

**Before the Federal Communications Commission**

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*IN RE*  
FRAMEWORK FOR NEXT GENERATION 9-1-1 DEPLOYMENT

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*ON NOTICE OF INQUIRY*

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**COMMENTS OF THE  
NATIONAL EMERGENCY NUMBER ASSOCIATION**

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The National Emergency Number Association (“NENA”) respectfully submits the following comments in response to the *Notice of Inquiry* adopted by the Commission on December 21<sup>st</sup>, 2010, in this proceeding.

### COMMENTS

NENA is delighted that the Commission has undertaken this critical first step toward unleashing the benefits that Next Generation 9-1-1 (“NG9-1-1”) will eventually bring to all Americans. Whether through expanded origination options, rich data exchange, improved accessibility, better caller location information, or faster response times, NG9-1-1 will revolutionize the way Americans request and receive emergency assistance. A revolution, however, is never a simple proposition: In order to achieve the many benefits of NG9-1-1, the Commission must work closely with Congress, state regulators, consumer groups,

regulated entities, commercial vendors, and the public safety community to ensure that deployment efforts are not hampered by laws, regulations, and policies formulated for legacy networks and 9-1-1 operations. In particular, it is imperative that the Commission adopt policies aimed at ensuring that consumers can access 9-1-1 from as many devices as possible, that 9-1-1 authorities and public safety answering points have access to a vibrant and competitive market for products and services, and that the burdens imposed upon access network operators and Originating Service Providers (“OSPs”) ensure quality, reliable service without inflicting unnecessary competitive or economic harm. The development of NENA’s NG9-1-1 system design has been a multi-year process involving NENA’s public and safety and commercial members. So far, this effort has produced a number of NG9-1-1 standards and documents, including the i3 architecture definition. NENA commends the work of its committees to the Commission and applauds the use of i3 by other standards development organizations such as ATIS.

## **I. NG9-1-1 Capabilities and Applications**

### ***A. Certain network elements and capabilities must be standardized across all NG9-1-1 deployments.***

Legacy 9-1-1 systems are based on a single, clearly-defined service: voice telephony. NG9-1-1, by contrast, has been designed from the ground up to handle a multitude of baseline services while providing for simple, inexpensive extensibility. In order to maximize the value of NG9-1-1 to consumers and public safety agencies while minimizing the overall costs of NG9-1-1, standardization and interoperability must be built-in from the start. NENA’s baseline architecture for NG9-1-1 achieves this by mandating the use of open, standards-based media formats, signaling methods, transport protocols, and interface specifications. Further, the draft standard specifies certain functional elements, databases, servers, and registries that must be deployed in every NG9-1-1 system.

1. A “Certification Authority” must be created and maintained at the national level.

NENA’s baseline model for NG9-1-1 contemplates the continued preeminence of state and local governments in the design and deployment of 9-1-1 systems, but it also recognizes one specialized service that must be provided at the national level to ensure nation-wide operability and security: a “PSAP Certification Authority.”

A PSAP Certification Authority (“PCA”) is a cryptographic service provider that enables role-based security for PSAPs by deploying a public-key infrastructure (“PKI”) and issuing root-signed digital certificates. In order to maintain the security of NG9-1-1 systems, the PCA must verify the identity of and authority of each entity that requests a cryptographic certificate to a high degree of certainty before issuing the requested certificate. In addition, it must maintain an easily-accessible Certificate Revocation List (“CRL”) to ensure that revoked certificates cannot continue in use. The stakes for this operation are high: An incorrectly issued certificate could allow a malicious entity to conduct trusted operations on an ESInet, potentially disrupting or disabling NG9-1-1 operations. Consequently, the PCA must be carefully designed, strictly controlled, and subjected to frequent and extensive audits.

Because of the need for high-trust operation and the relatively small number of clients that the PCA will serve, NENA anticipates that a single PCA will be deployed at the national level.<sup>1</sup> The national PCA, however, need not itself issue *every* PSAP certificate. In one alternative architecture, the national PCA could issue certificates to state-level authorities that would then issue certificates to verified PSAPs. This approach would eliminate a poten-

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<sup>1</sup> NENA standard 75-001, *Security for Next-Generation 9-1-1 (NG-SEC)*, (available at: <http://www.nena.org/joint-tech-ops-standards>) provides significant additional detail on the comprehensive security regime that NENA envisions for NG9-1-1.

tial bottleneck, but might prove more expensive or less secure unless national operating standards are imposed.

2. *Federated, hierarchical “forest guides” must be deployed to support the Emergency Call Routing Function.*

A Forest Guide is a database used to associate an NG9-1-1 service request with a particular Emergency Communication Routing Function (“ECRF”) and Location Verification Function (“LVF”). At the national level, the forest guide will provide pointers to the state level when a service request is made through a non-U.S.-based originating service provider. In turn, state, regional, and local-level forest guides will point service requests to the appropriate lower-level guide and, ultimately, to the geographically relevant ECRF and LVF. Deploying these routing functions in a hierarchical fashion keeps control of routing information in the hands of those who will populate it initially and maintain it on a regular basis. Importantly, the forest guides must be logically unitary: while more than one server may be deployed at each level of government to ensure availability, survivability, and short lookup times, the data set itself must be consistent across all servers and must be maintained with the greatest possible care.

3. *PSAP interface components must be standardized and interoperable to improve handling of overloads, disasters, and cyber attacks.*

NG9-1-1 must function well in disaster situations, and in the face of a Denial of Service (“DoS”) attack on the nation’s 9-1-1 systems. The single defining characteristic of both scenarios is that more service requests arrive at a PSAP than the staff at that PSAP or an overflow can handle. The current E9-1-1 system responds to such overloads with a busy response to the caller, and cannot distinguish calls that are important from calls that are not. In an NG9-1-1 environment, service requests can originate from many additional sources, but the overload prob-

lem (whether circumstantial or malicious) remains. In order to avoid presenting consumers with the equivalent of a busy signal, NG9-1-1 must handle such overloads gracefully.

