

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

In the Matter of)	
)	
Wireless E911 Location Accuracy Requirements)	PS Docket No. 07-114
)	
E911 Requirements for IP-Enabled Service Providers)	WC Docket No. 05-196
)	

COMMENTS OF AT&T INC.

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EXECUTIVE SUMMARY

AT&T Inc. (“AT&T”) supports the Commission’s efforts to enhance E911 service—and specifically, the rigorous, location accuracy rules recently adopted in the *Second Report and Order* (“*R & O*”). The new requirements grew out of unprecedented consensus-building between the FCC, public safety, manufacturers, and carriers, and present an aggressive yet balanced approach to improving location accuracy. While the requirements will necessitate significant investment and impose operational challenges for wireless providers over an eight-year implementation period, they promise the highest degree of location accuracy ever available. In light of these new requirements, the Commission should refrain from further modification of the 911 and E911 rules and enable carriers to focus on satisfying the demanding location accuracy requirements the Commission just adopted.

The *FNPRM* is premature and unwarranted in light of the *Second R&O*. Many of the proposals advanced have very recently been considered and rejected. For example, the *FNPRM*’s proposal to mandate specific location accuracy technologies or a single accuracy standard should be rejected. Mandating a specific technology or standard would prevent carriers from implementing E911 solutions that fully leverage their unique network characteristics and would stunt future competition between E911 solution vendors. Moreover, the use of a single accuracy standard or the new technologies described in the *FNPRM* is not technically or economically feasible at this time. Similarly, the Commission should not make mandatory the location accuracy testing guidelines of OET Bulletin 71. The OET Bulletin itself states that “it is not intended to establish mandatory procedures.” And converting the OET Bulletin into a mandate would not provide the flexibility necessary to address differences in technology, topology, and terrain.

Proposals for new, forward-looking requirements are also premature. The Commission should not adopt new requirements for 4G location accuracy or enhancing location accuracy in challenging environments. Work to address these challenges is ongoing and no potential solution is ripe for general adoption. These issues are better addressed by an E911 Technical Advisory Group. With respect to roaming, at least in the case of GSM carriers, it is not clear that a problem in locating roamers exists that requires a regulatory solution.

However, there are before the Commission proceedings that present “low hanging fruit” and afford the Commission a near term opportunity to materially improve location accuracy. Unauthorized signal boosters are a present day interference problem for both public safety and commercial wireless communications, routinely blocking and degrading wireless calls, including 911 calls. Granting the relief wireless carriers have requested in the ongoing signal booster proceeding would materially improve public safety. In addition, LightSquared has proposed a modification to its Ancillary Terrestrial Component (“ATC”) authorization that NTIA, the U.S. GPS Industry Council, and wireless carriers have indicated significantly increases the possibility of interference to GPS, including GPS receivers in wireless handsets used in establishing the location of 911 callers. Ensuring that the LightSquared ATC modification proceeding is resolved in a manner that protects GPS would also improve public safety.

The proposals contained in the *NOI* also are premature and raise serious concerns. Specifically, the Commission should not impose ALI requirements on interconnected VoIP providers at this time. Interconnected VoIP providers already are subject to significant E911 obligations. Moreover, no technology currently exists that supports ALI functionality for VoIP. The Commission also should refrain from modifying its E911 rules to regulate the use of emerging network technologies—such as femtocells and picocells—that CMRS providers

leverage to increase network coverage. How widely these technologies will be adopted and used remains an open question. In light of the rigorous, new location accuracy requirements adopted in the *Second R&O*, consideration of new requirements for these emerging technologies is premature.

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I. INTRODUCTION

AT&T Inc., on behalf of itself and its affiliates (“AT&T”), hereby submits comments in response to the Federal Communications Commission’s (“FCC” or “Commission”) Further Notice of Proposed Rulemaking (“*FNPRM*”) and Notice of Inquiry (“*NOI*”) (together, “*Notice*”) in the above-referenced proceeding.¹ The *Notice*—released with the companion *Second Report and Order* (“*Second R&O*”)²—explores how to further improve the location capability of 911 and E911 services for existing and new voice communications technologies, including new broadband technologies. These comments are divided into two parts: the first section addresses issues raised in the *FNPRM* about CMRS, and the second section addresses issues raised in the *NOI* about VoIP and next generation technologies. As detailed below, AT&T applauds the Commission’s drive to enhance E911 service—and specifically, the rigorous, new requirements

¹ *Wireless E911 Location Accuracy Requirements; E911 Requirements for IP-Enabled Service Providers*, Further Notice of Proposed Rulemaking and Notice of Inquiry, PS Docket No. 07-114, WC Docket No. 05-196, FCC 10-177 (2010) (“*Notice*”).

² *Wireless E911 Location Accuracy Requirements*, Second Report and Order, PS Docket No. 07-114, FCC 10-176 (2010) (“*Location Accuracy Second Report and Order*” or “*Second R&O*”).

adopted in the *Second R&O*.³ AT&T intends to continue to assist the Commission in strengthening E911 services going forward. For now, however, the Commission should refrain from significant modifications to the 911 and E911 rules and give communications providers time to meet the demanding location accuracy requirements it just adopted.

II. GIVEN THE RIGOROUS E911 RULES ADOPTED IN THE *SECOND R&O*, IT IS PREMATURE TO CONSIDER ADOPTING NEW E911 REQUIREMENTS FOR WIRELESS PROVIDERS AT THIS TIME.

