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

In the Matter of Wireless E911 Location Accuracy Requirements	PS Docket No. 07-114

T-MOBILE USA, INC. COMMENTS ON PUBLIC NOTICE ON THE ROADMAP FOR IMPROVING E911 LOCATION ACCURACY

Steve B. Sharkey
Eric Hagerson
T-MOBILE USA, INC.
601 Pennsylvania Ave., NW
Washington, DC 20004
(202) 654-5900

John T. Nakahata
Kristine Laudadio Devine
HARRIS, WILTSHIRE & GRANNIS LLP
1919 M Street NW, Eighth Floor
Washington, DC 20036
(202) 730-1300

Counsel to T-Mobile USA, Inc.

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I. INTRODUCTION AND SUMMARY.

T-Mobile USA, Inc.[1] ("T-Mobile") is proud to be one of the signatories, along with the Association of Public Safety Communications Officials International ("APCO"), the National Emergency Number Association ("NENA"), and the other national wireless carriers, to the Roadmap for Improving E911 Location Accuracy ("Roadmap").[2] The Roadmap is a transformational, data driven, and workable framework for significantly improving indoor Enhanced 911 ("E911") location accuracy that is a direct response to calls from the Federal Communications Commission ("FCC" or "Commission") for stakeholders to work collaboratively in order to provide alternative solutions to the new mandates it otherwise proposed.[3]

By making dispatchable location a key focus and aligning the technical evolution of commercial Location Based Services ("cLBS") with E911, the Roadmap is a real, paradigm shift in wireless emergency communications. Instead of relying on technologies that, for the most part, were designed only for E911 and are unlikely to develop and improve over time, the Roadmap incorporates a wide range of solutions, including cLBS technologies that will see continual, dynamic, market-driven improvements. The Roadmap is designed to leverage these technologies, where possible, to provide what public safety has called the gold standard for wireless E911—a dispatchable location that includes street address and other critical information

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1 T-Mobile USA, Inc. is a wholly owned subsidiary of T-Mobile US, Inc., a publicly-traded company.

2 Letter from Scott Bergman, Counsel, CTIA—The Wireless Association, to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 07-114 (filed Nov. 18, 2014) ("Roadmap").

3 *Wireless E911 Location Accuracy Requirements*, Third Further Notice of Proposed Rulemaking, FCC 14-13, 29 FCC Rcd. 2374, ¶ 6 ("*FNPRM*").

that may be necessary to locate a 911 caller, such as an apartment or floor number. At the same time, the Roadmap charts a path forward for continued development and improvement of wide-area radio and satellite based technologies through the advancement of today's best location methods and introduction of promising new technologies, as well as through rigorous empirical evaluation of emerging technologies to test and substantiate vendor promotional claims—all of which provides improved accuracy for both outdoor and indoor wireless 911 calls.

All providers of emergency service location solutions are welcome to participate in the test bed proposed in the Roadmap; none are excluded. This permits rational, evidence-based evaluation in a common test bed of all candidate technologies in parallel with the development of a dispatchable location solution. Indeed, while some location technologies are specifically included in the Roadmap (namely, those with the highest probability of providing the most improvement in the shortest time, those that will align emergency and commercial location services, and those capable of providing a dispatchable location), the goal of the Roadmap is not to exclude any particular technology but rather to provide a technology-neutral, empirically verifiable path for improving E911 location accuracy.

Furthermore, the Roadmap commits to new transparent reporting requirements, based for the first time on live 911 call data, to assist in evaluating enhanced location performance. It establishes position source yield metrics that must be met to demonstrate compliance with aggressive benchmarks. It also incorporates stakeholder assessments to gauge progress, and in the improbable event dispatchable location is not deemed to be on track, provides for a pivot to other location technologies that will have already been evaluated. In this way, the Roadmap improves the likelihood of success by allowing stakeholders to work on a dispatchable location solution in parallel with the assessment processes required for alternative location solutions,

including the use of barometric pressure sensors. This is all designed to provide maximum benefit to consumers and public safety.

