

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, DC 20554

In the Matter of	)	
	)	
Wireless E911 Location Accuracy Requirements	)	PS Docket No. 07-114
	)	
Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems	)	CC Docket No. 94-102
	)	
Association of Public-Safety Communications Officials-International, Inc. Request for Declaratory Ruling	)	
	)	
911 Requirements for IP-Enabled Service Providers	)	WC Docket No. 05-196
	)	

**COMMENTS OF THE WIRELESS COMMUNICATIONS ASSOCIATION  
INTERNATIONAL, INC.**

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August 20, 2007

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## EXECUTIVE SUMMARY

The Wireless Communications Association International, Inc. (“WCA”) supports the Commission’s effort to establish an effective E911 system for interconnected Voice over Internet Protocol (“VoIP”) services. WCA’s members are well-along in the process of designing system architectures, acquiring equipment and launching new wireless broadband networks that will carry their interconnected VoIP service to subscribers across the nation. However, the process of converting existing and planned wireless interconnected VoIP operations from the current “Registered Location” location accuracy paradigm to one incorporating automatic location information (“ALI”) mechanisms, and assuring that those ALI mechanisms work with a high degree of accuracy, will be far from trivial. To the contrary, wireless broadband network operators offering interconnected VoIP services face a variety of technical, operational and economic challenges in meeting even the location accuracy obligations currently imposed on Commercial Mobile Radio Service (“CMRS”) systems, much less the far more stringent requirements proposed by the Commission in this proceeding. And, those challenges become exponentially greater when the Commission contemplates the delivery of accurate location information for roaming subscribers.

None of this should come as a surprise. Indeed, in its 2005 *IP-Enabled Services First Report and Order and Notice of Proposed Rulemaking*, the Commission recognized that “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.” The record in that proceeding established in considerable detail the technical challenges that wireless broadband network operators will face in meeting CMRS-like location accuracy requirements for their portable and mobile interconnected VoIP services. A substantial number of parties thus urged the Commission not to force providers of those services to comply with mandatory location accuracy standards until industry and the public safety community are able to identify and evaluate appropriate solutions to the challenges presented.

Unfortunately, the *Notice of Proposed Rulemaking* (“NPRM”) in the instant proceeding charts a different course. With virtually no discussion of the earlier record, the Commission tentatively concludes that an interconnected VoIP service usable in more than one location should be required to comply with the same location accuracy requirements as CMRS providers. Although the *NPRM* suggests that the Commission might defer enforcement of those requirements for a certain period of time, it offers no guidance as to how long a transition period is contemplated. Accordingly, WCA is concerned that wireless broadband network operators offering portable or mobile interconnected VoIP services might be forced to comply with the CMRS standards long before they can feasibly do so.

While WCA appreciates the Commission’s desire to promote location accuracy of wireless interconnected VoIP services, the Commission’s objectives of promoting public safety and broadband deployment are not advanced by forcing emerging wireless broadband network providers to comply with location accuracy standards before they cannot reasonably be expected to do so. Given the facts before it, the Commission can best achieve its objectives by forming a joint advisory committee that includes Commission staff, representatives from the VoIP industry (including WCA as a representative of the emerging wireless broadband network operators that are offering interconnected VoIP), equipment vendors, state and local public safety officials, consumer groups and other interested parties to study the relevant technical, operational and

economic issues, identify solutions that are or will soon be available, and recommend final Commission rules.

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**COMMENTS OF THE WIRELESS COMMUNICATIONS ASSOCIATION  
INTERNATIONAL, INC.**

The Wireless Communications Association International, Inc. (“WCA”), pursuant to Section 1.415 of the Commission’s Rules, hereby submits its comments in response to Section III.B of the Commission’s *Notice of Proposed Rulemaking* in the above-captioned proceeding (“*Location Accuracy NPRM*”).<sup>1</sup> For the reasons set forth below, before the Commission modifies its current rules regarding the provision of Enhanced 911 (“E911”) services by interconnected Voice over Internet Protocol (“VoIP”) service providers, it should convene a joint advisory committee consisting of Commission staff, representatives from the VoIP industry (including WCA as a representative of those who are deploying new wireless broadband networks and providing interconnected VoIP services over those networks), equipment vendors, state and local public safety officials, consumer groups and other interested parties, and charge

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<sup>1</sup> See *Wireless E911 Location Accuracy Requirements et al.*, PS Docket No. 07-114 *et al.*, Notice of Proposed Rulemaking, FCC 07-108, ¶¶ 8-19 (rel. June 1, 2007) [“*Location Accuracy NPRM*”].

that committee with studying the complex technical, operational and economic issues presented by the *Location Accuracy NPRM* and recommending final Commission rules.

