

**AMENDMENT #1  
FOR  
RFI NUMBER 0001-2014**

**REQUEST FOR INFORMATION (RFI)**

*by*

Ohio Department of Administrative Services (DAS)

*for*

Emergency Services IP Network

and

Next Generation 9-1-1 Services

**RFI #0001-2014  
Ohio ESINet & NG9-1-1 Services**

**Release Date: June 6, 2014**

**Inquiries End Date: July 22nd, 2014 @ 11:59 AM Eastern Standard Time**

**Response Due Date: August 1st, 2014 @ 11:59 AM Eastern Standard Time**

This following pages represent the amendment for the Request for Information (RFI) listed above. Please use these pages to replace the page previously issued by the state.

Specifications and requirements that have been revised are indicated with asterisks and/or bold type.

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**REQUEST FOR INFORMATION  
BY THE  
STATE OF OHIO  
DEPARTMENT OF ADMINISTRATIVE SERVICES  
Emergency Services IP Network  
and  
Next Generation 9-1-1 Services**

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## **1.0 ADMINISTRATIVE INFORMATION**

### **1.1 Purpose**

The purpose of this RFI is to assist Ohio ESINet Steering Committee in gathering information and identifying solutions for building and managing an Emergency Services Network (ESINet) capable of supporting Next Generation (i3)<sup>1</sup> services within the State. Attachment A contains Background information, links to the ESINet Steering Committee's reports, NG9-1-1 Functional Requirements Applicable Standards and Terms. Respondents are encouraged to familiarize themselves with Attachment A as minimal guide to crafting a response.

It is not the State's intent to design or define the applications and appliances required of a solution; however the State of Ohio maintains networks and services that should be leveraged to the greatest extent possible in order to minimize cost and maximize previous investment in technology and data. Responses will be used to assist the Steering Committee in identifying suitable solutions and system features/components necessary to implement NG9-1-1 services within the State's infrastructure that would need to be included in a future procurement document.

This RFI is issued solely for information and planning purposes and shall not constitute a solicitation. Non response to this RFI will in no way preclude any vendor from participating in any future offerings or procurement requests developed as a result of this RFI. The Steering Committee is not a contracting body and has no authority to enter into a contractual arrangement with any vendor. Responses to this notice shall not constitute offers and shall not be accepted by the Steering Committee to form a binding contract. Respondents are solely responsible for all expenses associated with their response and any associated travel or other presentation expenses, as applicable, to this RFI.

A Full-Service responder is often referred to as the Prime Vendor and will be proposing all functional elements of their solution regardless of the source of any particular element. Respondents fulfilling the requirement of a full-service offering are encouraged to respond.

### **THIS RFI IS NOT A SOLICITATION FOR SUCH PRODUCTS OR SERVICES**

Information that any interested party wishes to submit will be done so voluntarily and with the understanding that this RFI is for information gathering purposes only and is not a formal solicitation. A formal procurement, such as a Request for Proposals (RFP) or Request for Quote (RFQ) may be issued as a result of, and subsequent to, this RFI. The Department of Administrative Services is interested in receiving information from interested vendors or any other source of information.

Similarly, cost information will be used solely for the purposes of performing a market analysis for the acquisition of the necessary products and services.

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<sup>1</sup>Any solutions described must meet NENA NG9-1-1 requirements currently available, vendors must ensure software, equipment and/or services will meet NENA NG9-1-1 requirements and standards as they become available in the future.

## 1.2 Inquiries

Vendors may make inquiries regarding this RFI anytime during the inquiry period listed in the Calendar of Events. To make an inquiry, vendors must use the following process:

- Access the State’s Procurement Website at <http://procure.ohio.gov/>;
- From the Navigation Bar on the left, select “**Find It Fast**”;
- Select “Doc/Bid/Schedule #” as the Type;
- Enter the RFI number found on the first page of this RFI;
- Click the “Find It Fast” button;
- On the document information page, click the “Submit Inquiry” button;
- On the document inquiry page, complete the required “Personal Information” section by providing:
  - First and last name of the prospective offeror’s representative who is responsible for the inquiry,
  - Name of the prospective offeror,
  - Representative’s business phone number, and
  - Representative’s email address;
- Type the inquiry in the space provided including:
  - A reference to the relevant part of this RFI,
  - The heading for the provision under question, and
  - The page number of the RFI where the provision can be found; and
- Click the “Submit” button.

A vendor submitting an inquiry will receive an immediate acknowledgement that the State has received the inquiry as well as an email acknowledging receipt. The vendor will not receive a personalized response to the question nor notification when the State has answered the question.

Vendors may view inquiries and responses on the State’s Procurement Website by using the “Find It Fast” feature described above and by clicking the “View Q & A” button on the document information page.

The State usually responds to all inquiries within three business days of receipt, excluding weekends and State holidays. But the State will not respond to any inquiries received after 8:00 a.m. on the inquiry end date.

## 1.3 Responses

The agency is seeking responses related to vendors’ products and service offerings. Vendors’ responses should provide information about their capability for performing the agency’s objectives and elaborate on any requirements. The agency realizes there may be other pertinent information that has not been solicited and encourages vendors to provide additional information as deemed appropriate. As all information received by the State will be considered public information, vendors are advised to not submit any proprietary or confidential information as part of their RFI response.

Responders to this RFI are encouraged to provide information about their Next Generation technologies and all alternative methodologies to inform Ohio ESINet Steering Committee of all potential IP-based call handling solutions. This information is vital for the assessment of which solutions will meet the future needs of the Ohio Next Generation 9-1-1 system.

The RFI process seeks responses from any and all respondents who offer partial or total solutions in order to assess all possible technologies or alternative methodologies as well as develop a range of total costs associated with each solution.

#### RESPONSE FORMAT

An identifiable tab sheet must precede each section of a response, and each response must follow the format outlined below. All pages, except pre-printed technical inserts, must be sequentially numbered. Respondents may include any additional information it believes is relevant.

Respondents shall provide detailed information on the following sections. Each section and sub-section must have a separate response, and responders are encouraged to provide a level of thoroughness that will enable the State to achieve the RFI objectives. Each response must contain the following ***tabbed sections***.

- Company Profile
- NG9-1-1 Vision
- Processing of Voice and Multimedia Payloads
- Standalone and Hosted PSAP Solutions
- Event Administrative Reports
- NG9-1-1 Applications and Appliances
- Mapping
- GIS Data Requirements
- GIS and Data Normalization Services
- Boundary Data Updates
- Network and Network Services
- Redundancy and Diversity
- Functional Element Recording
- Data Centers
- Security and Threat Prevention Capabilities
- Customer Premise Equipment CPE
- Implementation Strategy
- Ongoing Support
- Legal Requirements
- Optional Information
- Pricing and Acquisition Options
- Deployment Model

## **COMPANY PROFILE**

History; Lines of Business; Organizational Structure; Number of Employees; Staff Technical Expertise; Market Territory.

Experience - Legacy and NG9-1-1; Include information on any NG9-1-1 networks in operation – scope, # PSAPs, “NG” features/applications in place.

Participation in NG9-1-1 standards groups.

## **NG9-1-1 VISION**

NG9-1-1 Vision and plans for compliance with evolving standards development.

Industry Readiness – Solutions and Standards.

Legacy and IP PSAP transitions - Impact on PSAP CPE of migration to NG9-1-1.

Retention of legacy equipment vs. wholesale equipment replacement vs. hybrid solution for hosted and local services.

In addition respondents shall describe all solutions for each operational item set forth below:

## **PROCESSING OF VOICE AND MULTIMEDIA PAYLOADS**

Please describe your product, applications, and appliances’ abilities to process various existing and anticipated payloads from NG9-1-1 calls.

