
MEMORANDUM

DATE: September 29, 2006
TO: City Council Members
FROM: Sylvia Richards, Policy Analyst
RE: IMS Audit

The Matrix Consulting Group submitted to the City the Final Report of the IMS (Information Management Systems) Division's Management and Performance Audit in July of 2006. Attached is a copy of the Final Report.

The Scope of Work for the audit included an evaluation of the following items:

1. Strategic Direction of the IMS Division
2. Data Security
3. Systems Analysis and Design
4. Communication Services
5. Contracted Services
6. Customer Satisfaction with IMS Services
7. Help Desk Service Levels, Charter, Policies and Procedures
8. Adequacy of Support provided to End-users
9. Staffing Level
10. Core Business Applications and Automation
11. Technology Replacement Program
12. Billings to Users

The following is a list of major findings from the Audit:

1. IMS does not directly charge departments the cost of developing in-house software. Departments pay only if *off-the-shelf* software packages are purchased, which creates incentives to ask IMS to develop in-house software.
2. Currently, IMS does not have a process to evaluate the cost and benefit of integrating systems across multiple departments or divisions. Customers generally direct the development of programs or systems without regard to the needs of the city as a whole.
3. The city does not have a steering committee of representatives from departments to facilitate cross departmental approaches to system integration and cost effective solutions to IT (Information Technology) needs.

The IMS audit proposes the following recommendations:

Organization

1. Consolidate IT functions currently housed within the Airport (7 FTEs), and Fire Department (1 FTE) within the IMS Division. This would necessitate a reporting transfer of positions from the Airport and from the Fire Department to the IMS Fund on a reimbursement basis; therefore, **no direct fiscal impact**. A physical transfer of individuals may not be necessary.
2. Reorganize IMS operations: (a) consolidate the communication team into a new infrastructure team; (b) consolidate software engineering and technology consulting into one unit and add one executive manager to oversee both teams; (c) create a new policy and research unit initially staffed with one senior staff member to support technology planning, policy development and research. **(Total estimated cost: \$215,000)**

Long-term Technology Plan

1. Establish an IT steering committee composed of representatives from key departments. **(No direct fiscal impact.)**
2. Develop a strategic plan for information systems and technologies. **(No direct fiscal impact.)**

Data Security

1. Identify back-up sites for business resumption in the event of a disaster; provide additional training to employees on disaster recovery; test elements of the plan periodically. **(No direct fiscal impact.)**
2. Add additional internal firewalls, increase redundancy, utilize storage area networks, and implement virtual networks. **(Costs vary based on the technology utilized.)**
3. Provide additional training on security policies to city employees; test security plans on a regular basis. **(No direct fiscal impact.)**

Systems Acquisition and Analysis

1. Change the cost allocation model for software engineering system development. **(No direct fiscal impact.)**
2. Develop standardized project management tools; provide an itemization of costs and benefits of developing software in house. **(No direct fiscal impact.)**
3. Develop requirements for staff continuing education for a minimum 24 hours per year per staff member. IMS estimates that staff is receiving this level of training already; however, continuing education is not formally documented by the Division. **(No direct fiscal impact.)**

Communications Services

1. Streamline the content management process currently used to update city websites. **(No direct fiscal impact.)**
2. Evaluate feasibility of implementing Voice over IP technology. **(No direct fiscal impact.)**

Customer Satisfaction

1. Formalize approach to customer service including steering committee and service level agreements with users. **(No direct fiscal impact.)**

Adequacy of Support Provided to End Users

1. Evaluate core business applications to ensure appropriate levels of integration, eliminate duplication and enhance management information **(May require additional funding.)**

Level of Staffing

1. Staffing is within benchmark standards (Matrix's). IMS staffing is a product of its service level commitment. A technology steering committee should review development projects for duplicate software applications and solutions that may be provided by outside vendors. **(No direct fiscal impact.)**

Facilities

1. Identify potential back-up locations for disaster recovery and secure use agreements. **(No direct fiscal impact.)**

Infrastructure Planning and Replacement

1. Formalize approach to software replacement and lifecycle analysis; make recommendations for outdated systems. **(May require additional funding.)**

Billings to Users

1. The city should decide if full cost recovery from departments is desirable; user departments should be charged directly for software engineering costs to reduce the incentive to build in-house applications. **(No direct fiscal impact.)**

Management and Performance Audit of the Information Management Services Division

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1. INTRODUCTION AND EXECUTIVE SUMMARY

The City of Salt Lake City, Utah engaged the Matrix Consulting Group to analyze the information technology services provided by Information Management Services Division (IMS). The scope of work was extensive and included the following elements:

- **Evaluate the strategic direction of the IMS Division.** This includes an evaluation of the strategic direction of the IMS and its plans for use and deployment of technology. This includes plans for application portability and data transferability, service level expectations, etc.
- **Evaluate data security.** This analysis focuses on evaluation of information security architecture, security policies and procedures, support for implementation of these policies and procedures, end user awareness training, the approaches used to mitigate hardware and software risks, environmental failures, network failures, physical security, network and configuration security, business continuity and disaster planning, backup and recovery, software licensing, antivirus software, etc.
- **Evaluate systems analysis and design.** This step focuses on IMS documentation for application development and acquisition, the processes used to determine a make/buy decision, the extent of the existing backlog for application development, how systems and analysis staff allocate their time, the system development lifecycle, methodologies, project management standards and techniques, etc.
- **Evaluate communication services.** This analysis will assess the communications infrastructure relative to present and emerging industry standards (cabling, hubs, data transmission methods, protocols, etc.), network support, short and long-term planning for network communication systems, communication standards, network monitoring tools, the fault tolerant capability of the network systems, the extent of "uptime", etc.:
- **Evaluate contracted services.** This step involves an assessment of the services provided by contract and by in-house staff of the Division, sourcing strategies, existing contracts and whether this represents cost-effective outsourcing, the effectiveness of contract management, opportunities to expand contracting, etc.
- **Evaluate customer satisfaction with the services provided by the Division.** This analysis focuses on documenting the satisfaction of customers with the

services provided by the Division through the use of a customer satisfaction survey distributed to top and middle management of the departments. This step also involves an evaluation of the IMS governance structure such as the use of customer advisory committee.

- **Evaluate the Help Desk.** This includes an analysis of the help desk charter, policies and procedures, the level of service provided by the help desk, the technical skills and training of help desk personnel, the timeliness of the assistance provided to end users, the help desk calls and issues tracking system, etc.
- **Evaluate the adequacy of support provided to end-users.** This involves evaluating the availability, quality, and facilities for training of end-users, the extent of standardization of software among personal computers, the length of time required to install new personal computers, the deployment and replacement strategies for personal computers, the control of "customization" of personal computers by the Division to reduce workload for Division workstation support staff, the standards for IT literacy of end users, strategies for supporting end users beyond desktop workstations, the system management tools available for IMS such as network monitoring, desktop inventory, desktop management, etc
- **Evaluate the level of staffing for the Division.** This step involves the analysis of the authorized staffing for the Division using staffing metrics developed by the Matrix Consulting Group and other research organizations.
- **Evaluate the core business applications in place and the extent to which gaps remain in automation.** This includes an analysis of the City's primary software applications and the extent to which these applications meet the needs of the end user, the extent to which these applications are underutilized, the extent of a planned strategic approach to business application acquisition, that applications are reliable, etc.
- **Evaluate the technology replacement program for the City.** This step evaluates the lease agreements for desktop computes and how other cities handle lease agreements for desktop hardware, the attrition program for replacement of systems and software, hardware, the procurement process, the systems and methods used to manage inventories, the use of contractors for acquisition of equipment and supplies, the age of the phone system and whether upgrades would add value or increase efficiency, etc.
- **Evaluate billings to users.** This includes the analysis of methods to bill users for services, budgeting information, IMS rates and charges and their adequacy.

Matrix Consulting Group took a comprehensive approach to evaluating these issues. The steps taken included the following:

- The project team met with City and officials to identify key service level issues, technology planning issues, and other key facets impacting service delivery. These interviews focused on key users of IMS services (i.e., City departments).
- The project team met with the management team at IMS to discuss service level and planning issues, financial concerns, and organizational and operations facets of the organization.
- The project team met with staff within IMS to understand operational details, organizational structure and reporting relationships, systems utilized, and key roles and responsibilities.
- The project team collected documentation and data related to organization, management, strategic planning, workload, policies and procedures, budget, and other operational data.
- The team developed a descriptive profile which summarized key organizational and operational facets of the IMS Division. The document was reviewed with IMS management and City officials.
- The team distributed an employee survey and user survey to collect input regarding service levels, service provision, and customer service issues.
- The team conducted a comparative survey of similarly sized IT agencies in the western United States to document operational and organizational facets. However, because of a very poor response to this survey, the project team took these results under advisement only and did not summarize these data in this report.
- The project team prepared a diagnostic assessment of the IMS Division based on best management practices. This interim document was reviewed with IMS management for comment.

Collectively, these steps provided the project team with a thorough understanding of IT service provision within Salt Lake City.

Executive Summary

The findings and recommendations made within this report are extensive. This executive summary highlights the key findings and recommendations made with respect

to information technology provision within Salt Lake City. While this report identifies a number of improvement opportunities for the City and the Information Management Services Division, the project team believes it is appropriate to highlight some of the key strengths of the Division and the approach to providing information technology within the City.

(1) Strengths of the IMS Division

While the primary focus of this study is on opportunities for making improvements, the project team also believes that it is important to identify areas in which the IMS Division is already meeting or exceeding performance targets and expectations. These are summarized in the points which follow:

- The Salt Lake City IMS Division has been recognized by a number of IT organizations for its services, including the Center for Digital Government and the State of Utah, and has been recognized as a Best of the Web several times.
- The IMS Division has developed a number of cutting edge applications which allow City Departments to operate more efficiently and effectively.
- The Division utilizes a number of “best of breed” applications which provide sophisticated automation capabilities and increase the productivity of City Departments.
- The Division is very customer service oriented and works to provide a high level of service to user Departments. Customer satisfaction rates are very high as evidenced in the user survey in Chapter 3, and in quarterly surveys conducted by IMS. IMS closely follows the results of these surveys to assess customer satisfaction.
- The City and IMS have developed an efficient and effective approach to procuring and maintaining workstations, printers, and other hardware. The Corporate Rental Program is utilized by the majority of City departments. This program reduces the overall cost of computer acquisition and maintenance.
- IMS is focused on ensuring data security. The Division has developed a specialized team which implements security systems, conducts testing, and develops policy to protect critical City data systems. The Division has also

developed a Business Recovery Plan which identifies how the Division will deal with threats to data security, business interruptions, and other contingencies.

- IMS has developed a comprehensive set of policies which address critical topics such as acceptable use, network access, viruses, and other issues.
- IMS meets or exceeds many best practices related to network and pc management, monitoring, and maintenance.
- IMS provides a high level of training to City employees on several software packages.
- Helpdesk workloads and response statistics are tracked on a regular basis. The Division has also established service level targets for responding to work order requests based on priority levels.
- The City is well positioned to leverage Voice over IP (VoIP) technology to reduce land line charges for telephone service.

The points above are not an exhaustive list of all of the strengths of the IMS Division. They are intended to demonstrate examples of key strengths within the Division which should be acknowledged before identifying improvement opportunities.

(2) Summary of Improvement Opportunities and Other Recommendations

This section provides a summary of the project team's findings, conclusions and recommendations for the Information Management Services Division. This summary is provided in the matrix, which follows:

Index	Finding	Recommendation	Priority	Fiscal Impact
ORGANIZATION				
6.1.1	Information Technology functions have not been completely centralized. Several IT functions are organized under the Airport, Community Development Department, Fire Department, Public Services Department, and Public Utilities Department.	Some of the IT functions within other Departments should remain as organized due to the level of specialization needed. However, the project team recommends that IT functions currently housed within the Airport and Fire Department should be consolidated within the IMS Division.	High	\$0

Index	Finding	Recommendation	Priority	Fiscal Impact
6.1.2	The organizational structure of the IMS Division is relatively flat. The current organization creates barriers to applications development and acquisition. Spans of control within the current team organization also vary widely.	The IMS Division should reorganize its operations as follows: (1) Consolidate the Communication Team into a new Infrastructure Team; (2) Consolidate Software Engineering and Technology Consulting into one unit and add one executive manager to oversee both teams; (3) Create a new policy and research unit initially staffed with one senior staff member to support technology planning, policy development, and research.	High	\$215,00
LONG TERM TECHNOLOGY PLAN				
6.2	The IMS Division does not have an effective long term technology plan in place. In addition, the Division does not currently seek broad input to develop a technology plan.	<p>The IMS Division should spearhead the re-establishment of an IT Steering Committee composed of representatives from key Departments. This committee should be charged with facilitating a long term, cross departmental approach to systems integration and cost effective solutions to IT needs. Departments need to view information technology as important resources as other resources for which they commit budgetary resources (e.g., other equipment, vehicles and facilities).</p> <p>The Information Management Service Division should develop a strategic plan for information systems and technologies.</p>	High	Covered in costs above
DATA SECURITY				
6.3.1	The IMS Division should continue to develop an actionable business recovery plan.	The Division should work to identify sufficient back-up sites for business resumption in the event of a disaster. In addition, IMS should provide additional training to employees on disaster recovery policies and test elements of the plan periodically to identify weaknesses.	High	\$0

Index	Finding	Recommendation	Priority	Fiscal Impact
6.3.2	The Division utilizes a number of best practices to manage the City's network and ensure data security and availability. However, additional steps can be taken to ensure safe, effective, and efficient delivery of service.	The IMS Division should take additional steps to improve data security and availability including: adding additional internal firewalls, improving fault tolerance by increasing redundancy, utilizing Storage Area Networks, and the implementation and use of virtual networks. The estimated cost of these changes will vary based on the technology utilized and the configuration of firewalls and virtual networking devices.	High	Varies
6.3.3	Policies and procedures are comprehensive and contemporary. However, the Division can make improvements to the current security measures and policies in place.	IMS should provide additional training on security policies to City employees. In addition IMS should ensure that security plans are tested on a regular basis and policies and procedures are regularly updated.	High	\$0
SYSTEMS ACQUISITION AND ANALYSIS				
6.4.1	The Division does not have an effective technology approval and evaluation process in place.	The City should change the current software acquisition process to capture the benefits of enterprise level solutions and ensure cost effectiveness. This includes re-establishing the technology steering committee comprised of department representatives and IMS managers and changing the cost allocation model for software engineering system development. The committee should take the lead in developing the acquisition plan, supported by IMS, and making recommendations for fulfilling these needs to the City.	High	N/A
6.4.2	The Division can improve management of the current software development process.	The IMS Division should develop standardized project management tools to document business objectives, timelines, key deliverables, peer test plans and code audits, and track actual personnel utilization on development projects. This approach will provide an accurate picture of costs and benefits of developing software in house.	High	N/A

Index	Finding	Recommendation	Priority	Fiscal Impact
6.4.3	IMS should work toward increased training of software engineering personnel to ensure consistent service levels. There is an imbalance of skills among software engineering staff. This creates problems with assigning projects which require use of new development platforms, particularly the new .Net platform.	The IMS Division should develop requirements for staff continuing education. As a guideline, the Division should target a minimum of 24 hours per staff member each year.	High	N/A
COMMUNICATIONS SERVICES				
6.5.1	The Division should continue efforts to revamp city web sites and streamline the content management process.	The City should streamline the content management process currently used to update the City website.	Medium	N/A
6.5.2	The City has developed an efficient data and voice network. The City should continue to pursue enhancements to the communications infrastructure including Voice Over IP.	The City should establish a committee, spearheaded by IMS, to evaluate the feasibility of implementing Voice over IP technology.	Medium	N/A
CUSTOMER SATISFACTION				
6.6.1	While the Division provides a high level of service to customers and has measures in place to measure and ensure customer satisfaction, IMS should formalize its service level goals with user Departments.	The City and IMS should formalize its approach to IT customer service. This includes the re-establishment of an IT Steering Committee and the development of service level agreements with user departments which balance their needs with those of IMS and the City.	Medium	N/A
ADEQUACY OF SUPPORT PROVIDE TO END USERS				
6.7.1	The Division is providing a high level of service to user Departments and has implemented a number of tools to manage pc support and maintenance.	Make no changes to current staffing and service levels provided by the help desk.	N/A	N/A

Index	Finding	Recommendation	Priority	Fiscal Impact
CORE BUSINESS APPLICATIONS				
6.8	While the Division has developed a number of "best of breed" applications to support user Departments, there are a number of duplicative systems in place within the City and systems which are available from third party vendors.	The City and IMS should evaluate the core business applications (e.g. CRM, Finance, GIS, Permit Management, Maintenance Management, CAD/RMS, eGovernment, etc.) to ensure appropriate levels of integration, eliminate duplication and enhance management information.	High	Variable
LEVEL OF STAFFING				
6.9	Division staffing is within Matrix Consulting Group IT staffing benchmarks and below the Gartner Group benchmark. While the Division is within IT staffing benchmarks, IMS staffing is a product of its service level commitments.	A technology steering committee comprised of IMS managers and Department representatives should review development projects to identify duplicate software applications and solutions that are provided by outside vendors.	High	N/A
FACILITIES				
6.10	The Division makes effective use of facilities utilized for office space and storage. Appropriate access and environmental controls are also in place. Space is also appropriately distributed throughout the City. However, the City does not have effective back-up sites available in the event of a business interruption of service.	The Division should continue to work to identify potential back-up locations for disaster recovery and secure use agreements.	High	N/A
INFRASTRUCTURE PLANNING AND REPLACEMENT				
6.11	Overall, the Division has an effective infrastructure planning and replacement plan in place. However, the Division does not conduct formal, regular life cycle and technology needs assessments.	The IMS Division should formalize its approach to software replacement and lifecycle analysis. The Division should establish timelines for reviewing software in use by Departments and evaluate system usefulness. The Division should make recommendations to the City and the technology steering committee for the replacement of outdated systems.	High	N/A

Index	Finding	Recommendation	Priority	Fiscal Impact
BILLING TO USERS				
6.12	The Division does an effective job of administering the PC rental program which includes fees for new computer equipment and hardware support. However, the current cost allocation methodology for software engineering creates incentives for user departments to develop software in house since they are not directly charged for in house software development.	<p>The City and the re-established technology committee should develop a strategy and cross-departmental commitment to this approach. Without a charge back system, operating departments will not get a sense of the value of information technology resources. At whatever the appropriate level determined, user Department should be charged directly for software engineering costs to reduce the incentive to build in house applications.</p> <p>The project team recommended that IMS be consistent in how it evaluates the cost of software development and purchased packages so that the committee considers the cost of development in decisions to build or purchase systems.</p>	High	Variable

1. PROFILE OF THE INFORMATION MANAGEMENT SERVICES DIVISION

This chapter summarizes the current organization and operations of the Information Management Services Division. This document is organized into the following categories for a more comprehensive understanding of the current environment.

- Organization and staffing;
- Roles and responsibilities;
- Summary of key policies;
- Key performance indicators and strategic goals;
- Financial summary; and
- Technical summary.

This information was developed through interviews with City personnel, various budget and financial reports, as well as other documents relating to organization, workload activity, statistical reports, general operations, etc.

