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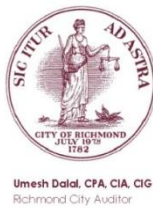
Richmond Department of Information Technology RAPIDS

Report Issued: December 16, 2013
Report Number: 2014-04

Committed to increasing government efficiency, effectiveness and accountability on behalf of the Citizens of Richmond.

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Executive Summary

January 14, 2013

The Honorable Members of the Richmond City Council
The Honorable Mayor Dwight C. Jones

Subject: City of Richmond – RAPIDS Audit Report

The City Auditor's Office has completed an audit of the RAPIDS implementation initiative. This audit covers the period of inception through implementation to the present. The audit was conducted by the audit team, which collectively had extensive information systems (including implementation and audit) experience.

The RAPIDS project had City-wide implications, which impacted all City agencies and external users such as vendors. The recommendations made in this report must be adopted with a view to improve City-wide processes for current and future major initiatives.

During this audit, the auditors faced significant challenges due to inadequate cooperation by the Administration. The City Auditor's Office had offered assistance at the onset of the project. However, DIT did not accept the City Auditor's offer. The audit was delayed from October 2011 to August 2012, as DIT resisted the audit. The audit was included in the FY13 Audit Plan and finally was initiated on August 2, 2012. Subsequently, the Administration requested postponement of the audit, which the City's Audit Committee rejected.

After the draft of this report was discussed in the Audit Committee meeting held on December 16, 2013, DIT shared with the City Auditor's Office a report prepared by a vendor regarding strategic improvement recommendations for DIT. This report was completed in January 2013. Had this report been shared with the City Auditor's Office in a timely manner, it could have saved a lot of efforts given that this audit report's findings and recommendations are effectively echoed in the vendor's report.

Salient Findings

When viewed collectively and analytically, the following areas emerged as significant and critical shortcomings for RAPIDS:

- Governance
- Risk Management
- Organizational Change Management
- Testing

Based on the results and findings of the audit methodology employed, the auditors concluded that the RAPIDS implementation had the following weaknesses, which may have significant future consequences:

- Organizational governance may have led the City to accept risks that may not be tolerable for the following reasons:
  - Change Management process was ineffective.
  - Acceptance Testing for the second phase of the initiative was not commensurate with enterprise risks. The City chose testing at the module level for accepting the system. Little assurance of performance of the comprehensive system and the soundness of required converted data can be attained from module level testing. The testing conducted was insufficient to provide the information needed to reasonably make a "Go Live" decision. Several symptoms of potential implementation deficiencies were noticed after the system was implemented.
  - The reliability of final verification of the accuracy and completeness of the database when the system went live is unknown.
  - Lack of contingency planning exposed the City to the risk of inability to continue operations in the event of a significant system failure.
  - Access control mechanisms were inadequate (Phase I) and incomplete (Phase II).
  - The time deadline established for the implementation was unrealistic.

- An adequate governance framework was not appropriately employed. If applied, it would have addressed the breadth of risks, segregation of duties, and other aspects, including assignment of accountability. It should be noted that while some good practices were employed, other aspects fell short.
- Risk Assessment for the City's business environment was not performed adequately for the enterprise-wide impact.
- Limited ability and/or capacity to apply lessons gained from prior experiences was noted.

- After multiple requests, the auditors did not receive details and supporting documentation for the RAPIDS expenditures. In the absence of full disclosure and proper classification of all expenses, it is not possible to verify if the project was completed at, below, or over budget. Lack of this basic information is concerning, as the accountability over the resources incurred cannot be verified.

The City Auditor's Office appreciates the cooperation of the City departments' staff. Please contact me for questions and comments on this report.

Sincerely,

Umesh Dalal

Umesh Dalal, CPA, CIA, CIG
City Auditor

cc: Mr. Byron C. Marshall, Chief Administrative Officer
      The Richmond City Audit Committee

#	*COMPREHENSIVE LIST OF RECOMMENDATIONS*	*PAGE*

1   Fully deploy appropriate City-wide governance frameworks (i.e., COBIT/COSO).   38

2   Develop and implement adequate controls to enforce adherence to these frameworks.   38

3   Accelerate development of DIT policies and procedures in conformance with adopted governance framework and include: 38

- Testing of the system being implemented commensurate with risk tolerance
- Ensuring complete and accurate data conversion
- Developing and documenting an appropriate contingency plan
- Implementing and monitoring change management activities and verifying their impact on user readiness
- Monitoring and reporting status of project budget
- Providing periodic status reports to the CAO

4   Establish and formalize a City-wide Project Management Methodology. Develop and institutionalize appropriate policies, standards, processes, procedures, educational materials, and tools related to the management of projects, programs, and portfolios.   38

5   Define a standard repository structure for retention of documents for all current and future projects.   38

6   Conduct an independent review of the role-based access model, assignments, and approvals as soon as possible.   39

7   Using the guidance provided in the report, define a valid, comprehensive, periodic access review process for RAPIDS.   39

Overview

Introduction and Scope

The City Auditor's Office has completed an audit of the RAPIDS implementation initiative. This audit covers the period of inception through implementation to the present. The objectives of this audit were to:

- Evaluate the adequacy and effectiveness of project management initiatives

- Evaluate the reasonableness of resources committed to the project

- Assess the appropriateness of pre-system implementation procedures followed

- Ensure compliance with City policies, procedures, and applicable rules and regulations

The RAPIDS project had City-wide implications that impacted all City agencies and external users, such as the City's vendors. The recommendations made in this report must be adopted with the overall goal of improving City-wide processes for current and future major initiatives.

The auditors conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that the auditors plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for their findings and conclusions based on the audit objectives. The auditors believe that the evidence obtained provides a reasonable basis for their findings and conclusions based on the audit objectives.

Methodology

The auditors employed the following procedures to complete this audit:

- Reviewed relevant records, policies, and regulations:
  - Examined the electronic project documentation repository
  - Reviewed the implementation vendor, Strategic Information Systems (SIS) tailored Project Plan
  - Reviewed DIT Policies and Procedures
  - Referenced industry accepted frameworks such as Control Objectives for Information and related Technology (COBIT) and Project Management Body of Knowledge (PMBOK), and whitepapers published by Oracle, KPMG, Hitachi Consulting, and other relevant literature
- Performed overtime and leave assurance testing
- Reviewed all of the provided Phase II user acceptance testing scripts and results
- Employed a structured approach:
  - Conducted pre and post-implementation interviews with:
    - Business and technical subject matter experts
    - The implementation vendor
    - Project management team
    - Steering Committee
    - The Deputy Chief Administrative Office (DCAO) over Finance and Administration
  - Focus Group sessions with City agencies and departmental personnel
  - Surveys across the RAPIDS team and focus group participants
- Performed other audit procedures, as deemed necessary

As noted in the "Challenges" section below, the audit team faced substantial challenges throughout the engagement. Only by conducting

a structured approach to interviews, focus groups, and surveys in controlled settings, which limited direct management influence, could the audit team gain even a reasonable understanding of the RAPIDS initiative's activities.

Frequently, the documentation provided to the audit team was weak and questionable (i.e. – dated, incomplete, and contradictory [e.g. – multiple versions of "FINAL" documentation]). This, in combination with a poorly controlled and relatively disorganized project documentation repository, led the audit team to conclude the documentation was generally insufficient, except as potential corroboration for the interviews, dialogues, focus groups, and surveys. This audit, as a consequence, relies less upon the provided documentation and much more upon the developed information, which was volunteered and corroborated across the body of interviews, focus groups, and other informational sources.

Interview, Focus Group, and Survey Methodology

The areas of governance, organizational change management, risk management, and testing emerged as significant and critical issues

RAPIDS Team

For the purpose of this report, the phrase "RAPIDS team" includes those individuals having specific responsibilities for the delivery and execution of Phase I and II of the RAPIDS initiative. This includes the Subject Matter Experts (SMEs), Project Managers (PMs), Steering Committee members, and the DCAO.

The audit team conducted both pre and post Phase II implementation interviews with 23 individual members of the RAPIDS team (total population of less than 100 individuals). This same group was used

throughout the interview and survey process, except for individuals who left the City in the interim.

Additional interviews were conducted with the individual SMEs shortly after "Go Live" to ascertain their assessment of how the implementation had gone and to gain an initial assessment of system viability.