AT&T strongly supports the public interest objective of providing first responders with fast and accurate information regarding the location of wireless subscribers making emergency calls. For this reason, AT&T played a major role in formulating the rigorous, consensus-based location accuracy requirements that the Commission recently adopted in the *Second R&O*.⁴

³ As the Commission has previously stated, 911 service is critical to our nation's ability to respond to a host of crises, and AT&T firmly believes that the *Second R&O*'s requirements will help "ensure that Americans have access to the most forward-thinking technologically advanced emergency response systems in the world." *Notice* at ¶ 1; *see also Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, 11 FCC Rcd 18676, ¶ 5 (1996) ("E911 saves lives and property by helping emergency services personnel do their jobs more quickly and efficiently."); *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems; Amendment of Parts 2 and 25 to Implement the Global Mobile Personal Communications by Satellite (GMPCS) Memorandum of Understanding and Arrangements; Petition of the National Telecommunications and Information Administration to Amend Part 25 of the Commission's Rules to Establish Emissions Limits for Mobile and Portable Earth Stations Operating in the 1610-1660.5 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 18 FCC Rcd 25340, ¶ 1 (2003) ("As many citizens, elected representatives, and public safety personnel recognize, 911 service is critical to our Nation's ability to respond to a host of crises.").

⁴ The new, consensus-based wireless E911 rules are based on the consensus proposals of NENA, APCO, AT&T, Verizon Wireless, and Sprint Nextel. *See* Letter from Brian Fontes, CEO, NENA, Robert M. Gurss, Director, Legal & Gov't Affairs, APCO, and Robert W. Quinn, Jr., SVP – Federal Regulatory, AT&T, to Marlene Dortch, Secretary, FCC (filed Aug. 25, 2008); Letter from Joan Marsh, Vice President – Federal Regulatory, AT&T, to Marlene H. Dortch, Secretary, FCC, at 2 (filed Sept. 5, 2008); Letter from Brian Fontes, CEO, NENA, Robert M. Gurss, Director, Legal & Gov't Affairs, APCO, and John T. Scott, III, VP & Deputy General Counsel, Verizon Wireless, to Kevin J. Martin, Chairman, FCC, at 1 (filed Aug. 20, 2008); Letter from Anna M. Gomez, Vice President, Federal and State Regulatory and Lawrence R. Krevor, Vice President, Spectrum, Sprint Nextel Corporation, to Kevin Martin, Chairman, FCC

These requirements represent the culmination of a long and contentious proceeding—spanning close to three years and involving a court appeal and voluntary remand.⁵

In light of this history and wireless carriers’ focus on satisfying the new requirements in the *Second R&O*, consideration of new and additional requirements is not appropriate at this time.⁶ Indeed, a Commission policy that pursues continual refinement of location accuracy without consideration of the cost-benefit trade-offs risks misallocating resources that could yield

(filed Aug. 21, 2008); Letter from John T. Scott, III, Vice President and Deputy General Counsel – Regulatory Law, Verizon Wireless, to Marlene H. Dortch, Secretary, FCC, at 1-2 (filed Sept. 5, 2008); Letter from Robert M. Gurss, Director, Legal and Governmental Affairs, APCO International, and Brian Fontes, Chief Executive Officer, NENA, to Marlene Dortch, Secretary, FCC, at 1 (filed on Sept. 9, 2008). The Commission readily acknowledges that these joint proposals—on which the new rules are based—“reflect[] agreement among leading 911 stakeholders for new E911 accuracy requirements for both handset-based and network-based location technologies.” *Second R&O* at ¶ 11.

⁵ This proceeding began with the *2007 Location Accuracy NPRM*, in which the Commission tentatively concluded that wireless licensees should meet the Phase II Section 20.18(h) location accuracy requirements at a “PSAP service area level.” *Wireless E911 Location Accuracy Requirements*, Notice of Proposed Rulemaking, 22 FCC Rcd 10609, ¶¶ 8-19 (2007) (“*Location Accuracy NPRM*”). Despite significant record evidence that imposing a PSAP service level requirement would be unlawful and unsound public policy, the Commission adopted the tentative conclusion in November 2007. *Wireless E911 Location Accuracy Requirements*, First Report and Order, 22 FCC Rcd 20105, ¶ 8 (“*First Report and Order*”). Several carriers—including AT&T—filed Motions for Stay with the Commission. See AT&T Motion for Expedited Stay Pending Judicial Review (filed Feb. 29, 2008); Sprint Nextel Motion for Stay (filed Jan. 28, 2008); T-Mobile Application for Expedited Stay (filed Jan. 28, 2008); Rural Cellular Association Motion for Stay *Pendente Lite* (filed Jan. 28, 2008); Alltel Corporation Response in Support of Motions for Stay (filed Feb. 4, 2008); Verizon Wireless Request for Stay Pending Judicial Review (filed Feb. 8, 2008). Carriers and trade associations also filed petitions for review with the United States Court of Appeals for the District of Columbia Circuit seeking stay of the rules. On March 25, 2008, the court stayed the PSAP service area requirement. *Rural Cellular Association and T-Mobile USA, Inc. v. Federal Communications Commission and the United States of America*, No. 08-1069, slip op. at 1 (D.C. Cir. Mar. 25, 2008) (per curiam).

⁶ The heart of the new consensus requirements is an aggressive eight-year implementation schedule for increasing location accuracy to a county or PSAP level, which the Commission believes “will provide public safety agencies with necessary information during emergencies, and benefit consumers, in a manner that is technologically achievable.” *Second R&O* at ¶ 11.

more public safety benefit when applied elsewhere. While the new requirements in the *Second R&O* will necessitate significant investment, they promise the highest degree of location accuracy ever available. In contrast, and as detailed below, additional tightening of the location accuracy requirements⁷—and the commensurate costs to providers—would not provide similar value for the public. That additional requirements are not needed at this time is reflected by the lack of concrete proposals in the *FNPRM*. Instead of providing specific proposals, the *FNPRM* poses a large number of broad questions in a style similar to the accompanying *NOI*. In fact, many of the proposals relate to technologies or capabilities not yet in existence.

