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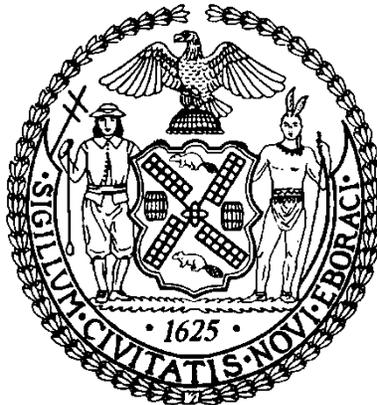# OFFICE OF THE COMPTROLLER
John C. Liu
COMPTROLLER

IT Audit and Research
Tina Kim
Deputy Comptroller for Audit

Audit Report on the
Development and Implementation of the
Computer Assisted Mass Appraisal System
by the Department of Finance

7A11-126

April 12, 2012

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

John C. Liu
COMPTROLLER

April 12, 2012

To the Residents of the City of New York:

My office has audited the Department of Finance (DOF) to determine whether the agency's implementation of the Computer Assisted Mass Appraisal (CAMA) system as a finished product will meet the overall goals as stated in the system justification and meet the initial business and system requirements. We audit entities such as DOF as a means of ensuring that systems and technological resources of City agencies are cost-effective, efficient, secure, and operate in the best interest of the public.

DOF expected that the off-the-shelf CAMA package with modifications would be implemented in 2007; however, DOF encountered problems during system development and testing. As a result, the implementation was delayed until August 2010, which was three years behind schedule. DOF has also identified numerous changes necessary for system enhancement.

CAMA generally met the initial business and system requirements. However, we found that CAMA used inappropriate comparable properties to assess the valuation of condominiums and cooperatives, which may affect their current market value assessments.

Additionally, the result of our user satisfaction survey revealed that 80 percent of the regular users stated they would like to see changes made to CAMA. We found 33 percent of the respondents rarely or never used CAMA, but these inactive users were not disabled or deleted from the system. Finally, we found DOF does not have a formal business continuity plan to bring the system up in the event of emergency or system failure.

The results of the audit have been discussed with DOF 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
IT Audit and Research

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AUDIT REPORT IN BRIEF

The Department of Finance (DOF) collects City revenues, calculates the value for all real property in the City, and maintains accurate property records. New York State and City real estate law is applied each year by DOF's Property Division to estimate the value of every New York City residential and commercial property.

In 2007, DOF entered into a $4.3 million contract (covering the period February 2007 to January 2010) with Vision Appraisal Technology, Inc. to develop a new system, Computer Assisted Mass Appraisal (CAMA), to collect property-related information and perform valuation calculations. Since August 2010, CAMA has been used by DOF in its annual valuations. Once CAMA determines market value for the properties, the values are then transferred to Real Property Assessment Data (RPAD) to determine the assessed value for tax purposes. In 2010, DOF renewed the contract for an additional $734,204 to provide training, software license, and maintenance for CAMA from February 2010 to January 2012. The current audit focused on DOF's implementation of CAMA and whether it will meet the initial business and system requirements, and overall goals. We are conducting a separate audit to determine specifically whether DOF, in using CAMA, properly calculated Tax Class 2 property values (*Audit Report on the Valuation of Class 2 Properties by the New York City Department of Finance*, FN11-130A).

Audit Findings and Conclusions

CAMA generally met the initial business and system requirements and the overall goals as stated in the system justification. DOF expected that the off-the-shelf CAMA package with modifications would be implemented in 2007; however, DOF encountered problems during system development and testing. As a result, the implementation was delayed until August 2010, which was three years behind schedule. DOF has also identified numerous changes necessary for system enhancement. The estimated amount for completion of these changes is $3.5 million with an additional $90,160 for annual maintenance.

We found that CAMA used inappropriate comparable properties to assess the valuation of condominiums and cooperatives, which may affect their current market value assessments.

Additionally, the result of our user satisfaction survey revealed that 80 percent of the regular users stated they would like to see changes made to CAMA. We found 33 percent of the respondents rarely or never used CAMA, but these inactive users were not disabled or deleted from the system. Finally, we found DOF does not have a formal business continuity plan to bring the system up in the event of emergency or system failure.

Audit Recommendations

DOF should:

- Monitor and ensure all future system developments are completed on schedule.

- Ensure all problems and concerns reported by the users on the Clear Quest (CQ) log are addressed in Phase II agreement.

- Ensure CAMA selects appropriate comparable properties for annual valuations.

- Review and modify its criteria when selecting comparable properties.

- Ensure that the user concerns identified in the report are addressed.

- Conduct periodic surveys to ensure that their concerns are addressed.

- Develop written policies and procedures for tracking system users and terminating inactive users. In addition, DOF should periodically review the status of inactive user accounts and terminate access when appropriate.

- Develop a formal business continuity plan for CAMA. Periodically update the plan to ensure that it functions as intended and is adequate to quickly resume computer operations without material loss of data.

Agency Response

In their response, DOF officials agreed with three recommendations and partially agreed with two recommendations dealing with the results of our user survey and the need to create formal plans for business continuity and disaster recovery. DOF disagreed with three recommendations dealing with problem resolution in the Phase II agreement, the need for periodic user surveys, and the need to create written policies and procedures.

INTRODUCTION

Background

DOF collects City revenues, calculates the value for all real property in the City, and maintains accurate property records. In accordance with New York State and City real estate law, DOF's Property Division estimates the value of every New York City residential and commercial property on an annual basis. The laws require DOF to assign every property to one of four real property tax classes. Class One consists of one, two, and three family residential properties and small condominiums. Class Two is all other residential property, including multi-family, cooperatives, and condominiums. Class Three is specific types of property owned by utility companies subject to governmental supervision. Class Four is all other commercial property, such as office buildings, factories, stores, lofts, and vacant land.

