New York City
Next Generation 9-1-1 Program
Request for Information

Issued by the New York City Department of Information Technology and Telecommunications

January 27, 2016

PIN: 85816RFI0001
RELEASED: January 28, 2016
RESPONSES DUE: February 26, 2016, 2:00PM (EST)
LOCATION: Responses to this RFI shall be submitted by mail to

New York City Department of Information Technology and Telecommunications
255 Greenwich Street, 9th Floor
New York, New York 10007
Attention: Paul Simms

All questions and requests for additional information concerning this RFI should be submitted **via e-mail** no later than February 8, 2016, 2:00PM (EST) directed to Paul Simms, the Authorized Agency Contact Person, at:

E-Mail Address: PSimms@doitt.nyc.gov

Introduction

The City of New York has initiated a program to identify potential paths to transition components of the E9-1-1 system in order to ensure that the City of New York's already robust system may incorporate technological enhancements as they are developed over time. Specifically, the City is studying potential programs to permit migration to IP-based switching infrastructure and call handling systems that would allow the City of New York to incorporate next generation applications.

Assessments performed by the City have concluded that the preferred option is to migrate the City to a new, IP-based, Next Generation 9-1-1 (NG9-1-1) system based on standards developed by the National Emergency Number Association (NENA). This RFI is an early step in our planning process and will provide the City with a better understanding, not only of the benefits, but also the challenges, risks, and issues associated with migrating to a NG9-1-1 platform.

This RFI is structured to focus on the unique challenges and opportunities facing the City of New York. Responders are encouraged to focus on the questions in the sections below and provide clear, succinct responses that demonstrate their knowledge and experience in implementing NG9-1-1 systems in similar customer environments. Diagrams are welcomed and encouraged.

Responders that demonstrate understanding of the City's challenges and opportunities, including those that assist peoples with disabilities, and realistic solutions to address them, may be invited to meet with staff of the New York City Department of Information Technology and Telecommunications (DoITT), the Fire Department (FDNY) and the Police Department (NYPD) to clarify their responses in person.

DoITT, the FDNY, and the NYPD appreciate the effort responders invest in this early stage of the process. Responses to this RFI will be carefully considered and will assist the program team to develop the most responsible approach to implementing its NG9-1-1 platform when the City is ready to take this step.

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NG9-1-1 Program Overview

Program Scope

The program is focused on replacing the two DMS 100s, the ALI database and the Call Handling System. The new system will be IP-based and implemented using an architecture and functional components consistent with NENA Standard 08-003 (the i3 standard) and all other related standards developed by NENA, IETF and other Standards organizations.

A concerted effort will be made to interconnect the Originating Service Providers (OSPs) operating in New York with the new system via SIP, thus eliminating, or at least significantly limiting, the need for Legacy Network Gateways (LNGs). This will also eliminate or reduce any future migration efforts that could affect operations.

The platform deployed should have all inherent NG9-1-1 capabilities and allow for turning on these features when requested by NYPD and FDNY. Specifically, the City would like the option to implement a variety of capabilities supported by NG9-1-1 including but not limited to the following:

- **Text to 9-1-1.** An interim solution will likely be implemented prior to the completion of a migration to NG9-1-1. A migration off this interim solution is included in our planning.
- **Participation by other agencies in the NG9-1-1 system.** The City would like the option to include first responder agencies in addition to NYPD and FDNY in the NG9-1-1 system. These additional agencies could include other city, state and federal agencies.
- **Interconnection with neighboring 9-1-1 Authorities.** The City must be capable of transferring and receiving 9-1-1 calls from neighboring jurisdictions in New Jersey, Connecticut, and other counties in the State. Interoperability with both legacy E9-1-1 systems and NG9-1-1 systems is required.
- **Interoperability with CAD and ancillary systems.** The NG9-1-1 system implemented must interoperate with the CAD systems currently installed. Similarly, there are other systems including the Emergency Reporting System (ERS aka Call Boxes)
- **Interoperability with automated alarms and external sources of incident data.** This capability covers a broad range of data sources including telematics services such as OnStar and Cross Country, home alarm services from ADT and Brinks, dedicated bank alarm systems, and commercial fire alarms to name a few. The NG9-1-1 system must provide the option of interfacing natively with these automated alarms and sources of external data.

The City of New York is considered by some experts to be the most linguistically diverse city in the world with what is believed to be as many as 800 spoken languages. The City believes that language translation services will be an essential component of a NG9-1-1 system.

The City of New York is an inclusive and accessible community that ensures that New Yorkers and visitors with disabilities can lead happy healthy and productive lives. The Mayor's Office for People with Disabilities leads this effort. The City will look to discuss options for providing people with disabilities access to a NG9-1-1 system.

Program Organization and Participants

The team authorized by the City to issue this RFI and manage the program is composed of representatives of the Department of Information Technology and Telecommunications (DoITT), The Police department (NYPD), and the Fire Department (FDNY).

Overview of DoITT

In addition to traditional information technology and telecommunications services, DoITT's role has expanded to include support services for the City's E9-1-1 system. For example, DoITT is currently managing the completion of the second Public Safety Answering Center (PSAC2). At PSAC 2 DoITT is managing the installation and integration of all the systems and networks required to provide 9-1-1 call handling, call logging and recording, and call dispatch. The NG9-1-1 Program will be managed and implemented by an integrated City Program Management Office (PMO) consisting of DoITT, NYPD, FDNY, and NYC Mayor's Office resources. The City seeks to purchase products and services directly from the selected vendors. DoITT intends to play an active role in the management and maintenance of the operational system.

While this is only a Request for Information, responders are encouraged to provide information about their products and services at a level that anticipates the sophistication of DoITT and the Agencies described in the following paragraphs.

Overview of FDNY and NYPD

The FDNY and NYPD are major stakeholders in this program and set the 9-1-1 operational standards that best meet the needs of the citizens and visitors to New York City. Population density, volume of 9-1-1 calls, the number and concentration of high-rise buildings, and the preponderance of iconic landmarks in the City drive 9-1-1 operational standards that are, at times, necessarily different than those adopted in many other jurisdictions. A primary goal of this program is to deliver a technology infrastructure that supports the current operational requirements of FDNY and NYPD. If new features are available as a result of implementing the new technology that allow NYPD and/or FDNY to change their operational policies to improve service, then, at the option of the agencies, these new features will be evaluated and tested under controlled environments prior to being considered for activation.

In addition to owning the operational procedures, FDNY and NYPD also bring a substantial amount of technological sophistication to the program. The two agencies will be involved in understanding and making decisions related to all technology being implemented.

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Goals, Structure, and Timeline

Program Goals

The New York City NG9-1-1 program has six important goals:

1. Move off the current DMS 100s, ALI database, and call handling system no later than January 2021;
2. Ensure no 9-1-1 calls go unanswered or delayed during the migration;
3. Minimize the disruption to NYPD and FDNY 9-1-1 call taking operations during the migration ;
4. Build an IP-based foundation that supports the City's goals and operational policies ;
5. Allow new features to be turned on if and when requested;
6. Provide NG9-1-1 system high availability, network reliability, resiliency, and redundancy levels that are equal to or greater than those provided by the current 9-1-1 system or as provided by law.

RFI Goals

The City has a solid understanding of NG9-1-1 concepts, architecture, and standards and is aware of the approaches taken by other 9-1-1 authorities at the state, and regional level. DoITT staff is also very familiar with most of the underlying technologies NG9-1-1 is based on and has experience in managing large, complex projects.