As detailed below, if the Commission nevertheless believes that additional E911 requirements warrant consideration at this time, it should establish an E911 Technical Advisory Group (“ETAG”) to address potential modifications to E911. The ETAG concept—which interested stakeholders have championed for several years⁸—offers the best and most constructive path towards improved E911 accuracy. The ETAG—which would include

⁷ The Commission seeks comment on a number of issues, including: whether it should consider more stringent location parameters in Section 20.18(h) of the Commission’s rules, which specifies the standards for wireless E911 Phase II location accuracy and reliability; what methodology carriers should employ to verify compliance, both initially and during ongoing testing; the format in which accuracy data should be automatically provided to PSAPs; how to address location accuracy while roaming; how location information and accuracy can be improved in more challenging environments; and whether location accuracy standards should include an elevation (Z-axis) component.

⁸ See, e.g., Comments of AT&T, Inc, PS Docket 07-114 (filed July 5, 2007); Reply Comments of AT&T, Inc., PS Docket No. 07-114 (filed July 11, 2007); Comments of AT&T, Inc., PS Docket No. 07-114 (filed Aug. 20, 2007); Comments of the National Emergency Number Ass’n, PS Docket No. 07-113, at 3 (filed Aug. 20, 2007); Comments of Rural Telecomm. Group, Inc., PS Docket No. 07-114, at 10 (filed Aug. 20, 2007); Comments of Telecomm. Indus. Ass’n, PS Docket No. 07-114, at 9 (filed Aug. 20, 2007); Comments of Texas 911 Alliance and Texas Comm. on State Emergency Commun’cns, PS Docket No. 07-114, at 2 (filed Aug. 20, 2007); Comments of Texas Instruments, Inc., PS Docket No. 07-114, at 6 (filed Aug. 20, 2007); Comments of Wireless Communc’ns Ass’n, PS Docket No. 07-114, at 14-15 (filed Aug. 20, 2007).

representatives from all sectors of the industry, including public safety, carriers, industry standards organizations, and technology vendors—would work cooperatively and expeditiously to define industry direction to enhance location accuracy and to improve the manner in which location accuracy is measured. The ETAG would also evaluate the feasibility and capabilities of emerging E911 location accuracy technologies while leaving decisions regarding technology choice to individual carriers or manufacturers subject to market forces. Perhaps most important, the ETAG—counterbalanced with input from all sides—would base its decisions on hard data, preferably data compiled during real world tests identifying technically and commercially feasible solutions.

A. The Commission Should Not Mandate Specific Location Accuracy Technologies or a Single Location Accuracy Standard, But Should Promote Additional Research and Development of a Variety of Technologies Through the ETAG.

The Commission should adhere to the distinct network-based, handset-based, and hybrid location accuracy standards adopted in the *Second R&O* instead of mandating specific location accuracy technologies or a single accuracy standard. As detailed below, mandating a specific technology or standard would prevent carriers from implementing E911 solutions that fully leverage their unique network characteristics and would stunt future competition between E911 solution vendors. Moreover, the use of a single accuracy standard or the new technologies described in the *FNPRM* is not technically or economically feasible at this time. Rather than considering new regulatory requirements, the Commission should call on the ETAG to promote research and development of future E911 solutions.

As the Commission has recognized, carriers are best-positioned to determine which location technologies are most compatible with their networks,⁹ and competition among location technology vendors continues to produce new developments. Network- and handset-based technologies each have merits depending on the environments in which they are deployed.¹⁰ Requiring implementation of specific technologies or a single standard at this time jeopardizes innovation in location technology and, as a result, the pace at which location accuracy improves. The Commission itself has made clear that its “intent is not to mandate the use of any particular technology, only to allow the broadest range of technologies a reasonable opportunity to compete.”¹¹ The Commission has further explained that “[n]etwork-based, handset-based, hybrid, or some other new or combined Automatic Location Information (“ALI”) technology may prove to be most effective generally or in specific situations.”¹² Adopting new regulatory requirements that mandate specific technologies or a single accuracy standard would run counter to this longstanding approach. Accordingly, the Commission should allow technology and standards to evolve over the eight-year implementation period and consider a single standard or technology only after full implementation of the *Second R&O*’s provisions.

Notably, the use of a single accuracy standard or the new technologies raised in the *Notice* is not technically or economically feasible at this time. Despite the claims of certain

⁹ See *Revision of the Commission’s Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, Third Report and Order, 14 FCC Rcd 17388, ¶ 32 (1999) (“*Third Report and Order*”) (revising E911 rules to allow wireless carriers to choose whether to use handset-based or hybrid solutions in addition to network-based solutions in order to speed actual implementation of E911 and promote competition in E911 location technology and service).

¹⁰ *Notice* at ¶ 18.

¹¹ *Third Report and Order* at ¶ 32.

¹² *Id.*

vendors, there is no location technology available to improve accuracy that does not require further research and development and that can be implemented in a timely, cost effective manner. Based on AT&T's experience, the available technologies currently promoted by certain manufacturers do not significantly improve accuracy and would require further review before they could seriously be considered. Several vendors propose adding additional components to handsets, which would take years to implement without any meaningful and proven improvement in accuracy. Still others have suggested integrating a network-based technology with handset-based AGPS, which would require significant changes in the AGPS handset solution, again without any proven benefit.