1. ORGANIZATION AND STAFFING

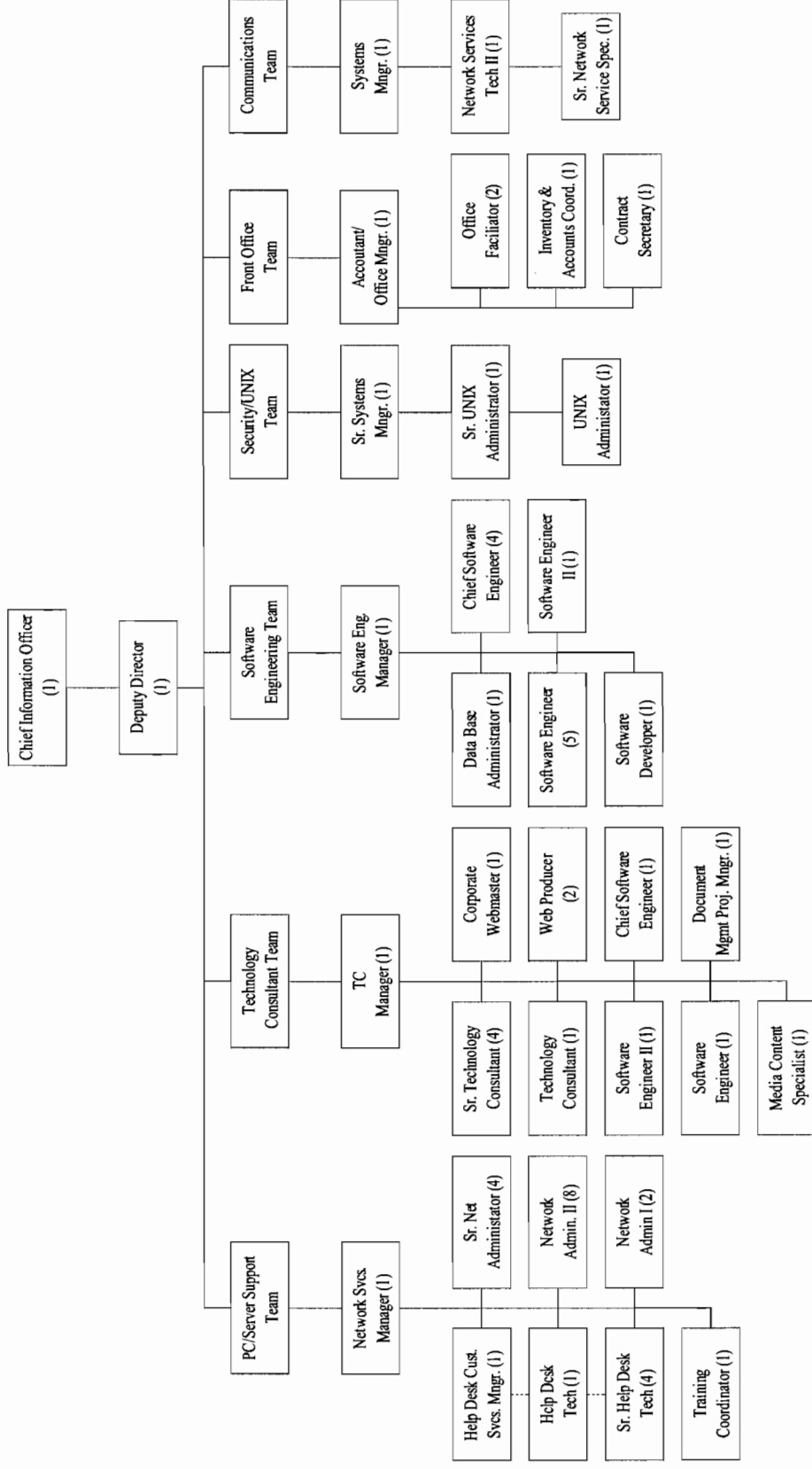
The Information Management Services Division is comprised of 60 full-time equivalent staff and 1 contract employee. The table below shows the number of personnel by position for the current fiscal year and the past two fiscal years.

CITY OF SALT LAKE CITY, UTAH**Final Report of the Management and Performance Audit of the IMS Division**

Position	FY 2003-04	FY 2004-05	FY 2005-06
CIO/City Recorder	1	1	1
Deputy Director IMS	1	1	1
Software Engineering Manager	1	1	1
Technology Consultant Manager	0	1	1
Senior Technology Consultant	0	4	4
Technology Consultant	5	1	1
Data Base Manager	1	1	1
Senior UNIX Administrator	1	1	1
Network Services Manager	1	1	1
Chief Systems Engineer	3	3	3
Document Management Project Manager	1	1	1
Senior Systems Manager	1	1	1
Chief Software Engineer	3	3	4
Systems Manager	1	1	1
Corporate Web Master	1	1	1
Web Producer	2	2	2
Digital Content Producer	0	0	1
Help Desk Customer Service Manager	1	1	1
Senior Network Administrator	5	4	4
UNIX Administrator	1	1	1
Software Engineer II	1	1	3
Software Engineer	6	6	3
Network Administrator II	8	8	8
Software Developer	1	1	1
IMS Training Coordinator	1	1	1
Senior Network Services Specialist	1	1	1
Network Administrator I	2	2	2
Senior Help Desk Tech	1	4	4
Network Service Tech II	1	1	1
Help Desk Tech	4	1	1
IMS Accountant / Office Manager	1	1	1
Officer Facilitator I	2	2	2
IMS Inventory & Account Coordinator	1	1	1
Total	59	59	60
Contract Employee	0	0	1

As shown above, the Division's authorized number of staff has only increased by one position over the past three fiscal years. The organization chart that follows shows the reporting relationships and functional assignment of personnel within the Information Management Service Division.

Organization of the Information Management Services Division Salt Lake City, Utah



As shown above, the IMS Division is comprised of six functional teams: PC/Server Support (22 staff), Technology Consultants Team (14 staff), Software Engineering Team (13 staff), Security/UNIX Team (3 staff), Front Office Team (4 staff and 1 contract staff), the Communications Team (3 staff), the Deputy Director and the Chief Information Officer.

The next section describes the roles and responsibilities of each of these teams and assigned personnel.

2. ROLES AND RESPONSIBILITIES

The table below describes the key roles and responsibilities of personnel within the IMS Division. Please note that the descriptions presented below are meant to highlight the key job functions performed by personnel and are not meant to be at the job description level of detail.

Function/Position	Number of FTEs	Key Roles and Responsibilities
Chief Information Officer	1	<ul style="list-style-type: none">• Serves as the Director for Information Management Services.• Sets the strategic direction for information technology including computer systems, networks, and telephone systems – with input from City Council, Administration, and City Departments.• Develops and submits budget recommendations and monitor expenditure control during the fiscal year.• Develops information technology policies relating to automation of departments and intranet/internet issues. Establishes, revises, reviews, and communicates IMS policies.• Directs staff in developing goals, and objectives, and monitors staff progress.• Meets with various department heads and elected officials to discuss and define information technology needs.• It should be noted that the CIO also serves as the City Recorder for Salt lake City, responsible for official records and archives.

Function/Position	Number of FTEs	Key Roles and Responsibilities
Deputy Director	1	<ul style="list-style-type: none"> Manages the day-to-day financial, administrative and operational programs of the IMS Division. Works with the management team to develop information technology procedures and projects. Manages the evaluation of new technology and recommends direction for such technologies. Ensures smooth coordination of efforts between IMS sections and customers. Handles personnel issues in the Division after first line supervisory level involvement. Provides a lead role in financial services issues in the Division, including coordinating the budget, setting rates, procurement, etc.
PC/Server Support Team		
Network Services Manager	1	<ul style="list-style-type: none"> Manages the network computing functions including network administration and help desk services. Manages the work of staff by establishing objectives, assigning work, establishing priorities, monitoring completion and implementation of work, evaluating effectiveness and providing direction as required to ensure satisfaction of customers. Establishes and implements data communication standards and assures documentation of network controls. Prepares cost benefit and feasibility studies to evaluate proposed new network system applications and network acquisitions. Defines the network technology, direction and strategy to maintain service levels and provide for system expansion. Leads the development of long-range network system development plans and coordinates with other staff to ensure the accomplishment of IMS goals and objectives.

Function/Position	Number of FTEs	Key Roles and Responsibilities
HELP DESK:		
Help Desk Customer Services Manager	1	<ul style="list-style-type: none"> The Help Desk Customer Services Manager supervises day to day help desk operations including personnel issues, planning and scheduling work, and monitoring employee performance. The Manager will also handle calls. Help Desk Personnel respond to calls for technical support from employees throughout the City with the exception of the Airport. Help Desk Technicians trouble shoot hardware and software problems over the phone and using remote control software. Network Administrator I & II positions respond to technical problems that cannot be dealt with over the phone or by using remote control software. Help Desk personnel resolve issues such as: printer set-up and installation, user accounts and network access settings, network problems, software installations and hardware set-up, email accounts, etc. If a Network Administrator I or II cannot resolve an issue, it is referred to a Sr. Network Administrator. Help Desk Personnel work staggered 8 hour schedules beginning at 7:00 and ending at 6:00 to ensure coverage of the help desk during business hours. Help Desk Personnel share after hours on call duty. One person is assigned after-hours duty each week. Staff each have collateral duties relating to, for example, tape back-ups, applications and data back-ups; purchasing; supplies; etc.
Sr. Help Desk Technician	4	
Help Desk Technician	1	
Network Administrator I	2	
Network Administrator II	8	
Sr. Network Administrator	4	<ul style="list-style-type: none"> Sr. Network Administrators administer the Windows and Novell networks across the City. Monitor network performance and availability of network resources. Ensure that patch and virus updates are installed. Two Network Administrator II personnel also assist with network administration. Generally, 3 personnel are assigned to Microsoft servers, and 1 person supports and maintains the Cisco routers and switches. Sr. Network Administrators work 8 hours days, 40 hours per week.

Function/Position	Number of FTEs	Key Roles and Responsibilities
Technology Consultants Team / Web Team		
Technology Consultant Manager	1	<ul style="list-style-type: none"> Leads the technology consultant team with overall responsibility for ensuring the match of user needs and systems capability. Provides direct oversight of the functions in this team, including customer relationship management, document management and web support. Identifies and coordinates necessary training internally and externally. Directly handles certain accounts or higher priority information management issues in the City (e.g., City Council, Management Services and Utilities).
Technology Consultant Team:		
Sr. Technology Consultants	4	<ul style="list-style-type: none"> Technology Consultants are each assigned to the following Departments: Police Department (1), Mayor's Office and Public Services (1), Management Services, City Council, and Public Utilities (1), Fire Department (1), Attorney's Office and CD (1). Technology Consultants ensure that customer needs are being met by identifying solutions to department problems, developing specifications, and monitoring implementation of new software and hardware. TCs also coordinate the development of new applications with the Software Engineering team to ensure application specifications are met. TC's meet regularly (at least monthly) with client departments to ensure the smooth interface of systems with operational needs. Software Engineers provide support to large in house developed applications used by customer Departments. For example, one software engineer supports the CAMP, Remedy, and Access applications utilized by purchasing which monitors contracts, accounts payable and receivable, and encumbrances, as well as the Learning Management System which tracks continuing education data for City employees. Software Engineers work 8 hour days, 40 hours per week.
Technology Consultant	1	
Software Engineer II	1	
Software Engineer I	1	

Function/Position	Number of FTEs	Key Roles and Responsibilities
Web Team: Corporate Webmaster Web Producer Chief Software Engineer	1 2 1	<ul style="list-style-type: none"> The Web Team is responsible for administering the City's web servers, developing and designing new content and developing new web pages for Departments. The Corporate Webmaster is also involved in production for SLC TV, the City's public access television station. The Chief Software Engineer administers web servers and monitors web server usage and security. Web Producers ensure that web content created by the Departments meets criteria developed by the Mayor and the City. Members of the web team work 8 hour days, 40 hours per week.
Document Management PM	1	<ul style="list-style-type: none"> The Document Management Project Manager is responsible for assisting operating departments manage document management needs, including transition to imaging technologies; analyzes the feasibility and cost effectiveness of alternative techniques and technologies; functions as an advocate for budget and implementation purposes; researches new document management technologies. Works 8 hours days, 40 hours per week.
Media Content Specialist	1	<ul style="list-style-type: none"> The Media Content specialist is responsible for producing content for Salt Lake City TV. This person also works on special projects such as the transition to digital TV as part of FCC requirements. The Media Content specialist works under the direction of the Corporate Webmaster and Technology Consultant Manager. Works 8 hour days, 40 days per week.
IMS Training Coordinator	1	<ul style="list-style-type: none"> The Training Coordinator manages training classes provided by the Division to city employees. These classes include Microsoft Office, GIS, Windows, and Telecommuting courses. This person also coordinates training for IMS employees. Assists help desk as needed. Works 8 hour days, 40 hours per week.

Function/Position	Number of FTEs	Key Roles and Responsibilities
Software Engineering Team		
Software Engineering Manager	1	<ul style="list-style-type: none"> Manages day to day operations of the Software Engineering team, which is primarily responsible for developing applications and databases for operating departments in the City. Handles GIS administration and management. Monitors progress towards completion of projects, schedules projects and prioritizes and assigns workload. Consults with customer departments, Technology Consultants and the Security Team to ensure customer needs are being met. Advises staff and clients regarding the advisability of outsourcing development of applications in house or 'off the shelf' commercially.
Database Administrator	1	<ul style="list-style-type: none"> The Software Engineering Team is responsible for developing new applications for City Departments, maintaining and upgrading existing applications, and testing and implementation of systems. Three personnel are currently assigned to Public Utilities to work on the migration from the Informix database to SQL server. The conversion to SQL server is a process that is also occurring city-wide. Two software engineers are also dedicated to support and development for the SLCPD. In addition, 1 software engineers is assigned to the airport, 1 to GIS applications, 1 to database management, and 1 to web applications. Other personnel within the team are assigned to projects based on workload and availability and area of expertise. Work 8 hour days, 40 hour per week.
Chief Software Engineer	4	
Software Engineer II	3	
Software Engineer	3	
Software Developer	1	

Function/Position	Number of FTEs	Key Roles and Responsibilities
Security/Unix Team		
Sr. Systems Manager	1	<ul style="list-style-type: none"> • Manages day to day operations of the Security/UNIX Team. • Manages Unix replacement projects and security systems upgrades and replacement. • Ensures that team objectives are met and workload is handled relating to systems security, anti-spam and anti-virus issues. • Coordinates the City's security team of IMS staff and user departments • Develops policies and procedures related to security issues. • Performs systems audits for security issues. • Trains and advises operating departments on systems security issues. • Plans for replacement of UNIX servers and acquisition of security applications. • Prioritizes security and UNIX projects
Sr. UNIX Administrator UNIX Administrator	1 1	<ul style="list-style-type: none"> • Responsible for administration and support of the UNIX and Linux Servers. The City has four HP-UX server systems: financial system (IFAS), Police RMS and CAD systems, and Public Utilities financial system. • Responsible for management of firewalls, spam filters, and intrusion prevention systems. • Involved in replacement of upgrade of UNIX and security systems. • Manages UNIX system set-ups, directories, patches and upgrades. • Handles ongoing UNIX maintenance relating to databases, back-ups, etc. • Monitors and supports log servers, spam servers, firewalls, IDS and IPS systems. • Handles help desk referrals for UNIX issues; has after hours call out responsibilities are shared between the Unix Administrators. • Also participates in other activities of the Team, including security audits, penetration tests, firewall maintenance, web content filtering, etc. • Work 8 hour days, 40 hours per week.

Function/Position	Number of FTEs	Key Roles and Responsibilities
Front Office Team		
Accountant / Office Manager	1	<ul style="list-style-type: none"> Working closely with the Deputy Director, prepares budget reconciliations, cost allocations, enterprise fund accounting, and prepares budget estimates / assists with the coordination of budget development in IMS. Manages the IMS / City fixed asset account relating to information and telecommunications technologies. Executes IMS decisions relating to procurement; handles accounts receivable and accounts payable functions. Monitors IMS internal controls. Manages and supervises the front office team.
Office Facilitator	2	<ul style="list-style-type: none"> Provide administrative support to IMS including accounts receivable and payable, coordination and scheduling of outside training, reconciliation of cellular telephone billing, etc. Performs special projects as needed. Assists with day to day administrative duties including: phones, messages, maintaining files, etc. Work 8 hour days, 40 hour per week.
IMS Inventory & Accounts Coordinator	1	<ul style="list-style-type: none"> Keeps inventory of all hardware issued by IMS to City departments as part of PC Rental Program. Manages equipment auction after expiration of rental term. Prepares telephone (landline) billing for City departments. Monitors all equipment received by the Division. Work 8 hour days, 40 hour per week.
Contract Secretary	1	<ul style="list-style-type: none"> Performs administrative responsibilities including handling phone calls, mail, filing, faxes, and other duties. Assists with special projects as needed. Work 8 hour days, 40 hour per week.

Function/Position	Number of FTEs	Key Roles and Responsibilities
Communications Team		
Systems Manager	1	<ul style="list-style-type: none"> Supervises staff in the installation, maintenance and upgrade of local area networks, wide area networks, voice networks and voice/data systems hardware and software. Provides technical support for the voice and data communications system, including Local Area and Wide Area Networks and Systems Network Architecture. Oversees the implementation and management of complex local and wide area networks. Directs the analysis of user requirements, determines resources required and hardware/software options for a variety of voice/data communications projects. Works closely with vendors and contractors to coordinate installation and maintenance projects and to identify and correct problems that may occur during start-up and operation. Oversees the installation and configuration of a variety of voice/data cable and hardware elements, including hubs, switches, routers, remote telephone modules, CSUs, DSUs, and peripheral equipment.
Sr. Network Services Specialist	1	<ul style="list-style-type: none"> Plans, implements and manages voice/data network's infrastructure. Establishes specifications for various hardware, software and transport media needed for efficient and reliable communications. Advises network customer as to voice/data network constraints and their effects on systems design. Identifies development, enhancement and maintenance priorities for voice, data, software and hardware solutions Serves as project manager on major voice and data network projects. Supervises operation of voice and data communications network facilities. Responds to emergencies, diagnosing system failures and effects repairs. Develops and maintains disaster recovery plan for voice/data network facilities.

Function/Position	Number of FTEs	Key Roles and Responsibilities
Network Services Specialist II	1	<ul style="list-style-type: none"> Responsible for the installation of hardware and software associated with the maintenance of local area networks (LAN's) and voice mail communications systems. Will also determine if a contract for installation is more cost effective. Manages the City's inventory of telecommunications equipment. Directs and evaluates feasibility studies for new and enhanced communication systems. Designs, tests and evaluates LAN hardware and software. Reconfigures system components and devices to ensure optimal network efficiency. Conducts ongoing evaluation of equipment types, compatibility, maintenance contracts, and technological updates to confirm optimal system services are provided in assigned areas. Ensures that telecommunications standards and security are maintained in the City. Is on call for telecommunications issues after hours.

The next section provides information policies and procedures developed by IMS.

3. SUMMARY OF KEY POLICIES AND PROCEDURES

The table that follows provides a summary of key policies and procedures related to use of information technology within the City.

Subject	Policy Description
Acceptable Use Policies	<ul style="list-style-type: none"> Users may access only those files/directories to which they are granted permission. Uses that disrupt or distract from City business, are illegal, cause harm to the City, involve the downloading of viruses or malicious program, or involve solicitation are prohibited. Distribution and or download of information that is sexually explicit, presents a copyright infringement, presents religious or political lobbying, distribution of confidential information without authorization, is for commercial use, or is illegal is prohibited. Passwords should be changed regularly and should not be based on easily discovered information. Outlines the procedure for contacting IMS when an employee leaves or enters into employment with the City.

Subject	Policy Description
Computer Viruses	<ul style="list-style-type: none">• Users must not intentionally write, generate, compile, copy, propagate, execute, or attempt to introduce any computer code designed to self-replicate, damage, or otherwise hinder the performance of any computer's memory, file system, or software. Such software is known as a virus, bacteria, worm, Trojan horse, and similar names.• Computer viruses can spread quickly and need to be eradicated as soon as possible to limit serious damage to computers and data. Accordingly, staff must report a computer virus infestation to the Security Administrator or Customer Support immediately after it is noticed.• To promptly detect and prevent the spread of computer viruses, all Salt Lake City Corporation's personal computers (PCs) and LAN servers must run integrity checking software. This software detects changes in configuration files, system software files, application software files, and other system resources. Integrity checking software must be continuously enabled or run daily.
City Network Security Team	<ul style="list-style-type: none">• In response to an increasing number of well-publicized threats to the integrity of computer and communication networks, the City has developed this policy. Salt Lake Corporation will insure that the City data and communication networks are secure and reliable. Salt Lake City has responsibility for ensuring that data stored on its network servers will only be accessed by authorized personnel.• The Salt Lake City Network/Server Security Team will approve all modifications to the data and communication network. The Team will be directed by the CIO or his designated representative.• This policy applies to all computers, servers, software, PDA's, etc, that will be connected to or used by Salt Lake City Corporation's networks. It is implemented to help meet the requirements of due diligence in safeguarding and protecting the City's networks.

Subject	Policy Description
Internet Guidelines	<ul style="list-style-type: none"> • All internet information should be considered suspect until confirmed by another source. • All software and files down-loaded from non-City sources via the Internet (or any other public network) must be screened with virus detection software (see 'Virus scanning' procedure). This screening must take place prior to being run or examined via another program such as a word processing package. • All connections between Salt Lake City internal networks and the Internet (or any other publicly-accessible computer network) must include an approved firewall and related access controls. • In addition, all in-bound dial-up lines connected to Salt Lake City Corporation's internal networks must pass through an approved firewall. • All users wishing to establish a connection with City computers via the Internet must authenticate themselves at a firewall before gaining access to Salt Lake City Corporation's internal network. This must be done via an extended user authentication process approved by the Security Administrator. • Staff may not establish Internet or any other external network physical connections which could allow non-Salt Lake City users to gain access to Salt Lake City systems and information unless prior approval of the Security Administrator has been obtained. • All FTP (File transfers) between the Internet and Salt Lake City Corporation's network must be via a FTP proxy server located on the "trusted" side of the "firewall". Internal files must be moved to this server before they may be accessed by non-Salt Lake City Corporation personnel.
Copyright Policy	<ul style="list-style-type: none"> • Salt Lake City Corporation strongly supports strict adherence to software vendor license agreements and copyright holder notices. Users must not copy software provided by Salt Lake City Corporation to any storage media (i.e. disk, tape, etc.), transfer such software to another computer, or disclose such software to outside parties without written permission from the Director of Information Management Services (or appointee). • Copying or transferring of software is only allowed within the limits of the copyright, and to the extent at is legally considered "fair use" (backup, contingency planning) or with the permission of the author/owner. • If users make unauthorized copies of software, the users are doing so on their own behalf, since all such copying is strictly forbidden by Salt Lake City Corporation. Violation of this procedure is subject to disciplinary action.