The goals of the RFI are primarily to understand from leading vendors how the unique challenges faced by New York City can be addressed in a NG9-1-1 System. The challenges are articulated in the following sections but are largely driven by two factors: (1) the volume of 9-1-1 calls handled and the unique operational systems and processes employed to address the volume, and (2) the unique characteristics of New York City, including the population density, the number of high visibility landmarks and the large number of high-rise buildings. In our research, we have not found another 9-1-1 authority with challenges of the same magnitude. This RFI is primarily focused on how we meet these unique challenges.

In addition to the specific goals of the RFI mentioned above, this RFI intends to:

- Profile the vendor and solution landscape;
- Refine our thinking about our plan and the timeline;
- Prepare for the possible development of RFPs.

Planning Horizon

To complete the City's migration to NG9-1-1, our current plan calls for vendor selection no later than early 2018, followed by a rapid, but responsible, construction and testing period in order to complete migration of key components no later than 2021. Where appropriate, responses to this RFI may anticipate the product and service portfolio of the responder that is likely to be available in that timeframe.

RFI Response Structure

There are four sections that responders are invited to complete. The first section, which all responders must complete, is general information about the proposer, including experience in NG9-1-1. This section is followed by sections covering the ESInet, NG9-1-1 Core Services and NG9-1-1 Call Handling. Responders should address only those sections that involve products and services that the proposer provides. Appendix D shows the outline to be used by all responders.

Note that responders do not need to respond to each of the four sections. Responders to the ESInet and Call Handling sections must be capable of providing a complete solution addressing the general requirements we have provided in this RFI. Responders to the NG9-1-1 Core Services section may provide a response that addresses a subset of the full list of functional elements.

Oral Presentations

The City may invite some or all of the responders to make presentations to the Program Working Team. These presentations will allow responders to provide additional clarification to their responses vis-à-vis the RFI.

RFI Timeline

Event	Target date
RFI Release	1/28/16
Questions from responders	2/8/16
Responses due	2/26/16
Oral Presentations from selected vendors	3/7/16 – 3/25/16

Participation in this RFI

This RFI is issued for information and planning purposes only and does not constitute a solicitation for any services or products. A response to this RFI is not an offer of any kind and cannot be accepted in any form to be a binding contract. No party is bound by the information provided in this RFI or by any response to this RFI. The City of New York shall not be liable for any costs incurred by responders in developing or submitting a response to this RFI.

Primary Contact for all Questions

All Questions should be directed to:
Paul Simms, Contract Manager, DoITT
PSimms@doitt.nyc.gov

Preferred Format and Method of Delivering Responses

Please send two electronic copies of the response to the primary contact for the City, listed above. One copy should be a PDF of the response; the other should be in Microsoft Word 2010.

Confidential Information Provided by Responders

Responders should identify those portions of their responses, if any, that they deem to be confidential, proprietary information or trade secrets and provide any justification of why such materials, upon

request, should not be disclosed by the City. Such information must be easily separable from the non-confidential sections of the response. All information not so identified may be disclosed by the City.

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Additional Topics to be Covered in more detail in an RFP

This RFI focuses on the high-level architecture of a NG9-1-1 system and the ability of responders to meet the unique requirements of New York City. Other important aspects of a NG9-1-1 system have not been addressed in detail in this document.

Provisioning and Administrative Systems

Provisioning and administrative systems are a critical aspect of a NG9-1-1 system selected for deployment. If an RFP is developed, detailed questions will be asked concerning the interfaces listed below. This RFI focuses on the high-level architecture of the envisioned NG9-1-1 System; as such, information pertaining to the provisioning systems is not included.

Important provisioning and administrative systems

- Provisioning the ECRF with geospatial data (NG9-1-1 Core Services)
- Provisioning the ESRP with the Policy Routing Rules (NG9-1-1 Core Services)
- Provisioning the LIS (NG9-1-1 Core Services)
- Provisioning the Location validation Function (LVF) (NG9-1-1 Core Services)
- Standard and ad hoc reporting (ESInet, NG9-1-1 Core Services, and NG9-1-1 Call handling)
- Provisioning system users with role-based permissions (all provisioning systems)

GIS Data Management System

Creating and maintaining the geospatial information database is a critical component of most NG9-1-1 systems. The unique aspects of the NG9-1-1 system envisioned for New York City requires additional considerations. An evaluation of the GIS data and the requirements of a NG9-1-1 system is underway.

User-Level Functionality Required in the NG9-1-1 Call Handling System

Call handling procedures in the City have evolved over time to address very high 9-1-1 call volumes, changes in technology and new or changing data gathering requirements. While the current call handling procedures are efficient and effective, the NYPD and FDNY both see the migration to NG9-1-1 as an opportunity to revisit and update operational procedures. This RFI process will provide visibility to the operations staff as to what NG9-1-1 offers. This awareness will be used during the development of future Requests for Proposals.

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Description of the New York City E9-1-1 System

Current System

The E9-1-1 system currently used in the City is similar in many ways to E9-1-1 systems across the country. Call aggregation, call routing, call handling systems, and all voice networks employed in the E9-1-1 system have all been procured through the 9-1-1 System Service Provider (SSP) responsible for the City. All Originating Service Providers (OPSs) with subscribers in the City send 9-1-1 calls initiated by their subscribers to a redundant pair of DMS 100 switches, both of which are dedicated to E9-1-1 calls placed in the City. These switches then route calls to one of two primary 9-1-1 call centers. Call takers at these two facilities are all members of the NYPD. These call takers gather the necessary information to determine the location and nature of the emergency. This information is logged and sent to police, fire, or EMT dispatch units for further action. Approximately 10 million 9-1-1 calls per year are processed using these operational procedures.

The DMS 100s are not configured as selective routers. Instead, they are configured as a large Centrex system. All 9-1-1 call taker workstations are directly connected to the DMS 100s. All initial call routing to the call taker workstations is handled by the DMS 100s. There are no additional PBXs at the 9-1-1 call centers providing ACD functionality. The DMS 100s have assigned queues for calls generally aligned with the borough the 9-1-1 call originated in. If the target call queue is full, the DMS 100 sends the call to the next available call taker.

After the initial call taker has gathered information about the nature and location of the emergency, responsibility for the call passes to police, fire, or EMT dispatch units. If the call requires a police response, responsibility is handed off directly to a NYPD dispatcher. If the call requires fire or EMT response, responsibility is handed off to another call taker tasked with gathering more information about the emergency. These secondary call takers are known as Alarm Receipt Dispatchers (ARDs). Once all necessary information is gathered by the fire or EMT ARD, responsibility for the call is handed off to a fire or EMT dispatcher. Note that police, fire, and EMT dispatchers do not communicate with the 9-1-1 caller.

