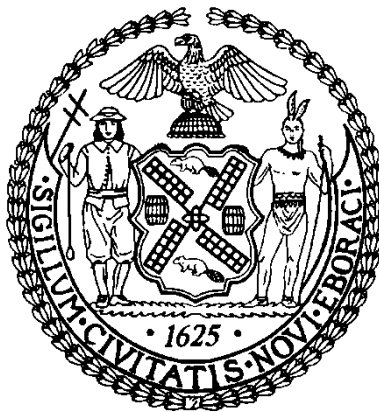# CITY OF NEW YORK
# OFFICE OF THE COMPTROLLER
## John C. Liu
## COMPTROLLER

## IT Audit and Research
### Tina Kim
### Deputy Comptroller for Audit

Audit Report on the
Project Management for the
Emergency Communications Transformation Program
by the New York City Department of Information
Technology and Telecommunications

*7A11-104*

**March 20, 2012**

March 20, 2012

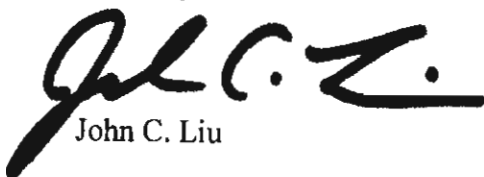**To the Residents of the City of New York**

My office has audited the Department of Information Technology and Telecommunications (Department) to determine whether the Department's overall project management of the Emergency Communications Transformation Program (ECTP) was reasonable, justified, and allowed for project completion on a timely basis. We audit entities such as the Department as a means of ensuring that systems and technological development and resources of City agencies are cost-effective, efficient, secure, and operate in the best interest of the public.

The Department embarked on the ECTP in 2004 with a reasonable and justified premise of establishing two Public Safety Answering Centers (PSAC1 and PSAC2) for the purpose of consolidating the City's emergency response services to establish system redundancy as well as to have a backup facility; modernize and strengthen the 911 network; improve data-sharing among City agencies; and enhance coordination and deployment of resources during emergencies. However, the Department's overall project management of the ECTP was lacking—due to its initial underestimation of time and the technical constraints involved in implementing the multi-agency mission-critical ECTP—which, therefore, did not allow for project completion on a timely basis. The ECTP project encountered obstacles during the initial stages of its implementation. The obstacles included defective project governance, technical impediments, and poor vendor performance. Collectively, the obstacles caused an elongated project timeline The audit contains three recommendations that if implemented should improve on the continued development of the ECTP by providing proper project governance, appropriately qualified project management personnel resources, and outside quality assurance monitoring of the project.

The results of the audit have been discussed with Department officials, and their comments have been considered in preparing this report. Their complete written response is attached to this report.

If you have any questions concerning this report, please e-mail my audit bureau at audit@Comptroller.nyc.gov.

Sincerely,

John C. Liu

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# The City of New York
# Office of the Comptroller
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# by the New York City Department of Information
# Technology and Telecommunications

## 7A11-104

## AUDIT REPORT IN BRIEF

The mission of the Department of Information Technology and Telecommunications (DoITT) is to ensure the efficient delivery of Information Technology (IT) services; establish the City's IT strategic direction; set security policies and standards; procure citywide IT services; evaluate emerging technologies; and provide project management, application development, and quality assurance services. DoITT leads the Citywide IT Infrastructure Services (CITIServ), the Citywide IT infrastructure consolidation program; supports the Emergency Communications Transformation Program (ECTP); and administers the technology and foundational infrastructure for the 311 Customer Service Center.

ECTP was initiated by the City through DoITT in 2004. The primary objective of the ECTP was to consolidate emergency communications within the City. ECTP is a multi-agency, multi-year program with the goals of modernizing all aspects of the emergency response system with upgraded telecommunications infrastructure and providing for two fully integrated Public Safety Answering Centers (PSACs) that include call-taking and dispatch operations for first responders from the City's Police Department (NYPD) and Fire Department (FDNY), including its Emergency Medical Services (EMS) unit. DoITT contracted with Hewlett-Packard Co. (HP) in 2005 to provide services as a system integrator[1] for PSAC1 and as project manager over other contractors providing services and equipment for PSAC1. A governance structure was established to monitor the multi-City agency ECTP project, and an outside independent Quality Assurance (QA) contractor was retained to monitor HP's performance and to advise on the overall ECTP project.

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[1] A systems integrator is a person or company specializing in bringing together component subsystems into a whole and ensuring that those subsystems function together, a practice known as System Integration. In the information technology (IT) field, system integrators integrate multiple systems for inputting, processing, interpreting, storing, and categorizing data.

## Audit Findings and Conclusions

DoITT embarked on the ECTP in 2004 with a reasonable and justified premise of establishing two PSACs (PSAC1 and PSAC2) for the purpose of consolidating the City's emergency response services to establish system redundancy as well as to have a backup facility; modernize and strengthen the 911 network; improve data-sharing among City agencies; and enhance coordination and deployment of resources during emergencies. We found DoITT's overall project management of the ECTP lacking—due to its initial underestimation of time and the technical constraints involved in implementing the multi-agency mission-critical ECTP—which, therefore, did not allow for project completion on a timely basis.