## I. INTRODUCTION.

As the trade association of the wireless broadband industry, WCA has a direct and immediate interest in the Commission's proposal to apply its E911 location accuracy requirements to providers of interconnected VoIP service.<sup>2</sup> WCA's membership includes a wide array of companies that are well along in designing network architectures, acquiring equipment and launching new wireless broadband networks that allow them to offer interconnected VoIP service to consumers equipped with fixed, portable and mobile devices.<sup>3</sup> In addition, WCA's membership includes most of the major equipment vendors that are providing the technology behind those new networks. Accordingly, this proceeding has significant implications for WCA's constituents.<sup>4</sup>

WCA shares the Commission's "continuing commitment to a nationwide communications system that promotes the safety and welfare of all Americans."<sup>5</sup> Indeed,

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<sup>2</sup> *Id.* at ¶ 18.

<sup>3</sup> *See, e.g.*, Press Release, Clearwire Corporation, Clearwire Becomes First International Wireless Broadband Company to Offer Simple, Reliable Internet Phone Service (April 10, 2006), [http://www.clearwire.com/company/news/04\\_10\\_06.php](http://www.clearwire.com/company/news/04_10_06.php) (last viewed Aug. 6, 2007) (announcing Clearwire's launch of wireless VoIP service in Stockton, CA). *See also IP-Enabled Services*, First Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 10245, 10247 (2005) ("The IP-enabled services marketplace is the latest new frontier of our nation's communications landscape. As such, new entrants and existing stakeholders are rushing to bring IP-enabled facilities and services to this market, relying on new technologies to provide a quickly evolving list of service features and functionalities.") [*IP-Enabled Services First R&O and NPRM*].

<sup>4</sup> WCA recognizes that in some cases wireless interconnected VoIP service will be integrated with existing cellular or PCS networks that already have ALI capability as required under the Commission's Phase II rules for wireless E911 service. *See* 47 C.F.R. § 20.18. Many of WCA's members, however, will be constructing and providing interconnected VoIP service over entirely new wireless broadband networks that do not have the same pre-existing ALI capability. WCA's comments thus reflect the perspective of facilities-based wireless interconnected VoIP service providers who must develop their E911 compliance methods from scratch, and as such will be affected substantially by any new E911 location accuracy requirements that may be imposed on interconnected VoIP service in this proceeding.

<sup>5</sup> *IP-Enabled Services First R&O and NPRM*, 20 FCC Rcd at 10248.

regardless of the final rules adopted in this proceeding, wireless broadband service providers that offer interconnected VoIP service have every incentive to afford E911 capabilities, since widespread marketplace acceptance of their interconnected VoIP service depends in part on whether consumers perceive it to be as reliable in emergency situations as competitive offerings. The submissions filed in the first comment phase of the *Location Accuracy NPRM* confirm that others in the VoIP industry hold the same view and are making substantial progress in their efforts to comply with Section 9.5 of the Commission's Rules, which sets forth the existing E911 rules for interconnected VoIP service.<sup>6</sup>

To the best of WCA's knowledge, those wireless broadband service providers who are offering portable or mobile interconnected VoIP are in full compliance with the provisions of Section 9.5 of the Rules, and those introducing service in the coming years are planning to be in compliance with those requirements. WCA does not disagree with the Commission's tentative conclusion that as technology has evolved to permit the offering of interconnected VoIP service *via* portable and mobile devices, an alternative to the "Registered Location" approach of Section 9.5 may be necessary.<sup>7</sup> Indeed, wireless broadband network operators that intend to provide a portable or mobile interconnected VoIP service already are evaluating potential ALI solutions that might be implemented to improve the accuracy of the location information provided when a subscriber places a 911 call. However, the unavoidable reality is that the technical, operational

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<sup>6</sup> See 47 C.F.R. § 9.1 *et seq.*; Comments of the Voice On The Net (VON) Coalition, PS Docket NO. 07-114 *et al.*, at 1-2 (filed July 5, 2007) ("[I]nterconnected VoIP providers have deployed E911 solutions on an aggressive timetable and have achieved extraordinary results – making E911 implementation progress faster than any other type of voice communication service in history. Today, there are fewer VoIP subscribers without access to E911 than any other technology – both in raw numbers and as a percentage of subscribers.").

