

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

In the Matter of)	
)	
Facilitating the Deployment of)	PS Docket No. 11-153
Text-to-911 and Other Next Generation)	
911 Applications)	
)	
Framework for Next Generation 911)	PS Docket No. 10-255
Deployment)	

COMMENTS OF SPRINT CORPORATION

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October 16, 2014

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I. INTRODUCTION AND SUMMARY

Sprint Corporation (“Sprint”) hereby submits these comments in response to the Federal Communications Commission’s (“FCC” or “Commission”) Second Report and Order and Third Further Notice of Proposed Rulemaking in the above-referenced proceeding.¹ As a signatory to the Voluntary Commitment to provide text-to-911 service signed by the four largest wireless carriers, Sprint continues to support the interim text-to-911 measure.² Like others in the wireless industry, Sprint is involved in ongoing efforts to explore the possibility of eventually making more detailed location information available for text-to-911 and plans to continue its involvement in working groups examining the issue. Sprint, however, urges the Commission to refrain from adopting an enhanced location information requirement for text-to-911 at this time.

¹ *Facilitating the Deployment of Text-to-911 and Other Next Generation 911 Applications*, PS Docket No. 11-153; *Framework for Next Generation 911 Deployment*, PS Docket No. 10-255, *Second Report and Order and Third Further Notice of Proposed Rulemaking* (Rel. August 13, 2014) (“Second R&O and Third FNPRM”).

² See Letter from Terry Hall, APCO International, Barbara Jaeger, NENA, Charles W. McKee, Sprint, Robert W. Quinn, Jr., AT&T, Kathleen O’Brien Ham, T-Mobile USA, and Kathleen Grillo, Verizon, to Julius Genachowski, Chairman, Federal Communications Commission, and Commissioners McDowell, Clyburn, Rosenworcel and Pai; PS Docket No. 11-153, PS Docket No. 10-255 (Dec. 6, 2012) (the “Voluntary Commitment”).

Comments filed in this proceeding and recent findings published by the CSRIC IV Working Group demonstrate that it is not feasible to provide enhanced location information without further development effort, time and expense. Similarly, requiring roaming support for text-to-911 would also be premature. There are significant technical complexities that must still be resolved and standards have not yet been developed. Requiring capabilities beyond the existing SMS system is inconsistent with the principles behind the Voluntary Commitment and will ultimately divert resources from NG9-1-1 deployment. Instead of attempting to mandate enhanced location requirements and roaming support at this time, the Commission should allow industry efforts that are already underway to continue to progress.

II. DISCUSSION

A. Enhanced Location Information for Text-to-911

The Commission proposes that, within two years of the effective date of final rules, covered text providers will deliver enhanced location information with texts to 911.³ Proposing an enhanced location information requirement for text-to-911 at this time is premature. As Sprint discussed in previous comments filed in this docket, requiring enhanced location information is inconsistent with the Voluntary Commitment and would require further development effort, time and expense that will ultimately divert resources from NG911.⁴ Under the Voluntary Commitment, carriers made clear they would provide an interim “best efforts” service intended to meet the near term objective of providing text-based emergency communications until the more comprehensive NG9-1-1 system is deployed. The signatories to the Voluntary Commitment stipulated that a voluntary SMS-to-9-1-1 solution would be limited to the

³ Second R&O and Third FNPRM at par. 82.

⁴ Sprint Comments, PS Docket Nos. 10-255 and 11-153 (filed April 4, 2014) (“Sprint Comments”) at 9.

capabilities of the existing SMS service offered by participating wireless service providers on the home wireless network to which a wireless subscriber originates an SMS message. The Voluntary Commitment did not include a requirement to provide any type of enhanced location information, as that capability is not part of the existing SMS service. Requiring carriers to enhance and expand the capabilities of the interim solution will divert resources from efforts to implement NG9-1-1, which promises to provide enhanced features and capabilities, including the possibility of more precise location information.

The Commission only recently adopted rules requiring other “covered text providers” to provide text messaging to 9-1-1, yet the Commission is already seeking to modify the rules further to impose enhanced location and roaming support requirements. It will be some time before all covered text providers and all PSAPs have fully deployed text-to-911 on a nationwide level. Before the Commission mandates further enhancements to SMS based text-to-911 service it should allow time to evaluate the deployment and utilization of SMS based text-to-911.

