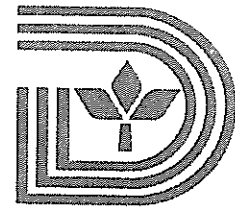


# Memorandum



CITY OF DALLAS

DATE: May 8, 2009

TO: Honorable Members of the Finance, Audit & Accountability Committee –  
Mitchell Rasansky, Chair; Jerry R. Allen, Vice-Chair; Dr. Elba Garcia, Mayor Pro Tem;  
Vonciel Jones Hill; Angela Hunt; Ron Natinsky; David A. Neumann

SUBJECT: Finance, Audit & Accountability Committee –  
Presentation on Assessment of Risk Related to the City's Mainframe Operations

The City Auditor's Office released the final audit report, *Follow-Up of Audit Recommendations, Department of Communication and Information Services, Fiscal Year 2007* (Report Number A09-006) on February 27, 2009.

CIS responded to 22 recommendations resulting from audits of the City's Mainframe Operating Systems, Security and Operations and the Audit of Mainframe Utilization.

The migration from mainframe applications to client-server applications will reduce the reliance on the mainframe computers, but there are still issues associated with the effectiveness of mainframe operations, maintenance of the mainframe computers, security, and the allocation of mainframe costs as departments transition to the client-server technology. Many of these issues were originally reported in 2004 yet still remain unresolved.

I will provide a short briefing to the members of the Finance, Audit & Accountability Committee on this matter on Monday, May 11, 2009.

Sincerely,

A handwritten signature in black ink that reads "Craig D. Kinton".

Craig D. Kinton  
City Auditor

**Presentation to  
Finance, Audit & Accountability  
Committee**

**Assessment of Risk  
Related to the City's  
Mainframe Operations**

**City of Dallas  
Office of the City Auditor  
May 11, 2009**





# Mainframe Computing Environment

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The City technology strategy is focused on the use of server-based technology as a replacement for mainframe-based applications, but until the transition is complete the City will continue to have an exposure to risk from mainframe operations.

# Prior Audits by City Auditor

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- Audit of the City's Mainframe Operating Systems and Operations  
*(November 24, 2004)*
- Follow-Up Report of the City's Mainframe Operating Systems and Operations  
*(January 5, 2007)*
- Audit of Mainframe Utilization  
*(March 30, 2007)*
- Follow-Up Audit of the City's Mainframe Operating Systems and Operations and Mainframe Utilization  
*(February 27, 2009)*

# Audit Follow-Up Results

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- Follow-Up Audit of the City's Mainframe Operating Systems and Operations and Mainframe Utilization (*February 27, 2009*)
- 22 Recommendations
  - ❖ 13 Recommendations (Report #A09-006)
    - 5 Implemented
    - 4 Partially Implemented
    - 4 Not Implemented
  - ❖ 9 Recommendations (Confidential Memo)
    - 2 Implemented
    - 4 Partially Implemented
    - 3 Not Implemented

# Areas of Concern

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- The Data Center fire suppression system was tested and failed
- Uninterruptible Power Supply (UPS) support and maintenance agreements have expired
- A backup LINC programmer has not been funded

# Significant Risks

Concern	Management Action	Risk
The fire suppression system for the Data Center was tested May 2007 and failed.	A contract for engineering and design of improvements for the electrical, mechanical and air handling systems was awarded December 2008.	Adequate safety measures are not in place to protect the mainframe computer and components.
UPS support and maintenance agreements have expired.	A Request for Competitive Sealed Proposal will be advertised in March 2009 with an expected award in June 2009.	Potentially affects the delivery of 9-1-1 services if the backup system is not fully operational.
Lack of backup programmer for LINC operating system and applications.	Access to former City employee with LINC experience. CIS stated that current employees have sufficient experience to support LINC platform.	Primary programmer may not have sufficient experience. Backup programmer not on staff. <b>There are applications critical to the City that are still dependent on the LINC operating system.</b>

# LINC Operating System Risk

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Concern	Management Action	Risk
Critical mainframe applications are still dependent on the LINC operating system.	The Fire and Police Computer Aided Dispatch systems have migrated to a client-server platform. The PAY1 project has transitioned water billing and collection to a client-server platform.	The Courts Case Management system is solely dependent upon the mainframe and LINC operating system. Police applications critical to the City are still dependent on the LINC operating system.



