

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

In the Matter of	)	
	)	
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
	)	

**REPLY COMMENTS OF  
NEXTNAV HOLDINGS, LLC**

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## SUMMARY

The Commission has taken important steps in this Notice of Proposed Rulemaking (“*NPRM*”) to advance the goal of ensuring that the 911 system keeps pace with the advance of communications technology. The Commission has sought and received comments on many of the important details of the proposed Next Generation 911 system, but the issue of location determination merits particular attention.

The records of both the Wireless E911 Location Accuracy Requirements proceeding and this proceeding illustrate broad consensus that current-generation SMS is not well adapted for use in emergency communications. Its best-efforts, store and forward design does not provide the reliability that public safety needs, nor is it capable of sending location information on a 911 caller. NextNav supports the efforts of industry groups that are working with stakeholders to develop standards that can overcome the limitations of SMS and provide a NG-911 system that meets the expectations of consumers and public safety. These standards contain many common elements, including the need for robust automatic location information as a crucial component of any Next Generation 911 system. Even more so than with voice calls, text and multimedia “calls” need to be augmented with the information critical to ensuring that emergency responders can rapidly and accurately locate the caller.

The *NPRM* asked about consumer expectations as to whether they can or should be able to contact 911 by text, but consumer expectations about 911 extend beyond the method by which consumers reach an operator. As far back as the first wireless E911 proceeding, the Commission, as well as public safety entities and carriers, has recognized that consumers expect a seamless 911 experience regardless of technology, and a major part of that expectation is that the 911 operator knows where to send help. Similarly, public safety operators rely on accurate and timely location

information to coordinate the emergency response. A Next Generation 911 system must include this information to ensure the continued efficacy of 911 response.

Thus, to stimulate development and foster implementation of a NG-911 system, the FCC should address the key issue of location capability by adopting near term standards and testing benchmarks. These will allow industry to shape its research and development and public safety entities to begin the process of adapting to the demands and opportunities afforded by a Next Generation 911 infrastructure.

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NEXTNAV HOLDINGS, LLC**

NextNav Holdings, LLC (“NextNav”), by its attorneys and pursuant to Section 1.415 of the Federal Communications Commission’s (“FCC” or “Commission”) rules, 47 C.F.R. § 1.415, hereby submits the following reply comments in response to the Commission’s Notice of Proposed Rulemaking (“*NPRM*”) in the above captioned proceeding.<sup>1</sup>

**I. INTRODUCTION**

NextNav commends the Commission’s efforts to accelerate the development and deployment of Next Generation 911 (“NG-911”) technology. As explained by numerous parties that filed comments in response to the *NPRM*, the rapid advance of communications technology has become increasingly at odds with the legacy infrastructure supporting the 911 system.<sup>2</sup> Meeting the evolving expectations of the public and the needs of public safety entities requires that

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<sup>1</sup> *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, Notice of Proposed Rulemaking, FCC 11-153 (rel. Sep. 22, 2011) (“*NG-911 NPRM*”).

<sup>2</sup> *See, e.g., Comments of APCO*, Docket Nos. 11-153 & 10-255 at 4 (Dec. 12, 2011); *Comments of King County E911 Program*, Docket Nos. 11-153 & 10-255 at 5 (Dec. 13, 2011); *Comments of Sprint Nextel*, Docket Nos. 11-153 & 10-255 at 12-13 (Dec. 12, 2011).

our 911 capabilities keep pace without sacrificing the functionality and simple reliability that is the hallmark of 911.

Like wireless voice 911 before it, the pursuit of text and multimedia NG-911 brings a host of new challenges. The best efforts, store-and-forward architecture of the present SMS standard is not well adapted to use as an emergency communications medium.<sup>3</sup> Additionally, SMS has no way to deliver location information, a key link in the emergency response chain.<sup>4</sup> These hurdles must be overcome, either in the present SMS-based system or in a more comprehensive handset-based protocol, before a viable NG-911 system can be implemented. NextNav supports the work that industry groups such as NENA and ATIS are doing to address these shortcomings. These comprehensive efforts can ensure that the development of NG-911 standards is deliberate, feasible, and capable of meeting the expectations of consumers and public safety.

