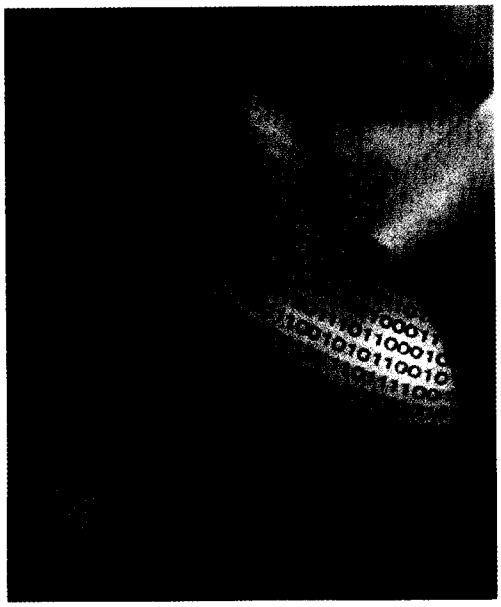
KPMG

Enterprise Resource Management Performance Audit

For

The City of San Antonio



August 6, 2003

INFORMATION RISK MANAGEMENT

OVERVIEW

KPMG was engaged by the City of San Antonio (the City) to assist the City Auditor of the City of San Antonio in performing an independent and objective performance audit of the Enterprise Resource Management (ERM) project controls and risk management processes that support the implementation of the:

- SAP R/3 system
- SAP Customer Relationship Management (CRM)
- Hansen Land Management System

This report summarizes our objectives, scope, methodology, findings and recommendations related to that performance audit. We conducted our performance audit in accordance with *Generally Accepted Government Auditing Standards* issued by the Comptroller General of the United States.

BACKGROUND

Following a process to select a prime consultant and systems integrator, the City of San Antonio selected an integration vendor as the project consultant and systems integrator. Funding was approved for the Phase 1 Statement of Work in June 2001, Phase 2 in October 2001 and Phase 3 in May and June 2002. The goal of the ERM Project is to replace several of the City's legacy financial and management systems with SAP R/3, CRM and the Hansen Land Management System. The City's objectives of the ERM Project are to improve efficiency, redirect resources to more value-added services and provide better information to users, City management and City officials.

The initial ERM Project Team plan was to implement the new business processes and systems in Waves, with seven expected go-live dates.

The original scheduled completion for the Waves follows:

Wave A – April 14, 2003, includes the Hansen Land Management System
Wave B – May 2003, includes Development Services, Code Compliance, Fire and Health
Wave C – May 2003, Customer Relationship Management (CRM)
Wave D – October 2003, CRM Web Functionality, Finance, HR, Purchasing and Inventory
Wave E – January 2004, Time and Attendance, Payroll, Employee Self Service and HR
Wave F – April 2004, Budget Preparation
Wave G – October 2004, CRM Help Desk, Grants, Tax, Maintenance and Fleet, and eProcurement

Wave A has been delivered and the go-live dates of remaining Waves were in the process of being revised during our engagement. Revised dates have now been set. City Management has indicated that certain items originally included in Waves E and G will not be implemented as part of the ERM Project as a result of the increased costs associated with project delays.

Given the high impact the ERM Project will have on the City and the cost of any project delay, the Office of the City Auditor requested an independent performance audit be performed, in accordance with *Generally Accepted Government Auditing Standards*, of the overall project risk and the effectiveness of project management controls that mitigate identified risks. Project risks, if not effectively mitigated, can threaten the timely delivery and implementation of the ERM Project.

OBJECTIVE AND SCOPE

The primary objective of the performance audit is to provide the City Auditor and City Council with an independent performance audit conducted in accordance with *Generally Accepted Government Auditing Standards*. The focus of this performance audit is to assess the project controls related to the ERM Project and verify that programs are in place to identify inherent risks within the ERM Project which could affect the timely completion of the project and the effectiveness of the planned and implemented mitigating project management controls.

KPMG has reviewed project controls and risks associated with the management of the ERM Project system implementation. The project management controls of the following ERM Project areas were reviewed at a high level:

- Hansen Land Management System
- SAP R/3
- SAP Customer Relationship Management (CRM)
- Technical Development (Authorizations, Reports, Interfaces, Conversions and Enhancements)
- Change Management and Training

The scope of this performance audit is limited to the resources and documentation available during our fieldwork. A detailed project financial audit of the ERM Project was not within the scope of this audit as the Office of the City Auditor is in the process of performing a project financial audit.

The following individuals were interviewed during the conduct of this review:

• Troy Elliott, City Project Director • Rusty Phelps, City Project Manager • Sandy Benitez, DC Project Director • Alan Smith, City Development Services/CRM Manager • Sue Ecklin, DC Development Services • Cindy Wells, City ERP Manager • Danny Dupont, DC ERP Manager • Nancy Gandara, City Communication Manager • Matt Kouri, DC Change & Training Manager • Gilbert Garza, City Technical Manager • Bob Gagnon, DC Technical Manager • Milo Nitschke, City Project Sponsor, Director, Finance Department • Travis Bishop, City Project Sponsor, Assistant City Manager • Gary Moeller, City Project Sponsor, Director, Information Technology Services	• Rebecca Waldman, Director, Asset Management • Billy Powers, Asset Management • Ryan Martinez, Assistant Director, Aviation • Debbi Handman, Aviation • Tony Bosmans, Director, Customer Service, 311 • Florencio Peña, SME, Director, Development Services • Elisa Bernal, Director, Human Resources • Malcom Matthews, Director, Parks and Recreation • Scott Stover, Parks and Recreation • Dennis Rosenberry, Police Department • Steven Morando, Assistant Director, Purchasing • Maria Villagomez, Public Works • Lisa Todd, Acting Controller, Finance • Irene Martinez, Accounting Supervisor, Finance

AUDIT APPROACH AND METHODOLOGY

We performed our audit using KPMG's proprietary Risk Management Project Review framework. This framework includes:

- A common and consistent approach for the review of risks and controls associated with projects
- A framework for advising the City on ensuring the controls required to mitigate project risks and maximize the likelihood that the ERM Project will meet the City's objectives.

