



Ontario 9-1-1 Advisory Board

**WIRELESS ENHANCED 9-1-1
TRIAL REPORT**

April, 2002

A Joint Effort to Enhance 9-1-1 Call Routing & Delivery from
Wireless Devices

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Trial History

Between February 23, 2000 and June 27, 2000 the Ontario 9-1-1 Advisory Board (OAB) tabled several letters (see Appendix 1) offering to conduct a Wireless Enhanced 9-1-1 Trial in Ontario. On September 28, 2000 the Ontario 9-1-1 Advisory Board (OAB) held the first meeting to establish the criterion for this Wireless Enhanced 9-1-1 Trial. One of the main objectives was to address concerns with regards to the lack of useful call associated data provided on wireless 9-1-1 calls. The attendees consisted of numerous industry representatives from the Wireless Carriers, the Public Safety Answering Points (PSAP's), the OAB, the provincial 9-1-1 Service Provider (Bell Canada), the Canadian Radio-television and Telecommunications Commission (CRTC), the Canadian Wireless Telecommunications Association (CWTA) and the Montreal Urban Community (MUC) 9-1-1. Over the next several months the Trial Team met on numerous occasions to review technical, operational, legal and regulatory implications surrounding the complex issue of how to best proceed with the Wireless Enhanced 9-1-1 Trial.

On December 11, 2000 the Trial participants (Toronto and York Region, Bell Canada and the four Wireless Carriers; Bell Mobility Cellular Inc., Rogers Wireless Inc., Microcell Connexions Inc., and TELUS Mobility) as well as invited parties (OAB, CRTC, CWTA and MUC 9-1-1) signed a non-disclosure agreement allowing for comprehensive Trial discussions to begin.

January 16, 2001 the OAB submitted a letter to the CRTC advising of the Commission of the Trial participants intent to use 5-1-1 as the NXX for the Emergency Services Routing Digit (ESRD). (see Appendix 6) The ESRD is a non-dialable number used to identify cell sites to municipal PSAPs. The OAB further requested a policy decision to reserve NXX 5-1-1 for Emergency Service Routing Digits (ESRD) purposes. The CRTC was requested to take whatever interim steps necessary to prevent the assignment of NXX 5-1-1 in NPAs 416, 647, 905 and 289 until such time as contributions could be developed and submitted to the Canadian Steering Committee on Numbering (CSCN). The CRTC approved the OABs request on February 16, 2001.

During the months of May and June 2001, the Toronto and York PSAPs undertook the training of 348 calltaking, supervisory and system support staff (Toronto Police Service 274 members, York Region Police Service 74 members) regarding the technical and procedural impact of the enhanced wireless data from the trial area.

An important step in preparation for the live trial was call testing by each carrier through the Bell Canada 9-1-1 Public Emergency Reporting Service (Bell Canada 9-1-1 PERS) to each PSAP. Due to extensive test plans submitted by the carriers and in order to limit the impact to the live 9-1-1 centre operations in Toronto, work was undertaken by Toronto Police Service ITS personnel and Bell Canada to establish an isolated/controlled "test bed" environment at their back-up centre. This centre was staffed over a four day period to accommodate the needs of the carrier interoperability testing.

A Memorandum Of Understanding (MOU), which defined the terms, conditions and obligations of the trial participants was signed on May 16, 2001, allowing the trial to proceed to subsequent stages. Pre-trial testing between the Wireless Carriers, the 9-1-1 Service Provider and each PSAP commenced on June 7, 2001. A coordinated conversion of emergency traffic from line-side trunk groups to E9-1-1 trunk groups within the trial area commenced on June 19, 2001 and completed on July 10, 2001.

This report presents the findings from the Ontario 9-1-1 Advisory Board and the Toronto/York Region Wireless Enhanced 9-1-1 Trial. Included are the technical features as implemented, tested and performed for the routing of wireless 9-1-1 calls to the Bell Canada 9-1-1 PERS. This Wireless E9-1-1 Trial took place within specified geographic boundaries in the Toronto and York Region 9-1-1 serving areas.

It should be noted that as part of the MOU agreement, an Interim Trial Report was developed to allow the 9-1-1 Service Provider to confirm whether the wireless E9-1-1 functionality provided during the Trial was considered appropriate for a formal service offering in its' operating territory. The Interim Trial Report further provided all Parties with the opportunity to express any concerns, highlight outstanding issues and to put forth recommendations for improvements to the proposed service. These issues were assessed and considered prior to the Bell Canada tariff filing. The Interim Trial Report was scheduled to be completed three (3) months after the start of the live stage of the trial.

Based on the results included in the Interim Trial Report and the 9-1-1 Service Provider's internal lab testing, the 9-1-1 Service Provider filed a tariff (Bell Canada Special Facilities Tariff Item G-310 - Wireless Service Provider Enhanced 9-1-1 Service (WSP E9-1-1 Service) with the CRTC.

On December 21, 2001 the CRTC approved on an interim basis, the tariff and agreement for WSP E9-1-1 Service, effective January 1, 2002. In order to allow for various service deployment activities to take place pursuant to the CRTC's interim tariff approval, the trials' end date was extended to February 28, 2002.

Throughout the pre-trial time period, preliminary activities initiated by individual parties included: (at the minimum)

Wireless Carriers

- Establish a 7X24 contact point to investigate and respond to PSAP queries
- Define and establish an ESRD process (assignment, datafill, ALI data transfer, corrections, etc.)
- Test case preparation and execution for pre-trial validation

PSAPs

- Staff training and establishment of new procedures
- Set-up of a test bed environment for pre-trial validation

9-1-1 Service Provider

- 9-1-1 tandem switches hardware and software upgrades
- Create interconnection guidelines for wireless carriers
- Test case preparation and execution for pre-trial validation

Technical Overview

The wireless interconnection to the Bell Canada 9-1-1 Public Emergency Reporting Service (9-1-1 PERS) network has traditionally been accomplished using line-side connections. As a result, the name of the wireless carrier is the only information available to a PSAP answering the call. Information such as the location of the caller or the identity of the subscriber is missing and must be obtained through other means.

The Ontario 9-1-1 Advisory Board, in an effort to further the Trial initiatives of TELUS in Alberta and the national CWTA Wireless E911 Working Group to a level appropriate to the 9-1-1 PERS network architecture deployed in Ontario and Quebec, requested that CWTA (on behalf of the Wireless Carriers operating in its territory) and Bell Canada conduct a Wireless technical trial using the 9-1-1 PERS network.

The Wireless E9-1-1 Trial was designed to assess the viability of the voice, data and database network technology and architecture deployed for the Toronto/York Region Wireless E9-1-1 Trial.

The Wireless E9-1-1 Trial architecture deployed in the trial areas is known as "Hybrid". It provides a Call-path Associated Signalling (CAS) arrangement between the wireless mobile switch and the 9-1-1 Tandem Switch and a Non Call-path Associated Signalling (NCAS) arrangement from the 9-1-1 Tandem Switch and to the PSAPs. This arrangement ensured that the conventional 9-1-1 capabilities were not impacted for PSAPs and wireline customers.

The technical Wireless E9-1-1 Trial verified the suitability of using Integrated Services Digital Network (ISDN) User Part (ISUP) 9-1-1 interconnection trunking, of the American National Standards Institute (ANSI) in Signalling System #7 (SS7) / Common Channel Signalling #7 (CCS7) protocol specifications, between the Wireless Carrier switches and Bell Canada 9-1-1 tandem switches as well as between Bell Canada 9-1-1 tandem switches.

This 9-1-1 dedicated trunking arrangement provided the ability to pass ESRD and call back number information from the wireless networks to the 9-1-1 network and within the 9-1-1 network. The ESRD is a 10-digit number assigned to cell sites/sectors and is used to provide routing information to the 9-1-1 tandem to enable selective routing of the wireless 9-1-1 calls in order to reach the designated PSAP. The ESRD and associated cell site/sector address information is also displayed on the PSAP's Automatic Number Identification/Automatic Location Information (ANI/ALI) display terminal and printer. It is used by emergency personnel to identify the location of the originating cell site/sector where the 9-1-1 call entered the wireless network. Forwarding the callers' mobile (aka call back number) to the PSAP provided emergency personnel with the opportunity to immediately return a call to the caller if an unexpected disconnect occurs. The call back number (CBN) also provided the PSAP with the option of contacting the Wireless Carrier to obtain additional information regarding the subscriber.

Summary of Trial Documentation

A copy of the Memorandum of Understanding (MOU) dated May 16, 2001 is included in Appendix 3. A trial extension amendment was completed by e-mail on December 18, 2001. Next is an explanation of the various components of the MOU:

- Body of the MOU – defines limits of liability and approval of the Trial participants.
- Trial Area (Schedule ‘A’) – details the agreed upon Trial Area coverage at a macro level. Each of the Wireless Carriers has coverage areas that are specific to their respective cell site deployments. The Trial Area provided the opportunity for call processing in both rural and urban settings.
- Trial Architecture (Schedule ‘B’) – is a high-level block diagram of the physical architecture of the Trial. It includes trunking arrangements, Emergency Services Routing Digits (ESRD), call flow, and network data elements (see Schedule ‘C’ for full details). Certain engineering level interconnection information that appears in the MOU and therefore are not included in this appendix.
- Data Elements & Presentation (Schedule ‘C’) – is a complete package of information that was used to create an Automatic Location Information (ALI) record to be associated to an Emergency Service Routing Digit (ESRD) for the trial. Each Wireless Carrier has established an automated data interconnection. The 9-1-1 Service Provider has processed a unique record for each wireless cell site/sector as provided by the Wireless Carrier. This record provided wireless cell site/sector associated ESRD and ALI address information at the PSAP call taker position that is currently not available for wireless calls.
- Trial Plan (Schedule ‘D’) – the Trial Plan is a complete list of technical and operational activities necessary to proceed with the Trial. The dates listed in this Schedule were only targets; a working version of the Trial Plan was kept to track the actual dates for each of the participants.
- Preliminary Assessment Factors for the Interim and Final Trial Reports (Schedule ‘E’) – this Schedule provides a preliminary list of assessment factors to be used to evaluate the success of the Trial.
- Detailed Carrier Interoperability test plans (Proprietary Carrier technical information and therefore not included in this report)
- Correspondence pertaining to the OAB request to the CRTC for approval of the use of universal NXX “5-1-1” for Emergency Service Routing Digit (ESRD) purposes (refer Appendix 6)

Trial Goals and Considerations

Goals of All Trial Participants

1. Interconnection to the existing 9-1-1 PERS platform
2. Display of 10-digit wireless Call Back Number and cell site/sector identification
3. Transfer of information to secondary PSAPs
4. Improvements through ESRD routing to multiple PSAPs
5. 24 x 7 access to Wireless Carrier subscriber information (i.e., name/billing address) via telephone access

Important Considerations

1. The solution for these goals must be scalable to the Bell Canada 9-1-1 PERS network elements and infrastructure similar to those deployed in the trial area. It is noted that Bell Canada utilizes at least one PSAP technology (Line Digital to Trunk PSAP (LDT-PSAP)) within its 9-1-1 PERS network that was not available in the trial area and that was assessed separately. While conclusive, the results of these assessments are not included in this report.
2. The solution(s), as much as practical, should not result in stranded investments for any of the parties involved.
3. The trial should provide meaningful and useful information to the PSAP calltakers with little or no impact to existing terminal equipment.

Detailed Assessment

Assessment of the viability of the technology and architecture for the Trial

1. Validate the regular routing arrangement of Wireless Carrier E9-1-1 traffic to the proper PSAP using 10-digit ESRD;

In general, the routing of wireless 9-1-1 calls has improved. The fact that each cell site/sector needed to point to a designated primary PSAP enabled the selection of the preferred routing arrangement. However, the routing of calls between the two PSAP boundaries would seem to be improved but remains subject to dynamic radio coverage issues. Tower sites located on Steeles Ave. or geographically within several blocks of this municipal border are still subject to the natural characteristics of radio transmissions when it comes to routing the calls to the designated PSAP. Within the first month of the trial, several sites were immediately identified as continually misrouting calls to Toronto from York Region. The enhanced data from the trial area provided the information needed to specifically identify the cell sites in question in order to remedy the situation. This was not possible in the past. The wireless E9-1-1 calls that were presented to the 9-1-1 tandem switch with a valid 10-digit ESRD number were routed based on the predetermined routing specifications.

2. Validate the appropriateness of overall default routing arrangements with the addition of Wireless Carrier E9-1-1 traffic;

Wireless E9-1-1 traffic required special default assignment and treatment. Activities related to this trial had an important impact on the basic default assignment. To support the redundant accesses and intra-tandem trunking requirements, the trunk signaling specifications necessitated that the existing default assignment rationale be modified to circumvent call flow incompatibility. From a wireless network perspective, at least one wireless carrier indicated that the appropriateness of the overall default routing arrangements, with the addition of Wireless Carrier E9-1-1 traffic, has been validated from its perspective.

3. Validate the overflow routing arrangements (i.e., at the mobile switch and between tandem switches) of Wireless Carrier E9-1-1 traffic to the proper PSAP using 10-digit ESRD;

During the trial, from the 9-1-1 Service Providers' perspective, in part due to the large amount of 9-1-1 trunk members in each trunk route and the low volume of simultaneous wireless 9-1-1 calls, there was no indication that the overflow routing arrangements were used. Nonetheless, during the carriers' interoperability testing

phase, calls were overflowed as per specifications. Overflowed calls, with missing ESRD identifier in the database, were processed and routed by the secondary 9-1-1 tandem switch using the incoming trunk group default routing identifier. That situation directed the need for default assignment changes identified at point #2. The Wireless Carriers confirmed that the overflow arrangement implemented in their mobile switch was tested positively during the trial.

From the wireless perspective, overflow routing functioned as expected whereby calls forced onto a secondary route would be delivered to the proper PSAP. Depending upon the network architecture employed between the Wireless Carrier and the 9-1-1 Service Provider for the trial, caller identification and caller location may not be available to the PSAP during rerouting situations.

4. Determine availability of 9-1-1 features (e.g., call control, ringback, hook switch status) with respect to Wireless E9-1-1 traffic;

Wireline based 9-1-1 features as described by the National Emergency Number Association (NENA) in document NENA-04-001 (entitled “NENA Recommended Generic Standards for E9-1-1 PSAP Equipment”) were tested throughout the trial period. Features such as call control, ringback and hook switch status were included in pretrial testing and were found not available.

While the 9-1-1 network is designed to support wireline E9-1-1 call control features, none of these features were found to be technically possible for wireless technology at this time. However, they are certainly enhancements the PSAPs would like to see explored further. They would be particularly useful in cases where a subscribers' handset accidentally dials 9-1-1 multiple times. The Toronto PSAP found that once the first call taker releases a line to do a call back, a second call can be immediately initiated to 9-1-1 by the same offending handset. In the meantime, the first call taker phones back to voicemail while the second call taker is attempting to deal with the second false call. Call records have shown this situation can repeat itself a half dozen times or more within minutes. Call control features similar to those available on wireline calls would reduce the enormous amount of cumulative time spent by call takers attempting to contact these subscribers. It should also be noted that these same subscribers are also not aware their private conversations are being overheard and recorded.

In addition, wireless customer features, such as 3-way calling; call waiting and automatic line (or hotline) have been modified by wireless switch vendors to support E9-1-1 services. These and other calling features were verified to ensure conflicts were not present during E9-1-1 calls.

5. Validate the selective transfer of Wireless Carrier 9-1-1 calls to the proper secondary PSAP using 10-digit ESRD;

Where applicable, the basic wireless call transfer scenarios to a secondary PSAP, and between PSAPs, were tested with positive results for both voice and ALI display.

The Toronto Police Service PSAP did not utilize the PERS selective transfer feature since there is only one ESN in the trial area. However, all calls transferred via the 9-1-1 network to the Toronto Ambulance and Toronto Fire Service Communications Centres were successfully routed with the associated ESRD information.

Technically, York Regional Police was a secondary PSAP with Bell Neutral Answering Service (BNAS) providing the initial point of contact at the time of the trial. It has been the experience that information and calls are being appropriately routed to York Region, including the Fire and EMS Services that answer independently from the Police.

6. Assess and define the appropriate provisioning guidelines required for congestion management (congestion control) for wireless CCS7 ISUP 9-1-1 trunk group and trunk group's member (e.g., similar grade of service, as provided for wireline 9-1-1 service);

From a 9-1-1 Service Provider perspective, the appropriate provisioning guidelines required for congestion management were not validated during the trial. While two wireless carriers have elected to implement redundant trunking that provides for full wireless functions, the two others have elected to retain an overflow to their existing line-side trunk arrangement, as a safety valve. It was identified that more voice channels were provisioned per wireless trunk group to support the fundamental quality of service than recommended for such a network configuration.

From a wireless perspective, it was not possible to provide the required grade of service with overflow routing capabilities and automated congestion management control in the wireless switch due to limitations in vendor software. Based on NENA-04-001, grade of service was considered to be a higher priority than congestion management and without historical 911 traffic data to assist in determining the 9-1-1 trunking requirements for the trial, over provisioning occurred between the wireless switch and the E9-1-1 Tandem.

7. Determine the overall call delivery time improvement using CCS7 ISUP trunking;

Although this factor was not tested nor measured during the trial period, the fact is calls encountered a shorter setup and delivery time from time of origination to PSAP answer. Improvements of up to 40% are expected over MF trunks currently used for emergency calls for the following reasons:

- a. SS7 call setup establishes the talk path in conjunction with the messaging path whereas MF signalling must seize a trunk before forwarding information (digit strings) across the trunk

- b. Wireless Carriers would require fewer switching elements to establish a connection to the PSAP as a result of the direct connections to the E9-1-1 tandems
- 8. Validate the display of 10-digit cell site/sector's ESRD and wireless caller's 10-digit call back number information on call taker display terminals and/or PSAP ANI/ALI printers;**

The two 10-digit fields [ESRD and CBN] associated with the wireless E9-1-1 calls were presented to the PSAP's printer and where applicable to the display terminal equipment. In cases where the PSAP's terminal equipment could not display the CBN information, a substitute display was provided.

The 10-digit call back number delivered to the Toronto PSAP in the CAD data stream uses a different format than the wireless ESRD and wireline telephone number displayed in the Automatic Number Identification (ANI) field. The 12-character ANI field is created from the extract of two data streams (i.e., 3-digit Area_Code (NPA) and 8 alphanumeric characters Telephone_Number (NXX-XXXX)) and the insertion of a space. The wireless ESRD and wireline telephone number is sent to and displayed by the Toronto PSAP CAD in the ANI field as follow:

416 808-2222

NPA(space)NXX(dash)XXXX

The wireless call back number (CBN) is sent to the CAD in a single data stream of 10 digits:

4168082222

NPANXXXXXX

It was noted that at the same time, where a hardcopy printer is available, the ANI/ALI display is manipulated by the ALI computer to present the wireless call back number in a similar format as the wireless ESRD and wireline telephone number, due to printer's data processing inability. The wireless ESRD and wireline telephone number is sent to and presented by the printer in the ANI field as follow:

511-1234 (416)

NXX(dash)XXXX(space)(left-parenthesis)NPA(right-parenthesis)

While the call back number information is sent and presented in the new CBN field as:

CBN#:555-9483 (416)

CBN(number-sign)(colon)NXX(dash)XXXX(space)(left-parenthesis)NPA(bracket)

While ALI-CAD data stream design intent, this CBN's CAD standard display directly impacts the ability of the Toronto PSAP to search for CAD events by telephone number after a call for service has been processed and is difficult to read on the terminal display.

