Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Amending the Definition of Interconnected	)	
VoIP Service in Section 9.3 of the	)	GN Docket No. 11-117
Commission's Rules	)	
	)	PS Docket No. 07-114
Wireless E911 Location Accuracy	)	
Requirements	)	WC Docket No. 05-196
	)	
E911 Requirements for IP-Enable Service Providers	)	

REPLY COMMENTS OF TRUEPOSITION, INC.

TruePosition, Inc. (TruePosition), submits these reply comments in response to the *Second Further Notice of Proposed Rulemaking* in the above proceedings.[1] TruePosition urges the Commission to amend its E 911 location accuracy rules to apply to indoor environments and to mandate compliance testing.

[1] In the Matter of the Definition of Interconnected VOIP Service in Section 9.3 of the Commission's Rules, et seq., *Notice of Proposed Rulemaking, Third Report and Order and Second Further Notice of Proposed Rulemaking,* FCC 11-107, GN Docket No. 11-117, PS Docket No. 07-114 and WC Docket No. 05-196 (July 13, 2011) ("*Second Further Notice*").

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Summary of Comments

Industry proclaims that mobile devices now exceed the US population.[2] As mobile devices are the primary means of communications, the National Emergency Number Association (NENA) emphasizes that consumers are ever more likely to use devices indoors and expect a mobile handset to be located during a 911 call. NENA states that indoor location performance testing is now unavoidably necessary.[3]

Carriers continue to object to indoor metrics and testing, asserting that nothing has changed,[4] that there are numerous challenges associated with indoor location accuracy testing[5] and it is not appropriate at this time to adopt indoor location accuracy and testing requirements.[6] Motorola Mobility recommends that first responders take real-time location accuracy measurements.[7] Verizon and Verizon Wireless state that since the limitations of A-GPS technologies in indoor GPS-denied environments are well understood, the principal impact of mandatory indoor testing at regular intervals will drain carriers' resources with little countervailing prospect of accuracy improvement.[8]

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[2] CTIA-The Wireless Association Semi-Annual Survey Reveals Historical Wireless Trend (October 11, 2011), http://www.ctia.org/media/press/body.cfm/prid/2133, *See also* Wireless Devices Eclipse People, New York Times (October 17, 2011) http://bits.blogs.nytimes.com/2011/10/12/the-u-s-has-more-wireless-devices-than-people/?scp=2&sq=wireless&st=cse

[3] NENA Comments at page 13, GN Docket 11-117 (October 3, 2011).

[4] Comments of AT&T at page iv (October 3, 2011), Comments of T-Mobile at page 8 (October 3, 2011).

[5] Comments of CTIA at page 3 (October 3, 2011).

[6] Comments of Sprint at page 8 (October 3, 2011).

[7] Comments of Motorola Mobility at page 11 (October 3, 2011).

[8] Comments of Verizon and Verizon Wireless at page 28 (October 3, 2011).

In contrast, the International Association of Chiefs of Police (IACP), the International Association of Fire Chiefs (IAFC), National Sheriffs' Association (NSA) and the Joint National EMS Leadership Conference (JNEMSLC), in joint comments, state that the gap in the Commission's current rules between outdoor and indoor location requirements creates a large and real risk that the location of 911 callers is not available to large portions of the population and emergency responders. Favorable technology trends and emerging approaches present a path to meaningful improvements in location information.[9] NENA states that it can no longer be said that accurate indoor positioning is not technologically feasible.[10] Commlabs concludes that the status quo is untenable, further steps are necessary to ensure that first responders receive highly accurate, reliable and consistent position location information from all emergency callers, including those using wireless devices in indoor environments, irrespective of technology.[11]

TruePosition urges the Commission to require measurements of indoor environments and to align its testing protocols to include such. A-GPS's limitations can no longer be ignored. While there are varying estimates of the number, or percentage, of 911 calls placed from indoor areas, there is ample evidence to indicate the volume of such calls is quite substantial. Ignoring those callers when formulating accuracy requirements leaves a big hole in the fabric of the safety net that consumers have come to expect, and they pay for (via 911 fees on their bill), as part of their wireless service.

