Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Wireless E9-1-1 Location Accuracy Requirements	)	PS Docket No. 07-114
	)	
	)	
E9-1-1 Requirements for IP-Enabled Service Providers	)	WC Docket No. 05-196
	)	

COMMENTS OF THE ALLIANCE FOR TELECOMMUNICATIONS INDUSTRY SOLUTIONS

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Table of Contents

Summary

The Alliance for Telecommunications Industry Solutions (ATIS) recognizes the importance of E9-1-1 services and the need to ensure that these services are sufficiently reliable and accurate to meet the needs of consumers and public safety agencies. As a developer of key technical standards pertaining to E9-1-1 and emergency communications, ATIS believes that it is important that the Commission ensure that any changes to its E9-1-1 rules are necessary, and that the changes are both technically feasible and commercially reasonable. A paramount consideration that should be taken into account before new regulations are adopted is the significant work that has been completed and is underway by the industry on issues such as accuracy testing and indoor testing. ATIS also urges the Commission not to act prematurely by imposing vertical location requirements until additional research on this topic has been completed, and cautions that any expansion on E9-1-1 requirements to new VoIP services must take into account the technical limitations, reasonable expectations of consumers, and nascent nature of many VoIP services.

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COMMENTS

The Alliance for Telecommunications Industry Solutions (ATIS), on behalf of its Emergency Services Interconnection Forum (ESIF), hereby submits these comments in response to the Federal Communications Commission's (Commission) *Further Notice of Proposed Rulemaking* (*FNPRM*) and *Notice of Inquiry (NOI)* in the above referenced dockets.[1] ESIF continues to support the Commission's goal of providing accurate and reliable location data and ensuring that E9-1-1 services meet the needs of consumers and public safety agencies. As discussed more fully below, ESIF urges the Commission to: (1) carefully investigate the technological feasibility and commercial reasonableness of any changes to its location accuracy standard; (2) take into account the significant work undertaken by the industry on issues such as accuracy testing and indoor testing in determining whether rule changes on these issues are warranted; and (3) not impose vertical location requirements until additional research has occurred. Finally, ESIF cautions that any expansion of E9-1-1 requirements to new VoIP

[1] In the Matter of Wireless E9-1-1 Location Accuracy Requirements and E9-1-1 Requirements for IP-Enabled Service Providers, PS Docket No.07-114, WC Docket No. 05-196, *Further Notice of Proposed Rulemaking* and *Notice of Inquiry*, FCC 10-177 (rel. Sept.23, 2010).

services must take into account technical limitations, the reasonable expectations of consumers, and the nascent nature of many of these services.

I. Background

ATIS is a global standards development and technical planning organization that leads, develops and promotes worldwide technical and operations standards for information, entertainment and communications technologies. ATIS's diverse membership includes key stakeholders from the information and communications technologies industry, including wireless and wireline service providers, equipment manufacturers, providers of commercial mobile radio services, broadband providers, consumer electronics companies, public safety agencies, and internet service providers. Nearly 600 industry subject matter experts work collaboratively in ATIS's 17 open industry committees, which develop standards, specifications, best practices, and guidelines essential to communications networks' operation and continued evolution.

ATIS's ESIF serves as the primary forum for the telecommunications industry, public safety and other stakeholders to identify and resolve recognized technical and operational interconnection issues related to the delivery of E9-1-1 services. ESIF liaises with standards and government organizations to apprise them of its deliberations and decisions. ESIF also works closely with the National Emergency Number Association (NENA), which currently manages the technical evolution of the 9-1-1 system and emergency communications process. ESIF is an open, technical/operational forum that enables many different telecommunications entities to determine voluntarily the best practices and solutions to effectively and promptly deploy E9-1-1 services nationwide. ATIS comments are based on ESIF members' technical expertise and past work developing technical recommendations for accuracy testing, functionality testing and maintenance testing of E9-1-1-enabled wireless networks.