Additionally, a survey of 17 participants (this represents the 23 original interviewees, excluding those who left the City and the DCAO) was conducted with RAPIDS team members after Phase II implementation. The survey was conducted in order to gain information that could be compared and reviewed, related to the effectiveness of Organizational Change Management, Project Management, Steering Committee, Executive Sponsor, and the Implementation Vendor (SIS).

Focus Groups

Focus group participants were identified using RAPIDS change agent rosters, and specifically targeting agencies/departments outside of Finance, Procurement, and HR, as they were already well represented in the RAPIDS team.

Focus group participants only rated effectiveness in regards to Organization Change Management, using the same criteria evaluated by the RAPIDS team, to allow for comparison. The other aspects (i.e., Project Management, Steering Committee, etc.) were not relevant from a non-RAPIDS team perspective. A total of 24 people participated in the sessions and the survey.

All focus group sessions, which were open discussions centered on gaining the users' perspective, were facilitated by the audit team. The participants were asked about how the system was performing and their understanding of experiences before and after implementation. Participants were asked to speak on behalf of themselves and their teams. Participants were surveyed at the end of the open discussions.

The interviews, surveys, and focus groups provided an array of opinions and details. When viewed collectively and analytically, however, the following areas emerged as significant and critical shortcomings for RAPIDS:

- Governance
- Risk Management
- Organizational Change Management
- Testing

Earlier participation by the City Auditor's Office, as offered, could have assisted in a more comprehensive implementation process

It should be noted that initial assistance by the City Auditor's Office was offered in 2010. Subsequently, the City Auditor's Office provided information related to accepted prudent practices for system implementation, and offered to meet to help DIT personnel understand how to incorporate such practices. However, DIT did not accept this offer.

Challenges

During this audit, the auditors faced significant challenges due to inadequate cooperation by the Administration. As mentioned previously, the City Auditor's Office offered assistance at the onset of the project; however, DIT did not accept the City Auditor's offer. The City Auditor eventually participated in an advisory capacity on the Steering Committee, for a limited period during Phase I of the initiative.

The City Auditor's Office faced significant resistance and difficulties in conducting this audit

The audit was delayed from October 2011 to August 2012, as DIT resisted the audit. The audit was included in the FY13 Audit Plan and finally was initiated on August 2, 2012. Subsequently, the Administration requested postponement of the audit, which the City's Audit Committee rejected.

After the audit was initiated, the auditors faced significant challenges in obtaining necessary and reliable information. In addition, there were some challenges in scheduling timely follow-up discussions and interviews with RAPIDS team members. Eventually, this audit was completed by using information provided to the auditors. There is no assurance of completeness or accuracy of this information.

After the draft of this report was discussed in the Audit Committee meeting held on December 16, 2013, DIT shared with the City Auditor's Office a report prepared by a vendor, regarding strategic improvement recommendations for DIT. This report was completed in January 2013. Had this report been shared with the City Auditor's Office in a timely manner, it could have saved much effort, given that this audit report's findings and recommendations are effectively echoed in the vendor's report.

The vendor's report not only confirms the Audit findings, but also supports the recommendations made in this report. It also highlights governance as a critical challenge for DIT and the City, and recommends implementation of City-wide governance similar to recommendation number one of this report.

Management
Responsibility

The management of the City of Richmond is responsible for ensuring resources are managed properly and used in compliance with laws and regulations; City programs are achieving their objectives; and services are being provided efficiently, economically and effectively.

Background

RAPIDS is an Enterprise Resource Planning (ERP) system that has now replaced the prior aging core business systems of the City. It is a collection of business computer applications (modules, such as General Ledger, Accounts Payable, Accounts Receivable, Procurement, Payroll, etc.) that leverage a central database in a unified manner. Oracle was chosen to provide the software and database, which has built-in capabilities that allow its use in most government or business environments. It also has the ability to share data, such as vendor information that is stored centrally, used, and updated across the applications. This basic capability offers the City a potentially superior way to manage its operations. The City has made a prudent choice in selecting a system, which has been implemented and used successfully in many organizations.

RAPIDS is a critical
core computer system
for the City

The City contracted with the vendor, SIS, to manage the implementation. The RAPIDS initiative had an initial budget of about $18 million. The project was completed in two phases:

- Phase I – HR/Payroll/Retirement, implemented in February 2012
- Phase II – All other purchased systems, including Financials, Reporting, etc., implemented in July 2013

In December 2012, the Information Technology Audit Manager resigned to seek other endeavors. The City Auditor's Office attempted to replace this position with a consultant having appropriate expertise

Collectively, the audit team had extensive information systems experience (including both implementation and audit)

to timely resume the audit. However, significant delays were encountered during the procurement process. Finally, in May 2013, the City Auditor's Office engaged an external consultant, having over 20 years of large-scale complex program, project, turnaround, re-engineering, and audit experience spanning business and information technology for global corporations and the federal government.

Observations and Recommendations

Internal Controls

According to Government Auditing Standards, internal control, in the broadest sense, encompasses the agency's plans, policies, procedures, methods, and processes adopted by management to meet its mission, goals, and objectives. Internal control includes the processes for planning, organizing, directing, and controlling program operations. It also includes systems for measuring, reporting, and monitoring program performance. Based on the results and findings of the audit methodology employed, the auditors concluded that the RAPIDS implementation had the following weaknesses, which have the potential to yield significant, future consequences:

The RAPIDS implementation had several weaknesses, which may have significant, future consequences

- Organizational governance may have led the City to accept risks that may not be tolerable for the following reasons:
    o The change management process was ineffective
    o Incomplete testing approaches were not commensurate with enterprise risks
    o Lack of contingency planning exposed the City to the risk of being unable to continue operations in the event of a significant system failure
    o Access control mechanisms were inadequate (Phase I) and incomplete (Phase II)

- Limited ability and/or capacity to apply lessons gained from prior experiences were noted

The following discussion addresses the above issues related to the RAPIDS implementation.

Pre-Implementation Procedures

The auditors conducted the following procedures to evaluate appropriateness of pre-implementation procedures:

- Evaluated the adequacy of the procurement process
- Determined if proper cost/benefit and risk analyses were performed
- Verified if the system requirements were properly defined

Procurement Process:

The auditors' examination found that the City has appropriately procured the system and implementation services.

- **Cost Benefit Analysis**

    For complex system implementations, it is customary to perform a cost-benefit analysis to verify the prudence of the investment in the project. Upon the auditors' inquiry, the Project Manager indicated that the cost-benefit analysis was not performed for the project, because the system replacement was mandated due to the age and the discontinued available support for the legacy system that was in place.

The project team performed neither cost-benefit nor ROI analyses to verify the cost effectiveness of RAPIDS

- **Return on Investment (ROI)**

    To justify an extension for the project deadline, in July 2012, the RAPIDS team proposed that the additional time would allow them business process reengineering based on ROI analysis. The Chief Administrative Officer's (CAO) Office was in the process of

preparing ROI analysis for the RAPIDS project. Conducting this type of analysis is a well accepted industry practice, to ensure the cost-benefit of making the investment in the system implementation project. However, after the auditor's request, the CAO's Office could not provide the analysis. Without such analysis, it may not be possible for the CAO to determine the cost-effectiveness of this technological solution.

- **Risk Assessment for the City's Business Environment was not Performed Adequately**

The available documentation focused only on project level risks rather than City-wide risks

The auditors did not find any evidence of a systematic and thorough risk assessment for the enterprise-wide impact. The DCAO over Finance and Administration was under the impression that the Steering Committee considered the enterprise-wide risks that may hinder continuing City operations after the system implementation. However, multiple Steering Committee members indicated that enterprise-wide risks were not discussed. The risk information provided, such as risk profiles, trackers, and other relevant e-mails and documentation, focused only on project level risks. The impact of this action has been discussed in post implementation observations included subsequently in this report.

- **Business Requirements**

The business requirements for the modules (Payroll, Time and Labor, Retirement, and Human Resources) appeared to be detailed and adequately defined. Each of the representatives from Payroll, Human Resources, and Retirement were involved in establishing the business requirements in their respective areas.