II. THE ROADMAP FURTHERS A NUMBER OF KEY GOALS FOR PUBLIC SAFETY AS WELL AS FOR THE COMMISSION, CONSUMERS, AND CARRIERS.

A. The Roadmap Ensures No Technologies Are Left Uninvestigated.

The Roadmap is a multi-pronged, parallel effort that pairs existing wide-area radio and satellite-based location technology development with dedicated efforts to implement a true dispatchable location solution. It ensures that, even as stakeholders work on implementing dispatchable location, they will also be engaged in the necessary evaluation of vertical location technologies in case they become necessary. The Roadmap also relies on the already in-progress deployment of Observed Time Difference of Arrival ("OTDOA") (a standardized terrestrial beacon technology) and Assisted-Global Navigation Satellite Systems ("A-GNSS").[4] These parallel efforts ensure that stakeholders can hit the ground running with the implementation of alternative standards-based technologies in the unlikely event stakeholders deem that dispatchable location has not progressed as planned at the 36 month assessment.

1. The Roadmap Does Not Exclude Any Candidate Technology.

Contrary to Roadmap detractors, the focus on dispatchable location will not eliminate consideration of other technologies. If it becomes necessary, carriers will be required to supplant dispatchable location methods with alternative location technologies to meet the Roadmap's aggressive benchmarks. Meanwhile, carriers will continue to work on the implementation of OTDOA and A-GNSS into their networks.[5]

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[4] Roadmap §§ 3, 5.

[5] Roadmap §§ 1, 5.

Moreover, any technology vendor is welcome to submit its candidate technology for evaluation in the test bed. The test bed will be designed to allow for an apples-to-apples comparison of various location technologies such as OTDOA, A-GNSS, Radio Frequency Fingerprinting, Uplink-Time Difference of Arrival ("U-TDOA"), and other terrestrial beacon systems. It will also include evaluation of barometric pressure-based altitude methods should vendors who offer such technologies choose to participate in the test bed. The open, transparent, and competitively neutral testing environment will ensure that stakeholders can fully evaluate all potential solutions in common, real-world conditions and morphologies.

2. The Proposed Dispatchable Location Solution Relies on Existing Technologies that Have Been Tested and Are Already in Use in the Commercial Space.

The Roadmap proposes leveraging existing commercial technologies for emergency services, something that has long been a Commission and public safety goal. CSRIC II, chartered in March 2009,[6] and CSRIC III, chartered in March 2011,[7] were both tasked with evaluating emerging location technologies for E911 use, which included evaluating commercially available location based services.[8] In addition, public safety specifically inquired

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[6] Communications Security, Reliability and Interoperability Council II, Charter (filed Mar. 19, 2009), *available at* http://transition.fcc.gov/pshs/docs/advisory/csric/CSRC_charter_03-19-2009.pdf ("CSRIC II Charter").

[7] Communications Security, Reliability and Interoperability Council III, Charter (filed Mar. 18, 2011), *available at* http://transition.fcc.gov/bureaus/pshs/advisory/csric3/CSRIC%20Charter%20Renewal%202011%20FINAL.pdf ("CSRIC III").

[8] Communications Security, Reliability and Interoperability Council II, Working Group 4C, Technical Options of E9-1-1 Location Accuracy, Final Report, at 39-48 (Mar. 14, 2011), *available at* http://transition.fcc.gov/pshs/docs/csric/CSRIC_4C_Comprehensive_Final_Report.pdf (evaluating various commercial technologies, including WiFi and Bluetooth, for E911 location estimates); Communications Security, Reliability and Interoperability Council III, Working Group 3: E9-1-1 Location Accuracy Description, *available at* http://transition.fcc.gov/bureaus/pshs/advisory/csric3/WG%203.pdf (noting that

about the use of cLBS for emergency services at the Commission's location accuracy workshop in November 2013. It is clear that the concept of using cLBS technologies to help mitigate E911 location challenges is not new—the concept has been repeatedly proposed and evaluated in the past, and for good reason. There is now a consensus that the various relevant commercial technologies, as well as handsets and wireless networks, have progressed to the point where it is feasible to leverage commercial methods for wireless emergency location purposes.

