

BeH



Wireless Location Accuracy in Canada

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Agenda

Wireless E9-1-1 Phase II

Availability

Features

Monitoring Process

Accuracy Performance

AML and ELS

Overview

Canadian Implementation

Q & A

Wireless E9-1-1 Phase II

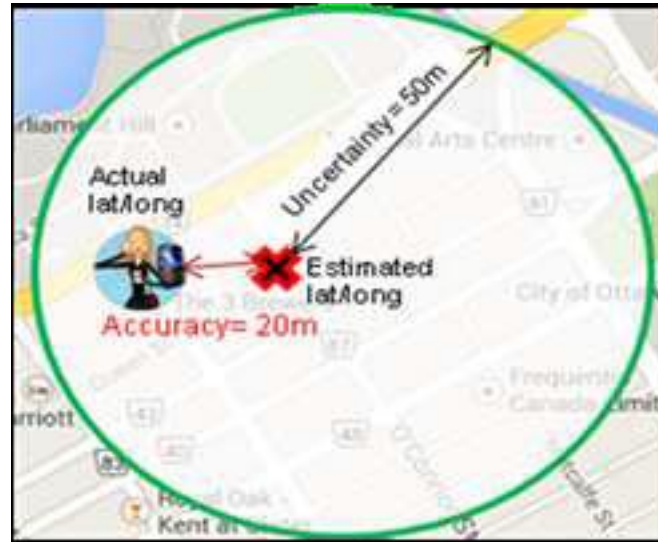
- Mandated by CRTC in 2009
- Delivery of a phone number and wireless E9-1-1 caller's location to the PSAP
- Available wherever wireline E9-1-1 is implemented in Canada
- Calculated within the Wireless Service Providers domain
- Location determination technologies used by WSPs:
 - GPS
 - Assisted GPS (A-GPS)
 - Advanced Forward Link Trilateration (AFLT)
 - Cell ID + Round Trip Time (CI-RTT)

Wireless E9-1-1 Phase II

- 30-second timer or error code is provided to the PSAP
- Uncertainty value – radius – expressed in meters
- Calculated latitude and longitude coordinates
- Confidence level – always set at 90%
- In Call Location Update (manual in 30 seconds intervals)

Wireless E9-1-1 Phase II Accuracy vs Uncertainty

Accuracy is defined as the difference between the estimated latitude and longitude coordinates of the calling handset and its actual latitude and longitude coordinates at the time the 9-1-1 call was placed.



Accuracy is measured in metres. The smaller the number, the better the location accuracy performance.

Factors affecting Wireless E9-1-1 Phase II accuracy

- environment (e.g. weather and tree cover)
- physical geography (e.g. urban/rural, surrounding tall buildings, underground, or terrain)
- situational (e.g. the 9-1-1 caller is indoors, outdoors, in motion, or stationary)
- mobile handset (handset) characteristics (e.g. GPS capability, battery charge and signal strength)
- Network coverage (the number of cell towers, small cells, Wi-Fi access points) in a particular area and the distance between them

Monitoring Process

- In 2014 CISC ESWG's proposed national minimum and target thresholds that WSPs must meet
- In 2015 the CRTC approved the CISC ESWG's recommended monitoring process and threshold
- In 2017 CRTC directs WSPs to use the new minimum and target thresholds or measuring their location accuracy performance
- WSPs to provide data to ESWG and commission on Quarterly basis for analysis
- Yearly report to the commission
- WSPs will disclose detailed performance measurements to the CRTC or to a PSAP requesting to receive its own data in confidence from the WSP(s).

Network performance is considered confidential WSP information

Minimum and Target thresholds 2017

% number of times location info from E9-1-1 calls provided by a wireless carrier, was below Uncertainty level in threshold category	<150m for Rural / Small PSAP's	<150m for Large / Metro PSAP's	<1000m for Rural / Small PSAP's	<1000m for Large / Metro PSAP's
Minimum threshold	50%	50%	65%	75%
Target threshold	65%	65%	80%	90%

Large/Metro PSAP

Large metro PSAPs serve areas that are census metropolitan areas, which encompass a very large urban area (known as the urban core), together with the adjacent urban and rural areas that have a high degree of social and economic integration with the urban core. A metropolitan area has an urban core population of at least 100,000, based on the last census.

Small/Rural PSAP

Small/rural PSAPs serve areas with an urban core population of less than 100,000, because it is either a mostly rural area or a small urban area.