NextNav's reply focuses specifically on the expectations of 911 system users, both consumer and public safety, with regard to automatic location information ("ALI"). Robust, rapid, and accurate location determination functionality ALI has become an underlying assumption of the 911 system since E911 was adopted across the Public Switched Telephone Network ("PSTN"), and preserving this functionality is a key factor in ensuring the public's continued confidence as the 911 system transitions into the 21<sup>st</sup> century.<sup>5</sup>

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<sup>3</sup> See e.g. *Comments of ATIS*, Docket Nos. 11-153 & 10-255 at 2 (Dec. 12, 2011); *Comments of APCO*, at 8-9; *Comments of CTIA*, Docket Nos. 11-153 & 10-255 at 7.

<sup>4</sup> See, e.g., *Comments of APCO* at 6; *Comments of CTIA* at 7.

<sup>5</sup> See *Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, CC Docket No. 94-102, Report and Order and Further Notice of Proposed Rulemaking, RM-8143, ¶ 5 (rel. July 6, 1996) (noting that "E911 saves lives and property by helping emergency services personnel do their jobs more quickly and efficiently. [ALI] capability permits rapid response in situations where callers are disoriented, disabled, unable to speak, or do not know their location").

NextNav is working closely with various stakeholders in the wireless industry and public safety community to facilitate the near term development, verification, and deployment of a handset-based ALI solution that satisfies the critical requirements for next generation location accuracy, particularly in indoor and urban settings that have remained a challenge to existing systems. NextNav, as Commlabs, has previously filed comments in the E911 proceedings detailing its Wide Area Positioning System (“WAPS”).<sup>6</sup>

WAPS is a highly synchronized network that uses Multilateration Location and Monitoring Service (“M-LMS”) spectrum to transmit location information to WAPS-enabled handsets and other mobile devices. The transmitter beacons are strategically placed to surround a GPS-challenged location (such as a metropolitan area) using existing structures, allowing WAPS-enabled devices to calculate their location from multiple beacons. The WAPS network also provides a caller’s vertical location through the use of millimeter-scale pressure sensors that can be easily incorporated into wireless devices. WAPS technology could be added to GPS chipsets for future generations of devices in many cases as a software or firmware upgrade.

In this way, WAPS can provide a viable and economical solution to the current location shortcomings facing 911 users, and offer a way to provide the location capability that is so critical to any NG-911 system. NextNav has completed extensive field tests, the success of which demonstrates the viability of NextNav’s WAPS network and its potential as a solution to the challenges that face current-generation position location technologies.<sup>7</sup>

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<sup>6</sup> See generally *Comments of Commlabs Inc.*, PS Docket No. 07-114 and WC Docket No. 05-196 (Jan 19, 2011); *Reply Comments of Commlabs, Inc.*, GN Docket No. 11-117, PS Docket No. 07-114, and WC Docket No. 05-196 (Oct. 3, 2011).

<sup>7</sup> *Reply Comments of Commlabs, Inc.*, GN Docket No. 11-117, PS Docket No. 07-114 and WC Docket No. 05-196 (Oct. 3, 2011). NextNav’s recent field tests were initiated in Santa Clara County, California in January 2010 and expanded to San Mateo and San Francisco Counties in August, 2010.

## II. ROBUST LOCATION DETERMINATION CAPABILITY IS BROADLY AGREED TO BE A CRITICAL REQUIREMENT OF ANY NG-911 SYSTEM

When this *NPRM* was first announced, it was accompanied by the announcement of a five-step “Action Plan to Improve the Deployment of Next Generation 9-1-1.”<sup>8</sup> Step one of the plan provided that the Commission would “develop automatic location accuracy mechanisms for NG-911.”<sup>9</sup> This step built on the important groundwork laid in the E911 location accuracy proceeding, in which the Commission has already considered the need for ALI, and location accuracy indoors in particular.<sup>10</sup> The need for this functionality is no less pressing in the context of NG-911. In fact, ALI is particularly important in the case of texting, with its lack of delivery confirmation, best-efforts architecture, and tendency to take place indoors.

The *NPRM* now seeks comment on a variety of important questions, but does not specifically address the role of location determination in the NG-911 framework. Nonetheless, numerous commenters addressed this issue, and their comments reflect broad agreement across stakeholder groups that the Commission should consider accurate and automatic location determination and reporting to be a key factor in any NG-911 system, whether an interim SMS-to-911 solution or a longer-term solution based on as-yet-undecided technology.

