

**Before the Federal Communications Commission**

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*IN THE MATTER OF*

WIRELESS E911 LOCATION ACCURACY REQUIREMENTS

*and*

E911 REQUIREMENTS FOR IP-ENABLED SERVICE PROVIDERS

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*ON FURTHER NOTICE OF PROPOSED RULEMAKING  
AND NOTICE OF INQUIRY*

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**REPLY TO T-MOBILE *EX PARTES*  
BY THE  
NATIONAL EMERGENCY NUMBER ASSOCIATION**

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**Before the Federal Communications Commission**

PS Docket № 07-114 – WC Docket № 05-196

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**REPLY TO T-MOBILE *EX PARTE*  
BY THE  
NATIONAL EMERGENCY NUMBER ASSOCIATION**

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The National Emergency Number Association (NENA) respectfully submits the following comments in response to the *ex parte* communications of T-Mobile, Inc., noticed in the above-captioned proceedings on July 26<sup>th</sup>, and 28<sup>th</sup>, and July 1<sup>st</sup>, 2011.

**REPLY TO *EX PARTE***

**I. Confidence and Uncertainty Trends Are Not Sufficient Proxies for Location Accuracy Testing.**

T-Mobile argues that the targeted re-testing regime adopted in the Commission's *Second Report & Order* should serve as a proxy for real-world experience in determining when wireless networks should be subject to testing obligations to determine the quality of reported

subscriber positions. Although these statistical figures are important to responders searching for an emergency caller, their own accuracy and integrity presents an ongoing problem that can only be resolved through rigorous physical verification of network location performance.

***A. Reported confidence and uncertainty data are themselves subject to systemic errors.***

As T-Mobile would have it, no network would be subject to a testing requirement unless localized position uncertainties grow beyond some threshold value or confidence metrics decline to unsatisfactory levels. Even then, the testing required would be limited to the area in which location accuracy metrics fell short of the required standards. T-Mobile is correct that either condition would indicate an unsafe network state that should trigger remediation requirements including network adjustments and re-testing. However, in the absence of a generalized testing program, errors in the computed uncertainty and confidence metrics could lead to a higher incidence of “false positive” events – requiring remedial testing due to erroneously degrading confidence and uncertainty measures – and “false negative” events – providing an inaccurate picture of actual positioning performance. Such systemic errors may be particularly pronounced for certain types of positioning technology, such as those that rely on implicit hyperbolic geometries, where network configurations make it difficult or impossible to obtain intersecting lines of position (the “string of pearls” problem).

***B. Absent testing, confidence and uncertainty measures are subject to manipulation.***

In addition to systemic errors, reliance solely on confidence and uncertainty trends could allow an unscrupulous network operator to avoid *any* testing obligation by simply programming network equipment to constrain the variation in reported confidence and uncertainty

measures to a limited range of value. In the worst case, an operator could simply program the network to outright fabricate confidence and uncertainty measures that always fall within the permissible range. While NENA considers such a possibility remote, the robust liability protections afforded to carriers (for which NENA has strongly advocated for in the past and will continue to advocate for in the future) could provide cover for such an action. Even without such a structural protection, the temptation to manipulate confidence and uncertainty trends for economic reasons could outweigh the deterrent force of potential private liability, particularly where consumer contracts limit the ability of subscribers to recover losses occasioned by even intentional acts of carriers.

## **II. Location accuracy testing is necessary to ensure both initial compliance and remediation.**

T-Mobile reads the *Second Report and Order* to require testing only as means to remediate degradation of location accuracy over time. Importantly, however, information about long-term trends in confidence and uncertainty will not be initially available. NENA supports the use of trend data for remedial purposes, but we consider it imperative that network operators provide Public Safety Answering Points and field responders with baseline test results in order to establish a context for the reported positioning performance of their networks.

For example, test data could establish that a particular network exhibits very accurate positioning results for subscribers located in one part of a county, but very inaccurate positioning results for subscribers located in another. Without test-based verification, no such baseline would be available, forcing telecommunicators, dispatchers, and field responders to rely on potentially erroneous data and to accumulate contextual information over much longer timeframes. For areas in which emergency calls are only occasionally made, such information

might never be fully developed. Testing solves these problems in a reasonable time.

***A. Longer testing intervals could be proven acceptable during the initial five-year rolling test period.***

Given the number and size of wireless networks in the United States, NENA considers it a reasonable and achievable requirement that networks undergo an initial five-year rolling test period. We recognize, however, that such testing is not without costs. If initial testing reveals that longer re-test intervals can be implemented without material degradation in network positioning performance between test intervals, NENA would support the adoption of a longer interval. As an initial matter, however, we believe that five years between tests is the maximum re-testing interval consistent with positioning performance the public safety community would deem adequate to its needs.

**III. Routine Changes in Deployed Networks Can Adversely Affect Location Accuracy.**

Contrary to T-Mobile's assertion that the positioning performance of networks does not materially change with time, NENA's members have accumulated a wealth of practical experiences that suggests that even routine changes in wireless networks can result in degraded positioning performance. For example, whenever workers adjust antenna systems or modify cell site equipment there exists a non-negligible risk that the change or adjustment will alter the alignment, position, or connection of critical positioning systems, sometimes in subtle ways. Even software changes can result in material changes to positioning accuracy, particularly where network equipment handles more of the computational load associated with location determination. NENA therefore considers it important that at least limited location accuracy testing be associated with *any* change to a deployed network.

#### **IV. The Addition of New Cell Sites Does Not Necessarily Increase the Accuracy of Reported Positions in a Given Area.**

Although T-Mobile is correct that an increase in the number of control points can improve the positioning accuracy of a given network in a particular area, this is not a necessary result. Improvements of this type are highly dependent on the type of positioning technologies deployed in a given network, the underlying geometry on which those technologies are based, and the geometric orientation of the new site(s) with respect to existing sites. Because the deployment of wireless towers is often dependent on external constraints such as the path of highly-traveled roadways, it would be inappropriate for the Commission to rely on speculated future increases in cell site density as a substitute for meaningful accuracy mandates in the present.

#### **CONCLUSION**

The Commission should adopt the five-year rolling test period suggested by NENA.

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