Prior to CAMA, DOF used the Cole Layer Trumble (CLT) application, running in a mainframe environment, to assess more than one million properties annually. This system was used to perform valuation calculations and determine the market value of properties. In conjunction with CLT, RPAD was the repository for all tax lot data used for assessment and exemption calculations. The RPAD interface involves the passing and updating of information such as assessed values, abatement calculations, apportionments, mergers, new parcels, and other descriptive data.

In 2007, DOF entered into a $4.375 million contract (covering the period February 2007 to January 2010) with Vision Appraisal Technology, Inc. to develop CAMA to replace CLT. The new system was expected to be available in September 2007 for the 2007/2008 valuation period. The term of the contract, which included maintenance, was for three years.

CAMA has been used by DOF in its annual valuations since its implementation in August 2010. CAMA collects property-related information and performs valuation calculations. Once CAMA determines market value for the properties, the values are then transferred to RPAD to determine the assessed value for tax purposes. In 2010, DOF renewed the contract for an additional $734,204 to provide training, software license, and maintenance for CAMA for the period February 2010 to January 2012.

The current audit focused on DOF's implementation of CAMA. We are conducting a separate audit to determine specifically whether DOF, in using CAMA, properly calculated Tax Class 2 property values (*Audit Report on the Valuation of Class 2 Properties by the New York City Department of Finance*, FN11-130A).

Objectives

The objectives of the audit are to evaluate the progress of DOF toward the implementation of CAMA and to determine whether CAMA:

1. As a finished product will meet overall goals as stated in the system justification and
2. Meets the initial business and system requirements.

        Office of New York City Comptroller John C. Liu

Scope and Methodology Statement

We conducted this performance 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 that 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.

The scope of this audit was from inception of CAMA in 2007 to the present. 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 DOF officials during and at the conclusion of this audit. This preliminary draft report was sent to DOF officials and was discussed at an exit conference held on January 20, 2012. On January 27, 2012, we submitted a draft report to DOF officials with a request for comments. We received a written response from DOF on February10, 2012. In their response, DOF officials agreed with three recommendations and partially agreed with two recommendations dealing with the results of our user survey and the need to create formal plans for business continuity and disaster recovery. DOF disagreed with three recommendations dealing with problem resolution in the Phase II agreement, the need for periodic user surveys, and the need to create written policies and procedures.

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

FINDINGS AND RECOMMENDATIONS

CAMA generally met the initial business and system requirements and the overall goals as stated in the system justification. DOF expected that the off-the-shelf CAMA package with modifications would be implemented in 2007; however, DOF encountered problems during system development and testing. As a result, the implementation was delayed until August 2010, which was three years behind schedule. DOF has also identified numerous changes necessary for system enhancement. The estimated amount for completion of these changes is $3.5 million with an additional $90,160 for annual maintenance. After the exit conference, DOF provided a revised Phase II estimate with a proposed amount of $1.4 million with a possible $300,000 in a discount provided by Vision Technologies.

We also found that inappropriate comparable properties were used to assess the valuation of condominiums and cooperatives, which may affect their current market value assessments.

Additionally, the result of our user satisfaction survey revealed that 80 percent of the regular users stated they would like to see changes made to CAMA. We found 33 percent of the respondents rarely or never used CAMA, but these inactive users were not disabled or deleted from the system. Finally, we found DOF does not have a formal business continuity plan to bring the system up in the event of emergency or system failure.

CAMA is Behind Schedule

The original contract to develop CAMA stated that the new system was to replace CLT as composed of a commercial off-the-shelf package with software customization. DOF expected CAMA to be available in September 2007 for the 2007/2008 valuation period. The original contract amount for CAMA was $4.375 million. In 2010, DOF signed a renewal agreement for $734,204 to provide training, software license and maintenance from February 2010 to January 2012.

The original contract specified tasks and deliverables during the project, which included Income and Expense Analysis, Cost Trend Analysis, and Sales Analysis depending on property type and tax class for valuation. The new system was expected to enhance access security at the application screen and field levels to ensure assessors and other DOF personnel only have access to property records and fields they need in order to complete assigned tasks.

DOF expected that the off-the-shelf CAMA package with modifications would be implemented in 2007. However, DOF encountered problems during system development and testing. As a result, the implementation was delayed until August 2010, which was three years behind schedule.

> ***DOF Response:*** DOF stated: "Since the Vision system was bought on-line in three years from the date of purchase, it is a mischaracterization to suggest there was a three year delay in project implementation. DOF agrees with the auditors that it was not realistic to expect that a commercial assessment application could be used without substantial

modification in New York City's complex real estate market. Nonetheless, the system went on-line only three years after it was purchased."

Auditor Comment: DOF initially expected the system to go on-line in 2007. The system went on-line in 2010. Further, in its response, DOF agrees that it was not realistic to expect Vision to be brought on-line immediately. We are, therefore, perplexed as to how one could conceive that we mischaracterize a delay in implementation. When an entity buys an off-the-shelf application, the expectation is that the application's functionality was assessed and analyzed, deemed appropriate to meet the demands of the user, and will be implemented for immediate use. This was not the case as DOF confirms it took three years to go on-line. Therefore, one would question whether the planning and assessment of the application was adequate.

Recommendation

DOF should:

1. Monitor and ensure all future system developments are completed on schedule.

DOF Response: DOF agreed with this recommendation.