The Project Risk Assessment Control/Risk Evaluation Process included the following steps:

- Assessing whether the project has addressed the inherent project risks
- Assessing whether the project has documented the controls in place
- Assessing whether the project has a process in place to assess and document the effectiveness of the controls
- Assessing whether the project has a process in place to identify control weaknesses
- Assessing whether the project has a process in place to deduce and document residual risk
- Documenting practice recommendations to mitigate the identified risks.

The unmitigated risks and ineffective controls identified in our performance audit together with recommendations to mitigate residual risks are prioritized and presented in our report with detailed findings listed below. This prioritization will enable the City Auditor and City Council to differentiate the project risks and controls that have high residual risks, which require immediate attention, from those risks that do not require immediate attention.

We conducted our audit using KPMG's Risk Management Project Review Methodology and the Project Management Institute's (PMI) Project Management Body of Knowledge (PMBOK) Criteria. The PMBOK Guide is a recognized standard for managing projects. The PMBOK Guide is approved as an American National Standard (ANS) by the American National Standards Institute (ANSI).

The scope of our engagement for the Office of the City Auditor specifically included the following:

Activity I: Project Review

The purpose of this activity was to assess whether the Project risks in the following categories were appropriately mitigated:

1. Resources
2. Processes
3. Technology
4. Data

KPMG's proprietary Risk Management Project Review framework was utilized in performing these assessments. Specific areas of focus by category were as follows:

1. Resource Assessment

The objective of this activity was to assess the controls around project resource requirements, level of involvement, skills and experience of the engagement team including the following key project personnel:

- Project sponsors
- Steering committee
- Core business process owners
- Vendors
- IT Department
- End Users
- Project Team
- Project Manager(s)

Our assessment was performed through inquiry and observation and comparison of current processes to recommended PMBOK resource management process requirements.

We identified control gaps and provided recommendations that will improve the effectiveness of project controls in this domain.

2. Process Assessment

The objective of this activity was to assess how effectively controls over existing and future business processes are being documented, taking into consideration internal control requirements and documentation standards, and to assess current processes related to testing the designed business processes and related controls. The process assessment covers:

- Process change: Assess Management's process for confirming existing business processes, identifying future business processes, and ensuring that the system and its controls are designed in accordance with management's approved business processes.
- Process testing: Assess the organization's efforts to ensure that adequate testing is performed on all business processes and controls affected by the new system.
- Documentation standards: Assess the adequacy of project controls and documentation of functional and technical specifications.
- Assess whether appropriate control requirements are included in the design of the system and business processes.

Our assessment was performed through inquiry and observation and comparison of current processes to recommended PMBOK process assessment requirements.

3. Technology Assessment

The objective of this activity was to assess the controls in the Technology environment associated with the project to ensure adequate steps have been taken to mitigate the information technology risks.

We assessed the risks and controls around technology infrastructure changes that are a result of the project. This includes activities that are carried out as part of the implementation or setting up of the new technological infrastructure. When these issues are not appropriately addressed, then the technology necessary to support the IT system during and after its development may not be adequate to handle expected volumes or be adequately controlled, making it more difficult to develop the related business system.

Our assessment was performed through inquiry and observation and comparison of current processes to technology assessment requirements.

We confirmed the inherent risks assessed for the technical solutions, assessed the strategies and plans to manage risks in this area, and recommended controls to mitigate risks in areas where controls are ineffective or no controls are currently planned.

4. Data Assessment

The objective of this activity was to assess the controls in the data environment associated with the project to verify that adequate steps have been taken to mitigate the following IT risks:

- Data structures
- Data quality
- Data cleansing
- Data preservation
- Data conversion
- Data migration
- Audit trails

Our assessment was performed through inquiry and observation and comparison of current processes to data assessment requirements.

We confirmed the inherent risks assessed for identifying data, assessed the controls, strategies and plans to manage risks in this area, and recommended controls to mitigate risks in areas where controls are ineffective or no controls are currently planned.

TIMING OF FIELDWORK AND OUR FINDINGS

Our test work was performed during the period from July 21, 2003 through August 6, 2003. Our findings are as of August 6, 2003 and have not been updated to reflect changes subsequent to the period of our review.

ERM Response:
The ERM Project has proposed responses to each of the findings or risks identified via KPMG's Risk Management Project Review Methodology and will continue to review risks on an ongoing basis as a component of project management. Each perceived risk is and will continue to be approached through an evaluation of the cost, available resources, time required and benefit of mitigating such risk. Through these efforts the ERM Project will continue to assess whether the project risks including but not limited to Resources, Processes, Technology and Data have been adequately mitigated.

SUMMARY OF FINDINGS

Opportunities for improvement in the project management controls and the need for an independent validation and verification function were noted during the performance audit. These controls if in place may allow the City to minimize the risk of potential project delays and cost overages, but not completely eliminate the risk of project delays and overages. The critical findings are summarized below.

A detailed listing of the findings and recommended actions can be found following the summary of our findings.

RESOURCE FINDINGS

During our review, a project delay was announced. The evaluation and resolution of desktop deployment options, hardware acquisitions, network and infrastructure issues, and data integrity related to addressing were cited as the causes of the delay.

• Delays in the ERM Project can and have resulted in contractor resources being rolled off of the project. These same resources may not be available to meet future project commitments.

• In some cases project resources are providing day-to-day production support functions instead of working on the project implementation.

• Independent resources have not been committed to review and document the testing of the financial controls within applications.

RESOURCE RECOMMENDATIONS

• Controls over resource management should be enhanced through the completion of a formal resource transition plan and an increased level of project plan documentation to facilitate bringing new resources up to speed on project requirements quickly.

• Resources should be committed to review and document the testing of financial controls within the new applications

ERM Response:
The project delay was the result of the following:
- *Addressing data integrity*
- *Network and Infrastructure issues*
- *Policies and procedures development*

The City is currently addressing these issues in the following manner:
- *Addressing data integrity – All plats have been entered and currently processed within seven days of recordation. Current address miss rate is less than four percent, which is an improvement over historical performance. The current budget has approved funds for professional services to reconcile all current address databases and GIS database layers.*

Council approved an annual contract with ESRI to update the data entry and editing tool for addresses as well as to update the address database design.