## Audit Recommendations

To address the audit issues, we recommend the following:

- DoITT, in conjunction with ECTP executive sponsors, should have its current governance strategy expanded, formulated into a plan, reviewed and formally approved by all stakeholders, and conveyed to all pertinent ECTP team members. The expanded areas should include operational coverage for PSAC1 upon full completion and occupancy, and line of authority for operations within PSAC1 should be clearly defined and conveyed to stakeholders.

- DoITT and the OCEC should increase its efforts to fill open positions with appropriately qualified personnel to ensure that the ECTP has sufficient resources required for the ongoing monitoring and management of the ECTP.

- DoITT should improve upon its current strategy to provide Quality Assurance coverage by retaining, on a temporary basis, independent quality assurance experts to monitor the balance of HP's contractual performance for the duration of its contract. In addition, DoITT should consider a Quality Assurance arrangement to monitor Grumman's performance at PSAC2.

## Agency Response

In their response, DoITT officials agreed with the three recommendations.

# INTRODUCTION

## Background

The mission of the Department of Information Technology and Telecommunications (DoITT) is to ensure the efficient delivery of Information Technology (IT) services; establish the City's IT strategic direction; set security policies and standards; procure citywide IT services; evaluate emerging technologies; and provide project management, application development, and quality assurance services.

As part of its overall mission, DoITT leads the Citywide IT Infrastructure Services (CITIServ), the Citywide IT infrastructure consolidation program; supports the Emergency Communications Transformation Program (ECTP); and administers the technology and foundational infrastructure for the 311 Customer Service Center.

ECTP was initiated by the City through DoITT in 2004. The primary objective of the ECTP was to consolidate emergency communications within the City. ECTP is a multi-agency, multi-year program with the goals of modernizing all aspects of the emergency response system with upgraded telecommunications infrastructure and providing for two fully integrated Public Safety Answering Centers (PSACs) that include call-taking and dispatch operations for first responders from the City's Police Department (NYPD) and Fire Department (FDNY), including its Emergency Medical Services (EMS) unit. DoITT contracted with Hewlett-Packard Co. (HP) in 2005 to provide services as a system integrator[2] for PSAC1 and as project manager over other contractors providing services and equipment for PSAC1. A governance structure was established to monitor the multi-City agency ECTP project, and an outside independent Quality Assurance (QA) contractor was retained to monitor HP's performance and to advise on the overall ECTP project.

DoITT served as the technical lead and overall coordinator of the ECTP prior to the creation of its Office of Citywide Emergency Communications (OCEC). OCEC, established in August 2010, currently leads the overall coordination with the Police and Fire Departments and other City agencies along with contracted resources. HP is the primary contractor for PSAC1, and Northrop Grumman Systems Corporation (Grumman) will be the primary contractor for PSAC2. A list of the major contractors participating in the ECTP effort can be found in Appendix I.

### New York City Emergency Response Prior to ECTP

Emergency response to 911 calls for assistance (crime, fire, or medical) was handled by various City departments at various locations, using different Computer Aided Dispatch (CAD) systems with no incident-related data sharing capability across the CAD systems.

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[2] A systems integrator is a person or company specializing in bringing together component subsystems into a whole and ensuring that those subsystems function together, a practice known as System Integration. In the information technology (IT) field, system integrators integrate multiple systems for inputting, processing, interpreting, storing, and categorizing data.

These 911 calls would go first to NYPD at PSAC1 in Brooklyn, and responses to 911 calls for assistance were divided among the NYPD, FDNY, or its EMS unit, depending on the nature of the call and the response resource required. If a call was for police assistance, an NYPD call-taker could act on the request directly; but, if the call related to a fire or a medical emergency, the NYPD call-taker entered the information from the caller into the NYPD CAD system and then called the FDNY or EMS and conferenced in their call-taker. The NYPD call-taker could not pass all entered incident-related data (from the NYPD CAD) directly onto the FDNY's or EMS's respective CAD systems. Instead, if the call was a fire-related emergency, the conference-in FDNY call-taker needed to enter the caller's information again into the FDNY CAD system, which then routed the information to a fire dispatcher for an appropriate response.

### ECTP Vision of New York City's Emergency Response

The ECTP's primary goals are to integrate the emergency response functions of the two agencies (NYPD, FDNY/EMS) into a single facility at a renovated PSAC1; to create a second facility, PSAC2, to be built at another location for redundancy and as a backup to PSAC1—each facility will be designed to have the same capability and full citywide capacity[3]; to modernize the E911 telecommunications network; and to implement a new shared CAD system for NYPD and FDNY/EMS. The ECTP includes the modernization and strengthening of the 911 network, improvement for data-sharing among agencies to promote better coordination of response, and deployment of resources to scenes of emergencies.