Subject	Policy Description
Contingency Plan	<ul style="list-style-type: none">• Information Management Services shall develop a contingency plan that covers critical systems in the event of a disruption of service. This plan will outline the recovery of service due to natural disasters (earthquake, tornado, flood, severe storm, etc), human intervention (sabotage, virus attack, hacker attack, terrorist attacks, operator error, etc.) and environmentally caused disruptions (equipment failure, software error, telecommunications network outage, electric power failure, etc.). This plan covers all computer infrastructure, software, data, and communications operated by City employees in the support of critical systems.• This plan will be formally documented by the Contingency Planning Coordinator.• The contingency plan will be formulated by the Contingency Planning team constituted by the Information Management Services leadership team. The Contingency Planning team will create and maintain as part of the plan an implementation team with roles and responsibilities assigned. Testing and training will be under the direction of this team.• Training and testing of the plan will be conducted on a yearly basis or as required. This training will provide an implementation team ready to complete the responsibilities outlined in the plan. Testing will identify weakness and changes that may need to be corrected in the plan.• The IMS Division has developed this plan.

Subject	Policy Description
Network Access	<ul style="list-style-type: none"> • Access to Salt Lake City internal networks from remote locations including worker homes, hotels, and customer offices, must in all instances be approved in advance by the involved worker's immediate manager and the Salt Lake City CIO. Remote access is not a universal benefit and may be revoked for cause including job performance and non-compliance with security policies. • In strictly controlled situations, Salt Lake City does allow third parties to access internal networks and connected computer systems. Both the Owner of the information to which the third party will be given access and the project manager in charge of the third party's work must agree in writing to such access before it will be established. The decision-making process for granting such access may include consideration of the controls on the systems to be connected, the third party's security policies, and the results of a background check. • All employees (including third parties) are responsible for the activity performed with their personal network user-IDs, whether or not these user-IDs are connecting via external network facilities. Network user-IDs must never be shared with others. Network user-IDs may not be utilized by anyone but the individuals to whom they have been issued. Similarly, employees are forbidden from performing any activity with network user-IDs belonging to other individuals (excepting anonymous user-IDs like "guest"). • Whenever a computer network connection is established with a Salt Lake City internal computer or network from a location outside an official City office, and whenever this connection transmits either Confidential or Private information, the link must be encrypted or firewall protected. • Changes to Salt Lake City internal networks include loading new software, changing network addresses, reconfiguring routers, adding dial-up lines. With the exception of emergency situations, all changes to Salt Lake City computer networks must be documented in a work order request and must be approved in advance by the agency LAN administrator and/or ITS. Emergency changes to Salt Lake City networks must only be made by persons who are authorized by IMS. • Employees must not establish electronic bulletin boards, local area networks, modem connections to existing local area networks, or other servers for communicating information without the approval of the IMS Network Architecture Team.

Subject	Policy Description
PC Standardization	<ul style="list-style-type: none">• In an effort to provide a more stable, higher quality PC and to reduce the cost of maintenance for the user, it is recommended that the City standardize on Compaq PCs. This will help us provide better maintenance by reducing the sheer number of different PC brands we support and allow us to be certified experts in support on one brand instead of attempting to be a Jack-of-all-trades for many PC brands. It will improve the synergy between technicians on problem repair thus shortening repair times. In accordance with general guidelines for enterprise PCs, as set forth from the Gartner Group (a recognized industry analyst), organizations that standardize on an enterprise level PC will reduce the total cost of ownership and improve customer satisfaction.• This does not mean that a department cannot purchase a PC from another computer manufacturer. We will continue to support the current installed base of PCs. However, installation is streamlined and quicker than the normal install. Help Desk and onsite support will be more knowledgeable about the standard PC and therefore will be more able to provide efficient support.• The City has standardized on HP and Dell notebook computers. The City's experience with both notebook vendors has been extremely positive and they offer a broad range of features common to notebooks. They also have proven to be dependable, of high quality and reasonable price.
Computer Room Access	<ul style="list-style-type: none">• Access to the computer room will be restricted to those who currently have access. Any requests for changes to the access cards or fobs to allow access to the computer room must be approved by the CIO or Deputy Director.• Computer room access will be reviewed every six months (December and June) of each year. If you need to provide permanent access for someone on your team that currently does not have access or perhaps a new employee please route your request through the CIO or the Deputy Director who will authorize the administrator to accomplish this, please don't ask the administrator with out prior authorization.

Subject	Policy Description
Software Development Documentation	<p>The following documentation is required on all software engineering application development projects:</p> <ul style="list-style-type: none">• Project Specification: This is normally a Microsoft Word document which provides the business rules, requirements and the logical data structures for the application.• E-R diagram: An entity-relationship diagram of the schema for each application is developed. The diagram is developed using Power Designer, Visio, or Microsoft SQL Server diagram tool. The E-R diagram is kept updated as changes are made to the schema.• Application Flowchart: A flowchart diagram of the application is developed. This diagram is normally produced using Visio. The diagram shows a flowchart of the application screens and the major functions performed in each screen.• Application Description: A document describing the overall functions of the application. This document is usually produced using Microsoft Word.• Application Change History: A change history document is kept on each application project. All changes made to the application are recorded in the change history document. The customer requesting the change, data of the request, name of the software engineer(s) making the change, and a brief description of the change are the main information recorded. If the requested change/enhancement is considered major, the request is taken through the application development process as if it was a new application request.

The next section provides information on the IMS Division's strategic goals and key performance indicators.

4. KEY PERFORMANCE INDICATORS AND STRATEGIC GOALS

The IMS Division has developed a mission statement that highlights the broad purpose of the Division:

The IMS Division serves Salt Lake City by providing reliable, secure, costs effective technology and related services. We proactively develop, research, and recommend the best technology to facilitate positive interaction with citizens and departments of the City.

We are a united team that provides the following best in class services which include:

- *Data & voice network*
- *Training*
- *Help Desk support*
- *Software Design*
- *Technical expertise*
- *Audio / video service*
- *SLCTV*
- *Web Development*
- *Service and support*
- *Document management*

(1) Five Year Business Plan

The Management Services Department, of which IMS is a division, has recently developed a five year business plan which outlines accomplishments and anticipated service demands, goals and objectives, and performance measures, for the next five years. The table that follows summarizes objectives and performance measures established within the five year plan for the IMS division:

<i>Customer Perspective</i>							
Objective							
Provide more City services online by continuing to enhance the 7/24/365 Online City Hall. Complete 2 of the identified online services per year until all identified services are completed.							
Measures	Annual Results & Targets						
	03-04 Results	04-05 Results	05-06 Target	06-07 Target	07-08 Target	08-09 Target	09-10 Target
1. Create one additional online service setup on the City's WEB page each six months (started September 2001), until all identified services are completed.	2	2	2	2	2	2	2
<i>In FY 2004-05 the two services added were VAWA (Violence Against Women Grant) crime tracking system, and Building Permits Inspection Scheduler.</i>							

In addition, the five-year business plan highlights the key accomplishments for fiscal year 2005. These include completion of the following projects:

- Interactive Voice Recognition (IVR) project for Inspection scheduling, filing inspection reports, and providing the results of the inspections to the citizens. A web application providing similar features was implemented as well. IVR system installation for the Justice Courts. Wiring upgrades for additional sections of the City and County Building and the remaining floors in the Public Safety Building were completed this past year;
- Installed an additional layer in the email spam filter. This reduced the amount of spam getting to our customers;
- Completed software projects for the web and internal systems. Among those are the following:
 - VAWA (Violence against Women) crime tracking system
 - Building Permits Inspection Scheduler
- Since January of 2005 IMS has completed 32 Audio/Video projects many of which aired on the SLCTV channel involving over 435 hours of filming crew time;
- Began a Downtown Wireless project provided by XMission. This project provides free public wireless access down much of Main Street, in Liberty and Pioneer parks, and the Gallivan Center;
- Migrated most of the remaining systems to the new Data Base leaving only a few others.

The Five year business plan also sets out expected changes in service demands over the next five years. These include:

- Internet usage and the number of services provided on the Internet will continue to increase as part of the goal for a 7/24/365 Online City Hall. This will require the Division to provide additional software development, software maintenance, and network maintenance;
- Growth in wireless services continues to improve and decrease in cost. City workers in the field currently doing manual paperwork, tracking and monitoring will be moved to wireless services that reduce or eliminate double entry work;
- Increased need to provide wireless services to citizens especially in public areas of our buildings such as conference rooms and hallways;
- Audio/video projects will likely continue to increase. This has been an extremely popular service that fills an important need;

- IMS expects an increase in Interactive Voice Recording requirements over the next few years. A project for the Courts system is complete and others are expected to take advantage of this popular service;
- Demand from the citizens for web based services will require modifications of existing systems and creation of new systems;
- Complexity in the network continues to increase with needs to protect, manage, and monitor our network and every PC within the network.

The IMS Division plans to deal with these future demands by performing the following:

- IMS will implement new tools and refine procedures to increase productivity of our software development and network staff. These tools and procedures will help with the expected increase in Internet systems and network load;
- XMission is implementing their public wireless solution for downtown areas. The implementation of this project is schedule for early in the first quarter of FY 2006;
- IMS will continue adding wireless access to areas of the City and County Building and other buildings as funds allow. We are looking at additional solutions for public access to wireless solutions in public areas for some of the major buildings;
- IMS received budget for funding increases for Salt Lake City cable television (SLCTV) that will fund a staff member and additional tools needed for this service;
- Continue to recommend the PC rental program to standardize PCs and reduce maintenance requirements;
- Infrastructure needs for a highly-reliable/high-speed network and 7/24/365 Online City Hall and to provide a system that will support the increased load expected within a stable environment will require an annual infrastructure budget of \$1,001,500 for FY 2007, \$1,001,500 for FY 2008, \$1,001,500 for FY 2009, \$1,001,500 for FY 2010 and \$1,001,500 for FY 2011. This is approximately the same level of funding as the previous several years.
- Wiring upgrades in City buildings are an ongoing project, started in FY 2002, to improve the city infrastructure, and will continue through FY 2006. This project improves the performance of the network overall and prepares us for new services. These wiring upgrades will also be funded by the infrastructure budget.

The next section summarizes network architecture.

(2) Network Architecture Document

The IMS Division also develops five year budget plans which summarize personnel and revenue needs and highlights key infrastructure improvement needs. In order to evaluate and prioritize infrastructure needs, IMS created a team to identify critical network architecture needs in the near future. The process for creating the team and developing recommendations is summarized by the following points:

- In the summer of 2005 IMS created a team consisting of the IMS staff to evaluate Infrastructure, both software and hardware and to create a Network Architecture Document that would provide the technology infrastructure to lead Salt Lake City Corporation through the coming years.
- This team worked diligently to create the NAD document that was presented to the Leadership team (consisting of the CIO, Deputy Director, and Team Managers) in September 2005 for approval.
- The document was approved, prioritized and became the budget plan for the Infrastructure in 2006. Infrastructure replacement items were then added to the final projections.
- This document also is supported in the 5-year budget plan and will continue to evolve and drive this budget as each year is adjusted to the funds available.
- The Leadership team reviewed each of the items on the document and received detailed presentations from staff on many of the most crucial projects. Each of the items in the document has supporting documentation including research conducted, testing plans, implementation plans, and training.

This process resulted in establishing the following goal and functional requirements:

Goal: A network that is reliable, secure, cost effective, no single critical place of failure, no critical single point of failure, all critical data backed up, streaming media, system supported policies, software compliance, and ease of use.

Functions:

1. Remote control (A)
2. Patch management (A)
3. Hardware Inventory (A)
4. Software Inventory (A, E)

5. Fixed assets (A)
6. Software Distribution (A)
7. Network Access Control (I)
8. SPAM control (D)
9. Remote Access (H)
10. Application Performance Monitoring (E, F)
11. Server Service Monitoring (E)
12. Server Event Log Monitoring (E)
13. Server Hardware Monitoring (E)
14. Network Capacity Management (B)
15. Profile Migration (A)
16. OS Deployment (A)
17. Policy Enforcement (user, system) (G)
18. Software Metering (A, E)
19. Software Restriction (only licensed software installed) (A, E)
20. Intrusion Detection/Prevention (C, O)
21. Virus/Trojan Prevention (C, M)
22. Mailware (C, D, M)
23. Network Segmentation (I)
24. Identity Management (K)
25. Archive/Restoration of Data (L)
26. Failover for Systems (N)
27. Printer Management (J)
28. Deliver multimedia content to the desktop (P)
29. Change Management (Q)

Modules: (Required to complete the above functions)

- A. Desktop Management (1, 2, 3, 4, 5, 6, 15, 16, 18, 19)
- B. Network Monitoring System (14)
- C. Firewall (20, 21, 22)
 - Perimeter
 - Host-based
 - Workstation-based
- D. Spam Filter (8, 22)
- E. Server Management Suite (2, 3, 4, 10, 11, 12, 13, 18, 19)
- F. Application Monitoring Suite (10)
- G. Active Directory Group Policy Editor (17)
- H. VPN (9)
- I. Switch Management (7, 23)
- J. Print Server Appliance (27)
- K. Single Logon/Biometrics (24)
 - Fingerprint Scanners
 - Token
 - Proximity Cards
- L. Document Management and Retention (25)
- M. Enterprise Antivirus Solution (21, 22)

- N. Disaster Recovery (26)
- O. Intrusion Detection System (20)
- P. Multi-media servers (28)
- Q. Change Management System (29)

It should be noted that a number of the functions identified above have been achieved with the purchase and implementation of LANDesk software. This application allows remote access to workstations, application metering and monitoring, network monitoring, and a number of other features.

5. FINANCIAL SUMMARY

This section provides information on the IMS division's budget and the cost allocation model used to operate as an internal service fund. The table, below, shows the division's revenues over the past five fiscal years by cost center:

Rev. by Cost Center	2000-01 Actual	2001-02 Actual	2002-03 Actual	2003-04 Actual	2004-05 Actual	2005-06 Budget
IFAS	172,866	176,223	179,577	183,795	197,699	178,994
Network/Infrastructure	2,769,220	3,570,730	3,669,016	4,141,575	3,491,098	3,229,882
Software Engineering	1,825,878	2,217,598	2,254,474	2,197,473	2,467,270	2,862,751
PC Rental Program	-	-	-	-	431,773	423,179
SLC Data Proc.	111,448	69,634	55,095	35,405	7,135	20,000
Tel. Administration	30,133	16,724	13,467	11,605	12,594	-
Telephone	920,258	978,546	978,727	973,585	974,214	947,468
Web	219,307	242,106	260,211	-	3,527	-
SLC TV Video Proc.	-	-	-	-	-	119,066
IMS Administration	4,334	422	142	1,168	289	-
Technology	-	-	-	-	11,436	16,937
UNIX	-	-	-	-	-	-
Total	\$6,053,444	\$7,271,983	\$7,410,709	\$7,544,606	\$7,597,035	\$7,798,277

As shown above, the Divisions estimated revenues for FY 2005-06 are approximately \$7.8 million. The table above also shows that the largest sources of revenue come from the Network/Infrastructure cost center (41%) and the Software Engineering costs center (37%). The table shown below illustrates the dollar and percentage change in revenues over the past five years and one year:

CITY OF SALT LAKE CITY, UTAH**Final Report of the Management and Performance Audit of the IMS Division**

Revenues by Cost Center	FY 01 – 06 \$\$ Change	FY 01 - 06 % Change	FY 05 - 06 \$\$ Change	FY 05 - 06 % Change
IFAS	6,128	4%	(18,705)	-9%
Network/Infrastructure	460,662	17%	(261,216)	-7%
Software Engineering	1,036,873	57%	395,481	16%
PC Rental Program	423,179		(8,594)	-2%
Salt Lake City Data Processing	(91,448)	-82%	12,865	180%
Telephone Administration	(30,133)	-100%	(12,594)	-100%
Telephone	27,210	3%	(26,746)	-3%
Web	(219,307)	-100%	(3,527)	-100%
SLC TV Video Processing	119,066		119,066	
IMS Administration / Overhead	(4,334)	-100%	(289)	-100%
Technology	16,937		5,501	48%
UNIX	-		-	
Total	\$1,744,833	29%	\$201,242	3%

The following points summarize the information above:

- From FY 01 to FY 06, revenues collected by the IMS internal service fund are expected to increase by approximately \$1.7 million or 29%. This represents an average annual growth rate of approximately 2% over the five year period.
- From FY 05 to FY 06, revenues are estimated to increase by approximately \$200,000 or 3%.
- The largest increase in revenue, over the five year period, is expected to come from software engineering which will increase by over \$1.0 million or 57%.
- The largest increase in revenue, over the one year period, on a percentage basis, is expected to come from Data Processing at 180% (a cost center which represents interest revenues).
- The largest increase in revenue, over the one year period, on a total dollar basis, is expected to come from Software Engineering which is expected to increase by just under \$400,000.

The next table, that follows, shows expenses over the same period by cost center:

CITY OF SALT LAKE CITY, UTAH**Final Report of the Management and Performance Audit of the IMS Division**

Expenses by Cost Center	2000-01 Actual	2001-02 Actual	2002-03 Actual	2003-04 Actual	2004-05 Actual	2005-06 Budget
IFAS	123,738	7,580	99,653	152,254	(1,122)	178,994
Network/Infrastructure	2,244,330	3,361,498	3,219,281	3,039,731	2,462,013	2,667,664
Software Engineering	2,037,306	1,921,474	1,071,297	1,182,462	1,201,217	1,323,740
PC Rental Program	-	-	-	-	232,888	225,000
Salt Lake City Data Proc.	(3,539)	(31)	100,016	-	-	-
Miscellaneous	-	120,647	-	-	-	-
Telephone Administration	-	-	-	-	-	-
Telephone	655,822	698,740	886,354	789,316	811,872	852,387
Web	88,464	109,943	488,726	451,206	459,559	389,554
SLC TV Video Processing	-	-	-	-	3,456	76,820
IMS Administration	609,317	578,521	761,140	791,162	706,865	479,402
Technology	-	-	917,938	935,905	954,790	1,025,761
UNIX	-	-	335,132	374,024	441,872	395,779
Total	5,755,438	6,798,372	7,879,537	7,716,060	7,273,410	7,615,101

As shown above, budgeted expenditures for fiscal year 2005-06 are approximately \$7.6 million. Of this amount, the largest components are Network/Infrastructure at 35% and Software Engineering at 17%. The next table shows the dollar and percentage change over the period FY 2001 to FY 2006 and FY 2005 to FY 2006:

Expenses by Cost Center	FY 01 – 06 \$\$ Change	FY 01 - 06 % Change	FY 05 - 06 \$\$ Change	FY 05 - 06 % Change
IFAS	55,256	45%	180,116	-16053%
Network/Infrastructure	423,334	19%	205,651	8%
Software Engineering	(713,566)	-35%	122,523	10%
PC Rental Program	225,000		(7,888)	-3%
Salt Lake City Data Processing	3,539	-100%	-	
Miscellaneous	-		-	
Telephone Administration	-		-	
Telephone	196,565	30%	40,515	5%
Web	301,090		(70,005)	
SLC TV Video Processing	76,820		73,364	2123%
IMS Administration / Overhead	(129,915)		(227,463)	-32%
Technology	1,025,761		70,971	
UNIX	\$395,779		-\$46,093	-10%
Total	\$1,859,663	32%	\$341,691	5%

The following points summarize the information above:

- From FY 01 to FY 06, expenses are expected to increase by approximately \$1.9 million or 32%. This represents an average annual growth rate of approximately 2% over the five year period.
- From FY 05 to FY 06, expenses are estimated to increase by approximately \$342,000 or 5%.
- The largest increase in expense, over the five year period, is expected to come from the technology cost center which will increase by over \$1.0 million.
- The largest increase in expense, over the one year period, on a percentage basis, is expected to come from SLC Video Processing at 2,123%.
- The largest increase in revenue, over the one year period, on a total dollar basis, is expected to come from which is expected to come from Network/Infrastructure at approximately \$206,000.

The IMS Division has developed cost allocation procedures to recover the costs of operation. This includes direct billing to departments within the City for direct costs such as PC rentals and maintenance through the PC Rental Program as well indirect costs for software development and technology consulting. The following points summarize the procedure for allocating various costs to customer departments:

- The IMS Division operates the Corporate Computer Equipment Rental Program whereby city departments can pay monthly fees for desktop computers, monitors, printers, and other equipment. These charges are billed directly to the respective departments. Each piece of hardware has a replacement cycle: PCs are replaced every three years, laptops every three years, monitors every five years, printers every four years, etc. IMS purchased inventory directly from the vendor and charges a rental fee to each Department. Examples of the current costs for various equipment is as follows:
 - Flat Panel Monitor (17") \$8.50 per month (\$102 per year) including maintenance.
 - HP DC7600 Desktop (3 year term) \$34.00 per month (\$408 per year) including maintenance.
 - HP DC 7600 Desktop (2 year term) \$50.00 per month (\$600 per year) including maintenance.

