NENA Next Generation Partner Program
NG9-1-1 Transition Policy Brief

NUMBER: Five

SUBJECT: Addressing Gaps in the Automatic Location of 9-1-1 Calls[1] for Current and Emerging Devices and Services

OBJECTIVE: Ensuring that accurate and automatic location is available for all consumer communications platforms; those available today and for new services when they come to market, for E9-1-1 and NG9-1-1 systems

TARGET AUDIENCE: Federal Communications Commission in conjunction with 9-1-1 and Public Safety Authorities, standards development organizations; National E9-1-1 Implementation and Coordination Office (ICO); Congress

JURISDICTION: Federal/National

BACKGROUND AND DISCUSSION: New forms of communications, from cell phones to Internet-based calling services, have consistently forced public safety to adapt. Indeed, it is these very advances that have exposed some of the limitations in our 9-1-1 infrastructure, and have provided an impetus for Next Generation 9-1-1 (NG9-1-1). Many devices in the hands of consumers today do not provide accurate automatic location of 9-1-1 calls. This current gap must be addressed. Also, new innovations are rapidly coming to market, such as femtocells[2], dual-mode handsets[3], softphones[4] and devices not yet envisioned that may not provide accurate automatic location for 9-1-1 calls. Significant leadership from policy makers is needed to address this issue.

NG9-1-1 policymaking efforts and investment have largely focused on the infrastructure side of 9-1-1. This Transition Policy Brief focuses on the critical need for accurate automatic location of all 9-1-1 calls to enable effective location-based routing and appropriate emergency response. It is a fundamental technical requirement of NG9-1-1 that the calling device or service must be aware of the caller's location for the call to be routed to the proper answering point. It must be a fundamental policy objective to ensure all communications devices capable of accessing 9-1-1, or those in which the customer reasonably expects to be able to do so, can be automatically and accurately located. This is true for current devices/services and for new consumer communications platforms when they come to market. Having 9-1-1 solutions and requirements in place for services when they come to market is a key policy objective and would be a welcome approach compared to the post-market 9-1-1 regulations that have been required in the past. Policy makers need to lead efforts to effectively promote innovation while ensuring the reasonable 9-1-1 expectations of consumers are met on the first day a new service is offered.

---

[1] In this Transition Policy Brief, the term 9-1-1 emergency "calls" refers to any voice calls or emergency data messages.

[2] Femtocell: Femtocells are low-power wireless access points that operate in licensed spectrum to connect standard mobile devices to a mobile operator's network using residential DSL or cable broadband connections [note: femtocell use is not limited to the residential environment]. (source: Femto Forum)

[3] Dual-mode handset: a calling device with both cellular and WiFi (802.11x) capability. The device typically rolls over to the subscriber's WiFi network when in the home.

[4] Softphone: A software program for making telephone calls over the Internet from a general-purpose computer, rather than a dedicated calling device.

Current Gaps

There are many devices/services which currently do not enable the automatic location of 9-1-1 calls, and many that offer no 9-1-1 service at all. For example, while wireless 9-1-1 calls are routed over the E9-1-1 system to Public Safety Answering Points (PSAPs) with location information, SMS messages that originate from the same devices cannot be routed to PSAPs. Approximately 75 billion SMS messages were sent in the United States in June 2008 alone, or roughly ten per day per cellular subscriber.[5] The same is true for Instant Messaging (IM) systems. Indeed, during the tragic Virginia Tech incident, some students expected that they could text message the 9-1-1 dispatch center with vital information only to find out that the 9-1-1 network does not support text messaging, photos or multimedia messages.[6] Also, while multi-line telephone systems (MLTS) used in the enterprise environment are certainly capable of sending precise 9-1-1 location information, most do not, and most states do not require such systems to be E9-1-1 capable. Thus far, nomadic interconnected VoIP services have provided 9-1-1 services by self-provided customer registration of location and providing that information for routing via the E9-1-1 system. This location may not be accurate or up to date and can cause 9-1-1 calls to route to the wrong PSAP when a customer fails to re-register his/her location when moving the device to a new location. There have been multiple public cases of 9-1-1 calls being routed to a PSAP using the customer's prior location, rather than the actual location.[7] Automatic location determination for all of these services would rectify this gap. Policymakers should lead a focused effort to promote research and development along with policies that will facilitate accurate automatic location capabilities for these technologies.

