Written Testimony of

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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 back to testify on yet another important public safety matter.

I'm pleased to have the opportunity to highlight the public safety implications of the transition of the nation's communications infrastructure to IP-based technologies.

I have been active in public safety communications for over 28 years. I started as a 9-1-1 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 Emergency Communications Center in West Valley City, Utah. My Public Safety Answering Point (PSAP) is a 9-1-1 police, fire, and emergency medical services dispatch center.

Thus, I am very familiar with the impact of changing technologies on the 9-1-1 system and emergency dispatch operations, including how best to ensure that as we embrace new technologies, we preserve, and improve, the safety of the public and first responders.

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 field 9-1-1 calls, dispatch critical information to first responders, and are integral to the implementation of

the critical communications networks used in the field by first responders. In all of these respects, APCO International provides the training, certification, technical, and standards development resources to make the most effective and efficient use of communications technologies in use today or planned for the future.

So as President of APCO, I also bring the perspective of an association that is focused on current and future implications of technological shifts, including the IP transition.

We recognize that the transition of the nation's communications networks to IP technology will bring many benefits to the public at large, such as the ability to deliver and share content rich video and multimedia messages, with increasing quality.

At the same time, maintaining and improving voice quality remains very important. This is because sometimes the ability of 9-1-1 call takers to hear and pass along subtle background sounds, like someone racking a shotgun, can make a significant difference to the first responder.

Just as another example, IP and related technologies also present us with an opportunity to acquire and utilize data on a large scale, which can help to identify ways to improve efficiencies in emergency response like never possible before.

Indeed, we are fully embracing efforts to bring IP and other advanced technologies into the public safety communications arena. We are actively supporting the FirstNet network, leading the way to responsibly drive implementation of Next Generation 9-1-1 ("NG9-1-1") networks, and ensuring development of the most effective mobile apps for public safety and emergency response purposes, among other initiatives. And there are other public safety communications capabilities that APCO is involved with that also will be impacted by the IP transition, including priority services, emergency alerting, and other existing and growing sources of information such as alarms, sensors, video, and social media.

For the remainder of my testimony, I will offer a few considerations we believe should be kept in mind as we explore how best to preserve the needs of the public safety community.

Reliability

Let me begin with reliability, as this was a term wisely included in the title of today's hearing.

Reliability has a unique importance in public safety – for example, when else would you want to have a more reliable communications capability than during a large-scale emergency? This means that communications networks need to continue to serve the 9-1-1 system, and the first responder community, in the wake of wide-scale physical damage, at times without advance warning, and with rapid and sustained surges in traffic demand.

Over decades, current time-division multiplexing (TDM) copper networks have been built to a very high reliability level of 99.999%. While more capable, and feature rich, IP-based networks may be less reliable. Thus, the design of IP-based networks should incorporate a reliable, redundant standard that anticipates real world conditions such as the ability to handle scalable traffic in emergencies. This includes supporting the ability of the general public to reach 9-1-1, the communications between dispatchers and first responders, and the communications systems supporting emergency operations centers and first responder agencies. IP-based networks, when properly designed and implemented, should be both logically and physically redundant.

APCO has been at the forefront of identifying reliable and redundant standards for advanced communications networks. Most recently, APCO worked with the National Public Safety Telecommunications Council to develop and deliver to FirstNet a report on "public safety grade" requirements. While these requirements were designed to provide guidance to FirstNet, many aspects of this report are equally applicable to, and should be part of, any IP network design intended for use or interconnection with public safety.

A related matter is service quality. In the IP world, as in wireless, "quality of service" is a key indicator. Thus, IP networks not only need to be reliable, but deliver the priority and quality of service required for public safety-related communications.

Also related to reliability is recovery and restoration particularly in the wake of severe natural or man-made disasters. On the plus side, IP networks are redundant by design. But as Hurricane Sandy and other disasters have shown, Mother Nature can defeat even the best designed networks. And the rollout of IP networks will involve multiple components serviced by multiple companies, which will require a new level of coordination and associated procedures to ensure rapid service restoration. Further, response plans should include appropriate priority for public safety communications.