Governance

Organizational Governance Could Have Been Better

The interviews, focus groups, and survey responses, detailed previously in this report, point to the root cause of the problems identified throughout this report. The City of Richmond's business functions and, in particular, DIT does not have a sufficient, formal, adopted, and appropriately enforced overarching governance and control framework.
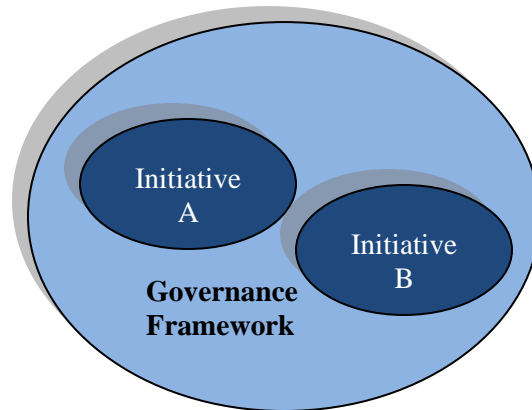
DIT does not have a sufficient, formal, adopted, and appropriately enforced overarching governance and control framework

Because DIT was the "Owner" organization for the RAPIDS implementation effort, COBIT, which is IT-oriented, will be explored here. If this initiative was owned by the Finance Department, however, a governance framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) would have been more appropriate.

COBIT Background Information

Governance and risk considerations are critical for complex and significant initiatives. In many ways, such considerations are "pre-conditions" for success in evaluating and implementing critical City-wide initiatives because of their comprehensive nature. According to COBIT 4.1:

> *"IT governance is the responsibility of executives and the board of directors, and consists of the leadership, organizational structures and processes that ensure that the enterprise's IT sustains and extends the organization's strategies and objectives."*

A governance framework ensures that initiatives remain aligned with strategic priorities, and proper decision making and control activities are in place, as depicted in the following diagram:

COBIT is recognized and used by business and non-business entities across the globe because it provides a framework to ensure that IT:

- is aligned with the business
- enables the business and maximizes benefits
- resources are used responsibly
- risks are managed appropriately

COBIT provides a mechanism for ensuring that all that needs to get done by IT does in fact get done, with the appropriate attention and considerations in context of the specific business situation.

The project team has employed, although on a piecemeal basis, some good practices identified in COBIT, Information Technology Infrastructure Library (ITIL), and the PMBOK in its efforts to manage the RAPIDS initiative. The RAPIDS team had various documents, such as project schedules and plans for change management, training, and acceptance testing. However, the mere existence of such plans did not ensure them to be appropriate for the environment, or to yield results

appropriate for the City of Richmond. While plans may have existed, the effectiveness of those plans was not monitored and evaluated when the effort was in progress. The audit team observed that while some good practices were employed, other aspects fell short. An adequate governance framework, if applied, would address the breadth of risks, segregation of duties, and other aspects, including assignment of accountability.
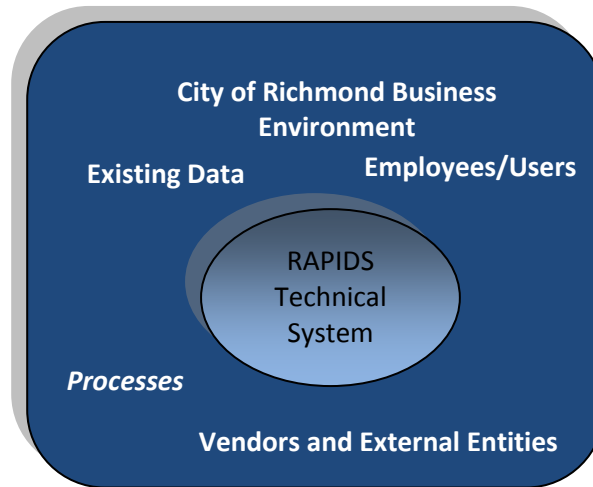
The following aspects led to subsequent activities and decisions within the RAPIDS initiative that may have an adverse impact:

- **The Time Deadline Established for the Implementation was Unrealistic**

  Interviews, focus groups, and survey responses during this audit indicate that the project was driven by specific timeframes, which were arbitrarily established. The initial deadline for implementing the entire system in October 2012 was unrealistic. The auditors made observations, reviewed extensive relevant documentation provided, and noticed the City did not have:

  o Reliable, current and well developed process maps

  o Advanced internal program management skills

  o Qualified replacement personnel for the staff required to maintain ongoing operations

  o Available and qualified business and technical staff to perform the critical functions of legacy data analysis and scrubbing, etc.

The following diagram depicts the relationship of the technical solution to its environment it impacts:

If the target was to implement a technical solution without due consideration of the City's business environment and historical data, the timeline established could have worked. However, replacing the City's payroll, personnel, financial, procurement, inventory/asset management systems, and implementing a new human resources system significantly impacted the business environment. Also, in this case, the conversion of the historical data cannot be ignored and required direct City participation and oversight. However, accomplishment of all of these tasks was not feasible in the timeframe the City desired. As it turned out, the Administration had to approach the City Council to extend the implementation deadline by a year. In fact, even with the additional time, which did reasonably accommodate the technical solution, the data conversion and change management aspects were not reasonably accommodated. These aspects are addressed subsequently in this report.

The RAPIDS team was informed that if the Phase II implementation was not completed by July 1, 2013, it would have to be postponed to July 2014. This was stated in a document entitled RAPIDS Phase II Modules Production Readiness produced by the Project Manager for sign-off by the DCAO, the acting IT Director, and the other Steering Committee members, all of whom signed off on June 27, 2013.

On the other hand, according to the President of the Oracle Application User Group, the go live date for financial systems, other than payroll, does not necessarily need to be at year-end. Going live mid-year is not an unusual practice. The arbitrary time constraint may have resulted in insufficient consideration and accommodation of organizational change management, testing, data analysis and conversion activities.

- **DIT has Outdated Policies and Procedures that are not Commensurate with Managing an Effort of the Complexity of RAPIDS**

  The auditors reviewed the current DIT policies and procedures and determined they are not up-to-date and commensurate with managing a complex initiative such as RAPIDS. The auditors were informed that an effort is underway and specifically aimed at updating the outdated policies and procedures to reflect more current technology and modern practices. Depending on resource availability, this is targeted for completion in June 2014. However, had these efforts been completed prior to implementing RAPIDS, it could have helped to guide the efforts.

- **Steering Committee Effectiveness must be Improved**

  The role of a Steering Committee in an ERP project implementation is to make decisions that will impact the project and outcomes. The members of the City's Steering Committee over the RAPIDS project included the Directors for the departments of Information Technology, Finance, Procurement Services, Human Resources, and Budget. In addition, the DCAO and the Controller also participated on the Steering Committee. During this project, several critical positions, including the DCAO and the Directors of Information Technology and Human Resources, experienced turnover.

  It should be noted that the City Auditor participated on the Steering Committee, in an advisory role, until August 2012 when he recused himself. It was the City Auditor's experience that the Steering Committee meetings were ineffective. The status of the project, as presented in the meetings using traffic light signal indicators, showed the status to be green indicating no issues with implementation for all aspects of the initiative. Issues being encountered were never raised in the Steering Committee meetings. The appearance of a perfect implementation was unrealistic, which was later confirmed by observations made during this audit. In addition, in May 2012, the Program Manager over this implementation publicly shared the deficiencies in the execution of the initiative. Due to a lack of opportunity to obtain insight into the issues encountered during implementation, the City Auditor decided to recuse himself, and began an audit of the RAPIDS implementation.

The Steering Committee received poor ratings from the project participants on several attributes

During the "lessons learned exercises" following the Phase I implementation, it was recognized that the Steering Committee decision making was slow and ineffective. This situation impacted timely completion of the project and did not provide adequate guidance to the project team. Timely decisions are critical for the project to proceed as scheduled. The auditors observed that the Steering Committee meetings were not well attended until June 2013. Prior to June 2013, meeting minutes reviewed by auditors indicated that generally one half or less of the required attendees were actually present for the scheduled meetings. This situation may have had an impact on the overall speed of decision making.

In Phase II, the Steering Committee continued to make decisions ineffectively as depicted in the following survey results:

Attributes	Ratings (Scale of 1-8 (8 being Highest/Best)
Setting Direction and Vision	3.91
Making Decisions	3.36
Resolving Conflict	3.50
Accountability	3.40
Overall	3.54

The above is the result of a survey of the 17 participants (the 23 original interviewees, excluding those who left the City and the DCAO), and excluding the Steering Committee members. As depicted above, the survey participant's ratings were unfavorable across all the effectiveness categories for the Steering Committee. This represents lack of confidence and inadequacies in the Steering Committee process.