The ECTP includes the concept of *Unified Call Taking*, a procedure based on improved technology and training. This would allow an NYPD call-taker to collect both NYPD and FDNY incident information and then electronically share and coordinate the appropriate emergency response with dispatchers from either agency. This procedure allows emergency callers to state the incident information one time, removing a redundant step for FDNY on fire-related emergencies and, therefore, promoting a more efficient response.

### Project Management Process

Project management (PM) is the application of knowledge, skills, tools, and techniques to plan activities to meet the project requirements. It is accomplished through the appropriate application and integration of PM processes in five main categories: Initiating, Planning, Executing, Monitoring and Controlling, and Closing. Managing a project generally includes identifying requirements; addressing various needs, concerns, and expectations of project stakeholders; and balancing competing project constraints in Scope, Quality, Schedule, Budget, Resources, and Risk. For the ECTP, DoITT is the overall project manager and technical lead. HP is responsible for services both as a system integrator and as project manager over other contractors providing support for the ECTP while DoITT was to oversee HP. To manage a project of the ECTP's scale, which involves citywide emergency response mission-critical

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[3] Each PSAC can provide full citywide service in the event of the unavailability of the other.

systems and cross-agency issues, a governance structure was conceived to help lead, drive strategy, and maintain momentum through the implementation of ECTP.

Project control is the element of PM that keeps a project on track, on time, and within budget. Project control begins early in the project with planning and ends late in the project with post-implementation review. Each project should be assessed for the appropriate level of control needed. Too much control is time consuming, and too little control is very risky. If project control is not implemented correctly, project implementation errors could occur, which would require remediation at additional cost with a potential impact on the overall project.

**Program Governance**

The ECTP is a unique program with mission-critical objectives involving state-of-the-art technologies and high expenditures, involving work in live operating environments with numerous participants and cross-agency stakeholders. Therefore, when the ECTP was announced in 2004, the executive sponsors included the Mayor's Office, DoITT, NYPD, FDNY, and the Office of Management and Budget (OMB). The executive sponsors established the ECTP vision and strategic directions, owned and were accountable for program success, and obtained support of other policy makers and executives.

**Program Governance, Roles, and Responsibilities[4]**

- **Office of the Mayor -** The Program Governance Bodies (ECTP Task Force and the ECTP Working Group)

  The Task Force was to have consisted of executive stakeholders, including executive level representation from the Mayor's Office, NYPD, FDNY, DoITT, OMB, Office of Labor Relations, Department of Citywide Administrative Services, Mayor's Office of Operations, and Mayor's Office of Contracts. The Task Force was responsible for the initial review of program directions, major program investments, and critical program issues and for direction and recommendations to the ECTP Working Group.

  The Working Group was to have consisted of City executives representing all stakeholder agencies and was to oversee execution of program vision and strategic directions; commit program/project team resources; participate in executive program review sessions; approve major program investments; and decide on escalated program/project issues.

- **Program Management Office (PMO) -** The PMO was to be made up of the DoITT ECTP Program Manager, the independent, external Quality Assurance Manager

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[4] As represented in the *Project Definition (PD) for the Provision of System Integration (SI) Services for the Emergency Communications Transformation Program (ECTP)* issued in March 2004

(Gartner, Inc.), NYPD Project Lead, FDNY Project Lead, the DoITT Program Contract Officer, and the DoITT Technical Architect.

The PMO was to manage execution of the program plan, overall budget, scope, and schedule; recommend major initiatives and program investments for approval by the ECTP Task Force; represent business/technology organizations/subject areas and transfer knowledge; provide resources, expertise, and issue resolution support to project teams; provide independent verification and validation of key project deliverables and milestones; and report to the ECTP Task Force and Working Group.

- **Functional Area Coordination Teams -** The ECTP projects were to be organized into four functional components: Facilities Development, Organizational Transformation, Application Systems, and Communications Infrastructure. Within the four components were to be teams established to coordinate efforts related to the respective functional areas.

  - ➢ Facilities Development projects were to include: Development of PSAC 1 and 2; Back-Up PSAC Build-Out; Move FDNY, EMD Call Takers, and Dispatchers to the PSACs; Renovate Borough Communications Offices.
  - ➢ Organizational Transformation projects were to include: Business Process Reengineering; Job Design; and Training Planning/Management.
  - ➢ Application Systems projects were to include: Unified CAD; NYPD CAD; FDNY CAD; EMS CAD; and Automated Vehicle Location (AVL).
  - ➢ Communications Infrastructure projects were to include: Wired Communications; Wireless Communications; Telephony, E911 Networking; Alarm Box Systems; Mobile Data Computing; Voice Alarm; Automatic Call Distribution (ACD); and Radio Communications.

### Independent External Quality Assurance Coverage

DoITT contracted with Gartner, Inc. (Gartner) in two separate engagements in 2004 and 2006 for Gartner to provide project management, project monitoring, and quality assurance consulting services in support of the ECTP from July 1, 2004, through March 31, 2011.

The 2004 Gartner engagement was for Gartner to perform the following tasks: a) establish Project Management office and strategy, which included organizing the ECTP PM office, project planning, and other activities (such as: identify space requirements and possible dispatch facility sites, review 911-related projects at NYPD/FDNY, and define requirements for Unified CAD and other critical technologies), and b) Program Management Oversight and Assistance, which included addressing long-term projects such as CAD development; site planning; voice and data networks; radio communications; integration of technologies; business process reengineering; training programs; and coordination of vendor and City resources.