- *Network and Infrastructure issues – ERM Project Team has proposed a plan to the council governance committee and full council to enhance the network and infrastructure to meet ERM Project needs. Council approved the first steps of the plan on September 11, 2003 with the purchase of the ERM Project Sun/UNIX hardware. Additionally, the plan included utilizing Mercury Interactive to provide an independent assessment of the City's current ERM Project hardware and network infrastructure as well as new hardware and network enhancements once installed.*
- *Policies and procedures development – ERM Project Team is working with Departments to develop policies and procedures in order to provide additional support and reference materials to City Departments for go-live and future productions activities.*

Delays in the project have resulted in key resources being rolled off the project. The Integration Vendor has kept some critical resources engaged in the project for continuity. All City staff have remained active on the project. The Integration Vendor is actively taking steps to bring back key resources once components of the engagement start. Prior to rolling off consulting resources, project personnel documented current knowledge and transferred knowledge to existing City staff resources.

Detailing the transition of key Wave A implementation staff to full-time Wave A support roles at go-live was part of the resource transition plan that was in place. A large component of the Wave A team is now transitioned into full-time support of the Wave A system, which is required to maintain the ongoing operation of the system. Additionally, as a part of the fiscal year 2004 budget process the full production support organization was evaluated and will be phased in over the course of the next two fiscal years. The support organization will consist of a combination of existing ERM staff, ITSD Staff and new positions.

As part of the implementation process the Integration Vendor brought in expertise from their Enterprise Risk Services organization, to review the blueprint and identify where internal controls were not clearly documented, and provide testing where appropriate. In addition, due to the nature and extent of change that the City will experience as part of the ERM Project Implementation, the Director of Finance was appointed as a project sponsor and the previous City Controller has been dedicated to the project as its Director in order to validate that the appropriate controls are implemented. The Finance Department will also perform thorough user testing to validate financial controls. Additionally, the City Management recommend the City Auditors Office be involved in the user acceptance testing of the project to validate or test internal controls as designed.

At the time that this performance review was conducted the revised timeline was still being finalized and formal plans had not been fully developed. However, now a formal transition (roll-on and roll-off) plan has been developed that incorporates the documentation of knowledge from current resources and will be utilized to facilitate bringing in future resources.

PROCESS FINDINGS

• Existing project plans do not meet recommended PMBOK guidance for mapping project dependencies, critical path analysis or earned value management. Project status reports do not include all necessary information for effective cost management, including estimates to complete and the impact of project issues or late tasks on the project schedule or project costs.

• Lack of formal documentation and communication of Departmental responsibilities has contributed to misaligned expectations between the ERM Project Team and the Departments in the areas of hardware acquisition, data conversion, and data cleansing and training.

• Although the Integration Vendor performs internally focused risk management reviews, a formal project risk management function focusing on the City and the overall project risk was not observed. Formal risk management tools and metrics are not utilized.

• Formal quality assurance processes and controls including independent quality reviews and formal team quality assurance procedures such as peer-to-peer reviews were not consistently observed.

• Benefit realization is not being formally monitored.

• A number of informal processes were in place to make the go-live decision however, a formal process to ensure change readiness and go-live readiness was not observed.

Process Recommendations

• The City should enhance ERM Project controls by strengthening the ERM program management office function and incorporating additional project management, quality management and risk management procedures in compliance with PMBOK criteria.

• Benefit realization should be actively monitored to ensure expected benefits are realized.

• Readiness criteria should be established and evaluated prior to the approval for each Wave implementation. This review process should include formal steering committee and Departmental user sign-off to acknowledge the system meets or exceeds business requirements.

ERM Response:
While the City Management recognizes the value of the PMBOK guidelines and incorporate many PMBOK tools and approaches in the ERM Project, the City Management disagree with its use as the sole measure for performance on this project for two primary reasons. First, the PMBOK Guide itself states that its generally accepted standards are not to be applied uniformly on all projects: "Generally accepted does not mean that the knowledge and practices described are or should be applied uniformly on all projects; the project management team is always responsible for determining what is appropriate for any given project." (PMBOK Guide, 2000). Secondly, the ERM Project Management Office's methodology and approach to the ERM Project is specifically suited for large-scale technology implementations and enterprise transformation projects. Both SAP's ASAP Methodology as well as the Integration Vendor's Enterprise Transformation 3.0 Methodology are used for management of the ERM Project as stated in the original project plan and will continue to be used during this engagement. These methodologies include specific tools for tracking the progress of the project including mapping dependencies and effectively managing costs. In addition, strict project controlling methods and tools have been used since the beginning of the project to manage costs, to maintain a high level of quality and client service, to mitigate risks, and to effectively measure project performance.

Additionally, the project team is improving the process through the development of a weekly report that will identify Departmental responsibilities, the Department individual, Department director, and

respective management team member, and task to be performed in order to effectively communicate Departmental responsibilities. The project has also adopted formal procedures for the documentation of communications between the Project and City Departments as well as instituting a process of documenting minutes for all meetings and decisions made.

The ERM Project Team is conducting and will continue to conduct formal and informal communication of expectations to the Departments according to the Projects established plan and methodology. These communications have taken and will continue to take numerous forms including regular meetings with key representatives from affected Departments, numerous written communications with key Subject Matter Experts, Department Directors, and stakeholders, as well as formal communications to the Project's Steering Committee. All formal meetings with Department representatives will continue to be documented and stored in the project's document library.

The Integration Vendor has deployed its US Public Sector Leader to the project to perform a formal and independent risk management review every 6-12 weeks depending upon the status of the project. The results of the periodic reviews can be shared with project management and key project stakeholders. The project sponsors are briefed on a weekly basis on any potential risks to the project. Additionally, the City will initiate a new risk evaluation process. This process will include the ERM Project Sponsor conducting a quarterly risk review with a formal report to be included in the ERM Project Status report. The ERM Project Team will coordinate and facilitate meetings with City and the Integration Vendor personnel for the Sponsor.

The Integration Vendor has provided an SAP experienced partner independent of the project and separate from the risk management partner to perform a quality review of deliverables periodically, as the project requires and after every major phase. The results of these quality assurance assessments can be shared with project management and key project stakeholders. The ERM Project Team is recommending that the City Auditor's Office adopt a regular quality review process and utilize the position provided by the ERM Project to assist in funding the quarterly quality reviews.

The business case for the project was developed during Phase I and updated during Phase II. The benefits identified in the business case are scheduled to be realized primarily during Wave D of the project. While not specifically listed as a deliverable of the project, the ERM Project Team will continue to track the business benefits of the project updated in Phase II and will communicate these benefits to City leaders and City Council as they are realized.

