2019 Annual Report on Implementation of Next Generation 9-1-1 in NYC

Pursuant to Local Law 78 of 2016

City of New York
Department of Information Technology & Telecommunications
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NYC Next Generation 9-1-1

2019 Annual Report

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1.0 Introduction

New York City's 9-1-1 system is the largest and most complex emergency communications system in the country, receiving approximately 9 million calls each year. To enhance the public's access to this critical 9-1-1 service, in 2014 the Administration began developing a long-term strategy to implement a Next Generation 9-1-1 (NG9-1-1) system, which would allow for the seamless transfer of digital information from the public to NYC's 9-1-1 system. Administration and Agency executives recognized that widespread adoption of rapidly advancing technologies like text, video, Voice over Internet Protocol (VoIP), and the saturation of high-speed broadband access have changed expectations for how people communicate, not only with each other but with their government, including 9-1-1 services.

Improvements to the core infrastructure of the City's 9-1-1 system are needed to support these new demands. To this end, the Department of Information Technology & Telecommunications (DoITT) is collaborating with the Fire Department of the City of New York (FDNY) and the New York City Police Department (NYPD) to plan for the migration to a NG9-1-1 system, technically ensuring NYC's continuing provision of a world class 9-1-1 call taking operation for decades to come while continuing to provide essential, uninterrupted emergency response services.

1.1 Background on Next Generation 9-1-1

Telecommunications carriers have been building out an entirely new digital infrastructure, separate from their copper-based legacy networks, to transition from older, analog telephone landline-based systems to current cellular phone technology-based systems. Similarly, 9-1-1 systems across the country have had to transition to an all-digital network infrastructure.

NG9-1-1 systems, built on this new infrastructure, can accept multimedia data (e.g., text, photographs, video, etc.), have improved interoperability between all public safety agencies that share a 9-1-1 system, have improved call routing between neighboring jurisdictions, and have greater accuracy when identifying a caller's location.

The federal government and the State of New York recognize the importance of NG9-1-1. Congress, the Federal Communications Commission (FCC), the United States Department of Transportation (US DOT), and the New York State Department of Homeland Security and Emergency Services (DHSES) have all initiated efforts to advance NG9-1-1 at national and state levels. NYC continues to support, monitor and participate in this dialogue, as appropriate.

1.2 Business Need and Technical Benefits

The current 9-1-1 system is based on analog technologies designed to support calls received from landline phones, wireless cellphones and VoIP phones. To support calls from wireless phones, and more recently calls from Voice over Internet Protocol (VoIP) phones, accommodations were made

to the current 9-1-1 system. However, the National Emergency Number Association (NENA), which acts as the 9-1-1 standards body for North America, has developed standards for NG9-1-1, which NYC is using as a basis for the development of the NG9-1-1 system.

The primary technical benefits of NG9-1-1 include the following:

1. Enhanced support for all communications devices currently capable and/or required to provide 9-1-1 service (i.e., faster call setup time, quicker delivery to call taker);

2. Support for future communications devices and services that may provide 9-1-1 service (i.e., Text to 9-1-1, transmission of incident data, photos, and video);

3. Improved system quality, accuracy, and efficiency (i.e., passing information gathered during the initial interaction with other public safety personnel when 9-1-1 calls are transferred);

4. Increased cost-effectiveness of the system through the use of commercially available, off-the-shelf products. (i.e., computer servers and network elements such as firewalls and routers); and,

5. Enhanced system supportability and maintainability through the elimination of outdated products and technologies.

Of these technical benefits, while enhanced supportability and maintainability are required to meet basic lifecycle management upgrades, the critical driver to the program is enhancing police, fire and medical response to the public. By moving to a NG9-1-1 system, NYC will position itself to be able to incrementally offer these benefits, resulting in more effective and efficient responses to 9-1-1 calls for years to come.