The 2006 Gartner engagement was for Gartner to assist in further developing the overall strategy for the ECTP; monitoring the implementation of that strategy; managing project risks,

costs, and timeline; working with various City agencies to facilitate project completion; and providing weekly reporting.  In addition, Gartner was to advise the City on overall project best practices and provide subject matter expertise that would allow the City to develop a new 911 organization consistent with best practices in the U.S.

### Events Subsequent to Audit Fieldwork

On January 5, 2012, Mayor Bloomberg announced the completion of major milestones in the 911 system overhaul that had been sought by the City for decades.  These included:

- "All of the City's more than 1,500 call takers are now using the same technology for the first time.
- Integration of NYPD and FDNY computer aided dispatch systems allowing 911 operators to automatically route an incident directly to the FDNY via a data link.
- Improved data sharing among agencies – including the immediate availability of emergency data to the NYPD, FDNY, and EMS – and allowing better coordination of resources directed to the scene of emergencies.
- Modern, state-of-the-art telephony – maps indicating the location of callers are now automatically presented to 911 call takers, lending to improved accuracy and speed in the dispatch of emergency resources.
- Upgrades to the City's emergency telephone and radio networks, strengthening the backbone of emergency communications' infrastructure and affording the City backup capabilities that have never before existed.
- Installation of Automated Vehicle Locator technology in emergency response vehicles.
- Renovations and upgrades at One Police Plaza, which houses will house a redundant emergency 911 operations for the NYPD.
- Renovations and upgrades at existing communications offices in Queens and the Bronx, which will house backup emergency 911 operations for the FDNY.[5]"

## Objectives

The objective of this audit was to determine whether the overall Project Management of the ECTP by DoITT was reasonable, justified, and allowed for project completion on a timely basis.

## Scope and Methodology Statement

We conducted this audit in accordance with generally accepted government auditing standards (GAGAS).  Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.  This audit was conducted in

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[5] As reported in the Mayor's Office press release PR-004-12 dated January 5, 2012.

accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter.

Our fieldwork was conducted from March 2011 to September 2011. Our audit focused on the current status of the ECTP program, which contains two primary goals. One goal is to update PSAC1, and the second goal is to establish PSAC2. Please refer to the Detailed Scope and Methodology at the end of this report for the specific procedures and tests that were conducted.

## Discussion of Audit Results

The matters covered in this report were discussed with DoITT officials during and at the conclusion of this audit. A preliminary draft report was sent to DoITT officials and was discussed at an exit conference held on February 9, 2012. On February 17, 2012, we submitted a draft report to DoITT officials with a request for comments. We received a written response from DoITT on March 5, 2012. In their response, DoITT officials agreed with the three recommendations.

The full text of the DOF response is included as an addendum to this final report.

# FINDINGS AND RECOMMENDATIONS

DoITT embarked on the ECTP in 2004 with a reasonable and justified premise of establishing two PSACs (PSAC1 and PSAC2) for the purpose of consolidating the City's emergency response services to establish system redundancy as well as to have a backup facility; modernize and strengthen the 911 network; improve data-sharing among City agencies; and enhance coordination and deployment of resources during emergencies. We found DoITT's overall project management of the ECTP lacking—due to its initial underestimation of time and the technical constraints involved in implementing the multi-agency mission-critical ECTP— which, therefore, did not allow for project completion on a timely basis.

The ECTP project encountered obstacles during the initial stages of its implementation. The obstacles included defective project governance, technical impediments, and poor vendor performance. Collectively, the obstacles caused an elongated project timeline and altered an original objective (having a Unified CAD). PSAC 1, was originally forecasted to be fully tested and operational in August 2005 with a Unified CAD, and PSAC 2 was to be operational in 2006; PSAC 1 is near completion as of end of audit fieldwork in September 2011, and PSAC 2 is beginning construction.

The original project governance, roles and responsibilities, and project controls (at HP) were found to be deficient by ECTP's independent quality assurance (QA) consultant in 2006 covering the 2005-2006 initial time period of HP's system integration work on the ECTP. Specifically, the QA consultant noted questionable judgment, poor decisions, and deficiencies in the ECTP governance structure, which caused key decisions not to be made in a timely manner. The consultant further noted that the collaborative approach was not effective in addressing critical, cross-agency issues, and also cited insufficient project controls at HP which affected the completion of ECTP tasks.

The effort by HP to implement a shared Computer Aided Dispatch (CAD) system for Police, Fire, and the Emergency Medical Services Division was a major technical misstep. Due to technical obstacles, ECTP departs from one of its original goals of having a shared CAD. NYPD, FDNY, and EMS will need to independently address their respective CAD systems requirements outside of the ECTP.

The deployment of a mission critical application, VESTA[6], was also delayed due to technical issues. The delay contributed substantially to the delay in completion of PSAC1, completion of which was originally anticipated by June 2007, but deployed over four years later, and was near roll-out at close of audit fieldwork in September 2011.