## **STANDALONE AND HOSTED PSAP SOLUTIONS**

The Steering Committee anticipates that the Next Generation 9-1-1 system will contain both standalone and hosted PSAPs. The difference between the two shall be the size and call load of the PSAPs contained in the section above. Please identify any differences in your solution that may exist for standalone and hosted PSAPs. In addition, describe how your CPE offering will handle “interim text” solutions as currently being offered. Should this function be carried through any of the Applications and Appliances specified herein, notate their function(s) within those relevant sections.

## **EVENT/ADMINISTRATIVE REPORTS**

Please describe how your Next Generation 9-1-1 solution produces standard reports regarding individual calls, collection of calls, summary of call loads, and other pertinent information gathered by the CPE. Additionally, please provide examples of event and administrative reports.

## **NG9-1-1 APPLICATIONS AND APPLIANCES**

Please provide a thorough discussion of the following applications, appliances and functions within the proposed solutions:

### **Legacy Network Gateway**

Calls in legacy origination networks undergo conversion to IP formats for delivery into the ESINet. The LNG attaches sufficient information to the call, such as location and callback number, for handling within the ESINet. While the legacy gateway will exist outside of the ESINet, there may be a period of time where this service may be offered by Ohio ESINet Steering Committee under a Legacy Network

Gateway. Respondents are encouraged to identify an effective and efficient solution to the provisioning of legacy gateway services for providers and a description of your legacy gateway services.

Describe your solution for the LNG within the ESINet environment.

### **Legacy PSAP Gateway**

The Next Generation 9-1-1 solution shall have the capability of connecting to the existing legacy Enhanced 9-1-1 system during the transition to a complete Next Generation 9-1-1 system. LPG plays a role in the delivery of emergency calls that traverse an i3 ESINet to get to a legacy PSAP, as well as in the transfer and alternate routing of emergency calls between legacy PSAPs and i3 PSAPs. The Legacy PSAP Gateway supports an IP (i.e., Session Initiated Protocol) interface towards the ESINet on one side, and a traditional Multi-Frequency (MF) or Enhanced MF interface (comparable to the interface between a traditional Selective Router and a legacy PSAP) on the other. The LPG also includes an ALI interface (as defined in NENA 04-001 or NENA 04-005) which can accept an ALI query from the legacy PSAP, and respond with location information that is formatted according to the ALI interface supported by the PSAP. If an emergency call routed via the ESINet contains a location reference, the LPG must support a de-referencing interface to a LIS or LNG or ingress LSRG to obtain the location information that will be returned to the legacy PSAP in the ALI response. To populate non-location information in the ALI response, the LPG may need to support an interface to a call information database (CIDB). The LPG may also support an interface to an ECRF which it can use to determine the transfer-to party under certain Selective Transfer scenarios.

The LPG is expected to provide special processing of the information received in incoming call setup signaling to facilitate call delivery to the legacy PSAP, to assist legacy PSAPs in obtaining callback and location information, and to support feature functionality that is currently available to legacy PSAPs, such as call transfer and requests for alternate routing.

The LPG is transitional in nature and is not envisioned as a viable long term solution. The envisioned solution will provide a fully functional LIF, ECRF/LVF that will replace the traditional ALI and associated database maintenance requirements with a fully implemented geospatial solution.

### **Border Control Function (BCF)**

Please describe your solution for the BCF including all required products and devices and any potential special deployment issues, challenges, or limitations for your solution. Additionally, respondents may specify security parameters that extend through the ESINet to the point of demarcation within the PSAP.

### **Event Recording**

Event recording differs in that event recording records information about the call or payload. This includes, but not limited to, hold times, where a payload entered the NG9-1-1 system, system transit times, how long it took to answer a payload or call and other timings not associated with DLR recording. Data collected by this function shall be available in report format.

Describe your solution for event recording and reporting.

### **Location Database**

As the location information server function may not be immediately available from the communications service providers at the inception of Next Generation 9-1-1 a Location Database will be necessary to facilitate the deployment of NG9-1-1 components. Please describe how the LBD would be provided and maintained as an interim service.

### **DLR Recorders (payload recording)**

Please describe your solution to record call or payloads. Describe your recording solution for hosted and standalone PSAPs. Describe how your recording solution is backed up and monitored. Please describe redundancy capabilities of the hosted recorders located at the two Data Centers. Additionally, please describe the expansion capabilities of your recording solution. PSAPs intend to keep 12 months of recordings.

### **Emergency Call Routing Function / Location Validation Function**

Call delivery is essential to the emergency call routing function. Clarity of this function is essential for Ohio ESINet Steering Committee to fully understand any respondent's potential solution. Please describe the functionality of your solution and its relationship to other applicable location-based solutions as well as how is the ECRF/LVF provisioned. Please describe your solution's interaction with and capabilities for location validation functions of civic based addresses and latitude/longitude data. Additionally, please identify any issues, challenges, or limitations of your solution with respect to call location validation.

Additionally, please describe your protocols employed, application compliance standards and minimum requirement for GIS data as required to replace existing tabular MSAG processes.

### **Emergency Services Routing Proxy**

The emergency service routing proxy is essential for direct call delivery to an appropriate PSAP based upon location and routing rules. Please describe your solution and how it interacts with the overall operation of the emergency service routing proxy. Additionally, please describe your process for all functions related to the emergency service routing proxy and identify any outstanding issues, challenges, or limitations your solution may have with this process.

### **Rules Based Routing Proxy**

Rule-based routing is a benefit of any Next Generation 9-1-1 system because of its ability to route calls based upon various parameters. Please describe how your solution's rule-based routing interfaces with other components of a Next Generation 9-1-1 system. Please identify the interface used by PSAPs to establish these rules and any conditions that may limit its function.

### **PSAP Demarcation Device**

Please describe any specialized equipment that your solution would require to be located within any PSAP located within the State. Additionally, please identify any equipment that your solution would require to be deployed in either a standalone or hosted PSAP environment.

### **Scalability**

Please describe the systems' scalability of the proposed system and how it will support statewide, regional or local implementations for the payloads delivered.

### **Improved Quality of Service**

Please explain how the proposed system will contribute to the reduction of call set-up times, transfer of calls, and transfer of calls to the secondary PSAPs (ring down centers), dropped calls, and callback requirements. Specifically, Ohio ESINet Steering Committee expects that call setup times will be improved where possible.

### **Legacy Location Data**

Please provide recommendations and describe how the solution will deal with ALI location data for legacy providers.

## **MAPPING**

Please describe your solution's mapping display capabilities and requirements for GIS data. Specifically, address Phase I, Phase II wireless calls and your solution's capabilities to manage the entire spectrum of current and anticipated payload. Please describe any features in your solution that can provide PSAPs with decision making information, such as tracking rebids and clearly identifying the call or payload. Additionally, please describe any interfaces of your mapping product for CAD and third party applications.

## **GIS DATA REQUIREMENTS**

Ohio's local governments maintain multiple geospatial datasets capable of supporting NG9-1-1 services; primarily the Location Based Response System (LBRS) uses field verified street centerline and site address information for 78 of the State's 88 Counties. The proposed solutions must leverage the work currently being done to maintain LBRS data at the local level to provide an integrated spatial basemap to support all other NG9-1-1 location information functions. Solutions must discuss the development of a common maintenance platform as well as addressing the following GIS database management tasks:

- GIS and Geospatial Routing DB
- Validation
- Routing Control
- Policy Rules
- Data Access rules
- System Logging
- Detail Call Records
- Security

### **GIS AND DATA NORMALIZATION SERVICES**

It is recognized that GIS is at the heart of a successful deployment of NG9-1-1 and the Ohio ESINet Steering Committee wishes to obtain the best input regarding these processes from the vendor community. Please describe your approach to maintaining GIS data intended for use within the Next Generation 9-1-1 environment while addressing the following:

- Geographic data linked to master street and address lists based on the FGDC standard for thoroughfare addresses. What processing and/or reformatting might be needed to use those datasets with the vendor's system?
- How will GIS datasets be migrated into the system, how will they be QA'd and how will they be maintained?
- How will GIS address and road information be reconciled with ALI/MSAG database?
- How will the roles and responsibilities for maintenance of geocoding data resources by local addressing authorities be implemented?
- How are new addresses validated and propagated throughout the system?
- What process will there be for identifying problems and remedying them?
- How will the system assure compliance with GIS standards by both service providers and local officials in terms of address format, spelling, etc? How does the maintenance of emergency service zones fit into the design of your system?