Based on the foregoing discussion, it appears that governance of this initiative could have been better. The impact of this situation has been noticed in post-implementation results discussed subsequently. It may take some time to realize the total impact of the discrepancy.

Budget Vs. Actual

Organizations strive to complete every significant information technology initiative in a timely manner and within budget. An initial budget of about $18 million was established at the inception of the project. The RAPIDS team was expected to track expenditures related to the system implementation.

After multiple requests, the auditors did not receive details and supporting documentation for the *RAPIDS expenditures*

After multiple requests, the detailed documentation provided to auditors was not sufficient. The *budgeted* expenses were presented by line item; however, the actual expenditure data provided was not categorized by line item, as presented in the budget. Very simplistically, a person could look solely at the bottom line dollars presented for a project to determine whether it is at above or below budget. However, without the ability to compare the line item data in both budgeted and actual expenditures, auditors cannot adequately evaluate whether the project was completed within budget or whether all expenditures were captured.

For example, detailed data related to the personnel resources utilized for the project is necessary to be able to properly account for all the expenses associated with the project. However, information provided did not include details, such as the name or position of employees and their time utilized for the project. As noted, auditors requested more

detailed information multiple times. In the absence of full disclosure and proper classification of all expenses, it is not possible to verify if the project was completed at, below, or over budget. Lack of this basic information is concerning, as the accountability over the resources incurred cannot be verified.

Inappropriate Segregation of Duties

Segregation of Duties between the service provider and users is a critical internal control. The RAPIDS project was assigned to DIT for delivery and execution. DIT has not had a formal Director for much of the second phase of this initiative. As a result, the DCAO has been the "Acting" Director of Information Technology. This situation puts the DCAO in a service provider function. However, the DCAO has oversight responsibility for the major users of the system, such as Procurement, Finance, Human Resources, Budget, and Information Technology. As such, this type of conflict may lead to a strong bias, dictating a timely delivery regardless of readiness. These departments were the primary users and responsible for accepting the system as implemented. It appears there were indications the system was not ready for acceptance when it went live, due to the reasons discussed in this report.

The DCAO acted as both service provider and service recipient simultaneously. This conflict may lead to a strong bias, dictating a timely delivery regardless of readiness

Change Management

Change Management is the process of preparing employees and other users for acceptance and effective use of the system

Ineffective Organizational Change Management has not Prepared the Users to Effectively Use the System

Organizational Change Management refers to preparing employees and other users of the system for acceptance and effective use of the system. This process is extremely important for any system implementation of any size. This is because without user acceptance and effective use, the best and most expensive system will not benefit the organization. Therefore, the resources expended will not get an

appropriate ROI, in terms of increased productivity and efficiencies. According to Info-Tech Research Group, "Preparing end-users is the most important factor for ERP implementation success."

Without user acceptance and effective use, the best and most expensive system will not benefit the organization

Change Management, in general, was noted as a weak area in the Phase I implementation, as reported in "the Lessons Learned" documentation, reviewed by the auditors. During Phase II, Change Management meetings were held on a monthly basis and were the primary method of communicating with the various RAPIDS stakeholders. Using this method, representatives (change agents) were identified for the various impacted departments and agencies. Those change agents were given information regarding RAPIDS and were expected to take it back and disseminate it in their respective areas.

The Change Management Activities Used by the RAPIDS Team

There are many approaches and aspects involved in Change Management. Two primary methods used for this purpose are communication and training.

Communication

The RAPIDS team offered communication primarily through change management meetings. Available records indicated the following:

The users generally considered change management efforts to be weak

The change agents, who participated in the interviews and focus group discussions, revealed a general belief that attendance at the change management meetings was poor. During the focus group meetings, several change agents felt they received minimal value for attending these meetings, as the information provided was mostly a promotion of the system's benefits. Also, the focus group participants indicated that,

while the meetings provided a forum for asking questions, the questions were often not answered. Subsequently, the auditors verified poor attendance at these meetings by reviewing the meeting logs. Consequently, it appears the change management meetings were not generally effective as communication channels.

In addition to the above efforts, the RAPIDS team established a website to help users. However, much of this website content, such as FAQ's, Newsletters, Change Agent Listing, etc., has been out-of-date. In October 2013, the majority of the website included information related to Phase I, except they had updated manuals presented in the training classes. This made the website an inadequate communication medium.

Training

The RAPIDS team offered training for the various modules. Attendance in the scheduled training sessions was monitored via a tracking log established by the project team. Participation by users, as identified in the logs, appeared reasonable. The training was provided as late as possible, so that the information conveyed would be as time-relevant as possible.

The training was too basic and not appropriate for preparing users to actually do their jobs effectively
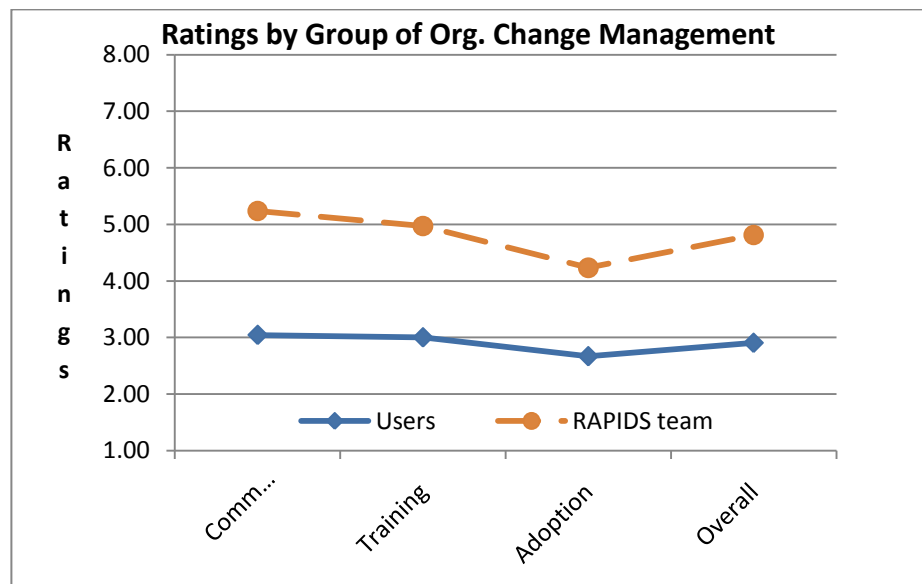
During interviews, prior to the system going live, several project team members were of the opinion that the training was too basic for many users. In interviews, shortly after the implementation, the RAPIDS team recognized that more training, especially cross functional training spanning several modules, was needed. Subsequent focus group discussions (held in late August 2013) revealed a common and recurring sentiment from users that the training was too basic (it was oriented towards a very general use of the modules) and not appropriate

for preparing users to actually do their jobs effectively. An automated tool used for online training appeared to be helpful as an introduction/refresher for the system by walking them through module-specific basics.

The audit team learned in the focus group discussions that, during the training, the users had very limited access or opportunity to use the system. Therefore, the user had no means to determine if the training was effective, in regards to preparing them to use the system.

A comparison of users' and change agents' perceptions of the RAPIDS team is depicted as follows (Rating Scale of 1 - 8 (8 being Highest/Best):

Ratings by Group of Org. Change Management

The users did not perceive that they were sufficiently prepared prior to the "Go Live" date

As described previously in the methodology, there were 17 RAPIDS team participants surveyed and 24 focus group participants surveyed. Their views, regarding Organizational Change Management, are captured in the chart above. Based on the above information, it appears the RAPIDS team had an inflated perception of the adequacy of

organizational change management, as compared to the users who felt unprepared.

Two key points were repeatedly and frequently raised in interviews and focus group discussions:

1) The employees, expected to use the system, did not perceive that they were prepared.

