

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

In the Matter of)	
)	
Public Safety and Homeland Security)	PS Docket No. 07-114
Bureau Announces Workshop on E911)	DA 13-1873
Phase II Location Accuracy)	
)	
Wireless E911 Location Accuracy)	PS Docket No. 07-114
Requirements)	

COMMENTS OF SPRINT CORPORATION

Sprint Corporation (“Sprint”) submits these Comments in response to the Public Notice issued by the Public Safety and Homeland Security Bureau (“Bureau”) in the above-referenced proceeding, which seeks comment on a number of questions related to E9-1-1 Phase II location accuracy.¹

I. INTRODUCTION

Sprint is committed to providing accurate location information for wireless 9-1-1 communications and has demonstrated this commitment through its ongoing provision of state-of-the-art Phase II E9-1-1 hybrid location technology using an advanced Assisted Global Positioning System (“AGPS”) combined with Advanced Forward Link Trilateration (“AFLT”)

¹ *Public Safety and Homeland Security Bureau Announces Workshop on E911 Phase II Location Accuracy, Public Notice, DA 13-1873, PS Docket No. 07-114 (Released September 9, 2013) (“Public Notice”).*

techniques.² Sprint supports the Bureau’s efforts to examine whether 9-1-1 location accuracy can be improved, but is concerned that information filed recently with the Commission paints a misleading picture regarding the accuracy of Phase II E9-1-1 location information. The data contained in the recent filing made by the California chapter of the National Emergency Number Association (“CALNENA”) does not provide an accurate measure of how often Phase II location information is provided by carriers and should not be used as a basis to trigger further regulatory mandates.³ With respect to indoor location accuracy, industry representatives have been working to examine this issue through the FCC’s Communications Security, Reliability, and Interoperability Council (“CSRIC”) and Sprint believes this is the appropriate forum for continuing to examine these issues.

II. PROVISION OF PHASE II LOCATION INFORMATION

A. A Number of Factors Can Affect Receipt of Phase II Location Information

There are a number of factors that can affect whether individual 9-1-1 calls include or do not include delivery of Phase II location information to the PSAP.⁴ If a PSAP has requested Phase II E9-1-1 services from Sprint, the network will be provisioned to deliver Phase II data to the Mobile Positioning Center (“MPC”) for the PSAP to pull the data. While in some cases Phase II location is delivered with the initial call set-up or initial bid, this is more the exception

² By using AFLT, Sprint’s 9-1-1 network does not rely solely on AGPS for Phase II location information. This hybrid approach can provide accurate and timely Phase II data when there may not be enough line-of-sight satellites available. The network initially attempts to generate the most accurate Phase II location of a device by obtaining the necessary GPS location utilizing data from a minimum of three satellites. If this is not possible, however, the network uses a combination of AGPS and AFLT to provide the most precise location information available.

³ Letter from Danita L. Crombach, ENP, CALNENA, to the Honorable Mignon Clyburn, Chairwoman, Federal Communications Commission, PS Docket No. 07-114 (filed Aug. 12, 2013) (“CALNENA *ex parte*”).

⁴ Public Notice at 2.

than the rule. This is because it usually takes more time to calculate the Phase II information than it does to set up the call, as explained in more detail below. As a result, the procedures used by an individual PSAP to bid/re-bid to receive Phase II information is a critical factor that will affect whether, or when, Phase II information is received for an individual 9-1-1 call.

In addition, various environmental factors that impact radio frequency and Global Positioning System (“GPS”) availability will determine whether more precise Phase II latitude and longitude information is available for the device. For example, geological topology, terrain, forestation, and the presence of “urban canyons,” are all factors that can affect outdoor location accuracy. Indoor challenges such as building type and materials, height, and whether the setting is urban or rural can impact the delivery of Phase II data.

B. The PSAP re-bidding process is critical to the provision of Phase II location information.

The re-bidding process is part of established best practices for public safety entities and is outlined in the National Emergency Number Association (“NENA”) best practices, which recommend that a PSAP manually perform at least one re-bid approximately 15 to 30 seconds after receipt of the initial location bid response in order to obtain the 9-1-1 caller’s accurate latitude and longitude.⁵ In addition, the APCO Project Locate Effective Practice released in 2007 also discussed the need to re-bid all wireless calls when the wireless caller is not able to provide a location.⁶

The re-bid process PSAPs perform for Phase II location information is necessary because obtaining more granular Phase II data takes additional time beyond what it is needed to provide

⁵ NENA, *Wireless Phase I & II Features and Functions Operational Information Document*, Doc. 57-501, § 3.2.8 (Jan. 20, 2003).