Implementing the proposed new technologies would also pose significant challenges. Available technologies cannot be incorporated immediately into networks in a practical manner. In addition to requiring handset changes, such technologies often require changes at the network level, including to cell sites, and may potentially require enhancement of PSAP networks as well (e.g., evolution to NG9-1-1). Even if these technologies were cost effective and offered significantly improved accuracy, national implementation would present the same challenges as the implementation that will take place pursuant to the requirements of the *Second R&O*.

Despite these challenges, development work to improve location accuracy is ongoing, and includes efforts by AT&T and other carriers, national and global standards bodies, and manufacturers. In particular, hybrid solutions that run two or more location technologies simultaneously show promise and warrant further study. Such technologies do not merge the raw data from two or more technologies into an integrated location fix but rather select the most accurate location fix from multiple outputs.

If the Commission ultimately believes that use of specific technologies or a single accuracy standard—for the period after carriers complete the *Second R&O*'s eight-year implementation schedule—requires present consideration, it is best addressed by the ETAG.¹³ As detailed above, the ETAG would be the most effective forum for the neutral testing and evaluation of location accuracy technologies. The ETAG—as a result of the competing interests of its constituents—would not be invested in the success or failure of a particular technology and would enable the Commission to base any future regulatory requirements on actual, real-world data—not the unsupported claims of vendors. Moreover, the ETAG would be able to leverage important standards development work of existing standards bodies already considering these issues.

B. The Commission Should Not Convert The OET Bulletin No. 71 Guidelines into Requirements, Nor Should It Impose A Mandatory Testing Schedule.

The Commission should not make mandatory the location accuracy testing recommendations of OET Bulletin 71 (“OET Bulletin”). The OET Bulletin itself states that “*it is not intended to establish mandatory procedures*” (emphasis in original) but rather to “provid[e] guidance” as technology develops.¹⁴ Further, a number of challenges make converting the OET Bulletin into rules inappropriate. First, the OET Bulletin calls for end-to-end testing, which

¹³ Additionally, commercial location based service (“LBS”) applications should be reviewed to determine if they have utility in a secondary or tertiary role supporting a primary E911 location technology as part of a multiple-technology, hybrid solution. But the Commission should be very careful about breaching the wall between E911 location technology and commercial LBS applications. Wireless carriers are prohibited by statute from using, disclosing, or accessing E911 location information for non-emergency or commercial purposes. *See* Wireless Communications and Public Safety Act of 1999 § 5(f), Pub. L. No. 106-81, 113 Stat. 1286 (1999) (amending 47 U.S.C. § 222 to state that a customer will not be considered to have approved the use, disclosure or access to call location information other than for emergency services purposes).

¹⁴ OET Bulletin No. 71, “Guidelines for Testing and Verifying the Accuracy of Wireless E911 Location Systems,” FCC, at 2 (Apr. 12, 2000).

necessarily requires the participation of PSAPs.¹⁵ However, state budget tightening has produced PSAP funding challenges that often preclude their participation in testing: challenges that will only increase with the new county-level accuracy requirements. In California, for example, the California Highway Patrol (“CHP”) suspended all E911 testing because of budget cuts impacting staffing and the CHP’s ability to carry out its core public safety mission. The CHP’s experience is comparable to public safety agencies in many states. Making the OET Bulletin mandatory at this time could place carriers in a situation in which regulatory compliance is virtually impossible because of the inability of PSAPs to participate in testing where PSAP participation is a necessary pre-condition for meaningful tests. Second, the OET Bulletin—because it was released long before the *Second R&O*—suggests in some instances that the appropriate geographic area for location accuracy testing is a PSAP’s coverage area (*i.e.*, testing at the PSAP-level¹⁶ or in even smaller areas).¹⁷ Obviously, this conflicts with the county-level location accuracy requirements recently adopted in the *Second R&O*. Third, the OET Bulletin methodology is not appropriate for all environments and situations. Converting the OET Bulletin into a mandate would not provide the flexibility necessary to address differences in technology, topology, and terrain.

AT&T also objects to the *FNPRM*’s proposal to increase the number of indoor test calls to 30%. AT&T agrees with Qualcomm that the location accuracy “mandate has always covered

¹⁵ *Id.* at 3 (explaining that “only completed calls should be included in test statistics. In other words, ALI accuracy data should be calculated only for completed 911 calls”).

¹⁶ *Id.* at 4 (“Thus, testing may initially cover an urban core and later extend to the response area of a local PSAP.”).

¹⁷ *Id.* (“Accuracy tests may be based on the coverage area of local PSAPs that request Phase II deployment.”).

67% and 95% of the calls to 911, period.”¹⁸ The current location accuracy rules do not distinguish between indoor and outdoor calls, nor should testing standards. Practically speaking, AT&T already finds it difficult to conduct outdoor testing on private property. AT&T expects that gaining indoor building access for testing purposes will be even more difficult. In fact, obtaining access to the number of indoor sites required to meet a 30% standard may be impossible.

Nor should the Commission impose a mandatory testing schedule or require that carriers file compliance and maintenance testing data with specific parties. The *NPRM*'s discussion of these topics ignores the Commission's decision in the *Second R&O* to trend uncertainty data to validate accuracy in an on-going manner. The *Second R&O* goes as far as stating that on-going accuracy testing is not required: “Once a carrier has established baseline confidence and uncertainty levels in a county or PSAP service area, ongoing accuracy shall be monitored based on the trending of uncertainty data and additional testing shall not be required.”¹⁹

Rather than imposing new regulations, an ETAG subcommittee should be formed to address these issues. It is important to note, however, that considerable work has already been done in this area that an ETAG could leverage. The Alliance for Telecommunications Industry Solutions (“ATIS”), through its Emergency Services Interconnection Forum (“ESIF”), has issued a number of reports involving location accuracy compliance testing.²⁰ These reports, which were

¹⁸ Comments of Qualcomm Incorporated, PS Docket 07-114, at 5 (filed Aug. 20, 2007).