2.0 NYC's Implementation Plan for Next Generation 9-1-1

New York City is planning an infrastructure upgrade of its 9-1-1 telecommunications network and the various subsystems that accept, route, and answer 9-1-1 calls so that it can reliably support any IP addressable device or service accessing 9-1-1, quickly and seamlessly connecting callers to police, fire or emergency medical personnel. NYC's NG9-1-1 solution will allow the City's public safety agencies to continue to provide high quality and responsive emergency services that those calling 9-1-1 depend upon.

2.1 Program Objectives

NYC's plan for NG9-1-1 is based on the following program objectives, listed in priority order:

1. Avoid any disruption to answering and processing of 9-1-1 calls;

2. Replace the systems that are at end of life prior to cessation of support;

3. Limit disruptions to the public safety agency operations of NYC's PSACs;

4. Provide a platform that allows PSAC call taking operations to evolve their methods and procedures at a pace chosen by the NYPD and FDNY;

5. Provide training for the NYPD, FDNY, and DoITT staff who will be interfacing with the new systems;

6. Plan and execute a public awareness campaign, highlighting the benefits of the new system and new features that will enhance New Yorkers' experience with 9-1-1 services; and

7. Provide a flexible platform that allows ancillary systems and stakeholder groups to evolve at their own pace.

2.2 High-Level Scope

1. Replace the end of life components of the current 9-1-1 system
   a. Replace the functionality of the current 9-1-1 call routing systems with NG9-1-1 call routing functionality.
   b. Replace the current call handling systems at PSAC1 and PSAC2. These systems will be replaced with systems that not only answer and process voice calls but handle native NG9-1-1 functionality (i.e., text, photo, video).
   c. Replace the current network facilities that connect the Originating Service Providers (OSPs, a.k.a. "telcos," "carriers," and "telecom service providers") to the call routing systems and to the PSACs.

2. Interface to Computer Aided Dispatch and/or other public safety ancillary systems
   a. Implement enhanced logging and recording technologies supporting quality controls and agency subpoena systems.

3. Interconnect with 9-1-1 systems in neighboring jurisdictions

a. Work in parallel with New York State Department of Homeland Security and Emergency Services (DHSES) for interconnections with neighboring jurisdictions within New York State and with jurisdictions in neighboring states.

4. Provide interfaces to public safety agency ancillary systems
   a. Provide an interface to the NG9-1-1 system with functionality materially the same or better than as is in place today.

5. Provide for the implementation of native NG9-1-1 capabilities, including:
   a. Text to 9-1-1.
   b. Data, photos and video.
   c. Internet of Things - Allow for the future support of new communications devices, particularly those that address the needs of people with disabilities.
   d. Provide training to all City staff who will be using and/or supporting the new systems.

6. Provide a platform that supports operational efficiencies
   a. Provide a platform that supports operational changes identified by the NYPD and FDNY during the initiation and planning phases.
   b. Provide a flexible platform that allows for future changes to accommodate police, fire or emergency medical operations.

7. Cybersecurity Requirements for Vendors & Contractors
   a. The Next Generation Systems of Systems will be designed and implemented in a manner that protects NYC infrastructure and critical systems from malicious attacks through the use of the latest technologies, public-private partnerships, and regular training and exercises for City employees. In implementing the NG9-1-1 system, City Agencies, their employees, contractors and vendors will follow the latest established editions of the Citywide Information Security Policies and Standards.

2.3 Process and Methodology

This program will be delivered by procuring products and services from vendors who specialize in NG9-1-1 networks and systems in accordance with best practices and national standards established for NG9-1-1 through the City's established procurement processes. The program will follow the business processes and management plans established under DoITT's Public Safety IT Program Management Office. DoITT will work collaboratively with the FDNY and the NYPD. FDNY and NYPD are the identified 9-1-1 Operational Subject Matter Experts and will provide functional Approval and Final System Acceptance along with DoITT.