The Commission is proposing to move forward with rules despite substantial evidence on the record demonstrating that deploying these capabilities is not yet feasible. As the Commission observes, the majority of commenters that responded to the Commission’s Second Further Notice indicated that delivery of enhanced location information is not possible at this time.⁵ In addition, the Commission acknowledges that CSRIC’s Enhanced Location Report concluded that “there is no solution for generating enhanced location in an SMS text to 9-1-1 session for any currently deployed systems that does not require user equipment (UE) changes, network changes, or both.”⁶ Despite clear evidence on the record indicating that enhanced

⁵ Second R&O and Third FNPRM at par. 84 and FN 227.

⁶ *Id.* at par. 85 quoting CSRIC IV WG1, Investigation into Location Improvements for Interim SMS (Text) to 9-1-1, Final Report (June 18, 2014) (“CSRIC Enhanced Location Report”) at 1

location information is not possible without significant development work, however, the Commission is proposing to require enhanced location information as part of SMS text-to-911.

Sprint, like others in the wireless industry, is researching and exploring methodologies that may enable a more precise estimate of location. Such methodologies, however, were not originally envisioned as part of SMS and have unique challenges. For example, as discussed further below, Commercial Location Based Services (“cLBS”) services can be disabled by the end user and some form of override would need to be in place so that, when a text message is sent to 9-1-1, the cLBS service is enabled. Standards have not yet been finalized to address the issues and challenges associated with these methodologies.

The Voluntary Commitment entered into by the four largest carriers has been a successful mechanism for furthering the Commission’s objective of making text-to-911 available to consumers. Instead of attempting to mandate enhanced location requirements at this time, the Commission should allow industry efforts that are already underway to continue to progress.

The CSRIC Enhanced Location Report outlined possible approaches to the location accuracy problem for text-to-911. Notably, while the CSRIC Enhanced Location Report discussed several possible approaches, it ultimately recommended that: “... the FCC refrain from wireless E9-1-1 Phase II-like mandates for SMS text to 9-1-1 service and instead encourage further development and implementation of more robust MMES solutions based on LTE/IMS as Public Safety evolves towards NG9-1-1 solutions.”⁷ Possible approaches discussed in the report included: (1) network-based location; (2) handset-based approaches; (3) end-to-end text-to-911

and CSRIC Enhanced Location Report at 21, Sec. 6.2 “Findings – Updating Location Information.”

⁷ CSRIC Enhanced Location Report at 24.

with location embedded in the SMS message, and, (4) a modified “embedded location” approach using a user-downloaded texting application.⁸

According to the CSRIC Enhanced Location Report, the two network based location methods that were considered in the report are U-TDOA and Radio Frequency Pattern Matching (“RFPM”).⁹ As CSRIC recognizes, however, U-TDOA has so far been deployed for GSM only (not for UMTS or CDMA) in the United States and deploying U-TDOA for UMTS and CDMA would require the addition of Location Measurement Units (“LMU”) to the network, in addition to RAN software changes.¹⁰ CSRIC concluded, “Therefore, it would be extremely difficult to justify such a network upgrade for an interim SMS text to 9-1-1 location solution.”¹¹ In addition to the issues CSRIC identified, there are several other concerns associated with implementing U-TDOA, discussed below. CSRIC also raised a number of additional challenges associated with implementing a network based location solution on CDMA networks.¹²

As the Commission points out, “... TruePosition contends that existing network-based U-TDOA location capabilities could be used to deliver location information, with “relatively minor development effort,” for texts to 911.”¹³ Sprint has evaluated vendor proposals centered around U-TDOA technologies numerous times and has found that the development and deployment

⁸ Second R&O and Third FNPRM at par. 86.

⁹ CSRIC Enhanced Location Report at pg. 18.

¹⁰ *Id.*

¹¹ *Id.*

¹² *Id.* In particular, the CSRIC Enhanced Location Report states that, “In order for network based location systems to be supported in a CDMA environment, new MLP interfaces may be required to support messaging for location queries from the TCC to the MPC/GMLC. Additionally new messaging between the MPC/GMLC, the Home Location Register (“HLR”), and Mobile Switching Center (“MSC”) may be necessary. Each new interface needs to be developed and tested. New CDMA network interfaces pose a risk to the existing maintenance procedures and operational sustainability of the existing E9-1-1 emergency platform.” CSRIC Enhanced Location Report at 18.