<sup>7</sup> See *IP-Enabled Services First R&O and NPRM*, 20 FCC Rcd at 10249. On the other hand, several wireless broadband network operators offer a fixed service (usually provided *via* an antenna affixed to the side or rooftop of a subscriber's premises) and provide an interconnected VoIP service that is intended to be accessed solely from the subscriber's premises. In such cases, the E911 regime set forth in Part 9 of the Commission's Rules has proven successful in assuring that public safety agencies receive accurate location information when a 911 call is made. Thus, WCA agrees with the Commission's tentative conclusion in the *NPRM* to retain the "Registered Location" paradigm for such service offerings.

and economic challenges presented by adding ALI and assuring a high degree of accuracy are complex, and only become exponentially more complex when the Commission considers, as it does here, the possibility of mandating accurate location identification in connection with 911 calls made by a roaming subscriber.<sup>8</sup> Thus, once final rules are adopted in response to the *Location Accuracy NPRM*, wireless broadband system operators will need time to transition their operations from the current Registered Location E911 paradigm to whatever ALI-based models satisfy the Commission's requirements. Accordingly, the Commission cannot adopt a "flash cut" mandate – just as the Commission did when it imposed Phase II E911 requirements on CMRS providers, any location accuracy standards for wireless broadband network operators that offer interconnected VoIP service must include a transition period that affords them a full and fair opportunity to bring their operations into compliance with the Commission's new rules.

Unfortunately, it is not clear from the *Location Accuracy NPRM* that the Commission is prepared to adopt this approach. To the contrary, the *Location Accuracy NPRM* turns 180° from the Commission's tentative conclusion just two years ago in its *IP-Enabled First R&O and NPRM* that interconnected VoIP providers cannot provide ALI-based location information with an accuracy similar to that of traditional CMRS providers.<sup>9</sup> WCA is concerned that in changing its position without specifying a transition period, the Commission fails to appreciate the enormous technical, operational and economic challenges wireless broadband network operators and their equipment suppliers will face if it prematurely imposes ALI and location accuracy requirements on interconnected VoIP service without further study.

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<sup>8</sup> See *Location Accuracy NPRM* at ¶ 17.

<sup>9</sup> See *id.* at ¶ 18. As discussed in Section III.A of the *Location Accuracy NPRM* (for which the comment cycle has already expired), the Commission is proposing to require that CMRS providers demonstrate their compliance with the Commission's location accuracy standards at the Public Safety Answering Point ("PSAP") level. See *id.* at ¶¶ 5-7. It also asks for comment on whether any transition period extended to CMRS under the more rigorous location accuracy standards should be applied to interconnected VoIP providers as well. See *id.* at ¶ 18.

WCA believes that a different course of action would better serve the Commission's objectives for wireless broadband. Rather than prematurely adopt onerous ALI and location accuracy requirements for interconnected VoIP services that could undermine the Commission's efforts to promote both wireless broadband deployment and public safety, the Commission should form a joint advisory committee that includes Commission staff, representatives from the VoIP industry (including WCA), equipment vendors, state and local public safety officials, consumer groups and other interested parties who would be empowered to study the problem in depth, work through all the relevant technical, operational and economic issues and recommend final rules to the Commission. The dialog inherent in such an approach will allow industry and the public safety community to provide meaningful input and establish a foundation for consensus on final Commission rules, including a reasonable timetable that gives portable and mobile wireless broadband network operators that offer interconnected VoIP service sufficient opportunity to evaluate, test and implement E911 solutions that satisfy the Commission's requirements and are best suited for their particular circumstances.

## **II. DISCUSSION.**

### **A. The Commission Cannot Ignore The Substantial Record Evidence Indicating That Mandatory Location Accuracy Requirements For Interconnected VoIP Service Would be Premature.**

The Commission's proposal to apply location accuracy requirements to interconnected VoIP service is a continuation of the Commission's earlier inquiry on the issue in the 2005 *IP-Enabled Services First R&O and NPRM*.<sup>10</sup> In the *First R&O* portion of that decision, the Commission adopted Part 9 of the Commission's Rules and imposed E911 requirements on all

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<sup>10</sup> See *Location Accuracy NPRM* at ¶ 18 (“[W]e invite commenters to update the record in the Commission's VoIP 911 proceeding with any new information or arguments they believe to be relevant to the questions raised in the June 2005 *Notice of Proposed Rulemaking* relating to location issues.”).

providers of interconnected VoIP service for the first time.<sup>11</sup> Among other things, those requirements mandate that an interconnected VoIP provider obtain from every customer the physical location where the customer uses the provider's service, *i.e.*, the customer's "Registered Location," and provide the subscriber with mechanisms for changing its Registered Location.<sup>12</sup> In turn, the interconnected VoIP provider generally must transmit all customer 911 calls, including the customer's call-back number and Registered Location, to the Public Safety Answering Point ("PSAP"), designated statewide default answering point, or appropriate local emergency authority that serves the customer's Registered Location.<sup>13</sup>