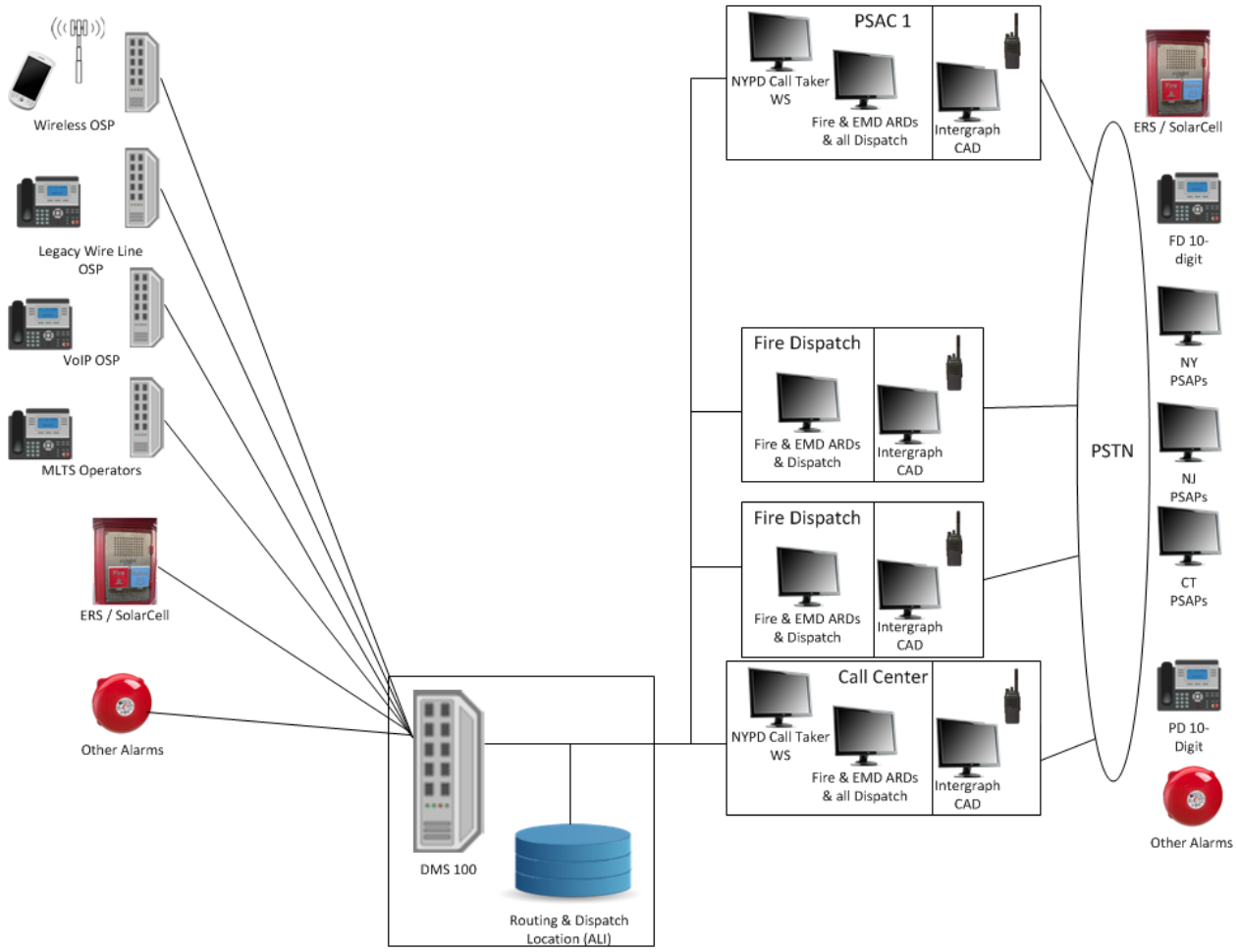
In addition to calls initiated by dialing 9-1-1, the current E9-1-1 system supports emergency calls initiated in other ways. For example, the FDNY publishes 10-digit numbers to report a fire. Another example is the Emergency Reporting System (ERS) which consists of call boxes located throughout the city that bypass the DMS 100s.

Currently, 9-1-1 call transfers to neighboring 9-1-1 jurisdictions is accomplished using 10-digit numbers.

The operational structure described above is currently hosted in 5 facilities within the City limits. One of those facilities is referred to as Public Safety Answering Center 1 (PSAC1). Figure 1 below shows the current configuration.

All NYPD call takers, NYPD dispatchers, Fire ARDs and dispatchers, EMT ARDs and dispatchers, and all supervisors have a call taking workstation that is to be replaced as part of this program. The call taking workstation functionality used at each position type varies.

Figure 1 – Current E9-1-1 Configuration



System Configuration when NG9-1-1 is Deployed

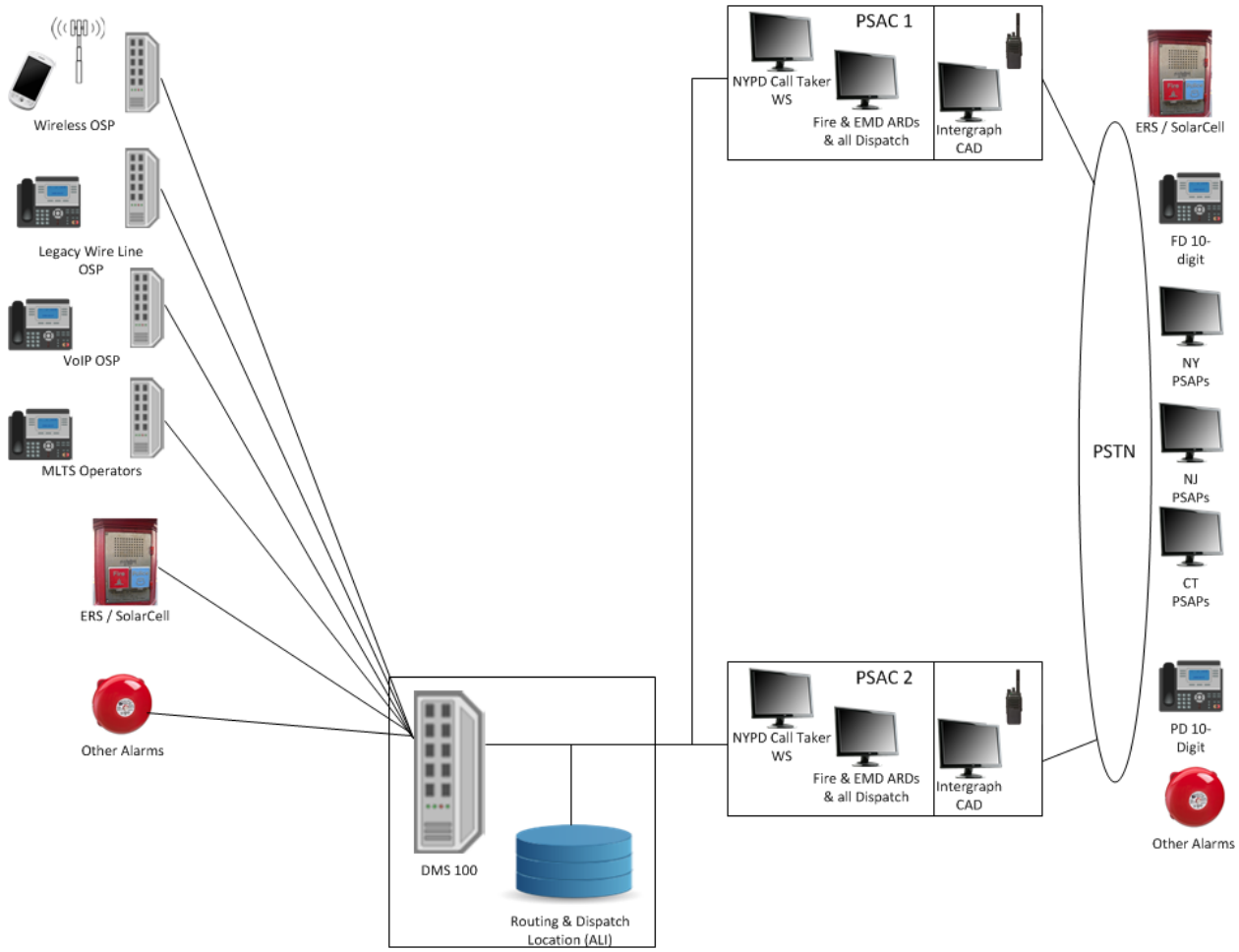
The primary change in operations scheduled to be completed prior to the migration to NG9-1-1 is the completion of a new, purpose-built facility that will host NYPD call handling and NYPD, Fire, and EMT dispatch. Once completed, this facility, known as PSAC 2, will allow the City to consolidate all call handling and dispatch operations into PSAC 1 and PSAC 2. The other 4 facilities will no longer be used for 9-1-1 call handling.