Project controls were found inadequate as contracted work by HP had discrepancies between billed work hours for reportedly completed tasks versus actual completed tasks.

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[6] VESTA is telephony software for call processing. Properly installed and configured, it becomes a system platform that can integrate seamlessly with system tools first responders' use, such as mapping, incident tracking, computer aided dispatch (CAD), radio and digital logging, and third party applications.

In 2010, the Mayor's Office implemented a new governance structure to help manage and monitor the ECTP project and created a new project office to provide dedicated focus on the ECTP project. The governance strategy outlined the roles and responsibilities of stakeholders in the ECTP. However, the new project office was not fully staffed as of close of audit fieldwork in September 2011.

Currently, the development[7] of PSAC2 is underway, with Grumman under contract with DoITT, to provide system integration services for the completion of PSAC2. The ECTP does not currently have an independent outside QA process to monitor the performance of its original contractor, HP, during its final contract year to end on March 30, 2012. Going forward on the Grumman endeavor without an independent QA process could re-create all the deficiencies noted in this report.

## PRIOR ISSUES

## DEFICIENCIES IN ECTP DEVELOPMENT

### Original ECTP Project Governance Structure Was Not Effective

Project governance provides a comprehensive and consistent method of controlling a project and ensuring its success—It is a constant process of revalidation of earlier assumptions, reviewing risks, and defining in more detail the processes needed to complete deliverables.[8]

DoITT embarked on the ECTP in 2004 with a reasonable and justified premise of establishing two PSACs (PSAC1 and PSAC2) for the purpose of consolidating the City's emergency response services to establish system redundancy as well as to have a backup facility; modernize and strengthen the 911 network; improve data-sharing among City agencies; and enhance coordination and deployment of resources during emergencies.

When the ECTP was announced in 2004, the executive sponsors included the Mayor's Office, DoITT, NYPD, FDNY, and the Office of Management and Budget (OMB). The executive sponsors established the ECTP vision and strategic directions, owned and were accountable for program success, and obtained support of other policy makers and executives.

The original governance, roles, and responsibilities were found to be deficient during the 2005-2006 time period by the ECTP's independent QA consultant. The QA consultant cited that key decisions were not being made in a timely manner; the collaborative approach was not effective in addressing critical, cross-agency issues; and the "Program required decisive leadership to drive strategy and maintain momentum." Specifically, the consultant noted:

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[7] Being constructed by an outside contractor, contracted and managed by New York City Department of Design & Construction.

[8] Project Management Body of Knowledge Guide, 4th Edition is a de facto worldwide standard in Project Management developed by the internationally recognized Project Management Institute.

- Lack of Timely Decision Making – "The organizational structure, participation and direction supporting ECTP is not effective and is limiting the visibility of key issues and not supportive of timely decision-making."

- Lack of Executive Sponsorship Participation – "Little or no participation by City Hall representatives; all City Hall meetings have been cancelled; little or no participation by executive team due to leadership transition with DoITT; no day-to-day participation by City Hall representatives."

- No Governance/Communications Center Administration Plan – "PMO cannot make effective decisions without central authority established; difficult to build/drive long term vision, planning without an established approach for Administration/Organizational structure of future Communication Center operations."

Gartner's document, *ECTP Planning Lessons Learned* document, dated May 2009, read, "The ECTP Steering Committee is responsible for making management-level decisions for the Program. . . Decisions have been lacking out of this group, and in fact the group no longer meets regularly, and as a result have lingered impacting schedules, budget, and accountability."

### A Shared Computer Aided Dispatch (CAD) System Was Not Implemented

ECTP's primary goals were to integrate the emergency response functions of the three agencies (NYPD, FDNY/EMS) into a single facility at a renovated PSAC1; create a second facility, PSAC2; modernize the E911 telecommunications network; and implement a new shared Computer Aided Dispatch (CAD) system for Police, Fire, and its Emergency Medical Services Division (EMD).

This shared CAD implementation was to have been completed by June 2007. However, due to the City's unique operational scale and user requirements, which were not correctly evaluated, a shared CAD was not implemented. In Gartner's document, *ECTP Planning Lessons Learned* document, dated May 2009, it was stated that "The Program contains high level strategies only (i.e., integrated CAD) so resulting lack of detail allows for a broad application . . ." Further, it reads, "Strategies are singular in nature and allowed to progress to become set in motion and difficult to turn back."

### VESTA Implementation Resulted in Substantial ECTP Delays

VESTA, the proposed call-processing telephony software, was to become the system platform that integrated seamlessly with system tools, such as mapping, incident tracking, CAD radio, and digital logging that first responders would use. VESTA, coupled with the appropriate computer systems and telecommunications equipment, is considered a leading-edge product for use in emergency response applications.