# LINC- Dependent Applications

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Key Focus Area	LINC Application	Description	Transition Date
Public Safety	Courts Case Mgmt	Warrant processing, court scheduling, citation processing and cash	TBD
Public Safety	Police Records Mgmt	Arrest reports, police personnel, crime analysis and Texas Crime Information Center look up	2011
E <sup>3</sup> Govt.	City Secretary System	City Council minutes, ordinances and City code.	2010
E <sup>3</sup> Govt.	Geographic Information	Street listings to verify accuracy of location for Police, Fire, Code, and Street Maintenance. Geographic and political boundary information.	TBD

# Conclusion

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The City will continue to be at risk until:

- A fire suppression system test is successful
- The support and maintenance agreements for the emergency Uninterruptible Power Supply back-up systems are renewed
- All LINC-based applications have been migrated to new operating system platforms

# QUESTIONS?



# Memorandum



**CITY OF DALLAS**  
**(Report No. A09-006)**

**Date:** February 27, 2009

**To:** Honorable Mayor and Members of the City Council

**Subject:** Final Report – Follow-Up of Audit Recommendations, Department of Communication and Information Services, Fiscal Year 2007

The Department of Communication and Information Services (CIS) has responded to 22 recommendations resulting from audits of the City's Mainframe Operating Systems, Security and Operations and the Audit of Mainframe Utilization. *Attachment A* provides detailed information for the 13 recommendations included in this audit<sup>1</sup> report.

Nine other recommendations from the *Confidential Memo Pertaining to the Mainframe Operating Systems, Security and Operations* have been communicated to the appropriate security personnel. Only two of the nine recommendations have been fully implemented.

### Summary of Follow-up Audit Results

Fiscal Year Audit Report Issued	Number of Report Recommendations	Recommendations Implemented	Recommendations Partially Implemented	Recommendations Not Implemented
2007	13	5	4	4

The migration from mainframe applications to client-server applications will reduce the reliance on the mainframe computers, **but there are still issues associated with the effectiveness of mainframe operations, maintenance of the mainframe computers, security, and the allocation of mainframe costs as departments transition to the client-server technology.** Many of these issues were originally reported in 2004 yet still remain unresolved.

<sup>1</sup> This audit was conducted under the authority of the City Charter, Chapter IX, Section 3 and in accordance with generally accepted government auditing standards. The audit objective was to verify that management has taken corrective action(s), the corrective action(s) are achieving the desired results, or management has assumed the risk of not taking corrective action(s). This performance audit was conducted in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusion based on our audit objective. We interviewed CIS department personnel, reviewed policies and procedures, and evaluated internal workplans.

This report was discussed with CIS management. Although a written response was not requested, the Chief Information Officer (CIO) expressed his disagreement with the "Not Implemented" status of the recommendation to provide funding to allow a backup LINC programmer to be hired or trained.

According to the CIO, LINC is an obsolete operating system and additional programming expertise or training is not available. The department continues to rely on two individuals on staff that have some LINC expertise or, when necessary, a retired City employee who was instrumental in operating and maintaining the LINC system.

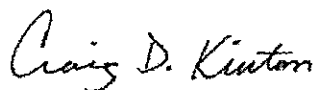
The CIO stated that two critical systems continue to rely on the LINC operating system:

- 1) the Police Department's Records Management System scheduled for migration in FY 2011; and,
- 2) the Courts Management system which does not currently have a timeline for migration.

We believe that the City will continue to be at risk until all LINC-based applications have been migrated to new operating system platforms.

If you have any questions or need additional information, please contact me at 214-670-3222 or Gary Lewis, Assistant City Auditor, at 214-670-5347.

Sincerely,



Craig D. Kinton  
City Auditor

Attachment A

C: Mary K. Suhm, City Manager  
Ramon F. Miguez, P.E., Assistant City Manager  
Worris Levine, Director – Communication and Information Services