II. Discussion

As an initial matter, ESIF urges the Commission to carefully consider the work that is on-going in other Commission forums related to 9-1-1, Next Generation 9-1-1, location accuracy, and disability access. ESIF understands that work cannot come to a standstill just because other groups are examining these important and complex issues, but it is important that any decisions take into account the substantial ongoing work in these groups. In particular, ESIF urges the Commission to consider the ongoing relevant work efforts within the Communications Security Reliability and Interoperability Council (CSRIC) and the newly-formed Emergency Access Advisory Committee (EAAC) before issuing new rules in this proceeding. Both these groups are working on issues that appear to be directly responsive to questions posed in the *FNPRM*.[2]

A. Single Location Accuracy Standard

In the *FNPRM*, the Commission seeks comment on potential modification to the location accuracy requirements of Section 20.18(h) of the FCC's rules.[3] As part of its inquiry, the Commission seeks comment on whether a single location accuracy standard should be established to replace the current bifurcated approach of separate accuracy requirements for network-based and handset-based technologies.[4] As a preliminary matter, ATIS ESIF believes that the Commission should await the full implementation of the *Second Report and Order*[5] to determine whether, as a practical matter at the end of the transition period, there will be multiple

[2] Two CSRIC working group reports may be particularly relevant: (1) the final report being developed by CSRIC Working Group 4B, which is investigating what changes to 9-1-1-related VoIP standards and best practices are required for the evolution of IP-based originating service providers to the IP-based NG9-1-1 system environment and ways that NG9-1-1 architectures and technologies can improve access for people with disabilities and non-English speaking communities; and (2) the report from CSRIC Working Group 4C, which is examining E9-1-1/Public Safety location technologies to identify current performance and limitations for use in NG Public Safety Applications and recommendations for improving E9-1-1 location accuracy.

[3] 47 CFR 20.18 (h).

[4] *FNPRM* at ¶17.

[5] In the Matter of Wireless E9-1-1 Location Accuracy Requirements, PS Docket No.07-114, *Second Report and Order*, FCC 10-176 (rel. Sept.23, 2010).

location technologies in use with different standards, or whether the standards will have become effectively unified as many network carriers implement handset-based solutions, as they have announced they will do. In addition, ESIF believes that before a new, single location accuracy standard could be established, inherent limitations in wireless technology that would require significant investment in technology development and deployment must be overcome. ESIF notes that the decision to establish a single accuracy standard is a complex undertaking with broad impacts on carriers, consumers, and public safety agencies. Therefore, before adopting new requirements, ESIF urges the Commission to carefully investigate the practical need, technological feasibility and commercial reasonableness of imposing such a standard and to ensure that the new standard is commercially viable and technology-neutral.

ESIF believes that the most effective way to determine the technical feasibility of a single accuracy standard is to create an open forum comprised of the wireless industry, public safety community, the Commission and other relevant stakeholders to conduct a thorough evaluation and make recommendations on the appropriate accuracy standard. This forum, which would remain open and inclusive of all stakeholders, could be based on the E9-1-1 Technical Advisory Group (ETAG) that has been proposed by AT&T,[6] and could be tasked with evaluating accuracy data across a variety of usage environments – dense urban, urban, suburban and rural - and assessing various location technologies. As the primary forum for the telecommunications industry, public safety, and other stakeholders to resolve 9-1-1-related technical and operational issues, ATIS ESIF would welcome the opportunity to convene such a forum.

[6] Comments of AT&T Inc. filed December 4, 2009, in response to *Public Notice*, PS Docket No. 07-114, DA 09-2397 (rel. Nov. 6, 2009) at pp. 12-14.