- HP Laser Jet Printers (4 year term) \$42.00 to \$69.00 per month (depending on model) including maintenance.
- Maintenance is provided on equipment purchased directly by Departments at a cost of \$12 per month for PCs and \$5 per month for printers.
- IMS personnel time allocation reports are generated to determine the percentage of time spent providing network services and software engineering for general fund or non-general fund departments (e.g. Public Utilities, Airport, Fleet, Golf, Sanitation, and Redevelopment).
- Network Administration cost allocations are determined by summarizing all costs for Network Administration (salaries, benefits, equipment, services, etc.) and then allocating these costs based on number of PCs supported by division. Costs are allocated to the general fund as a lump sum, while costs to enterprise funds are allocated by department.
- Software Engineering costs are allocated based on percentage of time spent by IMS personnel engaged in software engineering (this may include technology consultant, web team personnel, software engineering, and security/UNIX personnel). Personnel assigned to the Airport and Public Utilities are broken out separately. The total number of hours spent servicing the general fund, and non-general fund departments are calculated and multiplied by the annual labor rate (typically the network annual labor rate which is equivalent to total annual network costs divided by the sum of employees providing network support).
- Annual telephone cost allocations are done as follows: An updated report is generated from Order Pro for each Salt Lake City Division/Department identifying all lines, modems, equipment, special circuits, DSL, T-1 maintenance, or time and materials associated with the Division/Department. Charges are allocated directly to each Division/Department.

Other support costs are allocated directly to Departments/Divisions based on usage and or benefit. Examples of these additional services provided include: imaging, support of non-core software, support of hardware not purchased through the Computer Equipment Rental Program, training on non-core software, and others.

6. TECHNICAL SUMMARY

This section provides information on the systems in use by the City of Salt Lake. The first section provides information on applications supported by IMS.

(1) Applications Support and Developed by IMS

The table, that follows, shows purchased applications supported by the IMS division:

Department/Division	System Name	System Description
Fire	FDM	Fire dispatch and records
Fire	First Watch	Spots trends in CAD and PROQA for possible terrorist/arsonist, etc.
Fire	ProQA	Automates Dispatch protocols
Fire	FATPOT AVL	Automatic vehicle location (Purchasing in December 2005)
Fire	Quick Access Plan (QAP)	Building access plan information.
Management Services	IFAS	Finance, purchasing, asset tracking, etc. software
Human Resources	Performance Impact	Tracks employee goals and evaluations.
Human Resources	Pathlore	Tracks training.
IMS	Remedy	Work Order Tracking
Public Services	Kronos	Time keeping system
Police	OSL	Time keeping system
Police	Versadex	Police CAD and Records management
Police	AFIS	Fingerprint System
Public Utilities	Cityworks	Work Order System
Public Utilities	SCADA	Water System telemetry system
Airport	Airport Time Keeping System	Time keeping system
Courts	JEMS	Justice Courts management system
Citywide	Millennium Security	Security system in many of the city buildings.
Citywide	Crystal Reports	Report generating system
Citywide	Hummingbird	Document management
Citywide	Alchemy	Scanning & imaging software
Fleet	Fleet Faster System	Track maintenance on vehicles
Public Services	Famtrack	Tracks work orders.
Golf	Fairway Systems	Golf reservation system
Parking	Autovu	Track parking tickets.
HAND – Rehab	SS&C	Loan Tracking Program
Prosecutors	Prosecutor Dialog	Prosecution office management program – supplied by the State
Attorney – Risk	RiskMaster	Risk management program

As shown above, IMS supports a diverse set of applications purchased from outside vendors. The next table shows additional purchased systems supported by IMS.

These applications represent “core” City software applications:

- Microsoft Office (Powerpoint, Word, Excel, Excel Outlook)
- Operating Systems (Mostly Windows XP)
- Custom Built Applications (Powerbuilder, Internet)

- Databases (Informix and SQL)
- IFAS
- Folio
- Unix
- Internet
- Security Applications

Finally, the IMS Division supports software applications developed in-house for various customer Departments. This list is quite extensive. As a result it is attached to this document as Exhibit 1. In addition to those applications identified above, IMS is currently working on a number of projects. Projects scheduled to be completed within the next few months include:

Web Projects Due in the Next 30 Days

DATE	Dec 2005	
Application	Department	Application Description
In Out Board	Citywide	App to allow departments to keep track of employees.
Credit Card Payment	Engineering	Add the capability to pay for a permit fee by credit card or electronic check in to the Engineering Permits Online application.
Camp Encumbrance and Payment	Purchasing	Migration of camp encumbrance and payment to the web.

Internal Projects Due in the Next 30 Days

Application	Department	Application Description
Active Directory Sync	IMS	A process that will extract personnel info from city databases and populate the active directory structure.
Court Disposition	Police	Update court disposition to RMS.
Public Utilities IVR	Public Utilities	Interactive voice response system for public utilities.
Data Base Migration	Citywide	The process of migrating the database for an application from Informix to Microsoft SQL Server.
PROMIS	Police	A system to automate creating, reviewing and filing domestic violence cases by the Police Department and the City Prosecutor's office.
Conversion to SQL Server	Public Utilities	Rewrite of 4GL programs using PB data windows, C programs, etc.

Internal Projects Due Next Quarter

Application	Department	Application Description
Alchemy 8.0 Migration	Citywide	Upgrade all Alchemy licenses - Recorders, Pub Util., Water Rec., Council, Permits, Licensing to release 8.0
Hummingbird Enterprise	Citywide	Implement Hummingbird as an enterprise document management solution available to any department.

A number of other projects are also scheduled to be completed after the first quarter of 2006, and several are on hold status.

(2) Firewalls and Security Applications

IMS uses a number of security applications to protect the city's network. The following points summarize the security measures / applications currently in place:

- The City has deployed several firewall systems for network security.
- IMS has deployed an internal network firewall system that is still being configured and implemented. This system will eventually protect high value internal servers and databases.
- All firewalls log activities to one of several log servers. These firewall events are monitored and analyzed by the three (3) members of the Security Team. Firewall activities logs are maintained for three (3) years.
- The City also employs several network and host based intrusion detection (IDS) and intrusion prevention (IPS) systems as additional security monitoring systems in addition to the perimeter protection available from the City firewalls. This is considered part of the City "defense in depth" layered security strategy. These systems monitor network and host traffic for probing, misuse or malicious acts. Depending on the activity detected, the systems will notify administrators primarily by means of the specific systems graphical interface and in some cases immediately prevent the continued action or intrusion prevention.
- IMS also utilizes a spam filter to reduce the potential threat from viruses sent through email.

The City also deploys the Cisco VPN (Virtual Private Network) for remote access. Remote users utilizing a Cisco client are able to access the network through an encrypted, secure communications tunnel. The system averages 25 users per day.

Additionally, the City uses the VPN concentrator for a SSL (Secure Sockets Layer) VPN and a City secure portal www.slcportal.com for certain employees.

(3) Five Year Infrastructure Replacement Plan

The Division develops a five year infrastructure replacement plan for the City's network, software, and other hardware. This document shows the replacement costs of the various servers, routers, hardware, and software applications. Again, due to its large size it is attached to this document as Exhibit 2. The following points however, highlight the five year infrastructure plan:

- IMS plans to replace on average, approximately \$120,000 in servers each year over the next five years.
- The Police RMS/CAD servers will be replaced over the next five years funded by the Police and the County Law Enforcement at \$147,000. IMS will replace security hardware over the next five (5) years at a cost of \$100,000.
- The plan calls for the purchase of approximately \$58,000 for routers and switches each year on average over the next five years.
- Wiring upgrades average approximately \$47,000 over the next five years.
- Software purchases average about \$62,000 per year over the next five years.
- Total infrastructure purchases over the next five years average approximately \$689,200, for a total of roughly \$3.5 million.

The next section summarizes help desk support.

(4) Help Desk and PC Support

The IMS Division supports approximately 2,192 desktops and notebooks, 123 windows servers (2003, 2000, and NT), and 25 UNIX and Linux servers. The initial contact point for support within the city is the IMS Help Desk. IMS has established a number of standards related to the timeliness of resolution of problems. These include differential standards based on prioritization of work orders. These standards include:

URGENT - RESPOND WITHIN 15 MINUTES

An area's productivity is drastically affected

- A Server is down
- Communication (Voice - Data) is down (i.e.: PBX, Communication facility affecting an entire location, router, etc.).
- Critical Software - City wide is down (i.e. email, IFAS)
- Mission critical systems

HIGH - RESPOND WITHIN 1 HOURS

An area's productivity is significantly affected.

- A Hardware item that's critical to a department is down
- A software application that effects more than one customer is down (i.e. Microsoft Excel on a particular server)
- A Hardware item that affects more than one customer is down (i.e. network printer.

MEDIUM - RESPOND WITHIN 8 WORKING HOURS

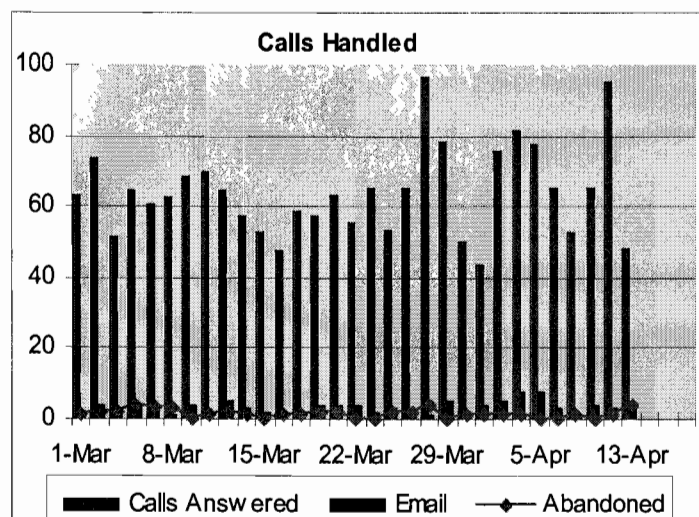
An area's productivity is not significantly affected

- Application is not working correctly, affecting one customer (i.e. Item within IFAS not available or working).
- Hardware affecting one customer, is not working (i.e. keyboard, mouse, monitor, drive) correctly.

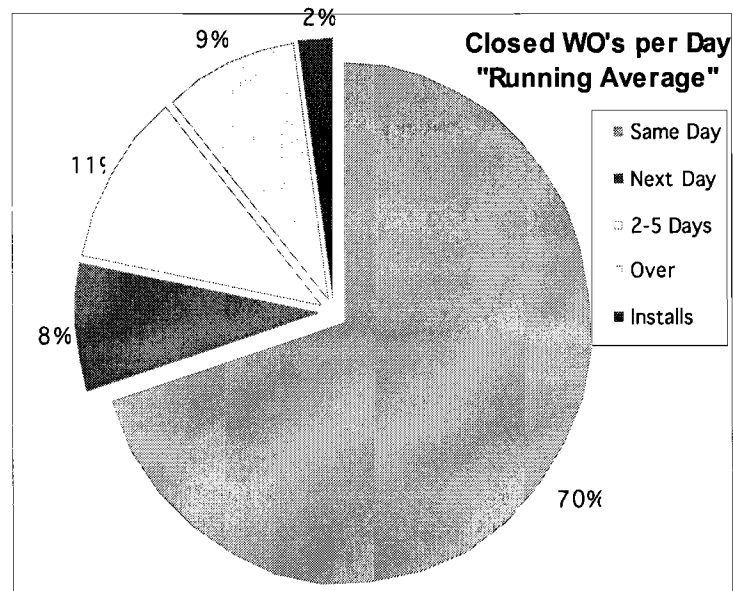
LOW – RESPOND WITHIN 5 WORKING DAYS

- Installation and/or upgrade of equipment (Hardware)
- Installation and/or upgrade of software application(s)
- Moving equipment (Given that IMS is notified within a reasonable time frame)

The Help Desk also tracks all work orders in a system called Remedy. Each work order is tracked to determine efficiency and effectiveness against each time standard. The chart that follows shows the number of work orders and percentage responded to based on each time category during April of 2006:



As shown above, during this period, the Help Desk handled approximately 60 calls per day in addition to seven email request each day. The Department closed 14,707 calls in calendar year 2005. The next chart, below, shows the percentage of worker orders closed by time category:



As shown above, approximately 70% of work orders are closed the same day they are opened, while 8% are closed the next day, 11% are closed within 2 to 5 days, and 9% are closed past 5 days.

Exhibit 1:

Software / System	Department/Division
501(C)9 Plan	Human Resources
Accidents Search (www)	Police
Air Budgeting	Airport
Air Stats	Airport
Air Time	Airport
Airventory	Airport
Alarms	Police
ALE- Administrative Law Enforcement	City Justice Court
ALE (www)	City Justice Court
APRVADJ	Public Utilities
AUTOCITE	CED/DOT
Bank Reconciliation	Management Services/Finance
Batch Print Requests	Public Utilities
Bid Labels	Finance
Bids (www)	Manage' Services
Bits	IMS
Boards & Commissions (www)	Mayor
Budget Resource & Planning	Manage' Services
Building & Housing Permit	Building & Housing
Building & Housing - IVR System	Building & Housing
Business License Search (www)	Business License
Business License	Business License
Business License Renewal (www)	Business License
Business Tax	Business License
CAD Inquiry	Police
CAMP	City Wide
Candidate Reporting Admin (www)	Recorder's

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Software / System	Department/Division
Candidate Reporting System (www)	Recorder's
Cash Receipt (www)	City Wide
Cash Register	Management Services/Treasurer
CAT - Community Action Team (www)	Mayor
CD Rate	Public Utilities
CIP	City Wide
City Vehicles	Attorney
Constituent Tracking (Currently not used)	Mayor's Office
Court Jury Module	City Justice Court
Cross Connection Control	Public Utilities
Customer Setup	Management Services/IMS
DalySumm	Public Utilities
Development Services	Public Utilities
Dispatch Log Inquiry	Police
DOT Meter	CED/DOT
DOT Signs, RFS, WO	CED/DOT
DP Time	Mngmt. Services/IMS
Engineering Map	Public Service/Engineering
Engineering Permit	Public Services/Engineering
Engineering Permit Inspection (www)	Public Services/Engineering
Engineering Permit Online Application	Public Services/Engineering
Engineering Project	Public Services/Engineering
Engineering Project Report (visual basic)	Public Services/Engineering
Engineering Survey	Public Services/Engineering
Event and News Calendar (www)	City Wide
Evidence Inventory/Auction	Police
Exit Interview (www)	City Wide
Fixed Assets	City Wide

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Software / System	Department/Division
Fixed Asset Scanners	City Wide
GIS Core	City Wide
GIS Map (visual)	City Wide
GO Query	Police
HAND	CED
Handheld – PU	Public Utilities
Hazmat (www)	Fire
Incident Pin Map (www)	Police
Infrastructure Management System	Engineering
Invstchk (Investigators Scheduling)	Public Utilities
Job Application (www)	Human Resources
Job Descriptions	Human Resources
Job History	Human Resources
Journal Entry (www)	Management Services/Treasurer
Justice Court Calendar	City Justice Court
Lighting Inventory	Engineering
Locator Log	Management Services/IMS
Locator Log (web version)	Management Services/IMS
Loc Box	Management Services/Treasurer
Material Lab	Engineering
Mayor's Hot Topics	Mayor
Meter Replacement (www)	Public Utilities
Mobile Work order	Airport
Officer Training Entry	Police
Online License Inspection Information	CED/Business License
OUTLOOK Add In	City Wide
Overtime	Airport
Paperless Travel (www)	Management Services

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Software / System	Department/Division
Park Survey	Public Services/Engineering
Parks Survey (ADA)	Public Services/Parks
Parks Reservation	Public Services/Parks
Password Sync	City Wide
Pastdues	Public Utilities
Pawn Query	Police
Pawns - Translator/Entry Collection	Police
PMVAL	Building and Housing
Police Crime Statistics	Police
Police Officer Secondary Employment	Police
Police Personnel Entry	Police
Police Queries & Reports	Police
Police Race Profiling	Police
POPS - Project. Of Personnel Services	City Wide
Pre-authorized Bank Payments PBP.exe	Public Utilities
Project Tracker	Public Utilities
PROMIS	Airport
PU Nightly Production	Public Utilities
Pu-Rpts	Public Utilities
Pubs Billing	Public Utilities
RDA - 1098 - (IRS 1098 process)	Finance
Read Log	Public Utilities
Real Property	Finance / Property
RECON	Finance
Record Storage	Management System/Recorders
Register Reporting	Treasurer
Residential Parking Permits	DOT
Retired	Public Utilities

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Software / System	Department/Division
Revenue Management (Rev Mgt)	Airport
RFS	City Wide
Ride Share (www)	City Wide
Salary Approval (www)	City Wide
SE Projects	IMS
SID Inquiry (www)	Treasurer
SID Special Improvement District	Treasurer
Statistical Report	Police
Survey	Public Service/Engineering
TERM, VOE, ORLTR	Human Resources
Tracker	Prosecutors
Traffic Accident Inquiry WWW	Police
Traffic Inquiry	Police
Traffic Volume File Consolidation	CED/DOT
Traffic/Parking Online Payment	Management Services/Courts
Training ETC.	Airport
Training HR	Management Services/HR
Training IMS	Management Services/IMS
Training - Officers	Police
Training Scheduler (www)	IMS
Travel Request (www)	City Wide
Tee Angel (www)	Public Service/Urban Forestry
Tree Inventory for Handhelds	Urban Forestry
Tree Inventory, RFS, WO (www)	Urban Forestry
Tree Map Online	Public Services/Urban Forestry
Urban Forestry Survey (www)	Urban Forestry
Visual Map	City Wide
Vendor Inquiry (www)	City Wide

Software / System	Department/Division
Voting Precincts (www)	Recorders
Water Assistance	Public Utilities
Wireless Investigations (www)	Public Utilities
Wo's – Maint. - Work Requests	Airport
Zoning Search (general address info) (www)	CED/Planning and Zoning

Exhibit 2:

**IMS Division
Five Year Infrastructure Replacement Plan**

Name/Location	Type	Model	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Servers							
Plaza 349 NAS server		NAS1			10,000		
C/C Nas server		NAS2			10,000		
Common NAS server		SLCICOMM			12,000		
PSB NAS server (police and fire)		SLCIPSB			10,000		
Arts council NAS server		SLCIARTS			4,000		
Cemetery NAS server		SLCICMTY			4,000		
Gallivan NAS server		SLCIGLVN			4,000		
Sorensen NAS server		SLCISMC			4,000		
Parks NAS server		SLCIPRK			5,000		
Streets NAS server		SLCISTR			5,000		
CD-Rom tower		CDROM		5,000			\$5,000
Internet mail gateway		SLCIOWA1		5,000			\$5,000
Internet mail gateway		SLCIOWA2		5,000			\$5,000
AC2000 Intranet Server		SLCIACP01	5,000				\$5,000
AC2000 Intranet Server		SLCIACP02	5,000				\$5,000
AC2000 Internet Server		SLCIACP03	5,000				\$5,000
AC2000 Internet Server		SLCIACP04	5,000				\$5,000
AC2000 Publishing Server		SLCIACPUB1	5,000				\$5,000
Radius server		SLCIACS	5,000			5,000	
AD DC, DNS (IMS)		SLCIAD1	5,000			5,000	
AD DC, WINS, DHCP, DNS (IMS)		SLCIAD2	5,000			5,000	
AD DC, WINS, DHCP, DNS\ (PSB)		SLCIAD3	5,000			5,000	
Servers Maps to SLCIMAP2		SLCIAPP1	5,000			5,000	
Report and Batch Job Server		SLCIAPP2	5,000			5,000	
SUS Server/Goodlink		SLCIARCHIVE	5,000			5,000	
Permits Alchemy Server		SLCIAWS2		6,000			\$6,000

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Name/Location	Type	Model	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Temp Doc Management System		SLCIAWS3		6,000			\$6,000
HP Data products Backup Server		SLCIBACKUP		8,000			\$8,000
Windows Arcserve Backup		SLCIBAK		6,000			\$4,000
Certification Authority (Root)		SLCICERT		4,000			
Cold Fusion Server\ (Michael's Office)		SLCICF01				4,000	
Citrix Secure Gateway		SLCICSG1		4,000			
Cisco Works server		SLCICWKS1		5,000			
Production SQL Server		SLCIDB1		10,000			
Document Management System		SLCIDM1		10,000			
Digital Voice Recorder\ (C&C)		SLCIDVR					
FACSys Fax Server\ (C&C)		SLCIFAX2		15,000			\$10,000
Exchange 2003 Enterprise Server (IMS)		SLCIMAIL1		10,000			
Exchange 2003 Enterprise Server (PSB)		SLCIMAIL2		10,000			
IFAS Web Server		SLCIWS1			5,000		
IFAS Web Server		SLCIWS2			5,000		
Live Publish		SLCILP				5,000	
Internet Map Server		SLCIMAP2				5,000	
Citrix/Terminal Server		SLCIMF2		5,000			\$5,000
Internal Citrix Server		SLCIMF3		5,000			\$5,000
Fire Citrix/Terminal Svr - slcfiremail		SLCIMF4		5,000			\$5,000
Citrix/Terminal Server - slcremote		SLCIMF5		5,000			\$5,000
Insight Manager; Web JetAdmin		SLCIMONITOR		5,000			\$5,000
Stats Collector - switches & rtrs\ (Dean)		SLCINGENIUS			5,000		
Remedy		SLCINT3	5,000			5,000	
Miscellaneous		SLCINVENTORY		5,000			\$5,000
IFAS Web Server		SLCIWS3			5,000		
SharePoint Portal Server		SLCIPSX1			5,000		\$5,000
Enterprise ISA Server		SLCISA01		8,000			
Enterprise ISA Server		SLCISA02		8,000			
Streaming Media Server		SLCISTREAM1	5,000				
Channel 17 Server		SLCITY	5,000				
WebAgain Svr/ISS Event Collector		SLCIWA01					
Intranet NLB Web		SLCIWEB1		5,000			