At the same time, the Commission made clear that it was not requiring interconnected VoIP providers to use ALI to determine the location of their end users,<sup>14</sup> since "[t]he record demonstrates that 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."<sup>15</sup> While the Commission "expect[ed] that customers of interconnected VoIP service will, in almost all cases, be able to provide their Registered Location in the form of a valid street address," it recognized that "wireless broadband

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<sup>11</sup> See *IP-Enabled Services First R&O and NPRM*, 20 FCC Rcd at 10256-76; see also 47 C.F.R. § 9.5(d)(1). The service provider also must provide its customers with one or more methods of updating their Registered Location, including at least one option that requires use only of the customer premises equipment ("CPE") necessary to access the provider's interconnected VoIP service. *Id.* § 9.5(d)(2).

<sup>12</sup> See *IP-Enabled Services First R&O and NPRM*, 20 FCC Rcd at 10271; see also 47 C.F.R. § 9.5(b)(2).

<sup>13</sup> See *IP-Enabled Services First R&O and NPRM*, 20 FCC Rcd at 10266; see also 47 C.F.R. § 9.5(c). An interconnected VoIP provider need only provide such call-back and location information as a PSAP, designated default answering point or appropriate local emergency authority is capable of receiving and utilizing. *Id.*

<sup>14</sup> *IP-Enabled Services First R&O and NPRM*, 20 FCC Rcd at 10271 n. 146.

<sup>15</sup> *Id.* at 10259 n. 81. For similar reasons, the Commission had previously determined that it should not impose location accuracy requirements on Mobile Satellite Service ("MSS") providers that provide interconnected two-way voice service. See *Revision of the Commission's Rules to Ensure Compatibility With Enhanced 911 Emergency Calling Systems*, Report and Order and Second Further Notice of Proposed Rulemaking, 18 FCC Rcd 25340, 25354 (2003) ("We do not believe that any location determination technology requirements are warranted at this time. No MSS carriers can presently determine caller location accuracy with the precision demanded by Section 20.18 of the Commission's rules, and moreover, it is clear that MSS carriers differ from each other in their location determination capabilities.").

technologies may increase the possibility that a user's location is not associated with a street address."<sup>16</sup> The Commission thus requested comment on potential ALI solutions where an interconnected VoIP subscriber is not at a static location:

[O]ne of the central customer benefits of portable interconnected VoIP services is the lack of geographic restrictions. However, because portable interconnected VoIP services may be offered independent of geography, currently there is no way for portable VoIP providers reliably and automatically to provide location information to PSAPs for these services without the customer's active cooperation. . . . A number of possible methods have been proposed to automatically identify the location of a VoIP user, including gathering location information through the use of: an access jack inventory; a wireless access point inventory; access point mapping and triangulation; HDTV signal triangulation; and various GPS-based solutions. . . . Should the Commission require all terminal adapters or other equipment used in the provision of interconnected VoIP service sold as of June 1, 2006 to be capable of providing location information automatically, whether imbedded in other equipment or sold to customers as a separate device?<sup>17</sup>

The comments filed in response to the Commission's inquiry were virtually unanimous in reaffirming that, as Vonage put it, "there is no viable automatic location identification solution available today for VoIP consumers that meets basic standards of reliability and usefulness," and that it therefore would be highly premature and counterproductive for the Commission to impose any location accuracy requirements on interconnected VoIP service by June 1, 2006 or any other mandatory deadline.<sup>18</sup> And, as reaffirmed again by the submissions filed in the initial comment

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<sup>16</sup> *IP-Enabled Services First R&O and NPRM*, 20 FCC Rcd at 10271 n. 148.

<sup>17</sup> *Id.* at 10276-77.

<sup>18</sup> Comments of Vonage America Inc., WC Docket No. 05-196, at 7 (filed Aug. 15, 2005) ["Vonage IP-Enabled Services Comments"]; *See also, e.g.*, Comments of United States Telecom Association, WC Docket No. 05-196, at 6 (filed Aug. 15, 2005) ("USTelecom members considering whether to provide a VoIP offering have said that they may be forced to delay doing so if they have to comply with E911 requirements for nomadic customers because it is technologically impossible at this time.") ["USTelecom IP-Enabled Services Comments"]; Comments of Verizon, WC Docket No. 05-196, at 3 (filed Aug. 15, 2005) ("Although several industry groups are involved in efforts to develop viable automatic location technologies for VoIP services, there are currently no workable solutions for automatically locating nomadic VoIP customers.") ["Verizon IP-Enabled Services Comments"]; Comments of Qwest Communications Corporation, WC Docket No. 05-196, at 3 (filed Aug. 15, 2005) ("It is clear, . . . , that

phase of the *Location Accuracy NPRM*, the technical, operational and economic challenges identified two years ago persist to this day and will take time to resolve.