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<sup>8</sup> FCC Chairman Genachowski Announces Five-Step Action Plan to Improve the Deployment of Next Generation 9-1-1, Federal Communications Commission News Release (Aug. 10, 2011).

<sup>9</sup> *Id.*

<sup>10</sup> *Amending the Definition of Interconnected VoIP Service in Section 9.3 of the Commission’s Rules*, GN Docket No. 11-117, *Wireless E911 Location Accuracy Requirements*, PS Docket No. 07-114; *E911 Requirements for IP-Enabled Service Providers*, WC Docket No. 05-196, Notice of Proposed Rulemaking, Third Report and Order, and Second Further Notice of Proposed Rulemaking, FCC 11-107, ¶ 81 (July 13, 2011) (“*Third Report and Order*” or “*Second FNPRM*”).

#### **A. Consumers Expect Next Generation 911 Calls to Provide Location Information**

The NPRM specifically requested comment on consumer expectations, but with regard to the ubiquity of texting, not about 911 location capabilities.<sup>11</sup> Nevertheless, a number of parties focused specifically on the location issue, noting that the public will expect any next generation solution to include automatic location capabilities.

Carriers commented on the potential for consumer confusion if NG-911 does not fulfill the expectations that have attached to the 911 system with regard to location information. For example, Sprint Nextel notes that “[c]onsumers have come to expect that some level of location information will be forwarded along with their communication based on the current voice 9-1-1 requirements, so consumer confusion will result when location information is not provided automatically to the PSAP.”<sup>12</sup> MetroPCS argues against an interim text-to-911 solution because it lacks “key elements,” including location information.<sup>13</sup> MetroPCS further cautions that a NG-911 system without location information “can, and will, result in consumer confusion, which will likely lead to lost faith and reliance on the system.”<sup>14</sup>

Public safety providers perceive similar consumer expectations for NG-911, and similar risks from an incomplete solution. Like the carriers, the National Emergency Number Association (“NENA”) also identifies location information as a key element of ensuring that NG-911 fulfills consumers’ interest in accurate and rapid public safety response.<sup>15</sup> Likewise, the Alliance for

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<sup>11</sup> *NG-911 NPRM* at ¶ 39.

<sup>12</sup> *Comments of Sprint Nextel*, Docket Nos. 11-153 & 10-255 at 12-13 (Dec. 12, 2011).

<sup>13</sup> *Comments of MetroPCS*, Docket Nos. 11-153 & 10-255 at 5 (Dec. 12, 2011).

<sup>14</sup> *Id.*

<sup>15</sup> *Comments of NENA*, Docket Nos. 11-153 & 10-255 at 2 (Dec. 12, 2011).

Telecommunications Industry Solutions (“ATIS”) in its comments concludes that a NG-911 system “without the benefit of accurate location would have very limited benefits...and would not meet consumer expectations.”<sup>16</sup> The King County 911 Program cautions that “we need to be careful that the texting service that is offered to the public meets basic requirements for emergency communications, such as accurate location provided with the text, before the service is offered, because as soon as one area implements, other PSAPs will be expected to follow suit.”<sup>17</sup> Implementing a NG-911 system that does not address this uncertainty will undermine 911’s role as a reliable resource and will not meet consumer’s expectations for NG-911 service.

One of the key expectations is that calling 911 provides the caller’s address to the public safety operator.<sup>18</sup> Just as modern consumers, equally fluent with texting as with calling, expect to be able reach 911 by text as well as by voice call, they will also expect 911’s capabilities to get better, not worse, as new technologies become available. Commission action promoting robust location capabilities as part of the NG-911 system will ensure that these expectations are met.

The comments filed in response to the *NPRM* are consistent with the Commission’s previous conclusions in this regard. As the Commission recognized in the original *E911 NPRM*

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<sup>16</sup> *Comments of ATIS*, Docket Nos. 11-153 & 10-255 at 8 (Dec. 12, 2011).

<sup>17</sup> *See Comments of King County E911 Program*, Docket Nos. 11-153 & 10-255 at 5 (Dec. 13, 2011).