2) The Project Management effort did not sufficiently monitor to ascertain whether the users were sufficiently prepared prior to the "Go Live" date. No documentation was available illustrating any efforts made for this purpose.
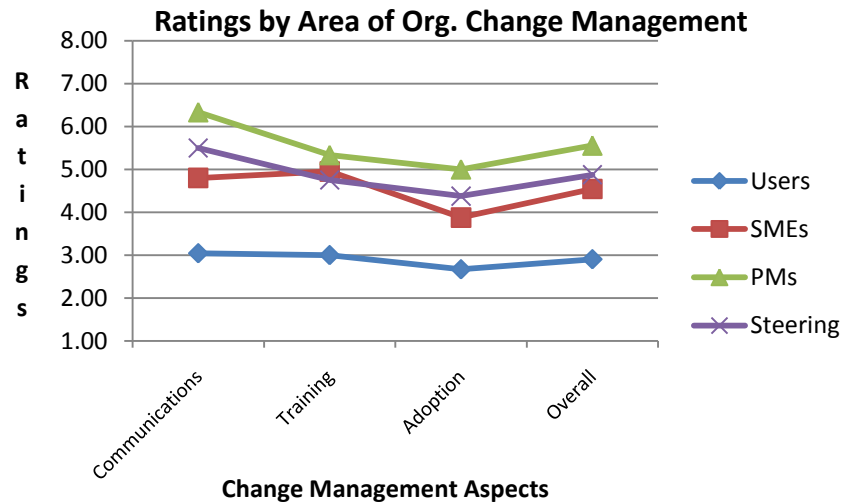
Auditors recognize that the surveys given to the training participants at the end of the training sessions generally received positive feedback. While this is useful in determining whether a class is viewed favorably, it is insufficient for determining if the class was effective in preparing the uses to use the system at "Go Live." The auditors found no other documentation indicating that the training program would meet its inferred goal of preparing the users to actually use the system upon "Go Live."

The following graph illustrates the perceptions of various stakeholders (as described previously in the methodology, there were 17 RAPIDS team participants surveyed and 24 focus group participants surveyed):

Ratings by Area of Org. Change Management

The above graph shows the Project Management team had an unrealistic view of the change management efforts, as compared with the users' perception. The SMEs and Steering Committee's views of Change Management were consistent but lower than the Project Management team's perspective. This is important, because users are the ultimate beneficiaries of change management efforts. Without them being ready to use the system, the entire effort of implementation of a new system would yield only marginal benefits. This may not represent an adequate return for the City's more than $18 million investment.

This represents a fundamental breakdown, in regards to the monitoring function of the Project Management team, and similarly reveals a fundamental breakdown in stakeholder management.

A different frustration expressed by the focus group participants was essentially that the many agencies and departments did not feel they had been properly engaged in the project tasks, such as testing, communications, and training. They felt preparation for their areas was

inadequate, and in fact, most considered it to be poor. This is reflected in the significantly lower survey ratings.

RAPIDS acceptance testing was conducted at the modular level, which cannot provide reasonable assurance of proper functioning of the comprehensive system and converted data

Incomplete Testing Approaches were not Commensurate with Enterprise Risks

The auditors requested and received testing information for RAPIDS Phase II. The review of the provided documentation indicated that modular level testing had occurred and was accepted by the SME's.

The following describes the weaknesses and insufficiency of limiting acceptance testing of Phase II to only modular testing.

Testing of a system before it is placed in a production environment is done to ensure that the system will function as intended. The only universal aspects, in regards to testing, are that testing should be conducted commensurate to the risk and reflect an organization's ability to absorb and overcome a catastrophic event resulting from lack of detection and prevention of errors.

There are both vendor responsibilities and customer user responsibilities, related to testing and acceptance as follows:

Vendor Testing Responsibilities

In an integrated system like RAPIDS, testing by the vendor can be performed at many levels, prior to the user acceptance as follows:

- *Unit/Module Test* – This type of testing is conducted with limited amount of data to verify if the configuration of a module or unit satisfies the defined requirements.

- *Integration Test* – This type of testing assures proper functioning of interfaces with the ancillary systems.
- *System Test* – End-to-end test of all the integration and modules. This type of testing is critical to assure that the system, as a whole, functions in accordance with the defined requirements.

Simultaneously, with the above testing, the vendor will also verify the following:

- *Conversion Program Test* – This type of testing confirms that the programs, developed by the vendor to load the City's provided data into the new database operate as expected.

In the procurement documentation, the Vendor and City responsibilities are well delineated and consistent with normal practices. Upon completion of system testing, the vendor delivers the system to the users, who are responsible for testing proper functioning of the system through user acceptance testing.

City's Testing Responsibilities

According to the vendor Statement of Work, the City was responsible for:

- Revising/scrubbing conversion data (i.e. – clean data confirmed via reconciliation)
- Conducting/executing acceptance test (i.e. – test to satisfaction)

These are reasonable because only the City can know if its data is sound, and what is needed for their satisfaction.

Additionally, the vendor indicated that its normal mode of acceptance testing support is comprehensive in nature but would, if the client so determined, also support modular level testing alternatively.

City Conversion Testing

The City needed to conduct the following testing prior to user acceptance:

- *Conversion Data Testing* – This type of testing runs simultaneously with the vendor's conversion program testing. It is performed to verify that the data desired to be retained from the legacy system is compatible in format with the new system's requirements, and is complete.

In order to evaluate conversion completeness, it is important for the team to understand their starting and ending points, and the relevant metrics (number of records in, number of records processed, number of records skipped, etc.). This is important to ensure that all items expected to be converted are indeed converted, or at least specifically identified for special handling.

On July 29, 2013, the auditors requested that the Project Manager provide basic metrics related to vendors, contracts, and purchase orders, as they existed prior to and just after implementation. It was also requested that any inconsistencies be explained. Typically, this basic information should be available on demand, given the importance of the historical data to the City, and assuming reasonable prudence and oversight by the team. Yet, the project team could not provide the information until August 8, 2013. This information was imprecise and inconsistent with interviews previously held with various employees. The Project Manager stated that the vendor count was "greater than

1,000". This is vague and imprecise information (especially after 10 days to provide the number) and suggests the team had not identified their starting point prior to conversion and implementation. As such, the City's data could not be reasonably accounted for, due to lack of information. On December 9, 2013, the audit team met with the Procurement Services representatives and was provided alternative numbers for contracts and Purchase Orders.

Purchase Orders:

Counts Provided	12/9/13	8/8/13	Difference
Total PO's in Original File	2,957	920	2,037
PO's Successfully Imported to RAPIDS	2,098	600	1,498
PO's Vendor Missing	236	N/A	236
Missing Ship To	623	N/A	623

Contracts:

Counts Provided	12/9/13	8/8/13	Difference
Total contracts in original file	475	998	(523)
Contracts loaded to RAPIDS	383	463	(80)
Total contracts not loaded from original File	116	N/A	116

As indicated above, the auditors received two sets of numbers from the Project Manager on August 8, 2013, and the Procurement Services Department on December 9, 2013. No supporting documentation was available indicating the source and validity of these numbers. The differences between the numbers were not explained. In addition, no reconciliation was available for the original numbers in the legacy Advantage system to the fully converted numbers in RAPIDS.

The reliability of final verification of the accuracy and completeness of the database when the system went live is unknown

Due to the timing of providing the revised information, it is not possible for the auditors to confirm the accuracy of any of these numbers. Nonetheless, for a well managed program, accurate numbers

should be available soon after the conversion. These deficiencies depict the challenges the audit team faced during this audit.

The Project Manager stated that assuring accuracy and completeness of the data was each functional area's responsibility. The reliability of final verification of the accuracy and completeness of the database when the system went live is unknown. However, according to the SMEs and focus group participants, procurement and accounts payable data had numerous operational problems.

City's Acceptance Testing

User acceptance testing is the responsibility of the City. This testing is done to ensure that the system to be delivered (RAPIDS) has met the agreed upon requirements. During interviews, both pre and post-implementation, several SMEs expressed that they were concerned about inadequate testing done prior to acceptance of the system. These individuals also expressed that the RAPIDS team's testing approach was challenged by some SMEs; however, the concerns were rejected. In regards to fully converted data, end-to-end testing was dismissed as unnecessary because Oracle was being used and consequently, it would not be necessary. Parallel testing was discussed. However, according to the information provided to the auditors, it was deemed to be too complex and expensive. It is worth noting that some SMEs, project management team members, and Steering Committee members expressed regrets about the lack of testing, and many observed this weakness prior to implementation.

The City could have done more extensive user acceptance testing to appropriately verify system readiness

Beyond the information gained, as described above, the audit team requested that the RAPIDS team provide all of the User Acceptance Testing information for Phase II. The information, which included

scripts and signoffs, was provided. The audit team reviewed the information provided and found it to be sound; and appropriate signoffs were provided for user acceptance only at the module level. No evidence was provided to indicate that acceptance testing of the entire system occurred, much less employing the fully converted data. No such testing or corresponding signoffs were presented or suggested.