[9] Comments of the IACP, IAFC, NSA and JNEMSLC at page 2 (October 3, 2011).

[10] Comments of NENA at page 13.

[11] Comments of Commlabs at page 11 (October 3, 2011).

Technological solutions exist to meet these needs.[12] TruePosition has submitted several sets of test results using U-TDOA to locate wireless users in challenging indoor environments. Boeing has announced the availability of a Iridium-based location system that can be effective indoors. Verizon Wireless has been deploying a Pilot Beacon solution in some indoor environments.[13]

Contrary to Verizon's position, an indoor rule will improve accuracy. Accountability will be established and promote market efficiencies. It will present real opportunity for universal location platforms shared by all carriers and technologies. An indoor rule will serve as a foundation for advanced services location information.

Given the demonstrated need for indoor location capability, and the availability of technological solutions to meet those needs, TruePosition urges the Commission to extend the current location accuracy rules. It should phase-in indoor location accuracy requirements over a reasonable timeframe and provide testing guidelines that industry groups (such as the Communications, Security, Reliability and Interoperability Advisory Committee (CSRIC) and the Emergency Services Interconnection Forum (ESIF)) can use to develop specific testing protocols that are efficient and cost effective.

Until the Commission acts, it embraces the status quo of A-GPS' inability to penetrate several common indoor environments from where calls are made. And by not acting, the Commission abandons its fidelity to technology neutral rules. The status quo is a *defacto*

[12] NENA notes, at page 14, that it can no longer be said that accurate indoor positioning is not technologically feasible.

[13] Comments of Cellular Specialties Inc. (CSI), at page 2 (October 3, 2011).

embrace of A-GPS' limitations.[14] As the joint comments of IACP, IAFC, NSA and JNEMSLC emphasize-- unless the Commission pursues indoor accuracy rules, nothing will happen.[15]

The Path to Improve Indoor Location Technology

There is ample evidence in the record that A-GPS location solutions perform poorly in dense urban and indoor environments.[16] Similarly, TruePosition has provided substantial data showing that the widely deployed U-TDOA location solution provides accurate locations in these challenging environment.[17]

Combining A-GPS and U-TDOA location capabilities into a dual-technology location solution can provide accurate location for all 911 callers. This technology is available today. Carriers that have already deployed a network-based solution (U-TDOA) and are rapidly rolling out A-GPS capable handsets can enable this dual-technology solution in their networks by configuring the use of A-GPS in areas where that technology will work well (rural and suburban

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[14] TruePosition reiterates that the Public Safety Communications Office of the California Technology Agency's September 20, 2011 comments describing the actions of the Communications Security, Reliability and Interoperability Council (CSRIC) Location Accuracy Subgroup (4C) are incorrect. Subgroup 4C did not determine that A-GPS technology has superior location accuracy. The Subgroup actually embraced the importance of an scientific ground truth measurement method.

In its initial submission to CSRIC Working Group 4C (August 9, 2010), the California 9-1-1 Emergency Communications Division provided a report on its "Routing on Empirical Data" (RED) project, which netted significant 911 call routing efficiencies by carefully reviewing call origination patterns against call routing criteria, and adjusting the call routing rules accordingly.

The report suggested A-GPS should be the only location technology; it went on to say that a scientific approach to reporting accuracy should not be used, instead accuracy compliance should be gauged upon the reported location uncertainties for each carrier. After many conference calls, Working Group 4c agreed to accept only the factual call routing analysis from Project RED, and added a statement that a scientific ground truth measurement method should be used to determine the statistical accuracy to demonstrate compliance with the Commission's wireless location accuracy rules.

[15] IACP, IAFC, NSA and JNEMSLC Comment at page 2.

[16] Comments of Verizon and Verizon Wireless at pages 3-4, PS Docket 07-114 (January 19, 2011), Comments of Sprint Nextel at page 5, PS Docket 07-114 (January 19, 2011), Comments of TruePosition at pages 4-5 (October 3, 2011), Comments of TruePosition at pages 8-11 (January 19, 2011).

