

SUMMARY

CTIA–The Wireless Association® and our member companies share the Commission’s goal to provide Public Safety Answering Points (“PSAPs”) and first responders with the ability to accurately identify the location of wireless 9-1-1 callers regardless of whether the caller is located indoors or outdoors. Three common themes emerge from the record:

- Multiple stakeholders including public safety representatives share the view that a consensus plan offers more promise for meaningful indoor location accuracy improvements and warrants pursuit. As history is our guide, we believe a consensus approach offers a prudent path towards achieving lasting improvements in 9-1-1.
- A review of the record shows it is not possible to meet the proposed indoor location accuracy benchmarks within the proposed timetable. No verified evidence has been submitted demonstrating that any current technology can meet the location requirements in the timetable proposed by the FCC.
- Resources would be better used pursuing dispatchable address technologies, “the ‘gold standard’ for 9-1-1 location accuracy.” Rather than pursue the proposed initial indoor accuracy benchmarks, the Commission should encourage a focus on technologies that show promise regarding the provision of dispatchable address information.

At a minimum, prior to implementing any new benchmarks, the Commission should allow a test bed to validate the technical feasibility and commercial reasonableness, including scalability, deployability and availability, of location information solutions. To the extent the Commission considers new regulations, any accuracy requirements – or the timeline for compliance – should only be established after a test bed can independently verify that location information solutions can meet the proposed requirements. The record also shows widespread support for the Commission’s test bed “safe harbor” approach: once a technology is certified as compliant in the test bed, a carrier should be deemed in compliance with the accuracy requirements if the technology is deployed in a manner consistent with the test bed methodology.

CTIA looks forward to working with the Commission and first responders to advance our common goal of improving indoor location accuracy for the public safety community and wireless 9-1-1 callers.

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ability to locate wireless 9-1-1 callers, whether indoors or outdoors.² As history is our guide in fulfilling that commitment, CTIA and many commenters believe that a consensus approach could offer a more prudent course than Commission action on these proposals.³

CTIA, its member companies, and public safety have a long track record of voluntary, collaborative efforts that have achieved E911 advancements, dating back to the original 1996 rules. Since then the wireless industry and public safety have forged other collaborative agreements in the 9-1-1 realm, including agreements on TTY 9-1-1 calls over digital wireless networks in 1999-2000, outdoor location accuracy improvements in 2008, and the nationwide carrier text-to-911 agreement in 2013.

CTIA agrees with those commenters – including public safety – supportive of a voluntary, consensus-driven approach today. The National Emergency Number Association (“NENA”) “is convinced that a voluntary location deployment framework could provide a majority of consumers with improved E9-1-1 location performance on an accelerated timescale.”⁴ The Association of Public-Safety Communications Officials (“APCO”) also expressed “open[ness] to consideration of an alternative, consensus approach that may evolve from discussions with wireless carriers and other stakeholders.”⁵ A multi-stakeholder process holds promise, as it “can enable affected parties to evaluate the complex technical challenges and balance competing policy objectives in a candid, objective and relatively non-adversarial

² Comments of CTIA, PS Docket No. 07-114, at 2-3 (May 12, 2014) (“CTIA Comments”).

³ See *NPRM*, 29 FCC Rcd at 2385 ¶ 26 (“invit[ing] relevant stakeholders – including public safety and industry – to propose a consensus approach that would help ensure that consumers placing wireless call to 911 from indoor environments receive the same protections as callers in outdoor environments.”).

⁴ Comments of the National Emergency Number Association, PS Docket No. 07-114, at 3-4 (May 12, 2014) (“NENA Comments”).

⁵ Comments of the Association of Public-Safety Communications Officials International, Inc., PS Docket No. 07-114, at 3 (May 12, 2014) (“APCO Comments”).

manner.”⁶ The Commission should provide stakeholders the opportunity to consider an alternative, consensus-based approach that charts a path to address public safety’s needs.

II. THE NPRM’S ACCURACY BENCHMARKS AND PROPOSED TIMETABLE CANNOT BE MET

Even as CTIA supports the Commission’s efforts to improve indoor location accuracy for 9-1-1 calls, a review of the record shows that the proposals and timelines identified in the *NPRM* cannot be achieved. There are several promising technologies, but none is capable of meeting the proposed requirements today or can be deployed across wireless networks within the proposed timelines.

A. Enthusiastic Statements Do Not Make the Near-Term Proposal Any More Technically Feasible

Supporters of the Commission’s near-term indoor accuracy proposal acknowledge it is “aggressive”⁷ but express hope that the proposed timetable will prompt further technology improvements necessary to satisfy the rules.⁸ Others note that with the various location technologies available, “the Commission’s 50m indoor location accuracy proposal is reasonable.”⁹ Aspirational claims like these, however, are insufficient to conclude that the near-term proposal is realistic. Rather, “[a]ny new rules adopted for indoor location accuracy must be firmly grounded in technical realities.”¹⁰

⁶ Comments of Verizon and Verizon Wireless, PS Docket No. 07-114, at 8 (May 12, 2014) (“Verizon Comments”) (hereinafter “Verizon”).