Two other changes are occurring that should be completed by the time NG9-1-1 is being implemented. First, the FDNY is implementing a new Computer Aided Dispatch System. And second, the interconnection between call handling facilities in the City and those in neighboring jurisdictions will move to inter-tandem connections instead of using 10 digit numbers to transfer calls.

Finally, DoITT will be handling all Tier 1 and Tier 2 support of the current call handling system. This includes on-site repair, a help desk, and system monitoring by an in-house Network Operations Center (NOC)

Figure 2 below shows the expected system configuration when NG9-1-1 begins deployment.

Figure 2 – E9-1-1 Configuration when NG9-1-1 begins deployment



Call Handling Positions to be Replaced

As outlined earlier, the current call handling system has workstations widely deployed at NYPD, Fire and EMD positions. At the time of the anticipated migration to NG9-1-1, the total number of call handling workstations to be replaced is approx. 840. Of these 579 are directly involved in process 9-1-1 calls, 155 are used for training, and the remainder are available to 7 other functions across NYPD, Fire, and EMD.

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Description of the Envisioned New York City NG9-1-1 System

The "straw man" architecture envisioned by the City follows the general model proposed in the NENA standards.

ESInet: The ESInet will connect the two Call Routing Facilities (CRFs) and the two Public Safety Answering Centers (PSACs). It will also provide points of presence at several locations around the City to provide interconnection with Originating Service Providers (OSPs). The ESInet will deliver the required 99.999% availability by providing multiple paths between all points of presence and by using redundant, resilient and diverse network facilities. SLAs for Jitter, Latency, packet Loss, system throughput, QoS, and other performance and quality aspects will be required.

Call Routing Facilities (CRFs): The City currently envisions two CRFs located in either the two PSACs, in Tier III data centers or in other facilities owned by the City. The CRFs will host all Core Services Functional Elements:

- Emergency Services Routing Proxies (ESRPs).
- Emergency Call Routing Function (ECRF).
- If some Originating Service Providers are limited to using a TDM connection to the systems, Legacy Network Gateways (LNGs) may also be located in the CRFs. Alternatively, Core Services vendors may recommend placing LNGs at call aggregation points.
- To interconnect with neighboring jurisdictions operating a legacy E9-1-1 system, a Legacy Selective Router Gateway may be required.
- It is also likely that the City will host a Location Information Server (LIS) if the OSPs have not implemented their own LIS consistent with the end state NG9-1-1 standard.
- The CRFs are also likely to host a VoIP call management system. This may be necessary to provide telephone service currently provided by the DMS 100s.
- If a hosted call handling systems is chosen, the CRF will host the call handling backend servers.
- The City favors a centralized logging and recording system per the NENA standard.

The NG9-1-1 Core Services will be resilient and deliver 99.999% availability and reliability by deploying functional elements in fault tolerant configurations by duplicating the configuration at each CRF. SLAs for Jitter, Latency, packet Loss and other performance and quality aspects will be also required.

PSACs: The two PSACs will host the Call Handling System Workstations and other equipment that supports the workstations.

Figure 4 below shows the high level architecture of the envisioned system. Figure 5 below shows a high level view of the Functional Elements planned for deployment In the CRFs.

