

The Path to Improving 9-1-1 Location Accuracy

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March 11, 2015

Overview

- The road to get here
- Highlights of new FCC rules
- What this means for APCO members
- What to expect next
- Q&A

Evolving 9-1-1 Calling Trends

- Consumers are replacing traditional landline phones with wireless devices, and more calls are being made while indoors
- Even where a wireline telephone is available, the first device reached for to call 9-1-1 is often a cell phone
- The location information currently available for wireless calls from indoor locations lacks any of the address-specific information provided with most wireline calls, and is generally inferior to location information available for outdoor wireless calls

A Brief History

- February 2014 – FCC proposal
 - Invited public safety entities and other stakeholders to develop alternate proposals
- November 2014 – APCO, NENA, & major carriers submit Roadmap
 - Additional assurances in December
- January 29, 2015 – FCC adopts Order

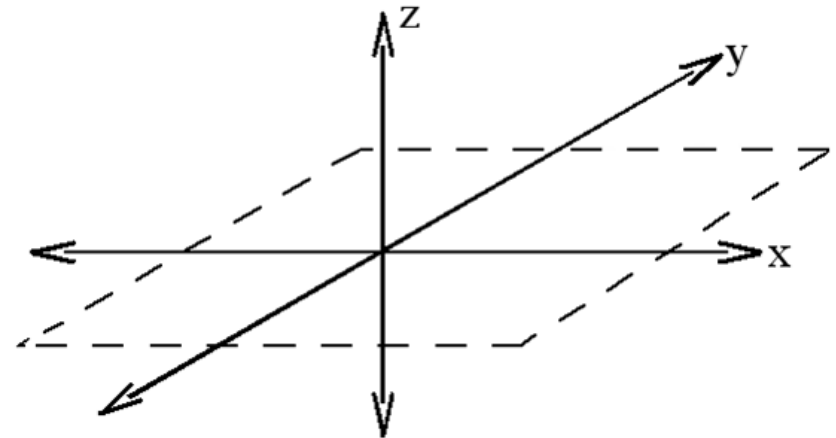
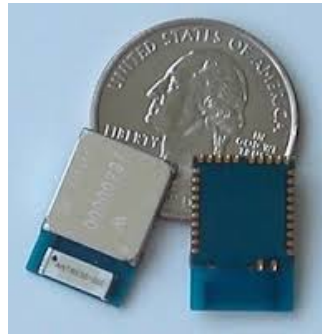
APCO Goals

- Meaningful, dispatchable location information for wireless 9-1-1 calls
- Objective testing in realistic environments
- Verifiable with real world performance monitoring
- Take advantage of technology and innovation available in the consumer marketplace

Contemplated Location Solutions

"Dispatchable" reference points

Z-Axis



What is a “Dispatchable Location”?

- “a location delivered to the PSAP by the CMRS provider with a 911 call that consists of the street address of the calling party, plus additional information such as suite, apartment or similar information necessary to adequately identify the location of the calling party”
- Example - 100 Main Street, Apt. 504
(Preferable to a position estimate of:
38.80489, -77.05631, + 10m above sea level)
- Equivalent to wireline location information

Key Features of the Roadmap

- Focus on dispatchable location solutions
 - Establish National Emergency Address Database (NEAD)
- Research and develop z-axis solutions
- Create an open, realistic test bed
- Assess performance with actual 9-1-1 data
- Provide a dispatchable location or x, y within 50m for 80% of calls within 6 years
- Develop standards for enhanced location solutions

The Bottom Line for Public Safety Telecommunicators:

This is a New Era of
9-1-1 Location Accuracy

A Quick Look: What's In and What's Out

IN:

- Dispatchable location solution for indoor 9-1-1 calls
- Setting PSAPs on tech-neutral path using competitive sources
- Fully transparent test bed
- Compliance measured with actual 9-1-1 data

OUT:

- Indoor problem not yet solved
- Specialized, static, single-source, proprietary solutions
- Limited test bed
- Compliance measured by carrier drive-testing

Overview of the New Rules

- Indoor Performance:
 - Test bed
 - Test regions
 - Actual 9-1-1 call data
- NEAD
- Benchmarks
- Reports and certifications
- Confidence and uncertainty information

Features of the Technology Test Bed

- Open, transparent, competitive- and technology-neutral
- Realistic environments
- Managed by non-governmental entity
- Will demonstrate and characterize performance
- Subject to various FCC requirements

Using Actual 9-1-1 Call Data

- Beginning at 18 months, aggregate data reported quarterly
- Will show percent of time each location method was used (satellite, DL, z-axis, other technologies or hybrids) to meet accuracy requirements

Actual 9-1-1 Data from Test Regions

Six geographic test regions & diverse morphologies

- San Francisco Bay Area
- Chicago
- Atlanta
- Denver/Front Range
- Philadelphia
- Manhattan

Measuring Compliance

| Technology | Test Bed Performance | Delivery with Actual 9-1-1 Calls | Carrier Performance | FCC Requirements |
|------------|------------------------|------------------------------------|----------------------------|--|
| A | <50m for 90% of tests | Technology A was delivered for 50% | $90\% \times 50\% = 45\%$ | |
| B | <50m for 100% of tests | Technology B was delivered for 20% | $100\% \times 20\% = 20\%$ | |
| | | | $45\% + 20\% = 65\%$ | 2 Year Benchmark: 40% 3 Year Benchmark: 50% 5 Year Benchmark: 70% 6 Year Benchmark: 80% |

National Emergency Address Database (NEAD)

- Standards within 18 months
- Correlates MAC address with DL
- Implement within 3 years
- Outreach program to promote wide integration
- Concurrent network and handset commitments
- Security and privacy measures

Indoor Location Accuracy Standards

Horizontal location:

50m (x, y), or a dispatchable location for:

- 40% of calls within 2 years
- 50% of calls within 3 years
- 70% of calls within 5 years
- 80% of calls within 6 years

(non-nationwide carriers have more time at years 5 and 6 tied to VoLTE deployment)

Indoor Location Accuracy Standards

Vertical location:

- Uncompensated barometric within 3 years
- Develop z-axis metric within 3 years
- In top 25 CMAs within 6 years and top 50 CMAs in 8 years:
 - Populate NEAD with reference points equal to 25% of population of CMA, or
 - Deploy z-axis technology to cover 80% of population of CMA

(non-nationwide carriers have an add'l year)

Reports

At 18 months:

- start reporting actual 9-1-1 data
- initial implementation plan for meeting indoor requirements generally
- progress report on deployment plans and implementation of indoor requirements
- NEAD privacy and security plan

Reports

3 years:

- progress report on implementation plan and assessment of DL deployment efforts
- submit z-axis metric

Certifications

- Compliance
 - required within 60 days of each horizontal & vertical location benchmark
- Deployment
 - at 36 and 72 months
 - technology deployed across carriers' networks is consistent with test bed deployments AND deployments in test cities for actual 9-1-1 data
- NEAD privacy and security
 - prior to use of database, CMRS providers must use NEAD only for purpose of responding to 9-1-1 calls

Confidence and Uncertainty

- Set confidence level at 90%, allow uncertainty to vary
- Standardize the way this information is delivered and presented to PSAPs
- Delivered for all wireless calls if requested by PSAP

APCO as Part of the Solution

- Assist with development of the test bed
- Participate in standards development
- Help design the NEAD
- Stakeholder outreach
- Assessment of z-axis and dispatchable location solutions
- Assess location accuracy based on actual 9-1-1 call data and test bed performance

Questions?

- Additional information and updates:
 - Government Relations Webpage
<https://www.apcointl.org/advocacy/topics/911-location-accuracy.html>
 - Twitter: @GRO_APCO