⁷ Comments of the National Association of State 911 Administrators, PS Docket No. 07-114, at 6 (May 12, 2014) (“NASNA Comments”).

⁸ Comments of the National Association of State EMS Officials, et al., PS Docket No. 07-114, at 4 (May 12, 2014) (“NASEO Comments”) (filed as Kevin McGinnis).

⁹ NENA Comments at 16.

¹⁰ Comments of T-Mobile USA, Inc., PS Docket No. 07-114, at 9 (May 12, 2014) (“T-Mobile Comments”).

Vendors themselves offer vague or incomplete assurances that indoor location technologies will enable carriers to meet the *NPRM*'s requirements under the proposed timetable. NextNav, for example, notes that: (i) 50 meter accuracy will be achievable “within a reasonable period of time,” provided technology is available from multiple vendors; (ii) a two year period should be sufficient to deploy the infrastructure necessary to meet the 50 meter requirement for 67 percent of 9-1-1 calls for “significant portions of the population”¹¹; and (iii) while two years is enough time for initial handsets to be available with compliant technology, “handset changes may require 5-6 years to reach very high penetration.”¹²

Polaris states that the proposed near-term horizontal and vertical accuracy requirements are achievable “today or *in the near future*,” but without any specificity of concrete evidence to support the claim.¹³ Polaris nonetheless acknowledges the challenges associated with the proposed near-term vertical accuracy requirements:

With regard to vertical estimation . . . there are substantial challenges to meeting the accuracy and reliability targets the Commission proposes. Our work, and that of others in the industry, shows the significant negative impact to vertical accuracy caused by wind and weather induced pressure phenomena. . . .¹⁴

While TruePosition claims that the proposed accuracy requirements are technically feasible with current technology, the company did not participate in CSRIC III's Working Group 3 Test Bed and the test results attached to its comments actually show that the

¹¹ Comments of NextNav, LLC, PS Docket No. 07-114, at 4-5, 8-9 (May 12, 2014) (“NextNav Comments”).

¹² *Id.* at 11-13.

¹³ Comments of Polaris Wireless, Inc., PS Docket No. 07-114, at 9 (May 12, 2014) (“Polaris Comments”) (emphasis added).

¹⁴ *Id.* at 6-7.

requirements *cannot be met across topologies*. TruePosition simply asserts that the accuracy of the cited test results can be improved through subsequent technological developments.¹⁵

Taken together, these claims do not establish an adequate basis to proceed with the proposals.

B. The Record Contains No New, Verifiable Evidence to Suggest the Proposal is Feasible

The record contains no *verifiable* evidence to show that current technologies can meet the proposed accuracy requirements across topologies today. Instead, vendor comments generally rely on blanket statements, unverified tests conducted outside an independent test bed, or solutions that diverge from current network architectures to support the proposed indoor accuracy rules. Many questions remain, however.

Appended to these reply comments is a technical paper prepared by Chuck Bokath, Senior Research Engineer at the Information and Communications Laboratory at the Georgia Tech Research Institute.¹⁶ The Bokath Report examines four categories of location accuracy technology solutions and assesses current prospects as indoor location solutions: (i) satellite-based solutions, (ii) Wi-Fi and small cell solutions, (iii) RF-based technologies, and (iv) barometric pressure sensors. After reviewing the record, Mr. Bokath concludes, “no credible evidence has been provided to the Commission that any technology will be able to meet the location requirements in the timetable proposed by the FCC.”¹⁷

¹⁵ Comments of TruePosition, PS Docket No. 07-114, at 5-17 (May 12, 2014) (“TruePosition Comments”).

¹⁶ See Exhibit 1, Chuck Bokath, “Technical and Environmental Factors Affecting Indoor E911 Location Accuracy (“Bokath Report”).

¹⁷ *Id.* at 1.

The Bokath Report first considers the challenges that Global Navigation Satellite Systems (“GNSS”) such as GPS face with respect to indoor location. Stand-alone GNSS solutions have “significant technical limitations” which currently prevent them from generating indoor location information that would comply with the proposed requirements.¹⁸ In particular, “signal attenuation and multipath effects negatively impact the utility of GNSS and GPS as a means to determine indoor location.”¹⁹ The use of A-GNSS and A-GPS can improve location accuracy but cannot overcome challenges achieving the proposed requirements across indoor locations. Although NextNav submitted a report in the record on A-GNSS, it did not test topologies most challenging to satellite-based indoor location solutions: multistory buildings in dense urban and urban areas.²⁰ The comments thus provide no evidence to show that satellite-based solutions can meet the proposed benchmarks.

Small cell systems and device solutions like Wi-Fi hold promise and appear to be strong candidates for further study, but do not appear to be easy or immediate solutions for meeting the Commission’s indoor location accuracy proposal. The Bokath Report identifies two significant challenges, among others. First, a dispatchable location database that compiles location information for Wi-Fi and small cell beacons must be created for use with these solutions. Second, such a solution requires ubiquitous deployment of Wi-Fi and small cell solutions – beyond what is occurring today – throughout buildings nationwide.²¹

¹⁸ *Id.* at 2.

