Squire Sanders (US) LLP
1200 19th Street, NW
Suite 300
Washington, D.C. 20036

O +1 202 626 6600
F +1 202 626 6780
squiresanders.com

Bruce A. Olcott
T +1 202 626 6615
bruce.olcott@squiresanders.com

December 23, 2013

BY ELECTRONIC FILING

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street S.W.
Washington D.C. 20554

Re: NextNav, LLC
Permitted Oral *Ex Parte* Notice
PS Docket No. 07-114

Dear Ms. Dortch:

On December 19, 2013, representatives of NextNav, LLC ("NextNav"), met with Rear Admiral David Simpson, Chief of the Public Safety and Homeland Security Bureau ("PSHSB"), and David Furth, PSHSB Deputy Bureau Chief. Participating in the meeting on behalf of NextNav were Gary Parsons, CEO of NextNav; Bruce Cox, Senior Director, Regulatory & Public Safety for NextNav; and the undersigned. During the meeting, the participants discussed the primarily elements that should be addressed in a Notice of Proposed Rulemaking ("NPRM") proposing the adoption of rules for indoor wireless location accuracy to support E911 first responders, including:

(1) horizontal accuracy,
(2) vertical accuracy,
(3) the time to first fix,
(4) yield,
(5) verification, and
(6) phased implementation.

Horizontal Location Accuracy

With respect to the required level of horizontal location accuracy, the NextNav representatives noted the position of the public safety community that, at a minimum, the initial indoor location rules should mirror the existing outdoor rules, thus extending the current outdoor

37 Offices in 18 Countries

Squire Sanders (US) LLP is part of the international legal practice Squire Sanders which operates worldwide through a number of separate legal entities.

Please visit squiresanders.com for more information.

requirements of within 50 meters for at least 67 percent of wireless calls and within 150 meters for at least 90 percent of wireless calls. As indicated during the recent indoor E911 Phase II Location Accuracy Workshop ("Workshop"),[1] in the reports of the CSRIC Working Group process,[2] and in subsequent ex parte submissions into the record,[3] multiple location technology vendors have indicated that their technology can satisfy the 50m/67% and 150m/90% requirements for wireless calls to E911 from indoor locations. Further, the Commission should require that the percentage of calls that achieve accuracy of within 50 meters increase in a phased approach above 67 percent over time in order to fulfill the stated needs of the Public Safety community for consistent sub-50 meter location accuracy in urban and suburban markets.[4]

Vertical Location Accuracy

With respect to vertical location accuracy, the parties discussed the need for the adoption of floor-level accuracy requirements, which public safety representatives have described as "imperative" in urban areas with large, multi-story structures.[5] The proposed rules could initially require three to five meter vertical accuracy, reducing to less than three meters (floor-level) over time. Here again, Workshop presentations and CSRIC reports have established that multiple

---

[1] Remarks of Kirk Burroughs, Senior Director of Technology, Qualcomm Engineering Services Group, E911 Phase II Location Accuracy Workshop, PS Docket No. 07-114 (Nov. 18, 2013) ("*Burroughs Remarks*"); Presentation of Polaris Wireless, E911 Phase II Location Accuracy Workshop, PS Docket No. 07-114, at 5 (Nov. 18, 2013) ("*Polaris Wireless Presentation*").

[2] *See, e.g., Report – "Leveraging LBS and Emerging Location Technologies for Indoor Wireless E9-1-1*," CSRIC III, Working Group 3, at 21-54 (March 14, 2013) ("*CSRIC LBS Report*") (identifying Navizon's Wi-Fi Access Point location technology, Skyhook's Wi-Fi location technology, NextNav's beacon technology, and CSR's hybrid A-GPS/Wi-Fi technology as all purporting to be capable of satisfying the 50m/67% and 150m/90% requirements for wireless calls from indoor locations).