### **BOUNDARY DATA UPDATES**

Please explain and describe the process used to update and maintain the response zone boundaries necessary to support LIF ECRF/LVF as well as any interim solutions for maintaining the ALI databases and reconciling them with the GIS database. The solutions shall provide the tools to perform data updates required to accommodate changes in relative boundaries for PSAP and cell site/sectors

### **NETWORK AND NETWORK SERVICES**

The successful Next Generation 9-1-1 vendor will be required to work cooperatively with Ohio ESINet Steering Committee and any appropriate state agencies to utilize and monitor an IP-based network interconnecting all elements of the network and authorized PSAPs including two data centers. The current plans include a blend of both public and private facilities. Please describe your ability to utilize and monitor

such a network within the State. In addition to managing existing network connectivity, the NG9-1-1 vendor may be required to operate a Network Operations Center. Please describe your current capabilities for performing this function and explain how you would utilize this privately managed network. Additionally, please describe how you conduct network performance auditing and what reports would you provide the Steering Committee.

When considering the makeup of the Next Generation 9-1-1 network, respondents should note that there are two possible models being considered by Ohio ESINet Steering Committee for deployment:

- The Next Generation 9-1-1 Contractor acquires and is responsible for all network activity.
- The Contractor manages network facilities through a blend of both public and private facilities.

### **REDUNDANCY AND DIVERSITY**

Please explain your philosophy for providing for diverse and redundant connectivity between the proposed system equipment and network resources to ensure system survivability.

### **FUNCTIONAL ELEMENT RECORDING**

Ohio ESINet Steering Committee will require the ability to receive reports from the NG9-1-1 Contractor regarding the effective and efficient delivery of payloads from the point of the BCF through the delivery of payloads to the PSAP. Please describe how your solution records events of transit and processing and offer an example of a management report if possible.

### **DATA CENTERS**

The preliminary functional design for Ohio's NG 9-1-1 system requires two data centers. Process continuity is a significant concern for any 9-1-1 system. If one center becomes unavailable, PSAP operations shall function off the remaining data center(s). It is paramount to provide a highly reliable infrastructure for Next Generation 9-1-1 operations, to minimize any service disruptions. Information security is also a major concern, and each data center shall offer a secure environment which minimizes security breaches. Each data center will provide the following: data center-based Next Generation 9-1-1 appliances and applications directly to the State's citizens and visitors; and hosted applications for non-standalone PSAPs.

To accomplish this goal, the State will operate and maintain one data center and a second tier 4 data center will be provided by the Next Generation 9-1-1 Contractor. Please describe your approach to and capability of providing a data center that meets all of the requirements of this subsection. Additionally, please describe all applicable standards your solution would follow in operating the data center.

### **SECURITY AND THREAT PREVENTION CAPABILITES**

Please describe your security procedures and policies for deploying and updating virus prevention, patch management, antivirus, worm, spyware, malware, other malicious software, and any additional PSAP or system threats.

Call taker equipment (CPE) located within a PSAP is that which is used to receive 9-1-1 calls from the public, interact with onsite technologies such as CAD and perform functions common to that represented by definitions of NENA. For the purposes of this RFI the vendor is encouraged to consider this request to include the ability to process various payloads from the public as may be presented by multi-media devices referred to herein as “payload”.

All descriptions of functionality should be comprehensive enough to allow review with an easy understanding of how the various functions operate from a call taker perspective.

### **CUSTOMER PREMISE EQUIPMENT (CPE)**

The Steering Committee understands the advancement of technologies inherent in NG9-1-1 allow for a more robust, secure method of payload delivery. Ohio ESINet Steering Committee is interested in understanding the benefits and drawbacks to a hosted CPE to ascertain the viability of providing such a service to local government as an optional solution to existing standalone implementations.

#### **STANDALONE**

The term “Standalone” in context of this RFI is used to describe CPE that is entirely housed within a PSAP. All functions of call acceptance from the Emergency Services Internet Protocol Network (ESINet) are contained within the premise other than that signaling sent to the applications and appliances located within the data centers as described under the section “Applications and Appliances suitable for i3 deployment”.

#### **HOSTED**

The term “Hosted” in context of this RFI is used to describe CPE that is controlled from the data centers with only the call taker workstations and ESINet connectivity devices located within the PSAP. The legacy “backroom” equivalent equipment is remote from the PSAP but the equivalent functionality of a standalone installation is maintained, hence the term Hosted.

#### **MAPPING**

Describe your product’s mapping display capabilities and requirements for GIS data. Special attention should be directed toward Phase II wireless calls but should reflect the entire spectrum of potential payloads and their solutions available within your product.

#### **EVENT/ADMINISTRATIVE REPORTS**

Please describe, and provide examples, of standard reports generated by the CPE regarding individual calls, collection of calls, summary of call loads and other pertinent information gathered by the CPE. Identify any differences that may exist between standalone and hosted solutions.

### **PAYLOAD RECORDING EQUIPMENT**

With ever-changing multimedia payloads, recording capabilities must expand beyond voice calls. The ability to record and playback events becomes increasingly important with the complexity of calls. Please describe how your current and anticipated solution records calls including the ability to instantly recall a recent event and the archival abilities of your solution. Respondents having these solutions are reminded that Ohio ESINet Steering Committee anticipates CPE to be deployed both as standalone and hosted. Please describe the differences, if any, that these deployments create for your solution.

### **IMPLEMENTATION STRATEGY**

The discussions should include an estimated timeline for each and provisions for functional interworking between the legacy and NG networks during transition.

### **ONGOING SUPPORT**

Responders must provide an overview of their engineering, maintenance and provisioning organizations and services that will support the State's network. In addition, the State requires that certain network performance data and reports be made available to the Steering Committee. Responders should provide an overview of the available performance data and reports.

### **LEGAL REQUIREMENTS**

Responders are encouraged to identify any issues specific to NG9-1-1 that have legal implications and to describe what remedies are suggested. Be as specific as possible to allow future consideration of these issues should a formal procurement (e.g., RFP, RFQ) be issued. If no specific legal requirements are required please indicate such.

### **OPTIONAL INFORMATION**

Responders are offered the opportunity to make any observations or offer other products and services not otherwise contained within the RFI. This is an opportunity to offer suggestions regarding the potential issuance of a formal procurement in a fair and unbiased manner. Responders are encouraged to use this section at will.

### **PRICING AND ACQUISITION OPTIONS**

The Ohio ESINet Steering Committee is interested in obtaining fiscal information regarding the acquisition of an NG9-1-1 solution as identified within this RFI for project planning purposes only.

It is understood that pricing for an Ohio NG9-1-1 network is not possible based on the information provided in this RFI; however it is important for the State to gain some knowledge of costs in order to begin preliminary funding initiatives necessary to support an RFP. Responders are asked to provide a range of costs for the proposed solutions along with any additional information that will be helpful in this area.

Based upon the proposed configuration(s), please indicate pricing in both non-recurring and recurring format. If your company offers any options such as extended financing, lease or lease/option please indicate.

When offering pricing, keep in mind Ohio ESINet Steering Committee will expect to place full responsibility on any vendor(s) awarded a contract through a legal / formal procurement process in the future. This is an informal RFI and no form of solicitation or offer to purchase is made nor should it be inferred.

### **DEPLOYMENT MODEL**

Responders who wish to provide samples of project management and deployments are encouraged to provide this information as either custom text or prepackaged material. An estimate regarding the amount of time required for a full deployment is appreciated as are any observations regarding impediments to a smooth transition.