Figure 3: NYC Target NG9-1-1 Configuration

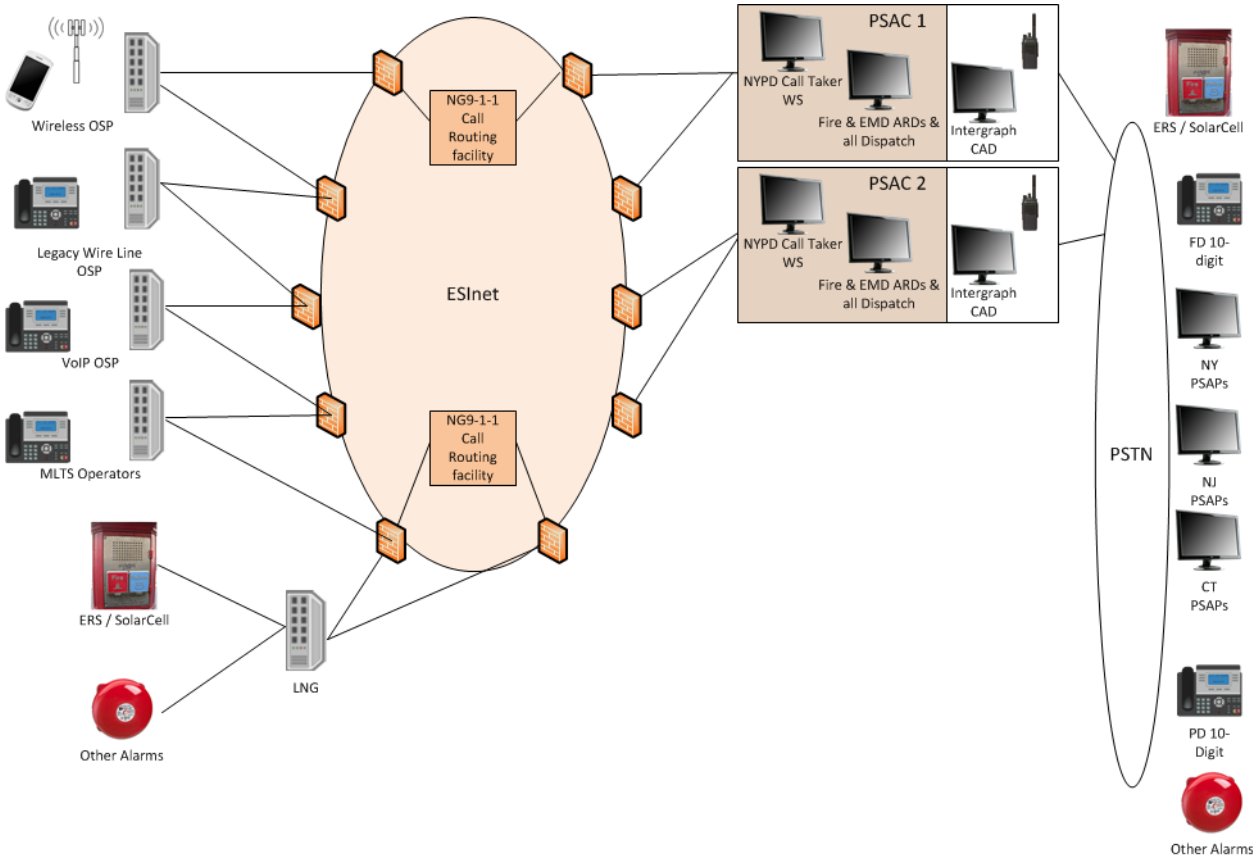

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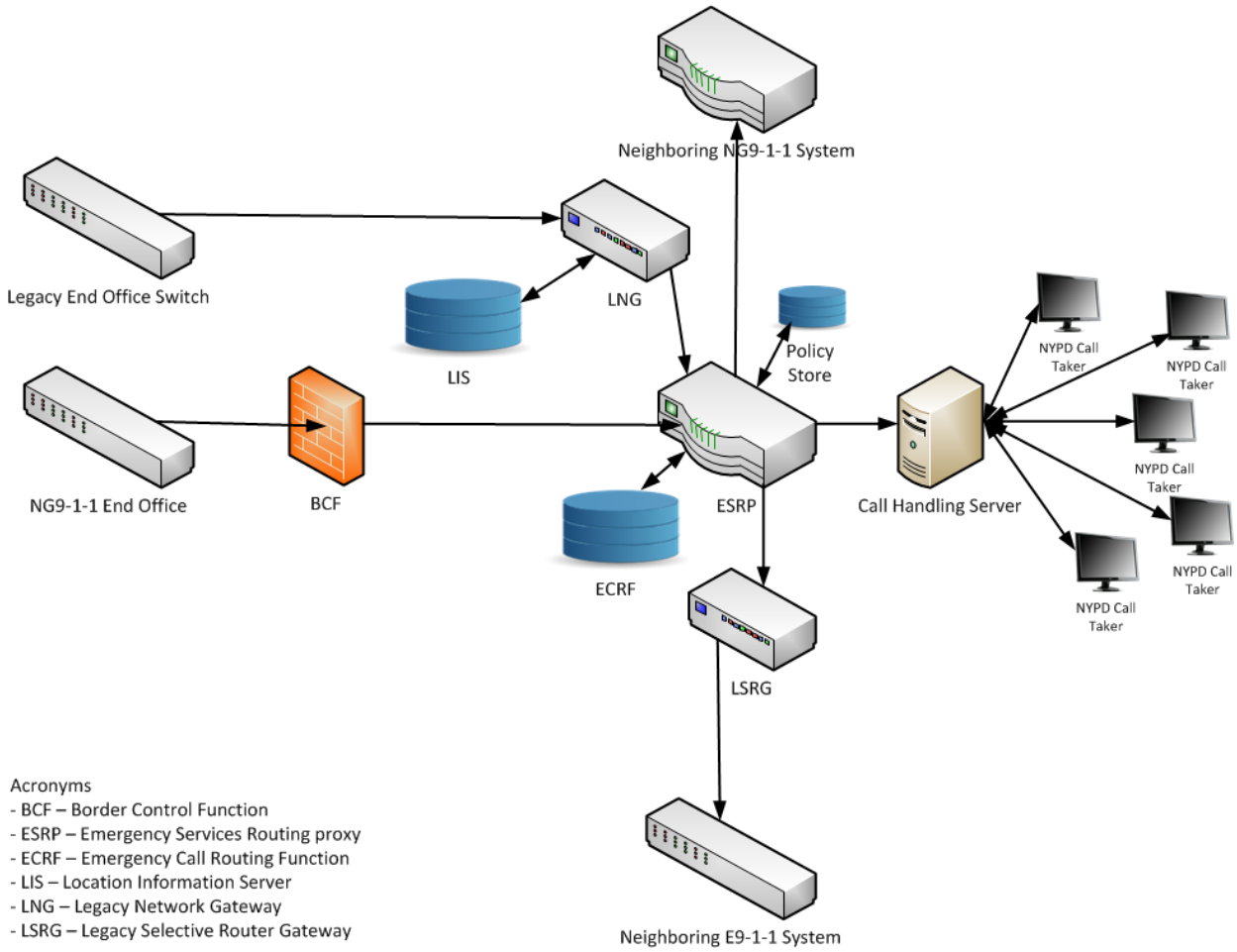
Figure 4: Detail of Call Routing Facility Configuration



Notes:

1. It is possible that a small number of Originating Service Providers will not be able to interconnect to the new NG9-1-1 system via SIP in time for the planned migration. If this is the case, the City may provide interconnection via a LNG.
2. It is likely that a shared LIS will be provided as a replacement of the current Automatic Location Information (ALI) Database.
3. System-wide logging and recording is not shown, but will also be implemented as part of this project.
4. The DMS 100s provide basic telephony services for all stations connected. When the DMS 100s are decommissioned, the new system will need to replace these telephony services. It is likely therefore that a VoIP Call Manager will be required.
5. The city expects to see each of the functional elements shown above to be deployed in a redundant configuration in each CRF and for the two CRFs to be connected to the ESInet in a redundant configuration.
6. Provisioning systems for Policy Routing Rules, the ECRF and the LIS are not shown but will be deployed in the CRFs.

Product and Service Procurement

As described previously, DoITT intends to play an active role in integrating the systems procured and managing and maintaining them after the NG9-1-1 system in in steady-state operations. The following points describe the City's current thoughts on matters related to the procurement process. Responders are invited to comment on these assumptions.

Procurement via Competitive Sealed Proposal / RFP: The city is considering issuing three RFPs, one for the ESInet, one for Core Services, and one for Call Handling. As contemplated, vendors would be invited to provide proposals in response to one, two, or all three of the RFPs. This City also contemplates accepting partial proposals to all three RFPs. This would allow the City to determine the level of systems integration it would undertake. Responders to this RFI are invited to comment on this approach.

The City has not established a specific payment model for this project. The City has evaluated a variety of models used in other projects, but invites Responders to suggest approaches for the City to consider.

Contract duration: The City will likely seek contract duration of a minimum of 10 years. Annual renewals after the initial term should be available to the City at predetermined prices for a minimum of two, five year extensions. The City would reserve the right to switch vendors for any of the three components at the end of the first term or at any time during the renewal period.

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Information Requested

All responders must provide the General Information requested, however, responders are only required to respond to sections (ESInet, NG9-1-1 Core Services, Call Handling Systems) for which they are proposing a solutions. Providers may propose solutions for one, two, or all three of the services.

General Information Requested From all Responders

Questions in this section must be answered by all responders:

1. What is the name of your company?
2. What is the address of your corporate headquarters?
3. If different from above, what is the address of the office that delivers NG9-1-1 products and services?
4. How long have you been in business?
5. How long have you been providing E9-1-1 systems?
6. How long have you been providing NG9-1-1 systems?
7. What is your company's annual revenue?
8. How many full time employees do you have dedicated to E9-1-1 and NG9-1-1?
9. Have you participated in NENA's Industry Collaboration Events? If so, which ones?
10. How many full time employees do you have working on NENA standards committees? Which ones?
11. How many full time employees do you have working on IETF committees? Which ones?
12. What vendors of NG9-1-1 products and services do you have formal marketing agreements with?
13. What vendors of NG9-1-1 products and services do you have formal technical agreements with?
14. Has your company ever been the defendant in a lawsuit brought by a government agency as a result of your participation in an E9-1-1, NG9-1-1 or other Public Safety project?
15. Please provide your thoughts on the "Procurement of Products and Services section above. Specifically
    a. What factors should the City consider if it issues three RFPs and accepts partial proposals on each?
    b. What payment options should the City consider for this project?
16. In your experience in other NG9-1-1 projects, how has public outreach been handled?
    a. What has your organization been asked to provide to support a public outreach campaign?
    b. Have you seen a particularly effective public outreach campaign?
17. In your experience in other NG9-1-1 projects, how has language translation services been handled?
18. In your experience in other NG9-1-1 projects, how has the needs for peoples with disabilities been handled?