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Name/Location	Type	Model	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
WebSense Log Server		SLCIWSLOG1	4,000			4,000	
WebSense Network Agent		SLCIWSNA1	4,000			4,000	
External Proxy Server		SLCOPROXY			4,000		
Channel 17 Server		SLCTV		8,000			
Production Internet IIS Server		SLCWEB				8,000	
Live Publish		SLCILP			5,000		
Door security		XSMSEVER	3,000				\$3,000
Growth		Growth		15,000	15,000	15,000	\$15,000
Total Network Replacement Servers			\$86,000	\$183,000	\$117,000	\$85,000	\$127,000
Unix Server/System							
RMS - upgrade system	HPUNIX	RP5405		\$50,000	\$34,000		
IFAS – upgrade	HPUNIX	RP5405			\$75,000		
Backup Hardware/Software -Upgrade			\$-		\$40,000	\$40,000	
Security							
Mailware Prevention Application			\$6,000				
DNS Server Replacements - Red Hat			\$6,000				
Remote Access Security			\$10,000	\$10,000	\$10,000	\$10,000	
CSA				\$40,000			
SPAM upgrade			\$4,000	\$10,000			
Pen Testing				\$20,000	\$20,000	\$20,000	20000
Replace O-Proxy			\$4,000				
NAC Control			\$20,000	\$40,000	\$40,000	\$20,000	20000
Web Sense Replacement				\$32,000	\$15,000		
Application Level Monitoring			\$10,000				
Internet Access Balancing Memory Upgrade to Router			\$3,000				
Sub Total UNIX/Security			\$63,000	\$202,000	\$234,000	\$90,000	
Web Servers- Inter/Intranet							
Internet Server	NT	Compaq					
Application Server	NT	Compaq					
Content Filtering		Sun					

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Name/Location	Type	Model	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Load Balancing		None					
Server Software							
Sub Total Web			\$-	\$-	\$-	\$-	
Total Servers and Software			\$149,000	\$385,000	\$351,000	\$175,000	\$127,000
Routers/Switches							
Sorensen 1	Router	Cisco2500series		\$3,000			\$3,000
Sorensen 2	Router	Cisco2500series		\$3,000			\$3,000
IMS/STREETS	Router	Cisco2500series		\$3,000			\$3,000
IMS/LSS	Router	Cisco3000series			\$9,000		
IMS Gateway	Router	Cisco3000series			\$3,000		
C/C	Router	Cisco3000series			\$3,000		
Airport	Router	Cisco3000series			\$3,000		
Gallivan	Router	Cisco2500series				\$3,000	
Arts	Router	Cisco2500series				\$3,000	
Water Rec	Router	Cisco2500series				\$3,000	
Cemetery	Router	Cisco1GS				\$3,000	
Parks	Router	Cisco2500series				\$3,000	
Streets	Router	Cisco2500series				\$3,000	
PSB/County	Router	Cisco2500series				\$3,000	
PSB/Ogden	Router	Cisco2500series				\$3,000	
IMS Core Switch	100MbRouter	Cisco4000	\$36,000				
C/C core Switch	Switch	Cisco4000		\$35,000			
IMS Intranet Router	Router	Cisco2621		\$3,000			
PSB Core Switch	Switch	Cisco4000			\$35,000		
Workgroup Switches				\$12,000	\$25,000	\$25,000	\$25,000
LSS Router Upgrades			\$12,000				
Fire Station 1					\$3,000		
Fire Station 2					\$3,000		
Fire Station 8					\$3,000		
Fire Station 9					\$3,000		

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Name/Location	Type	Model	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Fire Station 14					\$3,000		
Spares	Routers			\$3,000	\$3,000		
Totals for Routers/Switches			\$48,000	\$62,000	\$96,000	\$49,000	\$34,000
Biometrics							
Phase 2 Testing IMS DigitalPersona			\$9,375	\$10,000			
Wiring							
C/C			\$85,000		\$2,000	\$2,000	\$2,000
PSB					\$2,000	\$2,000	\$2,000
349 S. 200 E.			\$1,500		\$2,000	\$2,000	\$2,000
Parks				\$15,000			
SORENSEN				\$6,000			
REMOTE LOCATIONS				\$6,000	\$6,000	\$7,000	\$7,000
GALLIVAN				\$6,000			
CONTINGENCY PLANNING							
WIRELESS				\$25,000	\$10,000	\$10,000	\$10,000
UPS Upgrade			\$15,000				
Environmental Monitoring			\$8,000				
Totals for Wiring			\$109,500	\$58,000	\$22,000	\$23,000	\$23,000
Software							
Desktop Monitoring			\$67,000				
Network Monitoring			\$15,000				
SQL Clustering			\$30,000				
Corporate Fax							
Web Team Server Software							
Windows .NET			\$-				
Web Team Software Upgrades				\$2,000	\$2,000		

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Name/Location	Type	Model	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Software Engineering							
Development Software							
Visual Studio			\$15,000	\$2,500	\$2,500	\$2,500	\$2,500
Server Software							
SQL Server Enterprise Edition				\$35,000	\$10,000		
SQL Server Standard Ed. (10 CAL) - Development				\$1,125			
Windows 2000 - Advanced Server				\$6,000			
GIS Software			\$30,000				
Servers							
Database Server				\$20,000			
Web Application Servers				\$20,000			
Report / COM Server				\$10,000			
IVR							
IVR Training			\$10,000				
Forensic							
Forensic Software			\$1,700			\$2,000	
Research & Development							
Misc. Software				\$5,500	\$5,500	\$5,500	\$5,500
Total Software			\$168,700	\$102,125	\$20,000	\$10,000	\$8,000
Infrastructure Contingency			\$60,800				
Total New Infrastructure Per Year			\$484,575	\$617,125	\$489,000	\$257,000	\$192,000
Current Ongoing Infrastructure			\$466,772	\$469,772	\$469,772		
Lease Payments Per Year							
Total % of Overhead							

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Name/Location	Type	Model	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Total Infrastructure Per Year			\$951,347	\$1,086,897	\$958,772	\$257,000	\$192,000
Initial Projected Budget			\$886,888				
Difference			\$64,459	\$1,086,897	\$958,772		
New PC / Laptops for IMS							
PC and Equipment for IMS Staff			\$15,000	\$25,000	\$25,000	\$25,000	\$25,000
Laptops and Equipment for IMS Staff			\$15,000	\$25,000	\$25,000	\$25,000	\$25,000
Total Telephone Infrastructure			\$30,000	\$50,000	\$50,000	\$50,000	\$50,000
Rental Program Replacements/New Equipment							
New and Replacement Rental Units			\$225,000	\$275,000	\$275,000	\$275,001	\$275,002
Total Telephone Infrastructure			\$225,000	\$275,000	\$275,000	\$275,001	\$275,002
Telephone Infrastructure							
Replace Switch for PSB							
Replace Phones for PSB							
OCTEL Voice Mail Upgrades					\$50,000	\$20,000	
Replace the switch in the C&C Building					\$100,000	\$100,000	
UPGRADE CC PBX TO IP				\$50,000			
Replace Phones for C&C				\$15,000	\$20,000	\$20,000	
Replace phone systems for 6 smaller sites			\$-				
Current Lease Payments							
Total Telephone Infrastructure			\$-	\$65,000	\$170,000		
SLCTV							
Camera 1			\$2,500		\$4,000		
Camera 2			\$4,200			\$4,000	
Tripod			\$500		\$750	\$750	
Broadcast Monitors/Rack Mounted							\$2,000
Mini-DVD VTR				\$1,000		\$1,000	
Post Production/editing software			\$6,400	\$3,000	\$3,000	\$3,000	\$3,000
VHS Replication VCRs					\$2,000		

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Name/Location	Type	Model	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
4Channel AV Distribution Amplifier					\$500		
Portable Rack/Road Box					\$500		
Video/Audio Transmitter/Receiver(Fiber)			\$-	\$3,000	\$-	\$3,000	
Video/Audio Mixer			\$-	\$-	\$3,000		
Audio and Video Program Monitor			\$1,300				\$1,000
Teleprompter			\$5,000			\$2,500	
Encoding Device			\$-	\$-	\$1,000		
Delay Module			\$5,000		\$-		
Broadcast Monitor			\$500				
Video Capture Cards			\$2,000				
Will be separately funded			\$27,400	\$7,000	\$14,750	\$14,250	\$6,000

2. RESULTS OF THE EMPLOYEE SURVEY

As part of the comprehensive management study of the IMS Division of Salt Lake City, the project team conducted an employee survey to gather perspectives regarding Division operations, management, organization, and City information technology systems. The project team received a total of thirty-four (34) responses for a response rate of 56%. The distribution of respondents by team is shown in the table that follows:

Team	Number	Percent
PC Server Support	10	29%
Technology Consulting	6	18%
Software Engineering	10	29%
Security/Unix	2	6%
Administration	4	12%
Communications	0	0%
No Answer	2	6%
Total	34	100%

As shown above, the PC/Server Support Team, and the Software Engineering Team represented the largest share of responses at ten each, comprising approximately 60% of total responses. Technology Consulting was the next largest group of responders at six, or 18%.

Respondents were asked to indicate their level of agreement or disagreement, strongly disagree, disagree, neutral, agree, strongly agree, with several statements concerning service provision, Division operations, management and organization, and IT systems utilized by Salt Lake City.

The project team has summarized several key findings from the preliminary results of the employee survey. In addition, a detailed summary of responses by question is presented at the end of this document. These findings are organized into

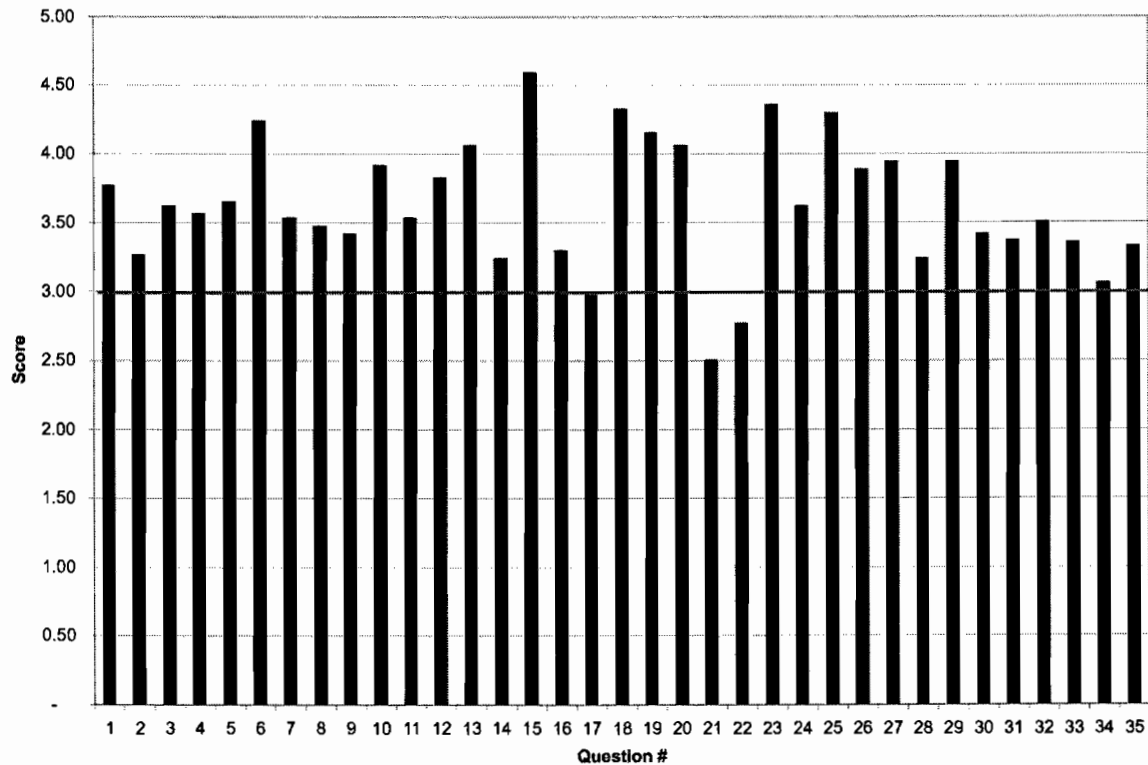
three broad categories: Overall Results, Highest and Lowest Ratings, General Service Provision and IT Systems, and Division Operations and Management. The points, that follow, present findings for each of these categories:

1. OVERALL RESULTS

This section summarizes the overall results of the employee survey. The following points describe the key findings:

- The majority of responses were positive and indicated agreement with positive statements (e.g. IMS does a good job of planning and scheduling work) regarding the effectiveness of operations, management, staffing, and service levels provided by the IMS Division. The two statements that received the highest average negative ratings are:
 - Question 21: Opportunities exist in my Division for career advancement. 53% disagree or strongly disagree.
 - Question 22: There is good teamwork and coordination in the City in information technology management. 41% disagree or strongly disagree.

The chart below shows the average response to each question (1 indicates strong disagreement and a score of 5 indicates strong agreement):



2. HIGHEST AND LOWEST RATINGS

The table below shows the questions with the highest and lowest levels of agreement with the questions posed in the survey. This table illustrates the strengths and potential improvement opportunities from the employee's perspective:

Question	Percentage Who Agree	Question	Percentage Who Agree
15. My Division provides a high level of service to the staff of the City and to the residents of Salt Lake City.	97%	21. Opportunities exist in my Division for career advancement.	29%
6. The citywide network is reliable.	88%	22. There is good teamwork and coordination in the City in information technology management	38%
18. Customer complaints are handled quickly and courteously in my division	88%	28. The City effectively uses document management (imaging and records management) systems	38%
23. The citywide network is secure (safe from viruses).	88%	17. Workload is evenly balanced among staff in my Division.	47%

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Question	Percentage Who Agree	Question	Percentage Who Agree
25. The employees in my Division are dedicated to meeting customer expectations.	88%	34. I am sufficiently represented in the technology-related decision making process.	47%
20. The network speed meets the needs of the staff of the City at its diverse work locations.	85%	2. My division has clear, well-documented policies and procedures to guide my day-to-day work.	50%
19. I have the tools and equipment I need to efficiently perform my job.	82%	31. The working relationships between the different sections in my Division are generally good.	50%
13. The staff of my division are skilled and capable in information technology.	79%	35. My division's overall technology related decision-making processes are effective.	53%
27. I feel that I am valued as a member of my Division.	79%	14. In my Division, at present, staffing is adequate for the workloads we handle.	56%
26. My supervisor empowers me to make decisions concerning my work.	76%	24. The City effectively uses mobile computing (field devices, PDA's, etc.).	56%

The following points summarize the table above:

- Employees had the highest levels of agreement with statements related to the provision of service, customer service, the performance of the City's network, the skills of personnel within the Department, and perceptions about being a valued and empowered member of the organization.
- Employees had the lowest levels of agreement with statements related to career advancement, teamwork, document management systems, the balancing of workload, policies and procedures, representation in the technology decision making process, working relationships between teams, and staffing.

The next section discusses response results by general topic area:

3. GENERAL SERVICE PROVISION AND IT SYSTEMS

This section summarizes responses to questions related to general service provision and the IT systems in place within Salt Lake City. The following points identify the key findings:

- The majority of respondents believe that IMS provides a high level of service to the City:

- 97% of respondents agree that the IMS Division provides a high level of service to the City.
- 88% of respondents agree that customer complaints are handled quickly and efficiently.
- 88% of respondents agree that the employees in the Division are dedicated to meeting customer expectations.
- The majority of respondents believe that the City invests adequately in information technology and that infrastructure is up to date. However, a plurality does not agree that there is good teamwork and coordination in IT management:
 - 74% of respondents agree that the City invests adequately in information technology.
 - 41% of respondents disagree or strongly disagree that there is good teamwork and coordination in the City in information technology management.
 - 56% of respondents agree that they are satisfied with the City's current funding mechanism with 32% neutral.
 - 71% agree that the information technology infrastructure is up to date.
- The majority of respondents agree that the citywide network and IT applications are functioning well. However, they indicated areas for improvement:
 - 88% of respondents agree that the citywide network is reliable.
 - 85% agree that network speed meets the needs of the staff of the City.
 - 88% agree that the citywide network is secure.
 - 62% of respondents agree that the City's information technology applications are well integrated so that information can be shared and duplicate data entry is avoided.
 - 56% of respondents agreed that the City makes effective use of mobile computing (PDAs, etc.)
 - 38% agreed that the City effectively uses document management (imaging and records management systems). However, with 44% neutral this indicates that many employees aren't involved in document management.

Overall, respondents were positive regarding general service provision and IT systems in place, with identification of some areas for improvement.

4. IMS MANAGEMENT AND DIVISION OPERATIONS

This section summarizes response results to questions related to IMS management and division operations. The following points highlight the key findings:

- The majority of respondents agree that IMS is a good place to work and that they are valued members of the division. However, most feel that career advancement opportunities are limited:
 - 68% of respondents agree that the IMS Division is a good place to work.
 - 79% of respondents agree that they feel valued as a member of the Division.
 - Only 29% agree that opportunities exist in the Division for career advancement.
- The majority of respondents agree that staff work well together and that the division is well managed:
 - 74% of respondents agree that the staff in their team work well together as a team.
 - 68% of respondents agree that the managers and supervisors in the IMS Division have clearly defined the direction for the Division.
 - 59% of respondents agree that the services of the Division are well managed with 24% neutral. 18% disagree or strongly disagree.
 - 65% of respondents agree that managers and supervisors do a good job of communicating important information in a timely manner.
- The majority of respondents agree that their supervisor provides them with important information and feedback on expectations:
 - 62% of respondents agree that they get enough feedback from their supervisor about their performance to know if they are meeting expectations.
 - 76% of respondents agree that their supervisor empowers them to make decisions regarding their work.

- The majority of respondents agree that their team does a good job of planning and scheduling work. However, only half believe that policies and procedures are clear and provide guidance for day-to-day work:
 - 50% of respondents agree that the Division has clear, well document policies and procedures to guide day-to-day work.
 - 65% of respondents agree that their division does a good job of planning and scheduling work. In addition, 65% agree that the work methods and practices in their division are efficient.
 - 79% of respondents agree that staff in their division is skilled and capable in information technology.
- The majority of respondents agreed that staffing is adequate to handled workload, however, less than half agreed that workload was evenly balanced among staff:
 - 56% of respondents agree that staffing is adequate for the workload handled.
 - Only 47% of respondents agree that workload is evenly balanced among staff in their division. 41% disagreed with this statement.
- The majority of respondents agree that their team is open to new ideas, however, only half agree that working relationships between different teams are generally good:
 - 65% of respondents agree that their team is open to new ideas suggested by others or them.
 - 50% of respondents agree that working relationships between the different sections of the Division are generally good with 29% neutral.
- The majority of respondents believe they understand how the Division makes technology related decisions and that this process is effective. However, respondents were mixed as to whether they feel sufficiently represented in this process:
 - 59% of respondents agree that they understand how the Division makes technology related decisions.
 - 53% of respondents agree that the Division's overall technology related decision making processes are effective.

- 29% of respondents disagree that they are sufficiently represented in the technology related decision making process, while 47% agree, and 24% are neutral.

The next section provides a summary of the written comments section of the survey.

5. SUMMARY OF WRITTEN COMMENTS

Respondents were also provided the opportunity to identify what they believe are the major strengths and potential improvement opportunities related IMS management, organization, operations, and service levels. The tables below summarize the most common responses to each of these areas:

Strengths of the IMS Division
<ul style="list-style-type: none">• The work environment is good.• Staff and Management are professional.• I am given independence to do by job.• Schedules are flexible.• Salaries are competitive with the private sector.• Access to training and new technology.• People are hard working.
Improvement Opportunities
<ul style="list-style-type: none">• Communications between Teams/Units is not effective.• The balance of workload between employees is not even.• There are little career advancement opportunities.• The City should purchase more off the shelf systems instead of developing interfaces.• Not all employees work as hard as others.• Need stronger leadership more progressive thinking from management.

The table on the following page provides detailed response results to each question in the employee survey.