[17] Comments of TruePosition at pages 12-19 (January 19, 2011).

areas) and the use of U-TDOA in areas where A-GPS is challenged, but where UTDOA can provide accurate locations (urban and dense urban areas). This type of dual-technology solution can be implemented expeditiously, without any additional software or hardware modifications, simply through location network configuration changes.

With very minor software changes, further improvements can be made to this dual-technology solution. The current deployed implementations allow for the location server (SMLC) to initiate either an A-GPS or a U-TDOA location request to the respective Position Determining Equipment (PDE) based on system configuration and handset capabilities. The necessary software changes would initiate both an A-GPS and a U-TDOA location request to both PDEs based on handset capabilities and select the location estimate with the lower returned uncertainty value.

With regard to carriers using network location technology, this path is well within reasonable network modifications carriers pursue over the course of a year to maintain and ensure that operations meet subscriber expectations. It does not depend upon replacement or the life cycle of handsets or deploying additional equipment at the base station. It does depend on the Commission applying its wireless location accuracy rules to indoors.

Proposed Indoor Location Accuracy Requirements

TruePosition proposes the following modifications (noted in ***italics***) to the location accuracy rules put forth in the *Second Order and Report*.[18]

The authority for Part 20 remains unchanged.

Section 20.18(h) is amended to read as follows:

* * *

(h) *Phase II accuracy*. Licensees subject to this section shall comply with the following standards for Phase II location accuracy and reliability, to be tested and measured either at the county or at the PSAP service area geographic level, based on outdoor ***and indoor*** measurements:

(1) Network-Based Technologies:

(i) 100 meters for 67 percent of calls, consistent with the following benchmarks:

(A) One year from January 18, 2011, carriers shall comply with this standard ***as to outdoor calls*** in 60 percent of counties or PSAP service areas. These counties or PSAP service areas must cover at least 70 percent of the population covered by the carrier across its entire network. Compliance will be measured on a per-county or per-PSAP basis using, at the carrier's election, either (1) network-based accuracy data, or (2) blended reporting as provided in paragraph (h)(1)(D) of this section.

(B) Three years from January 18, 2011, carriers shall comply with this standard ***as to outdoor and indoor calls*** in 70 percent of counties or PSAP service areas. These counties or PSAP service areas must cover at least 80 percent of the population covered by the carrier across its entire network ***and at least 80 percent of the population covered by the carrier across any urbanized area as defined by the US Census Bureau.*** Compliance will be measured on a per-county or per-PSAP basis using, at the carrier's election, either (1) network-based accuracy data, or (2) blended reporting as provided in paragraph (h)(1)(D) of this section.

(C) Five years from January 18, 2011, carriers shall comply with this standard ***as to outdoor and indoor calls*** in 100% of counties or PSAP service areas covered by the carrier. ***These counties or PSAP service areas must cover at least 90 percent of the population covered by the carrier across any urbanized area as defined by the US Census Bureau***. Compliance will be measured on a per-county or per-PSAP basis, using, at the carrier's election, either (1) network-based accuracy data, (2) blended reporting as

[18] In the Matter of Wireless E911 Location Accuracy Requirements, *Second Report and Order*, PS Docket No. 07-114, FCC 10-176 (September 23, 2010).

provided in paragraph (h)(1)(D) of this section, or (3) handset-based accuracy data as provided in paragraph (h)(1)(E) of this section.

(ii) 300 meters for 90 percent of calls, consistent with the following benchmarks:

(A) Three years from January 18, 2011, carriers shall comply with this standard ***as to outdoor and indoor calls*** in 60 percent of counties or PSAP service areas. These counties or PSAP service areas must cover at least 70 percent of the population covered by the carrier across its entire network ***and at least 70 percent of the population covered by the carrier across any urbanized area as defined by the US Census Bureau.*** Compliance will be measured on a per-county or per-PSAP basis using, at the carrier's election, either (1) network-based accuracy data, or (2) blended reporting as provided in paragraph (h)(1)(D) of this section.

