Before the

Federal Communications Commission

Washington, D.C. 20554

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

Comments of AARP

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Introduction

AARP respectfully submits these Comments for the FCC's consideration, and thanks the Commission for the opportunity to participate in this important proceeding regarding the reliability of 911 services. AARP believes that technology transition issues, including the growing importance of wireless mobility services, must be consistently addressed to ensure that public safety, a foundational mission objective of the Commission, is promoted. Location accuracy associated with wireless 911 calling must improve, and the Commission's proposed indoor location accuracy requirements provide a reasonable path forward.

AARP believes that legacy performance of 911 services provided through the wireline public switched telecommunications network (PSTN) continues to provide the minimum standard for future network performance. With regard to location accuracy, legacy wireline PSTN services perform with a high degree of reliability. It is appropriate for the Commission to pursue similar accuracy for wireless services, in both indoor and outdoor settings. In addition, as will be discussed further below, location accuracy also depends on the performance of wireless networks during power outages. The Commission must also ensure that consumers have the ability to reach first responders during a power outage with similar success while using their wireless devices as was the case for legacy wireline PSTN offerings, otherwise, improved location accuracy will not deliver its full potential.

Benefits of Improving Location Accuracy

The Notice of Proposed Rulemaking (NPRM) discusses the benefits and costs of improving location accuracy.[1] The information provided in the NPRM identifies a potential of $92 billion in annual benefits from improvements in location accuracy, based

[1] NPRM, ¶¶27-37.

on an estimated 10,000 lives saved per year resulting from improved response time.[2] AARP believes that the NPRM's discussion of benefits is overly conservative. The Commission's assessment of benefits is based strictly on lives saved, and there will be additional benefits arising from improved outcomes as a result of improved response time, including the prevention of the escalation of lesser illness/injuries into more complex situations. The value of these benefits should be considered by the Commission. As noted in Department of Transportation (DOT) guidance, scaling the Value of a Statistical Life (VSL) is a reasonable approach to quantifying the impact of nonfatal injuries:

> Nonfatal injuries are far more common than fatalities and vary widely in severity, as well as probability. In principle, the resulting losses in quality of life, including both pain and suffering and reduced income, should be estimated by potential victims' WTP (willingness to pay) for personal safety. . . . Because detailed WTP estimates covering the entire range of potential disabilities are unobtainable, we use an alternative standardized method to interpolate values of expected outcomes, scaled in proportion to VSL. Each type of accidental injury is rated (in terms of severity and duration) on a scale of quality-adjusted life years (QALYs), in comparison with the alternative of perfect health. These scores are grouped, according to the Abbreviated Injury Scale (AIS), yielding coefficients that can be applied to VSL to assign each injury class a value corresponding to a fraction of a fatality.[3]

The DOT states that the Statistical Value of Life can be adjusted to account for these benefits, with DOT providing the following summary:[4]

[2] NPRM, ¶33.
[3] U.S. Department of Transportation, "Guidance on Treatment of the Economic Value of a Statistical Life (VSL) in U.S. Department of Transportation Analyses," February 28, 2013, p. 8. http://www.dot.gov/sites/dot.gov/files/docs/VSL%20Guidance_2013.pdf
[4] *Id.* at 9.

AIS Level	Severity	Fraction of VSL
AIS 1	Minor	0.003
AIS 2	Moderate	0.047
AIS 3	Serious	0.105
AIS 4	Severe	0.266
AIS 5	Critical	0.593
AIS 6	Unsurvivable	1.000

Figure 1: Department of Transportation Injury Severity and VSL

More rapid response time due to improved location accuracy can prevent victim status from deteriorating, or can prevent complications from emerging. For example, if a victim was stabilized more quickly, an escalation of an injury incident from severe to critical might be prevented. The outcome—for a single incident—would achieve benefits of $2.98 million (based on DOT's guidance).[5]

There is no question that more rapid treatment of non-fatal injuries will improve health outcomes. Studies have identified the following favorable outcomes arising from more rapid response time: improved cardiac outcomes;[6] improved stroke treatment and outcomes;[7] fewer complications from multiple fracture injuries;[8] as well as generally