### **PRESENTATION**

Responders offering a full-service solution are invited to meet with the Steering Committee following the submission date of this RFI. This meeting is intended to allow the free flow of information regarding this project and offer the opportunity for responders to demonstrate their technologies in NG9-1-1. Responders fulfilling the requirement of a full-service offering may, at their discretion, bring any potential sub-contractor(s) they may have a business relationship with and who would reasonably be expected to partner for a formal procurement response.

#### **1.4 Disclosure of Responses**

Materials submitted in response to this RFI can be publicly disclosed.

#### **1.5 Confidential and Proprietary Information**

Materials submitted in response to this RFI will be publicly disclosed upon receipt of a public records request. Please do not submit any proprietary or confidential information with your response.

#### **1.6 Key Action Calendar Dates**

Release Date: June 6, 2014

Inquiries End Date: July 18<sup>th</sup> @ 11:59 AM Eastern Standard Time

Response Due Date: ~~July 25<sup>th</sup>~~ \***August 1, 2014** @ 11:59 AM Eastern Standard Time

#### **1.7 Clarifications and Additional Information**

The agency may request clarifications or additional information from any respondent that provides a response to this RFI.

### **2.0 INTRODUCTION**

The Ohio Emergency Services Internet Protocol Network (ESINet) Steering Committee firmly believes that a coordinated and centralized approach to delivering core Next Generation 9-1-1 (NG9-1-1) services over existing state assets will provide the most efficient cost effective implementation and support for a seamless and fully integrated NG9-1-1 system for both the citizens of Ohio and visitors alike. This RFI is intended to identify viable options for the State to support local government NG implementations. Respondents to this

RFI are encouraged to familiarize themselves with the current 9-1-1 environment in the State and provide a range of solutions from the state solely providing access to data transport through the State's ESI Network to a fully functional NG9-1-1 hosted solution.

Implementation of NG9-1-1 will entail significant investment, detailed planning, and close cooperation among the public and private sector entities responsible for the operation of 9-1-1 systems. Implementation presents both opportunity and challenge.

Ohio's vision is for a statewide ESINet to replace Ohio's existing patchwork of analog networks and provide for the centralization of equipment and services. This will improve efficiencies and reduce overall system costs while allowing local government to retain control over how 9-1-1 services are provided.

Ohio's implementation of a statewide ESINet and the transition to a NG9-1-1 system must ensure Ohio's NG9-1-1 system exceeds the existing E9-1-1 system in the areas of: security; speed of delivery; reliability; and redundancy, and; ensure the NG9-1-1 system has the ability to receive voice and data from any device or service that can access 9-1-1, anytime and anywhere in the state.

The Steering Committee envisions a statewide ESINet that interconnects a system of regional and/or local ESINets. The statewide ESINet will enable NG9-1-1 call access, transfers and backups among and between NG9-1-1 service providers and users on remote ESINets; it will provide flexibility in call-taking such that call takers no longer will have to be physically constrained to a specific communication center or Public Safety Answering Point (PSAP). Additionally, the statewide ESINet will enable access to and backups from other emergency services organizations during times of excessive call volumes, common during unfolding extreme weather and crisis events.

The implementation of a statewide ESINet will consist of shared systems which leverage current State technologies and assets to ensure standardized and efficient delivery of 9-1-1 services to the public. There are currently 322 PSAPs reported by County 9-1-1 Boards. 7,486,867 calls were placed to 9-1-1 in 2012. Of those calls, 5,401,307 or 72.14% were placed from wireless telephones. Since 2010 this represents an increase of 14.2% of the total call volume and a 23.8% increase in wireless call volume. Twenty six PSAPs in 17 counties reported they are evaluating consolidating or merging operations.

## **2.1 System Objectives**

The State of Ohio ESINet Steering Committee is seeking information on NG9-1-1 system design solutions that will:

- Assist the Steering Committee in the development of a NG9-1-1 transition plan.
- Prepare for budgeting and funding for core NG9-1-1 and optional services.
- Provide direction in policy development.

From the responses to this RFI, the State expects to enhance its NG9-1-1 knowledge base in the following subject matter areas:

- Profile and scope of the NG9-1-1 Service Provider marketplace – Qualifications; Experience; Leadership.

- Available Architectures/Solutions – Network and PSAP.
- Migration/Implementation Strategies.
- Ongoing Service Provider Organizational support and capabilities.
- Pricing Structures

### **3.0 SUBMITTAL REQUIREMENTS**

The agency does not intend to award a contract on the basis of responses, nor otherwise pay for the preparation of any information submitted or for the agency's use of such information. Acknowledgment of receipt of responses will be made, but respondents will not be notified of the agency's evaluation of the information received.

Please send e-mail responses to: [val.piccininni@oit.ohio.gov](mailto:val.piccininni@oit.ohio.gov)

Please submit one (1) electronic original Microsoft Word (unprotected) copy and one (1) electronic original Adobe PDF (unprotected) copy of your submission.

E-mail format for responses are the only acceptable format. Include "RFI# 0001-2014, Ohio ESINet & NG9-1-1 Services Response" as the subject line of your e-mail response. Include the company name, address, contact name, contact telephone and e-mail in the body of the e-mail.

The deadline for written responses is August 1, 2014 at 11:59 AM Eastern Standard Time.

## **ATTACHMENT A**

### **OHIO ESINet / NG9-1-1 RFI**

#### **BACKGROUND INFORMATION**

In Ohio, NG9-1-1 will utilize a secure, private managed IP-based network to process and manage multi-media services such as voice and text messaging, data, and video. Once fully implemented, NG will:

- Facilitate 9-1-1 call and data sharing;
- Provide a robust, redundant, and secure statewide emergency network;
- Provide equal access for all 9-1-1 callers, particularly the deaf and hard of hearing;
- Allow emergency responders to be better prepared for situations prior to arriving on the scene, potentially saving more lives;
- Provide significant benefits in disaster planning and recovery;
- Facilitate and enable Incident/Mutual Aid Collaborations;
- Make greater use of information from outside sources;
- Provide efficient statewide backup and overflow during crises, periods of high call volume, and planned and unplanned outages; and
- Support current and future communications devices.

The Steering Committee envisions a state level ESINet that will support core NG services related to generic IP-enable networks such as address allocation, domain name systems, services broker and network monitoring and management. The state level ESINet will also support multimedia services such as bridges, loggers, media servers, etc. Regional ESINets may choose to obtain some or all of the core and multimedia services through the state's ESINet. Additional information and reports may be found on the ESINet Steering Committee website<sup>2</sup>.

The ESINet will be built within the Ohio Academic Resources Network (OARnet) which will serve as the backbone for network services. The NG9-1-1 system will be built within the ESINet to leverage existing state owned infrastructure, hosted within the State of Ohio Computer Center as the primary location with sufficient remote data center locations to provide redundancy and system survivability. Core NG9-1-1 services will be hosted on servers within this environment. The intent of this RFI is to discover the breadth of solutions and services available with their associated costs in order for the State to determine the level of service delivery and support that will be necessary to ensure local 9-1-1 Authorities can successfully implement NG9-1-1 services that will be fully interoperable with all other NG9-1-1 implementations throughout the state as well as the nation. Solutions provided in response to this RFI must include full system administration and monitoring for all NG9-1-1 services proposed.

#### **NG9-1-1 NETWORK SERVICES AND CAPABILITIES**

The Ohio ESINet will offer shared network services for emergency NG9-1-1 activities to public safety responders (NG9-1-1, police, fire, EMS), and eventually support other emergency response professions, agencies and NGOs (e.g. emergency management, hospitals/trauma centers), public health professions (e.g.

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<sup>2</sup> <https://soh.sp.ohio.gov/sites/ESINET/SitePages/Home.aspx>

transportation, public works, IT, schools), critical infrastructure providers, the media, and other relevant participants. The Ohio Academic Resources Network will serve as the backbone for the ESINet and will be part of an interconnected and interoperable system of local, regional, and national emergency services networks.