¹⁹ *Second R&O* at ¶ 41.

²⁰ See, e.g., ATIS Technical Report, “Approaches to Wireless E9-1-1 Indoor Location Performance Testing,” ATIS-0500013; ATIS Technical Report, “Maintenance Testing,” ATIS-05000010; ATIS Technical Report, “Location Technology Performance Data: Define Topologies & Data Collection,” ATIS-0500011.

developed with the participation of the National Emergency Numbering Association (“NENA”), should be the starting point for ETAG evaluation.²¹

C. Other Forward-Looking Issues Raised By The *Notice* Should Be Addressed By The ETAG, Not the Commission.

The Commission also should rely on the ETAG for other forward-looking issues that are not ripe for Commission consideration at this time. A few specific areas for ETAG inquiry stand out. First, the ETAG—not the Commission—should study how to improve location accuracy in “challenging environments,” which the *FNPRM* describes as “indoor settings, urban canyons, buildings including high-rises, rural environments characteristic of heavy forestation, mountainous terrain, or sparsely located wireless towers.”²² As detailed above, the Commission’s approach in the *Second R&O* was to avoid being overly prescriptive and to provide carriers the flexibility they need to implement E911 location accuracy requirements in the real world, for example, by permitting carriers to exclude counties based on heavy forestation. The Commission should maintain this reasonable and recently-adopted approach, and leave it to the ETAG to study this issue further.

Ultimately, market forces—including competitive-incentives to improve coverage—will drive improvements in location accuracy in challenging environments. AT&T’s own experience supports this conclusion. For example, AT&T’s 3G Microcell service—which uses a femtocell to extend in-home cellular—shows great promise in improving indoor location accuracy. A call from a 3G Microcell will provide an accurate Master Street Address Guide (MSAG)-validated address and geographic coordinates (based on the femtocell location) for the call. It will

²¹ See ATIS: Emergency Services Interconnection Forum Home Page, *available at* <http://www.atis.org/esif>.

²² *Notice* at ¶ 22.

generally exhibit superior accuracy, relative to a regular indoor mobile call using the macrocellular network. The impact of technology ultimately will depend on consumer adoption, and the extent to which users will dial 9-1-1 from the premises where the devices are located.

Second, the Commission should not establish distinct location accuracy standards for 4G services.²³ Already, the 4G standards groups have been working with AGPS and Observed Time Difference of Arrival (“OTDOA”).²⁴ Because these efforts are still in their early stages and show promise, regulatory intervention is unnecessary. Instead, the Commission should have the ETAG partner with the existing 4G working groups to continue to test and evaluate these technologies.

Third, the task of capturing elevation, plotted on a z-axis, in location reporting also should be undertaken by the ETAG.²⁵ At the moment, AT&T is not aware of a practical solution that captures elevation location information. Given the importance of elevation information, however, AT&T would propose the creation of a distinct ETAG subcommittee to drive additional research and development in this area. Specifically, the subcommittee could focus on known challenges, including problems with indoor air pressure readings and difficulties with reconciling elevation measured in meters above sea level with the data most desired by public safety: identification of a particular floor in a multi-story building.

²³ The Commission asks “[h]ow does the implementation of 3G and 4G networks, services, and devices impact wireless E911 requirements?” *Notice* at ¶ 18.

²⁴ OTDOA is a downlink trilateration technique that requires the User Equipment (UE) to detect at least two neighbor eNodeBs (evolved Node B or base station) in addition to the serving eNodeB.

²⁵ The Commission “seek[s] comment on how location information can include an accurate Z-axis component.” *Notice* at ¶ 23.

D. Additional Requirements Regarding the Provision of E911 To Roamers Are Unnecessary.

The Commission should not adopt unnecessary requirements that address the provision of E911 services to roamers. In the *FNPRM*, the Commission expressed concern over the inability of some location solutions to provide Phase II data for 911 calls placed by roamers and seeks comment on requiring Phase II data for all callers, including roamers.²⁶ AT&T submits that such concerns are not warranted. As a carrier utilizing a network-based solution, AT&T can support locating roaming handsets as long as the handsets support compatible spectrum. Absent record evidence that other carriers do not provide similar E911 services for roamers, the Commission should not impose additional regulations in this area.

E. Commission Action in Other, Ongoing Proceedings Is Needed to Enhance E911 Location Accuracy.

Instead of considering proposals to make E911 requirements on CMRS providers still more rigorous, the Commission should address pressing E911 issues raised in other proceedings that pose an immediate threat to public safety. Two proceedings, in particular, warrant immediate attention: (1) the ongoing signal booster proceeding²⁷; and (2) the LightSquared Subsidiary, LLC (“LightSquared”) Mobile Satellite Service/Ancillary Terrestrial Component (“MSS/ATC”) license modification proceeding.²⁸ Both proceedings raise E911 interference concerns warranting Commission attention.

²⁶ Notice at ¶ 24.

²⁷ See *Petitions Regarding the Use of Signal Boosters and Other Signal Amplification Techniques Used with Wireless Services*, Public Notice, DA 10-14, WT Docket No. 10-4 (Jan. 6, 2010) (“*Signal Booster Notice*”).

²⁸ See Policy Branch Information, Satellite Space Applications Accepted for Filing, *Public Notice*, Report No. SAT-00738 (rel. Nov. 19, 2010) (“*LightSquared Public Notice*”).