Phase II and System Enhancement

DOF and its consultants created the Clear Quest (CQ) log to record problems faced by the users. While in system development and production, as of October 2011, users reported 338 issues on the CQ log. These issues were later included in upgrades to the current CAMA system or identified as Phase II. Some problems included issues with adjustments on the property information and income summary screen. For example, users were unable to make income summary entries while in edit mode. Users also reported that CAMA does not allow two users to view the same parcel at the same time. In addition, CAMA does not update the primary address on the parcel address screen when users change addresses on the account information screen.

DOF has identified 32 critical Phase II items and seven recommendations for system enhancement. Phase II critical items include adding filters, the ability to print screens directly from CAMA, flexibility in the choice of comparable data, and screen redesign to enhance workflow and permissions.

In November 2011, we requested an updated CQ log from DOF with any changes that had occurred since October. However, we did not receive an updated log until the date of the exit conference, January 20, 2012. That log indicated that 306 items of 341 items reported had been resolved. However, DOF did not provide this information until after field work had ended. We could not verify if these items were, in fact, resolved.

DOF Response: DOF stated "The audit report states that the auditors did not receive an updated CQ log list until January. In fact, the auditors were given access to the Sharepoint site where the CQ log resides on October 5, 2011."

Auditor Comment: DOF is being disingenuous. The auditors had access to the Sharepoint site in October 2011, when we noted that there were 338 items. At the exit conference, DOF informed us that they had just updated the CQ log on the Sharepoint site. The updated CQ log indicated that there were 341 items reported. However, as previously stated, we could not verify if these items were, in fact, resolved.

CAMA Phase II plans to integrate Geographic Information System data, which is used to map the location of the property. DOF is in the process of entering a new contract with the consultant. The estimated amount for completion of Phase II and system enhancements is $3.5 million. DOF also expects to pay $90,160 in annual maintenance for these changes.

After the exit conference, DOF provided a revised Phase II estimate with a proposed amount of $1.4 million with what they claim is a possible $300,000 in a discount provided by Vision Technologies. Based on what was provided, it appears that several system enhancements are excluded in the Phase II development, such as public access on-line for Geographic Information System Module. DOF did not provide this information until after fieldwork had ended and the documentation provided included only the appendix of a request to the Office of Management and Budget. The documentation did not include the narrative of the request or any information from the vendor. We, therefore, can place only limited reliance on this documentation.

DOF Response: DOF states "DOF informed the auditors that we had negotiated with Vision to obtain enhancements at a total cost of $1.1 million, and that we had submitted a request to OMB for funding to obtain these enhancements . . . the audit states that DOF plans to spend an additional $3.5 million on Vision. We have informed the auditors that DOF did not agree to the vendor's proposal; the document does not reflect the work we determined was necessary to enhance the Vision application or the pricing we had agreed to. We anticipate the auditors will delete this false statement from the report."

Auditor Comment: On October 20, 2011, DOF officials provided us with a $3.5 million preliminary draft of the Phase II agreement with the vendor, which included the implementation of a GIS module. At the exit conference on January 27, 2012, we were informed that DOF did not agree to the preliminary agreement. After the exit conference, DOF provided a revised Phase II estimate with a proposed amount of $1.4 million with what it claims is a possible $300,000 in a discount provided by Vision Technologies. However, this new proposed agreement excluded several corrections to the system deficiencies that were recommended by the Property Division and Finance Information Technology Division. All corresponding expenses should be incurred to meet the corrections for the noted deficiencies. Furthermore, as noted in the report text, "the documentation provided included only the appendix of a request to the Office of Management and Budget. The documentation did not include the narrative of the request

or any information from the vendor. We therefore can place only limited reliance on this documentation."

Recommendation

DOF should:

2. Ensure all problems and concerns reported by the users on the CQ log are addressed in Phase II agreement.

DOF Response: DOF disagreed, stating "All critical and high priority bugs were resolved and all items listed in the CQ log were addressed. However, DOF does not agree that all wish list items included in the CQ log should be included as enhancements to the application."

Auditor Comment: The updated CQ log indicated that 306 items of 341items had been resolved. However, DOF did not provide this information until the exit conference. We could not verify if these items were, in fact, resolved. Furthermore, items reported on the CQ log reflect user concerns with system errors of CAMA while only 20 percent of the items reported were low priority. DOF should include all potential corrections and any necessary changes for system enhancement as part of Phase II as a way of using the process of checks and balances to further ensure the integrity of the system.

<u>Inappropriate Comparable Data and</u>
<u>Inadequate Criteria for Comparable Properties</u>

DOF stated that comparable properties that were an exact match to the subject borough and style were selected to determine the current market value for condominiums and cooperatives. DOF further stated that the comparable valuation uses three criteria: distance from parcel to subject building, gross building area, and year built. The distance criterion is assigned the greatest weight.

To determine if CAMA selects comparable property using the criteria for valuation, we randomly selected 50 properties for review. We found that inappropriate comparable properties were used to assess the valuation of condominiums and cooperatives, which may affect their current market value assessments. We found four of 50 cases where the style criteria were either missing or did not match the subject property (see Table I).

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Table I
Style Comparison

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	Valuation Property	**Comparable Property 1**	**Comparable Property 2**	**Comparable Property 3**	**Comparable Property 4**	**Comparable Property 5**
Case #1	A01[1]	A01	N	A01	A01	
Case #2	N[2]	N	N	N	N	N
Case #3	N	N	N	A01		
Case #4	N	N	N	N	N	

DOF Response: DOF stated "Two 'style' cases cited in the audit report are a mistake by the auditors. In both cases, the style was an exact match at the time the subject property was valued. The styles of the two comparables at question were changed in Vision between the property valuation and the time the auditors looked at the Vision screens . . . The auditors were provided with the documentation demonstrating that the building style was correct at the time it was valued."