PSAPs that want to display the CBN field information in the similar format as the ANI/ESRD field must make sure that the CAD vendor or IT personnel apply the required software coding/fix to insert the additional characters to the CBN string.

As of February 28, 2002, approximately 44,095 calls with a valid ESRD number had been routed to the Toronto PSAP. A very small percentage of calls were received with associated data error messages of "No ANI/ALI Address", due to a missing ESRD record in the ALI database. In these cases, the ESRDs and associated cell site addresses were not available to the calltaker. However, these calls were still routed to the proper PSAP with the subscribers' call back number as part of the display. These data errors were resolved on a carrier by carrier basis.

York Regional Police were unable to integrate the ANI/ALI information to their 20 year old computer aided dispatch (CAD) system. The programming effort could not be justified given the fact that a new CAD system is to be implemented within the next year. A manual count of calls is being undertaken to provide actual numbers however this is a slow process. The ANI/ALI information that would be displayed on a CAD terminal is successfully reaching the 9-1-1 printer.

As of February 28, 2002 most of the approximately 9,152 calls with a valid ESRD number had been routed to the York Regional Police secondary PSAP.

9. Assess the impact on the 9-1-1 Service Provider, Wireless Carriers and PSAP personnel of creating ESRD records, managing and keeping the location (cell site/sector) information up to date as patterns change, new cell sites/sectors are added, correct cell site/sector become evident and as PSAPs provide feedback of problems;

Each Wireless Carrier was required to implement and use the existing electronic data file transfer process. As the ESRD record played a critical role in performing accurate call routing and display of location information for wireless E9-1-1 calls and the fact that some records were created incorrectly and required reload, that impacted the data provisioning process.

New processes were established to create, manage and remove ESRD records from the wireless switches, internal databases and the ALI database. Cell site administration within the trial area was more complex due to co-ordinated communication flow necessary between internal departments to properly administer ESRD information.

Internal databases were enhanced to administer ESRD assignment to avoid duplication and to maintain a correlation between cell site and ESRD.

Three wireless carriers encountered difficulties setting up the ESRD records data transfer method, due to transfer mechanism and encoding scheme criteria specific to the existing Bell Canada 9-1-1 PERS Data System. The inability to meet the existing encoding scheme increased the data transfer time for ALI updates.

Improvements to the error reporting process may be necessary between the PSAP and the Wireless Carrier to promptly amend incorrect or missing ESRD information. The current process, while adequate for the trial, may be susceptible to delays following network rollout.

10. Assess the impact on the 9-1-1 Service Provider, Wireless Carriers and PSAP personnel of managing 9-1-1 voice network and data system changes;

From the 9-1-1 Service Provider perspective the trunk provisioning did not follow the quality of service specified for the Bell Canada 9-1-1 PERS voice platform. It was highlighted that failure to provision the trunk accesses accordingly to established industry standards could impact emergency call delivery and put at risk the overall 9-1-1 network integrity and cause PSAP access congestion.

From a wireless perspective, managing the current 9-1-1 voice network falls within the current practises used for trunk monitoring. Additional evaluation will be necessary for rollout areas where new facilities are required.

11. Determine if the processing and display of ESRD, call back and ALI information is acceptable.

In general, the processing and display of ESRD, call back and ALI information was acceptable. An alternate display was provided for cases where the ESRD and/or CBN information was missing. The physical address information of the cell site location was provided in the record's name field. It was identified that having the Wireless Carrier's name displayed first in that field may restrict some of the information from being readily available to the 9-1-1 call takers using a Computer Aided Dispatch (CAD) terminal with a limited display name field size. PSAP specific comments are referenced in paragraph 8.

Assessment of the improvement to public safety and PSAP operations due to handling and managing Wireless E 9-1-1 calls

- 1. Determine if the receipt of call back number and cell site/sector information has improved the ability to handle wireless 9-1-1 calls;**

Callback Number

- This has been very helpful given many callers don't even seem to remember their own cell phone number. Either they are not in the habit of giving it out or similar to wireline customers they sometimes draw a blank during the emergency situation.
- Though difficult to quantify, the number of multiple false calls from handsets would seem to be reduced, as we are now able to contact the user. Further, it has allowed us to more quickly contact parents who have given their handsets to their children to play with which also results in numerous false calls to 9-1-1.
- The call back number has been especially useful in cases of "Unknown Trouble" type 9-1-1 calls where the call taker has been unable to obtain any useful information before the wireless connection is gone. (caller hangs up or cell connection interrupted)
- The call back number proved beneficial for quickly re-establishing voice contact with callers. Traditionally, our call takers would spend inordinate amounts of time listening on the line attempting to determine if the caller and/or background noise were possible indications of a potential emergency being reported.

Cell Site/Sector

- The cell site/sector information has been beneficial in a variety of ways. It has taken the existing situation of a Toronto 9-1-1 call taker attempting to determine where, within an approximate 600 square kilometre area (York Region 1,756 square kilometers) an emergency situation is occurring, to a more succinct part of the City.¹ Examples submitted by call takers are as follows;
 - a) The cell site address was used by a call taker to assist a caller who was involved in a personal injury accident but had no idea where they were. The cell address was used as a reference point to help the caller figure out their location.
 - b) The cell site address was used by a call taker after a male reported a fight on a street, but hung up the phone before the street number information could be obtained. While calling back to the complainant, the call taker used the cell

¹ Generally found to be true most of the time, but there are still instances where the cell site address has no identifiable geographic relevance to the location of the emergency

site address to check the CAD system to determine if any other emergencies had also been reported nearby. (150 meter radius). It was immediately determined that another caller had reported a fight nearby the cell site address and as a result the call taker was quickly able to verbally confirm with her caller that the incident was one and the same.² This would never have been possible if the call had come from outside the trial area.

- c) The cell site address was used to locate a male caller making crank calls to 9-1-1. We were actually able to narrow down the area where he was calling from, using the cell site info to question him further. Officers checked the general area and one constable spoke with a gas station attendant. The attendant advised that two males in a car, who were talking on a cell phone, had just left the station lot. We are not sure if the Officer spoke to these males, but the crank calls immediately stopped.

2. Determine if the receipt of cell site/sector data improves the efficiency of call takers when dealing with multiple calls for the same incident;

The Toronto and York Region PSAPs did not find the cell site/sector data improved the efficiency of dealing with multiple calls from the same incident. Most call takers felt that due to the need to be extremely specific and accurate with call locations, they were hesitant to make any multiple call decisions based on cell site information. This might be considered more of an urban issue since it is not unusual to have multiple, unrelated emergency calls within the same city block at same time.

3. Determine the utility of providing wireless coverage maps for locating caller's originating zone and for reference purposes;

Neither the Toronto nor York Region PSAPs were able to operationally utilize the wireless coverage maps provided by two of the four carriers. One was too small and the other too large to post in the Comm. Centres. However, the maps did prove useful as a training tool in providing 9-1-1 staff a visual insight of what exactly is meant by “cell site coverage areas”.

These maps were also useful in reviewing calls from the trial area after the fact. They were a good tool for assessing the validity of the location of the cell sites versus the location of the emergencies that had been reported. They also proved useful for trouble shooting when following up on mis-routed calls from the York Region/Toronto trial areas.

However, given the inherent uncertainty of any attempt to trace radio coverage boundaries, the continuous variations in these boundaries resulting from mobile traffic load and radio propagation effects, and the frequent changes made by wireless carriers to their coverage architectures, the wireless carriers are generally of the view that the administrative effort and expense that would be required to provide reliable

² This type of CAD address search functionality is not available in all Ontario PSAPs

up-to-date cell site/sector coverage maps to PSAPs would far outweigh the utility of the maps.

4. Determine if the timing, in terms of display of the ALI information to the call takers, is different than current wireline timing;

There was no discernible difference between the timing of the two types of ALI delivery in the Communications Centres.

5. Identify any problems with the delivery of accurate cell site/sector information;

The impact to the Toronto and York PSAPs has been minimal. Routing and data record correction has been a relatively simple process of electronically notifying the appropriate carrier representatives with the corresponding call record information.

6. Identify the operational and administrative impacts caused by the display of false call back numbers from unsubscribed handsets;

A small percentage of the calls were received from unsubscribed handsets in the Toronto PSAP. In cases where the original call back number was translated into a recognizable, non-dialable number (e.g. 060-911-XXXX, 570-911-XXXX) per switch the issues were two fold. Firstly, as a 9-1-1 Call taker and Supervisor training issue to understand the meaning of the display and the implications. Secondly, the implications being that in the event further information was needed on the call to send a response, it is not possible to re-establish contact with the caller.

On a going forward basis, wireless carriers, regulatory authorities, legislative bodies and PSAPs should consider means of addressing the issue of those customers who no longer subscribe to a Wireless Carrier but continue to hold on to their handset with the view of using it only in cases of emergencies.

In circumstances where the unsubscribed handset continued to display the old call back number, the problem proved not only confusing for 9-1-1 staff but frustrating/upsetting to the current customers.

- a) A current subscriber was continually called back due to numerous hangup calls from the old handset over a period of months. He was out of the country several times when this occurred. He was not only concerned about the long distance charges incurred during our callbacks, but also when it was explained why this was happening, was very uncomfortable about the time spent by 9-1-1 staff chasing these false calls.
- b) One evening a male caller was continually placing obscene calls to the female call takers of the Toronto PSAP. After placing dozens of these calls, this same males' handset signal happened to get picked up by a cell site within the trial area. Subscriber information was obtained from the Wireless Carrier and officers

dispatched to the home address. Fortunately for the current customer, the calls continued to be received in the Comm. Centre while police were inside their home and in possession of the current subscribers' handset. The suspect has yet to be found. Police have therefore learned that the ANI display can be ambiguous in such situations and is not always useful in identifying the proper suspects.

- c) A young child placed several calls to 9-1-1 saying they were lost. Attempts to verbally obtain any useful information from the child proved fruitless before the calls were disconnected. Call back to the number displayed was to a customer that had no children in the house. While it is believed these were probably false calls, we were never able to confirm one way or the other.

7. Identify the operational and administrative impacts caused by the display of call back numbers from uninitialized and unprogrammed handsets;

As described above in the first paragraph of Item 6,

8. Identify the operational and administrative impacts caused by the display of call back numbers from North American and international roaming callers;

Non-identified – 99 percent of the calls to the Toronto PSAP were from handsets with a 416/647 area code. In York Region approximately 30% were 416/647 and the remainder 905/289. However there were 9-1-1 calls from handsets with call back numbers from all over the country and the continent. This included the Yukon, California, New York, Florida, etc. In the Toronto PSAP as per past practice, long distance access is only provided to 9-1-1 Supervisors. For the purposes of the trial, this internal policy remained in place. It was a rare occasion where a long distance call back was required and therefore the impact was minimal.

9. Identify the operational and administrative impacts caused by the display of call back numbers from international handsets;

None identified by either York or Toronto.

10. Identify instances where the call back number is utilized for investigative purposes (i.e. to identify or re-contact a caller);

- a. Break and enter in progress to a residence. Re-establishing contact with the caller to gather further information for the responding units resulted in the arrest of two suspects. The reluctant witness agreed to meet with officers about a half-hour after the original call at a confidential location nearby.
- b. Call back number used to find a witness to an impaired driver that later caused a motor vehicle accident.

- c. Conversely, there was recently a triple shooting at a nightclub in Toronto, but outside the trial area. There were 10 calls in total to 9-1-1, 9 of which came from cellular phones. Only 4 of those callers were willing to verbally provide their call back numbers leaving 5 witnesses to this crime unaccounted for.

11. Identify instances where the call back number assisted in identifying nuisance or abusive callers;

The Toronto Police Service has two ongoing investigations for public mischief calls to 9-1-1. One pertains to dozens of false calls, which resulted in the unnecessary dispatch of Police, Fire and Ambulance crews. The second pertains to a verbally abusive caller who placed over sixty calls to the Toronto PSAP during a two week period. While neither situation was a direct result of call back numbers displayed from within the trial area, it is believed that the improved co-operation with the wireless carriers assisted in a quicker resolution to these public mischief incidents.

12. Analyse the effect on average total call duration (i.e. dialed digits to hang-up by the caller or primary/secondary PSAP) during the trial period [comparison of Wireless Carrier pre-trial samples versus their measurements during the trial];

These statistics were not captured before the start of the trial. As a result, we were unable to verify this assessment factor. PSAPs were also unable to analyse this factor due to a lack a historical data.

13. Determine number of actual dispatches to wireless 9-1-1 callers that are made during The Trial due to availability of cell site/sector data where none would have been possible before which is an assessment of the impact of having map information to locate callers.

York Region Police were able to locate a male suicidal caller in time to save his life. This was as a result of piecing together the cell site address, call back number and other information to pinpoint his location.

14. Determine if the problem resolution and emergency tracing procedures developed for The Trial resulted in improved response from Wireless Carriers to PSAP requests for assistance or information.

While the overall response to requests for information from PSAPs to Wireless Carriers has significantly improved during the trial, it still can sometimes be an unpredictable response situation after regular business hours. It was found that even during regular business hours, if the wrong person at the Wireless Carrier contact number happened to answer the phone, the PSAP supervisor could be directed to FAX the request.

PSAP Supervisor training and internal Comm. Centre procedures need to be further enhanced/formalized. Work is ongoing in the Toronto PSAP to provide Supervisors

with more a specific set of procedures to follow when contacting any Wireless Carrier. This will include a point by point type of “script” to be followed when leaving a message for any Wireless Carrier contact number.

Some Wireless Carriers suggested that 9-1-1 Supervisors move on to calling the second telephone on their contact list if there has been no response from the first one after five minutes. While this may seem reasonable in theory, it was found not always workable. Typically a 9-1-1 Supervisor has many other responsibilities and it was found sometimes ten minutes or more would pass before they realized the Wireless Carrier had not returned their call.

Observations & Recommendations of Trial Participants

Wireless Carrier Cell Site Data

Recommendation: The wireless carriers are generally of the view that cell sector azimuth data (i.e. a given sector's cardinal direction expressed in degrees from True North) can be included in wireless ESRD records on a sector-by-sector basis, and is objective, reliable and practical to administer on a going forward basis.

PSAP Technical

1. **Observation:** Traditionally all 9-1-1 dialed calls, both wireline and wireless have been delivered to the PSAP with a single telephone number on a CAD data spill, display terminal or hardcopy printout. Each call from the trial area was delivered with two telephone numbers (ESRD and CBN). The Toronto Police Service CAD system already had an existing field on the calltaker screen to accommodate a second telephone number. This field had been traditionally used for entering an additional telephone number sometimes required for the handling of third party emergency calls. This same pre-existing telephone number field was utilized for the display of the second telephone number (CBN) delivered with calls from the trial area.

York Region was not in a position during the course of the trial to modify their existing CAD equipment to display the second telephone number (CBN) and chose to use their hardcopy printer as an interim solution.

Recommendation: PSAPs need to determine ahead of time where to display the 10 digit call back number. This may or may not require some technical modifications to the existing CAD or other terminal equipment.

Recommendation: Many PSAPs download 9-1-1 call data from their CAD systems to Record Management Systems (RMS) for search and retrieval at a later time. Typically these records are used for trouble shooting or court purposes. This was the case in Toronto and the CAD RMS needed to be upgraded to capture the new call back number. PSAPs that make modifications to their CAD system for the display of the 10 digit call back number may also need to take into consideration any impact to associated Record Management Systems.

2. **Observation:** An important goal for the Ontario Trial was establishing the technical ability to transfer the Enhanced Wireless E9-1-1 data to secondary agencies. This 9-1-

1 software feature was not available at the time of the Alberta Trial. This functionality did prove technically feasible during the Ontario Trial and secondary agencies also had the same CAD considerations as PSAPs.

Recommendation: Secondary agencies in Ontario and Quebec need to determine where to display the 10 digit call back number prior to implementation of the WSP E9-1-1 Service in a given area. This may or may not require some technical modifications to their existing CAD or other terminal equipment.

PSAP Procedural

3. **Observation:** In order to prepare PSAP personnel (9-1-1 Calltakers and Supervisors) for the impact of the WSP E9-1-1 Service, operational policy and procedures needed to be considered ahead of time regarding the following:
 - Silent calls
 - Unknown trouble type calls (1) – calls where there is undetermined background noise (ie: mall talk, street traffic) and there does not seem to be an emergency response need.
 - Unknown trouble type calls (2) – calls where there are the sounds of a caller asking for help and/or attempting to speak with the calltaker but does not communicate directly with them or respond answer to specific questions.

In any of the above noted circumstances, 9-1-1 calltakers may need to release the line and try dialing back to the handset in an attempt to establish voice contact with the caller. However, when dialing back they may encounter any of the following;

- no answer or busy signal
- subscribers' personal voice mail
- automated network message (customer not available or service suspended)
- subscriber who did not place the original 9-1-1 call (display of a false call back number from an unsubscribed handset)

Recommendation: Policy and associated procedures regarding what further action can or should be taken by a Public Safety Agency in these situations should be established and documented prior to implementation for training purposes.

PSAP Training

4. **Observation:** Training requirements for PSAP personnel were more extensive than originally anticipated. The enhanced ANI/ALI data provided on calls from the trial area raised many new operational PSAP issues.

Recommendation: PSAP training (9-1-1 Calltaker and Supervisor) should include the following topics:

a) Data Elements

- Emergency Service Routing Digit (ESRD)
- always NPA-511-XXXX, blocks assigned by Wireless Carrier
- non-dialable number
- purpose – calls routed based on associated Cell Site/Sector ESRD record
- ESCO display in the format of NPA-911-XXXX

b) Call Back Number

- second telephone number with data spill
- where displayed on terminal equipment
- call back not ring back
- area codes may not be familiar (Canada and U.S.)
- long distance call back access (if calltaker sets blocked from long distance access)
- international – non-dialable number displays
- non-subscribed – non-dialable number display
- new handsets – non-dialable displays
- call back number – no ESRD or ALI
- new handsets – non-dialable displays
- ESCO display in the format of NPA - 911-XXXX

c) Cell Site Address

- name field of data spill
- cell site addresses can be outside physically outside municipal boundary but still route calls to proper PSAP
- no physical relationship guaranteed between cell site address and location of emergency caller

d) Procedures

- silent calls
- unknown trouble calls
- long distance call backs
- trouble reporting

Supervisor Training

5. **Observation:** Each of the four Wireless Carrier provided the PSAPs with a set of contact numbers for problem resolution (voice and data) and emergency tracing procedures. All four had different contact processes and escalation procedures intrinsic to their

organizations. It was also found that contact numbers and escalation processes per Carrier could also vary depending on the time of day and day of week. This initially caused some confusion for PSAP Supervisors who have not traditionally needed to deal with multiple contact/escalation processes to obtain subscriber information.