¹⁹ *Id.* at 2.

²⁰ NextNav, LLC Test Report, PS Docket No. 07-114, at 4 (May 12, 2014) (testing conducted in an area that “by definition not populated enough to be considered urban; and hence would not have dense urban structures such as skyscrapers.”).

²¹ Bokath Report at 4.

The Bokath Report also demonstrates that RF-based solutions are not a panacea to the indoor accuracy conundrum. RF-based technologies require multiple base stations to achieve a location fix, and non-line-of-sight and multi-path effects issues prevalent with indoor locations can be particularly troubling.²² The record confirms this finding. The consulting firm AdGen Telecom Group submitted a White Paper that “illustrates the relationship between the FCC’s proposed indoor accuracy standards and existing technologies.”²³ The focus of the White Paper is TDOA technology, and it demonstrates that TDOA solutions may not be able to satisfy the proposed requirements even with a 12 dB increase in power to the mobile unit.²⁴ TruePosition’s previously-filed data shows its RF-based technology *cannot* currently satisfy the proposed requirements in the requisite environments.²⁵ TruePosition claims, however, that the data shows the promise of its technology to meet the proposed requirements in the future.²⁶ More troubling, TruePosition continues to advance a solution that ignores the design features of modern wireless networks – it relies on hardware at each base station that sees handsets served by other base stations, even though modern networks “minimize the number of base stations interacting with a handset to prevent interference.”²⁷ And it applies a “power up” approach for 9-1-1 calls that increases the power of a handset but can result in disruptive interference to the network. This

²² *Id.* at 7-8.

²³ AdGen Telecom Group, Inc. White Paper, PS Docket 07-114, at 1 (May 8, 2014) (“AdGen White Paper”).

²⁴ *Id.* at 15 (noting that such an increase would produce an accuracy of between 31 and 76 meters for 67 percent of calls).

²⁵ TruePosition Comments at 5-17.

²⁶ *Id.*

²⁷ Posting of Joan Marsh to AT&T News, perspective and thoughts on government broadband policies, ‘911’ Location Accuracy: Getting to Dispatchable Addresses, <http://www.attpublic-policy.com/uncategorized/911-location-accuracy-getting-to-dispatchable-addresses/> (June 27, 2014, 11:39AM).

disruptive interference may prevent calls from successfully reaching a 9-1-1 operator in numerous situations in which many nearby wireless devices attempt to access a wireless network due to the emergency triggering the 9-1-1 call

Finally, the Bokath Report considers barometric sensors as there is significant focus on this solution for vertical accuracy. The barometric approach currently is in a nascent stage and does not perform with the level of certainty required for emergency calls. As noted by Mr. Bokath, “[w]hile barometric pressure sensors in mobile devices can perform many useful recreational functions, at this point they have limited utility as a means of producing z-axis data for 911 location information lifesaving purposes.”²⁸ There are several factors that pose problems for existing barometric sensor approaches, including: sudden changes in air pressure; gradual, seasonal changes in air pressure if altimeters are not periodically recalibrated; sudden movements if they occur more quickly than updates from the barometric sensor; and building issues that impact internal pressure measurements relative to outdoor static air pressure such as HVAC systems that maintain a positive air pressure, “leaky” buildings “more subject to natural processes such as ‘stack effect’ (which provides varying temperature, humidity and air pressure throughout a building), rapidly changing weather conditions, cold temperatures, high wind conditions, and other environmental factors.”²⁹

Bokath also observes that many of these technologies are in the prototype phase and “still require some combination of peer review, standards work, and product development” which cannot be completed within the timeline contemplated by the Commission.³⁰ To the extent vendors claim that their technologies could eventually meet the proposed requirements, these

²⁸ Bokath Report at 5.

²⁹ *Id.* at 6.

³⁰ *Id.* at 8.

claims lack independent verification – a threshold factor in assessing technical feasibility.³¹ As the Boulder Regional Emergency Telephone Service Authority recognized in its comments, the “number of location technologies which did not complete the CSRIC testing underscores the difference between claims, and proof, of functionality” on the one hand and “blind acceptance” on the other.³²

It would be inappropriate to proceed with a new location accuracy regime based on “blind acceptance” of vendor claims and unverified studies.

C. Numerous Commenters Show that the Near-Term Proposal’s Timeframe is Unrealistic and Urge the Commission to Avoid the Mistakes of Phase II

Placing too much reliance on a few vendors’ promises does not serve the public interest, as public safety, wireless providers, and the Commission learned in the E-911 Phase II experience. Numerous commenters made this point in their initial comments, with some expressing deep reservations that the near-term proposal is poised to follow the same, flawed path as Phase II.³³ Concerns extend beyond technical feasibility, however.