The record compiled in the signal boosters proceeding shows that the harmful interference caused by the illegal sale, marketing, and use of unauthorized signal boosters degrades and blocks 911 calls. The network disruptions and dropped calls caused by a single signal booster can prevent wireless subscribers throughout an entire geographic area from completing 911 calls.²⁹ Indeed, NENA has emphasized that “signal booster interference to public safety networks and 9-1-1 calling is well documented” and “can be a significant source of interference that impairs public safety networks and commercial wireless networks used for emergency 9-1-1 calls.”³⁰

²⁹ The severe network and service disruptions caused by boosters—which invariably impact 911 and public safety service—are well documented. In AT&T’s comments in the signal booster proceeding last year, AT&T noted that it had recorded 83 separate incidents triggered by signal boosters since July 2007. *See, e.g.*, AT&T Comments, WT Docket 10-4, at 30 (Feb. 5, 2010). One such incident, involving a signal booster aboard a yacht, caused substantial harmful interference to six AT&T towers in Florida, lasted for 21 hours, led to 2,795 dropped calls and 81,000 blocked or impaired calls. *Id.* at 31. Verizon’s experience is no different. Among numerous examples, Verizon Wireless notes an incident in 2009 where a Wilson Electronics amplifier installed in a building caused interference to one digital carrier at four cell sites over a seven day period. Verizon Wireless Comments, WT Docket 10-4, at 7 (Feb. 5, 2010). US Cellular also identifies recent booster interference incidents, including: a malfunctioning amplifier that took out service for a 10 mile radius in which calls could not be processed; 5 boosters causing the dropped call rate to increase from less than 1% to over 12%; and a booster in an individual’s apartment creating strong interference, causing a high dropped call rate and requiring USCC to temporarily decommission service for an entire sector-carrier to resolve the issue. US Cellular Comments, WT Docket No. 10-4, at 6-7 (Feb. 5, 2010). Numerous public safety agencies also identify specific instances in which signal boosters caused interference, harmed public safety efforts, and drained department resources. The Massachusetts State Police, for example, explains that “[s]ince July of 2004 . . . we have located over 60 sources of interference across the state. We have found that 54 of them were caused by signal boosters.” Massachusetts State Police Comments, WT Docket 10-4, at 1 (Feb. 5, 2010). The Orange County, California Sheriff’s Office “understands the negative side of poorly designed and implemented in-building and vehicular booster amplifiers, where we suffer from random and sometimes intense and widespread RF interference from these uncontrolled sources, almost on a weekly basis.” Orange County Comments, WT Docket No. 10-4, at 1-2 (Feb. 5, 2010).

³⁰ NENA Comments, WT Docket 10-4, at 1, 3 (Feb. 5, 2010).

Signal boosters also may decrease the effectiveness of E911 accuracy for the person being directly or inadvertently served by the booster. AT&T and other carriers employ Uplink Time Difference of Arrival (“U-TDOA”) as their network-based E911 positioning technology. U-TDOA is completely network-based and determines a mobile phone’s location by comparing the difference in time at which a cell signal reaches multiple Location Measurement Units (“LMUs”) installed at the operator’s base stations.³¹ In discussions with AT&T’s E911 technology vendor, AT&T has determined that handsets operating with signal boosters transmit inaccurate timing information to LMUs relative to the original handset signal. The LMUs are extremely sensitive and will often pick up both the boosted signal as well as the original handset signal, which will cause inaccurate location estimates that can be skewed by as much as thousands of meters. For signal boosters that AT&T installs or sanctions for customers, AT&T has established internal engineering guidelines that limit signal booster operation to applications where the distance between the signal booster and the handset is no more than 100 meters.

While the issue of the legality of the use, sale, and marketing of signal boosters without a license or licensee consent has been pending at the Commission for some time, the FCC has only issued a Public Notice regarding these issues. Comments on the Public Notice were received on February 5, 2010 and replies on March 8, 2010. Given the impact on E911 systems, AT&T urges the Commission to declare that the use, sale, and marketing of signal boosters without a license or licensee consent is unlawful and a direct threat to E911 communications. The Commission should also issue a Consumer Advisory that explains the requirements for use of a booster, the potential for harmful interference from such devices, and their potential impact on E911 communications.

³¹ See “U-TDOA – Uplink Time Difference of Arrival,” TruePosition, <http://www.trueposition.com/web/guest/u-tdoa>.

The Commission also should ensure that LightSquared’s proposed modification of its ATC authorization does not increase interference to GPS and degrade E911 service.³² Modification of LightSquared’s ATC authorization to enable terrestrial-only operation in the MSS L-band spectrum may cause interference to GPS communications, including those essential to delivering Commission-mandated E911 solutions.³³ As NTIA Administrator Strickling recently stated in a letter to Chairman Genachowski, the FCC should “ensure the interference issues [raised by LightSquared’s modification request] (including fundamental concerns about interference with GPS safety-of-life applications) are resolved prior to LightSquared offering service”³⁴ Given the substantial expansion of terrestrial use now proposed by LightSquared, the rules in place to protect GPS operations may need to be revised to account for this increased interference potential. While interference issues are generally best resolved between the parties, the potential impact of these particular interference issues on GPS and the E911 system necessitates early involvement by the FCC. In addressing LightSquared’s

³² *LightSquared Public Notice.*

³³ See Letter from F. Michael Swiek, Executive Director, U.S. GPS Industry Council, to 3GPP TSG-RAN WG4 Chairman, Takaharu Nakamura, at 3 (Jan. 7, 2011) (“[T]here is a significant potential for the [LightSquared] proposal to operate 3GPP systems on a co-primary terrestrial service used in the L band to cause harmful interference to the large installed base of GPS/GNSS users whose daily operations depend on receiving the positioning, navigation, and timing information from the GPS satellite signals”); see also Sprint, “Band 24 (L-Band) Impact on Legacy Devices,” 3GPP TSG RAN WG4 (Radio) Meeting # 57, Agenda Item 10.2.1, R4-104844 (2010) (expressing concern that LightSquared’s proposed ATC operations could cause harmful interference to millions of GPS users operating in the 1559-1610 MHz band due to out of band emissions and possible intermodulation.)