For Wave A, a formal "show stopper" issue list was created 60 days before go-live and updated weekly. This list was reviewed, discussed, and updated weekly during Project Management meetings. Action items were identified so that the issues could be resolved before go-live. In addition, a detailed go-live plan was developed and daily meetings were held for 3 weeks prior to go-live. A go-live readiness check was made at each of these meetings and any showstopper issues were identified and resolved. Weekly meetings were also held with the Development Services Department to address any go-live issues. Go/no go decisions were made by the project team in conjunction with end users. On the weekend of go-live after data conversion was completed and the end users tested the system, another go/no go meeting was held with representatives from the City Manager's Office, the Integration Vendor, Project Sponsors, and Department leaders. The decision to go live was unanimous.

In addition to the above, the City Management is developing a user readiness plan for Departments to follow. This plan will be monitored and made a part of the go-live decision in an effort to mitigate risks associated with the go-live decision process.

The current review process since the inception of the project does include formal steering committee and Departmental sign off to acknowledge that the system meets or exceeds business requirements and the ERM Project will continue to use these strategies in the future as the City Management progress through the remaining Wave implementations. However, as the City Management moves forward, the project team will fully document minutes from pre go-live meetings among the project team and weekly meetings held with Departments and the steering committee.

TECHNOLOGY FINDINGS

• The project team has determined that the original hardware purchased for the ERM Project is not adequate for the implementation.

• The project team has determined that the current network architecture and infrastructure for the City is not adequate to support the requirements of the Graphical User Interfaces (GUI) and the network data transmission requirements of the ERM Project as a whole.

• The business continuity requirements of the ERM Project have not been formally documented.

TECHNOLOGY RECOMMENDATIONS

• The requirements for the hardware and network infrastructure should be formally analyzed and documented and independently evaluated to ensure they meet the future needs of the City and the ERM Project.

• Business continuity requirements should be formally documented and the ERM Project Team should ensure that ERM requirements are included in the disaster recovery plan prepared by the City.

ERM Response:
The original hardware purchase in the fall of 2002 was based on an RFP, which included detailed requirements and estimated user counts. The procurement was initiated before the software was selected and completed very quickly after the software was selected in order to provide a minimum configuration consisting of a development and test environment to effectively manage City funds. The project strategy called for the user and transaction counts to continue to be refined prior to each Wave going live and any additional hardware requirements to be acquired later in the project.

In addition to the planned purchase of required project hardware, the project team has also identified the need for data center network architecture enhancements and a strategy for deploying to the user desktops. The Information Technology Services Department in cooperation with the ERM Project has identified the enhancements that are needed to deploy a stable, secure, and manageable SAP system. These enhancements are comprised of data center enhancements, a Citrix solution and the installation of enhanced Internet security.

The disaster recovery plan for the ERM Project hardware has been designed and documented. Development of functional continuity plans is the responsibility of City Departments and the project team will provide assistance and guidance as necessary to facilitate this development.

An independent process was followed in the development of the requirements of the hardware and network infrastructure. The process used to determine the necessary hardware was comprised of the following: Identification of user and transaction counts by the project team, utilization of third party sizing tools, and independent validation by hardware vendors. This process will be utilized prior to go-live of each Wave in order to validate estimated user and transaction counts. Network infrastructure components have been proposed based on analysis performed by the Information Technology Services Department in cooperation with the project team and third party vendors. The

Integration Vendor has also agreed to fund the services of Mercury Interactive to provide an independent validation of the project's hardware infrastructure. The ERM Project supports the need for additional quality assurance review and will continue to promote strict project controlling guidelines and will continue to conduct independent risk reviews and quality assessments as the needs of the project require.

DATA FINDINGS

• The quality of data from legacy systems is key in any system conversion. The ERM Project Team does not own conversion of user data. Each respective Department owns the data quality. Data integrity and data conversion issues were noted in the Wave A implementation due to a lack of formal user readiness procedures and user accountability for data quality.

• Departments do not have recent historical benchmarks to accurately assess the effort required for the data cleansing effort.

DATA RECOMMENDATION

• A process should be developed to assist Departmental managers in meeting their responsibilities to the ERM Project for data cleansing requirements. This should include assistance in data conversion planning, testing, reconciliation, sign-off and data roll-back procedures.

ERM Response:
Responsibility for data cleansing and quality resides with the user Departments. The project team is responsible for data migration and will assist Departments in data cleanup as necessary. This expectation has been communicated via several methods since the beginning of the project. In addition to the above, the City Management are developing a user readiness plan, which will include data quality standards, for Departments to follow. This plan will be monitored and made a part of the go-live decision.

While the ultimate responsibility lies with the user Departments, the ERM Project Team is communicating with and providing assistance to City Departments in this area. We will be coordinating with affected Departments where data-cleansing activities crosses Departmental boundaries.

As stated above, responsibility for data cleansing and quality resides with the user Departments, and this expectation has been communicated via several methods since the beginning of the project. The ERM Project has already developed guidance documents and communications to assist City Departments with data cleansing efforts. This information will be included as part of the user readiness plans and monitored by the project team. This information is meant to be a guide for City resources. It is not meant to replace the responsibility for the data cleansing effort. Expectations have been communicated to City Departments stating that go-live dates will be delayed if data is not properly cleansed, converted, and validated by the City Departments before go-live.

OVERALL RECOMMENDATION – INDEPENDENT VERIFICATION AND VALIDATION
Complex development efforts need continuous and effective risk management through strong and formal project management controls and independent oversight. Effective risk management often requires the deployment of an active independent project oversight function to provide the project sponsor, steering committee, or executive management with objective input aimed at mitigating project risk and effectively resolving issues.

We recommend that the City consider approving and funding a formal Independent Verification &

Validation process as an integral part of the City's ERM Project. Public entities including the National Aeronautics and Space Administration (NASA), Department of Defense (DOD), and a growing number of State governments require Independent Verification & Validation (IV&V) services to be incorporated into their large IT projects.

ERM Response:
The ERM Project Team is recommending that the City Auditor's Office adopt a regular quality review process and utilize the position provided by the ERM Project to perform an ongoing review or use the funds from the position to fund quarterly quality assurance reviews by an independent third party.