Recommendation: PSAP Supervisors need specific training to ensure they clearly understand the different processes for contacting each Wireless Carrier. Further, the same information needs to be clearly documented and easily accessible for any personnel temporarily fulfilling 9-1-1 Supervisory duties.

6. **Observation:** PSAPs involved in the trial found that they were not always successfully able to use the subscriber information provided.

Recommendation: PSAP Supervisors need to be aware that when they attempt to obtain wireless subscriber information from any of the Wireless Carriers, they may encounter any of the following results;

- no subscriber information in the database (typically pre-paid service)
- old subscriber information in the database (customer may have moved without informing their provider)
- false subscriber information in the database (customer provided)

APPENDIX 1 – Trial Offer Letter



June 27, 2000

TO: MS. JUDY TOTTMAN, 9-1-1 REGIONAL MANAGER, BELL CANADA
MR. DAVID FARNES, CANADIAN WIRELESS TELECOMMUNICATIONS ASSOCIATION
Mr. David Meadows, Canadian Radio and Telecommunications Commission

Re: Enhanced 9-1-1 Wireless Trial – Province of Ontario

I am writing you on behalf on the Ontario 9-1-1 Advisory Board (OAB) to provide you with an update regarding the current status of our Wireless Enhanced 9-1-1 Wireless Trial preparations.

Our original intent was to utilize the Region of Peel as a suitable trial area in Ontario. After much discussion and upon review of the Alberta Trial Report, representatives of Peel Region determined that they were not in a position to provide the necessary resources to meet the demands of this Wireless Trial. Ms. Kathryn Cameron, Region of Peel Manager, Administration Ambulance and Emergency Programs, informed me on Friday May 9th, that they were respectfully declining any involvement at this time.

Since May 9th, work has been ongoing to formally obtain the necessary commitment from the City of Toronto and York Region to participate in this Trial. Our intent is to as closely as possible meet the recommendations of the Alberta Trial Team. Attached for your information is our approach to each those recommendations.

I will inform you accordingly as soon these respective organizations have obtained the necessary approvals.

Judy Broomfield
Vice Chair, Ontario 9-1-1 Advisory Board
703 Don Mills Rd.,
8th floor
North York, Ontario
M3C 3N3

e-mail: communicationservices@torontopolice.on.ca

CC: MR. DENNIS BELAND, MICROCELL
MR. PARKE DAVIS, CLEARNET
MS. DARLENE FARROW, BELL MOBILITY
MR. JOEL THORPE, ROGERS WIRELESS INC.

APPENDIX 2 –Wireless E9-1-1 Trial

Participants

Key Lead Representatives

1. Tom Voisey – Ontario 9-1-1 Advisory Board / Peel Regional Police
2. Judy Broomfield – Toronto 9-1-1
3. Bruce Herridge – York Regional Police
4. Judy Tottman – Bell Canada
5. Pamela Beninato – Bell Canada
6. Don Woodford – Bell Mobility Cellular Inc.
7. Joel Thorp – Rogers Wireless Inc.
8. Jeff McDonald – Rogers Wireless Inc.
9. Dennis Beland – Microcell Connexions Inc.
10. Parke Davis – TELUS Mobility Inc.

Key Technical Support Representatives

1. Karl Druckman – City of Toronto Legal Services
2. Sheryl Macphail – York Regional Police
3. Kathy Sparks – York Regional Police
4. Teresa Mansfield – Bell Canada
5. Bernard Brabant – Bell Canada
6. Paul Piilonen – Bell Mobility Cellular Inc.
7. Kelly Hisaki – Bell Mobility Cellular Inc.
8. Phaedra van Buuren – Bell Mobility Cellular Inc.
9. Sylvie DesRuisseaux – Microcell Connexions Inc.
10. Sylvain Lapointe – Microcell Connexions Inc.
11. Gordon Chan – Rogers Wireless Inc
12. Jodi Bates – Rogers Wireless Inc.
13. Johathan Elkas – Microcell Connexions Inc.
14. Bill Barsley - TELUS Communications
15. Suzanne Hardy – TELUS Mobility Inc.
16. Noli Mateo – TELUS Mobility Inc.
17. Jeanette Butler Harley – TELUS Mobility

APPENDIX 3 – Memorandum of Understanding and Schedules

MEMORANDUM OF UNDERSTANDING
FOR A TRIAL OF AN ENHANCED WIRELESS INTERCONNECTION
TO THE BELL CANADA 9-1-1 PUBLIC EMERGENCY REPORTING SERVICE
(BELL CANADA 9-1-1 PERS)

This MEMORANDUM OF UNDERSTANDING (MOU) has been entered into effective the 16th day of May of 2001 by and between:

BELL CANADA, a company having a place of business at 250 Yonge St. - Flr 12, Toronto Ontario, M5B 2L7, and which operates a 9-1-1 Public Emergency Reporting Service (“Bell Canada 9-1-1- PERS”) to which municipalities in its serving territory subscribe (hereinafter referred to as the “9-1-1 Service Provider”) OF THE FIRST PART

and

TORONTO POLICE SERVICES BOARD, a local board of the City of Toronto, having a place of business at 40 College St., Toronto, Ontario, M5G 2J3, and which operates a 9-1-1 Public Safety Answering Point (PSAP) serving its citizens OF THE SECOND PART

and

THE REGIONAL MUNICIPALITY OF YORK POLICE SERVICES BOARD, a local board of The Regional Municipality of York, having a place of business at 17250 Yonge St., Newmarket, Ontario, L3Y 4W5, and which operates a PSAP serving its citizens OF THE THIRD PART

and

BELL MOBILITY CELLULAR INC., a company having a place of business at 2920 Matheson Blvd., Mississauga, Ontario, L4W 5J4, and which provides commercial wireless telecommunications services OF THE FOURTH PART

and

MICROCELL CONNEXIONS INC., a company having a place of business at 20 Bay Street, Suite 1601, Toronto, Ontario, M5J 2N8, and which provides commercial wireless telecommunications services OF THE FIFTH PART

and

ROGERS WIRELESS INC., a company having a place of business at One Mount Pleasant Road, Toronto, Ontario, M4Y 2Y5, and which provides commercial wireless telecommunications services OF THE SIXTH PART

and

TELUS MOBILITY, a division of TELUS Communications Inc., a company having a place of business at 3030 2 Ave. SE, Calgary, Alberta, T2A 5N7, and which provides commercial wireless telecommunications services OF THE SEVENTH PART

and

CLEARNET PCS INC., a company having a place of business at 200 Consilium Place, Toronto, Ontario, M1H 3J3, and which provides commercial wireless telecommunications services OF THE EIGHTH PART

and

CLEARNET COMPANY, a company having a place of business at 200 Consilium Place, Toronto, Ontario, M1H 3J3, and which provides commercial wireless telecommunications services OF THE NINTH PART.

The second and third parties are hereinafter referred to individually as a “Municipality” and collectively as the “Municipalities”.

The fourth through ninth parties are hereinafter referred to individually as a “Wireless Carrier” and collectively as the “Wireless Carriers”.

The nine parties are hereinafter referred to individually as a “Party” and collectively as the “Parties”.

WHEREAS the Parties share the objective of improving the quality of wireless 9-1-1 service in Bell Canada’s serving territory;

WHEREAS in pursuit of this common objective the Parties have agreed to participate in a Trial of an enhanced wireless interconnection to the Bell Canada 9-1-1 PERS (the “Trial”);

THEREFORE, in consideration of the mutual covenants herein contained, the Parties agree as follows:

1. TRIAL AREA

- 1.1 The geographic area to be covered by the Trial (the “Trial Area”) shall be as described in Schedule A attached hereto.
- 1.2 It is recognized that the initial stages of the Trial may take place over a more restricted geographic area than the Trial Area, consistent with the Trial Plan.
- 1.3 It is recognized that some of the Wireless Carriers do not offer wireless services throughout the Trial Area and consequently may support the Trial over a more restricted area.

2. TRIAL ARCHITECTURE

- 2.1 Each Wireless Carrier shall provide dedicated DS-1 facilities from its participating wireless switch(es) to the 9-1-1 Service Provider’s participating 9-1-1 selective routers.
- 2.2 The existing CCS7 signaling interconnection established for CCS7 signaling on trunk side interconnection between each Wireless Carrier and the 9-1-1 Service Provider (pursuant to existing interconnection tariffs) shall be used to support the 9-1-1 trunks assigned within the above noted DS-1 facilities for the purposes of the Trial.
- 2.3 Each Wireless Carrier, on a call-by-call basis for wireless 9-1-1 calls originating in the Trial Area, and consistent with the Trial Plan, shall transmit to the 9-1-1 Service Provider over the above noted interconnection method a ten-digit wireless call-back number as well as a ten-digit Emergency Services Routing Digit (“ESRD”) identifier uniquely associated with the cell site/sector in which the wireless 9-1-1 call originates.
- 2.4 The 9-1-1 Service Provider, on a call-by-call basis for wireless 9-1-1 calls originating in the Trial Area, and consistent with the Trial Plan, shall transmit to the appropriate Municipality’s primary

and secondary PSAPs over its existing interconnection facilities with the Municipality's primary and secondary PSAPs, the ten-digit wireless call-back number and ten-digit ESRD identifier received from the Wireless Carrier as well as the Wireless ESRD Record Information (i.e. wireless cell site/sector) corresponding to the ten-digit ESRD identifier received from the Wireless Carrier.

- 2.5 The detailed architecture for the Trial (the "Trial Architecture"), including the ten-digit ESRD numbering format for the Trial, shall be as described in Schedule B attached hereto.

3. TRIAL WIRELESS ESRD RECORD INFORMATION FORMAT

- 3.1 Each Wireless Carrier shall provide to the 9-1-1 Service Provider, and the 9-1-1 Service Provider shall enter into its E9-1-1 database, specific location information ("Wireless ESRD Record Information") for each of the Wireless Carrier's cell sites/ sectors which it selects for the Trial and which are located within the Trial Area. The format and presentation of the Wireless ESRD Record Information to be employed in the Trial (the "Trial Wireless ESRD Record Information Format") shall be as described in Schedule C attached hereto.
- 3.2 The Municipalities shall provide the necessary information and assistance to the Wireless Carriers to enable the Wireless Carriers to provide complete Wireless ESRD Record Information for each of their cell sites/sectors, consistent with the Trial Plan. Said information and assistance shall include, but not necessarily be limited to, the identification of the most appropriate Emergency Service Zone ("ESZ") and the associated Emergency Service Number ("ESN") to be assigned to each of the affected cell sites/sectors. It is recognized that the Municipalities are ultimately responsible for deciding which ESZ and associated ESN is assigned to any given cell site/sector.

4. TRIAL CALL ANSWER ARRANGEMENTS

- 4.1 Each Municipality shall ensure that its primary and secondary PSAPs are capable of receiving, displaying and interpreting the ten-digit wireless call-back numbers, ten-digit ESRDs and Wireless ESRD Record Information received from the 9-1-1 Service Provider in respect of wireless 9-1-1 calls processed during the Trial, consistent with the Trial Plan.
- 4.2 Each Municipality shall ensure that 9-1-1 calls from customers of the Wireless Carriers received by its primary and secondary PSAPs during the live phase of the Trial are afforded the same attention and priority as all other 9-1-1 calls received by the Municipality's primary and secondary PSAPs.

5. RETENTION OF EXISTING 9-1-1 CALL ROUTING AND CALL ANSWER ARRANGEMENTS

- 5.1 9-1-1 call routing and call answer arrangements in place and in use by the Wireless Carriers prior to the Trial shall remain in place and available for use by the Wireless Carriers throughout the Trial for back-up purposes.
- 5.2 9-1-1 call routing and call answer arrangements in place and in use by the Wireless Carriers prior to the Trial shall remain in place and available for use by the Wireless Carriers after the Trial is terminated, unless the Parties agree otherwise or are directed otherwise by the Canadian Radio-television and Telecommunications Commission ("CRTC").

6. RESPONSIBILITY FOR COSTS

- 6.1 Each Party shall bear its own costs of participation in the Trial. For greater clarity, each Wireless Carrier shall bear the costs of providing the necessary dedicated trunking from its participating wireless switch(es) to the 9-1-1 Service Provider's participating selective routers.

7. TRIAL PLAN

- 7.1 The Trial shall begin as a technical trial restricted to Wireless Carrier personnel and designates. It shall evolve into a live trial involving actual 9-1-1 calls from customers of the Wireless Carriers received by actual call takers at each Municipality's primary and secondary PSAPs.
- 7.2 The Trial shall commence on May 16, 2001 or as otherwise agreed to by all of the Parties (the "Start Date"), and shall terminate on December 19, 2001 or as otherwise agreed to by all of the Parties (the "End Date"). The period of time between the Start Date and the End Date shall be referred to as the "Trial Period". Within this Trial Period, provision may be made in the Trial Plan for the staggered entry or exit of the individual Wireless Carriers. For greater clarity, the Wireless Carriers shall not have any obligation to continue participation in any enhanced wireless interconnection to the Bell Canada 9-1-1 PERS after the Trial Period, unless mutually agreed by the Parties involved in such participation.
- 7.3 The detailed trial plan (the "Trial Plan") shall be as described in Schedule D attached hereto. It is recognized that amendments to a Trial plan during trial execution are a regular occurrence for a trial of this nature, and the Parties agree to work in good faith to accommodate reasonable requests for amendment.

8. TRIAL REPORTS

- 8.1 During the Trial, an interim report (the "Interim Trial Report") shall be prepared, the contents of which shall be agreed to in writing by all of the Parties. The purpose of this Interim Trial Report shall be to provide support and direction for a commercial service tariff filing by the 9-1-1 Service Provider. The Interim Trial Report will be available to the Parties and the CRTC. The Parties agree, however, not to disclose the Interim Trial Report or its contents to anyone else, except with the prior written agreement of all of the Parties.
- 8.2 The Trial shall be followed by the issuance of a final report (the "Final Trial Report"), the contents of which shall be agreed to in writing by all of the Parties prior to issuance to any outside party or to the general public.
- 8.3 The Final Trial Report shall include an assessment of the success of the trial in identifying an enhanced wireless interconnection to the Bell Canada 9-1-1 PERS capable of improving the quality of wireless 9-1-1 service in the 9-1-1 Service Provider's serving territory. A preliminary and non-exhaustive list of the factors that may be considered in undertaking this assessment is provided in Schedule E attached hereto.

9. TERMINATION OF THE MOU

- 9.1 This MOU shall terminate at the earlier of the issuance of the Final Trial Report or 180 days after the End Date, or as otherwise agreed to by all of the Parties.

10. PUBLICITY AND PUBLIC REPRESENTATION

- 10.1 No Party shall issue any press releases, generate any publicity, or otherwise make any public representations regarding the Trial without the prior written consent of all of the Parties.

11. NON- DISCLOSURE

11.1 The Parties acknowledge that the treatment of their confidential information for the purposes of the Trial is governed by the terms of a non-disclosure agreement, dated February 5, 2001, previously executed by the Parties (the “NDA”). The NDA shall survive the expiration and termination of this MOU in accordance with section 7 of the NDA.

12. LIMITATION OF LIABILITY AND INDEMNIFICATION OF THE 9-1-1 SERVICE PROVIDER

12.1 In this Section 12, “Tariff” means the tariffs of the 9-1-1 Service Provider, which include the terms of service and general regulations, as approved by the CRTC from time to time to the extent required under applicable law.

(a) Except for any breach of its obligations under Section 10 of this MOU or any breach of the NDA, the 9-1-1 Service Provider’s liability to each Wireless Carrier as a result of any claim, fine, demand, action, cause of action, loss, expense, liability, cost or damage of any kind or nature whatsoever, direct or indirect, regardless of the cause, arising out of or relating to this MOU or the Tariff, the operation of, failure of or failure to operate the Bell Canada 9-1-1 PERS or any part thereof, including, without limitation, any claim arising out of a failure to complete a 9-1-1 call, delay in completion of a 9-1-1 call, interruption of a 9-1-1 call, or error in information used in connection with the operation of the Bell Canada 9-1-1 PERS shall be limited to the extent set out in the Tariff or this MOU.

(b) Without restricting the generality of the foregoing, the 9-1-1 Service Provider shall not be liable and each Wireless Carrier shall defend and hold the 9-1-1 Service Provider harmless in the event of any claim, fine, demand, action, cause of action, loss, expense, liability, cost or damage of any kind whatsoever, direct or indirect from any of the Wireless Carrier’s end-customers, arising out of or in relation to any act or omission of the Wireless Carrier in the furnishing of service by the Wireless Carrier to its end-customers, or for any interruption in the Wireless Carrier’s service or interference with the operation of any facilities or equipment of the Wireless Carrier arising in any manner related to this MOU. Notwithstanding any other provision in this MOU or the Tariff, the Wireless Carrier assumes all responsibility, if any, to and in respect of its end-customers for the use of the services provided by the 9-1-1 Service Provider pursuant to this MOU.

(c) Without restricting the generality of the foregoing, the 9-1-1 Service Provider shall not be responsible and each Wireless Carrier shall defend and hold the 9-1-1 Service Provider harmless in the event of any claim, fine, demand, action, cause of action, loss, expense, liability, cost or damage of any kind whatsoever, direct or indirect, arising out of or in relation to the accuracy and content of the Wireless ESRD Record Information delivered by the Wireless Carrier to the 9-1-1 Service Provider, and the 9-1-1 Service Provider shall not be liable for any failure to carry out its obligations hereunder as a result of the Wireless Carrier’s failure to provide accurate Wireless ESRD Record Information , nor shall the 9-1-1 Service Provider be responsible or obligated hereunder to maintain the accuracy of such Wireless ESRD Record Information beyond the actual content of the Wireless ESRD Record Information as received by the 9-1-1 Service Provider from the Wireless Carrier, and the 9-1-1 Service Provider’s sole obligation shall be to retain the Wireless ESRD Record Information for the purposes intended herein.

12.2 Other than as provided for in this MOU, there are no warranties, representations, conditions or guarantees of any kind whatsoever provided by the 9-1-1 Service Provider to each Wireless Carrier, either expressly or implied, whether arising by statute, agreement, tort, product liability or otherwise, regarding this MOU and the services provided by the 9-1-1 Service Provider hereunder

including, but not limited to, warranties, representations, conditions and guarantees as to merchantability, fitness for any particular purpose, design, condition or quality.

- 12.3 Subject to Section 12.1, each Wireless Carrier hereby waives any claims it may now or in the future have in tort or contract law, under statute or in equity, and confirms that its rights, obligations, rights of indemnity and measure and type of damages in the event of breach are limited to those provided in this MOU.
- 12.4 This Section 12 shall survive the expiration or termination of this MOU.