WCA is pleased that the Commission has not proposed in the *Location Accuracy NPRM* to require the use of any particular technology for satisfying whatever location accuracy requirements it adopts in this proceeding. As observed by Cisco, “the appropriate universe and mix of advanced 911 technologies will undoubtedly change as VoIP and broadband service offerings continue to evolve. Any fixed technology mandate is therefore likely to become quickly obsolete and to burden future innovation.”<sup>19</sup> Wireless broadband network operators are best positioned to determine how to provide accurate location information for their subscribers’ portable and mobile 911 calls, and just as it has done with respect to CMRS, the Commission should afford wireless broadband network operators that offer portable and mobile interconnected VoIP the flexibility to meet their obligations in any way possible. That said, however, it appears that at least for the short term wireless broadband network operators that

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*automatic* location information (or “ALI”) functionality is desirable with regard to VoIP E911 services so that no customer interaction is necessary to update such information. Yet the current state of industry investigation, discussion and analysis is in its infancy with regard to technological solutions.”) (emphasis in original); Comments of SBC Communications Inc., WC Docket No. 05-196, at 9 (filed Aug. 15, 2005) (“It would be a serious mistake for the Commission to *require* the adoption of a single automatic location identification technology for all VoIP services before industry experts have had an opportunity to fully vet that technology.”) (emphasis in original) [“SBC IP-Enabled Services Comments”]; Comments of Skype Communications, SA, WC Docket No. 05-196, at 11 (filed Aug. 15, 2005) (“There is much ongoing work to develop possible answers . . . but none are yet close to provisioning a dependable E911 service [for interconnected VoIP].”; Reply Comments of Level 3 Communications, LLC, WC Docket No. 05-196, at 8 (filed Sept. 12, 2005) (“[T]he Commission should refrain from setting a June 2006 (or any other date certain) deadline for providing automatic geographic location sensing technologies. No known technology or mix of technologies can provide such information at this time.”); Reply Comments of the Telecommunications Industry Association, WT Docket No. 05-196, at 6-7 (filed Sept. 12, 2005) (“[T]here are still some serious technical limitations that impact the ability of VoIP systems to automatically convey location information to the appropriate PSAP. A solution for these technical limitations must still be standardized by the industry before VoIP systems are able to comply with the Commission’s proposed location requirement.”); Reply Comments of T-Mobile USA, Inc., WT Docket No. 05-196, at 6-7 (filed Sept. 12, 2005) (“Rather than adopting an arbitrary and potentially counterproductive deadline, the Commission should give providers and equipment manufacturers the freedom to find and adopt the best technological approaches to the challenge of automatically identifying the location of users of interconnected VoIP services.”).

<sup>19</sup> Comments of Cisco Systems, Inc., WC Docket No. 05-196, at 3 (filed August 15, 2005) [“Cisco IP-Enabled Services Comments”].

offer portable or mobile interconnected VoIP service have no choice but to rely on the same consumer device-based and network-based solutions as their CMRS brethren, as no other alternatives appear to be readily available.<sup>20</sup>

And therein lies the problem – whether a wireless broadband network operator offering portable or mobile interconnected VoIP service chooses to rely on a handset-based solution, a network-based solution, or one of the available hybrid combinations of the two, it faces serious technical, operational and economic challenges that will effectively prevent compliance with even today’s CMRS requirements anytime soon.

*Device-Based Solutions.* Presently, the most accurate and widely-used device-based solutions are those which rely in whole or in part on Global Positions System (“GPS”) technology. To date, GPS technology has not been incorporated into the equipment provided to subscribers by those wireless broadband network operators that offer interconnected VoIP service, and WCA understands that equipment development cycles necessitate that it will be several years before GPS technology can be added to customer equipment.<sup>21</sup> While GPS has been deployed in traditional cellular and PCS radios offered by operators that use CDMA and iDEN technology, the GPS solutions are deeply embedded into the CDMA and iDEN chip sets and cannot be simply “dropped in” to a new mobile VoIP device designed for use on an IEEE 802.16e-2005 network. It appears that, at least initially, a standalone GPS chip set will have to be pursued for these devices, which imposes a significant new learning curve on equipment vendors. Most importantly, the software interfaces, middleware layers, and GPS debugging tools

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<sup>20</sup> The joint advisory committee that WCA recommends should be tasked with exploring the issues associated with future standardization that might allow location information to be provided by roaming subscribers to the appropriate public safety officials, regardless of the technology used by the subscriber’s carrier to meet its ALI and accuracy obligations.