Expected phases and the associated deliverables for each are as follows:

1. The Initiation Phase will:
   a. Assess high-level requirements for a new system and create a straw-man target architecture, schedule, and implementation plan.
   b. Issue a Request for Information (RFI) to solicit vendor feedback on the straw-man plan and to further inform the City's Request for Proposals (RFP) process.

2. The Planning Phase will:
   a. Develop RFPs to facilitate the procurement of the required products and services.
   b. Release the RFPs and facilitate a process that results in responses from qualified vendors for all products and services required.
   c. Select qualified vendors and negotiate contracts.

3. The Implementation Phase will:
   a. Validate vendor proposed design
   b. Install and test all individual NG9-1-1 system components.
   c. Integrate and test all subsystems.
   d. Validate end-to-end functionality.
   e. Test system reliability, availability, resiliency, and capacity.
   f. Train all End Users on Use of the system.

4. Steady-state Operations will:
   a. Place the NG9-1-1 system into production.
   b. Conduct a lessons-learned process, culminating in the release of a final program report.

3.0 Update on NG9-1-1 Program Delivery

Progress since 2018 NG9-1-1 Annual Report. The NG9-1-1 Program is now at the end of the Planning Phase (see section 2.3).

1. *ESInet and Core Services RFP*. In 2019, the NG9-1-1 Program team completed its financial evaluations of vendor submissions in response to the City's ESInet and Core Services RFP (including Logging and Recording and Geographic Information System). The team is now negotiating all contract-related documents with vendors to finalize vendor selection and complete the procurement process. The goal is to complete the process in early 2020 as

previously committed, however, there is a possibility that the procurement will not be final until mid-2020.[1]

Milestones in 2019 include:

- Spring 2019: final financial evaluation of vendor submissions
- Summer 2019: contract negotiation team formed with representatives from DoITT, FDNY, NYPD, NYC Cyber Command
- Summer 2019 – Fall 2019: ongoing negotiations with vendors commenced on submissions
- Fall – Winter 2019: developing all contractual attachments as well as legal terms and conditions

2. *Call Handling System*. The City has decided to perform an upgrade to its current call handling system. The system upgrade will be compatible with all subsystems in the ESInet and Core Services RFP and capable of migration to NG9-1-1 Call Handling, in keeping with the aforementioned NG9-1-1 timetable.

3. *Independent Validation and Verification services*. In 2019, in consultation with the FDNY and NYPD, DoITT began the procurement process for Independent Validation and Verification (IV&V) services for the NG9-1-1 Program. The IV&V vendor will perform quality assurance on the program and ensure that best practices are followed through the NG9-1-1 Program's lifecycle.

Milestones in 2019 include:

- Fall 2019: Release of IV&V Request for Solicitation

Past Milestones.

1. Initiation Phase (2016):
   a. The NG9-1-1 Program team developed high-level requirements for a new system and created a target state architecture, schedule, and implementation plan.

   b. A Request for Information (RFI) was publicly released in January 2016 to gain insight into NG9-1-1 technologies and to solicit vendor feedback to further inform the City's Request for Proposals (RFP) process. Eighteen (18) highly qualified vendors responded to the RFI, further informing the City's plans for a NG9-1-1 system with information

[1] Procurement timelines are subject to change due to final negotiations and oversight review.

from experts across the industry on the benefits, challenges, risks, and issues associated with migrating to NG9-1-1 platform.

2. Planning Phase (2017-2018):
   a. The NG9-1-1 team developed RFPs and other related solicitations to begin the procurement process for the primary subsystems that compose the larger NG9-1-1 system: (1) the Emergency Services IP Network (ESInet), (2) Core Services (i.e. the Call Routing Services) and (3) Call Handling (i.e., the Call Answering System).

   b. The ESInet and Core Services RFP was completed and competitively bid.
      - June 13, 2017: Release of RFP
      - June 26, 2017: Mandatory pre-proposal conference
      - July 7, 2017: Deadline for submission of questions from proposers
      - July 28, 2017: Publication of RFP Q&A addendum
      - September 21, 2017: A sufficient number of responsive proposals received
      - 2018: Technical evaluations of RFPs completed; financial evaluations began, which will lead to contract negotiations

   c. DoITT, in collaboration with Mayor's Office for People with Disabilities, defined a role for a Deaf and Hard of Hearing subject-matter expert to work with DoITT and to implement enhanced capabilities offered by NG9-1-1.

