewed more positively by the hearing impaired because it is a modern medium. As well, texting will be done from their cellular devices that are likely to be with them at all times. It is also known that the texting of calls is a much longer process than handling a call by voice. While this will be an extremely valuable service to the hearing impaired, we must understand there will be a workload increase associated with more calls that arrive by texting. Also it will no doubt lead to the general public demanding text access to 9-1-1 services.

B.1.9.   If all citizens can use texting to report 9-1-1 calls, the amount of human resources required to manage 9-1-1 calls will increase significantly. This will clearly impact PSAP staffing.

B.1.10.   Thought must be given to whether the full range of digital media is advantageous for emergency situations. While texting has become a communication standard for many people, it does not transmit voice inflection, and therefore accuracy in gauging the gravity of the reported situation may suffer. Also, it is slower to text than it is to speak, so there will be extra time on the part of the call taker to get the necessary information relating to the emergency being reported. For a more complete list of issues see Appendix "A" – Assumptions on Text Messaging to 9-1-1.

B.1.11.   Another factor may be a significant increase in No Answer or Short Duration 9-1-1 calls due the proposed IP based 9-1-1 platform. The removal of Short Duration 9-1-1 call filtering that currently exists within legacy 9-1-1 systems may cease to exist once the move to IP based equipment is made. An analysis conducted by a large Ontario based PSAP estimates a 20 to 30 percent increase in 9-1-1 call volume due to this factor alone.[3] Budget planning will be necessary to manage this change. Additionally, how will such hiring impact the PSAPs' main business budget requests (in many cases the primary PSAPs are police services)?

B.1.12.   **Increased Resources: Accepting Video and Other Digital Assets** - If a citizen can submit videos, pictures or other digital assets in conjunction with 9-1-1 calls, the amount of human resources required to manage 9-1-1 calls will increase significantly. While in some cases videos or pictures may provide valuable information, too much information can be a danger. For example, if ten or 20 videos show up regarding a fire call or a major traffic accident, how will the PSAP find time to view those videos in a timely way?

B.1.13.   The lack of resources to view multiple videos in real time may create legal liability for PSAPs, particularly in cases where serious injury or death occurs in the incident. A tribunal may determine that a PSAP should have viewed all videos in real time to scan for valuable information, but this will seldom be possible. However, if we accept the video, we may very well be accepting the liability that goes with it.

B.1.14.   Provinces such as New Brunswick and Manitoba have created legislation that limits the liability of the PSAP in such situations so that they cannot be sued for not having sufficient staff to view the number of videos that may come in on a certain call (clearly such legislation does not shield the PSAP against claims resulting from negligence). *It*

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[3] On the current legacy 9-1-1 system, there is a filter that stops short duration 9-1-1 calls from coming through to the PSAP. These are true 9-1-1 dialed calls, but where someone hangs up quickly thereafter. Each PSAP has a filter (from 1 to 3 seconds) that prevents these calls from getting to a call taker. In the new IP architecture, there will not be a filter. We know from Bell tracking these short duration hang-ups that this will mean about a 20-30 percent increase in 9-1-1 call volumes. This doesn't account for the work time to follow up on or process these calls. The impact will be significant for PSAPs.

is recommended that a provincial government implement such legislation before implementing NG 9-1-1 in their jurisdiction. The New Brunswick and Manitoba legislation sections are found in Appendix "B".

B.1.15. Questions also exist regarding the receipt of multiple videos. Does the architecture of the NG9-1-1 system allow for the Quality of Service (QoS) of the voice component to be unaffected by the simultaneous receipt of multiple digital videos? Documentation viewed thus far does not make this clear, but it is a major consideration.

B.1.16. The Health sector is concerned that privacy issues may emerge if videos (or other digital assets) containing information about the medical condition of victims are forwarded to primary and secondary PSAPs. On the other hand, such videos may assist en route paramedic staff or hospital emergency personnel waiting for an ambulance to arrive, to be better prepared to take care of the victim.