<sup>18</sup> *NG-911 NPRM*, ¶ 25; *see also*, *Technical Options for E9-1-1 Location Accuracy*, Communications Security, Reliability and Interoperability Council Working Group 4C Final Report, at 29 (March 14, 2011) (“*CSRIC 4C Report*”) (concluding that “unmistakably the expectation among consumers and public safety entities is that highly accurate location needs to be provided when calling 9-1-1 from any service”).

establishing the wireless E911 docket, consumer expectations have attached not just to their telecommunications options, but to the function of 911 system as a whole.<sup>19</sup>

Noting that “as currently configured...wireless 911 services are inferior to the wireline 911 services that telephone users have come to expect,”<sup>20</sup> the Commission concluded that it needed to act “to ensure that...mobile radio service users on the public switched telephone network have the same level of access to 911 emergency services as wireline callers.”<sup>21</sup> This consistency of user experience is central to the public’s trust in this highly successful service. Unless and until E911 can provide the simple reliability of PSTN-based 911 calls, including robust determination and delivery of ALI, confusion and uncertainty will interfere with public confidence in this important institution.

**B. Effective Emergency Response Relies on Accurate and Automatic Location Information**

In addition to meeting consumer expectations, a NG-911 system must also meet the needs of public safety operators. NENA explains that the public’s interest in “accurate dispatching and rapid response” is fundamentally linked to public safety operators’ interest in “verifiable message delivery and message-associated location data.”<sup>22</sup> The Commission recognized this link as a primary reason for adding E911 requirements to wireless services when they became a major

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<sup>19</sup> *Revision of the Commission’s Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, CC Docket 94-102, RM-8143, Notice of Proposed Rulemaking, 9 FCC Rcd 6170, 6176, ¶ 37 (1994) (“*E911 NPRM*”) (observing that wireless customers expect access to 911 services and may be unaware that wireless services do not provide location information).

<sup>20</sup> *E911 NPRM* at 6172, ¶ 10.

<sup>21</sup> *Id.* at 6176, ¶ 37.

<sup>22</sup> *Comments of NENA*, Docket Nos. 11-153 & 10-255 at 2 (Dec. 12, 2011).

source of 911 calls.<sup>23</sup> Indeed, NENA provides in its model standard operating procedure for PSAPs that the exact location of the incident is first among the minimum information required to effectively address an emergency call.<sup>24</sup> More than any other single attribute of the 911 system, the public expects that when they call 911, help is on the way. Robust, accurate, and automatic location information is key to meeting this expectation.

This link between location and effective emergency response means that location information is critical in any NG-911 solution, even an interim one. ATIS, through its INES Incubator, concludes that even an interim solution should include “availability of at least coarse end user location to allow an emergency call to be routed.”<sup>25</sup> Similarly, the National Association of State 9-1-1 Administrators (“NASNA”) identifies location information as an important feature to E9-1-1 that is conspicuously absent in text messaging.<sup>26</sup>

State and local 9-1-1 providers agree. The King County E911 Program in the state of Washington explains that “[a]ny short term solution must include location, and the accuracy provided must be improved.”<sup>27</sup> The Public Safety Communications Office (“PSCO”) of the California Technology Agency requests that location information accurate to the address or

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<sup>23</sup> *E911 NPRM*, *supra* note 19, at 6172 (¶ 10).

<sup>24</sup> NENA Call Answering Standard/Model Recommendation, June 10, 2006, at 3.3 (available at [http://www.nena.org/resource/collection/ABEAA8F5-82F4-4531-AE4A-0AC5B2774E72/NENA\\_56-005\\_9-1-1\\_Call\\_Answering\\_Standard.pdf](http://www.nena.org/resource/collection/ABEAA8F5-82F4-4531-AE4A-0AC5B2774E72/NENA_56-005_9-1-1_Call_Answering_Standard.pdf)) The comment to Section 3.6.1 explains that “address verification is critical to the delivery of emergency services” and the Comment to section 3.3 provides “9-1-1 what is the address of the emergency?” as an example answering statement and first question. *Id.*

<sup>25</sup> *Comments of ATIS*, Appendix 1 at 11. The INES Requirement Solution Matrix states it as “SHALL provide coarse location, directly or indirectly, through standard, crossplatform, non-proprietary standards to a PSAP.” *Id.* (*emphasis in original*).

<sup>26</sup> *Comments of NASNA*, Docket Nos. 11-153 & 10-255 at 3 (Dec. 9, 2011).

<sup>27</sup> *Comments of the King County E911 Program*, *supra* note 17, at 5.

