

AUDIT REPORT



CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
BUREAU OF FINANCIAL AUDIT
WILLIAM C. THOMPSON, JR., COMPTROLLER

Audit Report on the Development and Implementation Of the NYC Serv Project By the Department of Finance

7A03-113

June 23, 2003



THE CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
1 CENTRE STREET
NEW YORK, N.Y. 10007-2341

WILLIAM C. THOMPSON, JR.
COMPTROLLER

To the Citizens of the City of New York

Ladies and Gentlemen:

In accordance with the Comptroller's responsibilities contained in Chapter 5, § 93, of the New York City Charter, my office has performed an audit of the development and implementation of the NYC Serv Project by the Department of Finance. The results of our audit, which are presented in this report, have been discussed with officials from the Department of Finance, and their comments have been considered in preparing this report.

Audits such as this provide a means of ensuring that City agencies are developing computer systems in an efficient, timely, and cost-effective manner.

I trust that this report contains information that is of interest to you. If you have any questions concerning this report, please contact my audit bureau at 212-669-3747 or e-mail us at audit@Comptroller.nyc.gov.

Very truly yours,

A handwritten signature in cursive script that reads "William C. Thompson, Jr.".

William C. Thompson, Jr.

WCT/GR

Report: #7A03-113
Filed: June 23, 2003

*Office of the Comptroller
Bureau of Financial Audit
EDP Audit Division*

**Audit Report on the
Development and Implementation
Of the NYCServ Project
By the Department of Finance**

7A03-113

AUDIT REPORT IN BRIEF

We performed an audit of the development and implementation of the NYCServ Project data processing applications by the Department of Finance (the Department). The purpose of NYCServ was to consolidate customer services by providing one-stop facilities where the public could make payments and pursue adjudicated judgment hearings. The Department along with its prime contractor, the International Business Machines Corporation (IBM), agreed to “re-engineer and support the consolidation of the licensing, payment and adjudication operations of the departments of Finance, Consumer Affairs, Health, Environmental Protection, the Department of Sanitation, and the Environmental Control Board.”

Audit Findings and Conclusions

NYCServ met the Department’s initial business and system requirements; the system design allowed for future enhancements and upgrades; and the Department generally complied with the City Charter and relevant Procurement Policy Board Rules. The developers followed a system development life cycle methodology, and the Department provided independent quality assurance test groups. However, the implementation of NYCServ has been delayed. Moreover, we do not know whether NYCServ will, as a finished product, meet the overall goals as stated in the system justification since certain applications have not been implemented. In addition, many of the system users who responded to our user-satisfaction survey stated that they were not satisfied with the Payments and Scofftow applications. Finally, contrary to Comptroller’s Directive 18, the Department has no disaster recovery plan for NYCServ.

Audit Recommendations

To address these issues, we recommend that the Department:

- Ensure that the remaining applications are completed, tested, and implemented. For future system development projects, the Department should ensure that: users review and approve all system design specifications; sufficient testing is

performed; and provisions are made to obtain source code for any software critical to the development.

- Ensure that all user concerns are addressed.
- Develop and implement a disaster recovery plan for NYC Serv in accordance with Directive 18

INTRODUCTION

Background

The Department of Finance (the Department) administers and enforces tax laws; collects taxes, judgments, and other charges levied by a number of City agencies and courts. The Department: educates the public about their rights and responsibilities with regard to taxes; processes parking summons; provides motorists with a forum to contest summons through an adjudication hearing; and collects court-ordered private and public sector debt.

In August 1995, to consolidate customer services by providing one-stop facilities where the public could make payments and pursue adjudicated hearings, the Department began a systems development project known as NYC Serv. On March 13, 1996, the Department solicited proposals from various vendors, and on September 17, 1997, it entered into a five-year contract with International Business Machines Corporation (IBM) to “re-engineer and support the consolidation of the licensing, payment and adjudication operations of the departments of Finance, Consumer Affairs, Health, Environmental Protection, the Department of Sanitation, and the Environmental Control Board.” IBM’s fees and reimbursements under the contract could not exceed \$33,919,252. IBM’s responsibilities included “workflow reengineering, system design, programming, testing, documentation, training and implementation, and providing equipment, software and maintenance services.”