DETAILED FINDINGS AND RECOMMENDATIONS

Our detailed findings and recommendations are included below. We recommend that the City address the detail findings and recommendations noted in our report in a timely manner. We recommend that progress toward addressing these matters be formally documented and monitored on a periodic basis to ensure accountability and that effective risk management practices be implemented as required.

1. Resource Assessment

Project Resources
Criteria – Conflicting internal project demands as well as normal operations can divert funds or resources from a project. If these risks are not effectively managed, a project may slip in its delivery or its scope may be affected, both of which may jeopardize the project's objectives. Controls should be in place to ensure that project resources are focused and available for the project.

Condition – The majority of the Integration Vendor resources are being rolled off due to the schedule delay. There is the potential that a number of these resources will not be available to return to the project. We noted that a staffing plan was not available for review.

During the interviews, Department personnel expressed resource concerns over City employees' experience relating to data cleansing and data input activities.

Cause – The staffing of the ERM Project is at risk due to the projected delay. Over the past year, the ERM Project team has upgraded the quality of the team's resources by replacing poor performers with high performers. Due to the projected project delay, a majority of the Integration Vendor employees and contractors are being rolled off the project.

Effect – Department resources may not be able to meet data cleansing and input delivery dates with current resources. The project will experience higher risks if these resources are not available to return once the project restarts. Project resources may not be available to return to project. New resources may need to pick up tasks and complete them. If that is the case, extra time will be required to bring new resources up to speed and the quality of the new resources will be unknown. New resources may not be as proficient and delays could be experienced.

Recommendation – Resources rolling off the project should clearly document all known remaining work. The ERM Project team will need to allow extra ramp up time for new team members and plan on a less efficient staff in the beginning. A staffing and resource management plan should be created and communicated with the project team. Controls over resource management should be enhanced through the creation of a formal resource transition plan and an increased level of project plan documentation to facilitate bringing new resources up to speed on project requirements quickly.

Resources should be committed to review and document the testing of financial controls within the new applications.

ERM Response:
Delays in the project have resulted in key resources being rolled off the project. The Integration Vendor has kept some critical resources engaged in the project for continuity. All City staff have remained active on the project. The Integration Vendor is actively taking steps to bring back key resources once components of the engagement start. Prior to rolling off consulting resources project personnel documented current knowledge and transferred knowledge to existing City staff resources.

Post Implementation Support
Criteria – Post implementation support plays an important role in ensuring that business productivity is not affected by a systems conversion. A project plan should include a requirement for the transition of daily production to qualified support staff that have the responsibility to operate and support the systems on a routine basis. This group should be managed and funded separately from the project management team.

Condition – The ERM production support organization has not been established or funded. Currently, production functions performed by ERM Project Team members take away from development work.

Cause – The support functions performed by ERM Project Team members is impacting performance against expected project responsibilities as required in the project plan.

Effect – This could lead to additional project delays as well as an inadequate support function for ongoing operations.

Recommendation – The project management and City management should develop a support structure that ensures that support personnel are not tasked with project development activities.

ERM Response:
ERM management has developed detailed staffing transition plans for future Waves to accurately and effectively transition staff to permanent support roles, which is required to maintain the ongoing operation of the system. Detailing the transition of key Wave A implementation staff to full-time Wave A support roles at go-live was part of the resource transition plan that was in place. A large component of the Wave A team is now transitioned into full-time support of the Wave A system, which is required to maintain the ongoing operation of the system. Furthermore, a comprehensive plan has been developed to establish a production support team, comprised of existing ERM Project Team staff, and transitioning ITSD staff into new roles as part of the FY04 budget process. This team will be reevaluated annually as part of the budget process to reassess project needs.

2. Process Assessment

Business Case Benefits

Criteria – The objective of a project business case and benefits realization monitoring is to ensure that the project is endorsed by the appropriate level of management, has an approved business case, and that expected benefits of the project are realized. Without sufficient focus and buy-in at all levels, there is an increased risk that the project may not deliver the expected value to the organization. Throughout a project the business case should be regularly revisited to account for changes in business needs and to assess that the expected benefits of the project are being realized.

Condition – The basis for the dollar amounts of expected project benefits are largely unknown by the project members interviewed. We noted that the functional teams are ensuring that the required information to track benefits is collected by the system; however, a formal process was not observed to benchmark and report on the targeted benefits. Project team members expressed concern over processes getting more complicated instead of simpler and questioned whether efficiencies would be gained through the process. Delays in the project roll-out schedule will require project resources extending their time on the project, which will impact the project costs and defer the benefits realization.

Cause – Business case benefits did not appear to be widely known among Departments.

Effect – No formal monitoring controls of performance against business case benefits metrics were evidenced. Little awareness of the business case and associated metrics was noted during our review.

Recommendation – Communications regarding the business case benefits should be formally communicated to all project team members. The benefits realization message should be continually re-enforced through the life of the project. A formal set of metrics and a measurement program should be developed and deployed. The program should include reporting on the progress toward achieving the metrics and estimated benefit dollars achieved. Project wide knowledge of the benefits to be received through the project is crucial to project success. Understanding the benefits allows the organization to make changes that are better for the overall organization.

ERM Response:

The business case for the project was developed during Phase I and updated during Phase II. The benefits identified in the business case are scheduled to be realized primarily during Wave D of the project. While not specifically listed as a deliverable of the project, the ERM Project Team will continue to track the business benefits of the project updated in Phase II and will communicate these benefits to City leaders and City Council as they are realized. The ERM Project Team is planning to enhance communication to City Departments primarily at the lower levels of the Departments through the use of "Road Shows" and product software demonstrations, as part of this process the team will communicate the benefits that have been identified in the business case.

Communication of Responsibilities

Criteria – The objective is to ensure that the project sponsorship, steering committee, project team members and the business units are communicating effectively and efficiently.

Condition – Interviewees viewed executive sponsors as being supportive of the project. The priority of the project at the Department level was observed to vary according to the level of sponsorship and interaction of the individual Departments. Departmental alignment was a major concern among the core project team and of some of the Department personnel interviewed. In addition, concerns about a perceived low project priority and resistance to change were cited during selected

interviews. Comprehension of the magnitude of change was evidenced with the higher Department level resources interviewed. During the interviews, a concern was observed with regard to the communication of the upcoming changes and that communication of these changes was not making it to lower levels of the organization.