In NENA's NG9-1-1 standards and documents, three functional elements, the Border Control Function ("BCF"), the ECRF, and the Emergency Services Routing Proxy ("ESRP") work together to provide an effective alternative to "busy signals" by diverting excess service requests to alternative PSAPs that are able to effectively handle them and provide help to the caller. However, these functions can only operate as intended if *all* PSAPs have these elements, and they are interoperable. Therefore, NENA asserts that the BCF, ECRF and ESRP should be required elements of every NG9-1-1 system, and that they should conform to NENA's draft 08-003 standard.<sup>2</sup>

*4. Requirements imposed on access networks and originating service providers should be limited.*

Consumers increasingly expect 9-1-1 to handle modern communications methods beyond legacy voice service. To meet those expectations, a critical goal of NG9-1-1 is to enable the broadest possible range of OSPs from which a consumer can initiate a service request. To achieve that goal, NG9-1-1 must provide open, standardized interfaces and minimize the cost-of-entry for OSPs and access network providers. NENA's draft i3 standard would minimize costs and compliance burdens in three ways: First, the draft standard would make hierarchical routing information available without charge on the public internet. Second, it will enable pervasive location determination capabilities at the cost of imposing some burdens on access network operators and originating service providers. Finally, the draft standard specifies free or low-cost methods for handling common media types (discussed below).

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<sup>2</sup> NENA Standard 08-003, the "NENA i3 Solution," is currently in draft status, awaiting approval by NENA's board.

5. *Other components will reduce transition costs and improve PSAP operational capabilities.*

In addition to the core components described above, five other components will play a role in deployed NG9-1-1 systems: a legacy network gateway, which connects unmodified legacy origination networks (e.g., wireline, wireless, or VoIP) to an NG9-1-1 system; a legacy PSAP gateway, which connects a legacy PSAP to an NG9-1-1 system; a logging service, which provides a history of every significant event or media stream for each service request or incident; a conference mixing bridge, used during call transfers; and an Interactive Media Response (IMR) unit, which functions as an automated, multimedia answering system and can be activated during some overload conditions.<sup>3</sup>

***B. All NG9-1-1 deployments must support a minimum set of media types and provide for robust extensibility.***

Consumers in the United States are technologically sophisticated and accustomed to using a variety of rich communications media including voice, photographs, video, text, and other data. Legacy 9-1-1 systems, however, support a single medium for service requests: voice telephone calls.<sup>4</sup> This limitation already leads to widespread consumer confusion as wireless subscribers, in particular,

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<sup>3</sup> An IMR might direct a caller to “Press ‘1’ if you are reporting the automobile accident near exit 24 on I-95; press ‘2’ for all other calls.” In addition, it could handle non-voice media such as pictures, video, text, or recorded audio.

<sup>4</sup> Strictly speaking, legacy systems also support “text” through TTY/TDD. These technologies are still based on an underlying voice infrastructure, however. Additionally, some 9-1-1 systems have recently been upgraded to handle SMS text on a limited, carrier-dependent basis. The geographic and network footprint of these deployments is limited, however, and support for the SMS medium is not standardized.

fail to understand the inability of 9-1-1 systems to receive, process, and respond to service requests presented using common protocols like SMS and MMS. NG9-1-1 has the potential to better meet consumer expectations by providing for baseline standards that encompass the most common media types<sup>5</sup> and robust extensibility made possible by open, standards-based interfaces, publicly-available routing information, and ubiquitous methods for accessing location information.

To meet public expectations and prevent consumer confusion it will be necessary to establish minimum functional requirements, such as image resolution or video frame rate, for NG9-1-1 deployments. Based on extensive technical and operational development work, NENA believes that the initial feature set of NG9-1-1 deployments should include support for each of the media types identified by the Commission, along with recorded video and wideband audio. Additionally, NENA considers it important that NG9-1-1 deployments include extensibility features from the outset to ensure that 9-1-1 service can evolve alongside commercial technology.

1. *PSAPs should accept standards-compliant message-based text.*

The ability to accept and respond to text-based communications media is a fundamental characteristic of NG9-1-1. Today, consumers are familiar with a large and growing variety of text-based communications methods including email, instant messaging, and SMS. Indeed, these methods are now the dominant modes of communication for certain demographic groups. In order to meet the clear expectation of consumers that they will be able to access emergency services via text messaging, it is imperative

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<sup>5</sup> NENA here assumes the Commission's use of the generic term "media type" to refer to *modes* of interaction, rather than specific protocols. E.g., NENA refers to "message-based text" as a media type, and to "SMS" as a messaging protocol.

that NG9-1-1 provide support for a wide range of text messaging platforms.

NENA's baseline design for NG9-1-1 provides a framework for PSAPs to accept next-generation message-based text presented using the open, standardized "Session Initiation Protocol" or "SIP." NENA selected this method for two reasons: First, SIP is already widely deployed for VoIP call setup and other uses and, unlike other protocols, provides enhancements needed to handle emergency text messages. Second, although SIP is not presently a dominant protocol for instant messaging, it is a straightforward and inexpensive matter for service providers and application developers to design products that interwork with SIP since it is a free, open-source standard.

NENA believes that any form of text messaging that has the characteristics needed to be effective in 9-1-1 service should be supported by NG9-1-1. That is, if a text messaging platform operates in near-real time and is controllable as an interactive, conversational messaging process, that platform should be able to access user location information and route service requests to 9-1-1. Provided that text messaging platforms meet the requirements described above, NENA's draft standards for PSAP interfaces should enable any compliant PSAP to accept and respond to service requests originated on those platforms.

## *2. PSAPS should accept standards-compliant Real-Time-Text.*

Due to its more conversational flow, Real-Time Text ("RTT") is a preferred method of communication for many text users, and particularly for individuals with disabilities. NENA believes that standards-compliant RTT should be supported in all NG9-1-1 deployments, and has included explicit support for RTT in the draft i3 standard. To facilitate interoperability and inexpensive widespread adoption of RTT, the draft i3 standard specifies Internet

Engineering Task Force (“IETF”) RFC4103 as the baseline RTT format.

3. *PSAPs should accept still images, real-time video, and recorded video.*

In terms of impact on first-responder activities, imaging, both still and video, is perhaps the greatest advance that NG9-1-1 can offer. Imagery can provide emergency medical technicians (“EMTs”) tremendous information about the severity of a medical situation that would take precious time to convey by voice; it can get the face of a suspect or escapee into the hands of law enforcement faster; and it can instantly show firefighters the type of structure and level of involvement for a given call.