Information Requested From Providers of ESInets

For the purposes of this RFI and consistent with NENA definitions, the ESInet consists of the underlying IP network that transports 9-1-1 calls. In this RFI, the ESInet also includes the data centers required to host the NG9-1-1 Core Services Functional Elements and the Points of Presence where Originating service providers can interconnect with the new NG9-1-1 System.

1. Please provide an overview of your ESInet offering.
2. How long have you been providing ESInet services (network and/or data centers) to customers?
3. In the past 24 months, have you been selected as the result of a competitive RFP process to deploy an ESInet or have your data centers been used? If so, how many projects? If possible, please list the jurisdictions that purchased your ESInet and/or data center services?
4. Do you have any ESInets fully deployed and in steady-state operations?
5. What SLAs have you contractually committed to with your customers?
6. What does your network footprint look like in New York City?
7. Where are your closest points of presence to our two PSACs?
8. Please list all Tier III data centers in the city where you have facilities.
9. From the time a contract is signed, roughly how long would it take to fully deploy an ESInet to the nearest half year?
10. Please describe the maintenance, repair and network upgrade model you would propose to meet the uptime requirements of a NG9-1-1 System.
11. Please describe how you will configure your solution to deliver 99.999% availability, as well as its reliability, resiliency, and redundancy.
12. IT Security is critical to the system implemented. All vendors should familiarize themselves with the citywide security policies that can be found at the City's website. While IT security will be designed at a system level, please answer the following questions:
    a. What recommendations would you make regarding the interconnections with the OSPs to provide maximum security?
    b. How would you secure the connections at the points of presence, the data centers hosting the NG9-1-1 Core Services, and the PSACs?
    c. What intrusion detection capabilities can you offer?

As mentioned in the program scope section, the City requires a NG9-1-1 system that supports advanced capabilities. The following questions are related to your support of enhanced features:

1. Text to 9-1-1. What guidance would you give the city in terms of capacity planning to support text to 9-1-1?
2. Photos and full motion video. What guidance would you give the City in terms of capacity planning to support transport of photos and full motion video?

As discussed previously, DoITT has developed the capability to actively participate in the planning, design, integration, management, and maintenance of the current E9-1-1 system and would like to be actively involved in the same way with the NG9-1-1 system, including the ESInet. To that end:

1. What management and maintenance services would you invite the City to take on in this program and still commit to performance SLAs?
2. Where and how are interfaces provided to monitor the system?
    a. Are interfaces directly to the ESInet offered?
    b. Is there an interface available to a dashboard that makes system performance available? Is this interface real-time?
3. What systems integration services would you find of value for the City to perform?
4. What network design role would you invite the City to play?

The City of New York has access to a significant amount of dark fiber available to use in this project.

1. Would you be willing to use existing dark fiber in an ESInet you provide to the City?
2. What impact, if any, would the use of this dark fiber have on the SLAs you would agree to?
3. Would you expect the cost saving to the City to be significant enough to warrant using the available dark fiber in the New York City ESInet?

The City would appreciate understanding the key variables that will impact the cost to the city. The following questions are not specific to New York City. Responders with previous experience deploying an ESInet for NG9-1-1 can draw upon that experience in answering these questions

- How do you structure your pricing for an ESInet?
- What are the key variables that drive the pricing of ESInets?
- What elements in the ESInet build out are nonrecurring costs?
- What aspects of the provisioning of ESInet services are recurring costs?
- Does your pricing change during the course of a contract based on increased call volume, transporting of calls with new media types or changes in the number of calls with additional non-voice media? Are there any other events that trigger changes in pricing during the contract?
- What costs will the city be responsible for that a contract with your company will not cover?
- Please provide thoughts on the Product and Services Procurement section above.

Based on the information provided in this RFI:

- Do you believe that your company can supply an NG9-1-1 ESInet that can meet the needs of New York City?
- If so, are you likely to respond to an RFP for an NG9-1-1 ESInet for the City of New York?
- Meeting the call volume requirements is perhaps the biggest challenge in this project. Will you be capable of demonstrating that the products and services you propose can handle the expected call volume?
- What information would you find useful in an RFP to develop a response that is priced accurately?
- What information would you find useful in an RFP for you to prepare a deployment schedule that has a high degree of certainty?

- What other suggestions do you have regarding the format and information provided in an RFP for an ESInet if the City decides to develop one?

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Information Requested From Providers of NG9-1-1 Core Services

Questions in this section should only be answered by companies that offer their own products and services in this category.

For purposes of this section, consistent with NENA definitions, NG9-1-1 Core Services includes the following functional elements: (i) Emergency Services Routing Proxy (ESRP), (ii) Emergency Call Routing Function (ECRF), (iii) Border Control Function (BCF), and Location Information Server (LIS). NG9-1-1 Core Services also includes the following transitional elements: (i) legacy Network Gateway (LNG), and (ii) Legacy Selective Router Gateway (LSRG).

1. Please provide an overview of your NG9-1-1 Core services offering.
2. Which NG9-1-1 Core Services Functional Elements does your company provide using its own products?
3. How long have you been providing these NG9-1-1 Core Services to customers?
4. In the past 24 months, have you been selected as the result of a competitive RFP process to deploy NG9-1-1 Core Services?
5. If so, how many projects? If possible, would you list the jurisdictions that purchased your NG9-1-1 Core Services?
6. Do you have any systems fully deployed and in steady-state operations?
7. If you have successfully migrated a customer from an E9-1-1 system to a NG9-1-1 system, please:
    a. provide an overview of the migration process you used;
    b. provide other migration options you would propose;
    c. offer your thoughts on the migration path that carries the least risk;
    d. offer your thoughts on migration options if a tertiary site is not available.
8. What SLAs have you contractually committed to with your customers?
9. Which vendors of NG9-1-1 Call Handling equipment have you tested with? Which vendors of NG9-1-1 Call Handling equipment have you deployed NG9-1-1 systems with?
10. If you don't have your own logging and recording system, which vendors of logging and recording systems have you tested with? Which vendors of NG9-1-1 logging and recording systems have you deployed with?
11. If you have your own logging and recording system, please answer these questions:
    a. All emergency messages sent to the PSAC would need to be documented in ICAD in order to accurately reproduce a specific incident in response to a judicial subpoena. Will all text messages, pictures etc. be attached to an ICAD event?
    b. How will each text message etc. be handled? A 2 alarm fire which would normally net an average of 10 9-1-1 calls and probably have an average of 20 text messages and pictures along with the 10 calls.
    c. How will all the different types of media be stored and archived for future judicial reproduction?
12. From the time a contract is signed, roughly how long will it take to fully deploy NG9-1-1 Core Services to the nearest half year?

13. How long would you estimate it to take to migrate all OSPs to the new NG9-1-1 system?
14. Please describe the maintenance, repair and upgrade model you would propose to meet the uptime requirements of a NG9-1-1 System. Please describe the use of on-site and centrally stored spares, and onsite and centrally dispatched technicians.
15. Please describe how you will configure your solution to deliver 99.999% availability as well as its reliability, resiliency, and redundancy.
16. IT Security is critical to the system implemented. All vendors should familiarize themselves with the citywide security policies that can be found at the City's website. While IT security will be designed at a system level, please answer the following questions:
    a. What recommendations would you make regarding the interconnections between NG9-1-1 Core Services functional elements and the ESInet?
    b. What recommendations would you make regarding the interconnections between NG9-1-1 Core Services functional elements and the PSACs?
    c. What intrusion detection capabilities can you offer?