The contract was subsequently amended three times. The first amendment was made subsequent to May 12, 1999, when “Stage 1” of the contract was complete; the amendment made additions to and changed the contract’s “Stage 2” deliverables. This amendment increased the total that IBM could be paid from \$33,919,252 to \$73,983,707. The second amendment, dated December 30, 1999, assigned certain responsibilities from IBM to its subcontractor, American Management Systems, Incorporated (AMS). This amendment did not alter the maximum amount to be paid; rather, it transferred a maximum of \$20,000,000 from IBM to AMS. The final amendment, dated January 9, 2002, was for IBM to provide additional services and equipment. This amendment brought the total fees and reimbursements that could be paid for the NYC Serve project, including the amount for AMS, to \$112,293,477.

The scope of work of the contract and amendments is shown in Table I following:

Table IScope of Work for NYCServ

Contract Date	Amount for IBM	Amount for AMS	Scope of Work
Initial Contract	\$33,919,252		IBM-Stage 1- Preliminary Requirements and Macro Level Design for the Payments, Hearings, Licensing, Permits, and Scofftow applications; Generate Cost-Benefit Analyses and Re-engineered work flows. IBM-Stage 2 – Development of Payments, Hearings, Licensing, Permits, Scofftow, Collector Workbench, Revenue Information Database, Network Infrastructure
Amendatory Agreement	\$40,064,455		IBM-Revision to scope of work for Payments, Adjudications, and Scofftow software application programs. Proposed architecture and the associated Shared Services definition, training plan description, and Audit and Collections software application.
Second Amendatory Agreement	(\$20,000,000)	\$20,000,000	AMS-Development of the Professional Audit Support System
Third Amendatory Agreement	\$38,309,772		IBM-Increases to and additions to services and equipment—additional maintenance and support, deployment of extra workstations, software, etc.
Sub-Total	\$92,283,433	\$20,000,000	
Total	\$112,283,433		

In addition, the Department entered into a contract with AMS on July 3, 2002, to operate and maintain NYCServ as well as other City mainframe systems at a maximum of \$156,439,192 for fees and reimbursements. Of this amount, \$80,299,763 was for NYCServ.

Objectives

The audit's objectives were to determine whether:

- NYCServ met the initial business and system requirements, as specified in the Request for Proposals (RFP);
- The overall system design allows for future enhancements and upgrades;
- NYCServ, as a finished product, will meet the overall goals as stated in the system justification;
- The developers followed a system development life cycle methodology; and
- The Department complied with all relevant Procurement Policy Board (PPB) Rules.

Scope and Methodology

Our fieldwork was conducted from October 2002 through April 2003. To achieve our audit objectives, we: (1) interviewed NYCServ Management Information Systems (MIS) staff; (2) performed walkthroughs of the Payments, Licenses, Permits, Adjudication, Professional Audit Support System (PASS), Collector's Workbench, and Scofftow applications; and (3) conducted user-satisfaction surveys on the Scofftow and the Payments applications; (4) reviewed system specification documents, contracts, purchase orders, and other system-related documentation.

We used the following as criteria in this audit: PPB Rules, the New York City Charter, New York City Comptroller's Internal Control and Accountability Directive #18, "Guidelines for the Management, Protection and Control of Agency Information and Information Processing Systems," and the National Institute of Standards and Technology (NIST) Special Publication #500-233, *A Framework for the Development and Assurance of High Integrity Software*

This audit was conducted in accordance with generally accepted government auditing standards (GAGAS) and included tests of the records and other auditing procedures considered necessary. This audit was performed in accordance with the audit responsibilities of the City Comptroller, as set forth in Chapter 5, § 93, of the New York City Charter.