B.1.17. **Position (Desk) ID** - Today, we can match the Automatic Line Identification and Automatic Number Identification (ALI/ANI) information to the 9-1-1 call taker that takes the voice call. This is critical for a PSAP in managing 9-1-1 calls. However, 9-1-1 suppliers are generally stating that the ***Position / Desk ID necessary to do this will be supplied differently in the NG 9-1-1-IP solution***. This will cause massive work to create software interfaces for each computer aided dispatch/phone system combination (in fact, the same computer aided dispatch system and phone system combination, in a different 9-1-1 region, may also require a separate interface). Long-term discussions have been taking place, but so far, there is no solution that does not require significant investment by the PSAPs. As well, some PSAPs have been told that their CAD developer would not be given access to the Telco network to develop such a solution. Clearly, a solution must be found, but from the PSAP perspective, the digitally advanced NG 9-1-1 system should not provide less functionality than the decades-old analog 9-1-1 system. ***CITIG recommends that the Position/Desk ID necessary to match ANI/ALI Information to a 9-1-1 call be supplied similarly in the NG 9-1-1-IP solution.***

B.1.18. **Secondary Impacts** - Secondary impacts to the above costs would include an increase in PSAP technical resources to manage the increased storage and networks demands; liability issues if staff are not available to view videos of major occurrences; traumatic impacts to dispatchers who view graphic scenes (accidents, fires suicides); and Records impacts to store video, do Freedom of Information (FOI) Requests, and so on.

B.1.19. Significant money will be spent to upgrade our 9-1-1 communications, CAD and RMS systems to accept digital assets, but there is much we don't know today. For example, there is no reliable way to determine the volumes of digital assets that will be received by PSAPs. Each digital asset received must be stored, managed, disclosed, purged and so on. At this point, there is also no reliable way to accurately predict the impact on PSAP systems of these additional digital assets and a possible increase in the number of 9-1-1 calls.

B.1.20.   Also, it may be possible for 9-1-1 calls or digital assets to be electronically generated for the purpose of a prank or a distraction during a serious crime. PSAPs would want to have an automated analysis system that would attempt to identify such occurrences.

B.1.21.   PSAPs will also have to inventory their support infrastructure to look for other impacts. For example, logger recorders work for analog voice today. But will all logger recorders record digital voice? Additionally, will such devices record tweets, texts, video, and many other digital assets? Public Safety is just starting to consider the impact of Social Media on 9-1-1 (another reason NG 9-1-1 must be implemented in small steps).

B.1.22.   From the forgoing, it is clear that the big issue in NG 9-1-1 implementation will be funding. The PSAPs cannot bear the costs that will be necessary to make NG 9-1-1 operational. There will be significant capital and operating costs. Therefore a new funding model will be necessary and legislation will likely be the tool to enable that model. Funds must be *collected and reserved specifically for the purpose of updating PSAPs*. A number of provinces have this legislation in place already.

2.   Next-generation - Architecture

The evolution to an all-IP architecture permits re-imagining the logical architecture of a 9-1-1 system. For example, certain back-up functions or databases could be national or provincial in scope, while service delivery could continue to be local or regional. Provide your views on what functions or databases could be provided on a national or provincial basis in order to promote robustness, resiliency and/or greater efficiencies.

B.2.1.   **All-IP Architecture Capabilities** - An all-IP Architecture will allow regional, provincial or national databases for reference information that is more local today. The digital architecture will allow more seamless hot-sites, back up and redirection. The IP structure would also allow out of town agencies or companies to forward information to a given PSAP regarding a call. As an example, OnStar is in Texas, and there is no easy way for them to contact the OPP in Ontario today.

B.2.2.   **All-IP Architecture Standards** – An all-IP Architecture would demand that national standards for such reference data be created and used - bigger data centers, perhaps national, means the same data standard will be used across the provinces. If a national standard were not possible, at minimum a national server would have to recognize the data standards used in regional areas so that it could properly format a response to a particular province or region. As a general comment, larger population densities require more standards because of cross-jurisdictional issues. This may be less critical in areas with lower population densities.