13. LIMITATION OF LIABILITY OF THE WIRELESS CARRIERS AND THE MUNICIPALITIES

- 13.1 In this Section 13, “End-Customer” means the ultimate user of telecommunications services provided by a Wireless Carrier.
- 13.2 Each Wireless Carrier shall not be liable and each Municipality shall hold the Wireless Carrier harmless in relation to any claim, fine, demand, action, cause of action, loss, expense, liability, cost or damage of any kind whatsoever, direct or indirect from any third parties, arising out of or in relation to any act or omission of the Municipality in fulfilling its obligations pursuant to this MOU or in furnishing 9-1-1 call answer services and emergency response services, other than to the extent that said act or omission is caused by the wrongful acts or omissions of the Wireless Carrier.
- 13.3 Without restricting the generality of the foregoing, each Wireless Carrier shall not be liable and each Municipality shall hold the Wireless Carrier harmless in relation to any claim, fine, demand, action, cause of action, loss, expense, liability, cost or damage of any kind whatsoever, direct or indirect from any third parties, arising out of or in relation to the information and assistance provided to the Wireless Carrier by the Municipality pursuant to Section 3.2 of this MOU.
- 13.4 Each Municipality shall not be liable, and each Wireless Carrier shall hold each Municipality harmless in relation to any claim, fine, demand, action, cause of action, loss, expense, liability, cost or damage of any kind whatsoever, direct or indirect from any third parties, arising out of or in relation to any act or omission of the Wireless Carrier in fulfilling its obligations pursuant to this MOU or in furnishing wireless telecommunications services to its End-Customers for the purpose of enabling calls to 9-1-1, other than to the extent that said act or omission is caused by the wrongful acts or omissions of the Municipality.
- 13.5 Each Wireless Carrier (the “First Wireless Carrier”) shall not be liable for any claim, fine, demand, action, cause of action, loss, expense, liability, cost or damage of any kind whatsoever, direct or indirect from any third parties, arising out of or in relation to any act or omission of each other Wireless Carrier (the “Second Wireless Carrier”) in fulfilling its obligations pursuant to this MOU or in furnishing wireless telecommunications services to its End-Customers for the purpose of enabling calls to 9-1-1, other than to the extent that said act or omission is caused by the wrongful acts or omissions of the First Wireless Carrier.
- 13.6 This Section 13 shall survive the expiration or termination of this MOU.

14. INSURANCE

- 14.1 Each Party shall, during the Trial Period and at all relevant times, obtain and maintain in full force and effect comprehensive general liability insurance in an amount not less than two million dollars (\$2,000,000.00) inclusive per occurrence or claim with respect to its obligations and activities under this MOU, which insurance shall include contractual liability coverage and contain a cross-liability clause. Each Party shall provide a certificate of insurance or other reasonable evidence of

such insurance coverage to any other Party upon receipt of a request. Alternatively, if a Party is self-insured, that Party shall provide reasonable evidence that it is or will be, during the Trial Period and at all relevant times, able to meet its obligations and liabilities under this MOU.

15. REGULATORY APPROVAL

15.1 Each Party shall use reasonable efforts, if required, to obtain all necessary regulatory approvals for the Trial.

16. WIRELESS CARRIER REGULATORY STATUS

16.1 Should any of the Wireless Carriers change its regulatory status before or during the Trial from Wireless Service Provider to Competitive Local Exchange Carrier, this change shall not impede or otherwise alter this Wireless Carrier's continued participation in the Trial in accordance with the Trial Plan or any of that Wireless Carrier's obligations under this MOU.

17. APPLICABLE LAWS

17.1 This MOU shall be governed by and be construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein.

18. WAIVERS

18.1 No term or condition of this MOU may be waived by any Party without the express written consent of the other affected Parties, and forbearance or indulgence by a Party in any regard whatsoever shall not constitute that Party's waiver. No consent or waiver shall be effective unless made in writing by an authorized officer of the Party.

19. ENTIRE MOU

19.1 With the exception of the NDA, this MOU cancels, replaces and supersedes all existing agreements and understandings, written or oral, between the Parties relating to the Trial. With the exception of the NDA, the entire contract between the Parties relating to the Trial is contained in this MOU and no preliminary proposals, written or oral, form any part of this MOU. This MOU may not be amended or modified except by mutual agreement of the Parties in writing.

20. SUCCESSORS AND ASSIGNS

20.1 This MOU shall not be assigned, in whole or in part, by any Party without the express written consent of the other Parties which shall not be unreasonably withheld. Notwithstanding any other provision of this MOU, a Party may, without consent, assign its rights and obligations under this MOU to a person that directly or indirectly controls, is controlled by or under common control with such Party and to a purchaser of all or substantially all of such Party's assets. A change of control of a Party shall not be considered an assignment of this MOU. This MOU shall be binding upon, and shall enure to the benefit of, the Parties and their respective successors and permitted assigns. Notwithstanding the preceding sentence, nothing herein shall prevent the 9-1-1 Service Provider from subcontracting the Bell Canada 9-1-1 PERS, in whole or in part, to any third party.

21. FORCE MAJEURE

21.1 No Party shall be liable to any other for any delay or failure in performance hereunder due to and including without limitation, fires, work stoppages, strikes, lock-outs, slow-downs and similar labour disruptions, embargoes, requirements imposed by governmental regulations, civil or military authorities, acts of God, the public enemy or other causes and circumstances which are

beyond the reasonable control of the Party unable to perform. If an excused performance occurs, the Party delayed or unable to perform shall give immediate notice to the other Parties.

22. COUNTERPARTS

22.1 This MOU may be signed in counterparts and each of such counterparts shall constitute an original document and such counterparts, taken together, shall constitute one and the same instrument.

On behalf of the Parties:

The Regional Municipality of York Police Services Board

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

Toronto Police Services Board

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

Bell Mobility Cellular Inc.

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

Microcell Connexions Inc.

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

Rogers Wireless Inc.

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

Rogers Wireless Inc.

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

**TELUS Mobility, A Division of TELUS
Communications Inc.**

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

Cleartnet PCS Inc.

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

Cleartnet Company

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

Bell Canada

SIGNATURE: _____

NAME: _____

TITLE: _____

DATE: _____

Schedule A Trial Area

NORTH BOUNDARY:

From Bathurst Street (Regional Road 38) in the Regional Municipality of York, Township of King on King Road (Regional Road 11) east to Yonge Street (Regional Road 1, formerly Provincial Highway 11) in the Town of Richmond Hill, south on Yonge Street to Sunset Beach Road and east on Sunset Beach Road to Bayview Avenue (Regional Road 34).

EAST BOUNDARY:

From Sunset Beach Road on Bayview Avenue (Regional Road 34) south through the Regional Municipality of York, Town of Richmond Hill, crossing Steeles Avenue East into the City of Toronto to York Mills Road.

SOUTH BOUNDARY:

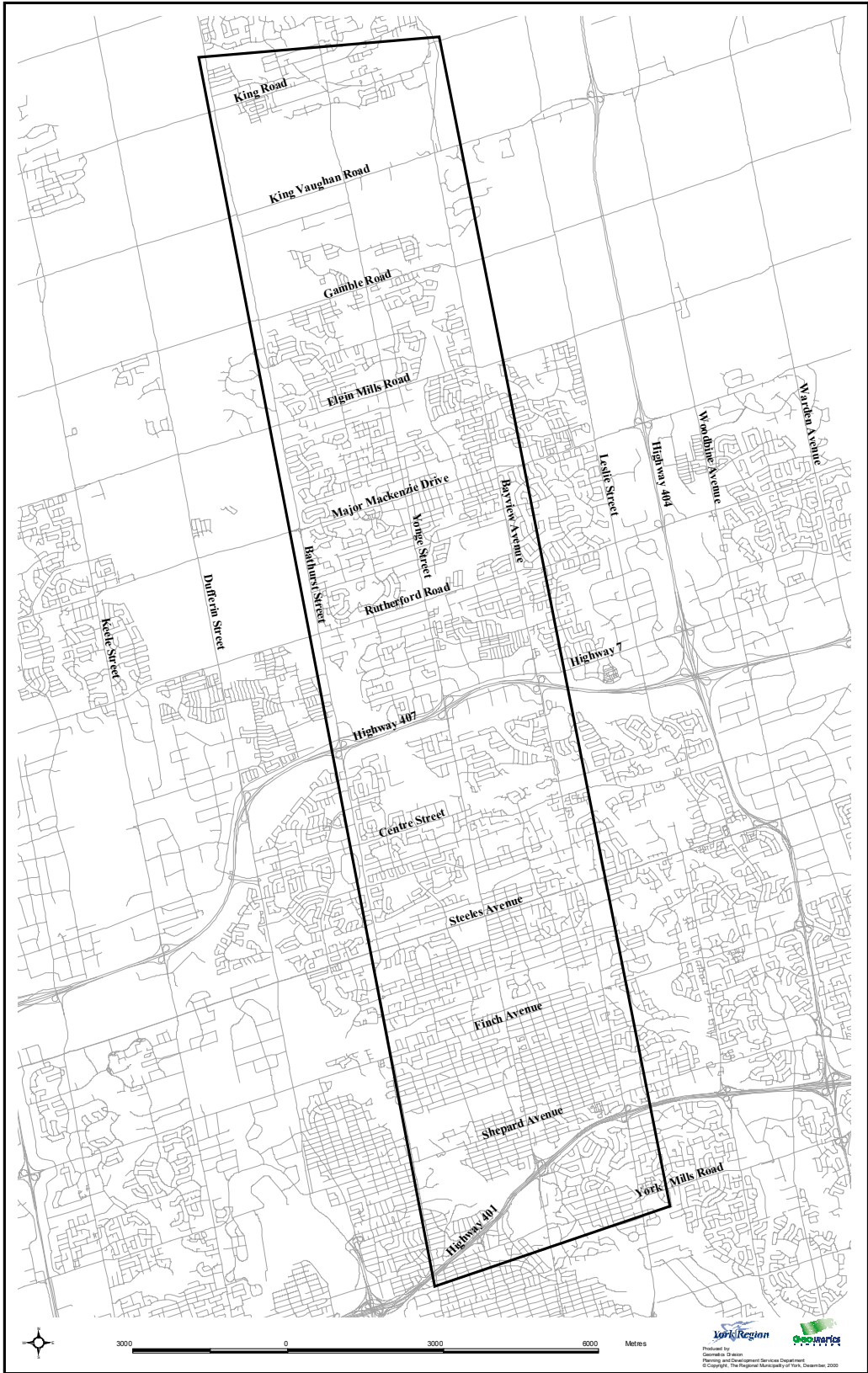
From Bayview Avenue west on York Mills Road to Yonge Street, continuing west on Wilson Avenue to Bathurst Street all in the City of Toronto.

WEST BOUNDARY:

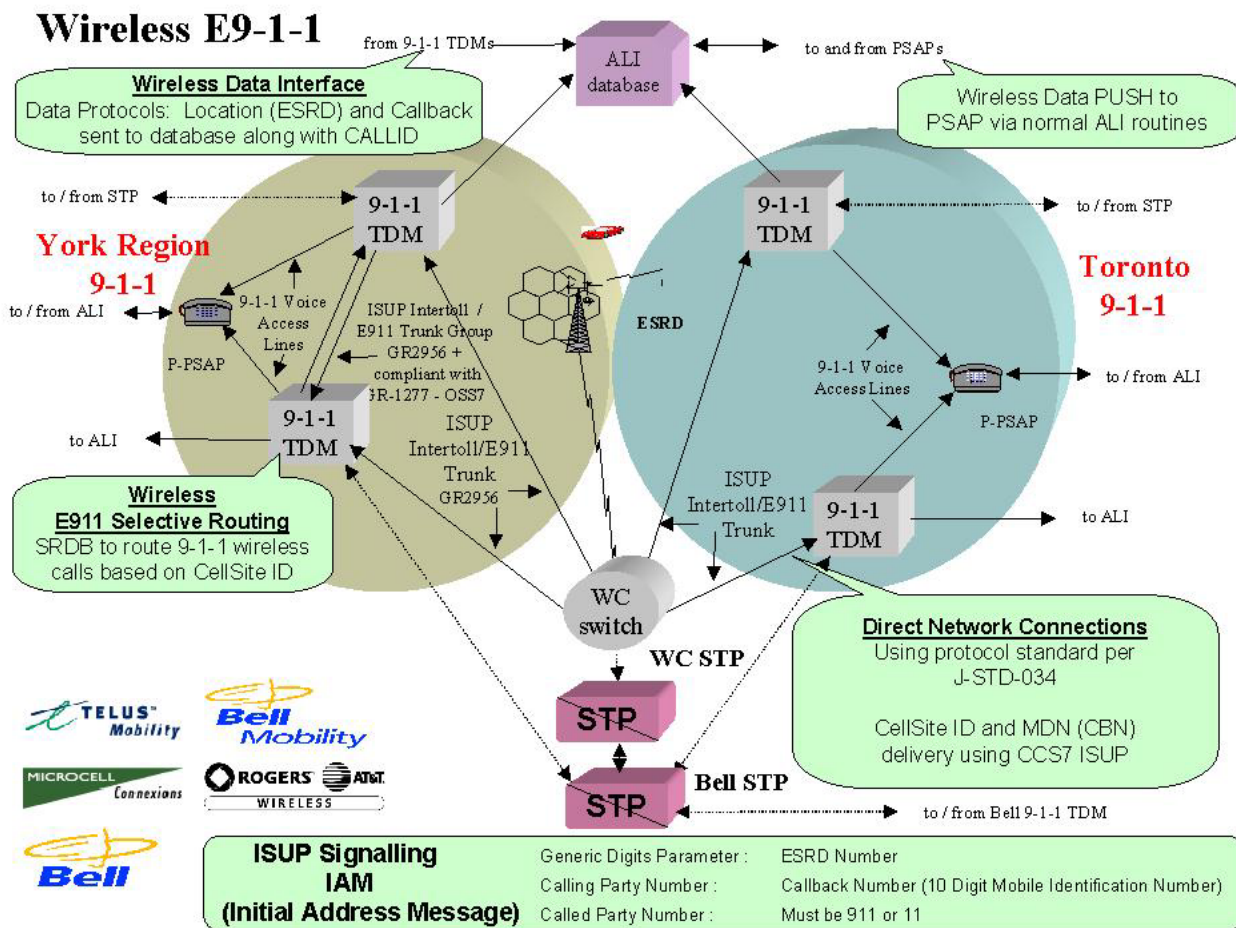
From Wilson Avenue north on Bathurst Street in the City of Toronto, crossing Steeles Avenue West into the Regional Municipality of York, City of Vaughan to King Road in the Regional Municipality of York, Township of King.

NOTE:

The above description identifies the geographic area within which the Trial infrastructure will handle wireless 9-1-1 calls in accordance with the project plan and objectives. The nature of wireless communications is such that the described boundaries reflect an agreed to area; however, Parties acknowledge that boundaries are somewhat uncertain. Any Party wishing to expand the area for their specific purpose will be required to notify all other Parties in a timely manner so that appropriate adjustments (if required) can be made and appropriate training can take place.



Schedule B Trial Architecture



Schedule C Trial Wireless ESRD Record Information Format

This document can be found in Appendix 7.

Schedule D Trial Plan

Preparation Stage

1) OVERLAY TRIAL AREA – Each Wireless Carrier will determine the specific cell sites, including the number of sectors, that are applicable to the Schedule ‘A’ – Trial Area. The target dates are as follows:

- Telus Mobility/Clearnet Date: May 21, 2001
- Microcell Connexions Inc. Date: May 21, 2001
- Rogers Wireless Inc. Date: May 21, 2001
- Bell Mobility Cellular Inc. Date: May 21, 2001

2) EXCHANGE ENCRYPTION KEY – Each Wireless Carrier will exchange Entrust Solo™ public encryption key, used for electronic data file transfer to the 9-1-1 PERS Data System, with the 9-1-1 Service Provider. The target dates are as follows:

- Telus Mobility/Clearnet Date: May 28, 2001
- Microcell Connexions Inc. Date: May, 28, 2001
- Rogers Wireless Inc. Date: May 28, 2001
- Bell Mobility Cellular Inc. Date: May 28 2001

3) INITIAL ESRD RECORDS FILE TRANSFER – Each Wireless Carrier will send an initial Wireless ESRD Record Information file to the 9-1-1 Service Provider's 9-1-1 PERS Data System using the electronic data file exchange process, to validate the transfer process, the file and record formats. The target dates are as follows:

- Telus Mobility/Clearnet Date: May 30, 2001
- Microcell Connexions Inc. Date: May 30, 2001
- Rogers Wireless Inc. Date: May 30, 2001
- Bell Mobility Cellular Inc. Date: May 31, 2001

4) CREATE WIRELESS ESRD RECORDS – Each Wireless Carrier will create an initial Wireless ESRD record for each cell site / sector in the format detailed in Schedule ‘C’ – Trial Wireless ESRD Record Information Format. This preparation will be a cooperative effort between the Wireless Carriers, the 9-1-1 Service Provider and each Municipality’s primary PSAP to ensure the best possible data is available for display to the call takers. The target dates are as follows:

- Telus Mobility/Clearnet Date: June 1, 2001
- Microcell Connexions Inc. Date: June 1, 2001
- Rogers Wireless Inc. Date: June 1, 2001
- Bell Mobility Cellular Inc. Date: June 1, 2001

5) ENTER WIRELESS ESRD RECORDS – Each Wireless Carrier will transfer its Wireless ESRD Record files to the 9-1-1 Service Provider's 9-1-1 PERS Data System using the electronic data file exchange process. The target dates are as follows:

- Telus Mobility/Clearnet Date: June 4, 2001
- Microcell Connexions Inc. Date: June 4, 2001
- Rogers Wireless Inc. Date: June 4, 2001
- Bell Mobility Cellular Inc. Date: June 4, 2001

6) ESTABLISH T1 TRUNKING – Each Wireless Carrier will work with the 9-1-1 Service Provider to establish and configure the trunking connection detailed in Schedule ‘B’ – Trial Architecture. The in-service target dates are as follows:

- Telus Mobility/Clearnet Date: May30, 2001
- Microcell Connexions Inc. Date: June 1, 2001
- Rogers Wireless Inc. Date: June 4, 2001
- Bell Mobility Cellular Inc. Date: May 30, 2001

Technical Stage

Once the ‘Preliminary Stage’ steps have been completed, the following technical testing and training is applicable:

7) TEST PSAP – The 9-1-1 Service Provider will build and turn up interconnection(s) that terminates at a controlled / test PSAP position for Toronto. The target date is as follows:

- 9-1-1 Service Provider Date: June 6, 2001

8) CAPTIVE CALL PROCESSING TO THE TEST PSAP – Working directly with each Municipality’s primary PSAP and the 9-1-1 Service Provider, each Wireless Carrier will separately process calls using a wireless network specific pre-trial test number, (eg 211). Wireless 9-1-1 calls routed to the 9-1-1 Service Provider’s 9-1-1 PERS voice network will be translated in the CCS7 ISUP message (i.e., Called Party Number field) as digit 911 or 11. This process will be used to verify proper interconnection and configuration. The target dates are as follows:

- Telus Mobility/Clearnet Date: June 7, 8, 11, 12, 2001
- Microcell Connexions Inc. Date: June 7, 8, 11, 12, 2001
- Rogers Wireless Inc. Date: June 7, 8, 11, 12, 2001
- Bell Mobility Cellular Inc. Date: June 7, 8, 11, 12, 2001

9) CONFIRM WIRELESS ESRD/ALI PRESENTATION – Working with the Wireless Carriers, and as required with the 9-1-1 Service Provider, each Municipality’s primary PSAP will confirm a sample number of Wireless ESRD/ALI records by answering Wireless Carrier generated test calls from various cell sites. This process will be used to verify that the correct data is being provided, as well it will be compared to Schedule ‘C’ presentation requirements. The target dates are as follows:

- Toronto Police Services Board Date: same time as item #8
- The Regional Municipality of York Police Services Board Date: same time as item #8

10) PROBLEM RESOLUTION & EMERGENCY TRACING PROCEDURES - The Wireless Carriers will provide each Municipality’s primary PSAP with a copy of their procedures related to problem resolution (voice and data) and emergency subscriber tracing. These procedures must include both administrative and 24x7 emergency contact telephone numbers as well as an escalation process. The target dates are as follows:

- Telus Mobility/Clearnet Date: May 29, 2001
- Microcell Connexions Inc. Date: May 23, 2001
- Rogers Wireless Inc. Date: May 25, 2001
- Bell Mobility Cellular Inc. Date: May 29, 2001

11) TRAINING PREPARATION – Each Municipality’s primary PSAP training personnel will be directly involved with the tasks detailed in items #8 and #9 above. This will provide them with the necessary understanding to create a training syllabus. The target dates are as follows:

- Toronto Police Services Board Date: May 23 to June 19, 2001
- The Regional Municipality of York Police Services Board Date: May 23 to June 19, 2001

12) WIRELESS CARRIER MAP OVERLAY FOR PSAP – A map overlay will be provided by each Wireless Carrier for the hanging file at each Municipality’s primary PSAP. It will provide a reference for both training and live trial operation. The target dates are as follows:

- Telus Mobility/Clearnet Date: June 4, 2001
- Microcell Connexions Inc. Date: June 4, 2001
- Rogers Wireless Inc. Date: June 4, 2001
- Bell Mobility Cellular Inc. Date: June 4, 2001

Live Stage

Once the ‘Technical Stage’ steps have been completed, the following steps will be undertaken for a ‘live’ Trial:

13) CUTOVER WIRELESS CARRIER TRUNKING TO ‘LIVE’ CALL PROCESSING – This will be a staged process, and will be a cooperative effort between all Parties to ensure that no calls are lost. A back-out procedure will be exercised if ‘voice’ call processing is disrupted in any manner. Depending on the success of the captive trial, the target dates are as follows:

- Telus Mobility/Clearnet Date: June 19, 2001
- Microcell Connexions Inc. Date: June 19, 2001
- Rogers Wireless Inc. Date: June 19, 2001
- Bell Mobility Cellular Inc. Date: June 19, 2001

14) BACKUP AND/OR CALL OVERFLOW TRUNKING – In cooperation with the 9-1-1 Service Provider, each Wireless Carrier (if technically possible) will ensure that interconnection is set up to provide for backup and/or overflow processing of the ‘voice’ call, should either eventuality be necessary. Depending on the success of the captive trial, the target dates are as follows:

- Telus Mobility/Clearnet Date: same time as item #13
- Microcell Connexions Inc. Date: same time as item #13
- Rogers Wireless Inc. Date: same time as item #13
- Bell Mobility Cellular Inc. Date: same time as item #13

15) CUTOVER SUPPORT AND TRAINING FOR PSAP CALLTAKERS – Each Municipality’s primary PSAP and the 9-1-1 Service Provider will have personnel on hand during the live cutover of each Wireless Carrier. The timing will be as follows:

- Toronto Police Services Board Date: same time as items #13 and #14
- The Regional Municipality of York Police Services Board Date: same time as items #13 and #14
- 9-1-1 Service Provider Date: same time as items #13 and #14

16) LIVE TRIAL MONITORING PROCESS – All Parties will be responsible for identifying problems that occur during the ‘live’ trial process. The PSAP call takers will report problems using the 9-1-1 Service Provider’s normal 9-1-1 Control Centre process, however issues related to the Trial will all be reported to a Trial designate person to ensure

timely response and, more importantly, complete tracking. Wireless Carriers will also report issues to the same Trial designate person, as required. The target dates are as follows:

- All Parties Date: from June 19 to December 19, 2001

17) PREPARATION OF INTERIM TRIAL REPORT - The Interim Trial Report will allow the 9-1-1 Service Provider to confirm that the wireless E9-1-1 functionality provided during the Trial is considered appropriate for a formal service offering. The Interim Trial Report will provide all Parties with the opportunity to express any concerns, highlight outstanding issues and make recommendations for improvements to the service which will be assessed and considered prior to filing. The Interim Trial Report is intended to be brief and informal in structure and should be completed three (3) months after the start of the live stage of the Trial. Based on the Interim Trial Report and the 9-1-1 Service Provider's internal lab testing results, the 9-1-1 Service Provider's plan is to file a tariff for the service. However, the 9-1-1 Service Provider makes no commitment to include any proposed functionality in the Interim Trial Report. The target date is as follows:

- All Parties Date: September 19, 2001

Training

PSAP Training Outline

- Preview – purpose of Trial, and expected outcomes
- Design – high level description of Trial architecture
- Screen Presentation – provide sample(s) of the typical CAD display of a wireless call
- Use of Overlay Maps – instruction regarding the use of each Wireless Carrier's Trial Area coverage map
- Issues – identify call processing irregularities and/or known problems, and how to handle
- Trouble Reporting – explain the process, and importance of reporting all problems / anomalies

9-1-1 Service Provider Training

Provide training and/or instructions to database, network and administration personnel, as deemed appropriate.

Wireless Carrier Training

Provide training and/or instructions to database, network and administration personnel, as deemed appropriate.

Schedule E Preliminary List of Assessment Factors for the Interim and Final Trial Reports

Part One

Assessment of the viability of the technology and architecture used (Interim and Final Trial Reports):

1. Validate the regular routing arrangement of Wireless Carrier E9-1-1 traffic to the proper PSAP using 10-digit ESRD;
2. Validate the appropriateness of overall default routing arrangements with the addition of Wireless Carrier E9-1-1 traffic;
3. Validate the overflow routing arrangements (i.e., at the mobile switch and between tandem switches) of Wireless Carrier E9-1-1 traffic to the proper PSAP using 10-digit ESRD;
4. Determine availability of 9-1-1 features (e.g., call control, ringback, hook switch status) with respect to Wireless E9-1-1 traffic;
5. Validate the selective transfer of Wireless Carrier 9-1-1 calls to the proper secondary PSAP using 10-digit ESRD;
6. Assess and define the appropriate provisioning guidelines required for congestion management (congestion control) for wireless CCS7 ISUP 9-1-1 trunk group and trunk group's member (e.g., similar grade of service, as provided for wireline 9-1-1 service);
7. Determine the overall call delivery time improvement using CCS7 ISUP trunking;
8. Validate the display of 10-digit cell site/sector's ESRD and wireless caller's 10-digit call-back number information on call taker display terminals and/or PSAP ANI/ALI printers;
9. Assess the impact to the 9-1-1 Service Provider, Wireless Carriers and PSAP personnel for creating ESRD records, managing and keeping the location (cell site/sector) information up to date as patterns change, new cell sites/sectors are added, correct cell site/sector become evident and as feedback from PSAPs provide feed back of problems;
10. Assess the impact to the 9-1-1 Service Provider, Wireless Carriers and PSAP personnel of managing 9-1-1 voice network and data system changes; and
11. Determine if the processing and display of ESRD, call back and ALI information is acceptable.

Part Two

Assessment of the improvement to public safety and PSAP operations due to handling and managing Wireless E 9-1-1 calls (mainly for Final Trial Report):

1. Determine if the receipt of call-back number and cell site/sector information has improved the ability to handle wireless 9-1-1 calls [survey method];
2. Determine if the receipt of cell site/sector data improves the efficiency of call takers when dealing with multiple calls for the same incident [survey method];
3. Determine the utility of providing wireless coverage maps for locating caller's originating zone and for reference purposes [survey method];
4. Determine if the timing, in terms of display of the ALI information to the call takers, is different than current wireline timing;
5. Identify any problems with the delivery of accurate cell site/sector information [sample analysis];
6. Identify the operational and administrative impacts caused by the display of false call-back numbers from unsubscribed handsets;
7. Identify the operational and administrative impacts caused by the display of call-back numbers from uninitialized and unprogrammed handsets;
8. Identify the operational and administrative impacts caused by the display of call-back numbers from North American and international roaming callers;
9. Identify the operational and administrative impacts caused by the display of call-back numbers from international handsets;
10. Identify instances where the call-back number is utilized for investigative purposes (i.e. to identify or re-contact a caller);
11. Identify instances where the call-back number assisted in identifying nuisance or abusive callers;
12. Analyze the effect on average total call duration (i.e. dialed digits to hang-up by the caller or primary/secondary PSAP) during the trial period [comparison of Wireless Carrier re-Trial samples versus their measurements during the Trial];
13. Determine the actual number of dispatches to wireless 9-1-1 callers that are made during the Trial due to availability of cell site/sector data where none would have been possible before which is an assessment of the impact of having map information to locate callers [number of responses]; and
14. Determine if the problem resolution and emergency tracing procedures developed for the Trial resulted in improved response from Wireless Carriers to PSAP requests for assistance or information.

APPENDIX 4 – Glossary of Terms

The main terms used within this document are described next.

<i>Term</i>	<i>Definition</i>
9-1-1	A three digit telephone number to facilitate the reporting of an emergency requiring response by a public safety agency
9-1-1 PERS	9-1-1 Public Emergency Reporting Service – The province-wide 9-1-1 service implemented in Bell Canada territory
9-1-1 Service Area	The geographic area that has been granted authority by a state or local governmental body to provide 9-1-1 service
9-1-1 Service Provider	An entity providing one or more of the following 9-1-1 elements: network, Customer Premises Equipment (CPE), or database service
9-1-1 System	The set of network, database and CPE elements and components required to provide 9-1-1 service
911 Tandem Switch	A switch that performs selective 9-1-1 call routing to the assigned Primary PSAP, based on the caller’s number and/or serving end office. It also permits fixed or selective call transfers
ACD	Automatic Call Distributor - Equipment that automatically distributes incoming calls to available PSAP attendants in the order the calls are received, or queues calls until an attendant becomes available
ACN	Automatic Collision Notification – Vehicles equipped with capability of generating a wireless call to a 3 rd party call centre when preset conditions are met, such as airbag deployment. GPS location is provided. If 9-1-1 emergency conditions exist a call to the serving PSAP is made. In some instances, if access to the 3 rd party call centre is not working or defective, a call to the 9-1-1 network may be initiated by the ACN device
ALI	Automatic Location Identification - The automatic display at the PSAP of the wireless cell site/sector’s ESRD and its location and the caller’s CBN or wireline caller’s telephone number, the address/location of the telephone, and supplementary emergency services information
ALI Database	The host computer system that stores the caller’s TN address and wireless ESRD’s location and dispatch information associated with the calling party. It is known as the set of ALI records
Alternate PSAP	A backup PSAP designated to receive calls when the primary PSAP is unable to do so

<i>Term</i>	<i>Definition</i>
ANI	Automatic Number Identification - Telephone number associated with the access line from which a call originates. In a wireless environment, it is the ESRD assigned to the cell site/sector. The ANI is used for call routing and ALI display retrieval purposes.
Back-up Centre	An alternate emergency response, communications and/or dispatch centre that duplicates the functions of an active PSAP
BID	Bell Interface Document – Documentation used by Bell Canada to disclose network-to-network and network-to-terminal interfaces
BNAS	Bell Neutral Answering Service – At the time of the trial, Bell Canada bureau providing neutral answering service to municipalities subscribing to the service
CAD	Computer Aided Dispatch - An optional computer-based system that presents enhanced caller identification information and dispatch options to the PSAP call attendant
Call Back	The capability to reestablish the communication with the calling party
Call Delivery	The capability to route a 9-1-1 call to the designated selective router for ultimate delivery to the designated PSAP for the caller's ANI/KEY
Call Overflow	The process of automatically rerouting calls to an alternate facility
Call Routing	The capability to selectively route the 9-1-1 call to the appropriate PSAP
Call Transfer	The capability to redirect a call to another party
Caller Hold	The capability of the PSAP to maintain control of a 9-1-1 caller's access line, even if the caller hangs up
CAMA	Centralized Automatic Message Accounting – An MF signaling protocol originally designed for billing purposes, capable of transmitting a single telephone number
CBN	Call Back Number - A number used by the PSAP to re-contact the location from which the 9-1-1 call was placed. The number may or may not be the number of the station used to originate the 9-1-1 call
CCS7	Common Channel Signaling No. 7 - An inter-office signaling network separate from the voice path network, utilizing high speed data transmission to accomplish call processing to manage out-of-band signaling system that provide basic routing information, call set-up and other call termination functions. Signaling is removed from the voice channel itself and put on a separate data network. Also known as Signaling System No. 7 (CCS7)
Cell	The coverage area of a wireless telecommunications (Cellular or PCS) omni or sectored antenna serving a specific geographic area

<i>Term</i>	<i>Definition</i>
Cell Sector	One face of a cell antenna that covers a distinct geographic area from the other sectors. A cell antenna typically supports 2 to 6 sectors
Cell Site	The location of a cell and related equipment
CAS	Call-Path Associated Signaling – A call flow arrangement between the wireless mobile switch and the 9-1-1 Tandem switch where the voice call, Emergency Service Routing Digits (ESRD) and CBN are transmitted from the MSC to the E9-1-1 tandem switch via CCS7/ Integrated Services Digital Network User Part (ISUP) trunks; and a call flow arrangement where the voice, Emergency Service Routing Digit (ESRD), and CBN are transmitted to the PSAP by the E9-1-1 Tandem switch using an Enhanced MF trunk
Class Of Service	A designation of the type of telephone service, e.g. residential, business, centrex, coin, PBX, wireless
CLEC	Competitive Local Exchange Carrier - An enterprise other than the traditional, established telephone company, that enters a local market to compete with the established carrier to provide local telephone service
CNA	Canadian Numbering Administrator – An organization that manages the numbering administration service for the Canadian telecommunications industry under contract to the Canadian Numbering Administration Consortium Inc.
CO	Central Office - The Local Exchange Carrier facility where access lines are connected to switching equipment for connection to the Public Switched Telephone Network
Conference / Transfer	The capability to bridge a third party onto an existing call. Also known as three-way calling
CPE	Customer Premises Equipment - Communications or terminal equipment located in the customer's facilities - Terminal equipment at a PSAP
CPN	Calling Party Number - see Call Back Number (CBN)
CRTC	Canadian Radio-television and Telecommunications Commission – Agency that supervises and regulates broadcasting and telecommunications systems in Canada
CSCN	Canadian Steering Committee on Numbering – An open public forum established as a subtending Working Group of the CRTC Interconnection Steering Committee (CISC) to consider and resolve numbering resource issues

<i>Term</i>	<i>Definition</i>
CWTA	Canadian Wireless Telecommunications Association - Association representing wireless carriers on wireless issues, developments and trends in Canada. Represents cellular, PCS, paging, mobile radio and mobile satellite carriers as well as companies that develop and produce products and services for the industry
Database	An organized collection of information, typically stored in computer systems, comprised of fields, records (data) and indexes. In 9-1-1, such databases include MSAG, telephone number or ESRD, ESN and location information records
Data System	A set of data processing and database management system using manual procedures and computer programs operated by the 9-1-1 Service Provider to create, store and update the data required to provide Selective Routing and/or Automatic Location Identification on E9-1-1 Systems
Dedicated Trunk	A telecommunication circuit used for a single purpose; such as the transmission of 9-1-1 calls
Default Routing	The capability to route a 9-1-1 call to a designated (default) PSAP when the incoming 9-1-1 call cannot be selectively routed due to an ANI/ESRD KEY failure or other cause
Diverse Routing	The practice of routing circuits along different physical paths in order to prevent total loss of 9-1-1 service in the event of a facility failure
Diversity	Duplication of components and/or trunk facilities, running in geographically different locations and/or over geographically separate paths
DN	Directory Number - A dialable 10-digit telephone number associated with a telephone subscriber or call destination
E9-1-1	Enhanced 9-1-1 - An emergency telephone system which includes network switching, database and CPE elements capable of providing Selective Routing, Selective Transfer, Fixed Transfer, caller routing and location information, and ALI [note that wireline specific features (i.e., caller hold, ringback, etc.) were not included]
E9-1-1 Tandem	The Central Office that provides the tandem switching of 9-1-1 calls. It controls delivery of the voice call with ANI to the PSAP and provides Selective Routing, Speed Calling, Selective Transfer, Fixed Transfer, and certain maintenance functions for each PSAP. Also known as 9-1-1 Control Office, Selective Routing Tandem or Selective Router
Emergency Call	A telephone request for public safety agency emergency services which requires immediate action to save a life, to report a fire or to stop a crime. May include other situations as determined locally

<i>Term</i>	<i>Definition</i>
Emergency Ringback	The capability of a PSAP attendant to ring the telephone on a held circuit. Requires Calling Party Hold. Also known as re-ring. (A Basic 9-1-1 feature compatible only with wireline type calls, where implemented)
ESCO	Emergency Service Central Office Number - The information delivered to the PSAP when there is an ANI failure between the end office and the 9-1-1 Control Office. When ANI/ESRD is not available, the 9-1-1 call is default routed and the ANI display at the PSAP will be “NPA-911-0XXX” where XXX identifies the last incoming trunk group. The ESCO also applied to a missing or invalid Call Back Number in the wireless environment
ESN / ESZ	Emergency Service Number / Zone - An ESN is a three to five digit number representing a unique combination of emergency service agencies (Law Enforcement, Fire, and Emergency Medical Service) designated to serve a specific range of addresses within a particular geographical area, or Emergency Service Zone (ESZ). The ESN facilitates selective routing and selective transfer, if required, to the appropriate PSAP and the dispatching of the proper service agency(ies)
ESRD	Emergency Service Routing Digit – 10-digit routing number assigned to the wireless Cell Site / Sector that initially captured the wireless 9-1-1 call
ES Trunk	Emergency Service Message trunk capable of providing ANI, connecting the serving central office of the 9-1-1 calling party and the designated E9-1-1 Tandem
Forced Disconnect	The capability of a PSAP attendant to disconnect a 9-1-1 call even if the calling party remains off-hook. Used to prevent overloading of 9-1-1 trunks
Hybrid Architecture	Network architecture deployed in Bell Canada territory that provides a Call-path Associated Signaling (CAS) arrangement between the wireless mobile switch and the 9-1-1 Tandem Switch and a Non Call-path Associated Signaling (NCAS) arrangement from the 9-1-1 Tandem switch and the PSAPs
Interoperability	The capability for disparate systems to work together. During the Trial the various carriers proceeded with interoperability testing to validate the various network functions
Inter-Tandem Trunking	The capability of route overflow a call from one 9-1-1 tandem switch to another 9-1-1 tandem switch
ISDN	Integrated Services Digital Network - Switched network providing end-to-end digital connectivity for simultaneous transmission of voice and/or data over multiple multiplexed communications channels and employing transmission and out-of-band signaling protocols that conform to internationally defined standards