[3] *See, e.g., Ex Parte* Letter of Polaris Wireless, Inc., PS Docket No. 07-114, at 1 (Aug. 14. 2013); *Ex Parte* Letter of NextNav, LLC, PS Docket No. 07-114, at 6 (Aug. 14, 2013); *Ex Parte* Presentation of Qualcomm Incorporated, PS Docket No. 07-114, at 6-7 (Aug. 15. 2013) ("*Qualcomm Presentation*").

[4] *See "Indoor Location Test Bed Report*," CSRIC III, Working Group 3, *Public Safety Foreword*, at 9 (March 14, 2013) ("*CSRIC Test Bed Report*") (explaining that "[h]orizontal positional fixes that substantially exceed 50 meter accuracy, provides only general location information. Tighter performance is required, particularly in urban and dense urban environments to narrow the search ring to a single building or a more reasonable number of adjacent buildings.").

[5] *See* Remarks of Lisa Hoffman, Deputy Director, Division of Emergency Communications, Department of Emergency Management, City & County of San Francisco, E911 Phase II Location Accuracy Workshop, PS Docket No. 07-114 (Nov. 18, 2013) ("*Hoffman Remarks*"); Remarks of Terry Hall, Director of Emergency Communications, York-Poquoson-Williamsburg ECC, (on behalf of Association of Public Safety Communications Officials (APCO), E911 Phase II Location Accuracy Workshop, PS Docket No. 07-114 (Nov. 18, 2013) ("*Hall Remarks*").

technologies are capable of providing vertical location information, including floor-level location in the near future.[6]

Time to First Fix

Participants in the meeting discussed the significant shifts in the position of various stakeholders involved in wireless indoor location accuracy that resulted from the Workshop discussion on the need of emergency dispatchers for the provision of some level of location information almost immediately following the initiation of an E911 call. Public safety representatives explained during the Workshop that a time-to-first-fix of 30 seconds is often too long to assist 911 operators because, rather than wait 30 seconds for Phase II location information, operators often spend the critical initial portion of an E911 call orally eliciting location information from the caller, substantially negating the benefit of Phase II location capabilities that require a full 30 seconds to become available to the public safety dispatcher.[7] Given this fact, the Commission's NPRM should consider adopting rules that encourage carriers to provide their 'best available' Phase II location information at the earliest possible time following the initiation of an emergency call, followed by more accurate Phase II location information made available for the PSAP to rebid within 30 seconds of the call's initiation.

Yield

The participants in the meeting also discussed the importance of ensuring that any indoor location accuracy solution must be capable of achieving significantly high yield. As explained by some of the participants in the CSRIC Working Group 3 report on outdoor location testing, "[a]ccuracy testing that ignores or side-steps [the issue of yield] can present an inaccurate and misleading picture of the accuracy that will actually be delivered to the public safety community."[8] The CSRIC test bed and the presentations during the Workshop confirm that multiple location service providers are capable of providing reliably high yield for indoor positioning.[9] Thus, any Commission compliance program should require that all test calls be included in assessing accuracy metrics (not simply those which achieved a successful Phase II location fix). Alternatively, E911 testing compliance should require, at a minimum, a high yield

---

[6] *See, e.g.,* Remarks of Ganesh Pattabiraman, Co-Founder and President, NextNav LLC, E911 Phase II Location Accuracy Workshop, PS Docket No. 07-114 (Nov. 18, 2013) ("*Pattabiraman Remarks*"); *Polaris Wireless Presentation* at 5-6; *CSRIC LBS Report* at 37, 40, 49, 54.

[7] *Hoffman Remarks*; Remarks of Jennifer Green, District of Columbia Office of Unified Communications, E911 Phase II Location Accuracy Workshop, PS Docket No. 07-114 (Nov. 18, 2013).

[8] *Final Report – Outdoor Location Accuracy*, CSRIC III, Working Group 3, at 29 (March 14, 2012) ("*CSRIC III Outdoor Location Report*").