The proposed timeframe fails to account for the steps necessary to move from a technically compliant solution to a commercially deployed product – indeed it will take years

³¹ See Test Bed Report at 12, 47.

³² Comments of the Boulder Regional Emergency Telephone Service Authority, PS Docket No. 07-114, at 15 (May 12, 2014) (“BRETSA Comments”).

³³ Comments of AT&T, PS Docket No. 07-114, at 4-10 (May 12, 2014) (“AT&T Comments”); CTIA Comments at 10-13; Mobile Future and Competitive Carriers Association Comments, PS Docket No. 07-114, at 2-3 (May 12, 2014) (“MBF/CCA Comments”); Comments of the NTCA-The Rural Broadband Association, PS Docket No. 07-114, at 2-5 (May 12, 2014) (“NTCA Comments”); Comments of Qualcomm Incorporated, PS Docket No. 07-114, at 4, 12 (May 12, 2014) (“Qualcomm Comments”); Comments of the Rural Wireless Association, Inc., PS Docket No. 07-114, at 2 (May 12, 2014) (“RWA Comments”); Comments of Sprint Corporation, PS Docket No. 07-114, at 3, 6-8 (May 12, 2014) (“Sprint Comments”); T-Mobile Comments at 10, 15; Verizon Comments at 23.

after compliant technologies are identified to implement and deploy them.³⁴ As Qualcomm observes, “no commercially available positioning technology can meet the Commission’s proposed requirements today, and, *even if there were something available*, it would not be feasible for a ubiquitous industry build-out within a two to three year period.”³⁵ There are several challenges.

First, once compliant technologies are developed, they must be incorporated into industry standards – a process that can take one to three years.³⁶ Because the standards process is often global, it is important to ensure that technologies can interoperate with the CMRS ecosystem and ensure that the technology can be offered by multiple vendors, thereby fostering competition and innovation.³⁷

Next, vendors need to develop and manufacture equipment and software built to the standard and the accuracy requirements, and this process can take an additional 18-24 months.³⁸ And service providers typically need at least an additional year for laboratory and field testing of vendor solutions, and only then do they begin deployment into their networks.³⁹

“Perhaps most critically, new technologies must be built into handsets, which must then be replaced across the subscriber base.”⁴⁰ The handset upgrade would be expected to take

³⁴ See Comments of Cisco Systems, Inc., PS Docket No. 07-114, at 3 (May 12, 2014) (“Cisco Comments”); Comments of Ericsson, PS Docket No. 07-114, at 3 (May 12, 2014) (“Ericsson Comments”); Comments of the Information Technology Industry Council, PS Docket No. 07-114, at 4 (May 12, 2014) (“ITIC Comments”).

³⁵ Qualcomm Comments at 1 (emphasis added); *see also* T-Mobile Comments at 18-20.

³⁶ See T-Mobile Comments at 19; Sprint Comments at 9.

³⁷ See T-Mobile at 19.

³⁸ See Verizon Comments at 20.

³⁹ See *id.*

⁴⁰ T-Mobile Comments at 19.

several years for sufficient penetration.⁴¹ Indeed, NextNav asserts it will take up to six years to achieve a high penetration of location-capable handsets.⁴²

The vertical proposal, moreover, is particularly problematic. Vertical location technologies are in nascent stages, cannot meet the proposed accuracy standards, and not even vocal proponent NextNav suggests they will be ubiquitously deployed.⁴³ There is no basis to conclude that the vertical location positioning can possibly be met and made widely available in three years.⁴⁴ Although barometric sensors may prove to be a meaningful solution for vertical location information, substantial questions remain. As Qualcomm observed, “[i]mprovements in barometric sensors and use of other sensors (*e.g.*, accelerometers) could well improve accuracy but time will be needed to develop, test, and refine an effective combination of techniques. . . .”⁴⁵ This process cannot be completed in the proposed timeframe.

Ultimately, regulation will not be upheld where a record shows that proposed rules are technically infeasible and would compel carriers to do the impossible.⁴⁶ Once technical infeasibility has been raised, the Commission must address the issue.⁴⁷ CTIA agrees with the Rural Wireless Association, Inc. that “[t]he burden should be on the regulator to ensure that it is

⁴¹ See Sprint Comments at 10.

⁴² See NextNav Comments at 11-14.

⁴³ See *id.* at 5, 8-9; see also ITIC Comments at 5; Qualcomm Comments at 11-13.

⁴⁴ Qualcomm Comments at iv, 15; see *id.* at 1.

⁴⁵ *Id.* at 15.

⁴⁶ CTIA Comments at 8; AT&T Comments at 7-10; Cisco Comments at 3; Sprint Comments at 6; see Verizon Comments at 21-22. Courts have determined that “impossible requirements imposed by an agency are perforce unreasonable” and that the “law does not compel the doing of impossibilities.” See *Alliance for Cannabis Therapeutics v. DEA*, 930 F.2d 936, 940 (D.C. Cir. 1991); *Hughey v. JMS Development Corp.*, 78 F.3d 1523, 1530 (11th Cir. 1996).

