

OMA-TP-2013-0xxx-Public_Safety_Location

Public Safety and the need for Indoor Location Standards

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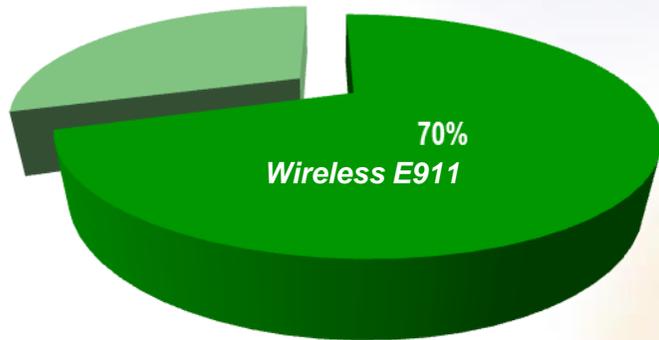
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Current State of Affairs on Emergency Calling in the US

All emergency wireless calls in the US are required to provide accurate location information of the caller to the Emergency Dispatcher



- **400,000 daily E911** calls from wireless devices
- Vast majority of wireless calls in the US are originating indoors – over 56%
- **36% of all households** have no landline (**52%** of families in poverty and **58%** of renters)

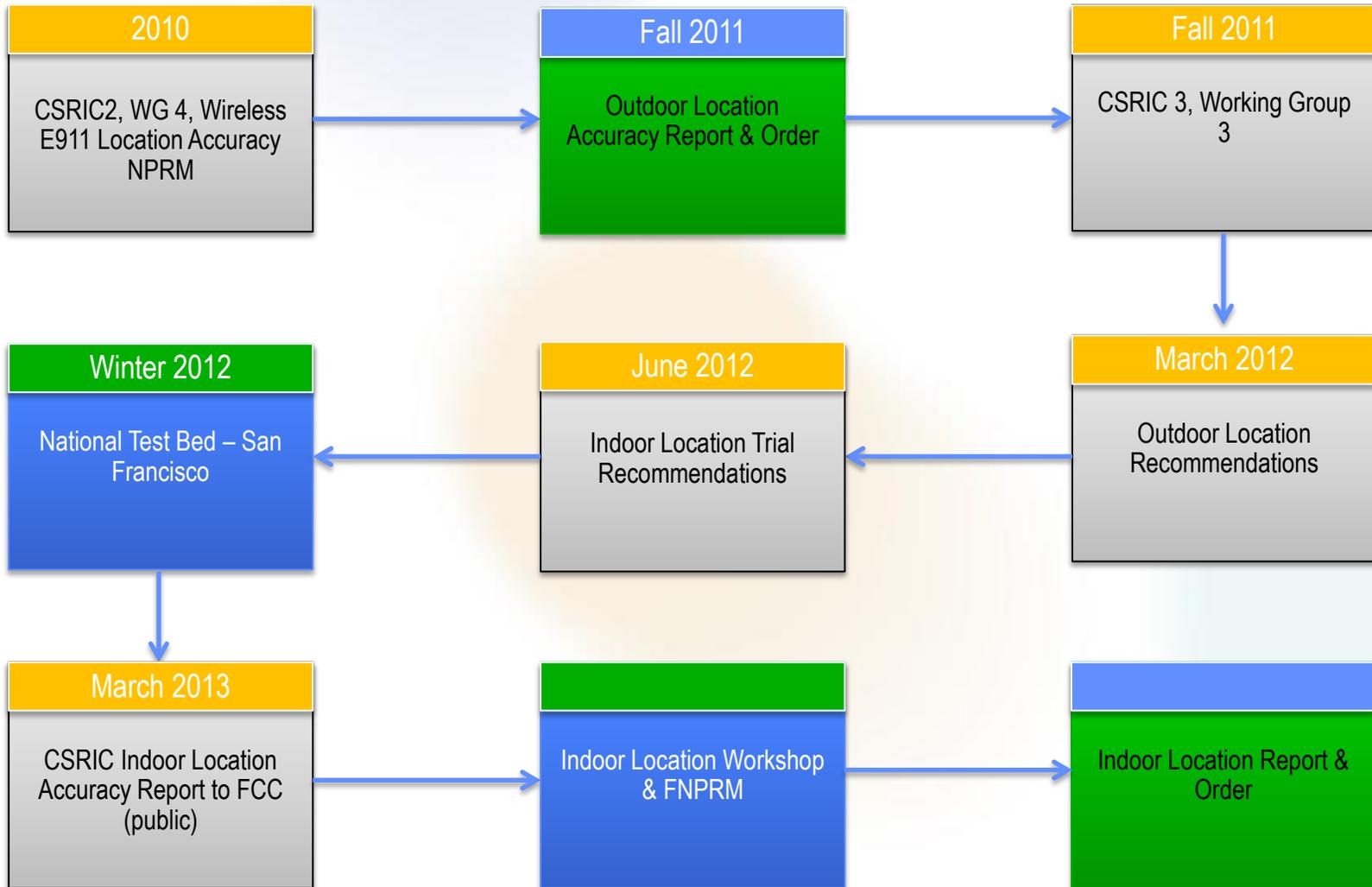
Topic	2011, December	2010, December	2006, December	2001, December	1996, December
Wireless Subscriber Connections	331.6M	302.9M	233.0M	128.4M	44.0M
Wireless Penetration in US Households	104.60%	~98.5%	76.60%	44.20%	16%
Wireless-Only Households (as % of US households)	31.60%	26.60%	10.50%	N/A	N/A
Wireless E-911 Calls(per day)	>400K	>296K	260K	139K	55K
Wireless E-911 Calls(per year)	>146M	108M	~93.6M	~50M	~19.8M