(B) Five years from January 18, 2011, carriers shall comply with this standard ***as to outdoor and indoor calls*** in 70 percent of counties or PSAP service areas. These counties or PSAP service areas must cover at least 80 percent of the population covered by the carrier across its entire network ***and at least 90 percent of the population covered by the carrier across any urbanized area as defined by the US Census Bureau.*** Compliance will be measured on a per-county or per-PSAP basis using, at the carrier's election, either (1) network-based accuracy data, or (2) blended reporting as provided in paragraph (h)(1)(D) of this section.

(C) Eight years from January 18, 2011, carriers shall comply ***with this standard as to outdoor and indoor calls*** in 85 percent of counties or PSAP service areas. **These counties or PSAP service areas must cover at least 90 percent of the population covered by the carrier across any urbanized area as defined by the US Census Bureau**. Compliance will be measured on a per-county or per-PSAP basis using, at the carrier's election, either (1) network-based accuracy data, (2) blended reporting as provided in paragraph (h)(1)(D) of this section, or (3) handset-based accuracy data as provided in paragraph (h)(1)(E) of this section.

(iii) County-level or PSAP-level location accuracy standards for network-based technologies will be applicable to those counties or PSAP service areas, on an individual basis, in which a network-based carrier has deployed Phase II in at least one cell site located within a county's or PSAP service area's boundary. Compliance with the requirements of paragraph (h)(1)(A) and paragraph (h)(1)(B) of this section shall be measured and reported independently.

(iv) Accuracy data from both network-based solutions and handset-based solutions may be blended to measure compliance with the accuracy requirements of paragraph (h)(1)(A)(i)-(iii) and paragraph (h)(1)(B)(i)-(iii) of this section. Such blending shall be based on weighting accuracy data in the ratio of assisted GPS ("A-GPS") handsets to non-A-GPS handsets in the carrier's subscriber base. The weighting ratio shall be applied to the accuracy data from each solution and measured against the network-based accuracy requirements of paragraph (h)(1) of this section.

(v) A carrier may rely solely on handset-based accuracy data in any county or PSAP service area if at least 85 percent of its subscribers, network-wide, use A-GPS handsets, or if it offers A-GPS handsets to subscribers in that county or PSAP service area at no cost to the subscriber.

(vi) A carrier may exclude from compliance particular counties, or portions of counties, where triangulation is not technically possible, such as locations where at least three cell sites are not sufficiently visible to a handset. Carriers must file a list of the specific counties or portions of counties where they are utilizing this exclusion within 90 days following approval from the Office of Management and Budget for the related information collection. This list must be submitted electronically into PS Docket No. 07-114, and copies must be sent to the National Emergency Number Association, the Association of Public-Safety Communications Officials-International, and the National Association of State 9-1-1 Administrators. Further, carriers must submit in the same manner any changes to their exclusion lists within thirty days of discovering such changes. This exclusion will sunset on 8 years after January 18, 2011.

(2) Handset-Based Technologies:

(i) Two years from January 18, 2011 50 meters for 67 percent of ***outdoor*** calls, and 150 meters for 80 percent of ***outdoor*** calls, on a per-county or per-PSAP basis. However, a carrier may exclude up to 15 percent of counties or PSAP service areas from the 150 meter requirement based upon heavy forestation that limits handset-based technology accuracy in those counties or PSAP service areas.

(ii) Five years from January 18, 2011, 50 meters for 67 percent of outdoor and indoor calls, and 150 meters for 85 percent of outdoor and indoor calls, on a per-county or per-PSAP basis. The percentage of calls must cover at least 90 percent of the population served by the carrier across any urbanized area as defined by the US Census Bureau. However, a carrier may exclude up to 15 percent of counties or PSAP service areas from the 150 meter requirement based upon heavy forestation that limits handset-based technology accuracy in those counties or PSAP service areas.

(iii) Eight years from January 18, 2011, 50 meters for 67 percent of calls, and 150 meters for 90 percent of ***outdoor*** calls ***and 85% for indoor calls***, on a per-county or per-PSAP basis. ***The percentage of calls must cover at least 90 percent of the population covered by the carrier across any urbanized area as defined by the US Census Bureau.*** However, a carrier may exclude up to 15 percent of counties or PSAP service areas from the 150 meter requirement based upon heavy forestation that limits handset-based technology accuracy in those counties or PSAP service areas.