Response Results of the IMS Employee Survey

Question	Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree	No Answer
1. The staff in my division work well together as a team.	2	4	3	16	9	0
	18%		9%	74%		0%
2. My division has clear, well-documented policies and procedures to guide my day-to-day work.	4	7	6	10	7	0
	32%		18%	50%		0%
3. The services of my division are well managed.	4	2	8	9	11	0
	18%		24%	59%		0%
4. I get enough feedback from my supervisor about my performance to know if I am meeting expectations.	4	5	4	10	11	0
	26%		12%	62%		0%
5. Managers and supervisors in my Division do a good job of communicating important information to me in a timely manner.	4	3	5	11	11	0
	21%		15%	65%		0%
6. The citywide network is reliable.	1	0	3	16	14	0
	3%		9%	88%		0%
7. I am satisfied with the City's current funding mechanisms for the division.	2	2	11	14	5	0
	12%		32%	56%		0%
8. The work methods and practices in my division are efficient.	3	5	4	17	5	0
	24%		12%	65%		0%
9. In my division, we do a good job planning and scheduling our work.	5	6	1	14	8	0
	32%		3%	65%		0%
10. The information technology infrastructure is up-to-date.	0	3	7	14	10	0
	9%		21%	71%		0%
11. The managers and supervisors in my division have clearly defined the direction for the division.	4	3	4	17	6	0
	21%		12%	68%		0%
12. The City invests adequately in information technology	1	3	5	17	8	0
	12%		15%	74%		0%

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Question	Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree	No Answer
13. The staff of my division are skilled and capable in information technology.	1	2	4	14	13	0
	9%		12%	79%		0%
14. In my Division, at present, staffing is adequate for the workloads we handle.	5	8	2	12	7	0
	38%		6%	56%		0%
15. My Division provides a high level of service to the staff of the City and to the residents of Salt Lake City.	0	0	1	12	21	0
	0%		3%	97%		0%
16. The City's information technology applications (financial, human resources, etc.) are well integrated so that information can be shared and duplicate data entry avoided.	3	6	4	20	1	0
	26%		12%	62%		0%
17. Workload is evenly balanced among staff in my Division.	8	6	4	11	5	0
	41%		12%	47%		0%
18. Customer complaints are handled quickly and courteously in my division	1	0	3	13	17	0
	3%		9%	88%		0%
19. I have the tools and equipment I need to efficiently perform my job.	0	2	4	15	13	0
	6%		12%	82%		0%
20. The network speed meets the needs of the staff of the City at its diverse work locations.	0	1	4	21	8	0
	3%		12%	85%		0%
21. Opportunities exist in my Division for career advancement.	10	8	6	9	1	0
	53%		18%	29%		0%
22. There is good teamwork and coordination in the City in information technology management	7	7	7	13	0	0
	41%		21%	38%		0%
23. The citywide network is secure (safe from viruses).	0	0	4	14	16	0
	0%		12%	88%		0%
24. The City effectively uses mobile computing (field devices, PDA's, etc.).	1	3	11	12	7	0

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Question	Strongly Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Strongly Agree	No Answer
	12%		32%	56%		0%
25. The employees in my Division are dedicated to meeting customer expectations.	1	2	1	12	18	0
	9%		3%	88%		0%
26. My supervisor empowers me to make decisions concerning my work.	3	3	2	13	13	0
	18%		6%	76%		0%
27. I feel that I am valued as a member of my Division.	2	3	2	15	12	0
	15%		6%	79%		0%
28. The City effectively uses document management (imaging and records management) systems	4	2	15	8	5	0
	18%		44%	38%		0%
29. My Division is a good place to work.	1	2	8	10	13	0
	9%		24%	68%		0%
30. In the past year, I have had adequate training to develop the skills I need to perform my job well.	4	5	4	15	6	0
	26%		12%	62%		0%
31. The working relationships between the different sections in my Division are generally good.	3	4	9	12	5	1
	21%		26%	50%		3%
32. My Division is open to new ideas suggested by others or myself.	4	4	4	15	7	0
	24%		12%	65%		0%
33. I understand how my division makes technology related-decisions.	2	7	5	17	3	0
	26%		15%	59%		0%
34. I am sufficiently represented in the technology-related decision making process.	8	2	8	12	4	0
	29%		24%	47%		0%
35. My division's overall technology related decision-making processes are effective.	4	2	10	15	3	0
	18%		29%	53%		0%

3. RESULTS OF THE USER SURVEY

The project team also conducted a survey of users of IMS services. A survey was issued to each of the Departments within the City to collect feedback regarding IMS services, organization, policies and procedures, and other issues. A total of 138 surveys were distributed to Departments with each Department receiving a different number of surveys based on number of employees. The project team received a total of 48 completed surveys. Responses by Department are shown below:

Department/Division	Number	Percentage
Mayor's Office	1	2%
SLC Int. Airport	0	0%
Fire Department	0	0%
Building Services	9	19%
Housing	1	2%
Transportation	0	0%
Parks	0	0%
Streets & Sanitation	2	4%
Accounting	0	0%
Policy & Budget	0	0%
Purchasing	1	2%
Recorder	0	0%
Police Department	5	10%
City Council Office	5	10%
Attorney's Office	0	0%
Art's Council	0	0%
Business Licenses	0	0%
Planning & Zoning	0	0%
Engineering	1	2%
Fleet Management	4	8%
Public Services	9	19%
Justice Court	3	6%
Human Resources	0	0%
Treasurer	0	0%
Public Utilities	2	4%
Management Services	1	2%
Other	1	2%
No Answer	3	6%
Total	48	100%

As shown above, Public Services had the largest share of responses at 19%, followed by Building Services, and the Police Department. The next table, below, shows the number of respondents by position:

Position	Number	Percentage
Manager	32	67%
Supervisor	7	15%
Line Staff	2	4%
No Answer	7	15%
Total	48	100%

As shown above, the majority of respondents were Managers at 67%. Respondents were asked for their level of agreement regarding a variety of statements related to general provision of service, policies and procedures, customer service, staff skills and competence, budget, IT decision making, and other issues. The results are organized into the following areas: Overall Results, Highest/Lowest Ratings, General Provision of Service, Customer Services, Specific Service and Operational Issues, and Summary of Written Results.

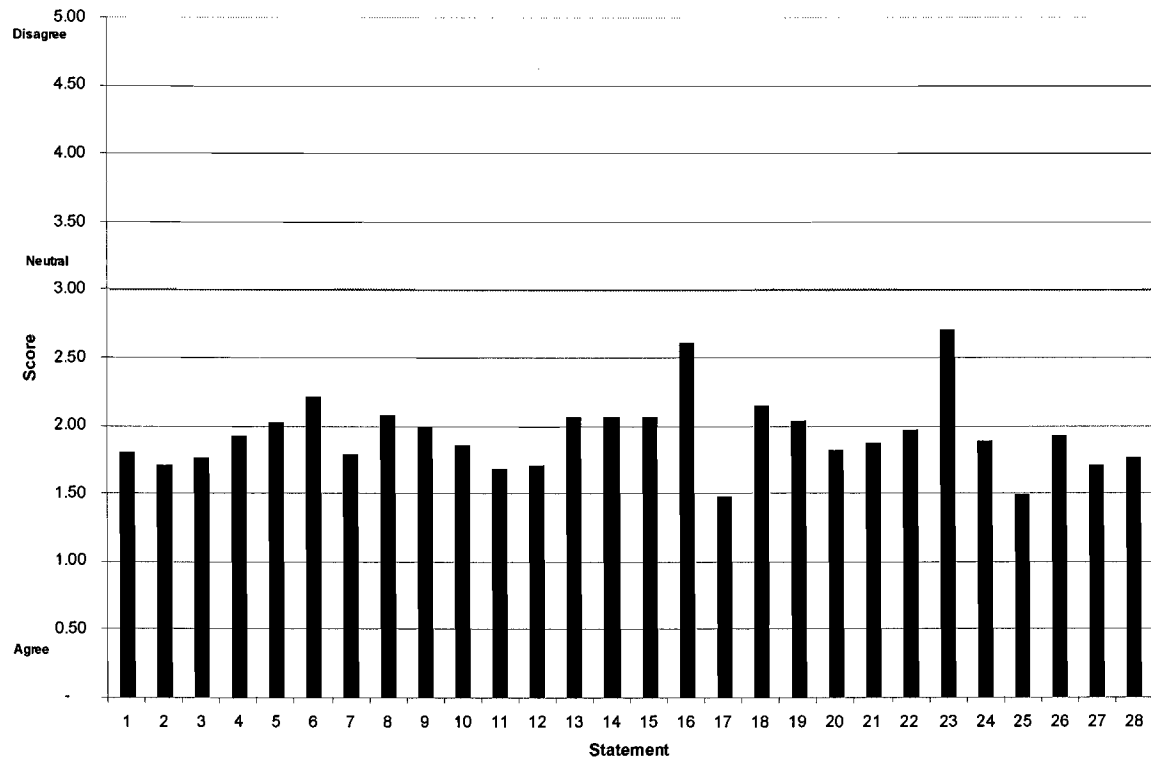
1. OVERALL RESULTS

The points below summarize the overall trend in response results:

- The Majority of responses were positive. As shown in the following table, the average response to each statement was close to agreement.
- There was no single statement that resulted in an average response that was negative.

The table that follows shows the average response to each statement. Note that strongly agree is 1, neutral is 3, and strongly disagree is 5. The red line also indicates neutral.

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2. HIGHEST / LOWEST RATINGS

The table below shows the ten statements with the highest levels of agreement and ten statements with the lowest level of agreement based on the percentage of respondents who checked either strongly agree or agree.

Statement	Percentage Who Agree	Statement	Percentage Who Agree
17. The IMS Help Desk works well.	94%	23. SLC TV services are of high quality and meet the needs of the City.	13% (43% neutral) (39% no answer)
25. The information technology I use in my job helps me be productive.	94%	16. The City should develop more software solutions in house.	44% (29% neutral) (8% no answer)
27. Overall, IMS provides high levels of service.	89%	18. The cost of IMS services to my unit seems reasonable.	55% (19% neutral) (13% no answer)

Statement	Percentage Who Agree	Statement	Percentage Who Agree
24. Salt Lake City utilizes up to date information technology.	85%	22. IMS provides sufficient training resources to help me effectively utilize City technology.	60% (24% neutral) (13% no answer)
2. When I have an IMS question or issue, I feel listened to and understood by IMS staff.	83%	6. I receive up-to-date information from IMS on the status of a non emergency request.	60% (21% neutral) (6% no answer)
11. IMS staff has high technical competence.	83%	20. The PC rental program is a real benefit to me and my Department.	64% (21% neutral) (15% no answer)
1. When I deal with IMS staff, I feel important, appreciated and valued as a customer.	81%	13. IMS staff provides good training on new equipment and software.	65% (19% neutral) (8% no answer)
3. When I need action on an emergency IMS concern or issue, I receive a timely response.	81%	14. Technology Consultants help my Department choose the right technology solution.	65% (13% neutral) (8% no answer)
4. When I require action on a non-emergency matter, I receive a timely response.	81%	15. Technology Consultants help my Department understand its technical requirements for new software.	67% (17% neutral) (10% no answer)
7. I receive accurate information from IMS when I request it.	81%	19. I understand the IMS charges associated to my budget.	68% (11% neutral) (11% no answer)

The following points highlight the information above:

- Respondents had the highest levels of agreement with statements related to the Help Desk, information technology allowing them to be more productive, overall levels of service and the City's use of up to date technology.
- Respondents also had high levels of agreement with statements related to IMS customer service, competence, and IMS general responsiveness.
- While respondents had the lowest level of agreement with statements related to IMS responsiveness to non-emergency request and the PC rental program, agreement levels are still above 60%. It should also be noted that several of these statements received a high percentage of neutral or no response results as indicated in parenthesis.

- IMS training on new equipment and software, technology consultant advice, and the IMS chargeback model also received the lower levels of agreement, although still above 64%.

The next section discusses response results to questions by subject areas including: General Service Provision, Customer Service, and Specific Service Areas.

3. GENERAL SERVICE PROVISION

This section summarizes response results to statements related to general service levels provided by IMS. The following points highlight key findings:

- The vast majority of respondents believe that IMS provides a high level of information technology service to the City and their Department:
 - 89% of respondents believe that overall, IMS provides a high level of service.
 - 85% of respondents agreed that the City uses up to date technology.
 - 94% of respondents agreed that the information technology helps them be more productive.
 - 77% of respondents believe that IMS is headed in the right direction.
 - 83% agree that IMS staff have high technical competence
- The majority (77%) also believe that outsourcing of IT services would result in a reduction of service.

Overall, respondents were very positive towards statements about general services provision. The next section discusses statements related to customer service.

4. CUSTOMER SERVICE

This section summarizes response results to statements regarding the quality of customer service provided by IMS. The following points highlight the key findings:

- The vast majority of respondents believe that IMS provides a high level of customer service:

- 81% of respondents agreed with the statement that they feel important, appreciated, and valued as a customer when dealing with IMS.
- 83% agreed that when issues arise, they feel listened to and understood by IMS staff.
- 81% agreed that when action is needed on an emergency concern, IMS provides a timely response.
- 81% agree that when action on a non-emergency matter is required, IMS provides a timely response.
- 73% agreed that they receive up to date information from IMS on the status of an emergency request.
- 81% agreed that they receive accurate information from IMS when requested.
- 73% agreed that when a problem needs to be addressed by IMS, it is done correctly and to their satisfaction.
- While a majority believes IMS is responsive to non-emergency requests:
 - 60%, users indicated a lower level of satisfaction with customer service related to non-emergency requests.
 - 60% agree that they receive up to date information from IMS on the status of a non-emergency request, compared to 21% who were neutral, 13% who disagreed and 6% who had no response.
- A majority of respondents indicate that the decision making process utilized by IMS is understood:
 - 71% agreed that when IMS must make a “yes” or “no” decision on a request, they understand the reasoning behind the decision.
 - 77% agreed that IMS policies that impact them are reasonable and the reasons for them are clearly understood.

Overall, respondents were again very positive towards statements regarding customer service provided by IMS. The next section discusses response results related to specific types of service and procedures utilized by IMS.

5. SPECIFIC SERVICE AND OPERATIONAL ISSUES

This section presents a summary of response results to statements regarding specific services, staffing levels, funding mechanisms and other elements of IMS operations. The points below summarize key findings:

- The majority of respondents, 81%, agree that IMS staff seem busy.
- Respondents indicate a high level of satisfaction with the Division Training Program:
 - 65% agree that IMS staff provides good training on new equipment and software.
 - 74% of respondents agreed that the training programs provided by IMS are a real benefit.
 - 61% of respondents agreed that IMS provides enough training resources to provide needed IT training, while 14% did not know, and 25% were neutral.
- A majority of respondents, 66%, agree that Technology Consultants help their Department choose the right technology solution.
- Only 44% of respondents agreed that the City should develop more software solutions in house. It should be noted that there was a high proportion of neutral (29%) and no responses (8%).
- The overwhelming majority of users (96%) believe that the help desk works well.
- Although a majority agree that IMS service charges are reasonable and easily understood, users indicated a lower level of satisfaction with these areas:
 - 57% of respondents agreed that the costs of IMS services seemed reasonable to their Department, compared to 20% who were neutral, 13% who did not know, and 5% who disagreed.
 - 70% of respondents agreed that they understand the charges allocated to their budget by IMS.
- A majority (64%) of users believe the PC rental program is a real benefit to them.

- Responses to the statement regarding the quality of cable TV programming indicate a lack of knowledge regarding these services. 39% of respondents had no response to the statement regarding whether the City has high quality cable TV programming and 43% were neutral.

Again, the responses to statements regarding specific services and elements of IMS operations were positive. The final section provides a summary of open ended questions about IMS strengths and weaknesses.

6. SUMMARY OF WRITTEN COMMENTS

This section summarizes responses to open ended questions regarding IMS strengths and improvement opportunities. Only a few respondents answered this section of the survey (10). However, the tables below show the most common responses to these questions:

Strengths of the IMS Division
<ul style="list-style-type: none">• IMS staff is very responsive to service requests.• IMS staff provides exceptional service.• IMS staff is on call at all hours.• Willingness to help, courteous nature.• IMS is a valued partner.
Improvement Opportunities
<ul style="list-style-type: none">• Additional support staff is needed.• Do not outsource IT services.

A table which shows detailed response results to each question begins on the next page.

Response Results to the IMS User Survey

	No Response	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. When I deal with IMS staff, I feel important, appreciated and valued as a customer.	2	18	21	5	2	0
	4%	81%		10%	4%	
2. When I have an IMS question or issue, I feel listened to and understood by IMS staff.	2	22	18	3	3	0
	4%	83%		6%	6%	
3. When I need action on an emergency IMS concern or issue, I receive a timely response.	2	23	16	2	5	0
	4%	81%		4%	10%	
4. When I require action on a non-emergency matter, I receive a timely response.	2	13	26	4	3	0
	4%	81%		8%	6%	
5. I receive up-to-date information from IMS on the status of an emergency request.	3	14	21	6	3	1
	6%	73%		13%	8%	
6. I receive up-to-date information on the status of a non emergency request.	3	12	17	10	6	0
	6%	60%		21%	13%	
7. I receive accurate information from IMS when I request it.	3	17	22	4	2	0
	6%	81%		8%	4%	
8. When I need an IMS problem addressed and resolved, it is done correctly and to my satisfaction.	2	13	22	5	6	0
	4%	73%		10%	13%	
9. When IMS must make a "yes" or "no" decision on a request of mine, I understand the reasons for the decision.	3	14	20	8	3	0
	6%	71%		17%	6%	
10. IMS policies that impact me are reasonable and the reasons for them are clearly understood.	3	15	22	7	1	0
	6%	77%		15%	2%	
11. IMS staff have high technical competence.	1	25	15	5	1	1
	2%	83%		10%	4%	

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	No Response	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
12. IMS staff seem busy.	3	19	20	6	0	0
	6%	81%		13%	0%	
13. IMS staff provides good training on new equipment and software.	4	14	17	9	4	0
	8%	65%		19%	8%	
14. Technology Consultants help my Department choose the right technology solution.	4	16	15	6	3	3
	9%	66%		13%	13%	
15. Technology Consultants help my Department understand its technical requirements for new software.	5	13	19	8	1	2
	10%	67%		17%	6%	
16. The City should develop more software solutions in house.	4	8	13	14	6	3
	8%	44%		29%	19%	
17. The IMS Help Desk works well.	0	25	20	2	0	0
	0%	96%		4%	0%	
18. The cost of IMS services to my unit seems reasonable.	6	12	14	9	4	1
	13%	57%		20%	11%	
19. I understand the IMS charges associated to my budget.	5	10	22	5	3	1
	11%	70%		11%	9%	
20. The PC rental program is a real benefit to me and my Department.	7	17	13	10	0	0
	15%	64%		21%	0%	
21. Training courses provided by IMS are useful and help me be more productive.	4	14	21	7	1	0
	9%	74%		15%	2%	
22. IMS provides sufficient training resources to help me effectively utilize City technology.	6	10	17	11	0	0
	14%	61%		25%	0%	
23. SLC TV services are of high quality and meet the needs of the City.	18	4	2	20	2	0
	39%	13%		43%	4%	
24. Salt Lake City utilizes up to date information technology.	2	13	27	3	1	1
	4%	85%		6%	4%	

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	No Response	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
25. The information technology I use in my job helps me be productive.	0	27	17	3	0	0
	0%	94%		6%	0%	
26. I believe that IMS is headed in the right direction.	2	14	22	8	0	1
	4%	77%		17%	2%	
27. Overall, IMS provides high levels of service.	1	18	24	3	1	0
	2%	89%		6%	2%	
28. I believe outsourcing IMS will result in a reduction in service.	5	22	14	2	2	2
	11%	77%		4%	9%	

5. BEST MANAGEMENT PRACTICES

The Matrix Consulting Group conducted a detailed review of the current practices of the IMS Division against “best practices” that exist in IT organizations in municipal operations throughout the Country. The review of the Salt Lake City IMS Division was based upon the current practices, organization, system architecture, and operational facets currently in place.

The measures utilized have been derived from the project team's collective experience and represent the following ways to identify departmental strengths as well as improvement opportunities:

- Statements of "effective practices" based on the study team's experience in evaluating operations in other agencies or “industry standards” from other research organizations.
- Identification of whether and how the IMS Division meets the performance targets.
- A brief description of potential alternatives to current practice.

The purpose of the diagnostic assessment was to develop an overall assessment of the IMS Division. Detailed analysis of the issues identified here was conducted following the completion of the Diagnostic Assessment and lead to the development of the final report. The sections, that follow, provide a summary of the strengths and weaknesses of the Division by subject area. This chapter is organized as follows: Administration and Organization, Security, PC and Network support, Software Development and Analysis, Web Services, Communications, and Document Management. The detailed BMP's are attached as an appendix to this chapter.