<i>Term</i>	<i>Definition</i>
ISUP	ISDN User Part - Part of the SS7 signaling specification for ISDN
IT	Information Technology - The development, installation, and implementation of computer systems and applications
LDT	Location Determination Technology - A system which computes the X and Y coordinates of a wireless 9-1-1 caller
LDT-PSAP	Line Digital to Trunk (PSAP) – A type of Multi Frequency (MF) trunk interface that requires the PSAP equipment to dip the ALI database
Line-Side	Set of trunk facilities that allow interconnection between two networks while not allowing identification of individual callers
LSP-ID	Local Service Provider Identification Number - A 3 to 5-character identifier chosen by the Local Exchange Carrier that identifies the entity providing dial tone. The LSP-ID is maintained by the 9-1-1 Service Provider
MDN	Mobile Directory Number - see Call Back Number (CBN)
MF	Multi-Frequency - An inband signaling method that makes use of pairs of standard tones to transmit signaling codes and digit pulsing between switching centers. Refers to analog 9-1-1 trunk signaling
MIME	Multipurpose Internet Mail Extension – A communications protocol that allows for the transmission of data in many forms, such as audio, binary, or video
MIN	Mobile Identification Number - A 34-bit binary number that a wireless handset transmits to identify itself to the wireless network
MOU	Memorandum Of Understanding – Set of arrangements and schedules defining legal specifications and agreements required to perform a duty
MSAG	Master Street Address Guide - A data base of street names and house number ranges within their associated communities defining Emergency Service Zones (ESZs) and their associated Emergency Service Numbers (ESNs) to enable proper routing of 9-1-1 calls. In a wireless environment, the MSAG contains distinct values
MSC	Mobile Switching Centre - The wireless equivalent of a Central Office, which provides switching functions from wireless calls
MUC	Montreal Urban Community – A consortium of municipalities located on Montreal Island in Quebec
NANP	North American Numbering Plan - Use of 10-digit dialing in the format of a 3-digit NPA, followed by 3-digit NXX and 4-digit line number. NPA-NXX-XXXX

<i>Term</i>	<i>Definition</i>
NCAS	Non Call-path Associated Signaling – A call flow arrangement where the voice is transmitted to the PSAP by the E9-1-1 Tandem switch using a 9-1-1 Voice Access Line while the Emergency Service Routing Digit (ESRD) and CBN are transmitted through the ALI computer
NENA	National Emergency Number Association – A not-for-profit corporation established in 1982 to further the goal of “One Nation-One Number”. NENA is a networking source and promotes research, planning and training. NENA strives to educate, set standards and provide certification programs, legislative representation and technical assistance for implementing and managing 9-1-1 systems
Non-dialable Number	A non-dialable number is a number that once dialed from any phone device cannot be routed over the Public Switched Telephone Network. The caller would reach either a recording or a fast busy. The wireless cell site/sector ESRD numbers are deemed as non-dialable
NPA	Numbering Plan Area: an established three-digit area code for a particular telephone calling area. It takes the form of X0/1X, where X is any digit from 2 through 9. It is the first set of three (3) digits in the North American Numbering Plan based on 10-digit phone numbers
NXX	A three-digit code to identify the Central Office in which N is any digit 2 through 9 and X is any digit. It is the second set of three (3) digits in the North American Numbering Plan based on 10-digit phone numbers
OAB	Ontario 9-1-1 Advisory Board – The not-for-profit organization overseeing the emergency service activities in the Province of Ontario
P.001 Quality of Service	The probability expressed as a decimal fraction of less than one (1) call out of one thousand (1,000) incoming calls to encounter a busy signal on the first dialing attempt during the busy hour of the average busy day
Primary PSAP	Primary Public Safety Answering Point - A PSAP to which 9-1-1 calls are routed directly from the 9-1-1 Control Office. Also referenced to as a Communications Centre
PSAP	Public Safety Answering Point - A Communications Centre or facility equipped and staffed to receive 9-1-1 calls. A Primary PSAP receives the calls directly. If the call is relayed or transferred, the next receiving PSAP is designated a Secondary PSAP
PSTN	Public Switched Telephone Network - The network of equipment, lines, and controls assembled to establish communication paths between calling and called parties in North America
Public Agency	A provincial, or any unit of local government or special purpose district located in whole or in part within a province, which provides police, fire prevention, medical or other emergency services or has authority to do so

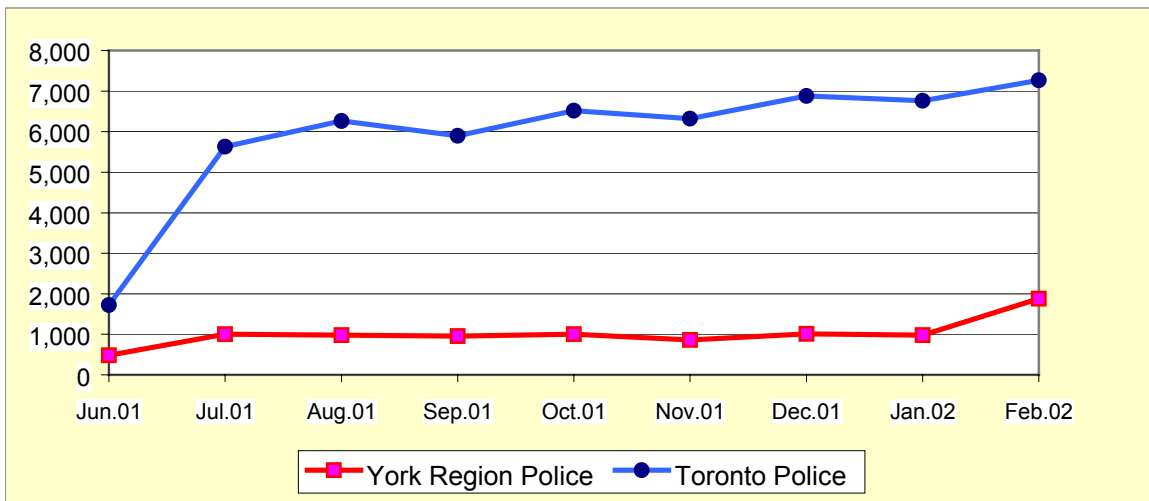
<i>Term</i>	<i>Definition</i>
Public Safety Agency	An entity that provides law enforcement, fire prevention, emergency medical, or other emergency service
QoS	Quality of Service - Measure of performance for a transmission system that reflects its transmission quality and service availability
Real-Time	The availability of information at the exact time it is occurring - A transmission or data processing operational mode in which the data is entered in an interactive (two-way communicating) session
Redundancy	Duplication of components, running in parallel, to increase reliability.; A backup system (either a device or a connection) that serves in the event of primary system failure
Response Agency	The public safety agency having legal or consensual obligation to respond to a call for service
Ringback	See Emergency Ringback
Ringback Tone	A tone returned to the caller to indicate that a call is being processed
Roaming	A wireless service offered by mobile communications network operators which allows a subscriber to use his/her radio or phone while in the service area of another carrier. Roaming requires an agreement between operators of technologically compatible systems in individual markets to permit customers of either operator to access the other's systems
Route Diversity	See Diverse Routing
Routing Number	See ESRD
SAG	Street Address Guide – See MSAG
Secondary PSAP	Secondary Public Safety Answering Point - A PSAP to which 9-1-1 calls are transferred after being screened for service required by the primary PSAP
Selective Routing	A function of the Telephone Network commonly performed by a special type of switching centre known as an E9-1-1 Tandem. Selective Routing routes the 9-1-1 calls based on originating number to the pre-assigned primary PSAP. This allows for fixed or selective transfer to secondary PSAPs. Selective routing is controlled by the ESN, which is derived from the wireline customer or wireless device location
Selective Transfer	The capability to transfer a 9-1-1 call to a response agency by operation of one of several buttons typically designated as police, fire and ambulance; based on the ESN of the caller
Service Address	The physical location of a subscriber access line or wireless cell site/sector. Service Address is the recommended address for 9-1-1 use. (May be different from the listed address or billing address)

<i>Term</i>	<i>Definition</i>
Service Provider	An entity providing one or more of the following 9-1-1 elements: network, CPE, or database service
Silent Call	Call for which the caller does not speak. This may be caused by the device being accidentally activated and initiating a 9-1-1 call. Usually, the caller is not aware of the situation
Source Database	The data base maintained by each Service Provider which provides customer telephone number or wireless cell site/sector location information for the initial load and ongoing updates to the ALI database
SRDB	Selective Routing Database - The routing table that contains wireline telephone number / wireless ESRD to ESN relationships, which determine the routing of 9-1-1 calls
SS7	Signaling System Number 7 - see Common Channel Signaling No. 7 (CCS7)
Tandem Switch	See E9-1-1 Tandem
Test Bed	Environment equipped with instruments, etc. for testing under working conditions and isolated from live operations
TN	Telephone Number – 10-digit number assigned to the telephone line
Transfer	A feature that allows the PSAP's call taker to redirect a 9-1-1 call to another location
Trunk	Typically, a communication path or channel between a wireless/wireline central office switch and the 9-1-1 tandem switch, or between two 9-1-1 tandem switches, or between the 9-1-1 tandem switch and the PSAP
Trunk Group	One or more trunks terminated at the same two points and serving the same Municipalities/Primary PSAP
Uninitialized Handset	A new wireless device (just out of the box) for which the owner has not yet establish a business relationship with the wireless carrier and for which the handset may or may not provide a generic call back number
Unprogrammed Handset	A previously-used wireless device for which the owner has terminated its business relationship with the wireless carrier and for which the handset has been deprogrammed and may or may not provide a generic call back number
Unsubscribed Handset	A previously-used device for which the owner has terminated its business relationship with the wireless carrier and for which the handset may or may not continue to display the previously assigned or a generic call back number
Wireless Carrier	The provider of wireless service

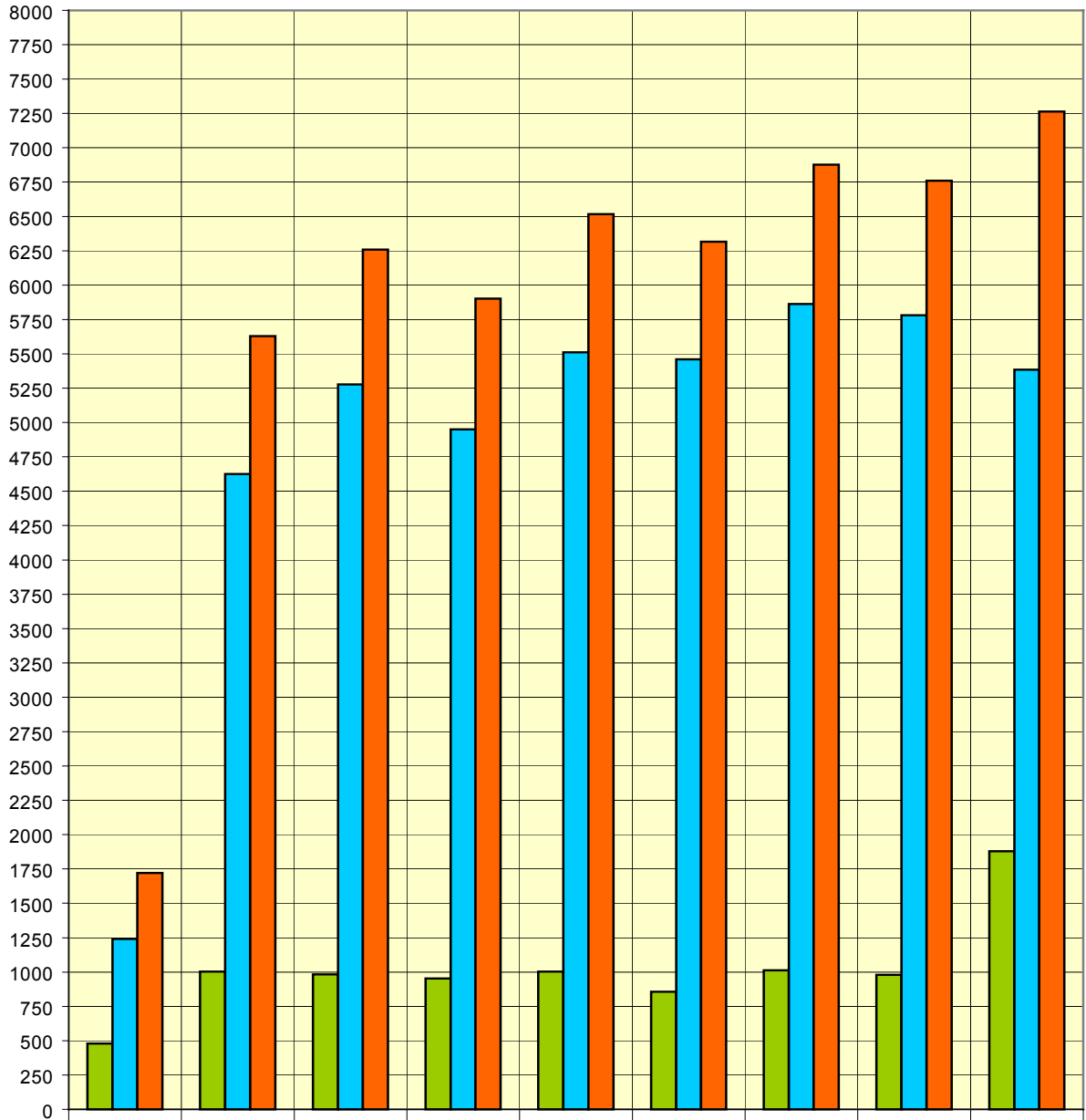
<i>Term</i>	<i>Definition</i>
Wireless E9-1-1	The delivery of a wireless 9-1-1 call with wireless caller's callback number and identification of the cell-sector from that initially captured the wireless 9-1-1 call. Call routing is determined by cell site/sector
Wireless Communications	The family of Telecommunications services under the heading of Commercial Mobile Radio Service. Includes Cellular, Personal Communications Services (PCS), Mobile Satellite Services (MSS) and Enhanced Specialized Mobile Radio (ESMR)
WSP	Wireless Service Provider - (referred to as Wireless Carrier herein)

APPENDIX 5 – Total Call Volumes by PSAP (June 2001 to February 2002)

Month	Toronto Police	York Region Police	Montly Totals
June-01	1,241	479	1,720
July-01	4,626	1,003	5,629
August-01	5,277	983	6,260
September-01	4,950	953	5,903
October-01	5,512	1,004	6,516
November-01	5,460	857	6,317
December-01	5,863	1,014	6,877
January-02	5,781	980	6,761
February-02	5,385	1,879	7,264
Trial Totals	44,095	9,152	53,247



TOTAL CALL VOLUME BY PSAP (JUNE 2001 TO FEBRUARY 2002)



■ York Region Police	479	1003	983	953	1004	857	1014	980	1879
■ Toronto Police	1241	4626	5277	4950	5512	5460	5863	5781	5385
■ Monthly Totals	1720	5629	6260	5903	6516	6317	6877	6761	7264

APPENDIX 6 – Emergency Services Routing Digit (ESRD) Correspondence



January 16, 2001

Ms Ursula Menke
Secretary General
Canadian Radio-television and
Telecommunications Commission
Ottawa, Ontario
K1A 0N2

Dear Ms Menke

RE: **Enhanced 9-1-1 Wireless Trial – Province of Ontario**

The Ontario 9-1-1 Advisory Board (OAB) has initiated a cooperative forum involving the Regional Municipality of York, City of Toronto, wireless service providers, Bell Canada, the Canadian Wireless Telecommunications Association (CWTA) and a representative of Quebec municipalities. Our goal is to conduct a technical trial which will see wireless service providers interconnect with the Provincial Enhanced 9-1-1 platform in such a manner that the appropriate 9-1-1 Public Safety Answering Points (PSAPs) receive call back numbers as well as cell site and sector information when emergency 9-1-1 calls are received from wireless subscribers. This trial is similar to that conducted recently in the Province of Alberta. The Bell Canada E9-1-1 Provincial platform differs somewhat to that utilized by Alberta and this is our opportunity to ensure that the citizens of Ontario and Quebec have effective access to emergency services from wireless telephones.

In order to proceed there is a need to reserve numbering resources that will provide the cell site identification information to municipal PSAPs. In the opinion of the trial participants, this would best be served through the establishment of routable, non-dialable Emergency Service Routing Digits (ESRD) that will route 9-1-1 calls to the appropriate PSAP and provide the necessary cell site/sector information. The ESRD is a ten-digit number used for this routing purpose when a call is originated from a wireless device.

Bell Canada will be utilizing wireless ESRDs from NXX 511 for our Ontario trial in NPAs 416, 647, 905 and 289. The trial participants anticipate that a proposal will be made to the appropriate numbering committee to reserve NXX 511 in all NPAs for wireless ESRD purposes. We realize that this process may take some time to complete. In the interim the trial participants are concerned that without a policy decision to reserve NXX 511 for ESRD, assignment of these numbers for other purposes may happen and result in severe limitations to the trial and ultimately to the rollout of essential enhancements to 9-1-1 services throughout the Province of Ontario and eventually the rest of Canada.

APCO Canada

**Association of
Municipalities of
Ontario**

NENA Ontario

**Ontario Association of
Chiefs of Police**

**Ontario Association of
Fire Chiefs**

**Ontario Ministry of
Health**

**Ontario Ministry of
Municipal Affairs**

**Ontario Ministry of
the Solicitor General
and Correctional
Services**

Ontario 9-1-1 Advisory Board
c/o Peel Regional Police
Telecommunications Systems
and Services
7750 Hurontario Street
Brampton, Ontario L6V 3W6

Tel: (905) 453-2121 Ext.4680

Fax:(905) 453-0002

Email:

voisey@peelpolice.on.ca

On behalf of the trial participants, the Ontario 9-1-1 Advisory Board requests that the Canadian Radio-television and Telecommunications Commission take whatever interim steps are necessary to prevent the assignment of NXX 511 in the NPAs 416, 647, 905 and 289 to any carriers until contributions to reserve NXX 511 in all NPAs for use as wireless ESRDs are submitted and dealt with by the appropriate committee.