Based on current market trends, NENA anticipates that many still images and recorded videos submitted to PSAPs will originate on mobile devices such as smart phones, tablet computers, or WiFi-enabled cameras. In this context imagery represents a near-term challenge for NG9-1-1. At present, voice calls to 9-1-1 cause cellular handsets to enter a special “emergency mode” in which they lock-on to the strongest available radio carrier and disable all non-voice communication functions. This blocks access to Multimedia Message Service (“MMS”) applications, which are the current standard for mobile imagery. For future handsets, this requirement should be modified so that users can include rich media like still images and video alongside voice calls or text messages requesting 9-1-1 service. Additionally, any regulations or standards should explicitly contemplate foreseeable advances in access provider network protocols such as the nascent Internet Multimedia Subsystem (“IMS”) and provide for interoperability either directly or through translation gateways. Recognizing this need, NENA is working with industry and other standards development organizations to ensure that standards inside and outside the NG9-1-1 ecosystem evolve in concert.

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PARTICULARLY TO individuals with disabilities, the promise of real-time video is perhaps the greatest of all NG9-1-1 benefits: Coupled with NG9-1-1's inherent 3-way calling ability, real-time video will allow telecommunicators to interact more directly with a deaf or hard-of-hearing caller through a video interpreter. In addition, this mode of communication will allow telecommunicators to derive significant additional information about the circumstances surrounding a video call by observing the background imagery, much as they do now for background sounds in a voice call.

To achieve these benefits, the draft NENA i3 standard requires originating service providers to present video streams in H.264 format using SIP signaling. NENA believes that H.264's ubiquity, modest bandwidth requirements, and straightforward interworking with other formats such as H.232 makes it the best choice for real-time video streaming in NG9-1-1.

4. *The value of telemetry data is dependent upon standardization and operational considerations.*

The ability to access data from telematics and other sensor systems represents a quantum leap in public safety capabilities. Already, real-time traffic monitoring and other sensing and imaging systems have improved response times by allowing dispatched units to avoid congested areas while en route. As connected sensor systems become less costly and are integrated into a wider array of consumer products, the volume of telemetry available to public safety will explode. In order for PSAPs, and responders, to be able to accept, process, analyze, and distribute data from such sources, NENA standards require that the data be held by the supplier, that a Uniform Resource Identifier (URI), a form of Internet address, be provided, and that the URI, when accessed, provides the data in a standardized form. Sending the URI instead of the data itself, minimizes the size of the signaling records for calls, and provides a mechanism for any entity in the path of the call to know the information is available, re-

trieve it if they need it, and pass it on to the next entity in the call path.

To ensure nation-wide consistency of services and provide interoperability among the broadest set of devices and services, telematics data structures must also be standardized. NENA anticipates that several schema will ultimately emerge, defined by groups of vendors working in particular areas such as automobiles, alarm systems, etc. From a PSAP perspective, however, it would be operationally impossible to handle telematics data routinely if the underlying schema become fragmented or inconsistent over time. Consequently, NENA has begun working with industry to ensure that such fragmentation does not occur. Assuming that work continues apace, NENA does not anticipate the need for regulation in this area. However, should market fragmentation occur, it may become necessary for the Commission to intervene.

*5. PSAPS should accept auxiliary medical and other personal data presented in secure, standards-compliant formats.*

NENA supports the delivery of auxiliary medical data alongside NG9-1-1 service requests on a voluntary, opt-in basis. To bring this function into widespread use, however, much work will need to be done to assure consumers that their sensitive personal data will be transported and stored securely, distributed only to trusted parties, and disposed of securely after an incident is resolved. Additionally, these new methods of using sensitive personal information and medical data must be incorporated into existing legislative and regulatory frameworks to build market confidence and attract investment. Perhaps most importantly, however, standards must be developed for the representation and transmission of medical and other data so that PSAP and field personnel are not confronted with confusing, inconsistent data or subtle differences in meaning between one data source and the next. These standardization efforts must be industry-driven, but must

also involve meaningful participation on the part of public safety to ensure that the resulting standards are operationally useful.

*6. PSAPs should support wideband voice calls.*

While photos, videos, and various forms of text messaging will attract much attention as novel features of NG9-1-1, NENA expects that many emergency service requests will still be made by voice call. This makes it important that NG9-1-1 provide support for rapidly-evolving voice telecommunications standards. Specifically, NENA considers it important that NG9-1-1 deployments provide support for wide-band telephony.

Although human hearing theoretically spans a total bandwidth of 20kHz, typical voice codecs have only a 3-4kHz pass band. This small audio bandwidth was originally chosen because most of the information carried by the human voice can be captured within that span and because early digital technology was severely bandwidth-constrained. As technology has advanced, however, improved compression techniques and less-expensive broadband data services have allowed the deployment of audio codecs with significantly wider pass bands. Indeed, codecs available in many common IP telephones now support audio pass bands as wide as seven or even 20kHz.

NENA believes that wideband voice telephony offers several benefits to consumers and public safety. First, it can improve the intelligibility of both the caller's voice and that of the responding telecommunicator. Second, it can provide telecommunicators with more and better contextual clues about the nature and circumstances of a given call, since it allows for significant non-voice audio to be clearly and efficiently transmitted. Finally, it can enable higher-quality call recordings for use in training, law enforcement work, and litigation. Because of these benefits, NENA considers it important that NG9-1-1 support wide-band audio using standardized codecs. Of course, many wide-band codecs should be considered for inclusion in NG9-1-1 services in the future. But requiring support for

at least one codec in the initial deployments of NG9-1-1 could ensure that planning decisions made in the near term do not foreclose the possibility of future upgrades or render them prohibitively expensive.

***C. Voice, text, and real-time video will be used as “primary media.”***

NENA agrees with the Commission’s assessment that voice, message-based text, and real-time text will be primary media as that term is defined in the NOI. However, NENA believes that live video also will be used as a primary medium. Over the past two years, video calling has finally evolved from a novelty service into a common feature in consumer electronics such as smart phones, laptops, tablet computers, televisions, and game consoles. NENA believes that this trend is likely to continue, especially as the deployment of 4G mobile networks eliminates video calling devices’ dependency on wired access networks. More importantly, however, the growing ubiquity of video calling capabilities has the potential to revolutionize access to 9-1-1 services for individuals with disabilities.

Currently, deaf or hard-of-hearing individuals face severe limitations on their ability to access emergency services. TTY/TDD devices do allow text-based access to 9-1-1, but these devices are bulky and are not incorporated directly into mobile devices. Wireline video phones provide access to video relay services, but these services are often unreliable and do not permit the telecommunicator to see the caller or the caller’s environment. Video calling – particularly in the mobile context – will allow individuals with hearing or speech disabilities to access emergency services via three-way video call, providing a more natural and convenient interaction for the caller and greater contextual information for the responding telecommunicator. NENA is committed to ensuring equality of service for *all* Americans and therefore strongly urges the Commission to include real-time two-way and three-way video calling in its definition of primary media.