⁶ APCO *Project Locate, Final Report*, Effective Practice, 380743, pg. 24 (April 2007).

the initial Phase I data used to route the call. While a 9-1-1 call is typically routed to the designated PSAPs just a few seconds after the call is initiated, calculation of Phase II information takes additional time. For carriers like Sprint using AGPS technology, to obtain Phase II location information, the wireless handset must receive information from the network regarding the expected location of satellites in that geographic location at that time of day, locate the satellites signals available (depending upon the environmental factors described above), receive and record the timing information broadcast by the satellite, transmit that information, along with other network data, to the MPC for calculation, and finally produce the latitude and longitude (“XY”) data associated with that handset. Wireless carriers must then make this Phase II location information available to the PSAPs through connections to the MPC. PSAPs are then responsible for bidding to receive Phase II location information or re-bidding after they receive the initial bid information for the call, if they desire to update or verify the initial Phase II bid location information.

The initial bid or call-set up that occurs on Sprint’s network will normally include Phase I level data and this is typically provided to PSAPs in the Class of Service designation. On Sprint’s network, the initial call set-up information provided a few seconds after the call is initiated provides: (a) the call-back number of the caller; (b) the physical or postal address (location description) of the cell site including the sector designation from which the call originated; (c) the latitude and longitude of the cell sector centroid; and, (d) the Class of Service information, which indicates Phase I data is being provided. The PSAP can then bid 15-20 seconds after receiving initial location information. If Phase II information is available, upon the bid the PSAP should receive: a) the call-back number of the caller; b) the latitude and longitude of the subscriber’s wireless handset; and, (c) the Class of Service information, which will

indicate Phase II data is being provided. Sprint provides a brief sheet to PSAPs to explain the importance of the re-bid process and how this process should work.

The duration of a call may also impact a carrier's ability to provide Phase II location information. Where AGPS technology is utilized, a shorter call may not be active long enough for the Phase II location calculation to be completed. If the call is shorter than 30 seconds, for example, there may not be sufficient time to complete the calculation and the Phase II information may not be available through the re-bid process as a result. Most calls of such short duration, however, are likely to be short because they are duplicative during a mass calling event, *e.g.*, an accident on a highway, or because the call did not require dispatch to a particular location.

C. The CALNENA *ex parte* filing does not accurately reflect the successful delivery of Phase II location information by wireless carriers to PSAPs.

The Public Notice specifically references the *ex parte* filing made by the California chapter of NENA ("CALNENA") filing and asks whether data in the record supports CALNENA's contention that there has been a decline in the delivery of accurate Phase II location information in the past few years.⁷ Based on Sprint's review of the data contained in the CALNENA *ex parte* filing, it appears the CALNENA analysis did not take into account those instances where Phase II E9-1-1 data was not received because the PSAP did not re-bid for Phase II information after receiving the initial call set-up information.⁸ As a result, the CALNENA

⁷ *Id.*

⁸ The CALNENA data shows the phase of data received "at call Termination." *See* CALNENA *ex parte* attachments. The CALNENA data is not consistent with Sprint's data. Sprint's data shows that Phase II data was delivered to the MPC an average of 95.53% of the time for the five counties mentioned in the CALNENA study (94.07% for Kern County, which includes the Bakersfield Police Department; 97.09% for Los Angeles County, which includes Pasadena

data should not be interpreted to mean that there has been a decline in the delivery of accurate Phase II location information by carriers. On the contrary, the CALNENA study emphasizes the importance of the public safety community understanding the wireless 9-1-1 system and how to use it effectively.