In regards to cLBS, WiFi and Bluetooth technologies in particular have already proven their utility, as evidenced by their wide scale deployment and pervasive use for commercial location based purposes in a variety of real-world indoor environments.[9] Leveraging, for the first time, these commercially available solutions for emergency communications ensures that public safety can reap the benefits of those technologies that prove to be viable and most useful in the market. Additionally, as cLBS naturally continues to evolve and improve for market driven reasons, E911 location accuracy will also improve. Incorporating cLBS functionality into emergency calling also cuts down on the risk of expensive stranded investment in technologies that are purpose-built solely for emergency services and are unlikely to evolve due to the lack of a global ecosystem.

Nor is the dispatchable location solution any more contingent on determining the feasibility and viability of various technologies than is the FCC's proposal and those submitted by technology vendors. In fact, the opposite is the case. The Roadmap's dispatchable location plan relies on underlying technologies that are well known, well understood, and widely

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the working group would "explore and make recommendations on methodologies for leveraging commercial location-based services for 9-1-1 location determination").

[9] Note that CSRIC II, WG 4C, evaluated WiFi and Bluetooth for potential 911 applications in the course of preparing their report, which was finalized nearly four years ago.

deployed, in contrast to NextNav's non-standardized, nascent terrestrial beacon system and TruePosition's "updated" U-TDOA system targeted for third and fourth generation networks (for which TruePosition has no commercial deployments in operation[10]).

B. The Roadmap Introduces the Use of Production 911 Call Results for Assessing Performance of Location Methods.

The Roadmap establishes real and reliable metrics for compliance, by calling for carriers to rely on live E911 call data for compliance, in addition to test bed and/or drive test evaluation to determine performance by position source, ensuring that carriers will be held accountable for actual, real-world results. Under the Roadmap, APCO and NENA will be provided quarterly reports from each signatory carrier detailing actual E911 position source yield data, for the first time. Public safety and the Commission have sought this information to resolve position method yield questions, to assess how well a particular location technology performs, and to further increase transparency and accountability.[11] The Roadmap establishes a commitment by carriers

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[10] As T-Mobile has noted in other filings, U-TDOA is also not on the technology path for any carrier. *See* T-Mobile USA, Inc. Comments on Third FNPRM on Location Accuracy, at 17, PS Docket No. 07-114 (filed May 12, 2014) ("Comments of T-Mobile USA, Inc."); T-Mobile USA, Inc. Reply Comments on Third FNPRM on Location Accuracy, at 16, PS Docket No. 07-114 (filed July 14, 2014) ("Reply Comments of T-Mobile USA, Inc.").

[11] *See* Letter from Danita L. Crombach, President, CALNENA, to Chairman Thomas Wheeler, Federal Communications Commission, PS Docket No. 07-114 (filed May 12, 2014) ("CalNENA Ex Parte"); *FNPRM* ¶ 177 ("the E911 Location Accuracy Workshop showed that yield can be a useful tool for assessing how well a particular location technology performs in various challenging environments"); Comments of APCO International in Advance of FCC Workshop on E9-1-1 Phase II Location Accuracy, at 4, PS Docket No. 07-114 (filed Sept. 25, 2013) (noting that "'yield' is extremely important as it would provide a more useful evaluation of the location information that is provided for all wireless calls to 9-1-1" and that "accuracy performance testing should include a consideration of 'yield.'"); CSRIC III, Working Group 3, E9-1-1 Location Accuracy, *Indoor Location Test Bed Report*, 29 (Mar. 14, 2013), *available at* http://transition.fcc.gov/bureaus/pshs/advisory/csric3/CSRIC_III_WG3_Report_March_%202013_ILTestBedReport ("CSRIC III WG3 Indoor Test Bed Report") ("yield levels are one of the key performance indicators that can be monitored on an on-going basis to assess the health of the location system"); *id.* at 31 ("It is

to provide this important and useful location performance information for live 911 calls on an ongoing basis.