Auditor Comment: DOF did not provide documentation to support reference case #3. DOF provided documentation for case #1; however, we reviewed the documentation and found that the assessor did not update the comparable property correctly. The User Audit Log indicated that the property was subdivided into 3 lots (3-37014-1 parking lot, 3-7014-2 building, and 3-7014-3 parking lot) in August 2011. The assessor visited the field in October 2011 and did not update the record to reflect the changes on the comparison lot correctly. The 3-37014-1 parking lot was erroneously selected from CAMA for comparison.

DOF Response: DOF also stated "Since the style field has not been consistently updated over the years, DOF did not use style as a criterion in selecting comparable properties for the 2011/2012 roll."

Auditor Comment: We received an email from DOF on January 24, 2012 stating "We would like to clarify that **…** Style was an 'exact match' in the comps last year for coops & condos (We erroneously stated in our exit conference that comps were not an exact match for style)." DOF has contradicted itself at the exit conference and in its response whether they use the style as a comparable criterion.

We also found seven of 50 cases that use incomparable properties of different building classifications (see Table II). We found a property with a D4 building class (elevator cooperative) compared to a property with a G7 building class (unlicensed parking lot). We also found a property with a C6 building class (walk-up cooperative) compared to a property with an I7 building class (adult care facility).

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[1]Style A01—High rise apartment.
[2] Style N—None

According to DOF officials, cooperatives and condominiums are not compared with properties of the same building classification. For example, a walk-up cooperative may be possibly compared to a professional building or one-story store building. However, DOF should review and modify criteria when selecting comparable properties to include similar building classification and to avoid incomparable building classifications such as parking lots and adult-care facilities.

Table II
Incomparable Building Classifications

	Valuation Property	Comparable Property 1	Comparable Property 2	Comparable Property 3	Comparable Property 4	Comparable Property 5
Case #1	D4 Elevator cooperative	L8 Loft with retail stores other than type one	D5 Elevator Apt.; converted	C7 Walk-up Apt.; over six families with stores	C7 Walk-up Apt.; over six families with stores	D9 Elevator Apt.; Miscellaneous
Case #2	D4 Elevator cooperative	D1 Elevator Apt.; semi-fireproof without stores	G7 Unlicensed parking Lot	D1 Elevator Apt.; semi-fireproof without stores	D7 Elevator Apt.; semi-fireproof with stores	
Case #3	C6 Walk-up Cooperative	C1 Over six families without stores	K1 Store building; one story	C1 Over six families without stores	O7 Professional Building	K1 Store building; one story
Case #4	C6 Walk-up Cooperative	K1 Store building; one story	D7 Elevator Apt.; semi-fireproof with stores	D1 Elevator Apt.; semi-fireproof without stores		
Case #5	C6 Walk-up Cooperative	I7 Adult care facility	C1 Over six families without stores	C7 Walk-up Apt.; over six families with stores	C7 Walk-up Apt.; over six families with stores	
Case #6	C6 Walk-up Cooperative	I7 Adult care facility	C1 Over six families without stores	C7 Walk-up Apt.; over six families with stores	S9 Single or multiple dwelling with stores or offices	
Case #7	C6 Walk-up Cooperative	C1 Over six families without stores	I7 Adult care facility	C1 Over six families without stores	C1 Over six families without stores	

In addition, CAMA did not display the distance between the subject parcel and the comparable property on the screen, which is the main criteria to select comparable properties. Without this information displayed, we could not determine whether the selection provided from CAMA is in close proximity.

On DOF's website, we located the *Comparable Rental Income for Condominiums and Cooperatives for fiscal year 2011/2012*, which provided the distance for the comparable property for Condominiums and Cooperatives. We analyzed this file to determine if the comparable data is as close as possible to the address or within a reasonable distance. We found cases where condominiums and cooperatives were compared to properties from three to nine miles away. For example, a cooperative in Alphabet city in Manhattan was compared to a property in Washington

Heights, a distance of nine miles. Additionally, a condominium in Flushing, Queens, was compared to a property in Far Rockaway, a distance of nine miles. Inappropriate comparable properties used for valuation may affect a property's current market value.

Because the distance is the greatest weight, CAMA should provide a nearby property for valuation of condominiums and cooperatives. DOF should review and modify its criteria when selecting comparable properties to include a maximum range for distance. (Please refer to our *Audit Report on the Valuation of Class 2 Properties by the New York City Department of Finance*, FN11-130A for additional information regarding DOF's calculation of Tax Class 2 property values).

Recommendations

DOF should:

3. Ensure CAMA selects appropriate comparable properties for annual valuations.

4. Review and modify its criteria when selecting comparable properties.

DOF Response 3 and 4: DOF agreed that "continual improvement of the modeling criteria for selection of comparable properties is appropriate."

User Satisfaction Survey

As part of our audit, we conducted a user-satisfaction survey (see Appendix) of all CAMA users. Based on our request, DOF provided a list of current CAMA users (262 users). As of November 18, 2011, we received 132 returned responses.

We found that 88 of 132 respondents are regular users. Of these regular users, 80 percent would like to see changes made to the system. The respondents noted concerns, which included no print screen functions, entering of repetitive data, and inaccurate data on the system. The suggested changes include providing more training, developing more user-friendly screens, and improving the accuracy of the data. In addition, 52 percent of respondents reported CAMA problems to their team leader and 19 percent of these respondents were dissatisfied with the problem's resolution.