Yours truly,

Tom Voisey
Chair, Ontario E9-1-1 Wireless Trial Committee, and
Executive Secretary
Ontario 9-1-1 Advisory Board

16 February 2001

Our file: [8698-C12-13/01](#)

Mr. Tom Voisey
c/o Peel Regional Police
Telecommunications Systems and Services
7750 Hurontario Street
Brampton, Ontario
L6V 3W6

Dear Mr. Voisey,

Subject: Enhanced 9-1-1 Wireless Trial – Province of Ontario

The Canadian Radio-television and Telecommunications Commission is in receipt of your letter of 16 January 2001 regarding the upcoming E9-1-1 field trial in the province of Ontario. It is understood that trial participants, including Regional Municipality of York, City of Toronto, wireless service providers, Bell Canada, the Canadian Wireless Telecommunications Association and a representative of Quebec municipalities, propose to use NXX 5-1-1 as part of a non-dialable number, to assist in identifying cell site information to municipal PSAPs. Although the trial participants anticipate that a proposal will be made to the numbering committee to reserve NXX 5-1-1, there is concern that this process will take some time and absent an interim policy decision, assignment of these numbers for other purposes may happen, which would result in limitations to the trial.

The Ontario 9-1-1 Advisory Board, is seeking a policy decision to reserve NXX 5-1-1 for Emergency Service Routing Digits (ESRD) and request that the Commission take whatever interim steps are necessary to prevent the assignment of NXX 5-1-1 in NPAs 416, 647, 905 and 289 until such time as contributions can be developed, submitted to the numbering committee. During the field trial, when a customer dials 9-1-1 from a wireless phone in the trial area, the PSAP will receive both the wireless customer's 10-digit telephone number as well as the ESRD. The Commission understands that ESRDs must be 10-digits in length, in the North American Numbering Plan (NANP) format (e.g., NXX-NXX-XXXX). Since the ESRDs are non-dialable and do not trigger routing, any string of digits in the NANP format may be used. In this instance, the 5-1-1 digits would data fill a "pseudo NXX" field in the D-E-F positions of a NANP-like 10-digit ESRD.

As you may be aware the Commission has recently initiated a public proceeding to examine issues relating to the assignment of the remaining N-1-1 service codes. It is noted that service code 5-1-1 is currently reserved and may be assigned in the future. It is understood however that the assignment of 5-1-1 as a service code will not conflict in any way with the use of 5-1-1 as proposed by the field trial participants, as a pseudo NXX, as ESRDs are non-dialable and do not trigger any routing.

With regard to the request that NXX 5-1-1 be reserved to avoid assignment of this resource to other purposes, it is noted that the assignment guidelines – which have been approved by the Commission prohibit the assignment of codes in the N-1-1 format as either a 3-digit NPA or a 3-digit Central Office in a 10-Digit NANP telephone number. As noted, these N-1-1 codes are used across the NANP as 3-digit service codes (e.g., 4-1-1, 6-1-1 and, 9-1-1). Accordingly, based on existing policy, there need be no concern that 5-1-1 will be assigned as a central office code within Canadian NPAs. Moreover, given that the ESRD would not trigger any network routing, and that the use of NXX 5-1-1 as part of the ESRD would not impact or preclude any future use of

NXX 5-1-1 as a service access code, there is nothing to preclude the use of NPA –5-1-1 – XXXX as ESRDs in Canada.

In light of the above, there is no objection to the proposed use of NXX 511 in the pseudo NXX field of ESRDS and considers that there is no need for any further action on the part of the CRTC. Should you have any questions, please contact Brenda Stevens at 819-953-8882.
Regards,

Shirley Soehn
Executive Director
CRTC Telecom Branch

APPENDIX 7 – Trial Wireless ESRD Record Information Format



**Enhanced Wireless Access
to Bell Canada
9-1-1 Public Emergency Reporting Service
(9-1-1 PERS)**

**Trial Wireless
Emergency Service Routing Digit (ESRD)
Record Information Format**

Version 4.0 - April 12, 2002

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NOTICE

This document has been prepared by Bell Canada to enable the Wireless Carriers to have their cell site / sector's Emergency Service Routing Digit (ESRD) data input into the Bell Canada 9-1-1 Public Emergency Reporting Service (PERS) Data System database.

The information contained in this document and the associated process is a proposal by Bell Canada. It is primarily designed to be used by participants in the Ontario Wireless E9-1-1 Trial.

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**Acronyms**

ALI	Automatic Location Identification
ANI	Automatic Number Identification
BID	Bell Interface Document
CAD	Computer Aided Dispatch
CBN	Call Back Number (Wireless subscriber telephone number)
CLEC	Competitive Local Exchange Carriers
CNA	Canadian Numbering Administrator
CO	Central Office
CRTC	Canadian Radio-television and Telecommunications Commission
CSCN	Canadian Steering Committee on Numbering
E9-1-1	Enhanced 9-1-1
ESN	Emergency Service Number
ESZ	Emergency Service Zone
ESRD	Emergency Service Routing Digit (Cell Site / Sector)
MIME	Multipurpose Internet Mail Extension
MSAG	Master Street Address Guide
NXX	Network number exchange
NPA	Numbering Plan Area (Area code)
Line	Telephone line number (the four last digits of the telephone number)
LSP	Local Service Provider
LSP ID	Local Service Provider Identification Number
MSC	Mobile Switching Centre
PERS	Public Emergency Reporting Service
PSAP	Public Safety Answering Point
PSTN	Public Switched Telephone Network
SAG	Street Address Guide
SRDB	Selective Routing Database
TN	Telephone Number
WC	Wireless Carrier
WSP	Wireless Service Provider (<i>referred to as Wireless Carrier herein</i>)



Revision History

Version	Revision Date	History / Comments	Revised By
1.0	March 27, 2001	Initial draft distributed within Bell Canada only	Bernard Brabant
2.0	April 18, 2001	Final draft distributed within Bell Canada only	Bernard Brabant
3.0	April 20, 2001	First version distributed to Wireless Carriers	Bernard Brabant
3.1	May 22, 2001	<p>In section 2.2, add 0000 to all number ranges and add a sub line and assign block of ESRDs to differentiate TELUS Mobility PCS from ESMR</p> <p>To be compliant with the wording used in the Memorandum Of Understanding (MOU):</p> <ul style="list-style-type: none">• Change the document's title name• Replace "Wireless Service Provider" and "WSP" with "Wireless Carrier" and "WC"• Replace "Customer Record Information" with "Wireless ESRD Record Information"	Bernard Brabant
3.2	May 24, 2001	<p>In section 2.2, interchanged the 0000 and 3000 numbering series between Bell Mobility and Microcell. Added an extra 100 numbers to the Bell Mobility's ESRD blocks.</p> <p>In section 3.3, change the ESRD number in the example table, for sector 2 to show unity with the document and added a note stating that more or less then 3 sectors could be provisioned to a cell site tower</p>	Bernard Brabant
4.0	April 12, 2002	Presentation of the document as created for the Trial, for Final Trial Report content compliance	Bernard Brabant



1. Introduction

For the purposes of the Wireless Enhanced 9-1-1 (E9-1-1) Trial and the subsequent rollout, Bell Canada has determined that it is appropriate for the Wireless Carriers (WCs) to update the E9-1-1 databases using the same methodology for data records exchange currently implemented for Local Service Providers (LSPs) interconnected to the Bell Canada 9-1-1 PERS service.

In order to appropriately route and display cell site / sector location information associated with wireless 9-1-1 calls, the 9-1-1 databases must be updated by the Wireless Carrier with unique wireless Emergency Service Routing Digit (ESRD) numbers (referred hereafter as ESRD) and the corresponding cell site / sector pseudo-location information.

The ESRD is a 10-digit administrative number. That number is routable, but non-dialable from the Public Switched Telephone Network (PSTN). The ESRD is not a number opened to the Mobile Switching Centre (MSC). The ESRD is used solely by both the MSC and the Bell Canada 9-1-1 tandem switch as an administrative/translation routing number. The ESRD shall be used to selectively route and display the details of the emergency 9-1-1 wireless calls to the designated set of Public Safety Answering Points (PSAPs), using existing protocols and facilities.

Strict adherence to the following guidelines by the Wireless Carriers shall facilitate the entry of the ESRD information into the 9-1-1 Databases (Selective Routing Database (SRDB) and Automatic Location Information (ALI)).

1.1 Wireless Carrier Input Process

The Wireless Carrier defines the best routing for each cell site / sector based on emergency agencies' coverage references, as provided by the Municipality.

The Wireless Carrier selects and assigns an ESRD from its block of 10-digit ESRDs to each cell site / sector, based on the serving NPA of the designated 9-1-1 PSAP / tandem switch (also known as Selective Router).

The Wireless Carrier creates its ESRD transaction records as per the end-to-end process flow diagram provided in Appendix 1 of this document (9-1-1 - Wireless ESRD Assignment and Record Creation Process). Each data file containing one or several ESRD transaction records must be sent to Bell, as specified in the relevant 9-1-1 Implementation Support Document.



2. Emergency Service Routing Digit Numbering Management

2.1 ESRD Numbering

The Canadian Radio-television and Telecommunications Commission (CRTC) has approved the use of NXX 511 for ESRD numbering during the Ontario Wireless E9-1-1 Trial. Until a determination by the Canadian Steering Committee on Numbering (CSCN) on the appropriate reservation and assignment process, the wireless ESRD format will be NPA-511-XXXX. It is expected that the Canadian Numbering Administrator (CNA) will be designated for the assignment of blocks of ESRD numbers to each Wireless Carrier.

In the interim, for the purposes of the Ontario Wireless E9-1-1 Trial, Bell Canada proposes the following allocation of blocks of wireless ESRD numbers for assignment by the Wireless Carriers.

2.2 Assignment of Block(s) of ESRDs by Wireless Carrier

The ESRDs numbering ranges are as follows:

Wireless Carrier	9-1-1 Area	From ESRD	To ESRD
Microcell	York Region	905 511 0000	905 511 0199
	Toronto	416 511 0000	416 511 0199
Bell Mobility	York Region	905 511 3000	905 511 3299
	Toronto	416 511 3000	416 511 3299
Rogers Wireless	York Region	905 511 5000	905 511 5199
	Toronto	416 511 5000	416 511 5199
TELUS PCS	Mobility York Region	905 511 7000	905 511 7199
	Toronto	416 511 7000	416 511 7199
TELUS ESMR	Mobility York Region	905 511 9000	905 511 9199
	Toronto	416 511 9000	416 511 9199

It is further recommended that each Wireless Carrier be assigned ESRD numbers within distinct thousand (1,000) block(s) within each NPA.



3. Emergency Service Routing Digit Record Management

3.1 Bell Canada 9-1-1 PERS Data System

The Bell Canada 9-1-1 PERS Data System is comprised of processing and database systems designed to use valid information entered into the customer transaction record fields. The Wireless Carrier must populate all required fields (see section 5.1) of the wireless ESRD transaction records.

Bell Canada does not guarantee that the validations performed by the 9-1-1 PERS Data System will identify all errors.

3.2 Emergency Service Zone / Number (ESZ / ESN)

A critical element used by the Bell Canada 9-1-1 PERS Data System is the Emergency Service Zone (ESZ) that outlines the combination of 9-1-1 answering centre (primary PSAP) and Police, Fire and Ambulance dispatch agencies (secondary PSAPs) serving a specific area. The ESZ in the 9-1-1 databases (tandem switches and ALI computers) is listed as an Emergency Service Number (ESN). The following chart shows combinations of emergency agencies designated by ESNs.

ESN	NPA	9-1-1	Police	Fire	Ambulance
28	905	Bell Neutral Answer	York Region	Vaughan	Georgian
47	416	Toronto	Toronto	Toronto	Toronto

Within a province, each ESN combination is unique. A Number Plan Area (NPA) code that matches the designated 9-1-1 tandem pair switches is associated with the serving area. That ESN's NPA value will be used when associating an ESRD number to a cell site / sector during the ESRD record creation, in order to allow the appropriate wireless call routing to and information display at the designated set of emergency agencies.

3.3 Cell Site / Sector Interaction with ESRD

Each wireless service tower's cell site / sector shall be mapped to an ESRD. Because the wireless service tower's physical location address' Emergency Service Zone (ESZ) may be different from that of where the wireless 9-1-1 call must be routed, the towers' cell site / sector physical address SHALL NOT be populated in the transaction record's common addressing fields.

For example, a wireless tower physically located in Toronto, south of Highway 401 and in the 416 NPA, may serve up to three distinct 9-1-1 platforms, as shown below.



Tower's Sector	Covering Area	NPA for ESRD	ESRD
1	York Region	905	905-511-0000
2	Durham Region	905	905-511-0999
3	Toronto	416	416-511-0000

ESRDs associated with a particular wireless tower cell site / sector physically located in one NPA (416) may require a code assignment from another NPA (905), as indicated by the above table.

Note: While most Wireless Carriers provision three sectors per cell site tower, some may have more or less than three sectors. Some may have up to six sectors, while others may have only one. In all cases, one ESRD will be assigned to each sector.

3.4 Cell Site / Sector's ESRD Address Creation

The automated Bell Canada 9-1-1 PERS Data System validates all customer records (wireline and wireless) against the Master Street Address Guide (MSAG) using the record's physical location address. In the 9-1-1 served areas, each physical address is associated to a given ESN. In the wireless environment, an address could potentially serve 3 different ESNs. In order to circumvent this specification, the cell site / sector location address will be entered in the subscriber's name field of the ESRD transaction record. The civic number field will be populated with the serving ESN. The street name field will be populated with "Cellular" so as to create a pseudo-address which will pass the system's validations.

As indicated in Appendix 1, the Municipality / Primary PSAP shall provide each Wireless Carrier with the most appropriate ESZ for each ESRD. An assignment example is provided below.

Tower's Sector	Routing ESN	Civic Number	Street Name	PSAP
1	777	777	Cellular	York
2	910	910	Cellular	Durham
3	555	555	Cellular	Toronto

* The ESNs used in the above chart are fictitious.



4. Bell Canada Electronic File Transfer Management

It is expected that for Wireless ESRD Record Information files exchange, the Wireless Carrier and Bell Canada will use the data exchange processes already developed and implemented for Competitive Local Exchange Carriers (CLECs), as initially disclosed in the Bell Interface Document # 024 (BID-024).

Once the wireless E9-1-1 access requirements and specifications are finalized, Bell Canada shall disclose a wireless-specific BID document. Until then, the document mentioned above can be ordered from the Bell Canada disclosure web site page at URL:

<http://bell.cdn-telco.com>

Electronic file transfer must be used for the initial load and any further additions and modifications to the Wireless Carriers' ESRD records.

4.1 Initial Load of ESRD Records

A Wireless ESRD Record Information (*wireless ESRD(s)*) file must be transmitted by the Wireless Carrier to the Bell Canada 9-1-1 PERS Data System as a file attachment to an electronic mail (e-mail) message. The Bell Canada 9-1-1 PERS Data System will transmit 9-1-1 Emergency Service Number (ESN) files and Error Return files to the Wireless Carrier similarly. There should be only one file attachment per e-mail message.

4.2 E-mail Software Specifications

Any e-mail software supporting MIME (Multipurpose Internet Mail Extension) can be used for sending and receiving e-mail messages with an attached data file.

The 9-1-1 ESN, Wireless ESRD Record Information and Error Return files contain confidential data. It is mandatory that the integrity and confidentiality of these files be preserved, not only in the Wireless Carrier and Bell Canada 9-1-1 PERS Data Systems, but also during their transfer.

The fundamental network security requirements supported by the Bell Canada 9-1-1 PERS Data System application are:

- | | |
|-------------------------|---|
| <i>Confidentiality:</i> | Ensures that data is not disclosed to unauthorized persons. |
| <i>Access Control:</i> | Ensures that only those who are authorized to view or modify data can access that data. |
| <i>Integrity:</i> | Ensures that the data has not been altered since it was originally created. |



Data Origin Authentication: Provides proof of the source of data.

Non-repudiation: Ensures that someone cannot deny involvement in an electronic transaction.

In order to ensure efficient and secure data transfer, all files will be digitally signed, encrypted and compressed using the Entrust® technology before being attached to the e-mail message.

Encryption provides for the confidentiality of information. It addresses the confidentiality and access control requirements. Only the authorized people can decrypt the file. The primary feature of public-key cryptography is that it removes the need to use the same key for encryption and decryption. Public-key cryptography facilitates key management by greatly reducing the need for on-line trusted key servers and by simplifying key distribution protocols. Furthermore, public-key cryptography can provide for digital signatures and can support non-repudiation.

Digital signature provides strong authentication of the originator and the prompt detection of any data tampering. It addresses the integrity, authentication, and non-repudiation requirements. A digital signature is analogous to a hand-written signature in that a digital signature can be used to assure a reader of the (non-repudiable) source of the information. In addition, a digital signature can ensure that any unauthorized changes to the data will be detected (integrity).

Compression ensures fast transmission of data files.

Entrust® provides a standard-based public-key cryptography key management solution that ensures key updates are automatic and transparent to users. It complies with the fundamental network security requirements.

4.3 Entrust/Solo™ Key Management Centre

The following is information specific to the encryption software company used by the Bell Canada 9-1-1 PERS Data System (mediated Management System).

Entrust Technologies Inc
4975 Preston Park Blvd
suite 400
Plano, Texas
USA 75093

1-888-690-2424 ou 972-943-7300
Fax : 972-943-7305
E-mail: entrust@entrust.com

For encryption specific information, contact Entrust/Solo™ Key Management Centre.



4.4 ESRD Records' File Management

Upon completion of the electronic file, as per pre-determined processes, the Wireless Carrier shall e-mail the file to the address to be provided by the Bell Canada 9-1-1 CLEC Administrator.

Upon receipt of the file, the mediated interface processes the transaction records in the Bell Canada 9-1-1 PERS Data System. Any error shall be returned to the Wireless Carrier in an error file with a detailing message.

4.5 Changes to ESRD after Initial Load

The Wireless Carrier can submit changes to their ESRD information by sending new records specifying the required action (addition or deletion). To modify an existing ESRD record, the record must first be deleted and then added back with the updated/corrected information.

Completed files are to be e-mailed to Bell Canada 9-1-1 PERS Data System.

4.6 ESRD Records Validation

The Bell Canada 9-1-1 PERS Data System is not designed to provide detailed reports of ESRD record validation information. After processing each incoming file, Bell Canada provides an error report file to the submitting party for those records that failed the validation. The error file can be used as file processing confirmation.

The wireless ESRD's ALI display information can be verified by the Wireless Carrier during the Trial's test period by placing test calls from designated cell site / sector.

4.7 File Format

File format specifications including Header and Trailer records and file management information are available in the Bell Canada Interface Document (BID-024), issued in May 2000, (9-1-1 Public Emergency Reporting Service - Network-to-Network Interface Between Local Service Providers and Bell Canada Network).

5. Wireless ESRD Transaction Record Management

This section provides detailed information on the Wireless ESRD transaction record format.

The Wireless ESRD transaction record is used to populate and update the 9-1-1 PERS databases.