⁴⁷ *Bunker Hill Co. v. EPA*, 572 F.2d 1286, 1294 (9th Cir. 1977) (citing *Portland Cement Ass’n v. Ruckelshaus*, 486 F.2d 375, 402 (D.C. Cir. 1973)).

not mandating the impossible, rather than on carriers to prove that the impossible remains impossible.”⁴⁸

The Commission should seize the opportunity to avoid repeating the dynamic that vexed E911 Phase II deployment – “the regulatory cart before the feasibility horse.”⁴⁹

III. THE COMMISSION SHOULD FOCUS STAKEHOLDER RESOURCES ON DISPATCHABLE ADDRESS SOLUTIONS, NOT MARGINAL IMPROVEMENTS TO LOCATION ACCURACY

As NENA, APCO, and other public safety stakeholders assert, dispatchable address is “the ‘gold standard’ for 9-1-1 location accuracy.”⁵⁰ Yet even as the *NPRM* finds that public safety “would be best served through the delivery of a dispatchable address,”⁵¹ it continues to propose *x*, *y* (and *z*) coordinates. Forcing providers to dedicate resources to make incremental improvements that are not appreciably more effective will only delay implementation of what public safety desires, a dispatchable address solution.⁵² As T-Mobile observes, “[r]ather than just trying to shrink the location estimate circle by a number of meters, it would be much better to end this multiyear transition with an indoor location solution that really meets public safety’s needs and delivers actionable dispatch information.”⁵³ Multiple commenters thus urge the

⁴⁸ RWA Comments at 2.

⁴⁹ AT&T Comments at 8.

⁵⁰ NENA Comments at 18; Texas 9-1-1 Entities Comments, PS Docket No. 07-113, at 2 (May 12, 2014) (“a validated civic address should be the immediate expectation from the Commission’s order resulting from this proceeding.”); APCO Comments at 3 (noting that the “ultimate goal” should be the provision of a “dispatchable address”); International Association of Fire Chiefs Comments, PS Docket No. 07-114, at 2 (May 12, 2014); NASEO Comments at 3-4. *See also* Comments of Telecommunications for the Deaf and Hard of Hearing, Inc., et al., PS Docket No. 07-114, at 2 (May 12, 2014) (expressing a clear desire for location solutions to “provide a true ‘dispatchable address’” to PSAPs).

⁵¹ *NPRM*, 29 FCC Rcd at 2418 ¶ 117 (citation omitted).

⁵² *See* AT&T Comments at 1-2.

⁵³ T-Mobile Comments at 5.

Commission to reconsider and, as Verizon suggests, shift to a “Phase III” of E911 location accuracy: dispatchable address.⁵⁴

Policymakers have an opportunity to leverage the growing availability of new commercial products that could provide, in time, more accurate information on the location of a 9-1-1 caller. Many of the most promising dispatchable address solutions involve commercial Location Based Service (“cLBS”) technologies, such as WiFi and Bluetooth beacons, that reside outside a wireless provider’s network.⁵⁵ In June 2014 CSRIC IV Working Group I issued its final report on Test Bed specifications and identified several key considerations looking ahead, including: (1) phone use is becoming more “always on, always position aware,” for example a location position from an LBS can be inserted at the beginning of a 9-1-1 call flow; and (2) small indoor cells and WiFi access points could increase in-building spatial accuracy.⁵⁶ As NENA and TCS note, many technologies may be able to generate location information with little or no carrier input.⁵⁷

Meaningful consideration of these technologies, however, requires a broader perspective on the E911 ecosystem and the scope of regulation. As AT&T asserts, location accuracy “should not fall solely on the shoulders of CMRS providers. Public safety is everybody’s job.”⁵⁸ To that end, T-Mobile observes:

⁵⁴ Verizon Comments at 10-11.

⁵⁵ CTIA supports further evaluation of these technologies. Any such evaluation should also consider potential privacy and liability issues that may arise based on reliance on cLBS.

⁵⁶ CSRIC Working Group I, Next Generation 911, *Final Report: Specification for Indoor Location Accuracy Test Bed*, at § 4.2 (June 2014) (“CSRIC June Report”), available at http://transition.fcc.gov/pshs/advisory/csric4/CSRIC_IV_WG-1_Subgroup3_061814.pdf.

⁵⁷ NENA Comments at 21-24; Comments of Telecommunications Systems, Inc., PS Docket No. 07-114, at 15-18 (May 12, 2014) (“TCS Comments”).

⁵⁸ AT&T Comments at 4.

To attain truly actionable indoor locations requires buy-in and development from all stakeholders—not just wireless carriers, but also public safety, handset manufacturers, location technology vendors, mobile operating system providers, state and local governments who regulate building codes, and, perhaps most critically, premises owners. “Smart buildings” should be more than just wired—they should also be capable of providing actionable locations to any mobile device (including Wi-Fi-only devices).⁵⁹

The Commission, of course, will be involved but so too should other bodies of government.