Source: FCC, NENA, CTIA.

Overview

- A large public policy gap exists between where mobile phones are used and current regulations on finding people in an emergency.
- Many reports filed into the FCC's public record
 - Public Safety Agencies: NENA, APCO, IAFC, IACP, CaINENA
 - Vendors
- Federal Communication Commission has initiated several steps to address this policy gap from a regulatory perspective
 - CSRIC Process
 - Location Workshop
- As complexity of use cases increases many operators will consider a reliable location system to complement the mobile use case

FCC's E911 Indoor Location Process

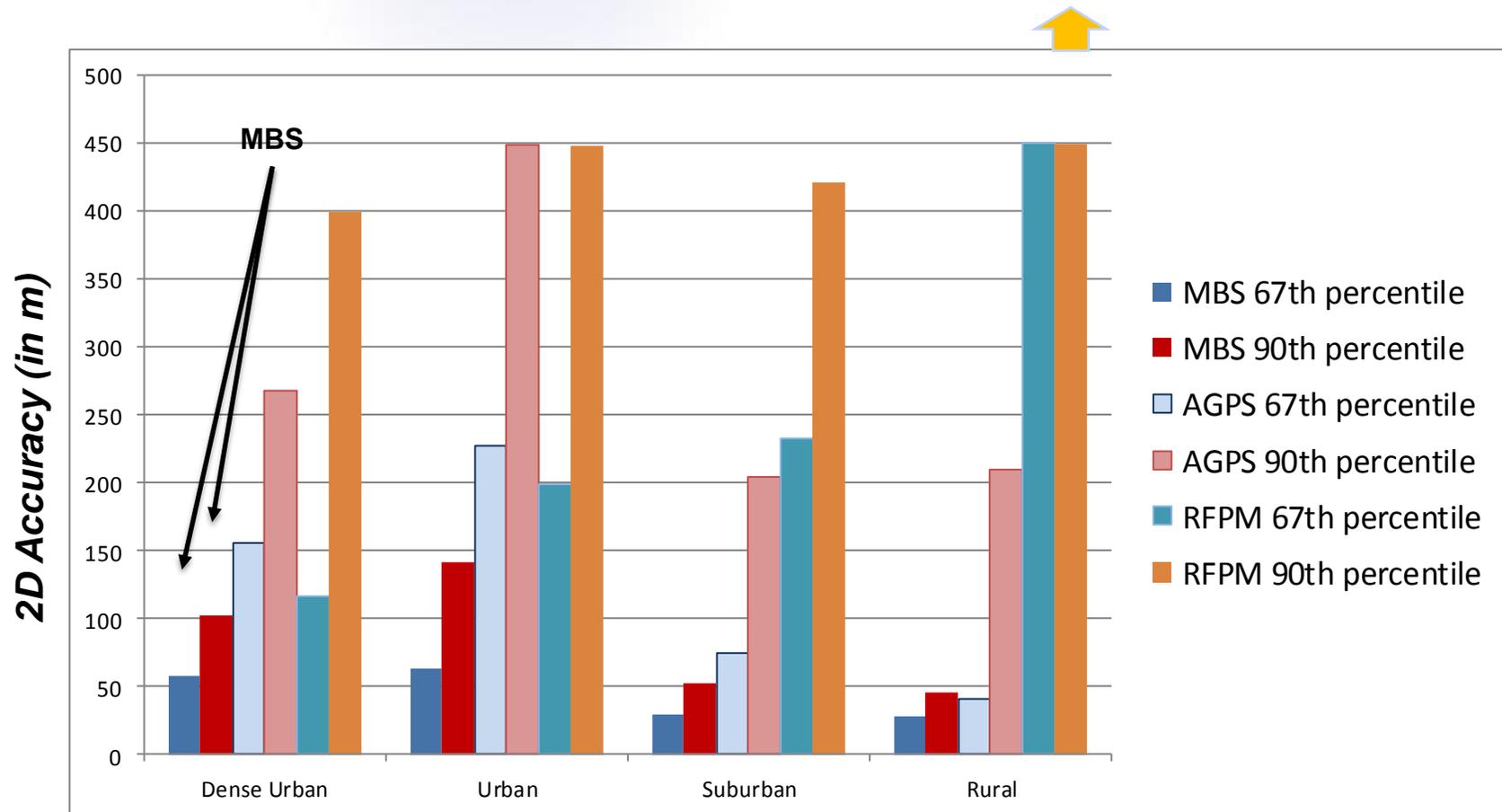


CSRIC Test Protocol Review

- CSRIC 3, Working Group 3 was chartered by the FCC with, among other things, creating an information base from which indoor location accuracy standards for E911 could be established