The specified Wireless ESRD Record Information format is to be used for each wireless ESRD transaction record to be included between the Header and the Trailer of every Wireless ESRD Record Information and Error Return file.



5.1 Wireless ESRD Transaction Record Format

The Wireless ESRD transaction record format is presented below. A sample record is available in section 5.2. Each of the record fields is described in section 5.3.

Field Name	Starting Position	Size	Type	Accepted Values / Comments
Transaction Code	01	1	Alphabetic	"A", "D" or "U"
NPA	02	3	Numeric	As per PSAP/tandem's serving area
NXX	05	3	Numeric	Always "511"
LINE	08	4	Numeric	Last 4 digits of ESRD number
Client Account ID	12	3	Numeric	"999" for wireless ESRD
Service Class	15	3	Alphanumeric	"CEL"
Postal Code	18	6	Alphanumeric	Always "NA" for wireless ESRD
Municipality Code	24	3	Alphanumeric	As per value provided in section 5.5
Pilot NPA	27	3	Numeric	Same as NPA above
Pilot NXX	30	3	Numeric	Same as NXX above
Pilot LINE	33	4	Numeric	Same as LINE above
Class of Service	37	5	Alphanumeric	BLANK for wireless ESRD
System Source	42	1	Alphabetic	"W"
Language Indicator	43	1	Alphabetic	"F" for French or Français, "A" for Anglais or "E" for English
Subscriber Name	44	75	Alphanumeric	Wireless Company name + Cell site / sector location + Map number (if applicable)
Civic Number	119	6	Numeric	ESN number
Civic Number Suffix	125	4	Alphanumeric	BLANK for wireless ESRD
Street Name	129	75	Alphanumeric	Ontario "Cellular" / Quebec "Cellulaire"
Street Direction	204	2	Alphabetic	BLANK for wireless ESRD
Street Suffix	207	2	Alphanumeric	Ontario "ST" / Quebec "RU"
Location Type	208	15	Alphanumeric	BLANK for wireless ESRD
Location Number	223	6	Alphanumeric	BLANK for wireless ESRD
Additional Information	229	22	Alphanumeric	BLANK for wireless ESRD
Service Municipality	251	35	Alphanumeric	Municipality Name for serving Area
Extended Municipality Name	286	28	Alphabetic	Ontario "Cellular" / Quebec "Cellulaire"
LSP ID	314	5	Alphanumeric	LSP ID assigned to the Wireless Carrier



5.2 Sample Wireless ESRD Transaction Record

The following table provides an example of the data required in the appropriate fields in a Wireless ESRD transaction record used to populate the Bell Canada 9-1-1 PERS Data System:

Field Name	Starting Position	Size	Type	Value / Inputting Comments
Transaction Code	01	1	Alphabetic	A
NPA	02	3	Numeric	416
NXX	05	3	Numeric	511
LINE	08	4	Numeric	0001
Client Account ID	12	3	Numeric	999
Service Class	15	3	Alphanumeric	CEL
Postal Code	18	6	Alphanumeric	NA
Municipality Code	24	3	Alphanumeric	ZZY
Pilot NPA	27	3	Numeric	416
Pilot NXX	30	3	Numeric	511
Pilot LINE	33	4	Numeric	0001
Class of Service	37	5	Alphanumeric	
System Source	42	1	Alphabetic	W
Language Indicator	43	1	Alphabetic	E
Subscriber Name	44	75	Alphanumeric	ABC WIRELESS (100 MAIN ST EAST, TORONTO) 23
Civic Number	119	6	Numeric	555
Civic Number Suffix	125	4	Alphanumeric (see Note)	
Street Name	129	75	Alphanumeric	CELLULAR
Street Direction	204	2	Alphabetic	
Street Suffix	207	2	Alphanumeric	ST
Location Type	208	15	Alphanumeric	
Location Number	223	6	Alphanumeric	
Additional Information	229	22	Alphanumeric	
Service Municipality	251	35	Alphanumeric	TORONTO
Extended Municipality Name	286	28	Alphabetic	CELLULAR
LSP ID	314	5	Alphanumeric	ABC



5.3 Wireless ESRD Transaction Record Fields - Content & Validation

GENERAL NOTE:

Unless otherwise specified, all fields:

- must be left justified and padded with spaces, and
- are sent to the PSAPs for display at the 9-1-1 call-taker screen.

Field Name		Information / Comments	
Transaction Code	Description	Wireline	Action required on the TN record («A»ddition, «D»eletion or «U»nlock)
		Wireless ESRD	Action required on the TN record («A»ddition or «D»eletion). «U»nlock does not apply to ESRD
	Purpose		Indicates the action to be taken on the TN record by the Bell Canada 9-1-1 PERS Data System. This information is not sent to the PSAPs
	Format		1 alphabetic character
	Validation		Must be « A », « D » or « U »
	Error Processing		Invalid value will lead to rejection of record. Record will be returned in Error Return file
	Error Impact		Default routing, no display
NPA	Description	Wireline	NPA portion of the customer's 10-digit telephone
		Wireless ESRD	NPA portion of the wireless ESRD number
	Purpose		Part of the customer's telephone / wireless ESRD number. Can be sent to the PSAPs for display on the 9-1-1 call-taker screen, depending on the PSAP settings
	Format		3 numeric characters
	Validation		Must be numeric, not blank. NPA must be valid and configured in the Bell Canada 9-1-1 PERS Data System
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code
Error Impact		Default routing, no display	



Field Name		Information / Comments	
NXX	Description	Wireline	NXX portion of the customer's 10-digit telephone number
		Wireless ESRD	Always enter « 511 », unless otherwise specified
	Purpose		Part of the customer's telephone / wireless ESRD number
	Format		3 numeric characters
	Validation		Must be numeric and not blank. NXX must be valid and configured in the Bell Canada 9-1-1 PERS Data System
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code
	Error Impact		Default routing, no display
LINE	Description	Wireline	LINE portion of the customer's 10-digit telephone number
		Wireless ESRD	Last 4 digits of ESRD assigned from block of numbers
	Purpose		Part of the customer's telephone / wireless ESRD number
	Format		4 numeric characters
	Validation		Must be numeric and not blank
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code
Error Impact		Default routing, no display	
Subscriber Account ID	Description	Wireline	Additional identification of the customer
		Wireless ESRD	Always enter « 999 »
	Purpose		Reserved for future use (to further identify a subscriber). This information is not sent to the PSAPs
	Format		3 numeric characters
	Validation		Must be numeric and not blank
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code
Error Impact		Default routing, erroneous display	



Field Name		Information / Comments	
Service Class	Description	Wireline	Type of telephone service of the customer's TN (ex.: RES, BUS, FEX, ...)
		Wireless ESRD	Always enter « CEL »
	Purpose		Gives more information on the origin of the call
	Format		3 alphanumeric characters
	Validation		Must not be blank. Must be one of the values defined in the Bell Canada 9-1-1 PERS Data System
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code
	Error Impact		Default routing, no display
Postal Code	Description	Wireline	Postal code of the customer's service address
		Wireless ESRD	Always enter « NA »
	Purpose		Part of the service address
	Format		6 alphanumeric characters
	Validation		Must not be blank, and first character must be alphabetic
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code
	Error Impact		Default routing, erroneous display
Municipality Code	Description	Wireline	Unique code assigned to each municipality
		Wireless ESRD	Enter value specified in section 5.5, unless otherwise specified
	Purpose		Uniquely identifies the municipality
	Format		3 alphanumeric characters
	Validation		Must not be blank. Must be one of the values defined in the Bell Canada 9-1-1 PERS Data System
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code
	Error Impact		Information would be sent to wrong 9-1-1 tandem pair leading to default routing, no display



Field Name		Information / Comments	
Pilot NPA	Description	Wireline	NPA portion of the customer's 10-digit telephone
		Wireless ESRD	NPA portion of the wireless ESRD number
	Purpose	Reserved for future use. This information is not sent to the PSAPs	
	Format	3 numeric characters	
	Validation	Must be numeric, not blank. NPA must be valid and configured in the Bell Canada 9-1-1 PERS Data System	
	Error Processing	Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code	
	Error Impact	Default routing, no display	
Pilot NXX	Description	Wireline	NXX portion of the customer's 10-digit telephone number
		Wireless ESRD	Always enter « 511 », unless otherwise specified
	Purpose	Reserved for future use. This information is not sent to the PSAPs	
	Format	3 numeric characters	
	Validation	Must be numeric, not blank, and equal to the NXX field value	
	Error Processing	Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code	
Error Impact	Default routing, no display		
Pilot LINE	Description	Wireline	LINE portion of the customer's 10-digit telephone number.
		Wireless ESRD	Last 4 digits of ESRD assigned from block of numbers
	Purpose	Reserved for future use. This information is not sent to the PSAPs	
	Format	4 numeric characters	
	Validation	Must be numeric, not blank, and equal to the LINE field value	
	Error Processing	Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code	
Error Impact	Default routing, no display		



Field Name		Information / Comments	
Class of Service	Description	Wireline	Code identifying the grade, class and type of service
		Wireless ESRD	Leave BLANK (<i>must be filled with space characters</i>)
	Purpose		Reserved for future use. This information is not sent to the PSAPs
	Format		5 alphanumeric characters
	Validation		None
	Error Processing		N/A
	Error Impact		N/A
System Source	Description	Wireline	Identifies the source database of the Transaction record
		Wireless ESRD	Always enter « W », unless otherwise specified
	Purpose		For internal Bell Canada 9-1-1 PERS Data System validation usage. Contact Bell Canada 9-1-1 LSP Administrator for the value to be used. This information is not displayed at the PSAPs
	Format		1 alphanumeric character
	Validation		N/A
	Error Processing		N/A
	Error Impact		N/A
Language Indicator	Description	Wireline	Indicates the customer's preferred language
		Wireless ESRD	Enter « E » in Ontario and « F » in Quebec
	Purpose		Reserved for future use. This information is not sent to the PSAPs
	Format		1 alphabetic character
	Validation		Must be one of the following: «E» (English), «F» (French/Français) or «A» (Anglais)
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code
	Error Impact		Default routing, erroneous display



Field Name		Information / Comments	
Subscriber Name	Description	Wireline	Name of the subscriber / company
		Wireless ESRD	Name of wireless company, plus the physical address of the cell site / sector tower in brackets (), and where applicable the wireless map coverage reference
	Purpose		Identifies customer name / wireless cell site /sector location
	Format		75 alphanumeric characters
	Validation		Must not be blank
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code
	Error Impact		Default routing, erroneous display
Civic Number	Description	Wireline	House number of the customer's service address. Part of the service address
		Wireless ESRD	Pseudo number that relates to the Emergency Service Zone's ESN number to be used to selectively route the wireless call
	Purpose		Used to validate the service address with the 9-1-1 SAG and assign the proper ESN
	Format		6 numeric characters. Right justified, with no leading zero.
	Validation		Must not be blank and be a valid civic number on the associated street
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code
	Error Impact		Default routing, erroneous display
Civic Number Suffix	Description	Wireline	Suffix of the house number.
		Wireless ESRD	Leave BLANK (<i>must be filled with space characters</i>)
	Purpose		Further characterizes the civic number, when necessary (ex.: 123-1/2, 456-A)
	Format		4 alphanumeric characters. It can be blank; when it isn't, the first character must be a dash (-). Left justified
	Validation		None
	Error Processing		N/A
	Error Impact		Erroneous display



Field Name		Information / Comments																									
Street Name	Description	Wireline	Name of the street. Part of the service address																								
		Wireless ESRD	Enter « Cellular » in Ontario and « Cellulaire » in Quebec																								
	Purpose		Used to validate service address with 9-1-1 SAG and assign the ESN																								
	Format		75 alphanumeric characters. Left justified																								
	Validation		Must not be blank. Must be a valid street name in the associated municipality (i.e., configured in the 9-1-1 SAG)																								
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code																								
	Error Impact		Default routing, erroneous display																								
Street Direction	Description	Wireline	Direction of the street. Part of the service address																								
		Wireless ESRD	Leave BLANK (<i>must be filled with space characters</i>)																								
	Purpose		Used to validate service address with 9-1-1 SAG and assign the ESN																								
	Format		2 alphabetic characters																								
	Validation		Must be blank or one of the following values (for Wireline): <table border="0" style="margin-left: 40px;"> <tr> <td>«N»</td><td>(North/Nord)</td> <td>«NE»</td><td>(North East/Nord Est)</td> </tr> <tr> <td>«S»</td><td>(South/Sud)</td> <td>«NW»</td><td>(North West)</td> </tr> <tr> <td>«E»</td><td>(East/Est)</td> <td>«NO»</td><td>(Nord Ouest)</td> </tr> <tr> <td>«W»</td><td>(West)</td> <td>«SE»</td><td>(South East/Sud Est)</td> </tr> <tr> <td>«O»</td><td>(Ouest)</td> <td>«SW»</td><td>(South West)</td> </tr> <tr> <td>«SO»</td><td>(South Ouest)</td> <td></td><td></td> </tr> </table>	«N»	(North/Nord)	«NE»	(North East/Nord Est)	«S»	(South/Sud)	«NW»	(North West)	«E»	(East/Est)	«NO»	(Nord Ouest)	«W»	(West)	«SE»	(South East/Sud Est)	«O»	(Ouest)	«SW»	(South West)	«SO»	(South Ouest)		
	«N»	(North/Nord)	«NE»	(North East/Nord Est)																							
	«S»	(South/Sud)	«NW»	(North West)																							
«E»	(East/Est)	«NO»	(Nord Ouest)																								
«W»	(West)	«SE»	(South East/Sud Est)																								
«O»	(Ouest)	«SW»	(South West)																								
«SO»	(South Ouest)																										
Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code																									
Error Impact		Default routing, erroneous display																									
Street Suffix	Description	Wireline	Type of street. Part of the service address																								
		Wireless ESRD	Enter « ST » in Ontario and « RU » in Quebec																								
	Purpose		Used to validate service address with 9-1-1 SAG and assign the ESN																								
	Format		2 alphabetic characters																								
	Validation		Must not be blank in Quebec. Must be the valid street type of the associated street (i.e., configured in the 9-1-1 SAG)																								
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code																								
Error Impact		Default routing, erroneous display																									



Field Name		Information / Comments	
Location Type	Description	Wireline	Type of location within a building or type of building (ex.: apartment, suite, shopping centre)
		Wireless ESRD	Leave BLANK (<i>must be filled with space characters</i>)
	Purpose		Further identifies the caller's location
	Format		15 alphanumeric characters
	Validation		None
	Error Processing		N/A
	Error Impact		N/A
Location Number	Description	Wireline	Number of the location identified in the Location Type field, when applicable (ex.: apartment 2, suite 305, floor 11)
		Wireless ESRD	Leave BLANK (<i>must be filled with space characters</i>)
	Purpose		Further identifies the caller's location
	Format		6 alphanumeric characters
	Validation		None
	Error Processing		N/A
	Error Impact		N/A
Additional information	Description	Wireline	For «I»ncoming files: Additional location information, to be used when all other fields have been used and more location information is available (ex.: «via back door», «on pool floor», «in the lobby») For «E»rror files: Error Code(s), if any error occurred on the record
		Wireless ESRD	Leave BLANK (<i>must be filled with space characters</i>)
	Purpose		For «I»ncoming files: Further identifies the caller's location. For «E»rror files: Identifies the error(s)
	Format		22 alphanumeric characters
	Validation		None
	Error Processing		N/A
	Error Impact		N/A



Field Name		Information / Comments	
Service Municipality	Description	Wireline	Town, village, borough or locality. Often based on the post office address or used to designate the former municipality name, after a merge. May differ from the Extended Municipality Name, which is used for routing of the call
		Wireless ESRD	Same as above
	Purpose		Further identifies the caller's location
	Format		35 alphanumeric characters
	Validation		Must not be blank
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code
	Error Impact		Default routing, erroneous display
Extended Municipality Name	Description	Wireline	Official Bell Canada 9-1-1 PERS name of the municipality. Part of the service address
		Wireless ESRD	Enter « Cellular » in Ontario and « Cellulaire » in Quebec
	Purpose		Is used to validate the service address with the 9-1-1 SAG and assign the proper ESN
	Format		28 alphanumeric characters
	Validation		Must not be blank. Must be the valid municipality name in which the service address resides (i.e., configured in the 9-1-1 SAG)
	Error Processing		Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code
Error Impact		Default routing, erroneous display	



Field Name		Information / Comments	
LSP ID	Description	Wireline	Unique code assigned to the LSP servicing that telephone number. Bell Canada CSG will confirm the LSP identifier requested by your Company. Negotiation may be required between the LSP and Bell Canada CSG to establish the LSP ID
		Wireless ESRD	Unique code assigned to the each Wireless Carrier. Bell Canada CSG will confirm the LSP identifier requested by your Company. Negotiation may be required between the WC and Bell Canada CSG to establish the LSP ID
	Purpose	Is used to identify the LSP / Wireless Carrier that provides telephone service for the telephone number. This information is not sent to the PSAPs, but the corresponding LSP Name is	
	Format	5 alphanumeric characters maximum (minimum 3 characters)	
	Validation	Must not be blank. Must be the valid LSP Identifier assigned to the LSP / Wireless Carrier	
	Error Processing	Invalid value will lead to rejection of record, which will be returned in Error Return file with the appropriate Error Code	
	Error Impact	Default routing, no display or erroneous display	

5.4 Subscriber Name Field

Due to the exceptional requirement to use the address-specific fields to create a routing pseudo-address and in order to help the call taker identify the wireless call originating location, the Wireless Carrier are required to populate the valid cell site / sector location information directly into the Subscriber Name field with the following information:

- Wireless Company name
- Cell site / sector address location
- Map number (where applicable)

Example: **ABC Wireless (100 Main St East, Toronto) 23**

That shall provide the PSAP call taker with identification of the exact location of the receiving wireless cell site / sector.

5.5 Municipality Code

In the Bell Canada 9-1-1 PERS Data System, each municipality is identified by a unique «Municipality Code». Municipalities served by 9-1-1 PERS have already been assigned



their Municipality Code. This is a mandatory field that must be validated by the Wireless Carrier.

For the Wireless E9-1-1 Trial, use the following Municipality Codes:

Province	Municipality Code Wireless-specific Value	Associated with Primary PSAP / Municipality served by the 9-1-1 Tandems pair
Ontario	ZZX	NPA 905 serving area
	ZZY	NPA 416 serving area

6. Display Data Delivery to PSAPs

6.1 ESRD Display at the PSAPs

The Bell Canada 9-1-1 PERS data facilities, Computer Aided Dispatch (CAD) packet format, Printer, etc. formats are disclosed in the Bell Interface Document 013 (BID-013). This document provides ESRD display information for wireless 9-1-1 calls.

The ESRD number will be presented in the ANI field for all devices (CAD packet, Printer, etc.). The wireless caller's Call Back Number (CBN) will be presented in a new specific field or in the "additional information" field depending on the PSAPs' capabilities.



Appendix 1 9-1-1 - Wireless ESRD Assignment and Record Creation Process