There is no question that live 911 call data is the ultimate real-world metric; thus, this unprecedented visibility into what works and what does not for actual 911 calls is in keeping with the collaborative spirit of the Roadmap. When combined with a thorough understanding of the performance provided by each position method used to locate 911 callers—another key component of the Roadmap—public safety and the Commission will have an extremely powerful tool to quantify and track real-world location performance over time.

III. CRITICISMS OF THE ROADMAP PRESENTED BY TECHNOLOGY VENDORS AND THEIR AFFILIATED ORGANIZATIONS ARE MISPLACED AND BASED ON TIMEFRAMES THAT THE LOCATION VENDORS CANNOT THEMSELVES DELIVER.

A. The Roadmap Does Not Rely On Untested Technologies.

Enterprise deployments already successfully use databases to reference the location of WiFi access points and Bluetooth beacons for location of customers, navigation to and management of inventory, and other purposes.[12] In the last six months, in fact, there have been successful demonstrations of use of this technology for 911 purposes.[13] While the Roadmap proposes a secure database on a larger scale and looks to leverage handsets to a larger extent, the concept of using beacons and access points is well established and proven and the steps required for E911 implementation are well understood.

Public Safety's consensus that service providers should account for and provide yield results in a separate report to the FCC upon request.").

[12] *See, e.g.*, Cisco Systems, Inc., *Cisco Location-Based Services Architecture*, WI-FI LOCATION-BASED SERVICES 4.1 DESIGN GUIDE, (MAY 8, 2008), *available at* http://www.cisco.com/c/en/us/td/docs/solutions/Enterprise/Mobility/WiFiLBS-DG/wifich3.html.

[13] *See, e.g.*, Letter from Mary L. Brown, Senior Dir. of Govt. Affiars, Cisco Systems, Inc. and Timothy J. Lorello, Senior Vice President, TCS, to Marlene Dortch, Secretary, Federal Communications Commission, Attachment, PS. Docket No. 07-114 (filed Oct. 21, 2014).

Contrast this to unproven technologies like NextNav's terrestrial beacon system that is currently not standardized or available in any production handset, has yet to be deployed with sufficient beacon density beyond a couple of selected local areas, and will never be deployed ubiquitously across the United States.[14] Similarly, contrast the proposed use of commercial technologies to TruePosition's advocacy for its U-TDOA solution, which has only been used with limited accuracy in second generation networks, as yet does not work with Long Term Evolution ("LTE") systems or with modernized base station physical antenna configurations, and does not provide a vertical component.[15] And, of course, neither technology is capable of providing a dispatchable location for first responders, instead providing only latitude and longitude (and, in the case of NextNav, perhaps vertical coordinates) within a search radius of many tens of meters.

Furthermore, unlike some of the alternative solutions on the record, the technologies that the Roadmap relies on, e.g., WiFi, Bluetooth, and OTDOA, are already widely deployed or soon will be. For example, there are over 124 million WiFi access points distributed throughout the US, with urban and suburban areas being particularly covered[16]—the very areas where dispatchable address are most useful. That number will only grow. Bluetooth beacons are also

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[14] *See* Reply Comments of T-Mobile USA, Inc., Exhibit 1, at 14; *see also* Letter from Bruce A. Olcott, Counsel, NextNav, to Marlene Dortch, Secretary, Federal Communications Commission, at 7, PS Docket No. 07-114 (filed May 12, 2014) ("NextNav Ex Parte").

[15] *See* Reply Comments of T-Mobile USA, Inc., at 21-22.

[16] Letter from H. Russell Frisby, Jr., Counsel, Telecommunication Systems, Inc., to Marlene Dortch, Secretary, Federal Communications Commission, PowerPoint Presentation, PS. Docket No. 07-114 (filed May 8, 2014).

growing in ubiquity[17] and are now being included in light bulbs[18] and wall sockets.[19] Clearly, the sheer volume of WiFi access points and Bluetooth beacons that are part of the Roadmap belies critics' assertions that such technologies are untested. In fact, they are some of the most tested and mature commercial location technologies in the marketplace today.