B. 4G Networks

In the *FNPRM*, the Commission seeks information pertaining to 4G networks, specifically how these networks will impact wireless E9-1-1 requirements, how they can be implemented to achieve location benefits, and what 4G standards bodies are considering for location identification.[7] As the North American Organizational Partner in the 3rd Generation Partnership Project (3GPP) that developed the Long Term Evolution (LTE) wireless technology set of standards, ATIS cautions the Commission to avoid imposing mandates that could stifle innovation and timely deployment of 4G technologies.[8] ATIS has been working with its partners in 3GPP to evolve LTE specifications to effectively leverage existing capabilities and address new technologies as they may evolve in the future and it is important that this effort remain industry-driven. ATIS believes that only a consensus-based, standards-driven solution can effectively promote continued evolution of specifications such as LTE and allow truly global specifications to emerge that can incorporate a wide variety of location enhancement technologies.

C. Compliance Testing

The *FNPRM* seeks to refresh the record on what methodologies carriers should employ to verify compliance both initially and during ongoing testing.[9] ESIF has developed and published several industry-accepted methodologies related to E9-1-1 Phase II compliance testing and urges the Commission take this work into account when determining whether new requirements are warranted. These methodologies, which were created and adopted through a consensus-driven

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[7] *FNPRM* at ¶18.

[8] 3GPP is a collaboration established in December 1998 that brings together a number of telecommunications standards bodies which are known as "Organizational Partners." ATIS is a founding and sole North American Organizational Partner of 3GPP. In addition to ATIS, the other current partners are the Association of Radio Industries and Businesses, China Communications Standards Association, European Telecommunications Standards Institute, Telecommunications Technology Association and Telecommunication Technology Committee.

[9] *FNPRM* at ¶ 20.

standards development process involving wireless carriers, public safety representatives, and other stakeholders, offer valuable insights and could serve as the basis for standard compliance-testing methodologies for wireless carriers. These documents, which are publically available on the ATIS website at http://www.atis.org/docstore/default.aspx, are summarized below:

- **High Level Requirements for Accuracy Testing Methodologies (ATIS-0500001).** This document addresses the need for industry-accepted requirements for testing accuracy performance of Wireless E9-1-1 Phase II systems. It provides a common frame of reference that wireless carriers and other stakeholders can use to validate the accuracy methodology of 9-1-1 location technologies. The testing framework set forth in this document "identifies all the critical and interrelated elements required to perform accuracy testing of an E9-1-1 Phase II location system."
- **Maintenance Testing (ATIS-0500010).** This document provides a common framework for accuracy maintenance testing to ensure a wireless carrier's network maintains location accuracy compliance as changes and updates occur over time.
- **High Level Requirements for End-to- End Functional Testing (ATIS-05000009).** This document addresses methodologies for testing the end-to-end functionality of E9-1-1 Phase I and Phase II systems other than accuracy. The document does not impose a specific testing methodology but provides a common frame of reference that can be used to validate the end-to-end functionality of a Phase I or Phase II integrated network and provides a set of minimum requirements for individual test methodologies.
- **Define Topologies & Data Collection Methodology (ATIS-0500011)**. This document defines the topologies in which representative location accuracy data should be aggregated, and the methodology to accomplish this data analysis.

The Commission also seeks comment on whether it should make OET Bulletin No. 71 mandatory.[10] ATIS notes that, while ESIF documents referenced above are compliant with and attempt to augment and clarify the guidelines found in OET Bulletin No. 71, it does not believe that this bulletin should be mandated.

D. Schedule for Testing

The *FNPRM* seeks to refresh the record on the appropriate schedule for accuracy testing and the statistical methodology for determining compliance.[11] The Commission also tentatively

[10] *FNPRM* at ¶20.
[11] *FNPRM* at ¶21.