Discussion of Audit Results

The matters covered in this report were discussed with Department officials during and at the conclusion of this audit. A preliminary draft was sent to Department officials and discussed at an exit conference held on May 28, 2003. On May 29, 2003, we submitted a draft report to Department officials with a request for comments. We received a written response from the Department on June 16, 2003. The Department described the steps that it has taken to improve the quality of its technology development projects. In addition, the Department stated that it would implement a disaster recovery plan for the system by March 2004. The full text of the Department's comments is included as an addendum to this report.

FINDINGS AND RECOMMENDATIONS

NYCServ met the Department's initial business and system requirements; the system design allowed for future enhancements and upgrades; and the Department generally complied with the City Charter and relevant PPB Rules when procuring services, equipment, and software for the system. The developers followed a system development life cycle methodology, and the Department provided independent quality assurance test groups to ensure that all NYCServ applications that have been implemented are functioning properly.

However, despite the Department's following a system development methodology and employing appropriate quality assurance personnel, the implementation of NYCServ has been delayed. Moreover, we do not know whether NYCServ will, as a finished product, meet the overall goals as stated in the system justification since certain applications have not been implemented. (Appendix I shows the current status of NYCServ development.) In addition, many of the system users who responded to our user-satisfaction survey stated that they were not satisfied with the Payments and Scofftow applications. Finally, contrary to Directive 18, the Department has no disaster recovery plan for NYCServ.

Delayed System Development

As previously stated, the Department's original plan was that NYCServ be fully operational in calendar year 2000. However, only one of 20 applications (scheduled to be implemented by the end of 2000) was completed on schedule. In fact, one application pertaining to license and permit applications and three other applications dealing with adjudication of violations have not been implemented. In addition, AMS is still upgrading the PASS System. The major causes of the delays in the development of NYCServ are as follows:

- *IBM had to redesign system reports and work screens because they had a different "look" for each agency.* From May through June 1998, IBM met separately with key users to gather suggestions for the re-engineering of required functions. However, in 1999, IBM created high-level designs without obtaining user signoffs; accordingly, when these designs were developed the user screens and system reports had a different look for each agency. Since one purpose of NYCServ was to consolidate functions so that each agency's screens and reports

were similar, IBM had to redesign these features, delaying the implementation of NYCServ beyond calendar year 2000.

- *IBM did not thoroughly test the system.* Because of the lack of testing by IBM, Department personnel who served as quality assurance user-testing groups discovered many problems that should have been identified and corrected by IBM during early stages of development.
- *The License and Permit applications to be used by two agencies were delayed.* Because Department of Consumer Affairs officials stated that they could not schedule their personnel to receive NYCServ training during regular work hours, the License and Permit applications meant for use by the Departments of Consumer Affairs and Health were delayed.
- *The Adjudication function of NYCServ was delayed.* Because VIP Ltd., with whom IBM sub-contracted to provide scanning services, went bankrupt early in calendar year 2000, IBM could not obtain VIP's program code. Therefore, IBM had to contract with another vendor who had to start the scanning process from the beginning.

User Satisfaction

Our survey revealed that some users were not satisfied with the system. However, as noted earlier, because some NYCServ applications were not completed at the time of our survey, indications of user satisfaction with the system may be misleading. To gain a better picture of NYCServ user satisfaction, we chose the Payments application and the Scofftow application for our survey since they had been processing information for the longest period.

We randomly selected 65 Payment users from the 151 users (as of March 14, 2003). Sixty-five percent of the 40 Payment system users who responded to our survey would like to see changes made to make the application it easier to operate. In addition, the survey disclosed that:

- 75 percent of the Payment users reported that the bar code equipment does not always function properly;
- 60 percent of the users stated that additional training on the system is needed; and
- 25 percent of the users complained that the system went down several times a day.

We also surveyed 52 of the 215 Scofftow system users (as of April 8, 2003). Thirty percent of the 44 individuals who responded stated that they are less productive since they began using the system because of the number of screens needed to process transactions. In addition:

- 25 percent of the Scofftow users stated that it is difficult to enter case information;

- 30 percent of the users stated that additional training on the system is needed; and
- 42 percent of the users indicated that the application could be more user-friendly.