Latest Results

Table 1. Wireless Location Accuracy Results for Periods 3 and 4						
	Period 3			Period 4		
SUMMARY WC Results	National	Provincial	PSAP	National	Provincial	PSAP
Number of Instances Below Minimum Threshold	0	0	0	0	0	0
Number of Instances Below Target Threshold	0	5	50	0	1	15
Number of Instances Below Minimum Yield	0	0	0	0	0	0
AGGREGATED INDIVIDUAL WC Results	Period 3			Period 4		
Number of Instances Below Minimum Threshold	0	1	7	0	0	3
Number of Instances Below Target Threshold	5	38	207	0	9	81
Number of Instances Below Minimum Yield	0	2	15	0	1	6

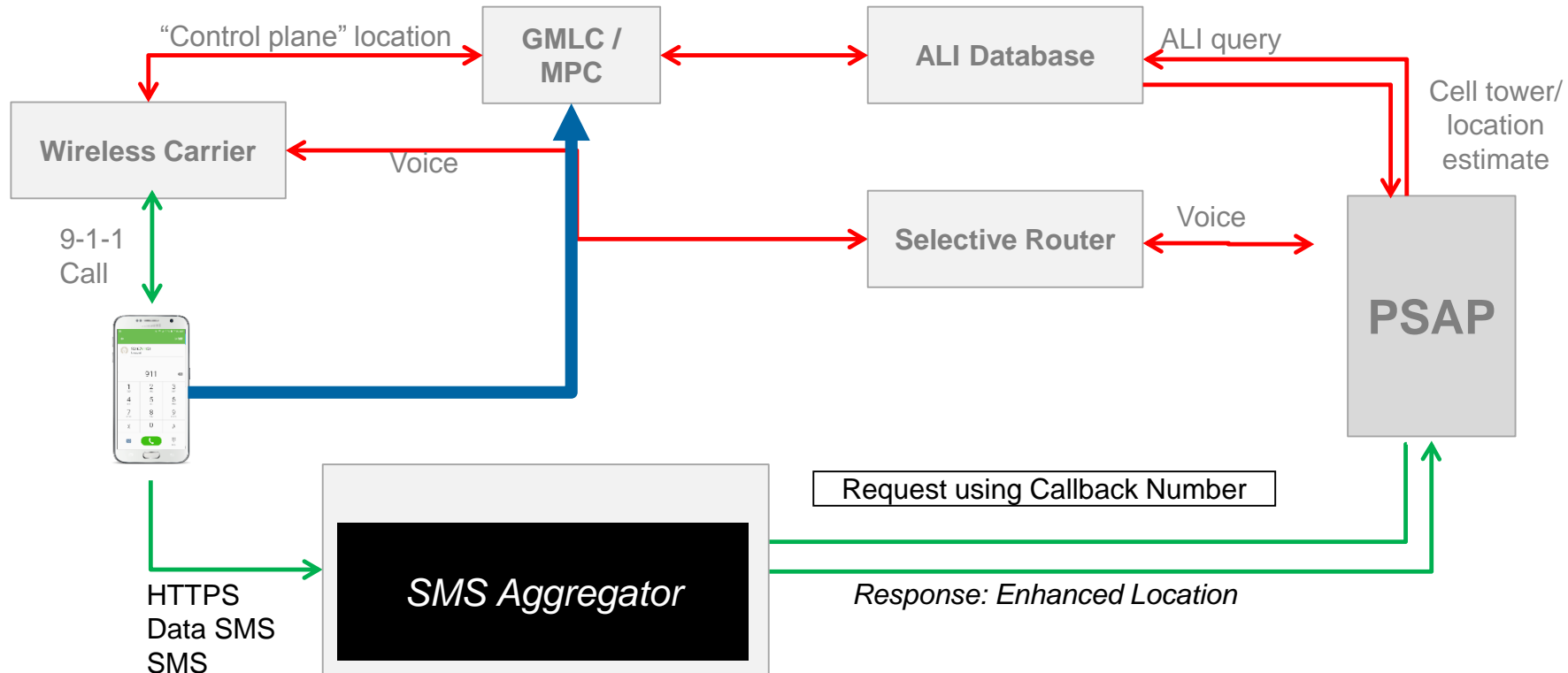
Why can Uber find me and 9-1-1 can't?

Handset-based emergency location technologies

- No special hardware, downloads or updates required
- Activated only when the user dials 9-1-1.
- Location is computed on the handset and sent to the PSAP using variety of sensors
 - » Wi-Fi hotspot proximity
 - » Bluetooth
 - » Magnetometer
 - » Barometer

Advanced Mobile Location and Emergency Location Service
Active in 10 countries around the world

Canadian Implementation



Proposed Canadian implementation does not require changes at the PSAPs