B.2.3.   As well, the importance of working with partners (fire, police, paramedics, etc.) to develop standards and Standard Operating Procedures (SOPs) cannot be over-stressed. All stakeholders must remember that this process is not just about technology, as is well illustrated by the Interoperability Continuum in Appendix "C".

The Communications Interoperability Strategy for Canada (CISC) makes use of the Interoperability Continuum to successfully map interoperability projects[4].

B.2.4. ***CITIG recommends that a National PSAP Registry be created*** to allow PSAPs to more quickly handle call transfers to other jurisdictions and reduce the wait time for emergency dispatches.

3. Next-generation – i3

The National Emergency Number Association (NENA) i3 solution has been proposed as the architecture for NG 9-1-1. To what extent has there been consensus in Canada that this is the way forward? If it is determined that the i3 solution is to be implemented,

- what steps would need to be taken in Canada to achieve this architecture?
- what institutions (e.g. public safety organizations, standards bodies, the Commission, carriers, PSAPs, first responders) would be involved?
- what role(s) would they play?
- what would be the timing for each step?

If there has not been consensus, provide your views.

B.3.1. **The i3 Solution: Origin** - While public safety practitioners generally accept the i3 standard as an excellent starting point, it is an American standard that needs a Canadian review.

B.3.2. **The i3 Solution: On-going Work** - Public safety practitioners generally accept the i3 standard as an excellent view of the future of 9-1-1, but all the parts necessary to make it work do not exist today. The CRTC technical advisory group, ESWG, must continue to work on the i3 standard.

B.3.3. **The i3 Solution: Incremental Approach** - The i3 standard must continue to be vetted and implemented in an incremental manner because no one can make the jump from the current environment to the full i3 environment in one move.

B.3.4. **The i3 Solution: Standards Based** - The i3 standard must be based on standards, to the extent possible, to allow for multiple vendors to supply components for the standard.

B.3.5. **Time Factor** - The Current 9-1-1 system will be decommissioned in 2016 so ***PSAPs must move to NG 9-1-1 as soon as possible***. While the process is moving along in Canada, there is much work to be done. PSAPs must continue down the NG 9-1-1 road because there is a deadline that will demand properly timed implementation. As a group, we must also realize the composition of the telephone system is changing in that more and ***more people are going wireless and VoIP, while less people are maintaining their copper lines***. This new mix must be reflected in the directions taken by the CRTC.

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[4] http://www.citig.ca/SharedFiles/Download.aspx?pageid=44&fileid=396&mid=121

B.3.6. **The i3 Solution: Participation** - There is much work to do on the development of the i3 Architecture. The CRTC technical advisory group, ESWG, must continue to work on the i3 standard, along with Telco's, PSAPs, CITIG and others. Generally, Public Safety believes that the I3 vision is sound.

B.3.7. ***CITIG recommends that a CITIG seat be created within ESWG*** (in addition to police, fire and paramedics representation) to bring the experience of the Tri-Services interoperability community to the table. The CRTC should consider funding certain committee activities, including travel for key stakeholders, including CITIG.

4. Next-generation – Data Collection

NG 9-1-1 will enable detailed data gathering and analysis of emergencies.
- What data would need to be collected to assist policy makers and operations managers in responding to emergencies and disaster relief planning?
- How would this data be collected?

B.4.1. **Data Standards: National Standards** – Ongoing work needs to be done to define a standard data set for Canada to allow proper comparisons to be made across the country. It is probably fairly easy to define the data set to assist operations managers with planning. However, it may be more difficult to define a data set that would assist in managing disaster relief efforts. More discussion across the PSAP population is needed on this question (please note that the recommendation to establish a national 9-1-1 Governance Body would impact this issue). As well, the NG 9-1-1 environment may create far more data to store and manage. For example, caller location may not be limited to one coordinate set, but NG 9-1-1 may be capable of storing re-bids on an electronic map for the purpose of tracking vehicles in movement and recreating their movement after the fact. There will be new problems such as determining who owns this information and to whom it may be released with respect to a given emergency.

