

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of:)	
)	
Public Safety and Homeland)	PS Docket No. 07-114
Security Bureau Seeks Comment)	
on Vertical (Z-Axis) Accuracy)	
Metric Proposed by the Nationwide)	
Wireless Carriers)	

**REPLY COMMENTS OF
POLARIS WIRELESS, INC.
(October 11, 2018)**

Polaris Wireless, Inc. ("Polaris Wireless") submits the following Reply Comments to the Commission's Public Notice¹ seeking comment on the vertical accuracy (z-axis) test bed report and the metric proposed by CTIA.²

There is a Clear Consensus on 3m Accuracy

The Public Safety community seeks and is expecting floor level accuracy (3m).³ Two barometric-based location solutions have demonstrated the ability to deliver floor level accuracy.⁴ As described in the Stage Z Report, the Polaris Wireless solution under test in Stage Z did not utilize available active compensation of the barometric pressure sensor; utilizing the active measures

¹ *Public Notice*, DA 18-928, released September 10, 2018.

² CTIA Letter, Wireless E-9-1-1 Location Accuracy Requirements (PS Docket No. 07-114) Submission of Z-axis Metric and Report, (August 3, 2018)

³ All comments provided by Public Safety entities seek a 3m or tighter accuracy metric.

⁴ Stage Z Report and Addendum, August 3, 2018.

would have made the results even more accurate. In the Addendum to the Stage Z Report, Polaris Wireless presented overall performance of 2.8m at 80% emulating "limited active compensation." These results used actual Stage Z test call data to update compensation data that was applied to all test calls in all three test markets and in all morphologies. Dr. R. Michael Buehrer, Professor in the Virginia Tech Department of Electrical and Computer Engineering, Director of "Wireless@VirginiaTech", IEEE Fellow, and an independent industry expert, has reviewed the Stage Z Report and Addendum, Polaris Wireless barometric sensor compensation algorithms, and the methodology in reprocessing actual Stage Z test data and has provided the following statement:

Based on my initial evaluation of Polaris' height estimation and calibration algorithms, it is my opinion that the gains demonstrated in the results presented in Figure 1 of the addendum of the "Report on Stage Z" by 911 Location Test Bed, LLC are consistent with what one would expect using their "limited active compensation" process. In fact the gains shown are likely a conservative estimate of the improvement that could be achieved through active compensation.

Industry standards necessary to implement the barometric sensor-based solutions tested in Stage Z are already adopted, and implementation of such standards are in the hands of carriers and device manufacturers. CTIA is also planning another round of z-axis testing in 2019 to include additional

Z-Axis technologies.⁵ With two solutions already delivering floor level accuracy and additional technologies being staged for testing in 2019, there is no reason to establish a metric less stringent than floor level. Setting the metric at 3m also will ensure current device barometric pressure standards are implemented in a timely manner to deliver available location performance and will push the competitive location technology market to even tighter performance.

NENA has stated that a 3m metric is “not only achievable using existing capabilities, but will also spur innovation in the indoor location industry.”⁶ Polaris Wireless has been innovating high accuracy software-based wireless location technologies for 18 years with numerous patents granted for wireless location, including many related specifically to barometric-based vertical location. This innovation will continue through Polaris Wireless’s highly extensible software-based solution as carrier networks evolve, devices continue to incorporate enriched sensors, and third party sensors and databases mature.

There is No Need for Complicated Requirements or a Market-based Build-out

The Boulder Regional Emergency Telephone Service Authority (“BRETSA”) proposes a 2m accuracy metric with suggested rules clearly

⁵ CTIA Letter, Wireless E-9-1-1 Location Accuracy (PS Docket No. 07-114), at 3 (October 1, 2018) (“*CTIA Comments*”).

⁶ Comments of NENA: The 9-1-1 Association, at 2 (October 2, 2018).

written specifically for NextNav, or at least for solutions requiring frequency licenses and hardware deployment.⁷ They propose (1) deployment schedules agreed upon between location solution providers and carriers to be filed with the FCC, (2) the accuracy metric apply only in markets where the solution has been deployed and proven to meet the metric, and (3) exceptions for markets in which a location technology is unnecessary or uneconomical. Additionally, BRETSA proposes waivers from compliance where the location provider is unable to meet the 2m accuracy metric and suggests that the commission mediate or arbitrate any disputes.⁸ This is both overly complex and completely unnecessary.