The City chose testing at the module level for accepting the system. This is the lowest level of testing the City could have done, and it gives little assurance of performance of the entire system as intended. Module level testing could have been performed as a part of the user acceptance testing. However, the system itself is greater than just the modules. The total system includes all of the modules, all interfaces to ancillary systems, and all new and old data necessary for use in the live RAPIDS system.

The above issue can be demonstrated by the following example. Positive testing results on the procurement module will not assure that the procurement module will communicate the output accurately and completely to the accounts payable module. Also, it does not give assurance that the accounts payable module will accept all the data communicated by the procurement module. This may be the case, as each module has different rules and requirements for processing data. Therefore, it is critical that after testing the modules, testing be conducted on module interaction and interfaces, and ultimately with the comprehensive and converted data.

What the City Could Have Done in Addition to Module Level User Acceptance

The Oracle Corporation issued a white paper on the subject of "Successful Data Migration." This paper identifies risks of inappropriate data migration and testing as follows:

- "Time and budget estimates will fall short of actual needs
- The target system will not perform effectively
- Workarounds will need to be implemented and resourced
- Remedial data cleansing work will need to be devised and resourced
- The costs of missing the deadline will include maintaining the team and incurring continued running costs of legacy systems and downtime on the target application
- The new system will be blamed, making it harder to gain user acceptance
- Management confidence will be questioned"

The City assumed the risks identified by Oracle, which appear to have been realized during post implementation. However, the full impact of assuming these risks may not be realized for some time in the future.

Given the mission critical nature of RAPIDS, without additional testing, any decision to go live can be associated with a risk, which the City may or may not be able to tolerate

The City had multiple options available to supplement module level testing, in order to gain reasonable assurance at the system level. Reasonable arguments can be made against parallel testing (complexity and costs), and unplanned/unstructured end-to-end testing can be extremely insufficient. A strong alternative would be to conduct an "End-to-end" test with verification of expected results for valid statistical samples of transactions. This type of test would provide greater assurance that the system will function as intended. However, the RAPIDS team decided not to conduct any of the alternatives and

relied upon the modular testing for determining acceptance, which was inadequate. The testing conducted was insufficient to provide the information needed to reasonably make a "Go Live" decision.

About 18 months after the implementation of the Payroll Module, the leave balances in the system database are still inaccurate

According to the audit testing, interviews, and discussions with RAPIDS team members and focus group participants, the following have been noticed:

- Phase I was implemented in early calendar year 2012. Auditors selected a sample of 90 individuals from various departments and identified 66 instances where the leave accruals were not calculated accurately, as depicted in the following table:

The City overruled SMEs' concerns about inadequate testing done prior to acceptance of the system and accepted all risks related to RAPIDS implementation

	Understated		Overstated	
	Vacation	**Sick**	**Vacation**	**Sick**
Fire Department	11	11		
Public Utilities	2			
DSS	1	1		
Parks & Recreation	1	1		
Finance	1	1		
Courts	2	8	6	
Registrar		2		
Police Department	3	1	1	
Sheriff Department	1	6	4	2
Totals	22	31	11	2

The issues were not limited to a single department; rather, they were spread throughout multiple departments. Without proper leave accrual, employees will either not be afforded their full benefit, or may use more leave hours than they are entitled to. Auditors notified Human Resources about this issue. After months of requests for additional information, the auditors were informed the issue would be corrected in October 2013. However, as of

Several symptoms of inadequate data conversion, change management, and testing inadequacies have been noticed after the implementation date

November 2013, the leave balances in the payroll system were still not accurate.

- Chart of Accounts was not stabilized until mid-June. This was confirmed, via interviews with SMEs and the controller, and visually confirmed by review of the corresponding RAPIDS team project minutes. It was asserted that this impacted the ability to test the system earlier, and the ability to complete approval hierarchies, prior to implementation.

- Social Services' files could not be processed, as purchase orders could not be generated; certain payments could not be processed; and warrant registers and budget update reports could not be generated, etc.

- Vendor self-registration was known to be incomplete at time of "Go Live" and, consequently, processing procurement and accounts payable transactions were difficult.

- The approval process for purchase orders bypassed supervisory approval and was forwarded to procurement.

- Conversion of purchase order data did not include the associated accounting string, which resulted in difficulties in researching these purchase orders.

- Invoices were not being paid on time.

- Finding converted data was difficult (POs for instance).

- Wire transfers and ACH data were rejected, due to the differences in character lengths between RAPIDS and Advantage, which required bank data to be entered manually.

- The reporting function was not user friendly and did not generate reports that could be manipulated for operational purposes.

- Generating customized reports remains very difficult.

The City of Richmond's situation called for a test of the full system in a production-equivalent test environment. The test must be conducted using the fully converted legacy data and the corresponding historic transactional data sets, representative of the various business cycles (e.g., daily, weekly, monthly, etc.). The results should be verified to meet expectations, using valid representative statistical samples.

Adequate Contingency Planning was not Performed

In recognition of potential, unanticipated system failure, contingency planning is necessary. Contingency planning is a proactive measure taken in advance of large scale complex changes. Through proper planning, in the event of severe problems, the solutions and responses do not have to be formulated under the duress of the situation. In proper contingency planning, escalation parameters and sequences are defined, adverse event communications (internal and external to the organization) are set, and technical products may be developed specifically for recovery. The auditors observed the following:

The system went live without adequate contingency planning. The investment in contingency planning would have easily been outweighed by the costs experienced if the system encountered a variety of failure modes

- According to nearly everyone interviewed, consideration of post "Go Live" contingency planning was very limited. This opinion was consistent with the documentary review observations, evidence provided, and follow up inquiries.

- A clear understanding of contingency planning, versus basic help desk functions, did not seem to be well understood. This is striking considering:

  o Published and documented ERP implementation failure rates exceed 50%.

  o Obvious and ongoing problems with Phase I should have triggered more caution in preparing for unanticipated challenges in the post-Phase II implementation.

- o General prudence and awareness anticipates that, for complex initiatives, some things can and usually do go wrong, with wide-ranging implications.

- It was stated that the vendor suggested manual handling was the fall-back plan. The auditors did not observe resource needs planning for handling the different levels and severity of adverse events, via manual processes.

- In the event that a call to the help desk could not be resolved by a group of SMEs, it would be addressed by the system manager. However, the system manager's response plan was insufficient in defining escalation paths.

The risk posed by unanticipated adverse events cannot be easily quantified. The investment in contingency planning for this effort would have easily been outweighed by the costs experienced if the system encountered a variety of failure modes.

After conveyance of the above information in the City Auditor's preliminary letter to City Council on July 1, 2013 the auditors learned the project team and Steering Committee subsequently engaged in dialogues. As of the date of this report, the auditors have not been presented with a viable contingency plan.

The auditors have learned the RAPIDS team knew, just before the system went live, that significant difficulties remained in regards to vendor migration and conversions. It was also realized by the RAPIDS team, very shortly after implementation, that the problems related to the vendors were considerably more severe than anticipated. With the knowledge of potential issues with the vendor files, the RAPIDS team

accepted a significant risk in choosing to go live, specifically in absence of a contingency plan.

In the absence of reasonable contingency planning, a strategy similar to that taken for Phase I, executing the legacy and new systems in parallel for some considered period of time after "Go Live" would have provided a fail-safe. This was not done.

Access Control

Inadequate and Incomplete Access Control Mechanisms

It is apparent, given the breadth and nature of the systems involved, access to the various applications should be well-defined and well-controlled, prior to implementation. From confidentiality concerns relative to the HR and Payroll systems, as well as fraud considerations relative to the financial systems, the potential exposures for the City are significant. A basic concept, in establishing access privileges, is the idea that access is limited and granted, based on the user's specific need- to- know, to perform their duties.

During Phase I, several users were granted "Super User" access allowing them to perform several conflicting duties. This type of privilege, if abused, may not be detected timely

The auditors learned, during the HR and Payroll modules implementation (Phase I), "Super User" privileges were granted to some employees, who did not need them based on their job responsibilities. These privileges could be misused and present potential fraud, confidentiality, and sabotage threats. Although steps were subsequently taken to reduce these privileges, to this date a full review and verification of the Phase I user assignments has not occurred.