 - WG3 consists of technology vendors, public safety representatives and the four major U.S. wireless carriers
- Rigorous test program was performed by a 3rd party (TechnoCom), and was completely **blind** to participants
 - Over 13,000 test calls for each participating vendor at 75 indoor test points per building
 - Test bias towards dense urban / urban (70% of test points)
- 3 final vendors tested utilizing various positioning technologies
 - Metropolitan Beacon System (MBS), AGPS/AFLT, and RF Pattern Matching (RFPM)
- Results published in March 2013; available at:

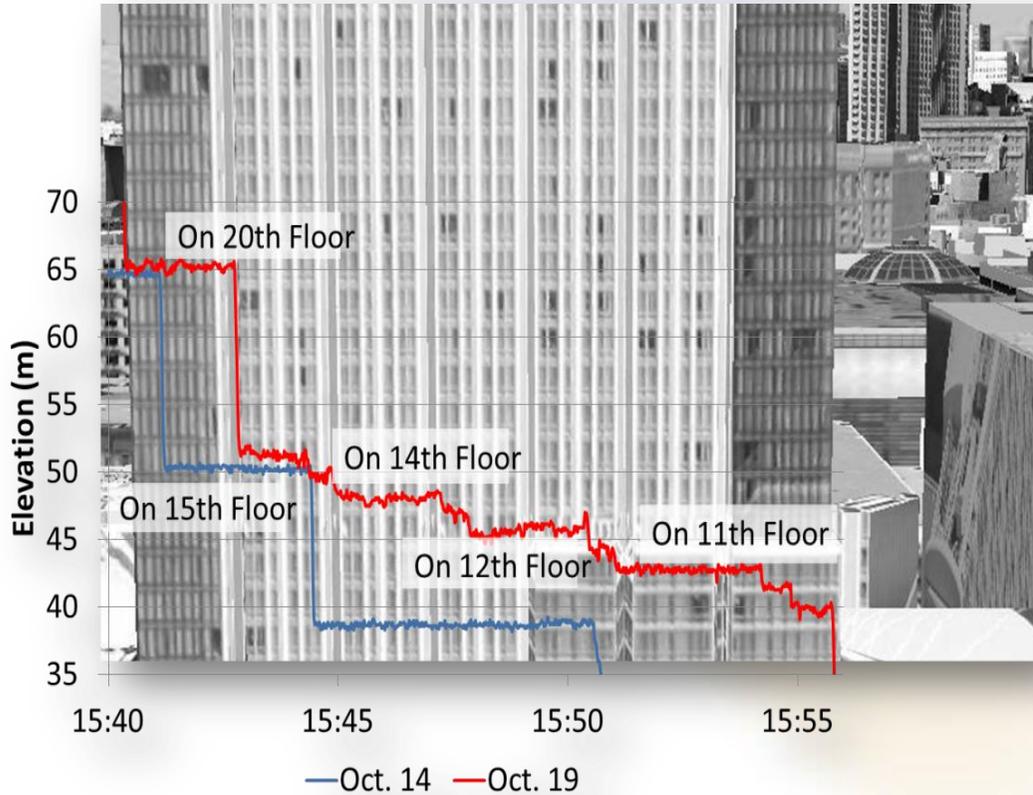
http://transition.fcc.gov/bureaus/pshs/advisory/csric3/CSRIC_III_WG3_Report_March_%202013_ILTestBedReport.pdf