As mentioned previously in the program scope section, the City is making a concerted effort to get the OSPs operating in the city to interconnect with the NG9-1-1 system using a full NG9-1-1 interface. Some OSPs might not be capable of using a full NG9-1-1 interface but may be able to interconnect via SIP. The City is hopeful that all OSPs will be interconnecting via SIP or an NG9-1-1 interface, but it is possible that a few might need to use a TDM interconnection thus requiring a Legacy Network gateway (LNG).

1. Is your NG9-1-1 system, especially the BCF and ESRP, capable of accepting a full NG9-1-1 interface from OSPs? For Voice, text, and other media?
2. Is your LNG capable of "building" a full NG9-1-1 session using a SIP interface and an interaction with a Location Information Server (LIS)?
3. Is your LNG capable of "building" a full NG9-1-1 session from an incoming TDM link?
4. For each of the above, please describe the requirements for a LIS?
5. Other than those listed above, what other options can you offer for delivering the initial location of a caller and subsequent location updates?

As mentioned in the program scope section, the City requires a NG9-1-1 system that supports advanced capabilities. The following questions relate to your support of enhanced features:

1. Text to 9-1-1. What guidance would you give the city in terms of how and where to integrate text messages into the NG9-1-1 architecture? You can assume that the City will have implemented an interim text to 9-1-1 solution accessing a TCC using a web browser. What options will the city have if the wireless OSPs interconnect with the NG9-1-1 system with a full NG9-1-1 interface that supports text messaging?
2. Photos and full motion video. What guidance would you give the City in terms of capacity planning and other impacts on Core Services to support transport of photos and full motion video?

As discussed earlier, the location of the two CRFs has not yet been determined. There are three options being considered: (i) colocation at the PSACs, (ii) at facilities owned by New York City, and (iii) at Tier IV data centers in the City.

1. Please provide your thoughts as to the impact on maintenance and repair of the functional elements you provide at the CRFs for each of these options.
2. Please provide your thoughts on overall system availability for each of these options.
3. Please provide your thoughts on differences in cost for each of these three options.
4. Are there other options the City should consider?

As discussed previously, DoITT has the capability to actively participate in the planning, design, integration, management and maintenance of the current E9-1-1 system and would like to be actively involved in the same way with the NG9-1-1 system, including the NG9-1-1 Core Services. To that end:

1. What management and maintenance services would you invite the City to take on in this program and still commit to performance SLAs?
2. Where and how are interfaces provided to monitor the system?
    a. Are interfaces directly to the ESInet offered?
    b. Is there an interface available to a dashboard that makes system performance available? Is this interface real-time?
3. What systems integration services would you find of value for the City to perform?

As discussed previously, all OSPs operating in any of the 5 boroughs of New York will interconnect to the new system in the CRFs. All calls will then be delivered to either PSAC1 or PSAC2. The load between the two facilities will be balanced. For this reason, the role of call routing (ESRP and ECRF) is far less than in a deployment with many PSAPs. Given this:

1. Would you recommend the deployment of an ESRP and ECRF? Why or why not?
2. Should the City consider an alternative to an ESRP and ECRF that is still consistent with the NENA NG9-1-1 standards that would better meet the City's needs? If so, please provide details.

In a typical year, the City takes over 10 million 9-1-1 calls. The peak load the NYPD would like to anticipate is 6,300 calls per hour assuming that the average call duration with the call taker is 20 seconds. Given this:

1. What configuration of ESRP and ECRF would be required to handle this call volume?
2. Please describe how you would propose to perform call volume testing of the solutions prior to cutover to 911 Operations.

The City would appreciate understanding the key variables that will impact the cost to the city. The following questions are not specific to New York City. Responders with previous experience deploying NG9-1-1 Core Services can draw upon that experience in answering these questions

- How do you structure your pricing for the NG9-1-1 Core Services you offer?

- What are the key variables that drive the pricing of the NG9-1-1 Core Services Functional Elements you offer? What are the differences in cost between an OSP that interconnects via SIP vs requiring an LNG?
- Which elements of the NG9-1-1 Core Services Functional Elements you are proposing are nonrecurring costs?
- Which elements of the NG9-1-1 Core Services Functional Elements you are proposing are recurring costs?
- Does your pricing change during the course of a contract based on increased call volume, routing of calls with new media types or changes in the number of calls with additional non-voice media? Are there any other events that trigger changes in pricing during the contract?
- What costs will the city be responsible for that a contract with your company will not cover?
- Please provide thoughts on the Product and Services Procurement section above.

Based on the information provided in this RFI:

- Do you believe that your company can supply NG9-1-1 Core Services that can meet the needs of New York City?
- If so, are you likely to respond to an RFP for NG9-1-1 Core Services for the City of New York?
- Meeting the call volume requirements is perhaps the biggest challenge in this project. Will you be capable of demonstrating that the products and services you propose can handle the expected call volume?
- What information would you find useful in an RFP to develop a response that is priced accurately?
- What information would you find useful in an RFP for you to prepare a deployment schedule that has a high degree of certainty?
- What other suggestions do you have regarding the format and information provided in an RFP for NG9-1-1 Core Services if the City decides to develop one?

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Information Requested From Providers of Call Handling Systems

For purposes of this section, the Call Handling System accepts calls from the NG9-1-1 Core Services ESRP and manages the call from that point forward.

1. Please provide an overview of your NG9-1-1 Call Handling System.
2. How long have you been providing NG9-1-1 Call Handling Systems?
3. In the past 24 months, have you been selected as the result of an RFP process to deploy a NG9-1-1 Call Handling System?
4. If so, how many projects? If possible, would you list the jurisdictions that purchased your NG9-1-1 Call Handling System?
5. Do you have any Call Handling Systems fully deployed and in steady-state operations?
6. If you have successfully migrated a customer from an E9-1-1 system to a NG9-1-1 system, please
    a. provide an overview of the migration process you used;
    b. provide other migration options you would propose;
    c. offer your thoughts on the migration path that carries the least risk;
    d. offer your thoughts on migration options if a tertiary site is not available.
7. What SLAs have you contractually committed to with your customers?
8. From the time a contract is signed, roughly how long would it take to fully deploy a NG9-1-1 Call Handling System to the nearest half year?
9. Please describe the maintenance, repair, and update model you would propose to meet the uptime requirements of a NG9-1-1 Call Handling System. Please describe the use of on-site and centrally stored spares, and onsite and centrally dispatched technicians.
10. Please describe how you will configure your solution to deliver 99.999% availability as well as its reliability, resiliency, and redundancy
11. IT Security is critical to the system implemented. All vendors should familiarize themselves with the citywide security policies that can be found at the City's website. While IT security will be designed at a system level, please answer the following questions:
    a. What recommendations would you make regarding the interconnections between NG9-1-1 Call Handling System and the NG9-1-1 Core Services?
    b. What recommendations would you make regarding the interconnections between NG9-1-1 Call Handling System and the ESInet?
    c. What intrusion detection capabilities can you offer?
12. Training all users on a new call handling system will be a significant undertaking. While the population of staff requiring training is geographically concentrated, the number of people requiring training is very large. Compounding the challenge is the number of user groups with different use cases. As explained previously, NYPD Call Takers, Fire ARDs, EMD ARDs, NYPD, and dispatchers all will use the call handling system as will supervisors for each group. Please provide your thoughts on the following aspects of your training strategy:
    a. In your experience, how much training is required for call takers on your system?
    b. Describe your training curriculum. What aspects of training are done in a classroom setting? Do you offer online courses? What other training methodologies to you employ?

c. For classroom training, what is the optimal size of a class?
d. What is your recommended strategy for dealing with refresher courses?
e. What training strategy do you employ when you release new versions of your system?
f. When advanced NG9-1-1 functionality (test to 9-1-1, photos, video, telematics data, etc) is implemented in the City, what is your recommended training strategy?