³⁴ See Letter from NTIA Administrator Lawrence Strickling to FCC Chairman Julius Genachowski, at 1 (Jan. 12, 2011); see also Letter from Karl B. Nebbia, Associate Administrator, Office of Spectrum Management, National Telecommunications and Information Administration, to Julius Knapp, Chief, Office of Engineering and Technology, Federal Communications Commission, ET Docket No. 10-142 (July 21, 2010).

modification request, the Commission should ensure that GPS, and E911 solutions that depend on GPS, are protected from harmful interference.

III. THE COMMISSION SHOULD NOT IMPOSE ADDITIONAL E911 REQUIREMENTS ON INTERCONNECTED VOIP PROVIDERS OR EMERGING NETWORK DEVICES.

The Commission should refrain from imposing E911 obligations that are technically infeasible or commercially unreasonable—especially when effective E911 obligations already exist. With this in mind, AT&T objects to imposing ALI requirements on interconnected VoIP providers at this time. No technology currently exists with this functionality. And before the Commission imposes cumbersome new requirements on interconnected VoIP providers—which already comply with significant E911 obligations established by this Commission—it should carefully analyze the technical hurdles and potential costs of such requirements. The Commission also should refrain from modifying its E911 rules to regulate the use of emerging network technologies—such as femtocells and picocells—that CMRS providers might leverage to improve network coverage. The recently-adopted *Second R&O* imposes rigorous, new location accuracy requirements on CMRS providers. The Commission should afford providers the flexibility in configuring their networks necessary to meet these stringent requirements.

A. The Commission Should Not Require that Providers of Portable Interconnected VoIP Service Automatically Provide Location Information to PSAPs.

AT&T continues to support the development of accurate ALI technologies for all varieties of interconnected VoIP services; however, as the Commission has recognized previously, “there currently are no solutions that allow a provider of portable VoIP services to determine the location of an end user absent the end user affirmatively telling the service

provider where he or she is.”³⁵ As detailed below, nothing entered into the record since the *Interconnected VoIP E911 First Report and Order* warrants a change to this conclusion. If anything, the goal of automatically identifying an interconnected VoIP subscriber’s location has become more difficult with the ever-increasing number of devices and technologies available for portable VoIP service. Further, all potential technological solutions for automatically identifying a subscriber’s location—including the solution discussed below—require further technological research and development and additional investigation to determine if they can be implemented in a cost effective manner. AT&T proposes that the Commission assign these tasks to the proposed ETAG.

The provision of accurate ALI for portable interconnected VoIP services is complicated by the variety of different portable VoIP services on the market. The Commission’s rules identify as interconnected VoIP services those services that: (1) enable real-time, two-way voice communications, (2) require a broadband connection from the user’s location, (3) require IP-compatible customer premises equipment, and (4) permit users to receive calls that originate on the PSTN and to terminate calls to the PSTN.³⁶ The services encompassed within this definition operate over a myriad of portable devices and technologies that permit portability, including commercial mobile smartphones running VoIP applications,³⁷ Wi-Fi enabled VoIP handsets,³⁸

³⁵ *IP-Enabled Services; E911 Requirements for IP-Enabled Service Providers*, First Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd. 10245, n.81 (2005).

³⁶ 47 C.F.R. § 9.3.

³⁷ See, e.g., CounterPath Corporation, *Bria Android Edition*, <http://www.counterpath.com/bria-android-edition.html> (last visited Nov. 17, 2010) (mobile VoIP softphone working over both 3G and Wi-Fi networks for the Android platform).

³⁸ See, e.g., Net2Phone, *VoiceLine XJ100 Wi-Fi Handset*, <http://www.net2phone.com/partnerships/distributors/product/broadband/xj100.asp> (last visited

portable terminal adapters,³⁹ USB dongles,⁴⁰ PC-based softphones,⁴¹ and more.⁴² Further, VoIP users might access the Internet through traditional wired broadband connections, public or private wireless access points, or commercial mobile broadband networks. Each permutation of device and network access may have unique technical and logistical challenges, which makes it infeasible today to rely on a single standard or technology for determining and relaying accurate ALI to PSAPs.

Despite these significant challenges, AT&T and others continue to work toward the goal of providing ALI for portable VoIP services. Looking forward, one possible technological solution that warrants further consideration would be to include integrated ALI capabilities in the design of terminal adapters or other user devices employed in the provision of portable VoIP service. For example, these devices could include A-GPS, passive CMRS wireless receivers, or both, for use in trilateration and identification of the user's location.

Nov. 17, 2010) (Wi-Fi enabled VoIP handset marketed for use in corporate environments, residential settings, or from free public hotspots).

³⁹ See, e.g., Vonage, *Vonage Phone Adapter, VoIP Phone Adapter and VoIP Networking Router*, http://www.vonage.com/how_vonage_works_adapters/ (last visited Nov. 17, 2010) (discussing the Vonage terminal adapter: "Small and Portable – works virtually anywhere in the World with any high-speed Internet connection").