GPS-coordinate level be included as part of any service provider data entering the 9-1-1 system.<sup>28</sup> The Boulder Regional Emergency Telephone Service Authority and Colorado 9-1-1 Task Force (“BRETSA”) argues against the establishment of an interim NG-911 system “until a solution is developed which meets certain criteria conditions for effectiveness ...[among them, that] ... [t]he location of the caller must be available for the purpose of routing the call ... and for automatically displaying the location at the PSAP.”<sup>29</sup> These comments show that regardless of the system ultimately adopted, whether network-based or over the top, interim or long-term, accurate ALI is a sine qua non of a workable Next Generation 9-1-1 system.

The comments filed in response to the *NPRM* accord with the findings of the Commission’s own Communications Security, Reliability and Interoperability Council (“CSRIC”) working groups. Beyond acknowledging the necessity of some location information system as part of a 9-1-1 system, the CSRIC II Working Group 4C (“Technical Options for E9-1-1 Location Accuracy”) concluded that a next generation location system must prove not just equivalent to existing methods but superior in “certain environments,” including challenging environments like deep indoors and in urban canyons, before actual deployment is considered.<sup>30</sup>

CSRIC III continues to study location accuracy through Working Group 3 (“E9-1-1 Location Accuracy”), which is specifically tasked with developing approaches to this issue through reports due in March and June of 2012. These reports will be important in quantifying and refining the timelines, testing procedures, and metrics involved, however, the key criteria to be

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<sup>28</sup> *Comments of CPSO*, Docket Nos. 11-153 & 10-255 at 6 (Dec. 12, 2011).

<sup>29</sup> *Joint Comments of the Boulder Regional Emergency Telephone Service Authority and the Colorado 9-1-1 Task Force*, Docket Nos. 11-153 & 10-255 at 20 (Dec. 12, 2011) (“*BRETSA Comments*”).

<sup>30</sup> *CSRIC 4C Report* at 9.3.4.

established are well known to the FCC based on prior CSRIC reports and ongoing rulemaking proceedings. The Commission, therefore, has ample evidence to move forward and begin the outline for an effective NG-911 location standard. NextNav suggests that any adequate NG-911 ALI must address: minimum accuracy, yield, time-to-first-fix, and Z-axis capability.

**C. Any NG-911 ALI System Capable of Meeting User Expectations Will Have Certain Minimum Requirements**

Ever since it became apparent that technological advances would compel E911 to make the leap from legacy wireline into wireless communications, the need for a progression path that maintains 911's capabilities has been clear.<sup>31</sup> To maintain this evolution in capabilities, any ALI solution for NG-911 must be at least as effective as the best current generation, handset-based location technologies. Additionally, a NG-911 system must enable the transmission of this location information to the PSAP in a rapid and reliable fashion. To ensure that NG-911, the next step in 911's evolution, meets the expectations of consumers and the needs of public safety, it must include ALI functionality that meets several minimum characteristics.

**i. NG-911 Systems Must Provide Accurate Location Even in Challenging Environments**

First, an ALI system for NG-911 must provide a location fix that is accurate enough not only to permit initial routing of the call, but also to guide the dispatch of emergency responders. Most network-based "coarse" location methods are simply not up to the latter task; their location often falls far short of the accuracy required to assist the PSAP in dispatching and directing

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<sup>31</sup> See generally *Transition to Next Generation 9-1-1*, Communications Security, Reliability and Interoperability Council Working Group 4B Final Report, March 14, 2011, available at <http://transition.fcc.gov/pshs/docs/csric/CSRIC-WG4B-Final-Report.pdf> (citing NENA's 2000 work on its Future Path Plan which includes objectives to ensure that, among other requirements, caller location data was delivered to the appropriate answering point, and 2002 work on IETF's location working group).

emergency responders.<sup>32</sup> The limited accuracy of existing technologies is further exacerbated in signal-poor areas such as urban canyons and indoors. Densely populated urban settings provide an additional challenge where commercial and residential high-rises often have not only many separate addresses close together, but also a vertical dimension that GPS cannot effectively measure.

The Commission concluded in its *E911 Third Report and Order* that effective 911 operation “requires development of indoor technical solutions and testing methodologies to verify the effectiveness of such solutions.”<sup>33</sup> The necessity remains the same for NG-911. Functioning indoors means not only that a solution should be able to fix location without a clear view of the sky, as GPS requires, but that it should be able to penetrate buildings regardless of structure or composition, and also should be able to determine elevation, a critical component of location in the dense, vertical layout of major urban centers.