OARnet is a statewide facilities based network running on 1850 miles of dark fiber. Services offered on the network include Optical DWDM, IP, Ethernet, MPLS, L2VPN and L3VPN. OARnet currently has 43 full service POPs across the state supporting standard IP router or Ethernet handoffs as well as optical interconnect. OARnet has an additional 7 POPs supporting optical interconnect for backhaul to one of the full service POPs.

The State ESINet will provide i3 compliant network transport services accepting connections from PSAPs, regional ESINets and NG9-1-1 service providers that meet the requirements of the ESINet Steering Committee for NG9-1-1 services.

ESINet management will include the following minimum services:

1. Performance monitoring of the network.
2. Real-time and historical reporting functions that demonstrate conformance with the Service Level Agreement (SLA).
3. Network proposals should include a complete set of sample reports that will be provided.
4. Alerting capabilities to notify technical staff and others of network outages.
5. Preventive maintenance on a regular basis as identified in the SLA.
6. Software upgrades to keep the network components up-to-date, compatible, and secure.
7. Infrastructure repair, routine, emergency and preventive maintenance, and replacement per the SLA.

The expectation is that 9-1-1 will be one of a group of agencies that will contract with an entity that will serve as the Ohio ESINet Network Manager. The manager will assemble the network and provide the software applications for managing the transport layer for all emergency agencies. It will also have responsibility for ensuring that a number of network-centric application layer services are hosted and function properly.

Policy rule sets will be developed by the appropriate emergency decision making entities (local, state and federal) using a Policy Editor and are stored in the Access Control core service for the Emergency Service Routing Proxy (ESRP) and other message brokers and systems to fetch. At the time of this writing, standards and/or requirements for the provisioning of policy rule sets to the Policy Store have not been developed. The Policy Editor may be a local application or a remote web browser interface. It is anticipated that a standardized Access Control core service containing a Policy Store with policy editing services will service Ohio agencies. In the future this may be offered by multiple providers.

## **FUNCTIONAL REQUIREMENTS**

The major NG9-1-1 applications that would reside on the ESINet include at least the following components:

(These can be defined within the document)

- Border Control Function (BCF)
- Emergency Call Routing Function (ECRF)
- Emergency Service Routing Proxy (ESRP)
- Location Validation Function (LVF)
- Legacy Network Gateways

Legacy PSAP Gateway  
Business Rules within the Policy Routing Function

Because the NG9-1-1 delivery system relies on geospatial information to route calls, Geographic Information Systems (GIS) technology and spatial data take on a completely new level of importance. In NG9-1-1, geospatial information becomes one of the central data stores necessary for the delivery of emergency services. All call location and routing functions will be based on geospatial datasets that drive the major components of NG9-1-1, including the Location Information Server (LIS), and the Emergency Call Routing Function (ECRF). This significant change includes the requirement that the database is and continues to be extremely accurate. There must be consistency and preciseness within the GIS database itself, between its various layers, and as compared to Master Street Address Guide (MSAG) and the Automated Location Information (ALI).

There are also a number of services which have traditionally been provided within individual agencies as well as a host of new and Ad Hoc services that may appropriately be offered as shared services through the State. There may be an opportunity to provide these additional services as optional network centric services for some or all participants. These could include those discussed below.

**Logging Service**

The NG9-1-1 logging service must be capable of logging voice, text, images, video and other data. All significant steps in processing a call and its associated media are logged. Emergency agencies and/or regional ESINets may acquire their own logging service and may have different internal interfaces. However, each instance of the service is required to have connections to the service on the state level ESINet and support the standard external logging interface for retrieval of logged events. The logging services log external events, internal events, media and messages. Play back service is provided for recorded media streams. Recorded media streams include integral time reference data within the stream. Time stamps must be synchronized across all logging services. Retrieval of data by other PSAPs, 9-1-1 entities or emergency services agencies is determined by the policy of the PSAP/9-1-1 entity that provides the logging service.

**Intelligent Message Broker**

It is neither practical nor desirable to have a single message brokering system. The value of standards is that a multiplicity of middleware and end point systems can be supported, encouraging innovation and cost competition. But to get interoperable messaging going quickly and provide a friendly innovation test bed, we plan to provide and host default middleware for Intelligent Message Brokering (IMB), security, and use of (and auditing of compliance with) agency location, access control and other core services.

An IMB will access the agency locator and Access Control core services to determine rules and policies for information distribution. It will enforce those policies. By merely registering for the incident/message type in the agency locator service, service participants would be able to easily gain event notification services. They could exchange and share information. Where information is known to exist (e.g., a database) and is readily available, consumers will request the information from the producer when they need it. In other cases, the information a producer wishes to make available may not be known or available in advance. The producer will push out the information, which may be location-sensitive, as it becomes available (e.g., hazmat alerts). In addition to the familiar emergency

events, the term “event” includes changes in the internal state of resources, inter-agency advisories, process workflow triggers, news feed items, weather, traffic and hazmat alerts and others.

Priorities for hosted services may include:

- Next Generation 9-1-1 “call” handling for PSAPs (IP based voice, text, multi-media, and video).
- Computer aided dispatch: police, fire and EMS. This could include decision support tools (e.g., upgraded emergency medical dispatch software).
- Data Management System.
- Interactive alerting/public warning. There is today a multiplicity of use-built, “stove pipe” warning systems. They need to be linked, not replaced. The way to do that is with common message standards and shared core services, not building new systems or stand-alone, limited use products. Our plan will create the ability to reach the public and vice versa both through social networks of all kinds, and more formally through established agencies, services, warning/alerting businesses, the media, and employers. We need to connect official sources authorized to issue alerts about every hazard, for every area to any and all systems of communication in use by the public, and offer the public at least one attractive messaging service for personal emergency use as well as communications to and from government entities, and among emergency organizations. A simple application to send and receive standardized data messages will be provided.

### **INFRASTRUCTURE, EQUIPMENT, AND TECHNOLOGY**

Technically, the focus of this request is “on the middle”, on network-centric software solutions that benefit all PSAPs and emergency response agencies, using a redundant, diverse network, rather than the traditional PSAP by PSAP approach to upgrading. Interfaces to legacy systems will be necessary until such time as all PSAPs and network providers have had the opportunity to upgrade to NG compatible systems. This will result in a uniform statewide 9-1-1 infrastructure or interconnected ESINets with equipment and technology to enable all 9-1-1 calls to be processed regardless of technology and to enable seamless transfer of voice and data among PSAPs within Ohio and adjoining states and regions.

At the core of the proposed network is a Multiprotocol Label Switching (MPLS) backbone as provided by an MPLS carrier. The proposed MPLS network will support traditional voice 9-1-1 traffic as well as video and data traffic. Voice, data, and video traffic, regardless of its source, are transmitted on the network as data packets. In order to maintain voice quality, voice traffic must be prioritized. Quality of Service (QoS) features must be implemented in the proposed network for this purpose. Specifically, the National Emergency Number Association (NENA) recommends that the Differentiated Services (DiffServ) QoS protocol be implemented. This will be a requirement that the selected carrier will implement and manage in the network. At a minimum, two geographically diverse data centers are required, each with the capacity to handle the entire call volume, in case one of the data centers is off line for any reason.

A three data center configuration is considered a best practice, since it maintains redundancy even if one data center is unavailable, whether due to an emergency, preventive maintenance, hardware/software upgrade, or any other reason. Each data center shall have full capability of supporting all the NG9-1-1 traffic originating in the state. Full capability is defined as including Border Control Function, Routing, and rules-

based servers. It is imperative that all calls delivered to the ESINet can appear at each center with call management handled as “overhead” between the load sharing capabilities of these centers.