The call handling workstations that must be replaced are used by all Call Takers, ARDs and Dispatchers and supervisors of all three. The functionality required by Dispatchers is fairly limited and focuses on telephony integration. To that end:

1. Does your company offer a reduced functionality workstation that can be used to deliver the functionality generally described? If so, please describe it.
2. Is your company aware of other products on the market that can integrate with your call taking system that could deliver the functionally generally described?

As mentioned in the program scope section, the City requires a NG9-1-1 system that supports advanced capabilities. The following questions related to your support of enhanced features:

1. Text to 9-1-1. What guidance would you give the city in terms of how your call handling systems supports text to 9-1-1?
2. Photos and full motion video. What guidance would you give the City in terms of capacity planning and other impacts on the call handling system to support transport of photos and full motion video?

As discussed previously, DoITT has the capability to actively participate in the planning, design, integration, management and maintenance of the current E9-1-1 system and would like to be actively involved in the same way with the NG9-1-1 system including the NG9-1-1 Call handling. To that end:

1. What management and maintenance services would you allow the City to take on in this program and still commit to performance SLAs?
2. Where and how are interfaces provided to monitor the system?
   a. Are interfaces directly to the ESInet offered?
   b. Is there an interface available to a dashboard that makes system performance available? Is this interface real-time?
3. What systems integration services would you find of value for the City to perform?

In a typical year, the City takes over 10 million 9-1-1 calls. The peak load the NYPD would like to anticipate is 6,300 calls per hour. Given this:

1. What Call Handling System configuration would be required to handle this call volume? A single system? Multiple Systems?
2. Please describe how you would propose to perform call volume testing of the solutions prior to cutover to 911 Operations.

The City would appreciate understanding the key variables that will impact the cost to the city. The following questions are not specific to New York City. Responders with previous experience deploying NG9-1-1 Call Handling can draw upon that experience in answering these questions

- How do you structure your pricing for the NG9-1-1 Call Handling systems you offer?
- What are the key variables that drive the pricing of the NG9-1-1 Call Handling System?
- What elements of the NG9-1-1 Call Handling System are nonrecurring costs?
- What elements of the NG9-1-1 Call Handling System are recurring costs?
- Does your pricing change during the course of a contract based on increased call volume, handling of calls with new media types or changes in the number of calls with additional non-voice media? Are there any other events that trigger changes in pricing during the contract?
- What costs will the city be responsible for that a contract with your company will not cover?
- Please provide thoughts on the Product and Services Procurement section above.

Based on the information provided in this RFI:

- Do you believe that your company can supply a NG9-1-1 Call Handling System that can meet the needs of New York City?
- If so, are you likely to respond to an RFP for a NG9-1-1 Call Handling System for the City of New York?
- Meeting the call volume requirements is perhaps the biggest challenge in this project. Will you be capable of demonstrating that the products and services you propose can handle the expected call volume?
- What information would you find useful in an RFP to develop a response that is priced accurately?
- What information would you find useful in an RFP for you to prepare a deployment schedule that has a high degree of certainty?
- What other suggestions do you have regarding the format and information provided in an RFP for a NG9-1-1 Call Handling System if the City decides to develop one?

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Appendix A – Glossary of NYC-Specific Terms and Acronyms

The acronyms and definitions listed below are unique to New York City or are included to ensure clarity in the RFI. In all other cases, this RFI uses terms defined in the NENA Master Glossary, which can be found at http://www.nena.org/?page=Glossary .

Acronym/Term	Definition
9-1-1 Authority	For purposes of this program, the Department of Information Technology and Telecommunications is effectively playing the role typically played by a 9-1-1 Authority. References to the 9-1-1 Authority typically mean DoITT
EMD Alarm Receipt Dispatchers (ARDs)	In the City, 9-1-1 calls are answered by Police call takers. If the caller is reporting a medical emergency, the call is transferred immediately to an EMD Alarm Receipt Dispatcher. This position gathers all of the information called for in the protocol. Once the intake is complete, the call is sent to a EMD dispatcher
ESInet	Emergency Services IP Network. The City's use of this term is consistent with the definition in the master glossary. It is included her to be clear that the ESInet is limited to the underlying IP network. The term ESInet does not include the NG9-1-1 Core Services.
FDNY ARDs	FDNY Alarm Receipt Dispatchers. In the City, calls are initially answered by Police Call Takers. If the emergency is either Fire or Medical, the call is transferred to a Fire ARD or EMD ARD. The Term FDNY ARD take refers to both the Fire ARDs and the EMD ARDs
ARDs	Fire Alarm Receipt Dispatchers. In the City, 9-1-1 calls are initially answered by Police call takers. If the caller is reporting a fire, the call is transferred immediately to a Fire ARD. This position gathers all of the information called for in the protocol. Once the intake is complete, the call is sent to a Fire department dispatcher
FDNY	New York City Fire Department
CRF	New York City Call Routing Facility. This refers to the two facilities that will host the NG9-1-1 Core Services.
NYPD	New York City Police Department
PSAC	Public Safety Answering Center
SR	Selective Router. The City uses a mated pair of DMS 100s to aggregate and distribute 9-1-1 calls. However, the DMS 100s do not include the Selective Router Feature set. Instead, the switches act as a large Centrex switch that performs all call routing to individual call taker workstations. CAMA trunks are not used between the DMS 100s and the workstations. References to the Selective Routers typically mean the DMS 100s.

Appendix B – Required Response Outline

Cover letter (required from all respondents).

- The name of the company responding to the RFI.
- The name and contact information for the single point of contact for all communications.
- A statement that all products and services the responder would provide for the system described in the RFI adhere to NENA Standard 08-003 and all other relevant NENA standards as well as those from IETF.
- A statement that the responder understands the performance and availability required in a NG9-1-1 system in general and the specific expectations included in the RFI.

Responses to the questions in the General Section (required from all respondents).

- In the response, please copy the question and then provide your response.
- Responses should be clear and succinct. Complete, specific, detailed responses are appreciated.

Responses to questions in the ESInet Section In the response please copy the question and then provide your response.

- Responses should be clear and succinct. Complete, specific, detailed responses are appreciated.
- Diagrams are welcomed and encouraged.

Responses to questions in the NG9-1-1 Core Services Section.

- In the response, please copy the question and then provide your response.
- Responses should be clear and succinct. Complete, specific, detailed responses are appreciated.
- Diagrams are welcomed and encouraged.

Responses to questions in the NG9-1-1 Call Handling Section.

- In the response, please copy the question and then provide your response.
- Responses should be clear and succinct. Complete, specific, detailed responses are appreciated.
- Diagrams are welcomed and encouraged.

Additional information not requested in the previous sections (optional for all respondents).

- Additional company and product information.
- Additional thoughts on meeting the requirements of NYC that weren't easily presented because of the way questions were asked.