

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)
)
Wireless E911 Location Accuracy Requirements) PS Docket No. 07-114

COMMENTS OF APCO

The Association of Public-Safety Communications Officials-International, Inc. (APCO) hereby submits the following comments filed in response to the Public Notice issued by the Public Safety and Homeland Security Bureau (Bureau) of the Federal Communications Commission (FCC), DA 14-1680 (released November 20, 2014).

APCO welcomes the opportunity to comment on the landmark consensus agreement we reached with NENA and the four major wireless carriers that will set the course for significant improvements in wireless 9-1-1 location accuracy. The use of cellphones to call 9-1-1, especially from inside buildings, continues to grow unabated. This trend brings new challenges and thus requires new thinking to solve these challenges.

APCO has always been a leader in working to advance the state of 9-1-1 services, including wireless location accuracy. We are proud to continue this tradition by participating in the development of the consensus agreement reached with our partners in public safety and industry. During a process lasting over seven months, both APCO and NENA conveyed what is most important and needed for the 9-1-1 community, and the industry became increasingly responsive to these needs. Building on the successful voluntary agreement reached on text-to-9-1-1 in 2012, the consensus agreement on location accuracy represents a blueprint for combining resources to solve both the present and future challenges. The roadmap establishes the

commitments and benchmarks necessary for real improvements, is flexible enough to make adjustments along the way, and anticipates future advancements both in the private and public safety sectors, including roll out of Next Generation 9-1-1 services.

The FCC's proposals were welcome and served as a great catalyst for the new thinking that is needed to solve wireless location accuracy. As the Public Safety and Homeland Security Bureau noted in the Public Notice, the Commission also invited alternative proposals developed by public safety and industry. We previously stated our support for the Commission's original proposals as a reasonable initial step, but also indicated that our goal was a "dispatchable address," and that we were open to considering alternative approaches to achieve that goal in a reasonable time frame. The roadmap is such an alternative as it is achievable, effective, and forward-looking. It embraces the expanded ecosystem of potential technologies and partnerships that can be leveraged to make real progress and reach public safety's gold standard for location accuracy: a dispatchable location.¹ We reached agreement and presented the consensus plan roadmap to the Commission on November 14.

The roadmap provides a comprehensive strategy that reflects the reality that short-term gains will be hard to achieve under any proposal. In the not-too-distant future, however, (within five years) the roadmap will yield far greater benefits than what could be achieved under the FCC's proposal alone. At the same time, the roadmap preserves the core aspects of the FCC's proposal, including performance benchmarks and enforceable rules.

¹ We were also true to the four principles that Commissioner Rosenworcel pointed out as the foundation for a solution: dispatchable ("The gold standard for location accuracy is dispatchable location—the actual floor plus office suite, apartment, hotel room, or classroom"), verifiable ("Any solution must include verifiable targets to measure accuracy"), flexible ("Technologies advance rapidly. A solution must be sufficiently flexible to accommodate technological advancements like next generation 911"), and reasonable time ("The perfect cannot be the enemy of the good. While we must continue to strive towards achieving dispatchable location, we must be honest that this goal could take some time. So we need solid interim benchmarks along the way"). Remarks of Commissioner Jessica Rosenworcel, APCO International 80th Conference and Expo, New Orleans, LA, August 6, 2014, at 4, at https://apps.fcc.gov/edocs_public/attachmatch/DOC-328698A1.pdf.

In our comments below, APCO takes this opportunity to highlight the especially valuable portions of the roadmap for public safety. We explain how these new features play into and enhance the value of the performance benchmarks contained in the roadmap, with substantial benefits over the prior way of doing business.

KEY FEATURES OF THE ROADMAP

The Roadmap Leads to the Gold Standard – a Dispatchable Location

When it comes to indoor location accuracy, APCO strove to improve upon traditional thinking tied to outdoor location technologies that would at best incrementally shrink the circle of uncertainty to identify the caller's location. We wanted to achieve an accuracy that is equivalent to what is provided for landline telephone calls, as that would be the most useful location information for emergency responders. Accordingly, we defined "dispatchable location" in the roadmap as "the civic address of the calling party plus additional information such as floor, suite, apartment or similar information that may be needed to adequately identify the location of the calling party" and set a path for achieving this goal. The path includes an aggressive timeline for accomplishing the necessary standards development, network and handset changes, technology demonstration, testing, and implementation of a National Emergency Address Database (NEAD) that will deliver dispatchable location to PSAPs.

The NEAD will be an essential part of the dispatchable location solution. This is why the roadmap ensures that the parties work together to develop the design, operations, and maintenance requirements within 12 months, and establish a database owner, funding mechanisms, provisions for defining security, privacy, performance, and management aspects within 24 months. Further, this effort will not be limited to the signatory parties alone, as the active contributions of many other stakeholders will significantly enhance its value.

Dispatchable location solutions would fully leverage the increasingly widespread Wi-Fi access points and Bluetooth Low Energy (LE) beacons across the country, and the associated growth in commercial location based services. Thus, the agreement calls for APCO, NENA, and the carriers to work together to develop an outreach program and enlist the support of other organizations to achieve a broader integration of Wi-Fi and Bluetooth sensor data into the NEAD.