Cause – The lack of formal communication between the ERM Project Team and the Departments has led to misaligned expectations regarding the Department's responsibilities regarding hardware acquisition, data conversion, data cleansing and training during Wave A.

Effect – The competing priorities at the Department level may lead to delays in project tasks. Communications regarding changes to the organization may not be making it to all intended parties creating risk of change readiness and resistance to change.

Recommendation – The ERM Project Team should solicit additional ongoing visible support from the executive sponsors. A consolidated effort is critical to the success of implementing an ERP system. Department accountability to the sponsorship teams should be clearly defined. The impact on the perceived project priority as it relates to the classification of the project as a Tier 3 project should be determined. The project team should provide clearly documented expectations to the user Departments. The project team should then track and monitor all dependent tasks assigned to the Departments. The project team should work to identify areas of resistance and leverage executive sponsorship in addressing issues noted. Project communications should be assessed to ensure consistent message delivery and content. The project web site should be kept up to date and reemphasized as a means of communication.

ERM Response:
The ERM Project will continue to communicate expectations to the user Departments and will continue to develop guidance documents to assist the City with data cleansing efforts. This information will be included as part of the user readiness plans and monitored by the project team. In addition, ongoing efforts will continue to ensure a consistent message is delivered to all City Departments and to ensure ongoing visible support from the executive sponsors. Additionally, the project team is improving the process through the development of a weekly report that will identify Departmental responsibilities, the Department individual, Department director and respective management team member, and task to be performed.

Project Plans – Existence
Criteria – The work plan is the major document for driving forward a project. The work plan identifies the work to be performed, the sequence of tasks, the assigned personnel and most importantly, it provides a tool for measuring progress. Logical groupings of tasks can be referred to as phases. Detailing of phases is ideally completed before work is due to begin on that phase.

Condition – A master project plan exists for the ERM Project and the individual phase plans roll-up to the master plan. However, the individual teams' detailed tasks are not included in the master project plan. The teams are tracking their tasks individually using MS Excel Workbooks or MS Project. It was noted during the interviews that all tasks are not be included in the teams' work plans.

Dependencies were softly built into the project plan by including dependent tasks in the schedules of work plans. The dependencies are not formally linked. Cross team communication is used for impact awareness. Charter dependencies are limited to funding, staffing and office space. External (non-ERM Project) dependencies were not tracked in the project plans.

Formal critical path analysis has not been performed. Informal analysis has been done within the core teams at major functionality levels. The PMO reviews project plans at a high level with plans to go into more detail beginning in Wave B. Responsibility for project plan execution at the Wave level is the Wave manager's responsibility.

The issues resolution process was well documented and supported by the Integration Vendor's Threadmanager tool. Issues are tracked to closure and escalated as necessary. Current process has had some bottlenecks and existing issue resolution process is being reworked to expedite decision-making. The revised process was not available for review.

Cause – While formal project plans do exist, standardized project plans and project plan controls were not found to be in place. Project plans are tracked in Microsoft Project at the Project Management Office level and in either Microsoft Excel or independent Microsoft Project plans at the project team level. Project plans do not contain hard dependencies making it difficult to assess impacts of task delays. Evidence of external dependencies being factored into the project plans was not found. Critical path analysis is not performed allowing the potential of a delay on an unknown critical task.

The current Wave management teams are strong; however, turnover of the Wave management teams could reduce the effectiveness of the teams and increase the risk of schedule slippage.

Effect – Inconsistent project plans and missing tasks can lead to project schedule slippage.

Impacts to the overall schedule could be overlooked due to dependencies not being highly visible. Turnover of staff may lead to dependencies being missed. External dependencies if not monitored can cause project delays to be longer than necessary.

Critical path analysis identifies the tasks that have no room to slip on the schedule. Failure to perform this analysis may lead to schedule slippage due to lack of proactive measures being taken to keep task on schedule.

Failure to monitor at a detail level exposes the project to schedule slippage due to lack of proactive measures being taken to keep the task on schedule.

Recommendation – The Project Management Office (PMO) should continue to be very involved in team activities.

A comprehensive master plan should be developed. All task and external and internal dependencies should be included in the plan. The PMO should work to identify all external and internal dependencies and assign individuals to monitor the progress of the dependencies.

Once all task, external dependencies, and internal dependencies have been input into the project work plan, a planning tool should be used to determine the project's critical path. The critical path should then be monitored on a regular basis.

All project plans should be created in the same tool so that they roll-up to the project master plan. Creating project plans in a consistent manner will allow for greater visibility to detailed tasks.

ERM Response:
The ERM Project has utilized from its inception MS Project for maintenance and development of its project plans. A detailed project plan exists for each Wave and is maintained by each individual project team in charge of that specific Wave. All detailed project plans for each Wave automatically roll up into a single master plan that is monitored at the ERM Project Management Office level. The master plan will be reviewed weekly once start up activities for the project commence. Until that date an interim work plan is being used to monitor activities for each project team.

A detailed monitoring of external and individual dependencies where appropriate is maintained outside of the project plans by the project team, which updates the project plan in summary fashion. The Project Management Office review plans each Wednesday with the separate individual project teams as well as a group meeting. Additionally, the Integration Vendor and the City teams hold separate meetings to discuss issues and plans each Tuesday.

Project Plans – Completeness and Maintenance
Criteria – A detailed work plan provides a measurable schedule for accomplishing specific goals. However, it must be constantly maintained until all tasks in the plan are complete. The successful coordination and arrangement of all these factors in a project plan requires significant effort and skill. Planning deficiencies may result in milestones being missed, time lines being extended and budget overruns.

Condition – Status reports are created weekly and presented to the management team. The status reports include a project summary, activities completed, items requiring sponsor attention, activities planned and deliverables status sections. During a review of the status reports, it was noted that the deliverables section contained many deliverables that were weeks or months behind on delivery and a date was not presented as to their expected completion date. The impact of the delayed deliverables is not included in the status report. It is difficult to determine the overall project schedule status based on the information presented. Overall, the impact of issues is not clearly documented.

Cause – Project status reports did not include all information necessary for informed decisions.

Effect – Revised estimated completion dates on past due tasks, impact of late task on the project schedule and the impact of identified issues were not included in the project status reports.