¹³ Second R&O and Third FNPRM at par. 88, citing True Position Comments, PS Docket Nos. 10-255 and 11-153 (filed Apr. 4, 2014) at 6.

effort that would be needed would be significant. Such proposed solutions would require substantial development for optimum U-TDOA performance because every base station and eNodeB would require new equipment, precise surveying, and calibration. A review of these vendor proposals also raised concerns as to whether the proposed solutions would be able to meet E9-1-1 Phase II accuracy requirements, particularly as base station topography becomes sparse on the edges of cellular coverage. Some technology providers Sprint engaged to evaluate a U-TDOA-based offering indicated that modifications to the handset would be necessary to improve U-TDOA performance, but even then may not meet the accuracy requirements for E9-1-1 Phase II. In general, the U-TDOA-based proposals appeared to provide less accurate position location solutions than the hybrid Assisted Cellular & Assisted GPS solutions Sprint launched for E9-1-1 Phase II compliance. Ultimately, resources would be better spent focused on NG9-1-1 technologies rather than pursuing modifications to existing U-TDOA capabilities.

There are several more general concerns that would arise with any network-based approach. Enhanced location determination technology has not been proven to deliver a position in time for PSAP routing decisions to occur, which seems to indicate that Phase I information would continue to be used for routing decisions and location determinations would need to be accessed by a PSAP bid/re-bid process. Investing in enhancements to SMS infrastructure would be a stranded investment since these enhancements will neither benefit voice 9-1-1 nor NG9-1-1. It is also unclear how an emergency class of service would be initiated on a text message as part of a network-based location determination without UE initiation (*e.g.*, dialing 9-1-1). This would require significant standards work, deployed network enhancements and UE changes. Privacy issues must be also considered for all proposed approaches outlined in the CSRIC

Enhanced Location Report since the end user may not otherwise be aware that their location will be made known as part of their text messaging communications.

The CSRIC Enhanced Location Report also discusses the possibility of handset-based location technology using cLBS methods.¹⁴ CSRIC explains that, “In order to obtain an enhanced location, the user must download a location agent application on legacy UEs, which supports location requests from the cLBS on behalf of the TCC.”¹⁵ This step is subject to human error. There is no way to ensure that the application will be downloaded to the UE and also no way to ensure that that the user will not remove the application at some point in time. CSRIC also explains that, “In addition to the location agent, the user must also have their location privacy settings turned off so that any commercial location service, including the location agent, may obtain the user location. (This approach does not currently work with all UE operating systems.)”¹⁶ As Sprint noted previously in this proceeding, however, with current commercial location services, a user is capable of disabling GPS location services on the device and there is currently no “override” that exists on most wireless handsets to enable GPS to function if a text message is directed to emergency services.¹⁷

There is currently no standard for UE behavior for non-voice emergency service initiation. For voice, the UE goes into emergency mode, but this concept does not yet exist for non-voice services. There is also no guarantee that all UE operating systems will support this. Carriers offer products on multiple operating system platforms that are not typically cross-functional for location technologies. Until there are standards to define the UE behavior for multi-media service and it can be implemented in UE hardware, operating systems and

¹⁴ CSRIC Enhanced Location Report at 18.

¹⁵ *Id.*

¹⁶ *Id.* at 19.

¹⁷ Sprint Comments at 10.

application programming interfaces, a mandate that relies on UE behavior should not be adopted.

The Commission references comments filed by TCS, which assert that “updated Phase II compatible” location technology is readily available to CMRS providers as deployable cLBS platforms.¹⁸ TCS seems to assume cLBS would have 9-1-1 reliability requirements, which is not the case. As Sprint has argued, commercial location services were not designed with emergency services in mind and as such do not adhere to the same level of quality, reliability and redundancy.¹⁹ Any attempt to impose the same standards on commercial location services would be a time-consuming and burdensome endeavor. There are also privacy and security concerns related to the use of cLBS. As discussed above, the end user may decide they want to disable the location feature of their phone and putting in place an override may trigger privacy concerns.

CSRIC also discussed the possibility of utilizing an end-to end text to 9-1-1 with location embedded in the SMS message using system SMS application.²⁰ Their report discusses numerous drawbacks associated with this approach.²¹ In addition, there are a number of other challenges that would need to be overcome. This proposed method would require a modification to the installed messaging application in the UE, so there will likely be issues related to migration. Because the UE has no way to distinguish a 9-1-1 message from a normal text message, the UE would need to send location information with every SMS message. It is likely that the location would be exposed to the user in some fashion and this may cause confusion to users when they see additional information added to an SMS message. It is also likely to cause

¹⁸ Second R&O and Third FNPRM at par. 87 citing TCS Comments, PS Docket Nos. 10-255 and 11-153 (filed April 4, 2014) at 13.