3.1 Next Steps

The NG9-1-1 Program team expects that the completion of the procurement process in 2020 will enable DoITT to target calendar year 2024 for full delivery of the NG9-1-1 system.

4.0 Interim Text to 9-1-1 Solution

Until the NG9-1-1 Program is complete, DoITT is implementing a major enhancement to NYC's existing 9-1-1 system to allow for text message communication between the City's 9-1-1 operators and persons in the five boroughs. The Interim Text to 9-1-1 (TT9-1-1) solution will utilize Short Message Service (SMS), a text messaging service component of phone, web or mobile communications systems, that uses standardized communications protocols to allow fixed line or cellphones to exchange short text messages. The TT9-1-1 team includes the same public safety stakeholders as the NG9-1-1 Program team.

This interim service would allow those who are unable to make a voice call but are able to text 9-1-1 (the Deaf and Hard-of-Hearing community, those with speech disabilities, and crime victims unable to make a voice call) to readily access 9-1-1, allowing for non-verbal communications with NYC's 9-1-1 call takers. Unlike Teletypewriters (TTY), Telecommunications Relay Services (TRS) and Video Relay Services (VRS), which are out of date and/or not broadly used, this solution will provide people who are unable to connect via existing voice services with greater access to 9-1-1 call takers.

4.1 Phased Approach to Deliver Interim TT9-1-1 Capabilities

A process similar to that outlined above in section 2.3 is being used to implement an Interim TT9-1-1 System for NYC. Since any solution will need to work with the existing 9-1-1 system provided by the City's contracted vendors, these firms along with third party vendors, are being engaged to provide this new functionality.

4.2 Next Steps

DoITT expects that TT9-1-1 will be live by June 30, 2020.

DoITT, in collaboration with NYPD and FDNY, has completed the Initiation and Planning phases (see below), and is in-process of testing the TT9-1-1 solution to begin implementation:

1. Initiation Phase:
   a. Requirements, system architecture and implementation plan were developed with the NYPD and FDNY for an Interim TT9-1-1 system. These were reviewed with existing 9-1-1 vendors and their subcontractors.

2. Planning Phase:
   a. Requirements are finalized with the NYPD and FDNY and Change Orders were released to provide TT9-1-1 capabilities, using the existing contract vehicles with NYC's current 9-1-1 vendors. This includes requirements related to cybersecurity and resiliency.
   b. Change Orders were registered by the NYC Comptroller and DoITT is now in the Implementation Phase.

3. Implementation and Steady State Phases:
   The expected go-live for TT9-1-1 is June 30, 2020. Implementation dates have been established in accordance with:
   a. NYPD and FDNY operational readiness for this new service, e.g., documented TT9-1-1 procedures, call-taker training, etc.

b. IT best practices and a systems integration approach to implementation and testing. This includes putting in place quality assurance teams and designing and implementing comprehensive test plans, including stringent cyber and load testing to ensure that all pieces of the complex system work properly in conjunction with one another.
c. Completion of testing of vendor solution in DoITT's System Development Environment (SDE) and acceptance in PSAC 2 and PSAC 1 production environment (both currently underway).
d. A public awareness campaign to communicate an important message to NYC 9-1-1 users -- "*Call if you can, text only if you can't.*"

5.0 Program Governance

This Annual Report on NYC Next Generation 9-1-1 Implementation was prepared by DoITT in consultation and collaboration with the NYPD and FDNY. These agency partners are the same participants in DoITT's integrated Public Safety IT Program Management Office, governed by the multiagency Public Safety IT Steering Committee of Agency executives.