**ii. NG-911 Systems Must Yield Location Information Reliably Regardless of the User’s Location**

One of the most important benefits of wireless communications is a caller’s ability to contact public safety during an emergency, wherever they may be.<sup>34</sup> The ability of PSAPs to

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<sup>32</sup> See *Comments of APCO*, *supra* note 2, at 6.

<sup>33</sup> *Third Report and Order*, ¶ 86.

<sup>34</sup> *Wireless E911 Location Accuracy Requirements*, PS Docket No. 07-114, *Revision of the Commission’s Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, Association of Public-Safety Communications Officials-International, Inc. Request for Declaratory Ruling, CC Docket No. 94-102, *911 Requirements for IP-Enabled Service Providers*, WC Docket No. 05-196, First Report and Order, 22 FCC Rcd 20105, 20108, ¶ 8 (2007) (“*First Report and Order*”) (adopting wireless location accuracy and yield standards); *Wireless E911 Location Accuracy Requirements*, PS Docket No. 07-114, Second Report and Order, FCC 10-176, ¶ 1 (2010) (“*Second Report and Order*”) (modifying the location accuracy and yield standards based on industry consensus).

locate consistently mobile callers is critical to realizing this benefit. Just as callers expect to be able to connect with 911 regardless of their device, they also rely on being able to do so from wherever they are, including indoors. Although accuracy is a primary criteria for a location system, even the most accurate system is useless if it cannot reliably achieve a successful fix.<sup>35</sup>

**iii. NG-911 Systems Must Achieve Much Faster Time to First Fix Than Current Generation Solutions**

An effective ALI system for NG-911 will provide a rapid time to first fix (“TTFF”) on the location of a caller. BRETSA notes in its comments a recurring concern that “[m]isrouting of 9-1-1 calls is a relatively frequent occurrence with wireless calls. Because GPS and other location systems take 30 seconds to several minutes to determine the caller’s location, if at all...wireless 9-1-1 calls are initially routed based upon the location of the cell tower or antenna on which the signal is received.”<sup>37</sup> The store-and-forward, best-effort nature of SMS communications compounds the problems of such a time delay, further raising the risk of improper routing or miscommunication with PSAP personnel that would hinder response efforts.<sup>38</sup> Conversely, GPS and assisted GPS (“A-GPS”) can often provide accurate location information, but doing so often requires significant time to get an accurate fix, time that may not be available in an emergency.<sup>39</sup> CSRIC Working Group 4C explains in its Final Report that a TTFF of 30 seconds or more is

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<sup>35</sup> *Third Report and Order*, ¶ 28.

<sup>37</sup> *BRETSA Comments*, *supra* note 29, at note 5.

<sup>38</sup> *ATIS Comments* at 8 (Dec. 12, 2011).

<sup>39</sup> *See Third Report and Order*, FN 21 *supra* note 10, ¶ 19 (explaining that “it is reasonable to expect that the more accurate location information under the handset-based location accuracy parameters will lead to more direct and quicker response by first responders addressing wireless 911 calls, and that expediting their response time will have significant public safety benefits”).

“excessive” for use in E911 position location.<sup>40</sup> By contrast, the CSRIC Final Report noted that initial test data has shown that WAPS can provide a TTF of three to five seconds following a cold start on at least 95 percent of attempts, and do so in most indoor environments.<sup>41</sup>

Therefore, to ensure that the ALI system supporting NG-911 meets the needs of emergency use, the Commission should adopt a requirement that TTF of any NG-911 solution not be excessive.

#### **iv. NG-911 Systems Must Include a Z-Axis Component**

The densely populated urban settings that create urban canyons and other “challenging environments” for traditional GPS provide an additional challenge: a significant vertical dimension. In major cities, the existence of high-rises and other multi-story buildings makes vertical location a major factor in accurately locating a caller, but these are the same situations where GPS-based solutions perform worst, if at all.

The need for a Z-axis location solution has been known for some time. Recognizing that GPS is insufficient to provide Z-axis information in those settings where it is of the greatest value, CSRIC II Working Group 4C recommended an “in-depth analysis of Z-height capability.”<sup>42</sup> Many of the public safety commenters to this NG-911 proceeding have already raised the importance of Z-axis location in the earlier E911 location accuracy proceeding. As APCO explained in its response to the E911 NPRM, the inclusion of Z-axis location capability would be extremely helpful in many situations, such as indoor environments.<sup>43</sup> For this reason, NENA has urged that

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<sup>40</sup> *CSRIC 4C Report*, *supra* note 18, at 29.