Recommendation – Status reports should be modified to include both the original expected completion data and the revised expected completion date. Impacts to dependent task and deliverables should be clearly presented in the status reports. The City should increase its participation in monitoring the project workplans. Without detailed monitoring by City employees, project status may not be accurately reflected and exceptions may not be appropriately managed. Executive sponsors may not receive required information for making an informed decision. The revised process will allow for improved project controls and increase decision time.

ERM Response:
The ERM Project Team has updated its status reports to include both the original expected completion date and the revised expected completion date for deliverables. Issues, due dates and the impact have been added to the status report. Status reports as well as project plans have been and will continue to be maintained and developed by the project team consisting of the Integration Vendor and City Employees. The communication of status reports will also be broadened to include the Mayor and Council and the City Executive Team in order to effectively communicate issues and increase timely decision-making. In addition all risks and issues are tracked by the ERM Project Team in an issue database and discussed weekly by all of the Project Managers at the weekly Project Management Office meeting.

Risk Management

Criteria – Risk management involves the identification, analysis, evaluation and proactive response to threats, both current and anticipated, throughout the project to enable the project to achieve its objectives. It is important that processes are in place to detect problems in order to reduce the risk of problems compounding if they are dealt with promptly. The procedure for managing risks and issues identified should provide a structured mechanism for documenting and prioritising project issues, assigning them for analysis, identifying and agreeing to a solution and implementing the solution to clear the risk.

Condition – The Integration Vendor performs risk management reviews quarterly. The Integration Vendor risk reviews have an internal focus and do include risks to the City. Outcomes of the review are only provided to the City when requested. The last requested review was performed in October 2002.

Cause – Inadequate project risk management controls were noted. Periodically the Integration Vendor risk reviews are performed, but City risk management reviews were not evidenced. Formal day-to-day project risk management processes and tools were not evidenced.

Effect – Risk management is a daily process and allows risks to be mitigated before the risks become potential project delays or cost overage issues.

Recommendation – A formal risk management process should be implemented and include a risk repository. Risk management processes should involve proactively managing potential project risk so that they don't become larger project issues.

ERM Response:

The Integration Vendor will continue to provide key independent resources to conduct periodic risk reviews, as the project requires. The Integration Vendor has deployed its US Public Sector Leader to the project to perform a formal and independent risk management review every 6-12 weeks depending upon the status of the project. The results of the periodic reviews can be shared with project management and key project stakeholders. Additionally, the City will initiate a new risk evaluation process. This process will include the ERM Project Sponsor conducting a quarterly risk review with a formal report to be included in the ERM Project Status report. The ERM Project Team will coordinate and facilitate meetings with City and Integration Vendor personnel for the Sponsor.

Quality Assurance

Criteria – To ensure the objective measurement of whether users' needs are satisfied and quality standards are adhered to, the project should schedule frequent reviews of goals, methods and performance by an independent reviewer.

Condition – The Integration Vendor has a quality assurance partner that comes in to perform quality assurance. No formal documentation could be found from an ERM Project Team Quality Assurance review. The Integration Vendor did the last Quality Assurance review at the beginning of January 2003. The Integration Vendor Quality Assurance review focuses on the Project Deliverables from The Integration Vendor's perspective. The City does not have a quality assurance review function.

An independent review of all of the deliverables has not been performed. As part of this review, a brief review of a selection of the deliverables was performed. There is a position on the organization chart called Internal Review - EDP Auditor that has been vacant since project inception.

Cause – Day-to-day quality assurance controls and processes such as independent quality reviews and formal team quality assurance processes were not evidenced.

Effect – A formal policy regarding quality assurance of control specifications was not evidenced, however the individual teams reported having each implemented some type of informal quality assurance measure. One exception to this is the training team. The training team has implemented a formal quality assurance program.

Recommendation – Quality assurance should be built into the deliverable creation process. Independent project assessments should be done at least quarterly if not done on a monthly basis. Formal quality assurance controls should be documented and implemented for each team. The City team members should increase their involvement in the quality assurance process. Relying solely on the vendor to provide quality assurance increases project risks.

The training team has a formal quality assurance process in place, but the other teams operated more informally. Formal quality assurance controls should be documented and implemented for each team.

ERM Response:
The Integration Vendor has provided an SAP experienced partner independent of the project and separate from the risk management partner to perform a quality review of deliverables periodically, as the project requires and after every major phase. The results of these quality assurance assessments can be shared with project management and key project stakeholders. The ERM Project Team is recommending that the City Auditor's office adopt a regular quality review process and utilize the position provided by the ERM Project to assist in funding the quarterly quality reviews.

Financial Controls
Criteria – The project should ensure that controls are implemented within the new system. Controls include both manual and system controls (authorization procedures, system validation checks), and organizational policies (for example - authorization levels).

Condition – The Office of the City Auditor has not performed an independent financial controls review.

Cause – Financial controls within the application have not had appropriate levels of review by an independent reviewer or the Office of the City Auditor.

Effect – Financial controls may not be appropriately configured within the system and may need to be redefined or configured later at greater cost to the project.

Recommendation – The project team should increase the involvement of the Office of the City Auditor. An independent reviewer should perform a financial control review.

ERM Response:
As part of the implementation process the Integration Vendor brought in expertise from their Enterprise Risk Services organization, to review the financial system blueprint and identify where internal controls were not clearly documented. In addition, due to the nature and extent of change that the City will experience as part of the ERM Project Implementation, the Director of Finance was appointed as a project sponsor and the previous City Controller has been dedicated to the project as its Director in order to validate that the appropriate controls are implemented. The Finance Department will also perform thorough user testing to validate financial controls. Additionally, the City Management recommend the City Auditors Office be involved in the user acceptance testing of the project to validate or test internal controls as designed prior to go-live.

3. Technology Assessment

Hardware Selection

Criteria – The project team should document formal requirements definitions for the software selected to ensure that the hardware will meet the performance requirements of the City. The project should consider how technology needs are assessed including new security, networking/connectivity requirements (e.g., Internet connections), data retention, capacity planning and impact on the network, compatibility with existing systems and hardware, and technical and physical constraints.