Legislators, for example, can adopt laws modifying building codes to require the installation of location beacons, especially in high-rise buildings, just like illuminated exit signs and fire alarms.⁶⁰

As Sprint points out, there are numerous questions about the use of cLBS to enhance E911 location accuracy, including the quality, reliability and redundancy built into the services.⁶¹ Much work is required, from standards development to commercial deployment. But as Verizon points out, work on dispatchable address is “a more appropriate use of industry, public safety and Commission resources than attempting to achieve the unworkable accuracy requirements proposed in the *FNPRM*.”⁶² NENA notes that by leveraging available technologies, carriers may be able to transmit dispatchable addresses “at lower cost and with lower complexity than is currently required where such systems rely on legacy databases and service processes.”⁶³

In sum, rather than focus on interim solutions that do not provide a dispatchable address, the Commission should assess the viability of dispatchable address solutions.

⁵⁹ T-Mobile Comments at 2.

⁶⁰ AT&T Comments at 3-4.

⁶¹ See Sprint Comments at 13.

⁶² Verizon Comments at 10.

⁶³ NENA Comments at 20.

IV. THE RECORD SUPPORTS USE OF A TEST BED TO DEVELOP INDOOR LOCATION ACCURACY BENCHMARKS, NOT JUST TO CERTIFY COMPLIANCE

Various commenters joined CTIA in urging the Commission, to the extent that it considers new regulatory mandates, to set indoor location accuracy requirements and deployment schedules *after* multiple technologies are validated in a test bed as capable of satisfying the requirements in indoor environments across morphologies.⁶⁴ The *NPRM* inquired about such an approach,⁶⁵ and Commissioners Pai and O’Rielly urged consideration of a test bed to develop indoor accuracy rules that are technically feasible.⁶⁶ CSRIC’s Working Group I just issued its final report on specifications for a permanent indoor location accuracy test bed and identified the key objectives of the test bed: evaluating candidate technologies; developing accuracy benchmarks; and continuing to inform Commission policy and rulemaking.⁶⁷ These objectives operate hand-in-hand with adopting a test bed approach to identify benchmarks and timetables for compliance.

Adoption of deployment benchmarks should be triggered by “the date when a competitive number of standardized and commercially available technologies are validated in a

⁶⁴ CTIA Comments at 13-16; ITIC Comments at 3; MBF/CCA Comments at 1; Comments of Motorola Mobility LLC, PS Docket No. 07-114, at 4-11 (May 12, 2014) (“Motorola Comments”); Sprint Comments at 3, 12; TCS Comments at 19, 32-35; T-Mobile Comments at 9-10, 15; Verizon Comments at 22-23.

⁶⁵ *NPRM*, 29 FCC Rcd at 2398 ¶ 60.

⁶⁶ *Id.* at 2465 (Statement of Commissioner Ajit Pai: “[T]he trigger for compliance should not be the effective date of the rules we ultimately adopt. Instead, the clock should start running when our [CSRIC] certifies that a technology vendor has demonstrated through an independently administered test bed program that a solution meets the horizontal and vertical location accuracy benchmarks set forth in those rules.”); *id.* at 2467 (Statement of Commissioner Michael O’Rielly: “One idea is basing the effective date of any rules on a successful demonstration, in a test bed, that there is technology available that meets the location accuracy requirements. . . .”).

⁶⁷ CSRIC June Report at § 2.

neutral test bed as compliant in all environments.”⁶⁸ It is important to tie implementation schedules to the availability of multiple commercially-available solutions, which can maximize the speed of deployment, help PSAPs and carriers manage costs, and foster greater innovation and better solutions to enhance location accuracy technology.⁶⁹ As Verizon noted, “rather than focusing on proprietary products,” location technology vendors will be more willing to standardize their products to facilitate competitive solutions that would trigger deployment deadlines.⁷⁰ Sprint observes that absent a sufficient pool of proven solutions, location requirements “cannot be technology-neutral,” affecting innovation and raising prices.⁷¹

Moreover, by linking the rules to the commercial availability of compliant solutions, the Commission can avoid imposing compliance dates based on a technology that performs well in a test bed using a field-test platform or prototype, but cannot be commercialized within the Commission’s pre-determined timeline.⁷² The Commission recognizes this problem in its test bed compliance discussion, proposing to require carriers to certify that the technology submitted to certify compliance will be deployed in the same manner in the marketplace.⁷³ The same standard should apply in adopting the location accuracy rules themselves.

⁶⁸ MBF/CCA Comments at 3.

⁶⁹ CTIA Comments at 13-16; AT&T Comments at 10; MBF/CCA Comments at 1; Sprint Comments at 2-5, 8-12; Verizon Comments at 22-23.

⁷⁰ Verizon Comments at 22-23; *see* AT&T Comments at 10 (“it would be reckless for regulators to require providers to put all their indoor location-accuracy eggs into one vendor basket”).

⁷¹ Sprint Comments at 12.

⁷² *See* Motorola Comments at 7-8; Comments of the Telecommunications Industry Association, PS Docket No. 07-114, at 9 (May 12, 2014).