B.4.2. Perhaps the MASAS X project, an initiative under the *Communications Interoperability Strategy for Canada*[5], could be a participant in discussions regarding disaster relief. However, the question is unclear as to whether the above CRTC question is discussing a major Fire/Police incident as opposed to an emergency management organization (EMO) type incident that cannot be resolved only by first responders (i.e., Flood or major bush fire effort that requires other types of support). However, further dialog will clarify and answer these matters. As well, the issue of the 700 MHz public safety network should be discussed in this context. In fact, there are communications needs created by NG 9-1-1 that may best be served by a network like the 700 MHz public safety network.

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[5] http://www.citig.ca/SharedFiles/Download.aspx?pageid=44&fileid=396&mid=121

Summary of CITIG Recommendations

- **That Canada follow the emerging U.S. wireless location standard** of 50 meters at the 67th percentile and 150 meters at the 90th percentile, and include the altitude, or 'z' coordinate as soon as technology allows.

- That every Province and Territory that does not currently have legislation with respect to the collection of funds for the *financial support of Public Safety Answering Points* begin the process of creating it.

- That such legislation authorizing the collection of funds be crafted with a view to providing funding for the improvement of public safety communications, including 9-1-1 and NG 9-1-1, and that *100% of the funding received (minus any fees for collection) be set aside for the sole use of improving such public safety* communications systems.

- That a solution for the upgrade problems faced by secondary PSAPs be addressed in the discussions following this consultation.

- That the Public Safety community research *Cloud Computing* to determine if a regionalized (or provincial or national) facility for storing high NG 9-1-1 data volumes can save money and meet security requirements.

- That a *new institution be established* to provide governance to the 9-1-1 "brand" in Canada. It is further recommended that this institution's mandate would cover 9-1-1 issues such as a standard set of 9-1-1 services, a standard technical interface across the country, and a standard set of statistical reports that would allow cross-country comparison of services levels provided by PSAPs.

- That a *national workshop be funded* and scheduled to take the high level recommendations from the national submissions to the CRTC and further develop them into a draft national framework, or strategy, and develop a set of detailed action plans designed to further the strategy over the next three to five years.

- That provincial governments review existing or implement new *legislation limiting PSAP Liability* before implementing NG 9-1-1 in their jurisdiction.

- That *Position / Desk ID data* necessary to match ANI/ALI Information to a 9-1-1 call be supplied in a similar manner in the NG 9-1-1-IP solution.

- That a *new funding model be developed* to collect and reserve funds for the specific purpose of updating PSAPs.

- That a *National PSAP Registry be created* to allow PSAPs to more quickly handle call transfers to other jurisdictions and reduce the wait time for emergency dispatches.

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- That decisions made by the CRTC ***reflect the fact that more citizens are choosing wireless and VoIP telephones while less people are maintaining their copper line telephones***.

- *That **CITIG be granted a seat within ESWG** to bring the valued experience of the Tri-Services (Fire, EMS, Police) to the table.*

Appendix "A" – Assumptions on Text Messaging to 9-1-1

The Association of Public-Safety Communications Officials (APCO) published a paper titled *Text Messages in a PSAP Environment* in July of 2012. The full report can be found at: http://psc.apcointl.org/wp-content/uploads/APCO-Emerging-Tech-Text-to-9-1-1-Final1.pdf. The following is an excerpt from this paper.

> *"Despite the lack of data concerning prospective volume, there are some relatively reliable assumptions that can be made based upon other experience and knowledge. Included here are:*
>
> - *A text conversation will take longer to process than a voice conversation regarding the same amount of information.*
> - *The ability to actively interact with the caller is of benefit to the telecommunicator.*
> - *Unlike TTY/TDD usage, there is currently no "official" guide to abbreviations used in texting. Misinterpretation of abbreviations could lead to longer processing times and/or errors.*
> - *Background noises, tone of voice, and other audio clues are often used by telecommunicators to gain additional knowledge regarding emergency calls. These will be absent in text calls, just as they are now in TDD/TTY.*
> - *Processes to adequately deal with protocol driven interrogation will have to be adapted for use with Next Generation 9-1-1, as will policies for dealing with non-English speaking callers.*
> - *Human friendly interfaces between the systems that receive Next Generation "calls" will need to be developed. While this may more properly fall under the realm of technology, these interfaces must be intuitive, and to the degree possible seamless, in order to be easily understood and used by telecommunicators. As the number and type of devices used to contact 9-1-1 increases, these interfaces must keep pace with the demand.*
> - *The impact of clusters of Next Generation calls upon PSAPs must also be understood. We have seen the results of this phenomenon with regards to wireless telephony. How will this play out in the NG world?*
> - *Both telecommunicator training and internal policy must reflect the ever changing world of Next Generation.*