Security

As public safety and the industry have already experienced, security is a critical issue. IP networks present new cyber-security and related vulnerabilities as compared to the "closed loop" legacy communications infrastructure. IP networks have been compromised by hackers, and denial of service, spamming, swatting, and other attacks are even more easily perpetrated on an IP-based system, including 9-1-1 networks. Security also becomes a cascading and increasingly complex problem to address, since an all-IP environment introduces a new variety of transport providers, network service providers, and interconnect players.

Thus, service providers should incorporate security procedures, failover plans, and mitigation strategies into their network design to best protect PSAP and other public safety communications.

Power

Copper-based networks are self-powered, whereas IP-based networks rely on power from the consumer electric grid. Thus, IP-based networks are more susceptible to power outages. During power outages, telephone service will not be available unless sufficient backup power is available. Further, IP networks bring a paradigm shift for the consumer, as the customer now becomes responsible for maintaining and ensuring battery back-up. Consider how important it has become for people to be able to-recharge their mobile devices in the wake of power outages that accompany emergencies. In this respect, consumer education will also be key. IP-based network designs need to consider stand-by power, battery back-up, and other contingency plans for power supply.

Location Information

Today's wireline networks typically provide very dependable and actionable, or as we say, "dispatchable" addresses, such as the specific street address of a 9-1-1 caller. Of course, this issue is near to me, as I spoke on the topic of wireless location accuracy in January before this very subcommittee. As I said back in January, 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. Further, this essential element of dispatching must occur regardless of the technology used to access 9-1-1.

As it relates to the IP transition, ensuring that the general public can reach emergency services in the first place is paramount. At the same time, new technology permits innovative solutions that can improve upon existing location technologies. Thus, we encourage active exploration of how to harness and implement such capabilities from the start.

Impact on 9-1-1 and Next Generation 9-1-1 Networks

We expect that the transition of the nation's communications networks will be an evolution, following a relatively steady process. But as compared to the transition to NG9-1-1, it will likely occur much more rapidly. To date, IP and NG9-1-1 transitions in the public safety community have been partial, and typically on a PSAP-by-PSAP and carrier-by-carrier basis.

Thus, IP networks will need to interconnect effectively with both legacy 9-1-1 and Enhanced 9-1-1 networks, as well as new text-to-911 services and future NG9-1-1 networks. Further, service providers will have to account for the fact that public safety networks will be provided by a variety of service providers, both private and public. In addition, IP networks will need to adhere to the two prevailing standards that are being deployed for NG 9-1-1 services. One is known as "i3" that some PSAPs are deploying today, and the other is IMS (IP Multimedia Subsystem), which we expect will be the standard used by many PSAPs as well as by FirstNet.

In the current economic environment, local governments are more likely to devote scarce resources first to public safety operations that directly impact both responders and the public (e.g., radios, squad cars, fire engines, ambulances, and related equipment and supplies). As a

result, legacy PSAPs are likely to remain operational for some time, and there will be a need to interconnect new IP-based networks to multiple PSAP types for many years to come. Certainly, additional funding mechanisms at the national level would support more rapid adoption of next generation technology at the nation's PSAPs, and thus help public safety keep pace with the industry's IP transition.

At the same time, public safety's transition to NG9-1-1 will present a number of opportunities and synergies with the evolution of communications networks to IP. Commonalities will include increased multimedia features, new network redundancy options, standardized interfaces for improved interoperability and information sharing, and a broader vendor and service provider ecosystem. APCO has been working with the industry with all of this in mind, and intends to continue to pursue ways to collaborate on network design and implementation to anticipate and meet the needs of the public safety community.

Wireless Options

Finally, let me briefly touch on how the IP transition can lead to wireless replacements of copper and TDM-based networks. In some early offerings, service providers offer wireless replacements as an option to consumers, and in others, a wireless replacement product may be the only option.

In such cases, we believe that certain steps will be necessary to preserve existing levels of 9-1-1 service. We support development of technology that can provide the equivalent of the home address, and detect when the device has been relocated to ensure the address is updated. Also, we recommend that the wireless network serving a wireless-only residence is made as redundant and resilient as possible to withstand natural or man-made disasters and afford sufficient network access and capacity.

In sum, we believe that the IP transition holds great promise for public safety communications, provided that the aforementioned issues are addressed. In this regard, APCO looks forward to working with this Subcommittee, and all stakeholders, to help guide the best path forward.

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