<sup>21</sup> It is worth noting that while many of WCA’s constituents are planning to deploy technology certified by the WiMAX Forum as compliant with the IEEE 802.16e-2005 standard, that standard does not require the use of any ALI technology.

associated with these chip sets all will change as GPS is integrated into 802.16e-2005 devices. Even for a handset vendor who has expertise deploying the GPS solutions used for CDMA and iDEN handsets, there will be significant delay associated with adapting to the new GPS chip sets and software protocols required for a WiMAX handset GPS scenario, and the development delay will be much worse for device makers with no GPS experience.

Moreover, as the Commission is well aware, once GPS technology can be incorporated into portable and mobile customer equipment, that technology remains inherently limited in its ability to pass accurate location information to the appropriate PSAP. For even “assisted” GPS to be effective, a customer’s device must be within line-of-sight to at least four GPS satellites simultaneously.<sup>22</sup> Hence, as the Commission recognized when it first proposed wireless E911 rules over a decade ago, GPS-based systems are not effective in indoor environments that preclude line-of-sight between GPS satellites and a customer’s handset.<sup>23</sup> Even in outdoor environments, GPS-based solutions are of limited efficacy in areas where visibility to multiple GPS satellites is poor due to terrain obstructions, heavy tree cover, buildings or other physical obstructions.<sup>24</sup>

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<sup>22</sup> See E911 Institute, “E911 Location Accuracy,” presented at E911 Location Roundtable (July 19, 2007), <http://www.e911institute.org> (last viewed August 20, 2007).

<sup>23</sup> See *Revision of the Commission’s Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, Notice of Proposed Rulemaking, 9 FCC Rcd 6170, 6178 (1994) (“GPS does not work well if a caller is inside a building or amid obstructions that attenuate or block the satellite radio signals.”); Comments of Motorola, Inc. and Nokia Inc., PS Docket No. 07-114 *et al.*, at 9 (filed July 5, 2007) (“GPS-based handset location technology, for example, is subject to tremendous attenuation when seeking to locate handsets within buildings or homes.”); Comments of Vonage America Inc., WC Docket No. 05-196, at 8 (filed Aug. 15, 2005) (“VoIP services are most frequently used indoors. Therefore, the automatic location solution must be designed to work effectively indoors.”); Verizon IP-Enabled Services Comments at 4 (“GPS technologies are unsuitable presently because it can be difficult consistently to maintain the required satellite communication inside buildings – which is where many VoIP services are likely to be used.”).

<sup>24</sup> See, e.g., Comments of Verizon Wireless, PS Docket No. 07-114 *et al.*, at 17-18 (filed July 5, 2007) [“Verizon First Phase Comments”]; Cisco IP-Enabled Services Comments 8.

*Network-based Solutions.* The most common network-based E911 solutions (either used on their own or as part of a hybrid solution with GPS) use a variety of techniques (including triangulation and trilateralization) to identify the customer's location *via* simultaneous communications between the customer's handset and at least three base stations. While these can be effective (particularly when used in conjunction with device-based GPS solutions), it will be some time before emerging wireless broadband network operators can employ network-based solutions to identify a subscriber's location.

Because network-based solutions require that the subscriber be in communication with at least three base stations simultaneously, they cannot be relied on to provide accurate location information unless and until the wireless network operator has a sufficient density of base stations in operation in a given geographic area.<sup>25</sup> This is precisely the predicament faced by wireless network operators who are only now launching service or intend to launch service in the future. Even in reasonably well-populated areas, site availability, network design and economic considerations are likely to limit the number of base stations constructed by emerging wireless network operators in a given geographic area, at least until subscriber demand requires the operator to add cells to meet bandwidth demand through frequency reuse. It is reasonable to anticipate that eventually there will be enough base stations in urban and suburban areas to permit network-based solutions, but more discussion within the industry is required before one can fairly predict when a sufficient number of base stations will have been deployed to permit wide-spread use of network-based techniques to reliably identify subscriber locations. Further, in more rural areas, network-based solutions will remain inherently problematic because the