<sup>41</sup> *Id.* at 47.

<sup>42</sup> *CSRIC 4C Report* at 28.

<sup>43</sup> *See, e.g., Comments of APCO*, Docket Nos. 05-196 & 07-114, at 5 (filed Jan. 19, 2011).

the delivery of vertical-axis position information should be “required for future-generation networks and devices, under uniform standards.”<sup>44</sup>

Acknowledging the importance of Z-axis as the remaining component of an effective location system, the Commission should ensure that the criteria for NG-911 provide for the delivery of full location information, including the vertical dimension.

### **III. THE COMMISSION SHOULD ENCOURAGE THE DEVELOPMENT OF LOCATION TECHNOLOGIES BY ESTABLISHING CORE REQUIREMENTS AND A TIMELINE FOR DEPLOYMENT IN THE NEXT GENERATION 911 PROCEEDING**

The Commission needs to move forward with location information both for the present, as it is doing in the E911 proceeding, and for the future, as it has begun to do in this NG-911 proceeding. When the Commission first adopted E911 location requirements and imposed a five year implementation schedule, it acknowledged that the plan was “ambitious” but necessary to “stimulate” innovation.<sup>45</sup> As the Commission later explained, the requirements provided a necessary impetus to drive stakeholders to coordinate their efforts and produce the technologies necessary to deliver location information for wireless 911 callers.”<sup>46</sup>

The same situation repeats itself here in the context of NG-911. To provide impetus and guidance, and assurance that currently-in-development location systems are ready to support Next Generation 911 when it is implemented, the Commission should employ the same approach it successfully used in the E911 proceeding. Specifically, the Commission, either on its own or with the assistance of CSRIC III, should adopt standards for the four important criteria that all

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<sup>44</sup> *Comments of NENA*, Docket Nos. 05-196 & 07-114, at 11 (filed Jan. 19, 2011).

<sup>45</sup> *Revision of the Commission’s Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, Fourth Memorandum Opinion and Order, 15 FCC Rcd 17442, ¶ 7 (2000).

<sup>46</sup> *Id.*

stakeholders need to design their systems to satisfy – a reasonable minimum accuracy with reliable yield, and a rapid TTFF that includes Z-axis information. Adopting standards that clarify these key criteria will allow stakeholders to effectively plan for the implementation of a NG-911 location system.

As a first step, the Commission should establish the core requirements for location accuracy in a NG-911 system. These should specify the sort of indoor environments it be designed to handle, as well as testing benchmarks detailing how success at this task will be measured. Second, the Commission should establish a timeline, even one subject to revision, for rollout of ALI capabilities required to support an NG-911 system. This timeline will shape the posture of industry research and development efforts as well as that of the public safety providers that need to know what assets they are likely to have available and when.

NextNav acknowledges that many challenges exist in developing a text-to-911 standard which can meet the many constraints of manufacturers, carriers, users, and emergency responders. The problems of real-time sessions, delivery confirmation, and delivering call metadata in a form useful to PSAPs must all be solved before NG-911 has the reliability that users have come to expect of the 911 system. Among these challenges, and because of them, robust location accuracy standards are a key factor in maintaining the efficacy of emergency response services during the migration of consumers from landline through next generation wireless communications. At the very least, the Commission should acknowledge this necessity by adopting requirements for ALI and providing an extended implementation period or tolling implementation until a predictable timeline can be established. Such an approach would be similar, and similarly successful, to the regulatory leadership that the Commission employed when it adopted its initial wireless E911 location accuracy requirements more than a decade ago.

**IV. CONCLUSION**

As explained by numerous commenters in this proceeding, in bringing the power and flexibility of NG-911 services to consumers, the Commission should not lose focus on the progress made thus far in ensuring that the 911 system provides the location information necessary to meet the needs and expectations of both emergency responders and the public. To stimulate the development of an effective NG-911 system, the Commission should adopt standards to ensure that NG-911 includes an effective location solution, and should establish a timeline to ensure that the various stakeholders continue to make progress on this important issue.

Respectfully submitted,

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