Furthermore, of the regular users:

- 52 percent (46 users) felt that they would like more training.

- 49 percent (44 users) reported that the information displayed is not easy to work with or difficult to work with.

- 34 percent (30 users) found it not easy or difficult to enter the data into the system.

DOF Response: "We were disappointed that the user survey did not ask any questions comparing the old CLT system to the new Vision system. We were also disappointed that the auditors did not provide results with enough information to be useful for DOF management."

Auditor Comment: We submitted the user satisfaction survey to DOF before we sent the surveys to the users. However, DOF did not have any concerns, comments, or feedback to the survey at that time. Nevertheless, the survey identified helpful users' concerns, which included no print screen functions, entering of repetitive data, and inaccurate data on the system.

Recommendations

DOF should:

5. Ensure that the user concerns identified in the report are addressed.

DOF Response: DOF partially agreed, stating that "Many of the recommendations contained in the survey are too vague, such as "Information displayed is not easy to work with." Another concern cited in the audit report was "inaccurate data," which is not a CAMA specific issue and one that is constantly being addressed. Other concerns identified in the audit report will be addressed through ongoing training for users."

Auditor Comment: As previously stated, we submitted the user satisfaction survey to DOF before we sent the surveys to the users. However, DOF did not have any concerns, comments, or feedback to the survey at that time. Our satisfaction survey was intended to serve as guidance to DOF management and reflects general concerns of the users. DOF Property and Quality Assurance divisions should collaborate and make an effort to ensure that all users concerns are resolved. This should enhance CAMA's ability to provide accurate data for annual valuations.

6. Conduct periodic surveys to ensure that their concerns are addressed.

DOF Response: "DOF does not agree that periodic surveys are useful. We agree that it is good to get ongoing, meaningful and honest feedback and we will continue to encourage discussions between assessors, supervisors and management."

Auditor Comment: DOF's response is perplexing as it states, "we will continue to encourage discussions between assessors, supervisors and management." DOF officials are suggesting that unstructured discussions among user and management are a better approach for identifying problems than structured periodic surveys. Surely the issue should be to obtain as much useful reliable feedback as possible to ensure that user concerns are addressed. Conducting periodic surveys encourages users to provide reliable feedback.

User Accounts not Adequately Controlled

We found that 33 percent of the user survey respondents indicated that they have either rarely or never used the system. However, these inactive users were not deleted or disabled from the system. User accounts should be assigned to appropriate personnel to perform their function. DOF officials should regularly review, update, and monitor the user accounts.

To determine whether the user IDs belong to authorized active employees, we compared the list of DOF user accounts (last name and first name) with DOF employees listed under the New York City Payroll Management System (PMS) database. We found 24 users were retired, terminated, or on leave, even though they are on the current user list. DOF should maintain an up-to-date user list.

Recommendation

DOF should:

7. Develop written policies and procedures for tracking system users and terminating inactive users. In addition, DOF should periodically review the status of inactive user accounts and terminate access when appropriate.

DOF Response: DOF disagreed, stating "We already have strong controls in place. DOF will continue to implement its internal controls for user accounts. DOF will offer additional training for infrequent users in other agencies to maximize the full potential of the new CAMA system."

Auditor Comment: Although DOF believes its internal controls are sufficient, in an external report and several previous Comptroller's audits, it was reported that DOF has not had adequate controls over its user access identification since June 2007. In addition, 33 percent of user respondents that indicated they have either rarely or never used the system still have access to CAMA. Further, DOF does not maintain an up-to-date user list. We found 24 users were retired, terminated, or on leave, even though they are on the current user list. Consequently, we reiterate our recommendation.

No Formal Business Continuity Plan

The Department of Information Technology and Telecommunications (DoITT) *Application Development Security Policy* states, "Each new application must create a business continuity and disaster recovery program in accordance with the business significance of the application."

DoITT is responsible for the disaster recovery for DOF. However, DOF does not have a formal agency-wide business continuity plan to bring CAMA up in the event of emergency or system failure. A business continuity plan should include: the contact list of personnel to continue system operations, updated lists of critical files, instructions to follow in the event of

emergency, actions to be taken for hardware failure, and procedures to determine whether an event is sufficiently serious to invoke DoITT's disaster recovery process. While DOF has instructions on how certain tasks will be accomplished, DOF could not produce a centralized document that included all the elements set forth by DoITT.

DOF should develop and periodically review the plan to ensure that the business continuation plan remains current. Without a formal business continuity plan for CAMA, DOF is vulnerable to the loss of critical information in the event of a disaster.

Recommendation

DOF should:

8. Develop a formal business continuity plan for CAMA. Periodically update the plan to ensure that it functions as intended and is adequate to quickly resume computer operations without material loss of data.

    DOF Response: DOF partially agreed, stating "DOF performs regular data back-ups and is actively working with OEM and DOITT on plans for business continuity and disaster recovery."

DETAILED SCOPE AND METHODOLOGY

We conducted this performance 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 that 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.

The scope of this audit was from the inception of CAMA in 2007 to the present. Our fieldwork was performed from May 2011 to November 2011. To achieve our audit objectives, we conducted a system walk-through to review how CAMA functions and interviewed various DOF officials from the Property Division and the Finance Information Technology Division.

To review the process for valuation of City properties, we obtained DOF's Organization Chart for Property Division, specification documents, correspondence with DOF and the contractor, and other system-related documentation. We also analyzed *Instructions to Assessors Business Rules for 2011/2012 Valuation* and DOF operating policies and procedures for CAMA.