¹⁹ Sprint Comments at 10.

²⁰ CSRIC Enhanced Location Report at 19.

²¹ *Id.* at 20.

problems in UE SMS clients displaying SMS conversations (location reports will be interspersed in the received message text). It is not clear whether “enhanced” location would be available at the first SMS to 9-1-1 message to support PSAP routing. The UE would only likely be able to identify its location and may not be able to analyze uncertainty, confidence and class of service. There would also be cybersecurity issues associated with accessing the UE’s location and overriding any privacy settings for non-911 use.

The CSRIC Enhanced Location Report also discusses the approach of a user-downloaded texting application and outlines numerous drawbacks associated with this approach.²² A number of the same issues outlined above (associated with the end-to-end text to 9-1-1 approach with location embedded in the SMS message) would arise in an approach that involved a user-downloaded texting application. In addition, as discussed herein, there are multiple platforms in use and not all feature phones can use downloadable technologies. This solution is also subject to human error since there is no guarantee the end user will download the application or retain it on their device.

B. Roaming Support for Text-to-911

The Commission also proposes to require covered text providers to support roaming for text-to-911 no later than two years from the effective date of the adoption of final roaming rules. The Commission asks whether solutions could be developed to provide roaming support in this timeframe and, if not, what would be a suitable timeframe.²³ As Sprint has discussed in previous comments filed in this docket, there are a number of complexities associated with supporting roaming for text-to-911.²⁴ Because text messages are routed through the home CMRS network,

²² CSRIC Enhanced Location Report at 21.

²³ Second R&O and Third FNPRM at par. 109.

²⁴ Sprint Comments at 10-12.

access to location information within the serving network and PSAP selection in the roaming area is not available. Even if location information could somehow be sent to the home CMRS network, the home CMRS network would not have the capability to identify the cell sites and sectors on the visited network. As a result, the home network would not be able to map to specific PSAPs located within the visited network area and would not be able to send the text message to the correct PSAP. The Commission has itself acknowledged the complexities associated with supporting roaming for text-to-911, remarking that, “Moreover, we acknowledged in the *Second Further Notice* that routing 911 text messages from roaming consumers presented technical complexities that might be necessary to resolve before we could require covered text providers to support text-to-911 in roaming situations.”²⁵ Although the Commission recognizes the issues associated with roaming support for text-to-911, it still proposes to adopt rules with a two-year compliance timeframe.

Like enhanced location information, roaming support was not included as part of the Voluntary Commitment because it was not a capability that is part of the existing SMS system. Requiring carriers to make modifications to support roaming for interim SMS-based text-to-911 will divert resources from NG9-1-1 deployment and will ultimately be a stranded investment since the near to mid-term goal is for the industry to deploy NG9-1-1.

The FCC seeks comment on the technical feasibility of adopting a hub-and-spoke approach to address near-term roaming issues and on any challenges associated with this approach.²⁶ A hub-and-spoke solution would involve developing another roaming network in

²⁵ Second R&O and Third FNPRM at par. 108, referencing Facilitating the Deployment of Text-to-911 & Other Next Generation 911 Applications Framework for Next Generation 911 Deployment, PS Docket Nos. 10-255 and 11-153, *Second Further Notice of Proposed Rulemaking*, 29 FCC Rcd 1547 (2014) (*Second Further Notice*), 29 FCC Rcd at 1565-66 par. 48.

²⁶ Second R&O and Third FNPRM at par. 110.

addition to the existing roaming interconnections. Another third-party arrangement to handle this 9-1-1 specialized roaming arrangement for all US CMRS providers would have to be established and interconnection arrangements made. This would likely be a time-consuming and costly process. In addition, a hub-and-spoke approach would not solve the “enhanced location” problem discussed further below.

The Commission also seeks comment on the feasibility of modifying the current text-messaging protocol to provide that text messages to 9-1-1 are handled by the serving network’s TCC when a consumer is roaming.²⁷ This approach would require changes to standards, and an extremely complex set of interactions would need to be addressed to facilitate this approach. Local breakout can only be applied to messages being sent from the device to the serving system directly to the PSAP. This causes the return path from the PSAP back through the home network to the serving network and finally to the device to be disconnected from each other. As a result there will be significant coordination and synchronization problems that would need to be resolved.