While the APCO paper goes on to provide more areas of concern, the above notes are sufficient to demonstrate that the ability to use Text-to-9-1-1 needs to be approached carefully.

APPENDIX "B" – Manitoba and New Brunswick Legislation Limiting PSAP Liability

Manitoba and New Brunswick have legislation regarding PSAPs. The legislation limits liability of PSAPs and establishes a structure for the funding of necessary 9-1-1 upgrades. ***Provinces without such legislation may wish to research and enact similar legislation to protect PSAPs and establish funding before NG 9-1-1 is implemented.***

Excerpt from The Emergency 9-1-1 Public Safety Answering Point Act, of Manitoba

Exclusion from liability

7(1) No claim shall be made against and no action lies or shall be instituted against the province, the minister, a municipality, a local government district, an emergency service provider, a licensed PSAP service operated on a non-profit basis or an employee or a volunteer engaged by any of them for any loss, damage or injury, up to and including death, suffered by any person by reason of anything in good faith done or omitted to be done by any of them in
(a) responding to an emergency 9-1-1 telephone call;
(b) acting at the request of an emergency service provider who is responding to an emergency 9-1-1 telephone call;
(c) operating a public safety answering point; or
(d) carrying out any responsibility or duty or exercising any power under this Act.

Further exclusion from liability

7(2) No claim shall be made against and no action lies or shall be instituted against an employee or a volunteer engaged by a licensed PSAP service operated on a for-profit basis for any loss, damage or injury, up to and including death, suffered by any person by reason of anything in good faith done or omitted to be done by the employee or volunteer in
(a) responding to an emergency 9-1-1 telephone call;
(b) acting at the request of an emergency service provider who is responding to an emergency 9-1-1 telephone call;
(c) operating a public safety answering point; or
(d) carrying out any responsibility or duty or exercising any power under this Act.

The URL for the complete Manitoba legislation that protects PSAPs is:
http://web2.gov.mb.ca/laws/statutes/ccsm/e085e.php
Please note section 7(1) and 7(2).