B. The Roadmap Follows the Industry Trajectory Toward LTE.

The Roadmap is a forward-looking improvement upon the Commission's proposals, not a backward movement from existing commitments or a watered down version of what the Commission proposed in the *FNPRM*, as critics claim. It leverages the fact that LTE standards, for the first time, incorporate simultaneous positioning methods, which allows deployment of very powerful combinations of location techniques within a given time period (*i.e.*, within 30 seconds). These new techniques also include the introduction of OTDOA, which is designed for and specifically integrated into the LTE radio network to ensure sufficient "hearability" of surrounding basestations, even in challenging environments.

Carriers are already incented to quickly move to LTE and Voice over LTE ("VoLTE") to maximize efficient use of spectrum. In fact, T-Mobile was the first US wireless carrier to launch

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[17] *See generally*, Claire Swedberg, *Simon to Implement Bluetooth Beacons at 240 Malls, Outlets*, RFID JOURNAL (Sept. 2, 2014), http://www.rfidjournal.com/articles/view?12144; Kevin Fitchard, *Mobiquity Switches on its Bluetooth Beacon Network Covering 100 U.S. Malls*, GIGAOM (Mar. 25, 2014), https://gigaom.com/2014/03/25/mobiquity-switches-on-its-bluetooth-beacon-network-covering-100-u-s-malls/.

[18] Lyndsey Gilpin, *How GE Created Smart Lights by Integrating Beacons into LEDs*, TECHREPUBLIC, (June 6, 2014), http://www.techrepublic.com/article/how-ge-created-smart-lights-by-integrating-beacons-into-leds/.

[19] Letter from Emmanuel Azih, Jr., Founder, SmarterSocket, to Marlene Dortch, Secretary, Federal Communications Commission, at 1, PS Docket No. 07-114 (filed Sept. 19, 2014).

a nationwide VoLTE network on July 31, 2014.[20] T-Mobile will continue to broaden VoLTE service with planned expansion of its LTE coverage. In other words, criticism of the Roadmap based on the issue of handset migration rings hollow. In the timeframe envisioned by the Roadmap, carriers will largely move their subscriber base to VoLTE and VoLTE-capable handsets. In addition, while the Roadmap does rely on carriers making VoLTE-capable handsets with dispatchable location functionality available and on consumer adoption of new handsets, the requirement for handset turnover is equally true for other technologies that hold any hope of meeting the Commission's proposed accuracy benchmarks.[21]

It is particularly critical, given the focus on z-axis information in the record, that the Commission note that *all* vertical technologies would require handset changeout—changeout which can only occur once those technologies have been standardized, integrated into devices, and tested to validate they provide viable vertical information.[22] Considering the need to create standards, integrate technology into handset designs, and complete validation testing prior to offering devices commercially, the timelines associated with implementing vertical solutions

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[20] John Legere, President and CEO, T-Mobile, *Firing On All Cylinders*, T-MOBILE ISSUES & INSIGHTS BLOG (July 31, 2014), http://newsroom.t-mobile.com/issues-insights-blog/firing-on-all-cylinders-earnings-jdp.htm?AID=11031750&PID=6147683&SID=1gtc6nq475kts.

[21] U-TDOA and RF Fingerprinting would not require handset changeout, but these are not high accuracy solutions. RF Fingerprinting proved highly inaccurate in the CSRIC III indoor test bed, with accuracy further degrading with increased height of the caller in multi-story buildings. U-TDOA was withdrawn from the CSRIC III test bed before it could be formally evaluated, but will never be more accurate than OTDOA which is already part of the Roadmap commitment. In addition, U-TDOA is impractical to deploy on modern radio access networks, and neither U-TDOA nor RF Fingerprinting include a vertical component.

[22] It is important to note that implementation of NextNav's proposed technology would also require handset changeout for either vertical or horizontal estimates, since it would require new control plane signaling of barometric pressure data for vertical estimates, and a new RF front-end and GPS chipset to receive and process signals from their terrestrial beacon network for both vertical and horizontal estimates.

other than dispatchable location will far exceed those in the Commission's proposed rules; the Roadmap is the only proposal that realistically aligns with what the Commission proffered.