Additionally, we reviewed DOF's *Standard Operating Procedure for Administering Access Permissions for CAMA* and tested whether CAMA has adequate access controls and complied with DoITT's *Password Policy*. We also reviewed DOF's disaster-recovery and contingency-planning process for CAMA to determine if measures were adequate according to DoITT's *Application Development Security Policy*.

To verify the reliability of the data recorded in the database, we compared the information recorded on CLT to the information on CAMA. We selected 50 samples for Fiscal Year 2011 and 2012 to verify whether the data was consistent. Our comparative analysis included property information, tax class, building classification, total units on the property if applicable, and property address.

We examined an additional 50 samples to determine if CAMA selects comparable property using the criteria for valuation. We also analyzed the *Comparable Rental Income for Condominiums and Cooperatives for fiscal year 2011/2012* reported on the DOF website to determine if the comparable data is within a reasonable distance.

We conducted a User Satisfaction Survey to determine whether users were satisfied with CAMA and what changes they would recommend are made to the system. Our survey was sent to all 262 current users that DOF identified. We examined the CAMA users list by comparing it to the PMS to determine whether employees no longer working for the agency have access to CAMA.

USER SATISFACTION SURVEY

Name: _____ **Office Title:** _____

CAMA User ID: _____ **Borough** _____ **Location** _____

1. **How often do you use CAMA?**

   A. Daily

   B. At least once a week

   C. A few times a month

   D. Rarely

   E. Never

2. **When was the last time you logged in to CAMA?**

   A. Less than a week ago

   B. More than a week ago

   C. More than a month ago

   D. More than three months ago

   E. Never

3. **Were you offered training sessions?**

   A. Yes

   B. No

4. **If yes, did you attend all training sessions offered to you?**

   C. Yes

   D. No

5. Which of the following best describes your training?

   A. The training was sufficient and I am comfortable using the system.

   B. The training was sufficient at the time, but I need more now.

   C. The training was not sufficient at the time, but I have learned what I need to know.

   D. The training was not sufficient and I still need more.

6. How would you describe CAMA's availability *(the ability to access the system)***?**

   A. The system is often available.

   B. The system is often unavailable.

7. How do you feel about the layout of the information displayed in the CAMA screens?

   A. The information is displayed in an order format that is very easy to work with.

   B. The information is somewhat easy to work with.

   C. The information displayed is not easy to work with, but is manageable.

   D. The information displayed is difficult to work with.

8. How would you describe CAMA' audit reporting capabilities?

   A. The reporting features always meet my needs.

   B. The reporting features usually meet my needs.

   C. The reporting features seldom meet my needs.

   D. I do not have access to reporting features.

9. How would you rate the accuracy of the data in CAMA?

   A. The data are always accurate.

   B. The data are somewhat accurate.

   C. The data are somewhat inaccurate.

   D. The data are often inaccurate.

10. How would you rate the process of entering the data into the system?

   A. Very easy to enter the data.

   B. Somewhat easy to enter the data.

   C. At times, not easy to enter the data.

   D. I find it difficult to enter the data

   E. N/A

11. How would you rate CAMA overall ease of use?

   A. CAMA is very easy to use.

   B. CAMA is somewhat easy to use, but I would like to see changes made to it.

   C. CAMA is somewhat difficult to use, and I would like to see some changes made to it.

   D. CAMA is very difficult to use.

12. Have you reported CAMA problems to your team leader within the last 60 days?

   A. Yes

   B. No

13. If yes, how satisfied are you with the resolution of your reported problem?

   A. Very satisfied with the problem's resolution.

   B. Somewhat satisfied with problem's resolution.

   C. Somewhat dissatisfied with the problem's resolution.

   D. Very dissatisfied with the problem's resolution.

14. Are the problems resolved in a timely manner?

    A. Within 24 hours

    B. Within 48 hours

    C. Within a week

    D. Less than a month

    E. A month or more

    F. Never resolved

15. In the space provided below, (i.) please state what you like or dislike about CAMA, (ii.) state how you would like to improve CAMA, (iii.) and please provide any other suggestions or comments that you may have about CAMA.

NYC

Finance

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February 10, 2012

H. Tina Kim
Deputy Comptroller for Audit
One Centre Street, 11th Floor
New York, NY 10007
Sent via e-mail: tkim@comptroller.nyc.gov

Re: **Draft Audit Report on the Development and Implementation of
the Computer Assisted Mass Appraisal System by the
Department of Finance (7A11-126)**

Dear Deputy Comptroller Kim:

I. Introduction

The Department of Finance (DOF) appreciates the Comptroller's
conclusion that "CAMA generally met the initial business and system
requirements and the overall goals as stated in the system justification."

The computer assisted mass appraisal system (CAMA) created by Vision
Government Solutions Inc. (Vision) replaced a mainframe CAMA system
created by a company known as Cole Layer Trumble (CLT) used by the
Department of Finance since the 1980's. Vision contained a number of
substantive improvements over the CLT system, including:
- Robust audit trail
- Enhanced reporting capability
- Modeling capability
- Condominium information
- Line-item information for income and expense valuation
- Comparable property modeling module

The Vision system formed a foundation for more efficient use of city
staff/resources, increased transparency to the public, more consistent and
less subjective valuations and improved accountability.

II. Comments on the Report

A. CAMA Behind Schedule

Since the Vision system was brought on-line in three years from date of
purchase, it is a mischaracterization to suggest there was a three year delay in
project implementation. DOF agrees with the auditors that it was not realistic
to expect that a commercial assessment application could be used without

substantial modification in New York City's complex real estate market. Nonetheless, the system went online only three years after it was purchased.