Other Issue

Disaster Recovery Plan

The Department has no disaster recovery plan for the NYCServ applications that are in use. Directive 18, § 10.1, states: “A formal plan for the recovery of agency operations and the continuation of business after a disruption due to a major loss of computer processing capability is an important part of the information protection plan.” Since the system is critical to the finances of the City, it is important that the Department develops a Disaster Recovery Plan for NYCServ.

Recommendations

The Department should:

1. Ensure that the remaining applications are completed, tested, and implemented. For future system development projects, the Department should ensure that: users review and approve all system design specifications; sufficient testing is performed; and provisions are made to obtain source code for any software critical to the development

Department Response: “Finance has already taken several steps to improve the quality of its technology development projects. First, we have created a new Office of Technology Solutions (OTS), the mission of OTS is to identify, develop, and install the best possible technology to meet Finance’s business needs. By separating this development role from the data processing production (Information Systems Services division), both groups will be able to focus better on their responsibilities. Second, OTS has adopted an internationally recognized standard for developing computer applications. The Capability Maturity Model (CMM) was created by the Software Engineering Institute at Carnegie Mellon University in the 1990s and is now used by many organizations in government and industry to guide the development of large, complex technology projects. The CMM standard establishes five levels of maturity. Finance’s ACRIS project already has been certified at level 3 and will pursue level 4 certification for the next major release. AMS is in the process of identifying the changes needed to NYCServ to attain level 2 maturity. As OTS establishes itself as a CMM certifying organization, NYCServ and all technology projects at Finance will be managed at level 3 maturity.”

2. Ensure that all user concerns are addressed.

Department Response: “Part of the CMM initiative of OTS described above includes a formal Change Management program. Some elements of this Change

Management program are already in place for NYCServ, but when fully implemented, will include regular surveys of users to identify training needs and possible design changes to improve the user's productivity. In addition, the results of the surveys will be used to schedule refresher training sessions and to evaluate proposed design changes. Change Management already requires advanced notice of any changes in application performance, including descriptions of the changes. When substantial changes occur that require re-training, that training will be scheduled before the changes are installed. In addition, Finance is upgrading the Help Desk's capabilities to capture more information about user problems with the NYCServ application and to provide better responses to reported problems."

3. Develop and implement a disaster recovery plan for NYCServ in accordance with Directive 18.

Department Response: "Finance agrees with this recommendation and has begun to develop a disaster recovery plan, including, comprehensive testing of the implementation plan. We are scheduled to implement and have tested a disaster recovery plan by March 2004."

**Table II
NYCServ Applications**

Application	Description	Status
Customer Service Payments – Release 1	In-person payments for parking violations	Implemented January 28, 2002
Customer Service Payments – Release 2	In-person payments for ECB, DEP	Implemented July 14, 2002
Customer Service Payments For Licenses and Permits– Release 3	DOH and DCA cannot receive payments via NYCServ	Not Implemented
Adjudication Calendar	Ability to calendar judges for parking violation hearings	Implemented February 19, 2002
Adjudication Content Manager	Ability to store and retrieve digital images of Parking violations	Implemented June 1, 2002
Adjudication of Parking Violations, Hearings by mail	Conduct Parking Violation adjudication’s by mail via NYCServ	Implemented November 4, 2002
Adjudication of Parking Violations, Live Hearing at Payment and Adjudication Centers	For live parking violation hearings	Not Implemented
Adjudication of ECB	For live ECB hearings	Not Implemented
Adjudication of DOH, DCA, Commercial Adjudication Unit	For live DOH, DCA and Commercial Adjudication Unit/Fleet programs hearings	Not Implemented
Scofftow Assignments	Assigns marshals and sheriffs for towing	Implemented September 1,2000
Scofftow Case Tracking	Manages the cases associated with towing activity	Implemented August 1, 2001
Scofftow Sheriff Auctions	Enhanced functionality to manage the auctioning processes	Implemented March 1, 2002
Internet Parking Violations, Property, DEP Inquiry, Interim Payment Violation Payments	Ability to inquire on the Internet about debt owed the city and to pay for violations using credit cards	Implemented February 1, 2002
Internet DOH, DCA, and ECB Inquiry	Ability to inquire on the Internet about debt owed	Implemented June 14, 2002
Internet Payments	Ability to make Internet payments using credit cards through NYCServ channels. Integration with NYCServ back office processing	Implemented August 27, 2002
Revenue Information Database (RID)	Data base to support the PASS and Collectors Work Bench	Implemented January 1, 2001
Shared Services	Underlying software such as legacy integration and security components	Implemented January 15, 2001
Interactive Voice Response, Call Path, and Help Center	User Support functions	Implemented
Professional Audit Support System (PASS)	Online modeling and case selection	Implemented October 30, 2002
	View transaction detail and view financial detail.	Not Implemented
	Allows the users the ability to apply dollar penalties manually.	Not Implemented
Collector’s Workbench	Help collector’s consolidate all fines associated with an individual	Implemented October 20, 2002