[5] I.e., the increment on the AIS scale shown in Figure 1 when moving from "severe" to "critical" is (0.593 – 0.266) = 0.327. This value will be multiplied by $9.1 million under the DOT approach, yielding $2.98 million.
[6] See, for example, Jonathan R. Studnek, PhD; Lee Garvey, MD; Tom Blackwell, MD; Steven Vandeventer; and Steven R. Ward, "Association Between Prehospital Time Intervals and ST-Elevation Myocardial Infarction System Performance," *Circulation*, 2010; 122: 1464-1469, Published online before print September 27, 2010.
[7] Martin Ebinger; Matthias Wendt; Michal Rozanski; Benjamin Winter; Carolin Waldschmidt; Joachim Weber; Kerstin Villringer; Jochen Fiebach; Alexander Kunz; Heinrich J Audebert. "Golden Hour-Thrombolysis by Starting Treatment Before Hospital Arrival the Pre-Hospital Acute Neurological Treatment and Optimization of Medical Care in Stroke Study (PHANTOM-S)," *Stroke*, 2014; 45: A104.
[8] Johnson, Kenneth D. M.D.; Cadambi, Ajai B.S.; Seibert, G. Burton Ph.D., "Incidence of Adult Respiratory Distress Syndrome in Patients with Multiple Musculoskeletal Injuries: Effect of Early Operative Stabilization of Fractures," *Journal of Trauma-Injury Infection & Critical Care*. May 1985.

improved treatment outcomes.[9] Thus, it is reasonable for the Commission to anticipate an expansive set of benefits associated with 911 location accuracy improvements beyond the saving of life identified in the NPRM. As noted by the Commission in the *911 Reliability Order* "Reliable 911 service provides public safety benefits that, while sometimes difficult to quantify, are *enormously valuable* to individual callers and to the nation as a whole."[10]

The National Broadband Plan also points out that the economic benefits of a more reliable wireless network are expansive:

> *A more reliable network would also benefit homeland security, public safety, businesses and consumers, who are increasingly dependent on their broadband communications, including their mobile phones. Today, more than 22% of households in America do not subscribe to fixed-line telephone service.*[11]

Of course, since that time, the number of households that no longer subscribe to fixed-line service has almost doubled to 39.4%, according to data from the National Health Interview Survey.[12] The public safety benefits from improved location accuracy are a key component of public safety given the reliance of households on wireless service as their sole source of 911 access.

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[9] Ian E. Blanchard, MSc, EMT-P, Christopher J. Doig, MD, MSc, FRCPC, Brent E. Hagel, PhD, Andrew R. Anton, MD, FRCPC, David A. Zygun, MD, MSc, FRCPC, John B. Kortbeek, MD, FRCSC, FACS, D. Gregory Powell, OC, MD, FRCPC, Tyler S. Williamson, PhD, Gordon H. Fick, PhD, Grant D. Innes, MD, FRCPC. "Emergency Medical Services Response Time and Mortality in an Urban Setting," "An exploratory analysis suggested there may be a small beneficial effect of response ≤7 minutes 59 seconds for those who survived to become an inpatient..." *Prehospital Emergency Care*, January-March 2012, Vol. 16, No. 1, Pages 142-151.

[10] *In the Matter of Improving 911 Reliability; Reliability and Continuity of Communications Networks, Including Broadband Technologies*, PS Docket No. 13-75, PS Docket No. 11-60, Report and Order, December 12, 2013, ¶73, emphasis added. (Hereinafter, "*911 Reliability Order*")

[11] National Broadband Plan, Recommendation 12.1, p. 251, emphasis added.

[12] Stephen J. Blumberg, Ph.D., and Julian V. Luke, "Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, January–June 2013," Division of Health Interview Statistics, National Center for Health Statistics, December 2012, p. 1. http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201312.pdf

Individuals with Disabilities, Including the Elderly, will Benefit

The NPRM also points to the potential for benefits for individuals with disabilities arising from improved 911 indoor location accuracy.[13] While AARP does not have a specific estimate of benefits of this aspect of improved 911 location performance, it is reasonable, as the NPRM suggests, that in cases where disabled individuals are attempting to contact emergency personnel, "automatically-generated location information can be critical to saving lives."[14]

These benefits are difficult to quantify, but should be considered. These benefits also weigh in favor of improved location accuracy. As noted in Executive Order 12866, the Commission should evaluate "qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider."[15] The benefits of improved location accuracy certainly rise to this level of consideration. AARP urges the Commission to assess the benefits of network reliability broadly, given the critical impact that 911 location accuracy has on personal safety and national security.

