

Written Testimony of

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on

“Locating 911 Callers in a Wireless World”

before the

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Subcommittee on Communications, Technology, and the Internet

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Good morning Chairman Pryor, Ranking Member Wicker, and Members of the Subcommittee.

My name is Gigi Smith, and I am the President of the Association of Public-Safety Communications Officials International, or APCO International. Thank you for inviting me to testify before you today.

I have been active in public safety communications for over 28 years. I started as a call taker, and then worked my way through the ranks of dispatcher, trainer, supervisor, and I now serve as the Police Operations Manager for the Salt Lake Valley Communications Center in West Valley City, Utah. My Public Safety Answering Point (PSAP) is a 9-1-1 police, fire, and medical emergency services dispatch Center.

I welcome this opportunity to discuss APCO with you, highlight issues that are increasingly important to our membership base, and offer some thoughts and observations on the important role of wireless 9-1-1 location accuracy.

APCO International is the world’s oldest and largest organization of public safety communications professionals, at over 20,000 members. Our members are mainly state and local government employees who manage and operate communications systems for law enforcement, fire, EMS and other public safety agencies.

Effectively, our members are the individuals that are responsible for fielding emergency 9-1-1 calls and dispatching critical information to first responders.

For many years, APCO has served a leading role in advancing policies to improve public safety communications, including wireless 9-1-1 services and related location accuracy issues. In this regard, we are active participants in the numerous related proceedings and workshops at the Federal Communications Commission, and appreciate the work of the agency for its commitment and dedication

toward these important matters. APCO has urged the Commission, wireless carriers, and location technology vendors that improvements must be made in wireless location accuracy for 9-1-1 calls, including calls from indoor locations.

Our commitment to improving location accuracy extends to our active participation in the FCC's Communications Security, Reliability and Interoperability Council, or CSRIC, including its focus on developing solutions for wireless 9-1-1 indoor location issues. We also seek to regularly collaborate with our partners in the industry to share information and pursue ways to improve upon past efforts and address new challenges.

Turning to the subject of this hearing, the prompt and effective dispatch of appropriate emergency services to any reported event is dependent upon obtaining the best location information possible from the caller. This essential element of dispatching must occur regardless of the technology used to access 9-1-1.

If you are indoors and place a call to 9-1-1 from a landline phone, your phone number and location, which typically is your street address, are usually automatically and quickly reported to the PSAP. However, 9-1-1 calls made with wireless phones do not afford the same degree of location accuracy. This difference in accuracy between wireline and wireless calls, coupled with the fact that more and more Americans are "cutting the cord" and relying exclusively on wireless devices for all of their voice communications, means that PSAPs must be increasingly vigilant to ensure they have the most accurate location information available.

At my own PSAP, we've noticed an upward trend in calls originating from wireless devices, including from inside buildings. Further, there is a gap between the expectations of consumers and our actual experience in the PSAP regarding the ability of their devices to promptly and accurately convey their location during a 9-1-1 call. Whether this disconnect comes from viewing too many good entertainment programs, or developing certain assumptions as our mobile devices get "smarter" and "smarter," it's critical we educate consumers about current technological limitations with regard to wireless location accuracy.

The predominant location technology for most of these wireless 9-1-1 calls, "Assisted GPS" or "A-GPS," has been generally effective in outdoor locations. However, A-GPS relies in large part on having direct line-of-sight for GPS signals, which do not penetrate buildings well in most cases. Wireless 9-1-1 calls from an indoor location will thus generally provide significantly less accurate location information than a call from an outdoor location. Even outdoors, natural and man-made features, such as "urban canyons," mountainous terrain, and heavy forestation, can negatively impact location accuracy determined with A-GPS.

The key point however is that growing reliance on wireless devices for making 9-1-1 calls from indoor locations is limiting, and will continue to limit, the location accuracy for those calls. In this regard, and before I turn to the location technologies that have been deployed for wireless 9-1-1 service, I'd like to describe the special skills and procedures employed by 9-1-1 call-takers to help determine a wireless callers' location.