Some dispatchable location solutions can be deployed before implementation of the NEAD. Many wireless service providers provide wireless consumer home products, such as femtocells and their own Wi-Fi products. Some of these products are able to make dispatchable location information available to PSAPs today, and the industry has committed to providing data on the number of such products soon after the one-year anniversary of the consensus agreement. The roadmap also would require the carriers to take the steps needed for future products to provide dispatchable location. These solutions would provide dispatchable location for PSAPs directly.

The Roadmap is Technology Neutral

To date, wireless location accuracy has depended on only a few technologies and associated vendors that were specific to 9-1-1 location determination. Such an environment limits competition and innovation. The open and collaborative nature of the roadmap moves us away from this model, permitting a carrier to use any technology to satisfy the performance benchmarks. At the same time, the roadmap ensures inclusion of dispatchable location technologies for indoor locations and other technologies that will serve to primarily improve outdoor locations, including additional satellite constellations (A-GNSS) and OTDOA.

A Newly Conceived Test Bed Will Add Confidence to Location Technology Performance

An improved test bed will be deployed to characterize the performance of technologies employed by the carriers to determine which qualify as “heightened location accuracy technologies” under the roadmap. This test bed will be developed within a year, and designed to be fully open, transparent, technology and vendor neutral, and operated under real-world conditions. This will be very useful for public safety. Unlike previous location accuracy test beds, we will have the opportunity to assess the performance of any technology, as well as the usefulness of the technology in PSAPs and in a realistic call and response environment. Further, the carriers will use the results of this testing as the basis for meeting the performance benchmarks.

Live 9-1-1 Call Data Will Be Used to Validate Results

For the first time, the carriers have committed to collect on a monthly basis, and report quarterly, location accuracy data based on live 9-1-1 calls. This data will be collected from six different geographic areas across the country that correspond to the ATIS ESIF test regions that represent a broad range of morphologies (dense urban, urban, suburban, and rural). This data will allow us to assess trends in how location accuracy is improving, and because it is derived from the six test regions, it will be representative of the diverse call environments throughout the country. Information on live 9-1-1 calls will thus offer a new level of transparency to public safety concerning how carriers meet location accuracy performance benchmarks.

Performance Benchmarks

The roadmap includes aggressive and achievable performance benchmarks that differ, and in many ways improve upon, the benchmarks proposed by the FCC. The primary difference is that the roadmap benchmarks represent a qualitative improvement in indoor location accuracy

by targeting dispatchable location, which is not part of the FCC's proposal. A dispatchable location, by definition, includes a vertical component (i.e. the building floor) and is far superior to a z-axis measurement alone, which would not necessarily translate to a specific building floor, or even a simple height above ground level. Further, it is important to appreciate the interplay of these benchmarks with the novel inclusions of the test bed and use of live 9-1-1 call data described above, which fundamentally shift the way location accuracy benchmarks have been measured in the past.

A simple side-by-side comparison of the FCC benchmarks vs. the roadmap benchmarks overlooks an additional qualitative difference. As compared to the existing (and proposed extension) of the FCC's location accuracy requirements, the roadmap benchmarks will improve our ability to assess real-world performance. This in turn empowers the public safety community and the FCC to hold the carriers accountable while at the same time incentivizing all stakeholders to pursue solutions that actually work.

The importance of the roadmap benchmarks, the test bed, and the live 9-1-1 data to ensuring improved location accuracy may not be intuitive. The carriers have committed to obtaining a location fix using "heightened location accuracy technologies," which means that any technology they deploy must first be evaluated in the test bed to show the technology either provides a dispatchable location or an estimate within 50 meters (50 meters being the baseline set by the FCC's proposal). The carriers in turn only receive "credit" towards meeting each benchmark to the extent that each technology they deploy either obtains a dispatchable location or a 50 meter fix. The test bed will indicate the percentage of the time that a location fix within 50 meters is obtained for each location technology that the carrier deploys. The live 9-1-1 call data will in turn illustrate how often each location technology was actually used to provide either

a dispatchable location or a 50 meter fix. Together, these percentages allow us to estimate real-world location accuracy.²

In the initial years, estimates will continue to be derived mainly from technology that was designed for outdoor locations, but the roadmap includes steps to improve upon those existing technologies (meaning the addition of GLONASS satellites and OTDOA) while setting the stage for improvement expected through indoor dispatchable location solutions and potentially z-axis options.

The FCC's proposal – even for the first benchmark at year 2 – assumed that new handsets would be required, and our roadmap similarly takes into account the fact that deploying advanced location technologies will take time and new handsets. The indoor and outdoor location technologies that will lead to the greatest improvements will be even more prevalent in five years.

In sum, while it is not possible to directly compare the roadmap benchmarks to the FCC's proposals, given the added qualitative improvements that the roadmap introduces, the relative value of the roadmap is clear at 5 years. At 5 years, the roadmap provides a slightly lower (75 percent) percentage (rising to 80 percent at 6 years), yet will result in a dispatchable location for indoor locations and a minimum of 50 meters both outdoors and indoors, as verified in the test bed and continually validated by live 9-1-1 call data.

² For example, if OTDOA produces 50m fixes 10% of the time (proven in the test bed), and 50% of a carrier's fixes came from OTDOA (based on live 9-1-1 call data), the carrier would receive credit for $10\% * 50\% = 5\%$ of compliant fixes.

CONCLUSION

For the reasons set forth above, APCO urges the Commission to adopt rules consistent with the sections identified in the roadmap for inclusion in the FCC's rules.

Respectfully submitted,

/s/

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