concludes, as it did in the previous *NPRM*, that it should establish a mandatory schedule for accuracy testing. ATIS ESIF urges that any such schedule should take into account and be consistent with industry work in this area. In particular, ATIS ESIF has published a technical report entitled "Maintenance Testing" (ATIS-0500010), which specifies events that should trigger accuracy maintenance testing. Those events include: (1) major network changes that may significantly impact location accuracy; (2) problems such as unexplained significant degradation of service, systematic failed delivery of service and catastrophic events; and 3) every two years, as a minimum, consistent with NRIC VII Focus Group 1A recommendations. Examples of major network changes that could significantly impact location accuracy and trigger accuracy maintenance testing on some or all of the deployed networks include:

a) Changes to core location technology;
b) Major system software upgrades that impact location algorithms;
c) Changes in radio frequency (RF) configuration that would result in a significant impact to location accuracy in the area being considered; and
d) Natural disasters that alter the topology of a significant portion of the infrastructure in an area of consideration. [12]

ATIS-0500010 also contains triggers for functionality testing if call routing problems are suspected. These triggers include: new cell sites; re-homing of cell sites from one Mobile Switching Center to another; cell site sector changes; PSAP-initiated routing changes for individual cell sites or groups of cell sites; platform software upgrades that have the potential to affect call routing; technology overlays; Mobile Positioning Center/Gateway Mobile Location Center vendor changes; and, selective router or trunk group changes.[13]

ATIS also notes that the Commission has addressed this issue in the *Second Report and Order* and is permitting the carriers to monitor trends in uncertainty estimates in compliant

[12] Maintenance Testing (ATIS-0500010) at pp. 7-8.
[13] *Id*. at p. 18.

counties to ensure continued proper operation of the location technology in those areas.[14] Since the use of uncertainty as a system quality indicator is subject to certain constraints and technical intricacies in establishing reliable trends, ESIF has recently initiated a study of the technical issues related to the use of uncertainty in such trending analysis.[15] ATIS recommends that before the Commission establishes a mandatory schedule for maintenance testing covering all counties and PSAPs, it should evaluate the extent to which the uncertainty trending promulgated in the *Second Report and Order*, as supplemented by ATIS-0500010, is working adequately.

E. Challenging Environments

The FCC also seeks to refresh the record in the *FNPRM* on how location information and accuracy can be improved in more challenging environments, including indoor settings.[16] ESIF notes that indoor testing presents distinct challenges in that location performance can vary greatly depending on the structure's composition, and the composition and density of surrounding structures and the placement of the call within the structure.

To assist the industry with such testing, ESIF has published ATIS-0500013, "Approaches to Wireless E9-1-1 Indoor Location Performance Testing," which presents optional guidelines for assessing the performance of wireless location technologies in various types of indoor structures and indoor calling scenarios. The document provides an overview of the indoor testing process and addresses: (1) the establishment of indoor test scenarios and locations; (2) the creation of a plan for the selection of test sites; (3) field testing and data collection; and (4) understanding performance test results. The standard also addresses the acquisition of accurate ground truth and provides in depth guidance on the various methods for acquiring indoor ground

[14] *Second Report and Order* at ¶51, ¶54.
[15] This issue, Issue 71, is being worked within the ESIF Emergency Services Methodologies (ESM) Subcommittee.
[16] *FNPRM* at ¶ 22.

truth and techniques to ensure that the ground truth for each site is accurate.[17] ESIF urges the Commission to consider this work when determining whether new procedures for verification of indoor location performance are necessary.

F. Elevation Data

The *FNPRM* seeks comment on how location information can include accurate vertical or z-axis data.[18] ATIS ESIF believes that additional research and development must occur before accurate z-axis information could be included in a location standard.[19] Currently no industry criterion exists for such data. Until such research is complete, ATIS ESIF believes that the adoption of Commission mandates would be inappropriate. As an additional matter, the Commission should carefully consider the large amount of work necessary within the PSAP itself and within its supporting GIS functions before altitude data can be used in a meaningful way by first responders. Requiring industry to develop a capability that is not useful in the PSAP would clearly be unreasonable.