While benefits associated with improved 911 location accuracy may be more difficult to quantify, the Commission should not dismiss the consideration of benefits simply because of those difficulties. As Executive Order 13563 explained, when considering regulatory options the Commission should:

> ". . . propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs (*recognizing that some benefits and costs are difficult to quantify*); . . . and select, in choosing among alternative regulatory approaches, those approaches that maximize net benefits (*including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity*). . . ."[16]

[13] NPRM, ¶34.
[14] NPRM, ¶34.
[15] Executive Order 12866, p. 1. http://www.archives.gov/federal-register/executive-orders/pdf/12866.pdf
[16] Executive Order 13563, p. 1, emphasis added. http://www.gpo.gov/fdsys/pkg/FR-2011-01-21/pdf/2011-1385.pdf

There is no question that the public health and safety benefits of improved location accuracy will be substantial—much more substantial than the $92 billion projected by the NPRM. Improved wireless 911 location accuracy will contribute to higher levels of network performance, improve health outcomes, and provide widespread economic and social benefits.

Relationship of this Proceeding to other Dockets

911 Location Accuracy and *Wireless Resiliency*

While AARP believes that location accuracy is one key component of ensuring public safety, the Commission must not overlook the reliability of the underlying wireless networks. In its December 12, 2013 *Report and Order* regarding 911 reliability, the Commission imposed standards for circuit diversity, backup power, and network monitoring. Importantly, the Commission required that any "Covered 911 Service Provider"[17] provide backup power for at least 24 hours in any central office that serves a Public Safety Answering Point (PSAP). The Covered 911 Service Provider is also required to provide backup power for at least 72 hours in other "critical" central offices (those that host selective routers).[18] However, the scope of the rules contained in the *911 Reliability Order* do not address the reliability of network components that are associated with the *origination* of 911 calls:

> This definition (Covered 911 Service Provider) encompasses entities that provide capabilities to route 911 calls and associated data such as ALI and ANI to the appropriate PSAP, *but not entities that merely provide the capability for customers to originate 911 calls.*[19]

[17] A "covered 911 service provider" is defined as "any entity that provides 911, E911, or NG911 capabilities such as call routing, ALI, ANI, or the functional equivalent of those capabilities, directly to a PSAP, statewide default answering point, or appropriate local emergency authority, or that operates one or more central offices that directly serve a PSAP." *911 Reliability Order*, ¶36.

[18] *911 Reliability Order*, ¶107. The critical central offices are those that host selective routers.

[19] *911 Reliability Order*, ¶36, emphasis in the original.

The *911 Reliability Order imposes no backup power standard with regard to wireless antenna networks*.[20] It is thus critical that the Commission also confront the larger issue of call origination and reliability as it addresses other aspects of critical communication with first responders through 911. With regard to the path forward with backup power standards for wireless antenna networks, AARP points the Commission to AARP's comments,[21] and also reminds the Commission of comments made earlier this year by Sprint in that same *Wireless Resiliency* proceeding. As Sprint there noted, there are substantial cost economies associated with the provision of backup power at macrocell sites:

> Many cell towers support multiple carriers, and the Commission rules should encourage the carriers sharing that tower—whether owned by one of the carriers or a third party—to have common backup power resources. This lessens the impact on the site because only one generator and fuel storage tank would be needed rather than separate facilities for each carrier. Backup power solutions can be difficult to deploy, can pose environmental risks and are infrequently utilized. Rather than creating a system that would encourage redundant deployment of backup power solutions by multiple carriers at the same location, the Commission should seek to stimulate cooperation among all parties.
>
> Most telecommunication providers own less than 10 percent of their sites—and one national carrier recently announced its intention to sell a substantial portion of its owned sites. Stand-alone cell towers are primarily owned by companies referred to as tower aggregators and many towers support multiple wireless carriers. *When all carriers at multi-tenant sites can tie into a diesel generator provisioned by the tower aggregator, it becomes the most effective and environmentally friendly way to make the telecommunications infrastructure more reliable. Rather than each carrier providing its own extended backup power source, a tower aggregator or other landlord can provide a fixed generator that carriers can access at a reasonable monthly charge. Rather than each carrier needing its own space—and space issues are becoming increasingly more difficult for each subsequent arriving carrier—a single generator model achieves efficiencies. Additionally, installing a single generator rather than multiple generators for all carriers can help avoid additional environmental, noise, space and other concerns.* The Commission could help in achieving this superior solution by focusing its

[20] The *911 Reliability Order* also leaves the overwhelming majority of central offices in the nation—72 percent—without Commission rules for backup power. *911 Reliability Order*, ¶120, footnote 319.
[21] AARP Comments and Reply Comments *In the Matter of Improving the Resiliency of Mobile Wireless Communications Networks Reliability and Continuity of Communications Networks, Including Broadband Technologies*, PS Docket Nos. 13-239 and 11-60, January 17, 2014 and February 18, 2014.