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<sup>25</sup> Likewise, network-based solutions yield degraded location accuracy in "indoor or dense forest areas where customer demands and zoning or other land use restrictions do not enable high cell site penetration and, thus, the availability of ranging measurements is limited." Verizon First Phase Comments at 18-19. *See also* Cisco IP-Enabled Services Comments at 9 (discussing additional technical limitations of network-based solutions).

population density does not support the economic deployment of enough base stations for location technologies to be effective.<sup>26</sup>

Of course, the inherent weaknesses of network-based solutions can be overcome to some degree by constructing base stations that otherwise would not be called for by the network operator's business plan. Requiring emerging network operators to do so, however, comes at a high price. As noted earlier in this proceeding by T-Mobile:

[T]he costs of building and operating additional sites are substantial. When additional sites would only be added to accommodate additional [location monitoring units], a carrier will have to consider dropping coverage in some hard-to-serve areas. In addition, the cost of building and operating these location-only sites detracts from the ability to build and operate sites that would enhance coverage and/or service, with associated safety benefits for consumers.<sup>27</sup>

In other words, while network-based solutions can be effective tools for augmenting the location capabilities of GPS, it is not a panacea. In fact, if the Commission effectively mandates reliance on network-based solutions that require a dense base station deployment, it will effectively force wireless broadband network operators that offer portable and mobile interconnected VoIP services to add cell sites solely to ensure compliance with the Commission's E911 rules. These deployments will come at the expense of creating coverage shortfalls in areas where new broadband service is needed the most, and that, of course, would defeat the Commission's parallel objective of accelerating deployment of broadband-based services to underserved areas.<sup>28</sup>

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<sup>26</sup> See e.g., Comments of Rural Cellular Association, PS Docket 07-114 *et al.*, at 6 (filed July 3, 2007).

<sup>27</sup> Comments of T-Mobile USA, Inc., PS Docket No. 07-114 *et al.*, at 6 (filed July 5, 2007).

<sup>28</sup> Although not as directly relevant to location accuracy as the limits inherent in GPS or triangulation or trilaterization approaches, other technical factors have been cited as barriers to a truly effective IP-based E911 system. For example, the Commission's current rules require that all interconnected VoIP 911 calls be routed through the dedicated Wireline E911 Network. See *IP-Enabled Services First R&O and NPRM*, 20 FCC Rcd at 10269. By the same token, the Commission has acknowledged that "[t]he Wireline E911 Network generally has

The challenges that wireless broadband network operators will face in providing accurate location information given current technology will become even more complex if the Commission were to require network operators to supply accurate location information with respect to roaming subscribers.<sup>29</sup> As noted above, WCA opposes any Commission mandate that all interconnected VoIP providers utilize a common technology for meeting its E911 obligations. Perhaps technology-neutral solutions can be developed that will accomplish the Commission's objective, while still providing each carrier the flexibility to meet its E911 location accuracy obligations using the technology that best services its needs. However, that remains to be seen and, in any event, it certainly will be some time before one can be identified and implemented.

In sum, the Commission cannot assume these challenges will be met quickly. Indeed, the Commission recognized as much when it gave CMRS providers five years to come into compliance with the agency's Phase II accuracy requirements.<sup>30</sup> Likewise, the Commission cannot merely assume that wireless interconnected VoIP service providers will be capable of implementing ALI solutions *and* coming into compliance with the CMRS accuracy standards anytime soon, particularly if the Commission adopts the more stringent CMRS accuracy standards proposed in the *Location Accuracy NPRM*.<sup>31</sup> Rather, it must provide an appropriate

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been implemented, operated, and maintained by a subset of incumbent LECs, and generally is paid for by PSAPs through tariffs. Network implementations vary from carrier to carrier and jurisdiction to jurisdiction, but usually are based on a 25-year-old architecture and implemented with legacy components that place significant limitations on the functions that can be performed over the network." *Id.* at 10251-2 (footnotes omitted); *see also* Joint Comments of Center for Democracy & Technology *et al.*, WC Docket No. 05-196, at 13 (filed Aug. 15, 2005) ("Not only do legacy systems have extraordinary limitations in the type and volume of information they can carry, they are also expensive to install, maintain and operate. . . The Commission should structure any rules it promulgates to clearly articulate the expectation that the emergency community must move beyond its decades-old architectures and modes of operating, and must permit the more direct integration of IP-based services into the emergency network.").

<sup>29</sup> *See Location Accuracy NPRM* at ¶ 17.

<sup>30</sup> The Commission adopted its Phase II requirements in 1996 but did not require compliance with the Phase II ALI requirements until October 1, 2001. *See Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, Third Report and Order, 14 FCC Rcd 17388, 17391 (1999).