[9] *See CSRIC Test Bed Report* at 54 (noting that "all technologies tested demonstrated relativity high yield and various levels of accuracy in indoor environments"); *Polaris Wireless Presentation* at 12; *Qualcomm Presentation* at 2.

percentage (such as 95 percent) measured across all test calls as a component of the Commission's E911 indoor location accuracy requirements.

Verification

Another important aspect of indoor location accuracy rules is the testing and verification process that is used to ensure that indoor wireless location technologies are actually achieving the accuracy results required by the Commission's rules. The parties discussed multiple options that have been considered to test and verify indoor location accuracy technologies.

The NextNav representatives suggested that the Commission propose indoor location test requirements that include physical testing inside a representative sampling of building construction types and locations in a representative set of communities across the country, with testing points weighted to reflect the population densities of the tested area. This limited physical testing, combined with a process of characterization of local building types and conditions, could be used to extrapolate and demonstrate that the representative test results can be reliably applied to the characterized homogeneous community. Public safety participants in the CSRIC Working Group 3 process have repeatedly expressed, both in the case of outdoor testing as well as indoor testing, a willingness to accept empirical testing that establishes representative environments, and then largely rely upon key performance indicators for sustainability monitoring and to identify areas where further empirical testing is required.[10]

Granted, depending upon the breadth and diversity of building types and morphologies required to establish a representative sample, such a characterization and validation process would require a concerted initial effort. The initial effort, however, would not need to be repeated with significant frequency, necessitating re-testing only in the case of degradation of key performance indicators, a change in the deployed location technology, or significant antidotal evidence of a mismatch between tested and observed performance. Further, CSRIC III test-bed results clearly reveal superior indoor performance accuracy, even from current and legacy location technologies, inside light residential construction in non-urban environments.[11] Therefore, no formalized indoor testing program may be required at all in counties characterized largely by these building types, with continued reliance instead upon agreed key performance indicators and observed performance metrics.

Phased Implementation

In order to adopt a truly effective solution to the wireless indoor location accuracy problem, it must be recognized that no reliable solution can be deployed by the wireless carriers immediately, or made available on the same timeframe in all communities. The parties discussed whether the Commission might therefore consider requiring compliance with horizontal and

[10] *See CSRIC III Outdoor Location Report* at 9.

[11] *See CSRIC Test Bed Report* at 31-32.

vertical accuracy requirements based on an escalating percentage of new handsets sold after the effective date of the rules (rather than the embedded base of handsets) and/or based on a percentage of the population in each wireless carrier's service territories. For indoor location particularly, the greatest need and challenge exists in large urban markets. Therefore, for example, the Commission might require that a carrier validate its indoor location capabilities (either by empirical testing or statistically valid morphology characterization) across some initial percentage of the urban population in its service territory (such as 25-50 percent) by the effective date of the rules, with increasing percentages required at subsequent anniversary dates.

Particularly when considering the need for carriers to deploy new technologies or enhance older technologies across their networks or base of handsets, establishing an achievable effective date for initial compliance is critical, with improved performance or staged deployments to follow on a reasonable programmatic basis. In response to specific questions from the Commission at the recent Workshop, all four location technology vendors present validated that their most advanced technology implementations could be commercially available in major metropolitan markets within a two year period.[12]

Thank you for your attention to this matter. Please contact the undersigned if you have any questions.

Sincerely,

Bruce A. Olcott
Counsel to NextNav, LLC

[12] *See, e.g.*, Remarks of Rob Anderson, Chief Technology Officer, TruePosition, E911 Phase II Location Accuracy Workshop, PS Docket No. 07-114 (Nov. 18, 2013); *Pattabiraman Remarks*; *Burroughs Remarks*; Remarks of David De Lorenzo, Principal Research Engineer, Polaris Wireless, E911 Phase II Location Accuracy Workshop, PS Docket No. 07-114 (Nov. 18, 2013).