G. Interconnected VoIP Services

Finally, ATIS notes that, in the *NOI* accompanying the *FNPRM,* the Commission seeks comment on whether to impose additional requirements on nomadic interconnected VoIP services and to refresh the record on the Commission's tentative conclusion in the *NPRM* that interconnected VoIP providers must employ an automatic location technology that meets the same accuracy standards as imposed on CMRS providers.[20] ESIF supports the application of E9-1-1 requirements to new services, but cautions that any expansion of autolocation

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[17] Approaches to Wireless E9-1-1 Indoor Location Performance Testing (ATIS-0500013) at p. 1.
[18] *FNPRM* at ¶ 23.
[19] Among other things, the Commission should consider whether the range of error may render elevation estimates unusable for emergency response. *See* Global Positioning System Standard Positioning Service Performance Standard, Assistant Secretary of Defense for Command, Control, Communications, and Intelligence at 13 (Table 3-3) (October 2001).
[20] *NOI at ¶¶26-27*.

requirements must take into account technical limitations and the nascent nature of many VoIP services. Before location accuracy requirements could be applied to some technologies, ESIF notes that additional work would be necessary including fundamental research and the development, testing, and deployment of standards by the industry. However, ESIF does not oppose the clarification of Interconnected VoIP location accuracy requirements that may be unclear -- such as whether a "registered location" associated with either a static or portable, nomadic Interconnected VoIP service must be validated against the Master Street Address Guide or Location Validation Function (whichever is made available) for Automatic Location Identification ("ALI") and 9-1-1 call routing purposes.

ATIS ESIF continues to work on emerging VoIP issues and has developed two relevant technical reports. The first report, entitled Local Acquisition for Internet Access Networks in Support of Emergency Services (ATIS-0500012), provides an analysis for VoIP location acquisition protocols. Among the report's recommendations: (1) the Location Information Server (LIS) function, which provides location information to a client, should be implemented in networks which do not already provide methods for configuring location in attached hosts, either by extending existing configuration methods or the use of an access-technology independent protocol; (2) different types of devices may serve as a LIS in different network deployments; (3) the need for standards for Operations Support Systems (OSSs) associated with a LIS should be liaised to an appropriate standards committee; and (4) for the NENA i2 architecture, HTTP-Enabled Location Delivery should be used as the access technology independent protocol where no other protocol has been specified or deployed.[21]

The second report pertains to the location parameter conveyance architectures and protocols. This report, Parameter Conveyance for Location Determination of Devices Attached

[21] Local Acquisition for Internet Access Networks in Support of Emergency Services (ATIS 0500012) at pp. 1-2.

to Access Networks (ATIS-0500015), defines a framework and associated protocol(s) to allow location-related network data to be conveyed from the relevant access network entities to a location determination function. While the methods of location determination are not discussed in the document, the report examines a common architecture or framework to describe how access network-related location parameters can be sent to or otherwise obtained by a location determination function so that location can be determined.[22]

Despite the progress made in ESIF regarding VoIP location accuracy, ATIS notes that additional work is necessary on emerging VoIP issues. ATIS ESIF believes that the open forum referenced above in Section II A of these comments could be an appropriate venue to further develop location accuracy standards for emerging VoIP technologies.

[22] Parameter Conveyance for Location Determination of Devices Attached to Access Networks (ATIS-0500015) at p. 1.

III. Conclusion

ESIF supports the Commission's goal to provide accurate and reliable location data and to ensure that E9-1-1 services meet the needs of consumers and public safety agencies. However, ESIF urges the Commission to carefully investigate the need, technological feasibility and commercial reasonableness of making any changes to existing location accuracy requirements. In determining whether any changes are warranted, ESIF urges the Commission to take into account the significant work done by the industry on issues such as accuracy testing and indoor testing. Furthermore, ESIF recommends that the Commission refrain from imposing vertical location requirements until additional research on this issue has been completed. Finally, ESIF cautions that any expansion on E9-1-1 requirements to new VoIP services must take into account technical limitations, the reasonable expectations of consumers, and the nascent nature of many of these services.

Respectfully submitted,

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