<sup>31</sup> *Cf. Bunker Hill Co. v. EPA*, 572 F.2d 1286, 1301 (9<sup>th</sup> Cir. 1977) ("The record must establish that the required technology is feasible, not merely *possibly* feasible.") (emphasis added).

transition period for those wireless broadband network operators providing interconnected VoIP services.

**B. The Commission Should Form a Joint Advisory Committee to Work Through the Relevant Issues and Formulate Recommendations on Appropriate Location Accuracy Requirements For Wireless Interconnected VoIP Service.**

WCA agrees with the Commission that the E911 regulatory framework for interconnected VoIP service should embody “a balanced approach that takes into consideration the expectations of consumers, the need to strengthen Americans ability to access public safety in times of crisis, and the needs of entities offering . . . innovative services.”<sup>32</sup> As others have suggested, the Commission can best achieve this objective by forming a joint advisory committee that includes Commission staff, representatives from the VoIP industry (including WCA), equipment vendors, state and local public safety officials, consumer groups and other interested parties who could study the issues raised by the *Location Accuracy NPRM* in depth, and make recommendations on final Commission rules, including an appropriate timetable for compliance as described above.<sup>33</sup>

This approach has a number of advantages. Most important, the successful implementation of any E911 program depends heavily on communication and cooperation among “wireless and wireline providers, manufacturers, third-party providers, state and local

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<sup>32</sup> *IP-Enabled Services First R&O and NPRM*, 20 FCC Rcd at 10248.

<sup>33</sup> See, e.g., Comments of NENA, PS Docket No. 07-114 *et al.*, at 4-5 (filed July 5, 2007) (announcing plans to hold a summit to “bring together public safety representatives and technologists with leaders from the wireless and IP industry, including those working on automatic location standards critical to the future of 9-1-1”); SBC IP-Enabled Services Comments at 8 (“The Commission should hold forums, sponsor workshops, and generally exercise its ability to focus industry attention on working through the technological challenges to automatically identifying a VoIP end user’s location for 911 purposes.”); USTelecom IP-Enabled Services Comments at 8 (recommending that the Commission “maintain an open dialog with consumer groups, industry representatives, public safety officials, and standards bodies to monitor compliance.”).

governments, public safety authorities, and consumer [public] interest groups.”<sup>34</sup> The issues raised by the *Location Accuracy NPRM* are complex, and an advisory committee that gives a voice to all interested parties will promote a comprehensive analysis and eventually rule recommendations that address those issues in a manner that best achieves the Commission’s regulatory objectives. Moreover, reliance on industry dialog will provide a forum for all possible alternatives to be accommodated, and thus will keep the Commission pointed squarely towards the sort of technology-neutral solutions that lie at the core of its regulatory framework for E911.<sup>35</sup> More give and take is necessary before the Commission can make a realistic assessment of what is required to meet its objectives, and how long it will take industry to comply with whatever new requirements are appropriate. Rather than risk the adoption of arbitrary and potentially counterproductive VoIP location accuracy requirements, the Commission should give all the relevant stakeholders the opportunity to discuss and eventually identify the approaches that are best suited for provisioning reliable ALI for portable and mobile interconnected VoIP service and developing a reasonable timeline for implementing those solutions.

### **III. CONCLUSION.**

WCA looks forward to working with the Commission and other parties in this proceeding to ensure that effective E911 solutions continue to be developed for wireless interconnected VoIP service. In that spirit, WCA urges the Commission to forego any mandatory location accuracy requirements at this time and to instead convene an advisory committee tasked with

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<sup>34</sup> *IP-Enabled Services First R&O and NPRM*, 20 FCC Rcd at 10253. See also Comments of United Online Inc., WT Docket No. 05-196, at 11 (filed August 15, 2005) (“[T]he Commission should actively work with the industry to determine what types of enhancements are practical and what a reasonable timeframe would be for implementing modifications. It is critical for the Commission to understand that VoIP providers must work in conjunction with a number of other parties in order to deliver E911 services.”).

<sup>35</sup> See, e.g., *IP-Enabled Services First R&O and NPRM*, 20 FCC Rcd at 10248 (stating Commission’s commitment to give service providers “flexibility to adopt a technological solution that works for them”).

proposing rules that will give wireless interconnected VoIP service providers a full and fair opportunity to find and implement solutions that ultimately will be most effective in protecting consumers in emergency situations.

Respectfully submitted,

**THE WIRELESS COMMUNICATIONS  
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August 20, 2007