Condition – Due to the nature of the City's requisition process all hardware was purchased in a single purchase based on the estimated requirements of the ERM Project. A detailed hardware requirements definition for the original acquisition is not available. The project team has determined that the original hardware selected is not adequate for the implementation and is requesting an additional procurement. While considerable effort appears to have been put into determining the new hardware requirements this process has not been formally documented and communicated.

Cause – The original hardware selected for the ERM Project is not adequate for the implementation and is being augmented with an additional procurement. The additional hardware acquisition may not meet the needs of the project as these needs and requirements have not been formally documented.

Effect – The hardware requirements definitions for the second hardware acquisition should include requirements for adequate test and development environments.

Recommendation – The hardware requirements analysis for the ERM Project should be formally documented and independently validated to ensure both adequacy and accountability.

ERM Response:

The requirements for the original hardware purchase were documented in the request for offer as part of the procurement process and were available upon request. This information was provided to the City Auditor's Office subsequent to this performance review. The requirements for the supplementary purchase of hardware have also been provided.

In addition, an independent process was followed in the development of the requirements of the hardware and network infrastructure. The process used to determine the necessary hardware was comprised of the following: Identification of user and transaction counts by the project team, utilization of third party sizing tools, and independent validation by hardware vendors. This process will be utilized prior to go-live of each Wave and to validate estimated user and transaction counts.

Network Infrastructure

Criteria – The City's Information Services Department should document the requirements of the underlying network infrastructure to ensure that the requirements of the implemented systems are met.

Condition – The current network architecture and infrastructure for the City does not have adequate bandwidth to support the requirements of the GUI interfaces and the additional network requirements of the ERM Project as a whole. Citrix terminal services are being proposed as a solution to address the bandwidth concerns. Additionally, network components will be purchased as part of the second hardware acquisition. However, the infrastructure requirements have not been formally documented and communicated. According to ITSD management, these acquisitions have been accelerated from future periods; however the ITSD budget is not detailed enough to determine when these items were to be purchased.

Cause – The current network architecture and infrastructure for the City is not robust enough to support the requirements of the GUI interfaces and the network requirements of the ERM Project as a whole. The project may be delayed further if the network infrastructure is not adequate.

Effect – The infrastructure costs may be absorbed by the ERM Project that should have been allocated to the ITSD budget. The revised hardware analysis has not been independently verified.

Recommendation – The network infrastructure requirements for the ERM Project should be formally documented and independently reviewed to ensure both adequacy and accountability. The project management and City management should work together to ensure that the network infrastructure purchases are appropriately allocated between the ERM Project and the ITSD budget.

ERM Response:
In addition to the planned purchase of required project hardware, the project team has also identified the need for data center network architecture enhancements and a strategy for deploying to the user desktops. The Information Technology Services Department in cooperation with the ERM Project has identified the enhancements that are needed to deploy a stable, secure, and manageable SAP system. These enhancements are comprised of data center enhancements, a Citrix solution and the installation of enhanced Internet security.

The Integration Vendor has also agreed to fund the services of Mercury Interactive to provide an independent validation of the project's hardware infrastructure through the direction of the City Auditors Office. The ERM Project supports the need for additional quality assurance review and will continue to promote strict project controlling guidelines and will continue to conduct independent risk reviews and quality assessments as the needs of the project require.

Business Continuity
Criteria – As part of the project risk management process, it is necessary to update the Organization's Disaster Recovery Plan and off-site disaster recovery facilities to include the new system.

Condition – The business continuity requirements have not been formally documented or tested.

Cause – The ERM Project is a mission-critical application, however the business continuity requirements have not received the required level of attention.

Effect – Without adequate disaster recovery and business continuity plans the City may lose data or be unable to provide key services in the event of a disaster.

Recommendation – Disaster recovery and business continuity requirements for the ERM project should be adequately documented. Project management should take ownership to ensure that an adequate DRP plan is put into place prior to the implementation of the ERM Project.

ERM Response:
The disaster recovery plan for the ERM Project hardware has been designed and documented. Development of functional continuity plans is the responsibility of each City Department and the ERM Project Team will provide the guidance and assistance necessary to develop the functional business continuity plans.

4. Data Assessment

Data Cleansing

Criteria – Organizations traditionally have a variety of legacy systems that may need to be combined over time. A culmination of end user computing and client server environments make data a challenging issue. Data cleansing, transformation and creation activities are a key element of an IT project. These activities enable data to be cleansed, updated, extracted, tested and migrated to a new system environment.

Condition – The ERM Project Team does not own the quality of data from the legacy systems. The data quality is owned by each of the respective Departments. During Wave A, the Departments were responsible for performing data clean up and monitoring for completion prior to the Wave A conversion. The ERM Project has created a database to track "readiness for go-live" and confirming that the data is ready for conversion is one of the database items. The Departments remain responsible for data cleansing. A high degree of concern was expressed by the Integration Vendor interviewees regarding the City preparation and processes to ensure compliance with its responsibility for data cleansing.

Cause – Data integrity and data conversion issues were noted in the Wave A implementation due to a lack of formal data cleansing procedures and unclear accountability for data quality.

Effect – Departments do not have recent historical benchmarks to accurately assess the effort required for the data cleansing effort.

Recommendation – The ERM Project management should verify that user Departments are trained on identifying legacy data requirements and ensuring that relevant data is captured. The ERM Project management team should have ultimate responsibility for tracking and managing the data cleansing. A process should be developed to assist Departmental managers in meeting their responsibilities to the ERM Project for data cleansing requirements. This should include assistance in data conversion planning, testing, reconciliation, sign-off and data roll-back procedures.

ERM Response:

Responsibility for data cleansing and quality resides with the user Departments, and this expectation has been communicated via several methods since the beginning of the project. The ERM Project has already developed guidance documents and communications to assist the City with data cleansing efforts. This information will be included as part of the user readiness plans and monitored by the project team. This information is meant to be a guide for City resources. It is not meant to replace the responsibility for the data cleansing effort. Expectations have been communicated to City staff stating that go-live dates will be delayed if data are not properly cleansed, converted, and validated by the City Departments before go-live.

In addition, data conversions are performed and practiced multiple times by the Project Team in cooperation with City Departments to identify and correct errors prior to going live. Actual production data is also loaded via conversion routines in a test environment and provided to Departments to validate prior to going live.

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This report was prepared for use by the Office of the City Auditor and the City of San Antonio and its management and is intended for Internal Use Only.