1. ORGANIZATION AND ADMINISTRATION

This section provides a summary of the key strengths and weaknesses of the organizational and administrative facets of the IMS Division. The following points summarize the strengths of the IMS Division in this area:

- The City has centralized the majority of IT services within IMS. This includes IT support, standardization on PCs and other computer equipment through administration of the PC Rental Program, Software Development, Communications, and Network Administration. Centralization allows for better coordination of services, reduced overhead, and elimination of duplicate systems and services.
- IMS and Management Services have developed a 5 year business plan which outlines goals and objectives, completed projects, and future projects.
- IMS ties Division goals and objectives to individual performance evaluations.
- IMS utilizes a group of Technology Consultants to understand user needs, operations, and identify technology solutions.
- The Division has developed a comprehensive set of policies and procedures.
- IMS measures customer satisfaction with IT services through use of a user survey administered quarterly. Changes in satisfaction are monitored to identify areas of improvement.
- IMS staffing and expenditure levels are consistent with commonly observed benchmarks.
- IMS does not have excessive layers of management.

The following points summarize the improvement opportunities in these areas:

- Not all IT services have been effectively centralized within IMS. Several Departments provide IT services and have IT staff including: the Airport which maintains its own network administration staff; Public Utilities has a number of technical personnel; the majority of GIS services are located within City Engineering; the Police Department has several IT personnel.
- IMS has not developed a comprehensive technology plan.

- While IMS incorporates user input into the development of the network architecture document, IMS does not incorporate broad user input into the development of a technology plan.
- IMS does not utilize a stakeholder group to conduct a technology needs assessment. The current approach relies on individual contacts which are typically informal.
- There are very few goals and objectives in place to guide Division operations and management. There are very few performance measures in place to monitor progress on these issues.
- IMS conducts ongoing reviews of its policies and procedures in its Leadership Team meeting, Daily 8:30am Status Meeting, and semi-annual update of its "Position Paper" document. However this review is informal and needs to be more structured through the creation of a formal policy, procedure and practice.
- IMS does not have formal IT governance authority over Department IT acquisition.
- IMS does not have formal service level agreements in place with user Departments.
- Spans of control within function units or teams vary widely from 1:3 to 1:14.
- IMS does not have a continuing education requirement or policy in place for staff development.

The next section discusses strengths and weaknesses related to security.

2. SECURITY

IMS has implemented a number of measures to ensure data security. A summary of the strengths of the Division's approach to security includes the following:

- **Business Recovery Plan:** IMS has undergone an initial analysis of potential threats and risks, analysis of likely impacts on the system, identification of critical systems, and a plan for disaster recovery. IMS has also explored options for back-up sites through agreements with other agencies including vendors (i.e. BiTech).
- IMS has conducted tests on systems to assess potential vulnerability and identify security systems.

- IMS has developed a comprehensive security management system including policies and procedures on virus control, data access, and appropriate use. A dedicated team was established to monitor firewalls, IPS/IDS, spam servers, and other security issues.
- IMS has taken a security approach that relies on “layers” of firewalls, IDS/IPS, spam filters, anti-virus, and network monitoring to ensure security.
- IMS staff tests beta versions of new operating systems (e.g. Vista) to evaluate potential costs and benefits.
- IMS monitors security threats through its IDS / IPS systems. Security plans and policies are updated based on recognition/identification of new threats.
- IMS utilizes a spam filter to filter all incoming email and remove unwanted email.
- IMS, as part of the “defense in depth” policy for protection of data, has implemented network internal firewalls around high-value database servers. The Implementation is currently being configured by the Security Team.

The project team has also identified the following improvement opportunities to strengthen data security:

- IMS should continue to explore back-up site options, increased system redundancy, and other methods for restoration of critical city systems.
- Disaster recovery training should be extended to all IMS employees as well as key City employees.
- Additional testing of various scenarios and critical systems should take place.
- IMS should continue to implement internal firewalls to improve the security of critical system data and mitigate potential internal threats. Security policies should be reviewed at minimum on an annual basis.
- IMS should implement virtual networks to segment the City network and secure access to sensitive data.
- IMS should continue to research and identify potential threats to the City's network and document new security measures.

The next section discusses PC support and customer service.

3. PC AND NETWORK SUPPORT

Based on a review of current practices to best management practices, the following strengths in PC and network support were identified:

- Desktops have been standardized through the PC Rental program. A core set of software has been developed for the city as well as virus protection programs, email usage, and internet filtering.
- Network monitoring, imaging of and remote control functionality is provided through LANDesk.
- IMS uses software (Remedy) to track help desk tickets and measure customer needs and recurring problems, turnaround time, identify training needs, and evaluate workload.
- Approximately 73% of help desk tickets are resolved within the same business day.
- IMS conducts user surveys to assess levels of satisfaction with a variety of services. These surveys are conducted quarterly.
- IMS has implemented LANDesk which allows network administrators to inventory workstations, operating systems, and utilization of software. This information can be updated as needed.
- IMS and Human Resources have established position descriptions for each classification within IMS that describe qualifications and technology skills needed.
- IMS has an enterprise license agreement with Microsoft for network operating systems and Office. In addition, the Division controls anti-virus and email scanning licensing.
- IMS has standardized on the Microsoft environment which reduces maintenance and support requirements. IMS has also developed a core set of software for the City.
- IMS administers the PC Rental Program which ensures that desktops are replaced on a regular basis.
- IMS develops replacement plans for network architecture.
- IMS provides a high level of service to Departments through use of technology consultants who act as business analysts for user Departments.

- IMS has implemented “best-of-breed” applications such as LanDesk, NetScout, Barracuda, WebSense, McAfee, Sabari Antigen, etc. These systems automate the management of updates, filter spam, audit the system, etc.

The project team has identified the following improvement opportunities regarding PC support and customer service:

- IMS has begun an effort that will automate the process of workstation software license compliance. The Department should ensure that this project is fully implemented and that these audits are performed at least semi-annual.
- IMS should ensure that Department purchased and implemented systems to not conflict with existing systems or cause additional maintenance.
- The City should develop a formal governance document which empowers IMS to review all major technology purchases and installs.
- IMS should evaluate system architecture to integrate systems that provide duplicate functions (e.g. timekeeping and maintenance management). In addition, package solutions should be evaluated against in-house developed applications to ensure enhanced functionality is not missed.
- IMS should develop formal service levels agreements with user departments.

The next section provides an assessment of software development and support.

4. SOFTWARE DEVELOPMENT AND ANALYSIS

The following points summarize the strengths of IMS in this area:

- IMS has developed a customer oriented approach to software development and acquisition. This approach relies on Technology Consultants who focus on business needs and evaluate the costs and benefits of technology solutions.
- IMS has developed a number of applications that improve the productivity and management of user Departments.

The following points highlight the key improvement opportunities:

- IMS does not utilize a Technology Steering Committee with department representation.
- The current approach does not evaluate the costs and benefits of integrating systems across multiple departments/divisions where necessary. In addition, customers generally direct the development of systems without regard to the

needs of the City as a whole. Since systems planning is handled on an individual Department basis, the full benefits of enterprise level solutions may not be fully examined.

- IMS does not directly charge departments the cost of in-house developed software. This creates incentives to build instead of buying outside packages.
- While IMS has developed a system to track staff time spent developing in house systems, it does not utilize this system to manage and plan systems development.

The next section discusses web services.

5. WEB SERVICES

The following points summarize IMS strengths related to the provision of web services and E-government:

- The City's website is nationally recognized by the Center for Digital Government since 2000 as one on the top governmental web sites in the nation. It has also been recognized as a Best of the Web and recognized by the State of Utah.
- The City's website has the ability to deliver streaming media content as well as live broadcasts.
- The City's website allows users to utilize a number of City services including: payment of parking and traffic tickets online, applying for a job, renewing business licenses and obtaining business registration information, paying and viewing assessments, payment of water bills, apply for permits and schedules inspections, report tree maintenance needed, report sign maintenance needed, report zoning and housing violations, and other services.

The following points highlight the key improvement opportunities related to web services:

- IMS should continue to revamp City and Department web pages to ensure a consistent look and feel.
- IMS should continue to pursue web based applications that provide additional transactional capabilities online (e.g. online building permit applications).
- IMS and the City should streamline the content review process and implement a content management system.

The next section discusses issues related to communications services.

6. COMMUNICATIONS AND NETWORK SERVICES

This section provides the project team's assessment of strengths and weaknesses of communications services. The following points summarize the key strengths of the Division in this area:

- IMS conducts an annual review of all telephone lines to ensure they are paying only for the facilities used. IMS also manages inventory using Qwest Control.
- In larger buildings with more than 100 Centrex lines, the City utilizes public branch exchanges (PBX) to reduce Centrex line costs. A private branch exchange (PBX) makes the City a miniature telephone company with the ability to add and delete telephone stations, select calling options and account for calls. Private branch exchange (PBX) switchboards relay incoming, outgoing, and interoffice calls within a single location.
- The existing PBX network is IP ready and capable of supporting point-to-point IP based services on the Wide-Area Network.

The following points highlight improvement opportunities in this area:

- IMS should evaluate the feasibility of implementing Voice over IP technology to reduce telephone line costs and improve the integration of voice, data, and video communications.
- IMS should develop formal service level agreements with user departments related to communications services.

The final section discusses issues related to document management.

7. DOCUMENT MANAGEMENT

IMS has begun the process of developing a comprehensive document management system. The City adheres to state standards regarding retention policies, has imaged approximately 2 million documents, and has begun the process of forms standardization. IMS should continue this process to develop an integrated, city-wide document management system.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Administration			
Information technology has been administratively centralized to assure the effective fulfillment of the IT strategic plan and the efficient use of resources.	Most IT services have been centralized within IMS including PC maintenance and acquisitions, software engineering, network support, and telephone services. The Airport however, maintains its own internal network and handles the purchase and maintenance of services, desktops, laptops, etc.	IMS manages the PC replacement program that provides for standardization of computers, printers, and other hardware, reducing the cost of maintenance. Centralization of network administration and software development also provides consistency in applications developed (i.e. common development platforms) and uniformity in network infrastructure planning.	Not all IT services have been effectively centralized within IMS. The Airport maintains its own network administration staff; Public Utilities has a number of technical personnel; GIS services are located within City Engineering; the Police Department has several IT personnel.
The IMS has developed a five-year strategic plan for information technology to assure the cost effective use of investments in technology, and is updated every other year.	The Management Services Department develops a five year business plan for all divisions including IMS. This document highlights accomplishments, challenges in the future, and goals for the next five years with performance measures.	IMS and Management Services utilize the five year business plan to develop division goals that are then tied to individual performance plans. These plans are evaluated using "red, yellow, green" reports to identify areas for improvement.	The five year strategic plan does not include goals and or information on the cost effective use of technology or methods to increase efficiency. In addition, Division goals are established in relative isolation from other divisions within Management Services or other City Departments. No technology committee, other than internal IMS committees, develops plans for key technology improvements.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
<p>At a minimum, the five-year technology plan addresses the subjects below.</p> <ul style="list-style-type: none"> • Individual departmental and city-wide technology needs; • Equitable resource allocation, anticipating growth and technology advances; • Funding for technology; • Cost-effective acquisition; • Professional development for technology users; • Technical support needs of users; • Infrastructure and network communication including community access issues; and • Information management and delivery. 	<p>The Management Services Department develops a five year business plan for all divisions including IMS. This document highlights accomplishments, challenges in the future, and goals for the next five years with performance measures</p> <p>Other planning documents include a five year infrastructure needs assessment and network architecture document (NAD), which identify critical technology needs, a replacement scheduled, and associated costs.</p> <p>Technology support needs are identified through Department interaction with Technology Consultants and the Help Desk.</p>	<p>IMS has developed a system whereby representatives (technology consultants) are the primary contact for City Departments. This allows users to have direct input into technology needs, support issues, etc. These needs are communicated to other IMS managers through meetings within the Technology Consultants Team and the Leadership Team. Infrastructure needs are planned through the NAD document and the Infrastructure Plan.</p>	<p>The five year business plan addresses broad goals and objectives of IMS. The business plan lacks detail on technology issues common to City Departments, costs associated with purchase, development, and or maintenance of technology.</p>
<p>The IMS solicited and used broad stakeholder input in developing the five-year technology plan</p>	<p>The business plan is generally developed by IMS with input in the form of Department interaction with the Technology Consultants.</p> <p>The five year infrastructure replacement document is also developed internally, as is the Network Architecture document.</p>	<p>IMS has taken steps to identify infrastructure needs and upgrades needed to increase efficiency and network support capabilities.</p>	<p>User Department input is somewhat limited and not formally incorporated into the five year business plan or other technology plans.</p>

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Performance Target	Current Practice	IMS Strength	Potential Improvements
The IMS annually conducts an assessment to identify technology needs.	IMS has developed internal committees to develop technology plans such as the Network Architecture Document. IMS also utilizes feedback from meetings with Departments and Technology Consultants to identify technology needs.	IMS developed a five year network architecture document to identify technology needs.	The needs assessment mainly relates to architecture and network support needs. The plan does not formally address user needs and evaluate and or prioritize these needs.
IMS has clearly stated program goals and measurable objectives that can be achieved within budget for each major program.	IMS has developed a mission statement and broad division goals. The five year business plan also identifies program goals and objectives with performance measures.	IMS has initiated the process of identifying goals and objectives and performance measures.	Relatively few objectives and performance measures have been established within the five year business plan. These relate to the development of web based applications for Departments.
IMS uses appropriate performance measures and interpretive benchmarks to evaluate its major programs and uses these in management decision-making	IMS has developed performance measures for some program objectives with performance measures. Broad Department goals are also used to develop individual performance plans Division heads and managers.	IMS has made efforts to measure program results and establish benchmarks to evaluate effectiveness.	There are relatively few performance measures developed to measure effectiveness of IMS programs and services.
An information technology steering committee has been established to provide customers the opportunity to provide input regarding IT policies, standards, application development priorities, etc.	IMS does not use an information steering committee to provide input on IT issues. Contact with users comes through contact with assigned Technology Consultants.	IMS has made efforts to consider the technology needs of user Departments. In addition, the use of Technology Consultants as IMS representatives to user Departments provides a "personalized" level of service.	User needs are not formally documented and evaluated in a city wide forum. Users also do not have the opportunity to understand shared needs between Departments they do not typically contact since no formal mechanism exists to bring users together.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Comprehensive technology policies and procedures have been developed and are available on the City's intranet. These include policies for data privacy, version control and upgrades, e-commerce, shared systems, shared data, infrastructure architecture, training, etc.	The IMS Division has developed comprehensive policies on appropriate technology usage, data access, security, privacy, and other issues. These are available on the City's intranet through the IMS portal.	Policies and procedures are comprehensive and readily available to all City employees.	IMS conducts ongoing reviews of its policies and procedures in its Leadership Team meeting, Daily 8:30 a.m. Status Meeting, and semi-annual update of its "Position Paper" document. However this review is informal and needs to be more structured through the creation of a formal policy, procedure and practice.
The annual hours of training of IMS employees are sufficient. On average, employees receive not less than 24 hours of training per year and the training budget for IMS approximates 2% of payroll.	IMS does not track employee training hours or formally require continuing education. However, staff is encouraged to upgrade their skills and learn new technology and continuing education goals are discussed with employees when evaluations are done.	Continuing education is encouraged and training funds are available for staff to improve their skills. IMS also provides information to employees on new technology issues.	IMS does not require skills enhancement or measure staff continuing education.
An employee performance management system has been created that is linked to the IMS strategic plan, goals, objectives, and performance measures	Division goals are linked to individual performance plans for Managers. Reports called "red, yellow, green" reports are used to measure progress / achievement of these goals.	IMS has tied division goals and objectives to individual performance plans and measures performance.	Since IMS has developed few measurable goals and performance measures, individual performance plans may not be effective.
IMS has clearly defined citywide IT governance authority.	While IMS is the leader and main IT service provider for the City, Departments are not required to adhere to IMS rules or utilize services.	IMS provides leadership to the City regarding new technologies, software development, and support.	New software acquisition does not have to be approved by IMS. This may create potential problems if system implementation creates problems or requires additional maintenance from IMS.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
IMS has developed and adopted service level agreements with their customers.	IMS has developed service level agreements for desktop support based on the priority of a problem: 15 minutes for urgent calls 1 hour for high priority calls 8 hours for medium priority 5 business days for low priority	A Technology Consultant is assigned to each Department within the City and provides coordination of services / assesses customer needs. The help desk measures time required to resolve hardware/software issues to ensure they are meeting established targets.	There are no formal service level agreements in place.
Customer satisfaction with IMS is routinely monitored and satisfaction with those services is high.	IMS conducts a user survey bi-annually to measure customer satisfaction. These data are retained to identify trends in customer satisfaction.	IMS has taken the initiative to measure customer satisfaction and has developed a fairly comprehensive user questionnaire.	NA
The ratio of IMS staff as a percentage of total City staff is 2% to 3%.	IMS staffing levels represents 2% of total City staffing (61 to 2,917).	IMS staffing is within the benchmark ratio.	NA
The span of control for supervisors and managers approximates 7 to 10.	IMS supervisor to staff ratios within each team range from 1:3 for the Communications and Security Teams to 1:15 for the Technology Consultant Team.	IMS has 6 managers, 1 Deputy Director and 1 CIO for 53 staff employees. This is within the benchmark range.	Spans of control within some teams are at the low end (e.g. communications and security) while some teams are at the high end (technology consultants).
The number of organizational layers does not exceed three (the number of layers that one employee would have to report to reach the CIO).	Staff generally report to one Team Supervisor who reports to the Deputy Director and CIO. Organizational layers are no more than 2 to 3.	IMS is within the benchmark.	IMS is organizationally flat. This may create "silos" or inhibit communications between teams.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
The level of IMS expenditures as a percentage of the City's total operating budget is 1.5% to 3%.	IMS expenditures represent approximately 1.2% of the City's total operating budget (including enterprise and internal service funds but excluded capital projects and debt service funds).	IMS is below the benchmark range.	NA
The training needs of IMS staff has been evaluated and identified, and a training strategy has been developed.	Team managers evaluate training needs on an individual and project basis. In addition, training goals are set annually during employee evaluations.	IMS encourages individuals to seek continuing education. In addition, skill sets are evaluated when assigning personnel to projects and during annual employee evaluations.	There is a wide range of skill sets within IMS particularly within Software Engineering.
Disaster Recovery			
<p>Disaster recovery standards, procedures, and policies have been developed and installed including:</p> <ul style="list-style-type: none"> • Business impact analysis (risk assessment); • Mitigation strategies and safeguards; • Backups and off-site storage; • Business resumption; • Contingency plans for different types of disruption of information systems; • Organizational responsibilities for implementing the disaster recovery plan; • Procedures for reporting incidents and implementing the disaster recovery plan; and • Multiple site storage of back-up documents. 	<p>IMS has prepared a Business Recovery Plan which covers the following elements:</p> <ul style="list-style-type: none"> • Business impact analysis including a risk assessment and critical systems inventory. • Mitigation strategies including an outline of back up procedures, server locations on site and off-site, security systems in place, and potential back up sites to utilize. • Organization responsibilities for implementing disaster recovery plan including communications structure and procedure. • Multiple site storage of back-up documents. 	IMS has undergone an initial analysis of potential threats and risks, analysis of likely impacts on the system, identification of critical systems, and a plan for disaster recovery. IMS has also explored options for back-up sites through agreements with other agencies including vendors (i.e. IFAS).	IMS should continue to explore back-up site options, increased system redundancy, and other methods for restoration of critical city systems.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Disaster Recovery (cont'd)			
IMS and city employees are routinely provided ongoing training in disaster recovery and contingency planning policies and procedures.	IMS has trained those involved with the creation of the Disaster Recovery Plan.	Initial training measures have been taken.	Disaster recovery training should be extended to all IMS employees as well as key City employees.
Contingency plans and policies are tested routinely and regularly updated.	IMS has conducted tests on the email system to determine the time needed to restore data. The IMS Security Team has also tested and audited various networked systems, including the SCADA Public Utilities system, for security setting and authorized access. The City website is tested quarterly as part of the Payment Industry Compliance (Credit Card certification). Various web applications are tested by the City webmaster for sql injection vulnerability.	IMS has conducted some testing of the contingency plan.	Additional testing of various scenarios and critical systems should take place.
IMS has clearly designated a manager in the division as the responsible for managing disaster recovery planning and installation	IMS has designed the leadership team and the CIO as the leads in implementing the business recovery plan. Roles and responsibilities have also been established.	IMS has clearly defined management authority during disaster scenarios.	NA

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Systems Security			
Effective security management and virus protection policies and procedures are in place that includes: <ul style="list-style-type: none"> • Security policies; • Security management; • Information asset security; and • Technology protection and continuity. 	IMS has developed a comprehensive security management system including policies and procedures on virus control, data access, and appropriate use. A dedicated team was established to monitor firewalls, IPS/IDS, spam servers, and other security issues.	IMS has developed a comprehensive approach to security management through development of policies and procedures, creation of a security team, and through its network infrastructure.	IMS should implement internal firewalls to improve the security of critical system data and mitigate potential internal threats. Security policies should be reviewed at minimum on an annual basis.
Security standards have been developed to include diagnostic tools, monitoring tools, intrusion detection systems, firewalls, encryption, secure e-mail, and anti-virus.	IMS has taken a security approach that relies on "layers" of firewalls, IDS/IPS, spam filters, anti-virus, and network monitoring to ensure security.	IMS has developed a comprehensive security system that monitors probing, misuse, and malicious attacks on a regular basis and reports these activities to administrators.	IMS should continue to conduct tests of the security systems and make adjustments accordingly. IMS should also develop formal policies for documenting security breaches and resolution.
IMS and city employees are provided ongoing training in the security procedures.	IMS provides security information mainly through policies and procedures.	IMS publishes security policies and procedures.	Additional training classes and/or information should be made available to City employees on ways to ensure system security.
To take advantage of security improvements, the most recent version of computer operating systems are obtained and installed after being thoroughly tested.	IMS staff tests beta versions of new operating systems (e.g. Vista) to evaluate potential costs and benefits.	IMS staff tests beta versions of new operating systems to evaluate potential costs and benefits.	NA

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Systems Security (cont'd)			
<p>A multi-layered approach to network security is utilized including:</p> <ul style="list-style-type: none"> Internet perimeter protection consisting of a perimeter firewall and stand-alone intrusion detection system; Subnet/router layer with firewall hardware and software at the subnet level; and Desktop machine and file server layer with personal firewall and virus scanning software. 	<p>The security system utilized by IMS includes each of the elements listed in the multi-layered approach:</p> <p>Internet perimeter protection utilizing firewalls and IDS/IPS.</p> <p>IMS is in the process of developing subnet/router level firewall hardware and software to protect critical information.</p> <p>Desktop machines are equipped with anti-virus protection and personal firewall software.</p>	<p>IMS has taken a multi-layered approach to security and implemented almost all of the benchmark elements.</p>	<p>Implement an internal firewall system to prevent unauthorized access to critical data sources (i.e. financial and other confidential data). Research, identify and implement additional network security tools as issues/vulnerabilities are recognized.</p>
Security plans and policies are tested routinely and regularly updated.	IMS monitors security threats through its IDS / IPS systems. Security plans and policies are updated based on recognition/identification of new threats.	IMS is proactive in identifying and monitoring security threats to the City's network.	IMS should continue to test the security of the system.
E-mail is filtered and inappropriate file types are blocked (such as EXE, SCR, BAT, PIF).	IMS utilizes a spam filter to filter all incoming email and remove unwanted email.	IMS meets the benchmark.	None.
IMS has clearly designated a manager in the division as the chief information security officer (CISO).	IMS has designated the manager of the Security Team as the Chief Information Security Officer.	IMS has designated the manager of the Security Team as the Chief Information Security Officer.	None.