MPLS services will be provided as a managed/routed solution. This approach requires the MPLS carrier to implement routing protocols based on policies and direction decided by the Board. An example of this would be through the establishment of “load sharing” among the data centers. As one center may concentrate on a geographical area of the state, the remaining centers are entirely capable of routing to any PSAP.

The design envisions that all 9-1-1 calls from all sources – landline, cellular, and Internet – will be delivered to, and aggregated by the MPLS carrier, transported as data packets, and routed to the data centers through the MPLS network. Routers at the carrier’s location will route calls to the data centers based on rules developed by the Board (i.e., load balance among the data centers or select a primary data center to handle all traffic, and have the other data centers act in a backup role in the event of a failure of the primary data center or network link).

Calculations have determined that the network links from the data centers to the ESINet should be sized at 200 Mbps initially. This bandwidth should meet the P.01 grade of service, based on existing call volumes (~8M/yr). These links will support the following traffic types:

- Incoming 9-1-1 calls from the carriers.
- Outgoing 9-1-1 calls to the PSAPs.
- Database synchronization functions.

Typically, database reconciliation will be a scheduled activity to occur during periods with low 9-1-1 call volumes so as not to interfere with emergency calls. Furthermore, database reconciliation functions will be assigned a lower priority within the QoS structure, ensuring that 9-1-1 calls are treated as the highest priority. The Service Level Agreement (SLA) between the Board and the MPLS carrier shall include a requirement for the provider to monitor traffic loads and upgrade (or downgrade) the capacity of the network links in response to changing call volumes and types.

Following is a list of requirements and assumptions concerning any NG9-1-1 solution:

- In the NG9-1-1 environment, any device capable of accessing 9-1-1 service will be able to connect through the device’s carrier or provider.
- The consumer will access 9-1-1 from a cell phone, landline phone, VoIP service, etc. The voice and/or data will be delivered to the PSAP at one time, instead of separately as today. The call will enter the IP cloud via a gateway, which will also route the call.
- All carriers/providers will need to connect to the State E9-1-1 Program Office owned or managed IP Connection Point, which will convert the analog signal to IP.
- Each provider will have to provide its own access to the gateway, and shall have to meet state standards and requirements for access.
- Each provider shall be responsible for the costs of connecting to and meeting the gateway requirements. This applies to transitional requirements for Automatic Location Identification (ALI) data, MSAG validation, and selective routing or providing for the originating Emergency Services

Routing Proxy (ESRP) as well as NG9-1-1 requirements for GIS and LDB in accordance with NENA i3 standards.

- During the transition each provider will work with local 9-1-1 authorities to ensure ALI and MSAG maintenance is reconciled nightly with the local addressing authority GIS databases.
- All data and voice from the IP cloud to the PSAP will be IP-based, via Session Initiated Protocol (SIP). PSAPs will have to meet state requirements for access, firewall, level of service, and CPE capability, among others.
- There will need to be a router, firewall, etc., between the originating border control and the terminating border control of the IP cloud and PSAPs.
- The network should be Multiple Protocol Label Switching (MPLS) or equivalent. Local governmental agencies will continue to retain control over their respective emergency response functions, including call-receivers. Local jurisdictions will also retain responsibility for managing their respective MSAGs and mapping.
- Implementation of NG9-1-1 will foster the migration to the centralization of equipment and sharing of host equipment. That is, 9-1-1 “calls” will continue to be received locally, but the host equipment can be shared across multiple PSAPs or counties. The implementation of a NG9-1-1 network makes it more cost effective to deploy a common network to serve multiple counties. Where it makes sense, the network should be used to facilitate the pooling of operational and capital resources.
- The State E9-1-1 Program Office will need to control access to the network.
- The State E9-1-1 Program Office should be responsible for the costs associated with the gateways and the clouds.
- PSAPs will be responsible for their own costs.
- Service providers will be responsible for the network costs.
- The State E9-1-1 Program Office will need to set standards and specifications, with the advice and assistance of the E911 Advisory Committee, designed with sufficient capacity to support all legacy and IP applications for statewide public safety needs.
- The network should be robust and designed with sufficient diversity and redundancy to ensure survivability. No single point of failure should be able to significantly impact the day-to-day 9-1-1 and PSAP operations. The network needs to support the new and evolving NENA technical and operating standards for IP networks and 9-1-1 call-taking equipment.
- The network should permit connection to the existing E9-1-1 network and the Public Switched Telephone Network (PSTN).
- The Subcommittee recommends that the State E9-1-1 Program Office set standards for voice compression and Quality of Service (QoS).
- The State E9-1-1 Program Office should require diverse routing from the PSAP to the first Point-of-Presence (POP) in the IP network, with the realization that technology and cost factors may require some adjustments to that standard.

## **APPLICABLE STANDARDS**

The State of Ohio recognizes that interoperable NG9-1-1 systems can only be fully realized if all components are open and standards-based. The National Emergency Numbering Association (NENA) facilitates events that allow vendors to test the interoperability of their products with products from other vendors. The goal of these **NG9-1-1 Industry Collaboration Events (NG9-1-1 ICE)** is to support all vendors in achieving fully standards based interoperable systems.

The State of Ohio believes that by participating in these events, vendors will better understand the ability of their products to interoperate in a complex system. Further, we believe that vendors will address any interoperability limitations they uncover during the events.

It is our strong recommendation that vendors seeking to provide NG9-1-1 services to 9-1-1 Authorities in Ohio participate in NENA NG9-1-1 Industry Collaboration Events to identify, address and disclose any remaining deficiencies prior to offering products and solutions for sale in the state.

Until such time as NG9-1-1 certification standards are in place it is imperative that procurement language include references to compliance with all NENA i3 Standards in effect as of this writing, as well as future standards by reference.

### **75-502 v1 - NG9-1-1 Security (NG-SEC) Checklist 9/4/2013**

This Information Document is a companion to the NENA 75-001 - NENA Security for Next-Generation 9-1-1 Standard (NG-SEC) Standard. To effectively use this document the user should have a clear understanding of the concepts and procedures described therein. This checklist provides a summary of the requirements and recommendations detailed in the NG-SEC standard and provide the educated user a method to document a NG-SEC Audit.

### **75-001 v1 - NG Security 9/4/2013**

The purpose of this document is to establish the minimal guidelines and requirements for the protection of NG9-1-1(?) assets or elements within a changing business environment.

### **04-503 v1 - PSAP Security 9/4/2013**

Today's Public Safety Answering Points (PSAPs) face more threats than ever before. In a post 9/11 world, the 9-1-1 community must recognize the reality of increased threats and vulnerabilities. New product paradigms are being designed and implemented by the PSAP community at a rapid pace. Today's call-centers are challenged to keep pace with the rapid shifts in technology.

### **INF-003 NG9-1-1 Potential Points of Demarcation 9/4/2013**

Potential Points of Demarcation in NG9-1-1 Networks Information Document, NENA-INF-003, March 21, 2013, has been NENA Board approved and posted to the NENA website. In NG9-1-1 networks, demarcation is not defined exclusively by a physical point of interconnection. NG9-1-1 is built on

Internet Protocol (IP) networks which follow the Open Systems Interconnection (OSI) layered model where points of demarcation can occur independently at different places in different OSI layers. This document's purpose is to identify points of demarcation, and not to advise on the relative merits of different demarcation options from a regulatory or financial perspective.

**08-002 v1 - Func Interface Standards NG91-1 (i3) 12/5/2011**

Major changes in the existing emergency services architecture are being driven by the rapid evolution of the types of devices and services that can be used to call for help. Also there is an increasing volume and diversity of information that can be made available to assist PSAPs and responders in an emergency. NENA recognizes this is a fundamental update to the North American 9-1-1 system, and is addressing the challenge with a system design called "Next Generation 9-1-1" (NG9-1-1). NG9-1-1 is the evolution of Enhanced 9-1-1 to an all-IP-based emergency communications system. This technical specification, commonly referred to as i3, is the first version of the NG9-1-1 system design.