The VESTA technical issues started during deployment in late 2008. These technical issues, which included the difficulty that the software had meeting New York City's call-volume and software stability requirements, preoccupied HP, the ECTP project team, the stakeholders,

and substantially affected the overall ECTP project timeline for the completion of PSAC1. In addition, training for VESTA had to be modified to incorporate necessary revisions to the software, with the inevitability of retraining due to lapse of time that had occurred between the training and non-usage of VESTA due to its failed deployment.

In Gartner's document, *ECTP Planning Lessons Learned* document, dated May 2009, it was stated that "DoITT's role with regard to technology decisions and management is not clear." Further, the document states that "approaches for planning, problem solving, and change management have been limited resulting in lack of traceability and inability to resolve problems."

## DEFICIENCIES IN THE PROJECT MANAGEMENT PROCESS AND CONTROLS

### HP Project Management Processes and Controls Were Deficient

The City acquired the services of HP in 2005 to provide system integration services and to manage and coordinate activities of other contractors in support of the City's ECTP. However, serious PM control weaknesses were identified at HP. Contracted work by HP, during the period from November 1, 2005, to June 10, 2006, had discrepancies between billed work hours for reportedly completed tasks versus actual completed tasks.

Although DoITT withheld certain payments to HP once these issues were exposed, these differences required that DoITT modify its method of tracking tasks by using specialized PM software to track deliverables, report on hours, and detail work performed by various HP deployed resources.

Further, during 2006, HP PM problems peaked. There was a DoITT leadership change (spanning approximately a three-month period) which affected the ECTP project management. City Hall representation and monitoring of the ECTP was formally elevated to the Deputy Mayor level. In a memorandum dated April 5, 2007, a DoITT representative said, "HP has failed to meet New York City's expectations and contractual requirements." Further, this representative recommended that the ECTP contract should be re-bid. However, this recommendation was never considered. Subsequently, the aforementioned problems arose. Specifically, the Deputy Mayor level response received reiterated three key goals and timeframes, but did not provide any additional resources or suggested alternatives to achieve improved performance. The three key goals included:

1. "NYPD will move into the new PSAC1 by March 1, 2008.
2. FDNY and EMS will move into PSAC1 by March 1, 2009 by which time the NYPD, FDNY and EMS call-taking positions will be unified and all CAD systems will be integrated.
3. We will break ground on PSAC2 by July 1, 2009."

These timeframes/goals were not achieved as disclosed in this report.

# CURRENT ISSUES

## NO INDEPENDENT OUTSIDE QUALITY ASSURANCE COVERAGE

Quality Assurance (QA) is a service function, which includes systematic monitoring and evaluating of the various aspects of a project, service, or facility to maximize the probability that minimum standards of quality are being attained by the production or implementation process. QA is not, however, a service function that guarantees the production of quality products or successful implementation of systems.

Throughout the ECTP project, DoITT contracted with Gartner in two separate engagements in 2004 and 2006. Gartner was to provide project management, project monitoring, and quality assurance consulting services in support of the ECTP from July 1, 2004, through March 31, 2011. However, the ECTP does not currently have an independent outside Quality Assurance process to monitor the performance of its primary contractor, HP, during its final contract year, which is scheduled to end on March 30, 2012. Gartner's 2006 engagement ended on March 31, 2011, without a suitable replacement having been engaged to cover HP's performance during the balance of its contract.

To replace Gartner for the interim period (April 1, 2011, to March 30, 2012) of the current HP contract, DoITT intends on having "additional project managers and subject management experts on the program."

We do not believe this is a viable alternative for several reasons:

- DoITT's approach is equivalent to partial self-monitoring and would not provide an independent, unbiased view and reports on ECTP's progress and performance by all parties (sponsors, stakeholders, and vendors) involved with the program.

- DoITT's interim Quality Assurance strategy does not intend on providing documentation on activities being monitored nor producing periodic Quality Assurance reports, which would potentially disclose project issues needing attention, guidance, or direction.

- Gartner, as an outside independent QA consultant, was able to produce frequent status reports on ECTP's activities and report its findings in an unbiased format.

- OCEC is not in the position to add QA tasks typically performed by an independent outside resource as the current OCEC has 38 percent unfilled positions with pre-assigned responsibilities other than in the area of QA.

- The ECTP is a City-wide mission-critical emergency response system being upgraded during real-time live operating environment, which requires independently-focused individuals to monitor every aspect of ECTP's execution.

## RECENT ECTP STATUS
(as of September 2011)

The renovation of PSAC1 is completed with FDNY/EMS operating from this new facility. NYPD is currently projected to migrate from its original PSAC1 location by year end 2011. The PSAC1 portion of the ECTP would be considered accomplished when fully staffed by NYPD, FDNY, and EMS personnel, along with completion of user training and installation of hardware and application software and fulfillment of all terms of the current HP contract by expiry on March 30, 2012.

The current status of the important stages of the ECTP project is as follows:

- A new NYPD CAD will be replacing the ECTP conceptual shared CAD that was not deployable (the new NYPD CAD is reportedly scheduled for 2012[9] [the shared CAD was scheduled to be completed in 2007]). Reportedly, the new NYPD CAD will be a NYPD independent project outside the context of the ECTP. FDNY/EMS legacy CADs were upgraded.