BRETSA stated they did not know “the extent to which Polaris Wireless must deploy in-market infrastructure to provide barometric sensor bias compensation.”⁹ The answer is simple: the Polaris Wireless solution does not require any such in-market infrastructure. The Polaris Wireless solution also does not require any spectrum licenses. In fact, the Polaris Wireless solution does not have any market dependencies for implementation and is deployable and functional nationwide on “Day One”. Polaris Wireless uses existing public weather reference networks and can augment these networks with simple weather reference stations where needed or desired for improved performance. There is no need for a drawn out deployment plan, there is no

⁷ Comments of the Boulder Regional Emergency Telephone Service Authority (October 1, 2018).

⁸ *Id.* at 6.

⁹ *Id.* at n5.

need for market-dependent economical consideration, and there is no need to defer compliance for the Top 50 markets until 2023 or to limit overall service to just the Top 50 markets.

Polaris Wireless offers an affordable software-based solution without the need for costly and time consuming in-market hardware build-out, maintenance, and upgrades, and without the need for overly complex compliance procedures and regulation.

Further Testing Not Needed to Establish a Metric

CTIA seeks a deferral of adopting a more stringent metric than their proposed 5m standard until they are able to test additional technology solutions.¹⁰ Polaris Wireless respectfully disagrees with CTIA's contention that it would be "premature" for the Commission to adopt a metric at this time.¹¹ As described above, the market seeks 3m accuracy, and the recently concluded Stage Z testing is only one of several tests that have proven the availability of floor level accuracy.¹²

Polaris Wireless and NextNav have both participated in two stages of Test Bed testing so far, and Polaris Wireless will likely participate in future rounds of testing. Nevertheless, there is no need for further testing and delay to establish a benchmark. Doing so provides a disservice to the Public Safety professionals and the safety of the public, and it provides a disservice to the

¹⁰ *CTIA Comments*, at 1.

¹¹ *Id.* at 2

¹² Comments of the International Association of Fire Fighters, (October 1, 2018).

location technology vendors who have now repeatedly participated in the Test Bed's own testing program.

CTIA acknowledges that testing is time consuming, expensive, and involves input from many stakeholders.¹³ There is also no guarantee that additional testing will be scheduled in a timely manner or that additional location providers will be able to participate. How much time is appropriate to allocate and how many more rounds will be requested all while the Public Safety community waits?

Polaris Wireless and iOS

The Florida Department of Management Services commented that the Polaris Wireless solution be tested using iOS devices.¹⁴ Polaris Wireless welcomes such testing. Polaris Wireless' barometric sensor-based location solution supports iOS devices. Further, Polaris Wireless wrote the Stage Z test application for Android with the opinion that it was more important to include as many different barometric pressure sensor manufacturers than it was to include different Operating System types; however, a test application for iOS devices has since been written and is available for testing. Nevertheless, testing performance of the Polaris Wireless iOS capability does not require a formal or full round of testing nor does it need to be a roadblock for establishing a metric.

¹³ *CTIA Comments*, at 2-3.

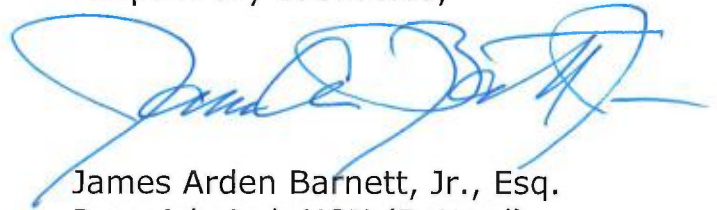
¹⁴ Comments of the State of Florida Department of Management Services *et al* (September 28, 2018).

Conclusion

The Polaris Wireless vertical location capabilities support a 3m metric. Since the safety concerns of the public safety community are thus satisfied, there is no need for complex or market-based deployment rules as the Polaris Wireless solution has no market or hardware dependencies and is available nationwide upon initial deployment. Although Polaris Wireless anticipates participating in future Test Bed stages, additional testing is not necessary to establish this metric, and additional testing should not be an excuse to delay this important public safety measure.

Dated: October 11, 2018

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "James Arden Barnett, Jr.", is written over the typed name.

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