**08-003 v1 - Detailed Func & Interface Specs (i3) 12/12/2011**

Getting to the i3 solution from where we are today means that we will have to go through a transition from existing legacy originating network and 9-1-1 PSAP interconnections to next generation interconnections. This document describes how NG9-1-1 works after transition, including ongoing interworking requirements for IP-based and TDM-based PSAPs and origination networks. It does not provide solutions for how PSAPs, origination networks, selective routers and ALI systems evolve. Rather, it describes the end point where conversion is complete. At that point, selective routers and existing ALI systems are decommissioned and all 9-1-1 calls are routed by the ECRF and arrive at the ESINet via SIP. The NENA NG9-1-1 Transition Planning Committee (NGTPC) will produce documents covering transition options and procedures.

**08-501 v1 - Network Interface to IP Capable PSAP 12/5/2011**

This "NENA Technical Information Document on the Network Interface to IP Capable PSAP" document provides technical information to guide manufacturers of network equipment and Public Safety answering Point (PSAP) Customer Premises Equipment (CPE) in the development of Internet Protocol based interfaces between the network and PSAP CPE and to assist E9-1-1 Network Service Providers and PSAP's in implementing such interfaces. It defines a service description for the capabilities that will need to be supported by the VoIP signaling on the interface, as well as the necessary network and CPE elements needed in the supporting architecture. The Appendices to this TID include specific assumptions/issues for individual candidate Voice over Internet Protocol (VoIP) signaling protocols, that will need to be considered in the specification of (separate) technical reference document(s) that provide signaling requirements for the individual VoIP protocol alternatives identified.

**08-502 v1 - E9-1-1 Requirements 12/5/2011**

This document is intended to provide a resource that describes the features and functions of the E9-1-1 system that is currently deployed in the United States. These features and functions are a compilation of different regional networks and some may not be present in any particular E9-1-1 network.

**08-503 v1 - VoIP Characteristics 12/5/2011**

The purpose of this document is to procure, create and publish a VoIP primer document to be used by individuals not familiar with VoIP technology.

**08-504 v1 - VoIP Stds Development Organizations 12/5/2011**

This “NENA VoIP Standards Development Organizations” is a reference for NENA technical committees to use for determining the various standards setting bodies involved in the implementation and ongoing development of VoIP protocols and procedures as they relate to emergency calling.

**08-505 v1 - Location Determination IP 9-1-1 12/5/2011**

This document is the first edition of what will be a comprehensive document addressing many access network configurations. This edition has a narrow solutions focus and will address only the automated mechanisms for the residential broadband market, manually configured location mechanisms for end-points are not discussed. User-provided location information is beyond the scope of this document. Revised editions of this document will add new sections to address enterprise, hosted and mobile access configurations.

**08-506 v1 - Emer. Serv. IP Network Design NG91-1 1/25/2012**

Many 9-1-1 entities have built, are building, or will build in the near future an Emergency Services IP network (ESINet) to connect PSAPs and other public safety agencies within a region and provide interconnect to other ESINets and originating service providers within a region or state. The effort and expense required to build these facilities is significant. The purpose of this document is to provide network architects, consultants, 9-1-1 entities, and state authorities with the information that will assist them in developing the requirements for and/or designing ESINets today that will be capable of meeting the requirements of an NG9-1-1 system.

**08-751 v1 - i3 Requirements Long Term Definition 12/5/2011**

This “NENA i3 Technical Requirements Document” is intended to specify the requirements the i3 (Long Term Definition) Standard should meet. This document is issued to guide the development of the i3 Standard.

**08-752 v1 - Location Info to Support IP 9-1-1 12/5/2011**

This Technical Reference document provides the NENA requirements for providing location information to support emergency calling. It also provides example scenarios and use cases that need to be supported. This is being provided to support organizations that are defining solutions for determining, acquiring and conveying location information to support emergency calling.

**57-503 Notification ERDB-VPC of ESN Changes 7/17/2013**

This document was developed as a recommendation for distribution of ESN changes and additions initiated by 9-1-1 Administrators to ERDB, VPC and ESGW operators in the i-2 VoIP environment, which assumes the use of wireline ESNs for the routing of VoIP calls. Its primary goal is to set expectations and improve communications amongst the parties involved to facilitate the timely implementation of VoIP ESN changes and additions, thereby facilitating the proper routing of VoIP E9-1-1 calls. It also makes recommendations as to how to provide the GIS files that reflect the ESN addition or changes requested. This procedural recommendation will involve technical development work. As such, a short term recommendation is also outlined.

**57-750 V1 NG9-1-1 System & PSAP Operational Feat. 10/5/2012**

This document is intended to be a guide for the NENA Technical and Operations Committees, as well as other national and international standards organizations, to use in developing and finalizing standards in preparation for implementation of standards-based NG9-1-1 systems. The IP network, 9-1-1 equipment, software vendors, as well as service providers should use this requirements document as a guide during their product research and development. PSAP administrators may also find this document useful for planning purposes, as they prepare to transition from their current 9-1-1 system to NG9-1-1 systems, and to update internal policy and procedures to leverage the new features, requirements, and capabilities in the NG environment.

**58-502 VoIP Funding & Regulatory Issues 12/5/2011**

Included in this document is a broad planning methodology that PSAPs can use as a conceptual framework in developing their own strategic approaches to the potential financial and regulatory impact of VoIP. The intention of this document is not to provide a single definitive solution to the funding and regulatory issues related to VoIP. Rather, this document is presented as a survey of the major topical areas related to VoIP funding and regulatory issues tangent to 9-1-1 services.

**73-501 v1 - Non-Voice-Centric Emergency Svcs 12/5/2011**

Non-Voice-Centric Emergency Services as defined in this document focuses on Next Generation Network (NGN) technology and does not include legacy messaging services, such as Short Messaging Service (SMS) . In addition, Non-Voice-Centric Emergency Services does not include support of calls from non-human initiated devices (e.g., fire alarms).

**TERMS**

As used herein the following terms apply:

**Alternate Routing:** The capability of routing 9-1-1 calls to a designated alternate location(s) if all 9-1-1 trunks are busy or out of service. May be activated upon request or automatically, if detectable, when 9-1-1 equipment fails or the PSAP itself is disabled.

**Applications and Appliances:** the hardware and software required for 9-1-1 call and payload acceptance, processing, and delivery to a PSAP.

**Attendant Position:** the CPE at which calls are answered and responded to by the telecommunicator.

**Automatic Location Identification (ALI):** an enhanced 9-1-1 service capability that allows for the automatic display of information relating to the geographical location of the communication device used to place a 9-1-1 call.

**Automatic Number Identification (ANI):** an enhanced 9-1-1 service capability that allows for the automatic display of the telephone number used to place or route a 9-1-1 call.

**Border Control Function (BCF):** provides a secure entry into the ESINet for emergency calls presented to the network. The BCF incorporates firewall, admission control, and may include anchoring of session and media as well as other security mechanisms to prevent deliberate, malicious attacks on PSAPs or other entities connected to the ESINet.

**Call:** a session established by signaling with two-way real time media and involves a human making a request for help. Sometimes it is referred to as a “voice call”, “video call” or “text call” when specific media is of primary importance. The term “non-human-initiated call” refers to a one-time notification or series of data exchanges established by signaling with, at most, one-way media and typically does not involve a human at the “calling” end. The term “call” can also be used to refer to either a “Voice Call”, “Video Call”, “Text Call” or “Data-only call”, since they are handled the same way through most of Next Generation 9-1-1. It is an element of current and anticipated 9-1-1 payload.

**Call delivery:** The capability to route a 9-1-1 call for delivery to the designated PSAP.

**Call Processing:** the system and process that permits a PSAP to receive, answer, and transfer a 9-1-1 call and other current and anticipated payload.