(iv) Carriers must file a list of the specific counties or PSAP service areas where they are utilizing the exclusion for heavy forestation within 90 days following approval from the Office of Management and Budget for the related information collection. This list must be submitted electronically into PS Docket No. 07-114, and copies must be sent to the National Emergency Number Association, the Association of Public-Safety Communications Officials-International, and the National Association of State 9-1-1 Administrators. Further, carriers must submit in the same manner any changes to their exclusion lists within thirty days of discovering such changes.

(3) Confidence and Uncertainty Data: Two years after [effective date of the Order], all carriers subject to this section shall be required to provide confidence and uncertainty data on a per-call basis upon the request of a PSAP. Once a carrier has established baseline confidence and uncertainty levels in a county or PSAP service area, ongoing accuracy shall be monitored based on the trending of uncertainty data and additional testing shall not be required. All entities responsible for transporting confidence and uncertainty between wireless carriers and PSAPs, including LECs, CLECs, owners of E911 networks, and emergency service providers (collectively, System Service Providers (SSPs)) must implement any modifications that will enable the transmission of confidence and uncertainty data provided by wireless carriers to the requesting PSAP. If an SSP does not pass confidence and uncertainty data to PSAPs, the SSP has the burden of proving that it is technically infeasible for it to provide such data.

Testing Guidelines

TruePosition urges the Commission to expand its *Guidelines for Testing and Verifying the Accuracy of E911 Locations Systems*- OET 71 to include indoor environments. It should follow its precedent of outdoor testing by setting general principles and guidelines, many of which remain applicable to indoor environments that foster industry and public safety effort resulting in further clarity to indoor testing protocols.

In previous location accuracy proceedings, the Commission set forth testing guidelines and let the industry develop its own detailed testing protocol to meet the needs of various environments and network configurations. TruePosition believes once accuracy requirements are adopted, a similar approach regarding testing protocols will drive industry to find solutions.

Importantly, the Commission has already requested CSRIC III Working Group 3 to investigate and recommend approaches to develop specific cost effective protocols for indoor testing. TruePosition supports this effort and is an active participant in the CSRIC working

group. We believe the Commission could greatly speed the work of that group by providing high-level testing guidelines, which could be conveyed as either an extension of OET-71, or as a separate document focused on indoor testing guidelines.

The main goal of those testing guidelines should be to ensure that the testing is performed in areas that are representative of the environment that exists in each County/PSAP. As discussed in our previous comments,[19] the CDG test plan provides a good breakdown of the various indoor and outdoor environments that typically exist in urban, suburban, and rural environments. The more recent ATIS document on indoor testing[20] also provides description of various indoor environments. Both of these documents also provide guidance on how subsets of these scenarios should be used based on the environment and the prevalence of various types of building structures in the test area of interest.

The Commission, through the work of the Office of Engineering and Technology, should adopt guidelines that assist the CSRIC III Working Group 3 in ensuring that the needs of emergency response are balanced and pursued by those of the industry at large.

[19] Comments of TruePosition at pages 15-18 (October 3, 2011).

[20] Alliance for Telecommunications Industry Solutions (ATIS), *Approaches to Wireless E9-1-1 Indoor Location Performance Testing* (ATIS-0500013) (2010) .

Conclusion

TruePosition urges the Commission to embrace the need to make meaningful improvements to emergency response by moving forward to amend its wireless location information rules to apply to indoors and to revise its testing guidelines to ensure compliance with its standards.[21]

Respectfully submitted,

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[21] Advocacy that the Commission should adopt an Intellectual Property Rights Policy with regard to emergency response technology, Comments of Telecommunications Services, Inc. at pages 17-21 (October 3, 2011), remains outside the scope of these proceedings. Notably, the premise of the position, that a compulsory patent license be provided for 911 technology, where responsibility for infringement is assumed by the United States, was proposed as an amendment in the Senate to the recently enacted patent reform legislation, Public Law No: 112-29 (September 16, 2011), but never formally considered.