Sprint has reviewed its own data associated with 9-1-1 calls in the five counties referenced in the CALNENA study and, based on its review, the PSAP re-bid rates in these counties fell between 15% and 45%. Of the five counties surveyed, one county did not re-bid for Phase II information 85% of the time and the county with the highest percentage of re-bids did not re-bid 55%, *or more than half*, the time. If a PSAP does not re-bid for Phase II information, they will not receive Phase II information even though the carrier has most likely delivered this information to the MPC. The data submitted by CALNENA is, therefore, not indicative of how frequently carriers are delivering Phase II data.

A re-bid may not always be necessary for various reasons, including the length of the call or the ability of the caller to provide an adequate description of his or her location. These situations will, unfortunately, skew interpretation of the data. The CALNENA data would seem to erroneously indicate in these instances that Phase II data was not *provided* by the carrier when, in fact, it was not *requested* through re-bidding by the PSAP.

The CALNENA study does not signify a problem with provision of Phase II location information by carriers. The study could indicate, however, that PSAPs may not be following well-established best practices to the extent they are not re-bidding to receive Phase II location information. It could also simply indicate that Phase II location information is only necessary in

Police Department; 96.24% for Santa Clara County, which includes the San Jose Police Department; and 97.23% for San Francisco City and County, and 93.04% for Ventura County).

a certain limited number of wireless calls to 9-1-1 where the location of the wireless caller is otherwise not known by the call taker and emergency responders would benefit from it.

III. INDOOR LOCATION ACCURACY

Carriers continue to monitor and review possible new technologies that could improve the performance of their 9-1-1 location accuracy, including indoor location. Although technological advancements may ultimately become possible, carriers must be given the opportunity to evaluate and test these technologies. Moreover, even if they can be demonstrated to be effective, most of these new technologies will likely require handset and/or network modifications, which would take considerable time to adopt and implement. Of the utmost importance, industry standards will need to be developed to allow all carriers and PSAPs to employ a consistent and reliable technological solution that will serve the emergency needs of the public and survive the test of time. Deploying disparate solutions will only create more operational confusion for PSAPs.

There are a number of challenges and important factors related to the provision of indoor location accuracy information that must be evaluated. The ability to determine the exact location of a caller indoors, including vertical location information, would be difficult and will require significant equipment upgrades for not only carriers, but also for PSAPs. To determine a location, the coordinates (latitude & longitude), uncertainty and altitude would have to be geocoded and plotted on a city map via a Geographic Information System that is capable of plotting the altitude. Even then, it would be hard to determine for certain whether a call was made indoors given the structure and height of the building or structure, or if the call came from a balcony or courtyard area with a view of the sky.

Based on Sprint's experience, even current commercial systems utilized for location do not have a system accurate enough to plot coordinates in or on the right building every time. In addition, radio frequency signal strength deteriorates sharply as wireless callers move deeper into buildings. Due to these challenges, researching the capabilities of current and future technology is essential to understanding what may be possible in the future to improve indoor location accuracy determinations. The addition of "small cells" into carrier networks, along with other in-building solutions, may hold some promise to help not only resolve coverage issues related to signal strength indoors, but may be able to provide additional assistance in locating callers with some specificity at indoor locations. These deployments, however, are only just beginning and it will be some time before they will offer a robust solution. Moreover, they may never address indoor location in areas other than dense urban cores.

Industry representatives have been working to examine the issues related to indoor location accuracy through the FCC CSRIC , which is the appropriate forum for continuing to examine these issues. With the recent launch of CSRIC IV, a new working group has been established to further examine indoor location accuracy.

IV. CONCLUSION

It is appropriate for the Commission, the public safety community and the wireless industry to continue to examine E9-1-1 location accuracy to determine if there are reasonable measures that can be taken to help improve upon the systems and procedures currently in place. It is equally important, however, for the Commission to recognize for the sake of public confidence that wireless carriers are delivering Phase II E9-1-1 location information in accordance with the FCC rules. CALNENA's *ex parte* filing does not accurately reflect how

frequently carriers are providing Phase II data and should not be interpreted to mean that there has been a decline in the delivery of accurate Phase II location information by carriers. Finally, the FCC CSRIC working group specifically assigned to the task is the proper forum to consider the complex issues associated with indoor location accuracy. The Commission should refrain from taking further action regarding wireless indoor location accuracy until CSRIC has had the opportunity to fully examine it and arrive at its recommendation for future direction.

Respectfully Submitted,

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