***D. SMS may play a transitional role in NG9-1-1 prior to the deployment of more advanced 4G messaging protocols.***

In the abstract NENA does not advocate the use of SMS as a means to access 9-1-1 systems. Today, SMS lacks many of the characteristics needed to support quality emergency communications. Therefore, NENA's current design for NG9-1-1 does not include support for SMS text. Nevertheless, the market, including several NENA members, is responding to consumer demand for 9-1-1 text messaging capabilities. Depending on the length of time required for the transition to NG9-1-1 and to 4G mobile networks, investments in SMS 9-1-1 capabilities may necessitate some support for SMS in initial NG9-1-1 deployments.

As a long-term matter, NENA anticipates that 4G mobile networks using more advanced text messaging protocols will eventually render SMS obsolete. NENA expects that this will happen before NG9-1-1 becomes widely available. To support that process, NENA's recent NG Messaging document provides use cases and high level needs for cellular system 4G standards development to improve the reliability and features of messaging for the purposes of emergency communications. However, should the roll-out of advanced messaging technology lag behind the transition to NG9-1-1, NENA may reevaluate its conclusions about the value of SMS text in NG9-1-1 systems. NENA therefore encourages the Commission to keep abreast of efforts by ATIS, 4GPP and other standards development organizations to develop reliable, low-latency messaging protocols for 4G mobile networks, as well as carriers' efforts to deploy them.

***1. Consumers must be educated about the limitations of SMS messaging.***

Despite some current limited deployments of SMS capabilities in IP-capable or pre-NG9-1-1 systems, NENA does not anticipate the rapid, widespread implementation of SMS capabilities by 9-1-1 service providers and hardware

vendors. However, as NG9-1-1 begins to roll out, consumers could erroneously assume that SMS texting can be received, processed, and responded to by E9-1-1 and NG9-1-1 systems. Left unchecked, this confusion could lead consumers to waste time texting 9-1-1 or leave unused other means of communications at their disposal, wasting precious seconds in an emergency. To combat this problem, the FCC should collaborate with industry and media partners and public safety to educate consumers about the current and ongoing limitations of SMS for emergency communications.

***E. Accessibility of NG9-1-1 service to individuals with disabilities can best be achieved by ensuring the use of open standards-based interfaces.***

As described above, individuals with disabilities face myriad problems in accessing emergency services through current generation 9-1-1 systems. In order to overcome these problems, NG9-1-1 must foster a competitive environment in which open standards-based systems allow device manufacturers and application developers to include accessibility features in a wider range of products.

NENA's NG9-1-1 design includes support for various forms of text and video messaging that are, to a great degree, already standardized. To establish a firm foundation for NG9-1-1, NENA believes that industry should implement these standards widely, quickly, and starting now. For example, already-completed standards can allow existing VRS and IP Relay services to easily migrate to NG9-1-1 standards, and instant messaging systems already in use by individuals with disabilities to be easily extended to support IM to NG9-1-1. Finally, NG9-1-1 capable RTT should be available and widely-deployed in off-the-shelf consumer devices.

In addition, NENA's NG9-1-1 system architecture supports operational models that improve accessibility. For example, NENA expects that individuals with disabilities will access NG9-1-1 using the same set of media

types as other English speakers. There will be some operational differences however, and NENA's NG9-1-1 design includes support for preferred language identifiers, signaling elements that alert networks and interface devices to incoming service requests that may require differing treatment such as special call routing options and potentially automatic conferencing of interpretation services. Additionally, the ability to establish three-way calls or request that family members be added to 9-1-1 calls will provide important benefits for individuals with disabilities by enabling them to use the same mechanisms used by other individuals.

## **II. NG9-1-1 Network Architecture**

### ***A. NG9-1-1 should be a flexible but unified service.***

In an ideal world, NENA believes that NG9-1-1 services must be based on only *one* standardized architecture and *one* set of interface standards. In reality, however, there are likely to be more than one standard architecture and set of interface standards. In this scenario, it is critically important that these architectures and associated standards interface and interoperate among architectures. The architecture and protocols should, however, be permitted to evolve over time as standards advance, provided that only standardized features are added and that no change to a local system can lead to incompatibility with baseline services or interfaces. The public safety community has long experienced system fragmentation in the land-mobile radio world and all of the operational and economic harms that result from it. Similar circumstances must not be allowed to develop in the 9-1-1 ecosystem.

### ***B. Two device classes can usefully provide emergency "calling" services.***

As a practical matter, NENA does not believe it feasible for *every* connected device to provide emergency calling services. At least two categories of devices, however, *should* support emergency service requests through NG9-1-1: those which support "primary media" and those

which provide interconnected sensing and alerting capabilities.

Devices supporting primary media need to support four features to be appropriate for inclusion in NG9-1-1. First, they must support interaction between two or more humans. Second, they must be able to recognize 9-1-1 as a valid service address. Third, they must be able to acquire location data from Location Information Servers in underlying access networks, use that information to acquire routing information for the geographically appropriate PSAP, and route the service request for response. Finally, they must provide a reasonably robust identity system to prevent abuse of the 9-1-1 system.

Like interactive devices, systems that provide sensing and alerting capabilities must provide routing and identity assurance functions. To be useful, however, non-human-initiated emergency service requests also must not generate substantial numbers of false requests. Likewise, they must be intelligent: NENA's draft standards for NG9-1-1 require machine-initiated alerts to include a fair amount of data, data which the underlying sensor system must be able to construct and transmit alongside the alert. Provided that sensing and alerting devices and systems can meet these criteria, NENA believes that they can play a large and increasing role in protecting life and property when coupled with the NG9-1-1 system.

***C. The Commission should establish minimal performance criteria for various media types.***

Long-term trends in bandwidth availability and data consumption by consumers lead NENA to believe that the Commission should establish floating performance floors for NG9-1-1 systems pegged to the capabilities of mainstream consumer devices. Such standards will ensure that planning for NG9-1-1 system deployments will take account of foreseeable changes in consumer behavior and device capabilities. Without such a standard, it is possible that short-sighted planning will leave some NG9-1-1 systems unable to cope with new capabilities and ever-

increasing bandwidth requirements. The Commission should stop short, however, of imposing specific format requirements, leaving the precise protocols, file specifications, and interface elements in the hands of industry and standards development organizations. This approach will allow industry to respond more nimbly to market trends in consumer devices and public safety agencies to reap the benefits of technological advances on a shorter timescale.