Comparison of MBS and other solutions in real world conditions – CSRIC Results

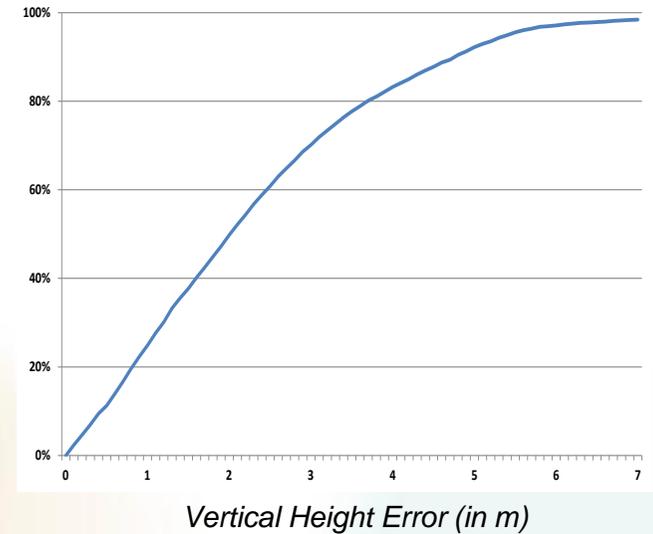


Morphology

MBS Floor-Level Height Accuracy

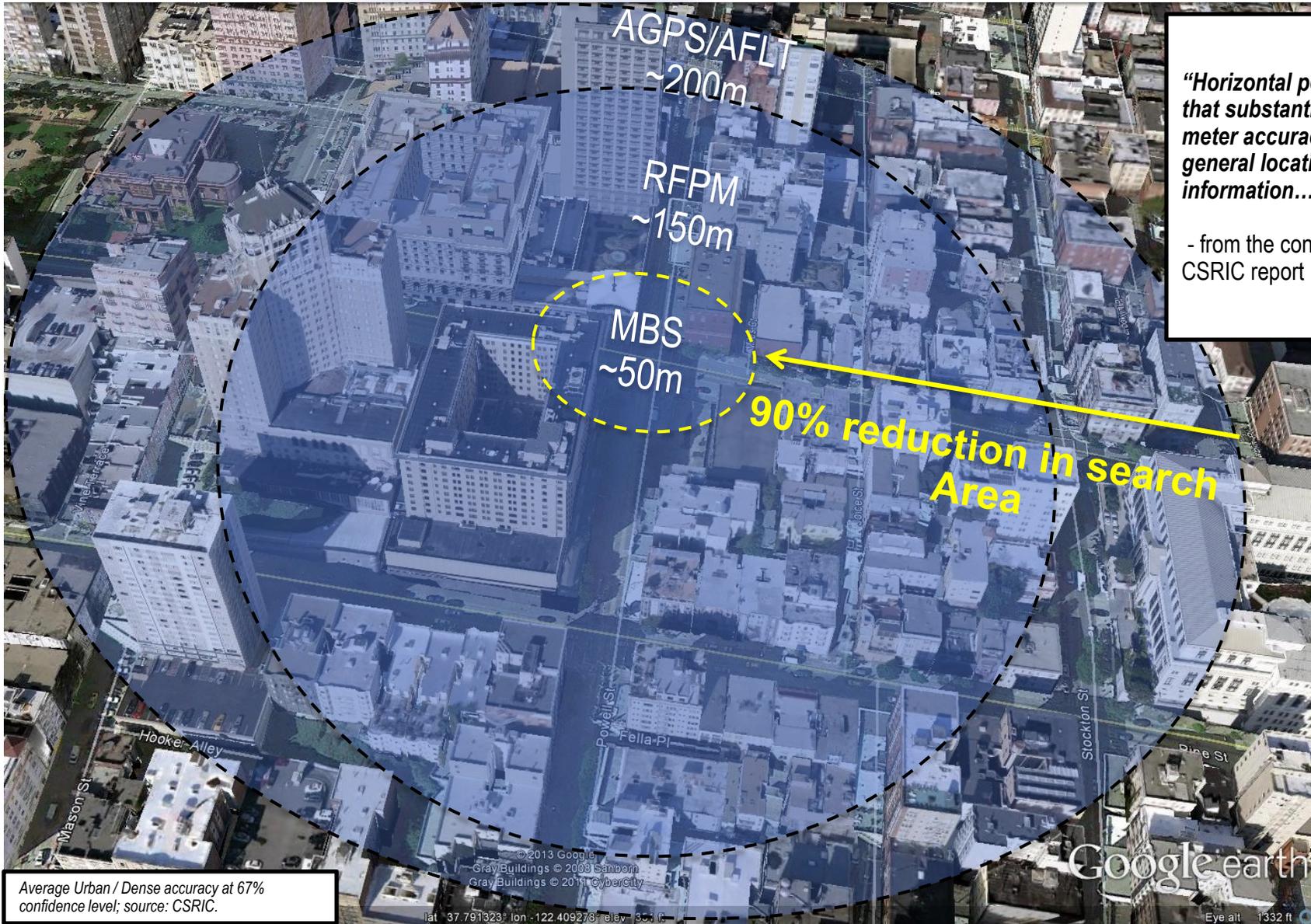


Vertical CDF (CSRIC Results)



Average Ht. Error 2m

Urban Search Ring Results



“Horizontal position fixes that substantially exceed 50 meter accuracy provide only general location information...”

- from the conclusions of the CSRIC report

Average Urban / Dense accuracy at 67% confidence level; source: CSRIC.

Public Safety Requirements from the CSRIC Report

- Public Safety desires reliable and consistent caller location information to a specific **dispatch-able building (and floor** in multi-story environments)
- **Tighter performance [than 50 meter accuracy] is required**, particularly in urban and dense urban environments to narrow the search ring to a single building or a more reasonable number of adjacent buildings
- Lacking the specific building and floor, the desire would be for the **smallest possible search ring**
- Public safety expects that standardization, commercial availability and deployment of such **[emerging]** technologies are priorities for all stakeholder

Other Public Safety Use Cases for In-Building Location

- Firefighter location and safety
- Incident resource management, particularly in larger / complex structures (e.g., airports, large office complexes, malls etc.)
 - *Who to dispatch, and where*
 - *Blue forces tracking*
- Out-of-vehicle officer location / safety in critical response scenarios