**ATTACHMENT A**

Audit Report	Audit Issues	Audit Recommendations	Audit Follow-Up Results
<p><b>Audit of the City's Mainframe Operating Systems, Security and Operations (January 5, 2007)</b></p>	<p>The assignment of operational responsibilities with Communications and Information Services current organizational structure appears to be causing operational inefficiencies or service gaps.</p>	<ul style="list-style-type: none"> <li>- Conduct an analysis focused on matching the appropriate alignment of functional tasks to organizational hierarchical responsibilities within CIS.</li> </ul>	<p><b>Implemented.</b> CIS has aligned functional tasks along four areas of organizational responsibility. The four areas are: Technology Management, Strategic Management, Application Management, and Business Management. Functional tasks are appropriately aligned within the organizational hierarchy.</p>
		<ul style="list-style-type: none"> <li>- Develop and implement a plan to execute the results of the organizational analysis.</li> </ul>	<p><b>Implemented.</b> CIS has implemented organizational changes; the most recent was effective June 2008.</p>
<p><b>Although controls exist for the change notification process, current procedures are not adequate to ensure a high level of quality in the software development process.</b></p>		<ul style="list-style-type: none"> <li>- Review and adopt the software review process as outlined in the Capability Maturity Model Integration Software (CMMI-SW), Version 1.1.</li> </ul>	<p><b>Implemented.</b> CIS has developed a Project Management Framework which has a pre-defined set of processes for software development projects. The software development lifecycle has five stages: Initiating, Planning, Executing/Controlling, Closing, and Continuous Improvement. There are five major quality assurance "gates" imbedded in the lifecycle.</p>
		<ul style="list-style-type: none"> <li>- Implement the use of software measurement tools to monitor the progress and quality of all created and modified code.</li> </ul>	<p><b>Not Implemented.</b> CIS does not have a software measurement tool for mainframe applications. CIS uses WorkSoft Certify software to test enhancements, changes, and modifications for the Pay1 billing system, but Pay1 is a client-server application.</p>

Audit Report	Audit Issues	Audit Recommendations	Audit Follow-Up Results
	<p>Lack of effective strategic planning may result in the areas of workforce composition, succession, training, and software application technology that are not being responsive to future needs.</p>	<ul style="list-style-type: none"> <li>- Provide funding to allow a backup LINC programmer to be hired or trained.</li> </ul>	<p><b>Not Implemented.</b> CIS responded on October 31, 2008 that "the department has trained staff to support applications running on the LINC operating system and the implementation of the Computer Assisted Dispatch (CAD) project will remove approximately 80 percent of the dependency on the LINC operating system." However, there are still City departments, such as the City Secretary, Courts, and Police that rely on LINC applications and the need for a backup programmer still exists.</p>
		<ul style="list-style-type: none"> <li>- Adopt the five principles for workforce planning as specified in the Government Accounting Office (GAO) report.</li> </ul>	<p><b>Not Implemented.</b> Per CIS, the City of Dallas is migrating systems off the mainframe and will not implement workforce planning for the mainframe.</p>
<p><b>Preventative maintenance is not adequate on key operational equipment for the data center and places unnecessary risk on critical City operations.</b></p>		<ul style="list-style-type: none"> <li>- Renew support and maintenance agreements for all the components of the City's emergency Uninterruptible Power Supply (UPS) back-up systems.</li> </ul>	<p><b>Not Implemented.</b> The UPS support and maintenance agreements have not been renewed. The systems were serviced during June 2007 and the vendor recommended establishing a UPS inspection schedule. Per CIS, a Request for Competitive Sealed Proposal will be advertised in March 2009 with an expected award in June 2009.</p> <p><b>Partially Implemented.</b> The fire suppression system was tested May 21, 2007 and failed. A contract for engineering and design improvements to the electrical, mechanical, and air handling systems was awarded by City Council on December 10, 2008. The contracted services are necessary to upgrade the Data Center's systems to meet cooling and fire suppression requirements.</p>
		<ul style="list-style-type: none"> <li>- Enforce the testing provisions of the fire suppression system maintenance contract.</li> </ul>	