***D. An industry-led testing and certification process is necessary to ensure interoperability and protect consumers.***

As service expands to a multitude of communications methods and devices, it is imperative that the 9-1-1 ecosystem continue to provide consumers with reliable and understandable means to request emergency services. To do this, it will be necessary for application developers, consumer electronics manufacturers, access network operators and originating service providers to have access to a ready means of ensuring that their products and services are compatible with 9-1-1. Given the sheer number of new services and devices that will connect consumers with PSAPs in NG9-1-1, NENA believes that device certification and testing should be left in the hands of industry and distributed among accredited, third-party laboratories. This will ensure a level competitive playing field, prevent the introduction of non-interoperable equipment, and provide reasonable assurance to consumers that certified devices can connect them with 9-1-1 when an emergency arises.

***E. PSAP Functions in an NG9-1-1 Environment***

In today's 9-1-1 environment, there are multiple vendors who provide 9-1-1 Customer Premise Equipment ("CPE"), call and data logging, and Computer Aided Dispatch ("CAD") which can, and in some cases do, function in a virtual PSAP arrangement. But these systems are currently limited by geographic factors such as 9-1-1 system

service provider (“SSP”) requirements and regulatory or legislative variations. With the higher level of standardization NENA envisions for NG9-1-1 systems, however, service provider requirements should no longer be limiting factors: Practically speaking, databases and CAD systems will be connected to ESInets, allowing non-local PSAPs to access data on a timely and reliable basis. Regulatory and legislative restrictions, particularly at the state level, on the other hand, will need to be adjusted or eliminated to allow this type of interoperation.

In addition to eliminating regulatory and legislative roadblocks to inter-jurisdictional virtualization, it is also important that data types and meanings be standardized in order to allow an out-of-jurisdiction PSAP to handle redirected or virtualized service requests effectively. Connecting PSAP databases and CAD systems to ESInets is a necessary first step to implementing these modes of operation. Because standardization of data across PSAP-related databases is a long term goal for NENA, NENA is working with public safety agencies and industry partners in multiple fora to achieve it. As those initiatives move forward, the results will contribute significantly towards eliminating any data confusion, both technically and operationally, within virtual PSAP implementations.

### **III. Other Specialized NG9-1-1 Applications**

#### ***A. NG9-1-1 can facilitate device-initiated service requests by providing uniform interfaces based on open standards.***

With the development of nanotechnology for use in sensors and the increased capabilities and use of machine-to-machine communications, NG9-1-1 centers must be designed to receive and process device-initiated service requests. NENA’s NG9-1-1 design will facilitate device-initiated emergency service requests by establishing uniform protocols for accessing PSAPs based on open standards. Additionally, NENA anticipates developing standards to ensure that device-initiated service requests do

not unduly complicate or interfere with the operations of NG9-1-1 PSAPs.

- 1. Laws, regulations, and policies that assume a PSTN-based 9-1-1 system must be updated to allow for device-initiated service requests and protect providers.*

Laws, regulations and policies based on voice-centric, monopoly-regulated wireline services and autodialers represent a problematic legacy for 9-1-1. As the Commission considers new rules aimed at enabling the deployment of NG9-1-1, there is a clear need to modify existing regulations and tariffs that prohibit or substantially restrict the provisioning of competitive 9-1-1 services. In addition, the Commission should provide leadership and guidance as Congress, state legislators, and state regulators consider similar changes. As it does so, the Commission should take care to ensure that devices-initiated service requests are considered fully in the policy-development process.

***B. All N-1-1 services should eventually be interoperable with NG9-1-1 and permit simple transfers of service requests to appropriate responders.***

NENA recognizes that emergencies may be identified through N-1-1 service requests and has long advocated for a straightforward transfer function between N-1-1 services and 9-1-1. While NG9-1-1 ESInets will be designed to support emergency services, it is possible and appropriate that N-1-1 and 9-1-1 services could share NG9-1-1 components, such as GIS database resources, for call routing purposes. Likewise, the services could share the underlying IP transport network, provided data could be appropriately secured and segregated. States and localities should therefore carefully review the benefits that could be realized through such an arrangement and plan their regulations and investments accordingly. As NG9-1-1 is more widely deployed and PSAP operations evolve to handle NG9-1-1 information flows, the ability to offer N-1-

1 services on an IP network that also supports ESNets and NG9-1-1 should be explicitly supported.

***C. The availability and utility of auxiliary data may be limited by liability concerns without strong protections in law and regulation.***

Although promising, auxiliary data development in the NG9-1-1 context could be limited if equipment manufacturers, database suppliers, and application developers face overly large or indefinite liability exposure. Assuming liability protection were to be codified in law or by rule, however, several approaches to “auxiliary” data access could prove fruitful. In one example known as “caller-associated data,” a device itself could provide information on what data are available. With the use of an URI, or a device feature, auxiliary data may be acquired from outside the NG9-1-1 system by the PSAP or other emergency response entity. Another example of auxiliary data use is when a 9-1-1 authority enters data in a specific location-related data layer in a GIS system, and that data is retrieved by a PSAP, using a URI, when a query is made. This approach underscores the value and potential costs savings from NG9-1-1 systems that are regional in nature, in that data stored in a single database could be retrieved by one or many NG9-1-1 PSAPs or other public safety entities.

***D. NG9-1-1 will radically improve disaster response and recovery efforts.***

In current-generation 9-1-1 systems, calls cannot be easily transferred or redirected when a disaster causes overwhelming call volume or forces the shutdown of a PSAP. NG9-1-1, by contrast, will explicitly provide for both the transfer of excess traffic to one or more designated PSAPs and the redirection of *all* traffic in a fail-over scenario. NG9-1-1 will also permit *virtual* PSAP operations: As public safety agencies begin to reconstitute services following a disaster, the ability to accept service requests from almost any location with internet access will allow

telecommunicators to work from locations outside the disaster area. It will even be possible for individual telecommunicators and dispatchers to work from different and even widely separated locations. These features are therefore particularly important from a disaster preparedness and national security standpoint, and NENA urges the Commission to ensure that they are among the minimum requirements for NG9-1-1 service turn-up.

***E. MLTS vendors should be required to provide explicit support for NG9-1-1 in future products.***

The regulation of Multi-Line Telephone System (“MLTS”) operators is fraught with practical, financial, and jurisdictional difficulties. NENA therefore will address only the need for MLTS equipment compatibility with NG9-1-1. The location, call routing, and other functions of NG9-1-1 can easily be built-in to IP telephones and PBX systems. Given the amount and footprint of remaining PSTN infrastructure, however, it is unlikely that legacy analog systems will drop completely off the market in the near future.