⁷³ *NPRM*, 29 FCC Rcd at 2407 ¶¶ 84-85.

V. ANY NEW FRAMEWORK SHOULD INCORPORATE A SENSIBLE APPROACH TO COMPLIANCE AND IMPLEMENTATION

A. Deployment of a Test Bed-Compliant Technology Should Serve as a Safe Harbor and Proposals for a Rebuttable Presumption, Periodic Re-Testing, or Reporting Obligations are Unnecessary and Conflicting

If the Commission moves forward with a carrier-centric, interim indoor accuracy requirement, it should incorporate an independently administered test bed program so CMRS providers can show that their technology solution and deployment plans meet the indoor rules.⁷⁴ Certification under the test bed should create a true safe harbor.⁷⁵

This safe harbor should insulate carriers from challenges, and “the only enforcement issue would be whether the CMRS provider” properly deployed the technology.⁷⁶ Parties that support a rebuttable presumption or seek compliance assessments in market-specific deployments fail to acknowledge the challenges of indoor testing. As NENA observed: “carriers cannot reasonably be expected to test their location platform performance in every building, or even a representative sample of buildings, in every community,” adding that the compliance test bed “will provide a sufficient evidentiary basis upon which the Commission can gauge compliance” with the indoor rules.⁷⁷ Establishing a rebuttable presumption that would permit parties to challenge the accuracy of test bed certified location technologies and trigger market-specific testing would be inconsistent with the purpose of the safe harbor and impractical to implement. The CSRIC test bed process demonstrates that it is extremely difficult to gain

⁷⁴ *Id.* at 2407 ¶ 84.

⁷⁵ AT&T Comments at 29-32; CTIA Comments at 17-18; RWA Comments at 4-5; Sprint Comments at 2, 15.

⁷⁶ AT&T Comments at 30.

⁷⁷ NENA Comments at 26-27; *NPRM*, 29 FCC Rcd at 2413 ¶ 103 (“ubiquitous in-building testing is likely to be both costly and impractical due to security and permission issues that make it difficult to access private buildings.”) (citation omitted).

access to buildings for testing purposes.⁷⁸ The test bed approach minimizes this problem whereas ubiquitous market-by-market testing magnifies the problem. In fact, there is no evidence that market-specific testing is even feasible given the building access problems identified by the CSRIC and recognized by the Commission.⁷⁹ Moreover, testing in a single test bed took months and was extremely costly.⁸⁰ CTIA thus agrees with the Commission that, rather than requiring market-specific testing, “a test bed approach, representative of real-life call scenarios, would be the most practical and cost-effective method for testing compliance with indoor location accuracy requirements.”⁸¹

Similarly, it would be inconsistent for the Commission to pursue the county- or PSAP-level compliance plans considered in the NPRM. These proposals would “defeat the purpose and promised efficiencies of a test bed...”⁸² The test bed should serve as the basis for compliance, along with ensuring the technology has been deployed.

Further, carriers introducing a new location methodology should demonstrate initial compliance via the test bed process, and re-testing should not be required.⁸³ It is implausible to proceed with re-testing whenever there is a “significant change” to a provider’s network technology, handset technology, or some other change in service. Wireless providers are

⁷⁸ CSRIC Working Group 3, E9-1-1 Location Accuracy, *Indoor Location Test Bed Report*, at §§ 12.2.2, 13.1 (Mar. 2013) (“The process of building identification and access proved to be one of the biggest challenges in establishing the Test Bed”) (“CSRIC March Report”), available at http://transition.fcc.gov/bureaus/pshs/advisory/csric3/CSRIC_III_WG3_Report_March_%202013_ILTestBedReport.pdf.

⁷⁹ CSRIC March Report at §§ 12.2.2, 13.1; *NPRM* at ¶ 103.

⁸⁰ CSRIC March Report at §§ 12.2.2, 13.1.

⁸¹ *NPRM* at ¶ 84.

⁸² Verizon Comments at 27. See also T-Mobile Comments at 20.

⁸³ T-Mobile Comments at 20.

constantly enhancing their networks and introducing new devices, and a broad, undefined trigger would undermine the benefits of the test bed approach.

B. The Record Supports a 30-Second Time to First Fix (“TTFF”) and Excluding Shorter Calls from Any Yield Analysis

Many commenters join CTIA in supporting the proposal to give carriers 30 seconds to generate an initial location fix and to include only calls lasting 30 seconds or more in yield calculations.⁸⁴ Although a few commenters urge adoption of a TTFF requirement that is less than 30 seconds,⁸⁵ the Commission should be mindful that public safety does not have a uniform view – some recognize that a faster requirement may not be technically feasible,⁸⁶ others want a location fix as soon as possible,⁸⁷ while others prefer a longer TTFF requirement if it will result in more accurate location information.⁸⁸ In addition, the time it takes to calculate a location is dependent upon the environment in which the call was placed, the ability of the device to see reference signals and the underlying network configuration. Setting a shorter TTFF would truncate the Phase II location calculation in challenging environments. This shortened time period would prevent the necessary location fix calculations from occurring and thereby likely result in a default, less accurate location fix that would have been available had the location calculation been able to complete.