- Co-location and Unified Operations (substantially complete at September 2011 [was originally anticipated to be completed in December 2009]) –FDNY/EMS has been operating from the new PSAC1 since the summer of 2010. NYPD is scheduled to be part of the operations by year-end 2011 with unified call-taking operations—with, however, no unified CAD, but with a real-time data link between NYPD and FDNY dispatch systems.

- Dual PSACs (new PSAC1 complete at September 2011 [dual operational PSACs were anticipated to have occurred in 2008]) – The new PSAC1 is at operational completion except for the NYPD cutover by year end 2011. PSAC2 is being constructed.

**PSAC2 Status** (as of September 2011)

We toured the PSAC2 site in September 2011 and observed the construction progress of the PSAC2 building, which is at the foundation creation stage (foundation floor and walls have been created). The System Integrator contractor, Grumman, has been engaged with resources assigned to the OCEC for stakeholder coordination and PSAC2 detailed design work.

The Grumman agreement has an effective date of January 3, 2011. It is a firm fixed price contract not to exceed $285,999,853.00[10]. It is a five-year term contract starting with the effective date with options for the City to renew for two additional two-year terms (contract completion could, therefore, be as extended to January 2, 2020).

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[9] A new NYPD CAD development will be an NYPD project outside the purview of the ECTP program. ECTP had envisioned a shared (with FDNY/EMS) CAD.
[10] Registered and encumbered at $95,000,000 in 2011.

As previously noted, subsequent to audit fieldwork Mayor Bloomberg publicly reported that:

"The second major phase of the project is the ongoing construction of the City's Public Safety Answering Center II facility in the Bronx, scheduled to be completed in 2015."

## Recommendations

To address the issues we found during this audit, we recommend the following:

1. DoITT, in conjunction with ECTP executive sponsors, should have its current governance strategy expanded, formulated into a plan, reviewed and formally approved by all stakeholders, and conveyed to all pertinent ECTP team members. The expanded areas should include operational coverage for PSAC1 upon full completion and occupancy, and line of authority for operations within PSAC1 should be clearly defined and conveyed to stakeholders.

*DoITT Response:* DoITT agreed with this recommendation.

2. DoITT and the OCEC should increase its efforts to fill open positions with appropriately qualified personnel to ensure that the ECTP has sufficient resources required for the ongoing monitoring and management of the ECTP.

*DoITT Response:* DoITT agreed with this recommendation.

3. DoITT should improve upon its current strategy to provide Quality Assurance coverage by retaining, on a temporary basis, independent quality assurance experts to monitor the balance of HP's contractual performance for the duration of its contract. In addition, DoITT should consider a Quality Assurance arrangement to monitor Grumman's performance at PSAC2.

*DoITT Response:* DoITT agreed with this recommendation, stating "We are nearing completion of a contract with NASA, the National Aeronautics and Space Administration, to provide independent verification and validation (IV&V) services."

# DETAILED SCOPE AND METHODOLOGY

We conducted this audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. This audit was conducted in accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter.

Our fieldwork was conducted from March 2011 to September 2011. Our audit focused on the current status of the ECTP program, which contains two primary goals. One goal is to update PSAC1. The second goal of the ECTP is the establishment of PSAC2. Based on security concerns, the physical locations of various facilities related to the ECTP project are intentionally omitted.

To achieve our audit objective, we:

- Met with certain members of the ECTP team for background information and to review confidential documents related to the deployment of VESTA, a call-processing application;

- Reviewed the *Project Definition (PD) for the Provision of System Integration (SI) Services for the Emergency Communications Transformation Program (ECTP)*, issued in March 2004, for an understanding of the scope of the ECTP.

- Reviewed the *Agreement for the Emergency Communications Transformation Program between The City of New York and Hewlett-Packard Company April 1, 2005,* for details on terms, conditions, and scope of work.

- Reviewed pertinent Gartner Inc. quality assurance reports on the ECTP implementation progress for information on project implementation issues encountered, Gartner's recommended corrective actions, and Gartner's risk analyses on the ECTP project tasks.

- Reviewed *ECTP Planning Lessons Learned* document, dated May 2009, for information on project implementation issues encountered, Gartner's recommended corrective actions, and Gartner's risk analyses on the ECTP project tasks.

- Reviewed the Hewlett-Packard Co. task orders and statements of work for details on scope of work associated with the task orders.

- Reviewed ECTP project schedules to evaluate the implementation status of the ECTP's goals.

- Examined training schedules for users of mission critical applications in PSAC1.

- Completed a walk-through of the new PSAC1 facility to observe the operations of FDNY and EMS at that location[11].

- Completed a walk-through of NYPD's E911 emergency response primary and backup facilities to observe its operations and confirmed the installation of key ECTP components at those locations.

- Toured the location of the future PSAC2 to observe its current construction progress.

- Obtained and reviewed the DoITT contract agreement with Northrop Grumman Systems Corp. for *System Integration Services for Stage II of the Emergency Communications Transformation Program* pertaining to PSAC2 for an understanding of the scope of PSAC2 work.