NENA’s NG9-1-1 standards and documents will improve emergency services for MLTS users by providing standardized mechanisms to accurately report the location of individual enterprise 9-1-1 callers, and provide additional contextual information based on that location. NENA’s work also addresses common situations where the range of the enterprise MLTS exceeds the service area of a single carrier. For example, NENA is particularly concerned about enterprises that have multiple locations, or provide access to their MLTS by nomadic or home based workers. Reporting location accurately in such circumstances can be very difficult: The MLTS operator may know the location of a wired analog or digital telephone, but may not know the location of a device or soft-client connected by an IP network that could be literally anywhere in the world. NENA’s approach to solving this problem, following IETF standards, is to separate the access network from the origination network. The enterprise

may provide the access network (and, therefore, the Location Information Server) in many cases; but a residential DSL or cable company may provide it to a teleworker; and a coffee shop WiFi network may provide it to a traveling employee. In each case, it is the access network that knows where the caller is, critical information if the call is to be routed correctly and directed to responders for help.<sup>6</sup>

NENA is committed to working with MLTS vendors to ensure NG9-1-1 features will be included in both analog and IP telephony equipment in the future. However, NENA also recognizes that consistency in implementation may depend upon the imposition of requirements for standards compliance, particularly with respect to caller location and call routing. Any such rules should operate prospectively only and should avoid imposing costly retrofitting requirements on the millions of small businesses with existing analog or IP multi-line systems.

#### **IV. Issues Related to NG9-1-1 Implementation / Transition**

##### ***A. Several Commission actions could encourage faster NG9-1-1 deployment.***

- 1. The Commission should monitor NG9-1-1 standards work to ensure that it promotes competition.*

NENA's work on technical and operational standards for NG9-1-1 is nearly complete. Likewise, NENA has already begun work to define transition processes and technical options. NENA believes that open, standards-based interfaces provide the best opportunity to ensure pervasive interoperability and a thriving competitive market. NENA's standards work is therefore designed to ensure that any resulting standards uphold those values. NENA is aware, however, that vendors are providing near-NG9-1-1 solutions today. These solutions are reported to be capable of

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<sup>6</sup> This approach assumes that the access network provider will supply location information. As explained below, however, other approaches could be adopted.

complying with NENA's NG9-1-1 standards when completed. This work is important to the advancement of NG9-1-1 and NENA looks forward to its integration into the NG9-1-1 ecosystem. NENA therefore encourages the Commission to keep abreast of both market advances and NENA's own standards work.

*2. The Commission will need to waive certain rules and regulations to facilitate the transition to NG9-1-1.*

The current E9-1-1 system is built around a specialized telephone switch, the Selective Router, and the ALI and MSAG databases. However, none of these elements exists in NG9-1-1, being replaced by the ESRP, the ECRF, the LVF and the LIS. To the extent that the Commission's regulations assume the existence of legacy components, waivers or new rules governing transitional NG9-1-1 deployments will be necessary.

***B. The Commission should establish a concrete timetable for the deployment of NG9-1-1, linked to the availability of sustainable funding.***

As NENA envisions NG9-1-1, there will be a larger role for state government than in the current E9-1-1 system. The FCC should require states to create an NG9-1-1 deployment plan, monitor it, and report regularly on progress against those plans. As part of this process, each state will need to coordinate the deployment of ESInets state-wide, along with a state BCF, ESRP, ECRF, and NG9-1-1 capabilities. As the states do so, it is important that they explicitly include appropriate tools and mechanisms to ensure that future upgrades can be deployed state-wide in a small number of years. NENA notes that the last upgrade cycle – to Phase II wireless support – remains incomplete over a decade after it began. It is therefore incumbent upon the Commission to prompt a more coordinated approach to future upgrade cycles to ensure that this pattern is not repeated. Finally, NENA's vision for state transition plans would have those plans provide for

seamless interoperability between legacy networks and NG9-1-1 networks.

*1. Transition milestones should be developed cooperatively but tracked by a single entity.*

Because the scope of NG9-1-1 is significantly broader than that of legacy 9-1-1 systems, it will be necessary for the Commission to work cooperatively with a much wider range of entities than might have previously been required. At the Federal level, NTIA, DoT, and DHS will each play an important role. Likewise, state regulators, 9-1-1 administrators, and public safety officials will be crucial partners. Finally, the Commission also must engage with industry to ensure that deployment milestones are linked to commercially-realistic outcomes and timeframes. To prevent duplication and minimize reporting requirements, NENA considers it important that NG9-1-1 deployment be tracked by only one entity. To the extent that any tracking or reporting requirements cross jurisdiction lines, NENA encourages the Commission to work closely with its partner agencies at the state and Federal levels to devise a workable mechanism for consolidating requirements and reduce burdens on PSAPs and 9-1-1 service providers.

*2. The process of transitioning to NG9-1-1 is clearly defined.*

A transition to NG9-1-1 starts when an ESInet is deployed and one PSAP is ready to utilize NG9-1-1. Transitions for other PSAPs and origination networks served by the same selective router can then continue in any order until all PSAPs are upgraded to NG9-1-1 capability, or moved to a Legacy PSAP Gateway.<sup>7</sup> Similarly, origination networks will upgrade to NG9-1-1 standards or move to the Legacy Network Gateway, which allows an

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<sup>7</sup> Some data conversion must be accomplished before a PSAP can transition to an LPG, however NENA expects this process to be relatively straightforward.

unmodified legacy wireline, wireless or VoIP network to interconnect with an ESInet with only minor network changes and modest database and process changes. Transition is complete when all PSAPs and all origination networks are migrated off the selective router, which is then decommissioned, along with the ALI database. NENA recommends that the Commission adopt this transition plan because it provides flexible upgrade paths to all stakeholders.

*3. Several potential milestones could accelerate the deployment of NG9-1-1 systems.*

Assuming a sustainable funding stream is identified, primary milestones for NG9-1-1 deployment should include:

- i. planning for ESInets,
- ii. deployment of ESInets,
- iii. planning for NG9-1-1 systems (running on the ESInets),
- iv. development of GIS and other required databases,
- v. selection of vendors by 9-1-1 Authorities,
- vi. deployment of NG9-1-1 systems,
- vii. detailed acceptance testing, and
- viii. NG9-1-1 service turn-up.