The auditors have over-stated the amount the City spent on CAMA. DOF's total spending on the Vision system from 2007 to January 2012 was $4.418 million, not $5.109 million as claimed by the audit. This information was provided to the auditors and is available in the City's financial systems.

Audit Recommendation:

1. Monitor and ensure all future system developments are completed on schedule.

DOF agrees, to the extent that realistic system development schedules are set, they should be met.

B. Phase II and System Enhancement

CQ log
The CQ log was used to list all potential 'bugs' with the Vision application. All items on the CQ log were addressed. A leadership team from Property and FIT worked through the list to determine which listed items were in fact bugs that needed to be fixed as opposed to new ideas to rewrite the application and add new functionality. All items were separated into critical, high and low priority categories.

DOF required the vendor to resolve all critical and high priority issues. Items listed in the CQ log that were suggestions for new functionality, not defects, and low priority items were reviewed to determine if they should be added to a list of potential enhancements to the application.

The audit report states that the auditors did not receive an updated CQ log list until January. In fact, the auditors were given access to the Sharepoint site where the CQ log resides on October 5, 2011.

Enhancement Request
DOF informed the auditors that we had negotiated with Vision to obtain enhancements at a total cost of $1.1 million, and that we had submitted a request to OMB for funding to obtain these enhancements. DOF provided the auditors with multi-page list of the enhancements. Citing a proposal from the vendor, the audit states that DOF plans to spend an additional $3.5 million on Vision. We have informed the auditors that DOF did not agree to the vendor's proposal; the document does not reflect the work we determined was necessary to enhance the Vision application or the pricing we had agreed to. We anticipate the auditors will delete this false statement from the report.

Contrary to the auditors' apparent recommendation, DOF does not believe it is critical to develop an on-line GIS module within Vision at this time. DOF has recently started using a Pictometry application used by other City agencies, such as NYPD and FDNY, which provides similar functionality.

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Audit Recommendation:

2. Ensure all problems and concerns reported by the users on the Clear Quest log are addressed in Phase II agreement.

DOF does not agree. All critical and high priority bugs were resolved and all items listed in the CQ log were addressed. However, DOF does not agree that all wish list items included in the CQ log should be included as enhancements to the application. DOF management will continue to make choices about what work is necessary to produce an accurate assessment roll. DOF will continue to use the CQ log for tracking new issues and ideas to continually improve Vision.

C. Inappropriate Comparable Data and Inadequate Criteria for Comparable Properties

The Vision system improved comparable property selection over DOF's previous methods. Prior to Vision, assessors did not have access to any comps through the CLT CAMA system for Tax Class 2 or 4 properties. Assessors most recently used giant spreadsheets listing rental properties to manually select comparables for co-ops and condos.

The audit report reviews the first year the Vision system was used. The comparable property selection process was a major improvement over the old system because it provided standards that could be applied systematically throughout the city for selection of comparables, but continued to permit assessors to exercise judgment in determining the comparable property selection.

Any system used for the first time will likely have aspects that can be improved. We identified corrections and improvements for comparable property selection after the first year of experience with Vision and implemented some of those changes in the valuations used in calendar 2011 for the 2012/13 roll. We anticipate that we will continue to refine the comparable property modeling with each new assessment roll.

A statistically-based modeled comparable system is a tool for assessors, but Vision-selected comps are only the starting point in valuation process. In its first year of operation, the Vision system provided assessors up to 5 recommended comp properties. Assessors could also use an additional 15 "custom" comp properties, or add in other properties as necessary. Assessors do not directly apply a comparable property to a co-op or condo, the system proposed a median of the suggested values, and assessors could adjust from the median where appropriate.

The audit sampled 50 properties and yielded 10 with alleged problems in one or two of the comparable properties out of the approximately 200 comparables that would have been selected by Vision. The issues were of style match, building class match and distance (13 cases are cited in the report, but 3 were cited for multiple issues.) Of the 10 properties cited by the auditors, 4 applied to the Tax Commission for a remission. Only 1 property was granted a remission by the Tax Commission; valuations were upheld as correct for the other 3 properties.

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In nine out of the ten properties cited by the audit report the allegedly incorrect comparable was either correct at the time the roll was issued or did not create a valuation problem. In one instance a property was potentially under-valued.

Style
Two "style" cases[1] cited in the audit report are a mistake by the auditors. In both cases, the style was an exact match at the time the subject property was valued. The styles of the two comparables at question were changed in Vision between the property valuation and the time the auditors looked at the Vision screens. One property was subdivided and the apartment building is now recorded on a different lot. The physical information on the other property was updated by an assessor after a field visit in September 2011. The auditors were provided with the documentation demonstrating that the building style was correct at the time it was valued and these properties should be dropped from the report.

In three cases[2] cited by the audit report, the subject property did not show a building style (style indicator "N" or none). Therefore by definition the style could not match to a comparable property and style was not a meaningful point of comparison. Since the style field has not been consistently updated over the years, DOF did not use style as a criterion in selecting comparable properties for the 2011/12 roll.

Building Class
Seven properties[3] cited in the audit report had one or two comps with a building class that is generally not compatible with the subject's building class. However, assessors reviewed the properties and did not use any of the comps with inappropriate building classes in the final valuation. Assessors' judgment remains an important component of the valuation process when working with the Vision comparable model. In these cases, the model plus assessor judgment ensured that only appropriate comparables were actually used to value the properties.