In contrast, it is far more likely that even low-end handsets will continue to incorporate Bluetooth (for example to enable hands-free use) and WiFi functionality rather than more specialized capabilities such as barometric pressure sensors.[23] The ability to use Bluetooth and/or WiFi information for E911 dispatchable locations will therefore require only new software functionality in handsets, once the necessary standards work is completed, enabling continued availability of low-end price point handsets. Similarly, near-term technologies like OTDOA and expanded A-GNSS capability are already being incorporated into handsets. These transitions are underway and unlike other proposed solutions on the record, introduce no additional delay in making improved location accuracy available to public safety.

C. Dispatchable Location Provides the Ultimate Vertical Location.

A dispatchable location provides the ultimate vertical location—its very definition includes necessary and actionable height information for multi-story structures. Dispatchable locations will be provisioned to provide not only street address but also floor and/or unit numbers where necessary. This is a significantly better result for first responders than what the Commission has proposed. Even if vendors were able to achieve the proposed accuracy standards, these latitude/longitude and altitude estimates would often direct first responders to the wrong floor or even the wrong building.[24] By providing a provisioned, actionable location of a caller, including identifying information such as apartment number or floor level, the Roadmap's dispatchable location solution should obviate the need to provide independent

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[23] All handsets offered by T-Mobile today have WiFi functionality.

[24] CSRIC III WG3 Indoor Test Bed Report at 39 (noting that only about one third of the time did the most accurate technology tested [NextNav] place the caller in the correct building).

altitude information—the provision of which comes with a myriad of technical and operational issues, including estimating the altitude and converting the altitude estimate into an actionable description for first responders.

Those parties that incorrectly criticize the Roadmap for ignoring public safety's long-held desire for vertical information completely overlook the fact that the provision of a dispatchable location is most useful for first responders. Public safety has been very clear—the ultimate goal for wireless E911 is dispatchable location.[25] Vertical location estimates are just that, estimates, and even accurate estimates are subject to substantial additional error when reverse geocoded to provide public safety a location to dispatch to. By contrast, a dispatchable location allows 911 call takers and first responders to directly know where the call originated. Hence, the Roadmap rightfully focuses on the proposed dispatchable location solution as the primary method for wireless E911 because that solution will have the greatest benefit for public safety and for consumers.

D. Critics Present a False Dilemma in Contrasting a Choice Between the Benchmarks and Timelines Proposed by the Commission and those in the Roadmap.

Some entities have complained that the Roadmap's benchmarks will delay carrier action for years, by establishing benchmarks and timelines that are much longer than those proposed by the Commission.[26] That is simply not correct; the Roadmap's benchmarks are aggressive and closely align with what the Commission proposed. Moreover, it is absolutely critical that those

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[25] *See, e.g.*, Reply Comments of the National Emergency Number Association, at 15, PS Docket No. 07-114 (filed July, 2014); Texas 9-1-1 Entities Reply Comments on the Third Further Notice of Proposed Rulemaking, at 2, PS Docket No. 07-114 (filed July 14, 2014); Reply Comments of APCO, at 1, PS Docket No. 07-114 (filed July 14, 2014).

[26] *See* CalNENA Ex Parte; NextNav Ex Parte; Letter from James Arden Barnett, Jr., Counsel, TruePosition, Inc., to Marlene Dortch, Secretary, Federal Communications Commission, PS Docket No. 07-117 (filed July 26, 2013).

entities—and the Commission—recognize that the Commission's proposed rules and benchmarks *do not result in a dispatchable location for first responders*—the stated goal of both public safety and the Commission. It is also clear from the record in this proceeding that the Commission's proposed timeframes and location accuracy benchmarks are infeasible.[27] Given the need for standards work as well as the necessary development, manufacturing, installation, and integration work required to adopt any new technology that might facilitate improved location accuracy, the Commission's two-year and five-year benchmarks for horizontal location accuracy and three-year and five-year benchmarks for vertical location accuracy simply cannot be achieved.