Secondary milestones could include movement from legacy to IP interfaces for call and data egress to NG9-1-1 systems, and the implementation of NG9-1-1 capable PSAP features, which can be relatively independent of items 1-8 above, due to legacy gateway provisions in NG9-1-1 design.

In addition to the system-centric milestones identified above, aggregate measures of NG9-1-1 deployment should be considered as well: These could include the percentages of PSAPs that are NG9-1-1 capable and the percentage of local access networks within the geographic footprint of NG9-1-1 capable PSAPs that have transitioned to NG9-1-1 compliant interfaces.

4. *A rational and sustainable funding model is a necessary prerequisite to the imposition of mandatory milestone due-dates.*

All efforts to develop milestones, measure progress, and disseminate progress reports will be for naught without funding. In an NG9-1-1 world, funding models must be fundamentally reshaped: The traditional “grant” approach to public safety funding is simply no longer workable. NG9-1-1 systems will require extensive planning, deployment, and maintenance efforts over the long term. Additionally, NG9-1-1 systems must be able to upgrade software and hardware quickly and without regard to jurisdictional peculiarities in order to ensure consistent service to consumers and reap the benefits of scale for taxpayers. These things can *only* happen if NG9-1-1 systems are funded through rational and sustainable mechanisms that are decoupled from annual appropriations cycles. In addition, state and local public safety agencies and 9-1-1 authorities must begin to take a hard look at the cost savings that could be realized through regionalization of non-PSAP NG9-1-1 components such as ESInets.

***C. Fostering competition among NG9-1-1 service providers must be a central goal for the Commission.***

In an NG9-1-1 world, 9-1-1 authorities and PSAPs should be able to choose among 9-1-1 service providers. To realize the price and interoperability benefits of competition, however, PSAPs must be able to choose between system providers who are obligated to comply with relevant standards and provide explicit support for interoperation with other standards-compliant equipment and services. Otherwise, fragmentation of NG9-1-1 system characteristics could lead to inconsistent service availability or a lack of next-generation features such as call transfer and PSAP failover. A way to ensure technical and operational quality and integrity is needed. One solution to this problem would be to introduce a new testing and certification regime to replace the “certified carrier” designation.

***D. The Commission should conduct a comprehensive examination of Federal and state laws pertaining to 9-1-1 services.***

In 2010 NENA's Next Generation Partner Program looked at the overall telecommunications policy environment with a view toward advocating policy changes that could speed the deployment of NG9-1-1 systems. The result of that effort was NENA's *Next-Generation 9-1-1 Transition Policy Implementation Handbook*.<sup>8</sup> To quote the *Handbook's* findings:

Much of the legislative and regulatory framework governing the provisioning, operation and maintenance of PSAPs, and the 9-1-1 / emergency communications system that serves PSAPs, rests with state and local governments, and as such, varies greatly across the country. Additionally, the Federal Communications Commission plays a significant role in regulating communications providers and contains current rules that require the delivery of wireless and voice over IP (VoIP) 9-1-1 "calls" over the "wireline E9-1-1 network" which could be argued does not clearly include the routing of 9-1-1 calls via an IP-based NG9-1-1 system. These state and federal laws were written in an era where all the possibilities and technological capabilities of NG9-1-1 simply did not exist. Many existing laws, regulations and tariffs make specific reference to older technologies or system capabilities which may inadvertently inhibit the migration to NG9-1-1. To foster the rapid migration of NG9-1-1, it is essential that state and federal legislatures and regulatory bodies review current laws and regulations to keep pace with the rapidly changing public

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<sup>8</sup> Available at: <http://www.nena.org/> (click "Government Affairs," then "Reports and Resolutions.")

safety marketplace. Efforts should be designed to create a framework which will optimize 9-1-1 governing authority choices and establish a competitively neutral marketplace that allows 9-1-1 authorities to replace legacy 9-1-1 functions component by component.<sup>9</sup>

In order to set effective national policy for NG9-1-1, the Commission will need to gain a complete understanding of the legal and regulatory landscape described by the NENA *Handbook*, and work closely with legislators and regulators around the country to ensure that islands of non-standard or non-interoperable services do not develop. A critical first step in this process will be to survey existing state legislation and rules to identify specific provisions that could hinder or prohibit the extension of 9-1-1 service beyond the borders of the legacy PSTN. At the same time, the Commission should examine the differing cost recovery mechanisms used throughout the country with an eye toward eventual harmonization of these mechanisms for all services that allow consumers to access 9-1-1.

***E. The Commission should carefully weigh the competitive impact of any new regulations.***

The existing market for 9-1-1-related services suffers from several distorting influences that primarily result from 9-1-1's origin in the legacy wireline system. For example, NENA believes that incumbent 9-1-1 system service providers ("SSPs") do not currently have sufficient incentives to upgrade their technology. Rather than responding to this problem with regulatory mandates, however, NENA believes that the Commission could best serve taxpayers, public safety agencies, and industry by opening the market to greater competition.

Perhaps the single most competition-enabling change the Commission could implement would be to require the use of open standards in all NG9-1-1 systems. This would

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<sup>9</sup> *Id.* at 11.

allow 9-1-1 authorities to choose between competing vendors without regard to a particular vendor's status as a certified carrier. Indeed, such a change could even allow 9-1-1 authorities the choice to act as their own SSP, deploying and upgrading technology when, where, and how they see fit in order to best serve their citizens. To facilitate this type of competition during the transition period, it may also be necessary to modify existing laws, regulations, and tariffs to clarify which actors can or must maintain legacy equipment and how the costs associated with that equipment will be distributed.

1. *Liability concerns must be addressed to attract market participants and protect public safety agencies and 9-1-1 authorities.*

The NET 911 Improvement Act of 2008<sup>10</sup> extended liability protection previously enjoyed by wireline and cellular voice providers to IP-enabled voice providers and other emergency communications service providers. The Act goes on to define "other emergency communications service provider[s]" as:

'(A) an entity other than a local exchange carrier, wireless carrier, or an IP-enabled voice service provider that is required by the Federal Communications Commission consistent with the Commission's authority under the Communications Act of 1934 to provide other emergency communications services; or

'(B) in the absence of a Commission requirement as described in subparagraph (A), an entity that voluntarily elects to provide other emergency communications services and is specifically authorized by the appropriate local or State 9-1-1 service governing authority to

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<sup>10</sup> Pub. L. 110-283, 122 Stat. 2620.

provide other emergency communications services.<sup>11</sup>

NENA believes that this provision is sufficiently broad to encompass nearly all NG9-1-1 participants, with the possible exceptions of application developers and consumer device manufacturers. NENA therefore encourages the Commission to thoughtfully review its authority under section 4 of the Communications Act and include within a revised 9-1-1 scope order the broadest possible class of NG9-1-1 participants. Congressional action may still be required to insulate participants that are currently beyond the Commission's jurisdictional reach. But issuing a revised scope order would allow a broader segment of industry to begin development and testing of NG9-1-1 network devices and services in advance of wide-scale roll-outs. NENA looks forward to commenting on a proposed new scope order designed specifically for NG9-1-1.