Distance
Two examples cited in the audit report used comps that were quite a distance away. The final valuation for one of the properties was in the appropriate range of income per square foot for the neighborhood and type of buildings, in spite of using a comp located at a distance. The other subject property cited for having a distant comparable may have had a slightly lower market value than it should have due to the selection of comps.

We are enhancing the comparable modeling within Vision to set distance parameters as part of the model, allowing a maximum distance between subject and comp to be set by borough. However, Vision will not display the comp's distance on screen as the audit report recommends, because it is a calculated data field (not stored). It is a fundamental part of the assessor's job to know the neighborhoods he/she is responsible for and the distances between the comparables and the subjects.

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[1] Table 1 Style Comparison: Cases #1 & 3
[2] Table 1 Style Comparison: Case #2, 3 & 4 (Case #3 did not match and had a subject property with "N")
[3] Table II Incomparable Building Classifications: Cases #1-7

Audit Recommendations:

3. Ensure CAMA selects appropriate comparable properties for annual valuations
4. Review and modify its criteria when selecting comparable properties

DOF agrees that continual improvement of the modeling criteria for selection of comparable properties is appropriate.

In the second year of Vision, we have instituted substantial improvements to the model which were used for the 2011/2012 roll. Some of these include:

- Criteria for comp selection were expanded to include more variables: the number of residential units, the number of regulated units, commercial square footage, and the number of stories. In addition, instead of actual age, effective age (defined as age since last altered) was used this year.
- A separate model was developed for each borough.
- A separate model was developed for co-ops, condos and rental non-RPIE filers.
- More restrictive criteria were implemented for building classes. A co-op or condo will generally be compared with rental buildings in building classes C and D and, a walk-up (elevator) co-op/condo will generally be compared with a walk-up (elevator) rental.

Other improvements are planned for the next valuation cycle (13/14), including:

- Allowing for adjustments in income to account for differences between subject and comp.
- Limiting the adjustments allowed between subject and comp.
- Absolute distance parameters between the subject and comp properties.
- Allowing for the choice of comp to be based on the minimum or median score, rather than the median income.

D. User Satisfaction Survey

Any new major IT system will require a period of getting used to the new system. Change is often difficult, but also often better. We were disappointed that the user survey did not ask any questions comparing the old CLT system to the new Vision system. We were also disappointed that the auditors did not provide results with enough information to be useful for DOF management. As the number of returned surveys demonstrated, the staff is engaged and actively making suggestions for improvements to CAMA, and we are pleased that 81% of respondents with problems were satisfied with the problem's resolution. DOF sees this as a very positive result.

Audit Recommendation:

5. Ensure that the user concerns identified in the report are addressed.

DOF partially agrees. Many of the recommendations contained in the survey are too vague, such as "Information displayed is not easy to work with." Another concern cited in the audit report was

"inaccurate data," which is not a CAMA specific issue and one that is constantly being addressed. Other concerns identified in the audit report will be addressed through ongoing training for users.

6. Conduct periodic surveys to ensure that their concerns are addressed.

DOF does not agree that periodic surveys are useful. We agree that it is good to get ongoing, meaningful and honest feedback and we will continue to encourage discussions between assessors, supervisors and management.

E. User Accounts not Adequately Controlled

DOF currently has a strong system in place for controlling user accounts. Property receives a separation email weekly from DOF Human Resources and makes changes to the CAMA user security tables weekly. Monthly, Property checks the entire DOF list. In addition, the entire list of CAMA users is reviewed at least once annually for access rights and activity. (Users outside DOF have inquiry, read-only access to CAMA.) Some users are infrequent users, but still require access. Tax Commission staff and auditors are some examples. In addition, some infrequent users identified by the auditors were new employees who had just started work at DOF and came at a time in the valuation cycle where Vision is not used heavily.

In order to provide an accurate historical audit trail within the CAMA application, user accounts for employees are never deleted from the system. If a former CAMA user's ID were deleted from the system that would preclude identifying who made a change to a parcel. The mechanism that has been put in place to prevent unauthorized access by former CAMA users is to modify a database parameter to mark those accounts "disabled". There are currently 34 users marked as "disabled" in the CAMA application database, and as such these users do not have access to the application. Furthermore, users who leave the agency have their DOF network IDs revoked which would prevent access to any DOF system.

Audit Recommendation:

7. Develop written policies and procedures for tracking system users and terminating inactive users. In addition, DOF should periodically review the status of inactive user accounts and terminate access when appropriate.

DOF disagrees with this recommendation, as we already have strong controls in place. DOF will continue to implement its internal controls for user accounts. DOF will offer additional training for infrequent users in other agencies to maximize the full potential of the new CAMA system.

F. No Formal Business Continuity Plan

Audit Recommendation:

6

8. Develop a formal business continuity plan for CAMA. Periodically update the plan to ensure that it functions as intended and is adequate to quickly resume computer operations without material loss of data.

DOF partially agrees. DOF performs regular data back-ups and is actively working with OEM and DOITT on plans for business continuity and disaster recovery. DOF participates in the Citywide COOP plan and tabletop exercises. DOF's COOP Plan identifies the CAMA users' business sites as well as CAMA as a necessary application function.

Sincerely,
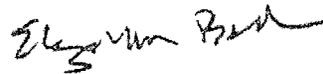
Elizabeth Botwin

cc: George Davis III, Deputy Director, Mayor's Office of Operations
  Michael Hyman, Deputy Commissioner, Tax Policy and Planning
  Thomas Harty, Deputy Commissioner, IT
  Timothy Sheares, Assistant Commissioner, Property
  Celia Carino, Director, Internal Audit