Audit Report	Audit Issues	Audit Recommendations	Audit Follow-Up Results
		<ul style="list-style-type: none"> <li>- Develop and implement a plan to identify and remove unused cabling in the raised-flooring.</li> </ul>	<p><b>Partially Implemented.</b> A contract for engineering and design improvements to the electrical, mechanical, and air handling systems was awarded by City Council on December 10, 2008. This is necessary to upgrade the Data Center's systems to meet cooling and fire suppression requirements.</p>
<p><b>Audit of Mainframe Utilization (March 30, 2007)</b></p>	<p><b>Management has not routinely measured and monitored the performance and utilization of the mainframe.</b></p>	<ul style="list-style-type: none"> <li>- Direct mainframe operations personnel to gather and routinely report performance and utilization measurements.</li> <li>- Develop and implement a system to measure and monitor the effectiveness of mainframe operations in providing service to the City.</li> </ul>	<p><b>Implemented.</b> Reports are generated on a daily, weekly and monthly basis covering: LINC activity, Direct Access Storage Device usage, print jobs, and jobs submitted through Control-D and Control-M.</p>
		<ul style="list-style-type: none"> <li>- Perform analysis regarding applications running on the mainframe to determine the appropriate computational and operational environment for the application.</li> </ul>	<p><b>Partially Implemented.</b> CIS has an "Operations Daily Flash Report" which is a snapshot of operational statistics such as data center incidents, lines printed, and server backup status. However, CIS did not provide evidence of ongoing analysis of the operational statistics which is necessary to measure and monitor the effectiveness of mainframe operations.</p>
			<p><b>Implemented.</b> CIS has developed a Mainframe Application Replacement plan, but did not provide evidence of the formal analysis used to determine the appropriate computational and operational environment for computer applications.</p>



Audit Report	Audit Issues	Audit Recommendations	Audit Follow-Up Results
		<p>- Develop, document, publish, and implement a plan that integrates mainframe operations into CIS service delivery strategy.</p>	<p><b>Partially Implemented.</b> CIS has developed a "Mainframe Application Replacement" plan with application names, Key Focus Areas, budget timeframes, and status. Several mainframe applications, such as the 911 Support System and PAY1, are either implemented or in progress. However, the plan does not address ongoing maintenance, the effectiveness of mainframe operations, or the allocation of costs. Remaining departments will have to bear an increased proportion of the operating costs of the mainframe as departments are no longer charged for the use of the mainframe as applications are shifted to the client-server environment.</p>

**LINC Operating System Applications Table**

<b>LINC Application</b>	<b>Date to Port to New Architecture</b>	<b>New Architecture Platform &amp; Software System</b>
City Secretary System	2010	Electronic Document Management System (EMDS)
Courts Case Management System	RFCSP issued 04/08	
Courts Imaging System	RFCSP issued 04/08	
Courts/DPD Regional Wanted Persons	TBD during budget process	
Fire 9-1-1 Support Systems (MSAG)	08-2007	VisiCad Command
Fire Automatic Vehicle Locator (AVL) Client	08-2007	VisiCad Command/CLD Message Switch
Fire Computer Aided Dispatch System	08-2007	VisiCad Command/CLD Message Switch
Fire Fleet Management System		
Fire MARS (False Fire/Medical Alarms)	08-2007	
Fire Mobile Digital Device (MDD) Client	TBD during budget process	
Fire Safety Inspection Registration	TBD during budget process	
Fire Security System	TBD during budget process	
Fire Tactical Information System	08-2007	VisiCad System
Geographic Information System	TBD during budget process	
Police Arrest Reporting	TBD during budget process	
Police Automated Vehicle Locator (AVL) Client	08-2007	VisiCad Command/CLD Message Switch
Police Dispatch	08-2007	VisiCad Command/CLD Message Switch
Police Miscellaneous Incident Reporting (MIR)	TBD during budget process	
Police Prosecution System (PROS)	TBD during budget process	Dallas County Arrest Information System (AIS)
Police MDD Client (Mobile and Network)	TBD during budget process	
Police Offense Reporting System	TBD during budget process	
Police Pawn Shop Interface (x/TCIC)	TBD during budget process	
Police Support Systems a. Personnel (Needed for RMS) b. Crime Analysis (Extract from Offense System) c. Repossession System (TOW/REPO) d. TCIC/NCIC Look Up Transaction	TBD during budget process	
Police Weapons and Property Inventory System (WEPI)	TBD during budget process	
Police Alarm Incident Reporting	TBD during budget process	
Police System of Total Automated Reporting and Retrieval (STARR)	TBD during budget process	
Police NCIC/TCIC	TBD during budget process	

LINC Application	Date to Port to New Architecture	New Architecture Platform & Software System
Employee Retirement Fund (ERF)	TBD during budget process	
Police and Fire Pension Fund (PFP)	TBD during budget process	
Police MARS (False Security Alarms)	TBD during budget process	
Tax LINC Shadow Files	TBD during budget process	
Water LINC Shadow Files System	TBD during budget process	
Workers' Compensation System	TBD during budget process	
Collection Agency Interface – Special Collections	TBD during budget process	