Emerging Services Coming to Market

Too often in the past, 9-1-1 service and 9-1-1 automatic location capabilities have been a post-market afterthought. With the increasing complexities and capabilities of communications services and networks, it is more essential than ever that policymakers encourage, and require where necessary, industry groups to work cooperatively as services are developed to ensure that automatic and accurate 9-1-1 location capability is a fundamental tenet adhered to as new services come to market. Some examples include WiFi and WiMAX enabled devices ranging from notebook computers to multimedia Internet devices and Cellular/WiFi dual-mode devices.

Service providers and the network providers have typically been one and the same. This will no longer be the case in many instances as communications devices[8] become more heterogeneous. In theory, any device with voice and data inputs and IP communications capability can become voice and data "calling" devices. The same device is likely able to have multiple location detection and routing capabilities depending on the network to which it is connected. Thus, devices (including the applications downloaded on devices) will need to be able to determine or acquire their own location regardless of who provides the network connectivity. Similarly, network providers must be able to assist in enabling devices not uniquely designed for their specific network technology to acquire location and provide caller location information to 9-1-1 systems and public safety agencies. All of the issues above apply to current E9-1-1 systems and to NG9-1-1 systems. A key challenge will be to insure a proper focus on integrating services with NG9-1-1 while also being cognizant of the fact that many areas will still rely on the E9-1-1 system in the near future.

---

[5] http://www.ctia.org/advocacy/research/index.cfm/AID/10323
[6] http://www.911alliance.org/9IA_Health_of_US_911%20_2_.pdf at pages 14, 70.
[7] http://www.apco911.org/new/commcenter911/downloads/VoIP_flavors.pdf
[8] As used in this Brief, the term "devices" include a physical device and also separate software applications that are downloaded to the device that enable voice or data communications.

ACTIONS PROPOSED TO RESOLVE ISSUE:

- The FCC, in conjunction with appropriate public safety and industry stakeholders, should take the lead in setting out the ultimate policy goal for location information from communications devices capable of accessing the 9-1-1 system. In doing so, the FCC should establish clear expectations of all stakeholders, require appropriate 9-1-1 service capability disclosures to consumers, and require a phased-in approach to 9-1-1 requirements, thus allowing carriers and providers to comply over time.
- Policymakers should actively support the development of nationally recognized standards and best practices to ensure effective automatic 9-1-1 location capabilities are put in place for all technologies and services as they go to market.
- Policymakers should be equally concerned with the accuracy of location information used to determine how to route 9-1-1 calls, and location information delivered to the PSAPs.
- Where industry does not act, to the extent technically feasible, the FCC should take steps to require automatic location capabilities. Regulations and a conflict resolution process may be necessary to compel cooperation among competitors to ensure information is appropriately shared to locate and route 9-1-1 calls.
- The national E9-1-1 Implementation and Coordination Office (ICO) should coordinate with the FCC and appropriate industry and public safety groups to faithfully execute its requirement to "analyze efforts to provide automatic location for enhanced 9–1–1 services and provide recommendations on regulatory or legislative changes that are necessary to achieve automatic location for enhanced 9–1–1 services."[9]
- The FCC should address the issue of accurate and automatic location of all 9-1-1 calls holistically and across technology and service types where possible. The FCC should develop a framework to treat 9-1-1 location issues for all technologies and service as a single issue to ensure the call is properly routed in a timely manner and first responders know precisely where to go to render emergency assistance.
- Policymakers should promote a regulatory framework such that general 9-1-1 requirements are widely applicable across technologies where the public would have a reasonable expectation of 9-1-1 call delivery, taking unique service characteristics into consideration as appropriate. Without stifling innovation, service providers should be on notice that it is generally expected that where there is a reasonable customer expectation, 9-1-1 access and call routing capability will be integrated into new service offerings as services become available to the public, not after going to market.
- Policymakers should also address caller location and call routing issues for other N-1-1 services and national 800 number services (such as the national suicide hotline) to ensure these calls are effectively routed to geographically appropriate entities and that location information can be shared between other N-1-1 services and PSAPs as appropriate.

[9] P.L. 110-283.