⁸⁴ AT&T Comments at 34-35; BRETSA Comments at 17; CTIA Comments at 18-19; NextNav Comments at 41-44; NTCA Comments at 6-7; T-Mobile Comments at 20-21.

⁸⁵ See Comments of the National Association of Regulatory Utility Commissioners, PS Docket No. 07-114, at 10-11 (May 12, 2014) (“NARUC Comments”); The California Chapter of the National Emergency Number Association Comments, PS Docket No. 07-114, at 1 (May 12, 2014) (“CALNENA Comments”).

⁸⁶ See BRETSA Comments at 17.

⁸⁷ CALNENA Comments at 1; NARUC Comments at 11.

⁸⁸ See APCO Comments at 7.

A 30 second TTFB requirement will ensure that PSAPs and wireless carriers have the same expectations regarding the timeframe for delivering location information.⁸⁹ Moreover, it balances public safety’s desire for location information quickly with the fact that location accuracy improves the longer a carrier has to generate a fix.⁹⁰

C. Commenters Generally Oppose Any Requirement that the Indoor/Outdoor Nature of a 9-1-1 Call be Identified

The Commission sought comment on whether it is technically feasible to identify whether a call is placed in indoor or outdoor environments and, if so, whether such information would be useful for PSAPs.⁹¹ The record demonstrates that such a requirement is not technically feasible.⁹² Moreover, only one commenter from the public safety community expressed support for such an identification requirement.⁹³ Accordingly, the Commission should refrain from requiring CMRS carriers to identify whether a 9-1-1 call was placed indoors or outdoors.

D. The FCC Should Ensure a Meaningful Waiver Process

As discussed above, CTIA urges the Commission to support a voluntary, consensus-driven approach rather than one based on technically infeasible regulatory requirements. Particularly given the aspirational nature of the proposed rules, several parties urged the Commission to articulate a standard for granting waivers that takes into account the technical challenges associated with indoor location accuracy.⁹⁴ As noted in CTIA’s initial comments,

⁸⁹ See *NPRM*, 29 FCC Rcd at 2428-29 ¶ 144.

⁹⁰ See *id.* at 2427 ¶ 143 (“there is a trade-off between the accuracy of the location information and the time to complete a location fix”) (citation omitted).

⁹¹ *Id.* at 2420 ¶¶ 124, 126.

⁹² BRETSA Comments at 27-28; CTIA Comments at 23; RWA Comments at 7; TCS Comments at 4, 26.

⁹³ *But see* NASNA Comments at 12 (supporting such a requirement).

⁹⁴ See BRETSA Comments at 25; CTIA Comments at 19-20; NTCA Comments at 5; Rural Wireless Association Comments at 7.

“proper application of the current waiver standard, or a useful discussion of how that standard would be applied here, would be a productive step as history shows that E911 location accuracy is rife with ‘unforeseeable circumstances that might arise that would justify limited relief.’”⁹⁵

CTIA again urges the Commission to clarify that waivers of indoor 9-1-1 location accuracy rules will be granted where carriers show that deadlines cannot reasonably be met due to the unavailability of compliant solutions.⁹⁶

VI. COMMENTERS GENERALLY RECOGNIZE THAT PSAP READINESS IS A KEY TO MEANINGFUL IMPROVEMENTS IN 9-1-1 LOCATION ACCURACY

Public safety and other commenters recognize that most PSAPs will be unable to utilize vertical location information without updating their systems.⁹⁷ It will require resources and take time for PSAPs to implement these updates.⁹⁸ Thus, before mandating that carriers prepare to incur the substantial costs necessary to provide “floor level” accuracy, the FCC should ensure that the majority of PSAPs are willing and able to expend the substantial resources that will be needed for them to properly utilize vertical location data.⁹⁹

CONCLUSION

CTIA supports efforts to improve the accuracy of locating wireless 9-1-1 callers, whether indoors or outdoors, and welcomes the opportunity to identify a consensus plan to meet public safety’s needs. The rules as proposed by the Commission, however, cannot be achieved based on existing technical solutions. Any Commission action should be based on verifiable evidence

⁹⁵ CTIA Comments at 20.

⁹⁶ *See id.* at 19-20; BRETSA Comments at 25; NTCA Comments at 5; RWA Comments at 2-3, 7.

⁹⁷ APCO Comments at 6; AT&T Comments at 17-22; CTIA Comments at 20-22; Verizon Comments at 26-27.

⁹⁸ TCS Comments at 27-29; T-Mobile Comments at 10-11.

⁹⁹ RWA Comments at 4; *see* CTIA Comments at 20-22; Verizon Comments at 26-27.

that multiple technologies currently exist that can satisfy the Commission's proposed accuracy requirements in all environments. The Commission should focus efforts on developing solutions that can provide a dispatchable address to PSAPs.

Respectfully submitted,

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