> efforts on encouraging the use of common backup power solutions and promoting industry cooperation for the use of limited assets when needed.[22]

AARP finds merit in Sprint's observations regarding the cost effectiveness of backup power at cell towers and the economies of sharing. Furthermore, the benefits associated with the deployment of backup power at macrocell sites—because they cover broad areas—are considerably higher than the benefits associated with some microcell sites, as microcell and DAS systems are often providing a localized overlay, with the wireless user still able to receive a signal from the nearest macrocell site, in the event that power is out at the microcell.[23] The result of backup power rules for macrocells would be an improvement in overall wireless network reliability—including 911 reliability—with a core wireless network delivering robust service in the event of grid power outages.

Given the focus in this NPRM on the location-accuracy of wireless devices, the Commission must not forget that unless wireless networks (both wireless switching centers *and* wireless antenna networks) have adequate backup power capabilities, improved location accuracy will not deliver its full potential.

IP Transition Trials

The Commission is also in the process of evaluating an AT&T request for "all-IP trials." In the *Trials Order*, the Commission noted the importance of collecting data on 911 performance:

> [T]he Commission will find useful experiments that collect and provide to the Commission data on key attributes of IP-based services, such as network capacity, call quality, device interoperability, service to persons with disabilities, system availability, 911 and PSAP service, cybersecurity, call persistence, call functionality, and service coverage.[24]

[22] Sprint Comments *In the Matter of Improving the Resiliency of Mobile Wireless Communications Networks; Reliability and Continuity of Communications Networks, Including Broadband Technologies.* PS Docket No. 13-239, PS Docket No. 11-60, January 17, 2014, pp. 10-11, emphasis added.
[23] See, Ex Parte Letter from PCIA to Marlene H. Dortch in PS Docket No. 11-60, August 5, 2013, p. 2.
[24] *In the Matter of Technology Transitions AT&T Petition to Launch a Proceeding Concerning the TDM-to-IP*

Here too, the interrelationship of the issues raised in the instant NPRM must be considered. Location accuracy improvements for wireless devices could overcome some of the weaknesses of current wireless-based services. As submitted, AT&T's proposal to replace wireline basic service with a CMRS-based wireless alternative will result in degradation of the reliability of 911 services.[25] Improvements in location accuracy of wireless services will help insure that consumers who choose wireless options do not experience degraded 911 performance.

Conclusion

Evidence indicates that there will be substantial benefits from improving 911 location accuracy. As discussed above, the $92 billion per year projected by the Commission, by focusing exclusively on the benefits of lives saved, is overly conservative. The large number of incidents not involving fatalities will also benefit from improved response time, and those receiving care more rapidly as a result will experience improved outcomes. The scaling of Statistical Value of Life approach recently advanced by the Department of Transportation points to the potential for substantial additional benefits arising from improved 911 location accuracy.

The Commission's foundational mission of promoting safety of life and property through the use of wire and radio communication must persist during the transition to next-generation networks. Given the expansive and growing role of mobility networks in economic and social activities, failure to insure that networks are reliable will undermine the benefits of broadband, and limit the economic development potential of these technologies. AARP supports the Commission's

Transition, Connect America Fund, Structure and Practices of the Video Relay Service Program, Telecommunications Relay Services And Speech-to-Speech Services for Individuals with Hearing and Speech Disabilities, Numbering Policies for Modern Communications, GN Docket No. 13-5, GN Docket No. 12-353, WC Docket No. 10-90, CG Docket No. 10-51, CG Docket No. 03-123, WC Docket No. 13-97, Order, Report and Order and Further Notice of Proposed Rulemaking, Report and Order, Order and Further Notice of Proposed Rulemaking, Proposal for Ongoing Data Initiative, January 31, 2014, ¶¶73-74, emphasis added. Hereinafter *Trials Order*.

[25] For a discussion of the weaknesses of AT&T's Wireless Home Phone service, see AARP's comments and reply comments filed in GN Docket No. 13-5.

proposal to improve the location capabilities of wireless networks. However, the Commission's efforts with regard to the "tree" of improvements in location-based accuracy must not obscure the forest of wireless network reliability—including adequate backup power. Given the critical role that telecommunications services play in the economic and social life of the nation, the Commission must establish foundational levels of network performance, thus ensuring that its statutory responsibilities regarding the promotion of the safety of life and property through the use of wire and radio communication are successfully carried out.