The Commission also seeks comment on whether the serving network could either: (1) automatically include enhanced location information embedded in the message, which could then be used by the home network to route the text to the appropriate PSAP; or, (2) otherwise communicate and coordinate location information with the home network through other means.²⁸ Deployment of the NENA Forest Guide would be essential to enabling this approach.²⁹ When it is deployed, the NENA Forest Guide should allow the home CMRS provider to identify the

²⁷ *Id.* at par. 111.

²⁸ *Id.*

²⁹ The NENA Forest Guide will allow for the Location of Service Translations (“LoST”) server within an ESInet to engage in a specific protocol query process that enables it to “discover” call routing information outside of its own ESInet or state level Emergency Call Routing Function (“ECRF”).

proper PSAP to which a text-to-911 message should be routed. NENA has only recently published a requirements document which can be used to issue a RFI to set up the service, however, and the responsible organization to oversee the NENA Forest Guide has not been identified. As a result, the NENA Forest Guide is not likely to be deployed within the near term and certainly not within two years. This approach would also trigger privacy concerns to the extent an end user's location information is revealed without their consent.

The Commission seeks comment on NENA's proposal that the Commission establish a "medium-term roaming capability requirement" and require roaming support for text-to-911 service "as a precondition to the turn-up of any IP-based replacement for current-generation integrated text platforms."³⁰ Such an approach could negatively impact the move toward a more advanced NG9-1-1 offering and should not be adopted. Carriers are already turning up IP-based replacements for current generation SMS services and should not be constrained from doing so.

The Commission should be aware that requiring roaming support with "enhanced location" information would introduce a level of complexity far beyond that of providing roaming support with Phase I level information. In order to enable roaming support with enhanced location, every roaming agreement and roaming infrastructure would need to be upgraded to support delivery of enhanced location such as through the deployment of Open Mobile Alliance's Roaming Location Protocol ("RLP"). In addition, PSAPs/NENA would need to deploy the NENA Forest Guide service. As discussed above, however, the NENA Forest Guide service is not yet available and will likely take more than two years to be deployed.

³⁰ Second R&O and Third FNPRM at par. 114 quoting NENA Comments at 11.

For the reasons discussed herein and due to the issues associated with proposed methods for addressing roaming support, the Commission should not adopt a requirement that covered text providers support roaming as part of the interim SMS-based text-to-911 offering.

C. Future Texting Services

The Commission seeks comment on the following matters: (1) 911 text messages delivered over Wi-Fi and non-CMRS networks; (2) non-interconnected text applications; (3) rich media services, including texts, video, photos, and the like; (4) real-time text communications; and, (5) telematics and potentially additional public safety services.³¹ Further study is needed with respect to each of these services, and the potential implications associated with regulating these services go beyond what should be examined in this docket in the context of the interim SMS-based text to 9-1-1 service. For example, issues associated with WiFi communications are being evaluated in the Commission's docket on indoor location accuracy and taking action before those issues are fully examined is premature. With respect to rich media services, ATIS is currently working to standardize the delivery of the text portions of MMS to PSAPs. It is, therefore, premature for the FCC to take additional steps to mandate any particular solution. It is also premature for the FCC to consider adding support for additional MMS media (beyond just the text portion of the message). Rich media services would be more appropriately addressed in the context of NG9-1-1. With respect to telematics, the Commission must consider possible impacts, including the additional load on PSAPs to handle telematics-initiated communications, especially where such communications are generated automatically to the PSAP rather than being filtered by a telematics service call center. The far-reaching impacts associated with applying text-to-911 requirements to telematics should be evaluated separately.

³¹ *Id.* at par. 124.

III. CONCLUSION

Sprint supports efforts to explore the possibility of making more detailed location information available for text-to-911 and continues to be actively engaged in industry working groups and other efforts to further examine this issue. The Commission should not, however, move forward with the proposed requirements to require enhanced location accuracy as part of interim SMS-based text-to-911. The Commission should also refrain from adopting requirements that text providers support roaming. Neither of these proposals is consistent with the Voluntary Commitment and adopting these proposals would divert resources away from NG9-1-1 text messaging solutions. The record demonstrates that there are still significant issues that would need to be resolved before enhanced location could be provided and before roaming could be supported for SMS-based text-to-911. As discussed herein, the potential approaches to address these issues outlined in the Third FNPRM have shortcomings. The Commission should allow industry efforts that are already underway to continue to progress. The Commission should encourage development and implementation of the long term NG9-1-1 solution rather than attempting to mandate further enhancements to SMS-based text-to-911, a service that was recognized to be “best efforts” and interim in nature.

Respectfully submitted,

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October 16, 2014