- Obtained and reviewed the revised ECTP Governance Plan to determine its adequacy for guiding and monitoring the project of ECTP's scale.

- Reviewed DoITT's PM Office Methodology to examine DoITT's PM standards as prescribed to other City agencies.

As criteria for our evaluation, we used the PMBOK (Project Management Body of Knowledge) Guide, 4th Edition. The PMBOK is a de facto worldwide standard in PM developed by the internationally recognized Project Management Institute. We also used DoITT's PM Office Methodology, which incorporates and prescribes citywide PM standards to City agencies.

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[11] NYPD was in transition into the new PSAC1 location from its original location.

**Office of New York City Comptroller John C. Liu**

# Prime Contractors[12] Participating in the ECTP Project

DoITT retained the services of several prime contractors specifically for the ECTP project. The contractors and their individual sub-contractors provide services and/or equipment as follows:

| Prime Contractor | Service Type | Original Contract Amount | Current Contract Amount[13] | Contract Start Date | Contract End Date |
|---|---|---|---|---|---|
| Hewlett Packard Co. | ECTP Systems Integration PSAC1 | $380,000,000.00 | $380,000,000.00 | 04/01/2005 | 03/30/2012 |
| Telesector Resources Group Inc.[14] | E911 network equip. & services | $195,550,001.00 | $195,550,001.00 | 07/01/2006 | 06/30/2013 |
| Gartner Inc. | PM & QA for 911 ECTP | $41,354,218.00 | $51,404,161.00 | 04/01/2006 | 03/31/2011 |
| Gartner Inc. | Consolidated Public Safety dispatch (911) PM/QA | $10,078,763.00 | $10,078,763.00 | 07/01/2004 | 03/31/2006 |
| Motorola Inc. | 911 ECTP Consolidated Dispatch | $666,467.57 | $666,467.57 | 08/15/2008 | 06/30/2009 |
| Motorola Inc. | ECTP EMD PPT & EM Training | $268,597.00 | $268,597.00 | 03/01/2009 | 08/30/2009 |
| Evans Consoles Inc. | Design, Build, Install Public Safety Console Equip. | $3,240,085.00 | $5,485,611.16 | 03/01/2006 | 02/28/2013 |
| Northrop Grumman Systems Corp. | ECTP Stage II Systems Integration PSAC2 | $285,999,853.00 | $285,999,853.00[15] | 01/03/2011 | 01/02/2016[16] |
| | | | | | |

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[12] Contractors specifically contracted by DoITT for the ECTP effort; excluding contracts initiated by NYPD & FDNY, contracts expired prior to 2004, PSAC2 land/building/construction, and services/equipment acquired for the ECTP procured via requirement contracts.
[13] As of close of audit fieldwork, September 2011.
[14] Doing business as Verizon Services Group.
[15] Registered and encumbered at $95,000,000 in 2011.
[16] Renewable at the City's option for two additional two-year terms.

**Information
Technology &
Telecommunications**

**Carole Post**
*Commissioner*
75 Park Place
New York, NY 10007
212-788-6600

March 5, 2012

The Honorable Tina Kim
Deputy Comptroller
Audits and Accountancy
1 Centre Street
New York, New York   10007-2341

Dear Deputy Comptroller Kim:

Thank you for the draft report with respect to your audit of the project management of the Emergency Communication Transformation Program (ECTP).

ECTP has produced a robust, resilient, state-of-the-art system, with substantially improved call capacity.  PSAC1 is completed and operational.  Police, fire and medical emergency call-takers have all co-located to PSAC1 and are successfully operating on the new interoperable telecommunications and network systems.  Construction of PSAC2 is underway.  The existing Police Department call center at 1 Police Plaza, and Fire Department call centers in Queens and the Bronx have been upgraded to serve as back-up facilities.

With respect to the audit findings and recommendations, we agree with recommendation #1 and intend to maintain the executive level leadership of the program under the direction of the Office of Citywide Emergency Communications (OCEC). OCEC works extensively with all stakeholders of the program and has appropriate authority to implement all aspects of the program.

Regarding recommendation #2, we agree with the need to fill vacant positions with appropriately qualified personnel. Attracting and retaining qualified IT professionals can be a challenge, particularly given the complexity of some of the roles and responsibilities, and the

competitive nature of the IT marketplace.

Finally, regarding recommendation #3, we intend to maintain our current strategy to provide independent quality assurance experts to monitor the program. We are nearing completion of a contract with NASA, the National Aeronautics and Space Administration, to provide independent verification and validation (IV&V) services. IV&V goes beyond traditional quality assurance, which is primarily process-oriented. IV&V is a well-defined and proven systems engineering discipline designed to reduce risk through early identification and efficient mitigation of risk.

These activities will continue to help ensure that ECTP accomplishes its strategic objectives including with respect to fostering public health and safety.

Again, we appreciate the opportunity to offer these comments on your draft findings and recommendations, as well as the inclusion of this response in the final audit report.

Sincerely,

Carole Post
Commissioner

Cc: C. Holloway, B. Gaskey, L.Mercurio