**FINANCE
NEW • YORK**
THE CITY OF NEW YORK
DEPARTMENT OF FINANCE

BY FAX AND HAND-DELIVERY

June 13, 2003

Mr. Greg Brooks
Deputy Comptroller
Office of the Comptroller
1 Centre Street
New York, NY 10007

Re: Audit # 7A03-113

**Draft Audit Report on the Development and Implementation
of the NYCServ Project by the Department of Finance**

Dear Mr. Brooks,

I am writing in response to your draft report on the above-captioned audit.

Thank you for your audit recommendations. The audit was helpful to our operations because it highlights areas where we can improve. The draft report suggests that Finance implement three recommendations. Below are the recommendations made in the draft report, and Finance's comments:

The Department of Finance should:

1. Ensure that the remaining applications are completed, tested, and implemented. For future system development projects, the Department should ensure that: users review and approve all system design specifications; sufficient testing is performed; and provisions are made to obtain source code for any software critical to the development.

Finance has already taken several steps to improve the quality of its technology development projects. First, we have created a new Office of Technology Solutions (OTS), the mission of OTS is to identify, develop, and install the best possible technology to meet Finance's business needs. By separating this development role from the data processing production (Information Systems Services division), both groups will be able to focus better on their responsibilities. Second, OTS has adopted an internationally recognized standard for developing computer applications. The Capability Maturity Model (CMM) was created by the Software Engineering Institute at Carnegie Mellon University in the 1990s and is now used by many organizations in government and industry to guide the development of large, complex technology projects. The CMM standard establishes five levels of maturity. Finance's ACRIS project already has been certified at level 3 and will pursue level 4 certification for the next major release. AMS is in the process of identifying the changes needed to NYCServ to attain level 2 maturity. As OTS establishes itself as a CMM certifying organization, NYCServ and all technology projects at Finance will be managed at level 3 maturity.

2. Ensure that all user concerns are addressed.

Part of the CMM initiative of OTS described above includes a formal Change Management program. Some elements of this Change Management program are already in place for NYCServ, but when fully implemented, will include regular surveys of users to identify training needs and possible design changes to improve the user's productivity. In addition, the results of the surveys will be used to schedule refresher training sessions and to evaluate proposed design changes. Change Management already requires advanced notice of any changes in application performance, including descriptions of the changes. When substantial changes occur that require re-training, that training will be scheduled before the changes are installed. In addition, Finance is upgrading the Help Desk's capabilities to capture more information about user problems with the NCYServ application and to provide better responses to reported problems.

3. Develop and implement a disaster recovery plan for NYCServ in accordance with Directive 18.

Finance agrees with this recommendation and has begun to develop a disaster recovery plan, including, comprehensive testing of the implementation plan. We are scheduled to implement and have tested a disaster recovery plan by March 2004.

If you have any questions concerning this response, please feel free to call me at
(212) 669-4878.

Sincerely,

A handwritten signature in cursive script that reads "Carla Van de Walle".

Carla Van de Walle

cc: Martha E. Stark, Commissioner, Department of Finance
George Davis, III Deputy Director, Mayor's Office of Operations
Anna Bacchia, Director, Internal Audit, Department of Consumer Affairs