The simple fact is that rules that force the adoption of new and unproven technologies will in no way facilitate a rapid positive impact on public safety. For instance, when the Commission imposed new location accuracy requirements in 1999, carriers scrambled to identify a workable path to compliance, including adopting what was then a new and unproven technology (U-TDOA) because it promised high accuracy and rapid implementation. But U-TDOA proved incapable of meeting mandated accuracy standards unless averaged over a carrier's national coverage footprint, and carriers found themselves unable to meet the

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[27] *See, e.g.*, Comments of T-Mobile USA, Inc.; Reply Comments of T-Mobile USA, Inc.; Comments of AT&T, at 7-9, PS Docket No. 07-114, (filed May 12, 2014); Comments of Cisco Systems, Inc., at 3, PS Docket No. 07-114, (filed May 12, 2014); Comments of CTIA—The Wireless Association, at 7-8, PS Docket No. 07-114, (filed May 12, 2014); Comments of Qualcomm Incorporated, at 7, PS Docket No. 07-114 (filed May 12, 2014); Comments of Sprint Corporation, at 11-12, PS Docket No. 07-114 (filed May 12, 2014); Comments of Verizon and Verizon Wireless, at 17, PS Docket No. 07-114, (filed May 12, 2014); Reply Comments of Competitive Carriers Association, at 6, PS Docket No. 07-114, (filed July 14, 2014); Reply Comments of Motorola Mobility, LLC, at 2, PS Docket No 07-114, (filed July 14, 2014). Note that even technology vendors acknowledge that some of the Commission's timeframes are unrealistic. For instance, NextNav does not advocate that all handsets meet new benchmarks within two years, only that they must be available. *See* Reply Comments of NextNav, LLC, at 28, PS Docket No. 07-114 (filed July 14, 2014).

Commission's location accuracy mandate.[28] The result was a series of waivers, consent decrees, lawsuits, and modifications to the Commission's original timelines, to the detriment of consumers and public safety. Looking back on the history of this process, it is clear that the arbitrary mandate, with unrealistic timelines and ahead of any identified location technology capable of compliance, actually delayed by many years the eventual adoption and benefit of high-accuracy A-GPS for many 911 callers. Rather than risk history repeating itself, the Commission would be better served by leveraging existing technologies that are already proven and widely adopted—which is precisely what the Roadmap proposes.

The Roadmap defines an aggressive, ambitious, yet feasible approach to real improvements as quickly as possible for both consumers and first responders. It strikes the right balance between pushing technological limits and aligning emergency services with commercial services, thereby reaching the end goal of public safety—a dispatchable location for indoor wireless E911 calls. The Roadmap is unique in that its framework necessarily envisions establishing a cooperative effort between carriers, public safety, and other stakeholders to work together to resolve remaining obstacles to significantly improving wireless E911 location accuracy. Along the way, it implements enforceable metrics for assessing performance, takes into account and resolves legitimate unknowns, and requires alternate solutions should the primary path prove unworkable.

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[28] Interestingly, carriers initially hoped to implement A-GPS technology, though it was at the time untested for wireless 911 purposes. Carriers chose other technologies, including U-TDOA, out of a concern that they would be unable to meet the handset turnover benchmarks established in those early rules. After years of dedicated effort and substantial investment in those other technologies, carriers eventually found themselves transitioning to A-GPS in order to meet county-level compliance requirements.

IV. CONCLUSION

The Roadmap represents a groundbreaking consensus between wireless carriers and public safety to adopt a framework that will lead to the gold standard in location accuracy improvement—dispatchable location. It proposes realistic but also ambitious timeframes for technology-neutral evaluation and implementation of alternative technologies. And it provides remarkable transparency and visibility into location accuracy by adopting performance-based metrics and giving public safety access to live 911 yield data for the first time. T-Mobile encourages the Commission to support this alternative proposal as it moves forward with E911 location accuracy.

Steve B. Sharkey
Eric Hagerson
T-MOBILE USA, INC.
601 Pennsylvania Ave., NW
Washington, D.C. 20004
(202) 654-5900

John T. Nakahata
Kristine Laudadio Devine
HARRIS, WILTSHIRE & GRANNIS LLP
1919 M. Street, NW, Eighth Floor
Washington, D.C. 20036
(202) 730-1300

Counsel to T-Mobile USA, Inc.

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