Because we are growing accustomed to the use of wireless location technology, we often lead off each call by asking, "9-1-1, what is the address of your emergency." If the caller is not able to provide his or her address, we then question the caller in detail to provide verbal information regarding his or her

location. For example, we inquire of any landmarks like billboards or a local store. We also utilize a program that helps us match landmarks referenced on a call through what we refer to as a “commons place” table within our Computer Aided Dispatch (CAD) system. When none of this works, we employ our experience and become even more creative: in one case I recall, we advised an injured person who was inside a car to continually honk his horn, which resulted in a 9-1-1 call from a nearby home with a noise complaint that led first responders to the victim. However, implementing these methods can be time consuming, and 9-1-1 callers are occasionally panicked, scared, injured, or otherwise unable to speak or provide correct information.

We employ these methods along with the automatic location identification technologies deployed by the wireless carriers, which have been successful in helping PSAPs locate 9-1-1 callers. When provided, accurate “Phase II” information, which contains the “x, y” coordinates of the caller within a certain radius that meets or exceeds FCC requirements, is extremely helpful in those situations.

When a wireless 9-1-1 call is delivered to the PSAP, it is initially accompanied by some form of location information. In some instances, the technology used to locate the wireless 9-1-1 caller may not have determined his or her specific location by the time the emergency call is delivered to the PSAP. In order to ensure quick routing of the voice portion of the call, wireless calls are initially routed based on “Phase I” location information, which consists only of the location of the cell site or base station transmitting the call. This means that the caller can be anywhere within the radius of that particular cell site.

Subsequent and nearly simultaneous to receiving the routing location, a request (or “bid”) is made to obtain more accurate, or Phase II, location information to deliver with the call. This request utilizes the carrier’s location information infrastructure to obtain the x,y coordinates of the caller when available. This request will result in delivery of initial Phase II data that may not be the best location information available, but it is better than Phase I data only.

Because the best location data may not arrive with the initial wireless 9-1-1 call, a common practice for call-takers is to solicit updated location data from the wireless carrier at some point after initiation of the call, which is known as a rebid. Rebidding for this information often affords more accurate, Phase II location information, which provides the PSAP call-taker with the latitude and longitude of the wireless caller. The Phase II information provided to the PSAP must meet FCC accuracy standards, ranging from 50 to 300 meters, depending on the type of technology used.

APCO, an American National Standards Institute (ANSI) certified standards development organization, has implemented training protocols, standards, and best practices to address the rationale and methods for rebidding wireless 9-1-1 calls. APCO recommends that PSAPs rebid the Phase II location data to ensure the most accurate information is available. Policies on rebidding vary from agency to agency. At my PSAP, the phone system we use automatically rebids every 15 seconds. Further, because even 15 seconds in some cases can be too long to wait, call takers can also manually rebid the location information at shorter intervals.

Phase II information sometimes lacks sufficient accuracy to ensure a rapid and efficient emergency response. This is especially the case for calls from indoor locations, where accuracy is compromised both by the technical limitations of GPS, and the lack of vertical information (often referred to as the “z-axis”) for tall buildings. Yet, location is especially important for indoor calls, as emergency responders are often unable to make visual contact upon arriving at the approximate address.

As I mentioned, rebidding can help improve the location fix. However, the rebidding process adds time to the call-taking/dispatching process, potentially delaying emergency response to the correct location. For indoor locations, even a rebid may not provide sufficient information for responders to locate the caller quickly in a building, or even identify the correct building in a dense urban area.

From my own experience in the greater Salt Lake City area, we encounter a diverse natural topography with mountains, canyons, large gullies, and river bottoms that are often concealed by the surrounding terrain. At the same time, we also have a bustling downtown complete with subterranean parking, basements, and high-rise concrete structures.

Thus, I know first-hand of the impact to PSAPs from the growing use of wireless phones to place 9-1-1 calls, as well as the technological limitations of A-GPS technology in challenging environments such as inside buildings. Further, we lack agreed-upon accuracy standards for indoor environments. APCO stands ready to work with the wireless industry, location technology vendors, our partners in the public safety community, and the FCC to explore new wireless location accuracy solutions that make sense for PSAPs and the general public. APCO would also support revised FCC rules that require improvements in indoor location accuracy over a reasonable period of time.

I appreciate that the Subcommittee has taken up this important and timely topic. This hearing will help highlight the needs of public safety communications professionals who answer 9-1-1 calls and dispatch emergency responders, to best serve the general public.

Thank you for the opportunity to address you, and I look forward to answering any questions you may have.