⁴⁰ See, e.g., magicJack, <http://www.magicjack.com/> (last visited Nov. 17, 2010) (USB dongle-sized VoIP terminal adapter).

⁴¹ See Nadeem Unuth, "Software-Based VoIP Services And Applications," *About.com*, <http://voip.about.com/od/voipsoftware/a/SoftphoneList.htm> (last visited Nov. 17, 2010) (discussing popular "softphone" VoIP applications that enable all traditional telephone features, including placing and receiving calls over the PSTN, without the use of any hardware besides a PC).

⁴² See Voip-info.org, *VOIP Phones*, <http://www.voip-info.org/wiki/view/VOIP+Phones> (last visited Nov. 17, 2010) (Wiki entry listing scores of different commercial and noncommercial VoIP solutions).

Implementing this solution, however, would first require that significant technical and logistical challenges be overcome. Identifying a compatible technology and setting a standard for integration into all interconnected VoIP devices may be unrealistic in light of the variety of user devices. Although the integration of A-GPS or passive CMRS receivers into a portable terminal adapter or handset may not be problematic, the same may not be achievable for devices with smaller form factors such as USB dongles. Moreover, in the case of softphones, which have no dedicated hardware and run entirely as an application on the user's broadband-enabled PC, the integration of a separate wireless receiver would be impossible, and any Commission rule requiring such a solution could effectively prohibit this entire class of services.

Even if these initial device challenges are resolved, there are still significant difficulties providing accurate location information for interconnected VoIP users through an A-GPS or CMRS receiver solution. For example, although usage patterns are constantly changing, many interconnected VoIP subscribers use their service indoors or in urban environments. These scenarios present particular challenges for A-GPS receivers, which rely upon satellite signals to identify a user's location. In urban environments, satellite transmissions may suffer from multipath propagation when signals are reflected off buildings and other obstructions, making it difficult for receivers to locate a satellite. Furthermore, indoor use may impede satellite effectiveness because of signal attenuation caused by the physical structure.

In addition to these technical and logistical concerns, cost considerations also merit careful analysis. This proposed solution would demand substantial up-front investment well before any appreciable results would be seen. Neither interconnected VoIP services nor the equipment used to access such services currently provide ALI and such capability would have to be developed, which may necessitate significant reengineering. Existing devices may have to be

replaced, requiring significant customer outreach efforts and additional expense for subscribers or service providers.

Despite these technological, logistical, and economic hurdles, AT&T is committed to participating in the development of capabilities for interconnected VoIP providers to automatically identify the geographic location of their customers for E911 purposes. Through the ETAG, industry and technology experts will be able to fully examine these issues in an orderly and unbiased way. No further regulatory obligations should be imposed without the benefit of this further investigation.⁴³

B. Although Emerging Network Devices Show Promise for Enhancing Location Accuracy, the Commission Should Not Impose E911 Obligations on Such Devices at this Time.

Although some communications service providers may choose to experiment with leveraging emerging network components—such as femtocells, picocells, and microcells—to enhance location accuracy and satisfy their existing E911 regulatory obligations, the Commission should avoid interfering with this experimentation by imposing any regulatory obligations on these network components. These devices, because of their smaller ranges, have the potential to provide more precise ALI, especially in challenging environments such as

⁴³ AT&T also considered another theoretical solution in which the Commission could create a registry of all broadband access points and their physical locations. Under this solution, when a portable VoIP device is attached to an access point, the device would be automatically associated with that geographic location and this information would be made available to PSAPs when responding to an emergency call. Implementing this solution, however, would require that significant technical and logistical challenges be overcome, which would come at great cost and may not even be possible. AT&T is not aware of any technological solution capable of performing the functions that would be required, nor does a registry of broadband access points exist. Significant standards development work would be required to determine what information would be in the database and how it would be collected, stored, managed, and made accessible to public safety agencies on a timely basis during an emergency. Moreover, the collection and dissemination of this information raises potential privacy concerns, especially with respect to private residential broadband networks.

indoors or in rural areas with limited network coverage. As the Commission explained, a “femtocell could be viewed as typically installed in a semi-permanent manner at a particular home or office, that could thus be programmed with an exact address, or even have an embedded A-GPS chip. If that address could be transported with a 911 call, that would lead to significant improvement in location accuracy, akin to the location quality of wireline networks.”⁴⁴ At this time, however, deployment of these devices is still in the early phases, and carriers are unsure how prominently these technologies will figure into their network architectures. Given these facts, the Commission should not impose additional E911 regulatory obligations on carrier use of these emerging network components, as it could stifle innovation to the detriment of overall network coverage, service reliability, and E911 service.

As explained in Section II above, the Commission should focus on implementing the new location accuracy standards adopted in the *Second R&O* instead of mandating the use of specific location accuracy technologies. Carriers appear to be the stakeholders best able to determine which location technologies are most compatible with their networks. Moreover, different technologies or environments may call for different solutions to provide accurate ALI. Requiring implementation of a specific technology also risks decreasing innovation in other location technologies and conflicts with the Commission’s commitment to technological neutrality. Although further technology mandates are inappropriate at this time, these emerging network technologies merit further study, and the ETAG is the most appropriate group to conduct such a review.

⁴⁴ Notice at ¶ 41.

IV. CONCLUSION

AT&T supports the rigorous, new requirements adopted by the Commission in the *Second R&O* and intends to continue to assist the Commission as it strengthens E911 services going forward. But AT&T urges the Commission to refrain from any other significant changes to the 911 and E911 rules at this time. Instead, the Commission should allow communications providers to focus on modifying their networks to meet the new and rigorous requirements of the *Second R&O*.

Respectfully submitted,

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