Summary

- Immediate and pressing need for different location technologies to address the needs of Indoor positioning
 - Federal Communications Commission is actively pursuing a “rule making” on indoor location
- Many of these technologies need to be standardized to truly scale to the needs of public safety (and benefit consumers also)
- Characteristics of indoor location systems for public safety needs:
 - Provides consistent, reliable location
 - Works across a Metropolitan area
 - Provides vertical, along with 2D positioning
- OMA/BoDEvolve can play a key role in the adoption of these technologies that build on and extend the use cases of the traditional Mobile Phone

APPENDIX

CSRIC Participants – WG 3

WG 3 Indoor Location Test Bed Subgroup consisted of the following members:

Organization
Motorola Mobility, Inc.
CommScope
Verizon Wireless
TechnoCom Corporation
Wiley Rein LLP
Sprint
NENA
T-Mobile
Time Warner Cable
CenturyLink
Applied Communication Sciences
Boeing
APCO International
Metro Emergency Services Board
NextNav LLC
True Position, Inc.
AT&T
Cassidian Communications

Organization
Bexar Metro 9-1-1 Network District
ATIS
Polaris Wireless, Inc.
Verizon Wireless
TeleCommunications Systems, Inc. (TSC)
Intrado, Inc.
Virginia Information Technologies Agency
US Cellular
CSR Technology Inc.
Qualcomm Inc.
APCO International
Nokia Siemens Networks

- Over 30 technology companies, wireless operators and public safety entities participated in the process to evaluate location technologies over an 18 month process