With regard to Phase II role assignments, the RAPIDS team retained a trained and experienced system administrator to establish and manage a Role Based Access Control (RBAC) model. The access control work is still in progress (as discussed and visually reviewed). To this date, the administrator has not had the time or opportunity to validate the user assignments made prior to his arrival or to establish a periodic review cycle.

After implementing a RBAC model it is necessary to verify the accuracy and appropriateness of both user access rights and responsibility definitions. This is typically done by conducting a structured initial review, followed by periodic reviews until a clean (i.e., no exceptions/deficiencies identified) review is obtained. A typical review cycle is commonly established as quarterly, for user access and semi-annually, for responsibility definitions. After clean reviews have been obtained, it may be appropriate to extend the review cycles to semi-annual (user access) and annual (responsibility definitions).

Reviews should involve appropriate personnel and function-owners. Among other things, reviews should confirm:

- Verifiable approvals exist for all users IDs
- Terminated users are removed
- Segregation of duties is maintained
- Generic or system IDs are justified and currently needed
- Any elevated access is justified

Recommendations

The following recommendations are made to the Chief Administrative Officer:

1. Fully deploy appropriate City-wide governance frameworks (i.e., COBIT/COSO).

2. Develop and implement adequate controls to enforce adherence to these frameworks.

3. Accelerate development of DIT policies and procedures in conformance with adopted governance framework and include:
   - Testing of the system being implemented commensurate with risk tolerance
   - Ensuring complete and accurate data conversion
   - Developing and documenting an appropriate contingency plan
   - Implementing and monitoring change management activities and verifying their impact on user readiness
   - Monitoring and reporting status of project budget
   - Providing periodic status reports to the CAO

4. Establish and formalize a City-wide Project Management Methodology. Develop and institutionalize appropriate policies, standards, processes, procedures, educational materials, and tools related to the management of projects, programs, and portfolios.

5. Define a standard repository structure for retention of documents for all current and future projects.

6. Conduct an independent review of the role-based access model, assignments, and approvals as soon as possible.

7. Using the guidance provided in the report, define a valid, comprehensive, periodic access review process for RAPIDS.

MANAGEMENT RESPONSE FORM
RAPIDS Implementation 2014-04

#	RECOMMENDATION	CONCUR Y-N	ACTION STEPS	Response from Management January 14 Audit Committee Meeting Audit Committee Deferred to CAO for Response
1	**This Recommendation is made to the CAO and for the CAO to respond.** **Original Recommendation:** **Adopt a recognized governance framework such as COBIT and COSO (Integrated Framework published by the Committee of Sponsoring Organizations of the Treadway Commission).** **Revised Recommendation:** Fully deploy appropriate city-wide governance frameworks (i.e., COBIT/COSO). *[Please refer to attachment B "Likely COBIT (4.1) focus areas" for additional guidance for COBIT deployment.]* **Note** - after the initial audit committee meeting (12/16/2013) the RAPIDS team provided documentation on 12/19/2013 that showed that a vendor had been consulted and asked to provide a review of DIT. This report confirms and supports the recommendations in this report and highlights governance as a critical challenge for DIT and the City. The City Auditor's office will be available to assist the Administration in an advisory capacity for adoption and implementation of the frameworks.	Y	**CAO Response (3/11/2014):** This recommendation speaks to an overall governance strategy by which projects such as RAPIDS would have established criteria to ensure consistent implementation. While it is clear that the RAPIDS project had established and defined responsibilities, authorizations on both the functional and operational level, the City has always agreed that an organization-wide governance framework is necessary. In response to our needs we consulted with Info-Tech Research group to conduct thorough diagnostic testing of DIT. A number of their recommendations were related to organization-wide governance. These recommendations detail the process the City has undertaken to achieve organization wide governance. These recommendations were shared with the Auditor's Office during the RAPIDS audit. DIT had already begun to implement the recommendations for IT governance made by Info Tech, and had adopted a service delivery framework derived from standards such as ITIL, COBIT, and Project Management Institute (PMI). DIT is working to develop its governance framework based on the best practices that match our service delivery model. We anticipate full implementation of the City IT governance in FY15.	As it relates to the RAPIDS Project, in March of 2009 a governance committee was established as defined by responsibilities, authorizations, required managerial support and levels of information (Exhibit 1). The Governance Plan consisted of the executive (strategic), functional (operational) and program management (program) levels. The executive level was responsible for: -- Driving organizational change -- Approves budget, scope, resource allocation -- Assigns functional level resources -- Approves approach and strategic changes -- Final escalation level The functional level was responsible for: -- Providing information and proposals to the executive level -- Managing program and organizational change management on a monthly basis -- Ensuring allocation of approved resources -- Addressing 2nd level of escalation -- Contract management The program management level was responsible for: -- Day to day management of the overall program, projects, resources, vendor and budget -- Manages program and project escalations The Steering Committee is the successor to the Executive Governance Committee. **Revised response (1/9/2014):** We disagree with this revised recommendation. While the Auditor has changed his initial recommendation from "adopt" to "fully deploy a recognized governance framework...", it still remains outside the scope of the audit. The RAPIDS Project being audited, adopted and fully deployed a recognized governance framework. **Auditor's Comment(s):** It does not appear that the RAPIDS team understands the recommendation. A governing framework, such as COBIT/COSO, refers to the management and control environment in which the RAPIDS initiative was conducted. The explanation provided refers to the governance within the RAPIDS initiative. There were significant issues with internal governance of this initiative. The external governance framework did not exist to allow for properly informed, strategic decision making related to the initiative and within the initiative. Deploying a governance framework at this time will only impact current and future initiatives.

	TITLE OF RESPONSIBLE PERSON		TARGET DATE	
	IF IN PROGRESS, EXPLAIN ANY DELAYS		IF IMPLEMENTED, DETAILS OF IMPLEMENTATION	

#	RECOMMENDATION	CONCUR Y-N	ACTION STEPS	Response from Management January 14 Audit Committee Meeting Audit Committee Deferred to CAO for Response

2	**This Recommendation is made to the CAO and for the CAO to respond.**
	
	Develop and implement adequate controls to enforce adherence to these frameworks.
		Y	**CAO Response (3/11/2014):**
			This recommendation also speaks to an organization-wide IT governance strategy. Please see the CAO Response to Recommendation #1. It is important to note that for the RAPIDS project an established framework was in place. In regards to Citywide governance, the DIT Governance Model addresses appropriate controls via the Operating Committee and Steering Committee. In the documented model, there are appropriate controls at multiple levels of responsibility, complexity, and priority. This includes but is not limited to the four practice areas (Risk Management (RM), Project Portfolio Management (PPM), Project Management (PM), Service Delivery Management (SDM)).
				We believe there were adequate controls in the RAPIDS Project to enforce the framework discussed above in item #1.
				
				Levels of enforcement in descending order:
				(1) CAO and DCAO for Finance & Administration (Project Champion)
				(2) Steering Committee
				(3) DIT Director (Project Sponsor)
				(4) Project Managers
				    -Technical Leads
				(5) Business Owners
				    -Business Leads
				    -Subject Matter Experts (SMEs)
				
				Revised response (1/9/2014):
				We still do not concur with this recommendation. The RAPIDS Project had adequate controls to enforce adherence to the framework used.
				
				Auditor's Comment(s): Please refer to the auditor's comment in #1.