*2. Confidentiality and privacy concerns must be addressed to ensure consumer acceptance of auxiliary data capabilities in NG9-1-1.*

As NENA's Next Generation Partner Program concluded in the *Next-Generation 9-1-1 Transition Policy Implementation Handbook*,

The amount and types of information (voice, text or video) that may be received by PSAPs and shared with emergency response agencies will greatly surpass current E9-1-1 systems. In addition to the increased amount of data, the nature of the content of data will be dramatically different in some instances. For example, NG9-1-1 will make it possible to transmit video, still images, medical information and a host of other data for a 9-1-1 call. Additionally, the architecture of NG9-1-1 systems will significantly increase the amount of data that

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<sup>11</sup> *Id.* at 2625 (adding "other emergency communications service providers" to provisions of 47 U.S.C. §615(a) (2006)).

is contained in shared databases with data residing in the network rather than in single-purpose databases housed locally.

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In this environment, states and the federal government need to be careful not to unnecessarily restrict access to critical emergency information, while maintaining the confidentiality of specific data. Privacy advocates and emergency responders can almost always agree on exceptions for life-saving situations, as they have done in the federal health records law, the Health Insurance Portability and Accountability Act (HIPAA), and with E9-1-1 location information in Section 222 of the Communications Act and comparable state laws.

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Similarly, there need to be exceptions for legitimate research regarding improving end-to-end emergency response, assuming appropriate protections ensuring anonymous and aggregate use of data. For example, NG9-1-1 will make possible the collection and analysis of data from the beginning of an incident to the discharge of a patient from the hospital.<sup>12</sup>

NG9-1-1 dramatically increases the amount and range of data available to PSAPs and responders. Historically, any information that entered a 9-1-1 system became available within that system and to responders in the field with few, if any limitations. Given the amount and detail of information such as medical history that may be available in an NG9-1-1 environment, information must be managed with significantly greater rigor. NENA's technical standards therefore provide a uniform data rights management system.

Under NENA's proposed system, access to all data items is controlled by a role-based security mechanism

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<sup>12</sup> *Supra*, note 6, at 18-19.

and public-key cryptographic infrastructure. Using this system, a PSAP certification authority at the state or national level will define a role for all agencies and individuals and issue secure credentials corresponding to those roles. Also, each database will implement a digital rights management (“DRM”) scheme that allows the data owner to control access based on the role and identity of the party requesting it using a standards-based policy language.

NENA’s proposal also makes extensive use of indirect data storage mechanisms: often sending a URI, rather than data itself. Sending a URI instead of the data itself allows a database to evaluate the policy applicable to a person or agency that requests access to its data. If such an entity successfully retrieves data and subsequently needs to share that data with another entity, it passes *only* the URI, and not the data it retrieved from the database. This allows the database to apply its policy to the subsequent receiver of the URI as well, maintaining the security of the data. In order to be effective, however, all of these security mechanisms must be uniformly implemented and routinely used.

3. *Responsibility for providing location information should be assigned to all access network operators.*

For certain types of services, only access providers can identify the location of the person requesting service, and since location is fundamental to accurate 9-1-1 service, location must be provided by those with access to it. NENA’s draft i3 standard contemplates access network operators providing location information through Location Information Servers (“LIS”) using the HELD protocol. Once LIS databases are populated with validated network end-point location-related data, that data can be added to a service request by the access network provider, either directly or via location reference methods, so that routing and other location-dependent NG9-1-1 functions are supported.

NENA believes that *all* access network operators should have the same fundamental requirements to pro-

vide location information for emergency service requests, but understands that this proposal represents a new imposition on non-legacy access networks and could only be implemented at significant cost to most broadband providers. NENA further understands that many providers offer both access networks and origination services and currently treat such networks and services as an integrated product: asking that such operators pass location information to other services that they do not provide would be a new requirement. NENA is unaware, however, of any other proposal that would provide PSAPs and emergency responders with the location information they need to effectively respond to NG9-1-1 service requests. NENA therefore welcomes the views of other commenters who may suggest differing solutions, provided those solutions can meet the requirements of public safety for timely, accurate, and easily-accessible location information.

*4. The Commission should work with NENA, APCO, and others to develop and disseminate information about NG9-1-1 capabilities and roll-out.*

The development and dissemination of information about NG9-1-1 capabilities and functionalities is especially important for 9-1-1 Authorities and others who must make decisions about NG9-1-1 deployments. The NENA/APCO Education Steering Committee is currently working to educate NG9-1-1 stakeholders. To complement that effort, the Commission should consider working with stakeholders to define common terms and terminology, clarify the roles and responsibilities of regulators and agencies at all levels of government, and foster an atmosphere of collaboration on challenges facing NG9-1-1 deployment.

## **V. Jurisdiction and Regulatory Roles**

Just as with the public safety broadband efforts, the Commission has recognized the need for common requirements, such as interoperability, the need for a single standard and so forth, so is the need for federal participation in NG9-1-1. Certainly, the need for common stan-

dards and policies enabling rather than restricting NG9-1-1 is essential. States, too, have an important role and each state should designate an organization that will be responsible for planning, coordinating, and implementing the NG9-1-1 system without unduly interfering with local emergency call and response management. Additionally, it is imperative that 9-1-1 authorities work with the designated state organization to ensure that planning and deployment activities are coordinated and consistent with standards and law. The designated state organization and the Commission should work with Tribal authorities to ensure that residents on Tribal land also have the benefits of NG9-1-1 and their NG9-1-1 systems are integrated into the broader deployment of NG9-1-1 systems.

### CONCLUSION

The Commission through this NOI has asked multiple questions pertinent to NG9-1-1. Again, NENA applauds this effort. The challenge now is to propose and solicit comment on interim and final rules consistent with the above recommendations. To that end, NENA commits to work constructively with the Commission and all stakeholders to ensure that our nation's 9-1-1 public safety service moves to 21<sup>st</sup> century technology.

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