**Call Taker:** an agent of a PSAP who answers emergency calls.

**Communication Service Provider:** an entity that provides communication services to a subscriber or end user.

**Communication Services:** includes any of the following: (a) the transmission, conveyance or routing of real-time, two-way voice communications to a point or between or among points by or through any electronic, radio, satellite, cable, optical, microwave, wireline, wireless, or other medium or method, regardless of the protocol used; (b) the ability to provide two-way voice communication on the public switched network; (c) wireless enhanced 9-1-1 service; (d) wireline enhanced 9-1-1 service; (e) interconnected VoIP provider service as defined by FCC regulations; (f) IP-enabled service; or (g) prepaid wireless service.

**Customer Premises Equipment (CPE):** Communications or terminal equipment located in the customer's facilities – terminal equipment at a PSAP.

**Emergency Call Routing Function (ECRF):** A functional element in an ESINet which is a LoST protocol server where location information (either civic address or geo-coordinates) and a Service URN serves as input to a mapping function that returns a URI used to route an emergency call toward the appropriate PSAP for the caller's location or towards a responder agency.

**Emergency Services Internet Protocol Network or ESINet:** a managed IP network that is used for emergency services communications, and which can be shared by all public safety agencies. It provides the IP transport infrastructure upon which independent application platforms and core functional processes can be deployed, including, but not restricted to, those necessary for providing NG9-1-1 services. ESINets may be constructed from a mix of dedicated and shared facilities. ESINets may be interconnected at local, regional, state, federal, national, and international levels to form an IP based inter-network (network of networks).

**End User:** a person who uses communication services.

**Enhanced 9-1-1 Network Features:** the components of Enhanced 9-1-1 service that provide selective routing, automatic number identification, and automatic location identification.

**Enhanced 9-1-1 Service Provider:** any entity that provides one or more of the following 9-1-1 elements: network, database, or PSAP customer premises equipment.

**Enhanced 9-1-1 Service:** a service consisting of communication network, database, and equipment features provided for subscribers or end users of communication services enabling such subscribers or end users to reach a PSAP by dialing the digits 9-1-1, or by other means approved by the department, that directs calls to appropriate PSAPs based on selective routing and provides the capability for automatic number identification and automatic location identification.

**Enhanced 9-1-1 Systems:** a distinct entity or geographical segment in which enhanced 9-1-1 service is provided, consisting of network routing elements serving as a control office and trunking connecting all central offices within a geographical segment, and including PSAPs and network used to deliver location data to PSAPs from a data base.

**FCC:** the Federal Communications Commission.

**Functional Element:** major process, appliance, or application including network bandwidth and bandwidth support.

**Geographic Information Systems (GIS):** A computer software system that enables one to visualize geographic aspects of a body of data. It contains the ability to translate implicit geographic data (such as a street address) into an explicit map location. It has the ability to query and analyze data in order to receive the results in the form of a map. It also can be used to graphically display coordinates on a map i.e. Latitude/Longitude from a wireless 9-1-1 call.

**Hosted PSAP:** a PSAP whose CPE function is provided by one or more data centers with only the 9-1-1 call taker workstations and ESINet connectivity devices located within the PSAP. The “backroom” equipment is remote from the PSAP but the equivalent functionality of a standalone installation is maintained.

**IP-enabled Service:** a service, device, or application which makes use of Internet Protocol, or IP, and is capable of entering the digits 9-1-1, or by other means as approved the Ohio ESINet Steering Committee, for the purposes of interconnecting users to the 9-1-1 system including, but not limited to, voice over IP and other services, devices, or applications provided through or using wireline, cable, wireless, or satellite facilities or any other facility that may be provided in the future.

**Legacy Gateway:** a signaling and media interconnection point between callers in legacy wireline/wireless originating networks and the i3 architecture, so that i3 PSAPs are able to receive emergency calls from such legacy networks.

**Legacy Network Gateway or LNG:** refer to Legacy Gateway

**Legacy PSAP Gateway (LPG):** an i3 functional element that supports the interconnection of the ESINet with legacy PSAPs.

**Legacy System:** the existing analog-based enhanced 9-1-1 system.

**Location Information Server (LIS):** is a functional entity that provides locations of endpoints in the ESINet. A LIS can provide Location-by-Reference, or Location-by-Value, and, if the latter, in geo or civic forms. A LIS can be queried by an endpoint for its own location, or by another entity for the location of an endpoint. In either case, the LIS receives a unique identifier that represents the endpoint, for example an IP address, circuit-ID or MAC address, and returns the location (value or reference) associated with that identifier. The LIS is also the entity that provides the dereferencing service, exchanging a location reference for a location value.

**Location to Service Translation (LoST) Protocol:** a protocol that takes location information and a Service URN and returns a URI. Used generally for location-based call routing. In Next Generation 9-1-1, it is used as the protocol for the ECRF and LVF.

**Location Validation:** refers to the action of ensuring that a civic address can be used to discern a route (for the call for service) to the correct PSAP.

**Location Validation Function (LVF):** function that provides sufficient location-based information to a PSAP that allows a 9-1-1 call taker to dispatch emergency responders to a 9-1-1 call scene. The location information is provided by civic based addresses or latitude/longitude data.

**National Emergency Number Association (NENA):** is a not-for-profit corporation established in 1982 to further the goal of “One Nation-One Number.” NENA is a networking source and promotes research, planning, and training. NENA strives to educate, set standards, and provide certification programs, legislative representation, and technical assistance for implementing and managing 9-1-1 systems.

**NENA Next Generation 9-1-1 Standards for i3:** standards and requirements, including the NENA Security for Next Generation 9-1-1 Standard and the NENA Next Generation Technical Requirements Documents, now available or as may become available in the future.

**Next Generation 9-1-1:** an enhanced 9-1-1 system that incorporates the handling of all 9-1-1 calls and messages, including those using IP-enabled services or other advanced communications technologies in the infrastructure of the 9-1-1 system itself.

**Network Components:** any software or hardware for a control switch, other switch modification, trunking or any components of a computer storage system or database used for selective routing of 9-1-1 calls, automatic number identification, and automatic location identification (including a PSAP).

**Payload:** Any multi-media packet that presents to the network as a call, or an equivalent, including without limitation, real-time communication and non-real time communication, voice, text, video, images, alerts, alarms, graphics, or telematics.

**Primary PSAP:** a PSAP equipped with ALI and ANI displays, and is the first point of reception of a 9-1-1 call. It serves the municipality in which it is located.

**Public Safety Answering Point (PSAP):** a facility assigned the responsibility of receiving 9-1-1 calls and, as appropriate, directly dispatching emergency response services or transferring or relaying emergency 9-1-1 calls to other public or private safety agencies or other PSAPs.

**Public Safety Department:** a functional division of a municipality or a state that provides firefighting, law enforcement, ambulance, medical or other emergency services.

**Public Switched Telephone Network (PSTN):** the network of equipment, lines, and controls assembled to establish communication paths between calling and called parties in North America.

**Request for Information (RFI):** the mechanism used to gather information to assist in the development of a potential procurement by inviting potential bidders or other interested parties to provide technical and business advice concerning industry standards, practice, or other information which is relevant to the type of commodities or services, or both, that Ohio ESINet Steering Committee seeks to procure.

**Request for Proposal (RFP):** the mechanism used to communicate procurement specifications and to request responses from interested respondents.

**Secondary PSAP:** a PSAP equipped with automatic number identification and automatic location identification displays. It receives 9-1-1 calls only when they are transferred from the primary PSAP or on an alternative routing basis when calls cannot be completed to the primary PSAP.

**Selective Routing:** the method to direct 9-1-1 calls to the appropriate PSAP using a call routing database derived from the geographical location from which the call originated.

**Spatial or Geospatial:** Relating to, occupying, or having the character of space. Geographic Information Systems store spatial data in regional databases.

**Standalone PSAP:** a PSAP whose CPE is entirely housed within the facility. All functions of call acceptance from the ESINet are contained within the PSAP premises, except the signaling sent to the applications and appliances.