	TITLE OF RESPONSIBLE PERSON		TARGET DATE	
	IF IN PROGRESS, EXPLAIN ANY DELAYS		IF IMPLEMENTED, DETAILS OF IMPLEMENTATION	

#	RECOMMENDATION	CONCUR Y-N	ACTION STEPS	Response from Management January 14 Audit Committee Meeting Audit Committee Deferred to CAO for Response
3	**This Recommendation is made to the CAO and for the CAO to respond.** Accelerate development of DIT policies and procedures in conformance with adopted governance framework and include: • Testing of the system being implemented commensurate with risk tolerance • Ensuring complete and accurate data conversion • Developing and documenting an appropriate contingency plan • Implementing and monitoring change management activities and verifying their impact on user readiness • Monitoring and reporting status of project budget • Providing periodic status reports to the CAO	Y	**CAO Response (3/11/2014):** This recommendation also speaks to an organization-wide IT governance strategy. Please see the CAO Response to Recommendation #1. In the absence of an organization-wide IT governance strategy it is important to note that policies and procedures were in place for the RAPIDS project. The development of DIT policies and procedures is an existing, ongoing, and continuously improving process. The policies and procedures exist not only to comply with the framework, but to support generally the full operations model (not just the governance framework) of DIT. Recommendations from both Info tech and the Internal Auditor will be incorporated in DIT policy and procedures.	As this relates to the RAPIDS Project, these concerns were addressed and provided for from the outset as evidenced by: --Project Plan --Testing Plan --Training Plan --Organizational Change Management Plan The Project Champion submits to the CAO on the 1st and 15th of each month a status update. This was in addition to regular, biweekly 1x1 meetings. **Revised response (1/9/2014):** Our response remains the same. The RAPIDS Project as outlined above did have plans and procedures. While there is an ongoing effort in DIT to revise all policies and procedures, scheduled to be completed by June 2014, this recommendation falls outside the scope of the Audit as defined by the Auditor. **Auditor's Comment(s):** Please refer to auditor's comment in #1. Detailed policies and procedures developed in conformance with an established governance framework would have prevented several deficiencies noticed during the course of this audit.
	TITLE OF RESPONSIBLE PERSON		TARGET DATE	
	IF IN PROGRESS, EXPLAIN ANY DELAYS		IF IMPLEMENTED, DETAILS OF IMPLEMENTATION	

#	RECOMMENDATION	CONCUR Y-N	ACTION STEPS	Response from Management January 14 Audit Committee Meeting Audit Committee Deferred to CAO for Response
4	**This Recommendation is made to the CAO and for the CAO to respond.** Establish and formalize a city-wide Project Management Methodology. Develop and institutionalize appropriate policies, standards, processes, procedures, educational materials, and tools related to the management of projects, programs, and portfolios.	Y	**CAO Response (3/11/2014):** The Auditor's comments refer to an organization-wide IT governance strategy. Please see the CAO Response to Recommendation #1. It is important to emphasize that for the RAPIDS project a proven management methodology was established and implemented. While DIT already has and utilizes appropriate PM methodology, as evidenced by the discovery of the methodology in the RAPIDS project by the audit, the Department will more transparently formalize adoption and control adherence through the DIT Governance model. DIT will standardize project management best practices (derived primarily from PMI framework) within the Department.	As it relates to the RAPIDS Project, project management best practices were followed as indicated below: 1. Project Management Approach: Given the size and complexity of the RAPIDS project, the Project Manager was accountable directly to the Director of the Department of Information Technology. The roles, responsibilities, and accountabilities of the project sponsor, steering committee, and project manager were clearly defined, along with the expectations for reporting and phase reviews. 2. Stakeholder Commitment: Affected stakeholders were committed and participated beginning with the definition of the project, continuing through to implementation. 3. Project Scope Statement: The nature and scope of the project were well defined and approved by project sponsor and steering committee. Stakeholders held a common understanding of that scope. 4. Project Phase Initiation: Stakeholders and project sponsor were aware of each project phase and involved in signoff/acceptance of deliverables. 5. Integration Project Plan: There was a formal project plan, updated by the project manager throughout the life of the project. 6. Project Resources: There were responsibilities, relationships, and performance criteria for project team members. 7. Project Risk Management: There was a process for planning, identifying, analyzing, and responding to areas or events that had the potential for unwanted change. Risks faced by the project management team were centrally recorded and managed. 8. Project Performance Measurement, Reporting, and Monitoring: Regular reports were provided to the Steering Committee, stakeholders, and project sponsor to indicate progress against planned results and to identify any deviations. Reports included financial results and budget status. **Revised response (1/9/2014):** While this recommendation is a change from the original, there was a proven project management methodology deployed by the RAPIDS Project Team and the Implementation Vendor. This recommendation speaks to a City-wide methodology which falls outside of the scope of the Audit. **Auditor's Comment(s):** The project management, during Phase I of the project, had significant deficiencies as acknowledged by the RAPIDS team in the "Lessons Learned" documentation. The impact of the deficiencies is evidenced by the fact that the leave balances in payroll module are still not accurate after almost two years. Project management in Phase II showed significant improvement; however, it followed the best practices only in an ad-hoc manner as acknowledged by the Project Manager. Without a structured and authorized project management approach, no two projects will be managed consistently and in accordance with accepted and prudent practices.
	TITLE OF RESPONSIBLE PERSON		TARGET DATE	
	IF IN PROGRESS, EXPLAIN ANY DELAYS		IF IMPLEMENTED, DETAILS OF IMPLEMENTATION	

#	RECOMMENDATION	CONCUR Y-N	ACTION STEPS
5	Define a standard repository structure for retention of documents for all current and future projects.	Y	There exist today repositories for all current and future projects. The RAPIDS project documentation was and is located in SharePoint. The Audit team was clearly aware of this repository for RAPIDS and had access to it, as was evidenced by this statement on page 1 of the Audit Report: "Examined the electronic project documentation repository". They were also informed that documents in the document library were still being modified and would be finalized once the project was implemented. **Revised response (1/9/2014):** We recognize the revision of this recommendation by the Auditor based on our discussion and acknowledgement that this was our next step. This action item will be completed by March 31, 2014.
	TITLE OF RESPONSIBLE PERSON		**TARGET DATE**
	DIT Application Services Manager		31-Mar-14
	IF IN PROGRESS, EXPLAIN ANY DELAYS		**IF IMPLEMENTED, DETAILS OF IMPLEMENTATION**
	N/A		N/A

#	RECOMMENDATION	CONCUR Y-N	ACTION STEPS
6	Conduct an independent review of the role-based access model, assignments, and approvals as soon as possible.	Y	We do not believe it would be cost-effective to engage a resource for an independent review, as we believe we are on target for security management best practices as evidenced below: Security management goals for RAPIDS: 1. All users of RAPIDS are uniquely identifiable, via authentication mechanism. 2. User access rights to systems and data are in line with defined and documented business needs. 3. User access rights are (a) requested by defined process, (b) approved by system owners or designees, and (c) implemented by persons responsible for system security. 4. Requesting, establishing, suspending, and modifying user accounts and related privileges are addressed by a set of user account management processes and procedures. 5. Logging is enabled as part of efforts to manage risk of unusual or abnormal activities. 6. Process for regular review of all accounts and related privileges. Key indicators of RAPIDS security will include: 1. Number of incidents with business impact 2. Time to grant, change, and remove access privileges 3. Number and type of suspected and actual access violations 4. Number of violations in segregation of duties 5. Number and type of obsolete accounts 6. Number of access rights authorized, revoked, reset, or changed. **Revised response (1/9/2014):** We agree that once the system is stabilized, it would be beneficial to conduct ongoing security reviews by an external reviewer. We currently have an internal process in place to grant minimum access based on job requirements. If budgetary funding allows, this action item will be completed within the next 12 months. **Auditor's Comment(s):** Given the nature of the system (financial and personnel) involved, it is critical that access controls are verified as soon as possible. This review should be conducted irrespective of system stabilization.
	TITLE OF RESPONSIBLE PERSON		TARGET DATE
	RAPIDS System Administrator		31-Dec-14
	IF IN PROGRESS, EXPLAIN ANY DELAYS		IF IMPLEMENTED, DETAILS OF IMPLEMENTATION
	N/A		N/A

#	RECOMMENDATION	CONCUR Y-N	ACTION STEPS	
7	Using the guidance provided in the report, define a valid, comprehensive, periodic access review process for RAPIDS.	Y	A process has been established, and will be documented by 3/31/14. Please refer to item #6 above. **Revised response (1/9/2014):** We recognize the revision of this recommendation by the Auditor based on our discussion and acknowledgement that the RAPIDS Project had (1) an established, comprehensive and periodic access review process and (2) we would document this process by March 31, 2014 as evidenced above in our original response. **Auditor's Comment(s):** The City Auditor's Office does not believe the RAPIDS project has an established comprehensive, periodic review process. March 31, 2014 deadline is acceptable for this purposes.	
	TITLE OF RESPONSIBLE PERSON		**TARGET DATE**	
	RAPIDS System Administrator		31-Mar-14	
	IF IN PROGRESS, EXPLAIN ANY DELAYS		**IF IMPLEMENTED, DETAILS OF IMPLEMENTATION**	
	N/A		N/A	