Excerpt from Emergency 9-1-1 Act (R.S.N.B. 2011, c. 146), of New Brunswick

Protection from liability

8 The Province, the Minister, a person who enters into an agreement with the Minister under subsection 4(1), a telecommunications service provider, a municipality, an emergency service provider or an employee or a volunteer engaged by any of them is not liable for any loss or damage suffered by any person by reason of anything in good faith done or omitted to be done by the Province, the Minister, the person who enters into an agreement with the Minister under subsection 4(1), the telecommunications service provider, the municipality, the emergency service provider, the employee or the volunteer under the authority of this Act or the regulations.
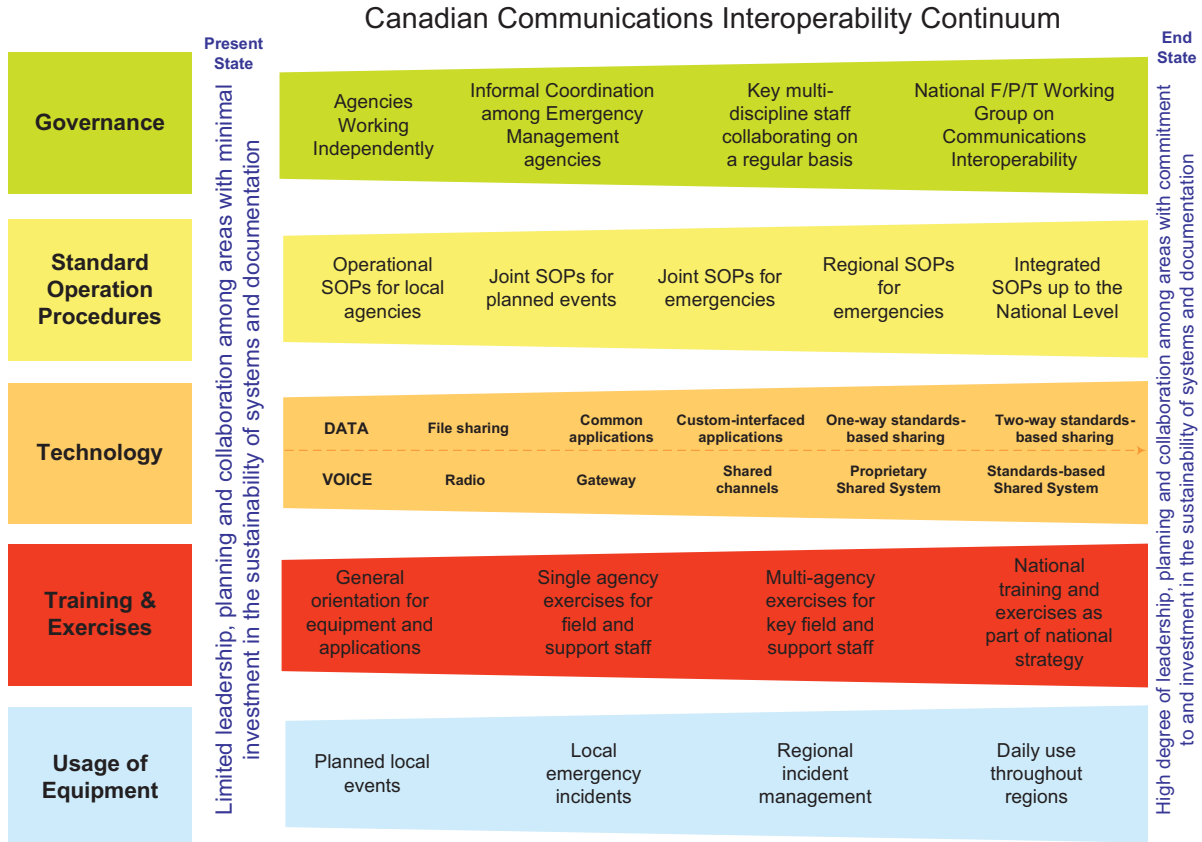
The URL for the complete New Brunswick legislation that protects PSAPs is:

http://laws.gnb.ca/en/ShowTdm/cs/2011-c.146//
Please use the section selector and compare Section 8 for a discussion of liability.

APPENDIX "C" – The Interoperability Continuum

The Interoperability Continuum demonstrates that implementing major interoperability projects is not just a technology issue, as is sometimes assumed. Rather there are five distinct levels that all contribute to the success of the project.

Canadian Communications Interoperability Continuum

	Present State → End State
Governance	Agencies Working Independently — Informal Coordination among Emergency Management agencies — Key multi-discipline staff collaborating on a regular basis — National F/P/T Working Group on Communications Interoperability
Standard Operation Procedures	Operational SOPs for local agencies — Joint SOPs for planned events — Joint SOPs for emergencies — Regional SOPs for emergencies — Integrated SOPs up to the National Level
Technology	DATA: File sharing — Common applications — Custom-interfaced applications — One-way standards-based sharing — Two-way standards-based sharing VOICE: Radio — Gateway — Shared channels — Proprietary Shared System — Standards-based Shared System
Training & Exercises	General orientation for equipment and applications — Single agency exercises for field and support staff — Multi-agency exercises for key field and support staff — National training and exercises as part of national strategy
Usage of Equipment	Planned local events — Local emergency incidents — Regional incident management — Daily use throughout regions

Left axis: Limited leadership, planning and collaboration among areas with minimal investment in the sustainability of systems and documentation

Right axis: High degree of leadership, planning and collaboration among areas with commitment to and investment in the sustainability of systems and documentation

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