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Help Desk / Support			
Desktop standards have been developed including desktop maintenance, desktop configuration/software sets, e-mail usage, virus protection programs and implementation, help desk systems and Internet filtering.	Desktops have been standardized through the PC Rental program. A core set of software has been developed for the city as well as virus protection programs, email usage, and internet filtering. Maintenance is also provided through LANDesk and remote imaging to configure desktops.	The PC rental program has allowed for standardization of most desktops throughout the City. In addition, IMS and the City have developed a core application set to minimize maintenance requirements. This includes virus protection programs, internet filtering, and other network administration tools.	IMS should ensure that Department which do not participate in the PC Rental program have appropriate standards in place.
Helpdesk tracking software is utilized to automate helpdesk tracking, build the knowledge base regarding customer needs, documents recurring problems, identify training or documentation needs, allow for reporting of helpdesk resource utilization (e.g. volume of calls) which can be used as staffing justification	IMS uses Remedy to track help desk tickets and measure customer needs and recurring problems, turnaround time, identify training needs, and evaluate workload.	IMS is monitoring help desk workload and measuring performance against service level agreements. Recurring problems and training issues can be identified using Remedy.	IMS should continue to report performance of the help desk including reporting those issues which require the most time to resolve.
70% of the help desk calls are responded and closed over-the-phone the same workday	Over a sixteen month period (July 2004 to October 2005) the help desk averaged 73% same day closure.	IMS is performing above the benchmark.	IMS should continue to monitor performance against this target to ensure high customer service levels.
70% of the help desk calls that require an on-site response are responded to and closed within one workday.	IMS does not track on-site responses separately.	N/A	IMS should track this element of help desk response.

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An up-to-date inventory of computer equipment that describes hardware and equipment configurations by workstation has been established and is continuously updated.	IMS has implemented LANDesk which allows network administrators to inventory workstations, operating systems, and utilization of software. This information can be updated as needed.	IMS has addressed the need to inventory workstations, operating systems, and software highlighted by the Network Architecture Document developed by the Department.	IMS should continue with its implementation of LANDesk project that will electronically provide the equipment inventory that is currently being done manually.
The IMS, in concert with Human Resources, has established criteria in classification descriptions that include technology skills for staff as appropriate.	IMS and Human Resources have established position descriptions for each classification within IMS that describe qualifications and technology skills needed.	IMS has developed position descriptions that describe technology skill requirements.	None.
Effective software licensing control procedures and software are in place to detect the presence of unlicensed software on personal computers, and to ensure compliance with licensing laws.	IMS has recently implemented LANDesk software which allows administrators to inventory licensed and unlicensed software on workstations, usage, and compare these figures to license agreements.	IMS has an effective software licensing tool to ensure compliance with licensing laws and to ensure cost effectiveness.	IMS should establish a regular updated and or audit of workstations to ensure compliance with licensing agreements.
Software licensing is controlled in-house through IMS.	Operating systems are purchased when workstations are purchased through the PC rental program. Other licensing is done through IMS has master agreements with Microsoft and other vendors, such as networking operating systems, Microsoft Office, and anti-virus software. Other software licensing (e.g. Police and Fire CAD/RMS systems, IFAS) is controlled by individual Departments.	IMS has effectively centralized the majority of software licensing.	IMS should ensure that Department purchased and implemented systems to not conflict with existing systems or cause additional maintenance. The City should develop a formal governance document which empowers IMS to review all major technology purchases and installs.

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The City has an enterprise license agreement with Microsoft.	IMS has a master license agreement with Microsoft for Office and network operating software.	IMS meets the benchmarks.	NA
A workstation or personal computer refresh program is in place to ensure hardware is replaced on a timely basis.	IMS administers the Corporate Equipment Rental Program which provides for replacement of desktops every three years, monitors every four years, and printers every five years.	The PC rental program ensures that users receive updated technology periodically to take advantage of changes in technology.	NA
Workstations or personal computers have been standardized on a single platform to simplify support and the development environment.	IMS has standardized on the Microsoft Windows environment. While there are several version of Windows on City computers, most operate on Windows XP.	IMS has taken measures to standardize workstations and systems. This allows for more efficient maintenance of the network and development of new systems.	NA
The desktop computing software environment has been standardized in terms of core applications.	IMS has developed core software including: Microsoft Office, Windows Operating Systems, custom built databases (Powerbuilder, Internet), IFAS, Folio, Novell, Unix, Internet, and Security Applications.	Core desktop computer software has been standardized.	None.
Desktop lockdown software is utilized to avoid malware / spyware, allow enforcement of software standards, and simplify the support environment.	IMS utilizes lockdown features of Windows. These features prevent unauthorized access to a user's computer when they are away.	Lockdown functions are in place to prevent unauthorized use of City workstations.	IMS should consider additional desktop lockdown software which provides a higher level of security than Windows.
A centralized anti-virus server is utilized to allow central management of desktop virus protection for more efficient, reliable desktop virus protection.	Desktops receive anti-virus updated through one of two servers.	IMS meets the benchmark.	None.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
A centralized patch server is utilized to allow centralized management and distribution of software patches.	IMS utilizes a centralized patch server. In addition, LANDesk can automatically and remotely update workstations when patches are needed.	IMS meets the benchmark.	None.
IMS enforces password security including periodic changes to passwords.	IMS has a policy on periodic password changes which requires users to change their passwords every 56 days. In addition, the policy requires the use of number and letter characters.	IMS requires password security.	None.
IMS has implemented a remote desktop management solution to allow remote desktop management for more efficient helpdesk support.	IMS utilizes LANDesk to allow remote desktop management.	IMS recently implemented LANDesk to improve network management including: patch management, updates, remote control, imaging, etc.	None.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
<p>IMS has developed and utilizes an enterprise architecture approach to manage and align the information technology assets with the business strategy of the City, assure the development of integrated, enterprise level software applications, and avoid the consequences of fragmentation including:</p> <ul style="list-style-type: none"> • Duplicate systems, processes and resources; • More hardware and applications support; • Increased complexity and risk; • Islands of technology; • Unclear accountabilities and responsibilities; • Lack of integration and connectivity; and • More expense to "keep the lights on". 	<p>IMS manages architecture and systems planning on an individual basis with each Department within the City. The role of the Technology Consultant is to understand the needs of each customer Department/Division. This includes systems requirements, level of integration with other Departmental/City systems, and operational requirements.</p>	<p>The current approach to systems planning provides a high level of customization to each user. Operational needs and resource requirements are clearly understood and a single point of contact is maintained with the user. Broader issues concerning the City as a whole are discussed in Technology Consultant meetings and in Leadership Team meetings.</p>	<p>The current approach does not evaluate the costs and benefits of integrating systems across multiple departments/divisions where necessary. In addition, customers generally direct the development of systems without regard to the needs of the City as a whole.</p> <p>Since systems planning is handled on an individual Department basis, there are several duplicate systems in place for maintenance management, timekeeping, and CAD/RMS.</p>
<p>The role of IMS in providing leadership to develop integrated applications and an enterprise oversight and approval process to obtain optimal return on IT investments.</p>	<p>IMS provides consultation services to customer Departments / Divisions. Users generally drive the process for software development through development requests to Technology Consultants.</p>	<p>IMS provides a high level of service to customers. The individual approach ensures that operational needs are understood.</p>	<p>IMS does not utilize a formal approval process for developing applications. Users generally drive the process. As a result, broader enterprise level solutions and integration of systems may not be fully explored.</p>

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Help Desk / Support (cont'd)			
Effective and formal practices are utilized for application selection, acquisition, and project management, including build versus buy determination.	<p>Application selection and acquisition is coordinates by the Technology Consultant assigned to each Department. Meetings are held to discuss the costs and benefits of various applications including the ability and costs of benefits of in-house development.</p> <p>Technology Consultants become project managers for applications developed in house and develop initial requirement and specifications, and monitor progress on system development.</p>	IMS provides a high level of service to user Departments to allow them to consider the costs and benefits of various applications. The assignment of Technology Consultants also provides a single point of contact for development projects. Issues and or problems can be directed to the respective Technology Consultant.	Since non-enterprise fund Departments do not pay the direct cost of software developed in-house, the true costs and benefits of build versus buy are not considered. Costs are typically represented in terms of time available for development and potential delays.
The City has acquired or developed "best-of-breed" applications that provide sophisticated automation capabilities improving operational productivity and management information.	<p>IMS has implemented "best-of-breed" applications such as LanDesk, NetScout, Barracuda, WebSense, McAfee, Sabari Antigen, etc. These systems automate the management of updates, filter spam, audit the system, etc.</p> <p>The City has several systems in place that are duplicates including maintenance management and timekeeping. In addition, enterprise packages such as IFAS have not been fully implemented. IMS has developed several modules that may be provided in the new version of IFAS.</p>	IMS has acquired a number of "best of breed" applications.	IMS should evaluate system architecture to integrate systems that provide duplicate functions (e.g. timekeeping and maintenance management). In addition, package solutions should be evaluated against in-house developed applications to ensure enhanced functionality is not missed.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Technology Consultants / Software Engineering			
<p>IMS utilizes effective practices for designing, developing, and implementing an IT application project including:</p> <ul style="list-style-type: none"> • Designing, developing and acceptance testing the project appropriately according to specifications; • Establishing measurable objectives for the project; • Documenting critical development decisions and continuously reporting progress in the design, development, and implementation of the systems; • Establishing appropriate policies and procedures to manage and control changes for the developing project; • Developing an adequate information security system to detect and prevent inappropriate access; and • An on-line project tracking system. 	<p>Design and specification requirements for new applications are developed by user department in concert with a Technology Consultant and software engineer. Depending on the scope of the project these specification can be broad to detailed.</p> <p>Application development requirements have been documented in policy including:</p> <ul style="list-style-type: none"> • Project Specification • E-R diagram • Application Flowchart • Application Description • Application Change History <p>In addition, the software development policy states that production and development files will be segregated, production information will be sanitized including references to unauthorized file paths, and that a change control procedure will be used.</p>	<p>IMS has policies and procedures in place to guide software documentation, the process for changes, and for addressing security issues. The Division also has templates for project specifications, recording changes, and identifying deliverables. Projects are managed using Microsoft Project.</p>	<p>While IMS has developed a system to track time spent on software development projects, this system is not used to manage staff or plan projects. Quality Assurance plans are not routinely tested by peers.</p>

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Technology Consultants / Software Engineering (cont'd)			
<p>IMS uses effective practices to assure the quality of IT application projects including:</p> <ul style="list-style-type: none"> • The development of an effective quality assurance mechanism for each phase of development; and • Acceptance testing after each deliverable and before moving ahead with the next phase. 	<p>IMS requires that applications are developed that meet user specifications and that acceptance testing is performed to ensure that applications perform correctly.</p>	<p>IMS utilizes quality assurance methods to test software.</p>	<p>IMS utilizes user testing to evaluate projects. The Division does not consistently utilize peer testing to evaluate software including code audits.</p>
<p>IMS has acquired and installed an Enterprise Resource Planning platform to integrate financial data, to standardize processes, and to maintain core reference and supporting information such as HR and asset data. The elements of the ERP include:</p> <ul style="list-style-type: none"> • Finance and Accounting • Human Resources (HR) • Purchasing / Procurement • Customer Relationship Management • Enterprise Asset Management • ECommerce 	<p>The City does not have an enterprise resource planning platform. Financial data is maintained in IFAS. Another system, CAMP, is used to track contract administration and program management, a Fixed Asset system was developed to track City fixed assets, etc. A number of applications have been developed to integrate these various systems.</p>	<p>IMS has developed a number of applications to interface with the various systems in use by the City.</p>	<p>IMS and the City should evaluate the need for integration of the critical business systems in place. Package solutions should be evaluated against the need to develop multiple modules to integrate critical business systems.</p>

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Network			
Effective practices have been put in place to ensure the integrity of the network to minimize downtime; the 'uptime' for the network approximates 99.999%.	While IMS does not track network downtime, anecdotal evidence suggests that downtime is minimal. Effective security and back-up procedures are in place to minimize downtime and software upgrades and patches are performed during off peak hours.	Network downtime is minimal as evidenced through interviews with users and Department staff.	Explore network monitoring software, including LANDesk and NetScout, for features that provide reports on network downtime.
The LAN utilizes category 6 wiring.	Some segments of the network utilize category 6 while the majority use category 5E. A few areas (e.g. City and County building ~30 machines) use category 3.	IMS has upgraded the City's network to ensure high level of connectivity. This includes plans to re-wire the areas of the City County building with category 3 wiring.	IMS should upgrade wiring in the City/County building.
The WAN utilizes T-1 services or fiber optic services.	The City utilizes four T-1 and DSL at fire stations fiber optic lines from different vendors.	IMS meets the benchmark.	None.
Network connectivity is accomplished through TCP/IP protocol and switched ethernet using full duplex communication.	Network connectivity is established through TCP/IP protocol and switched Ethernet using full duplex communication.	IMS meets the benchmark.	None.
Desktop connections to the network are not less than 100Mb/sec capability at the desktop, with a 1Gb/sec upgrade for GIS users.	The majority of desktop connections to the network are at the 100Mb/sec level. Some users (e.g. City/County) are at the 10MB/sec level.	Connectivity meets the benchmark for the majority of the network.	Improve connectivity within the City/County building. Improve connectivity for GIS users to 1Gb/sec.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
The concentrators (hubs) provide for device monitoring, isolation of faulty ports or segments, and fault tolerance capability for the concentrator.	IMS utilizes switches with SNMP agents to monitor device performance, faulty ports, and network segment performance.	IMS uses current technology to monitor network infrastructure.	None.
The concentrators (hubs) have the capacity for intelligent monitoring, "virtual" high speed individual networks segments, and switching technologies.	IMS utilizes CISCO switches with the capacity for intelligent monitoring, "virtual" high speed individual network segments, and switching technologies.	IMS uses current technology to management network resources.	None.
IMS uses several tools for network monitoring.	IMS uses networking monitoring software such as NetScout to monitor network traffic, perform packet analysis, and identify network slowdowns. IMS also uses LANDesk to monitor network performance and perform maintenance.	IMS has various tools available to monitor network performance.	IMS should continue to monitor network performance to ensure a high level of availability.
IMS uses SNMP (Simple Network Management Protocol) agents in network devices to provide monitoring and alarms for the network.	IMS utilizes CISCO switches with SNMP agents to provide monitoring and alarms for the network.	IMS meets the benchmark.	None.
IMS developed a fault tolerant network through redundancy.	Mailbox servers are configured in an active/passive luster using Microsoft Cluster Service. Front end servers (OWA/Internet email) are configured in a network load balanced cluster. IMS also utilizes redundant servers for large applications such as IFAS and public safety CAD/RMS systems.	IMS has build in redundancy for large applications to provide for fault tolerance.	Several file and application servers do not have backups/redundant hardware.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
IMS effectively utilizes virtual area networks (VLAN's) to separate traffic by department and function to enhance network performance and ensure the integrity and segregation of sensitive data between different departments and segments by creating logical barriers that isolate information access only to authorized users.	IMS utilizes VLANs when needed. Typically these are used by non-city employees (e.g. during the Olympics outside users could access the network through a VLAN).	IMS makes use of technology to secure access to the City's network from non-city employees.	IMS should utilize VLANs to improve system security and isolate sensitive data. Implement VLANs in the near future.
IMS provides network connectivity to all City buildings and work sites.	All City buildings and work sites are connected to the City network.	IMS supports the City wide network and ensures connectivity for all user Departments.	None.
IMS provides effective wireless solutions for field access for such applications as citation processing, field inspections, fire and police field inquiries, service dispatch and status updates.	IMS provides wireless access to fire and police field inquiries and service dispatch updates. IMS is in the process of developing wireless solutions for field inspections and citation processing.	IMS has taken steps towards development of wireless solutions for the City.	IMS should continue to provide leadership to the Departments to develop/acquire wireless solutions.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Network (cont'd)			
Data centers are deployed with physical and environmental controls with a comprehensive backup system in place.	Data centers are secured at several locations throughout the City with environmental controls in place. The City utilizes a backup system which consists of making backup tapes on a regular basis and storing these tapes on and off site.	IMS provides secured, environmentally controlled areas for data center equipment.	None.
IMS provides a ratio of 500 workstations to 1 e-mail/calendaring server.	The City network consists of approximately 1,385 workstations supported by 2 back-end mailbox servers and 2 front-end outlook web access/internet email servers. This results in a ratio of 346 workstations to 1 email server.	IMS meets the benchmark.	None.
IMS provides a ratio of 250 workstations to 1 file/print server.	IMS supports over 1800 users on 12 file and print servers.	IMS is below the benchmark.	Evaluate the ability to utilize file/print servers as redundant servers.
IMS provides centralized back up servers for desktops and file servers, and routinely backs up desktops and file servers.	Back up is done through manual tape backup. Backups are done on a regular basis and stored on and off site. There are relatively few back up servers available across the network.	IMS has pursued a low cost approach to file backup.	The lack of centralized back up servers increases the amount of time spent retrieving stored files in the event of an outage.
IMS has implemented a secure data sharing system to allow for efficient and secure file sharing.	IMS has implemented Microsoft Storage Server 2003 to securely and efficiently share data.	IMS meets the benchmark.	IMS is in the process of implementing internal firewalls to segment the network. IMS should continue this process to ensure only authorized users have access to confidential information.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
IMS has developed a standard citywide approach for those employees that need remote access to the City's network (such as from their home) using a VPN remote access system.	IMS has implemented a Cisco VPN to provide secure remote access to users.	IMS has standardized this approach to remote access.	None
A Storage Area Network (SAN) has been implemented to lower the City's costs for servers and have a secure high availability system for file storage and retrieval	IMS uses SANS on the Unix side of the network. IMS does not use a Storage Area Network for file storage and retrieval on the Microsoft side. Tape backups are done on a regular basis and stored on and off site. Centralized backup servers for file storage are not used.	IMS has taken a low cost approach to file storage and retrieval.	Implement a Storage Area Network to improve the availability of back up data.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Telephone System			
Landline telephone costs are routinely audited to assure proper billing of costs.	IMS conducts an annual review of all telephone lines to ensure they are paying only for the facilities used. Besides internal controls, IMS uses Qwest Control for maintaining the current inventory.	IMS meets the benchmark.	NA
Landline telephone lines have been inventoried to assure invoices for telephones are factually based upon the actual phone and data circuit services that are in use.	Same as above.	Same as above.	NA
In larger buildings with more than 100 centrex lines, the City utilizes public branch exchanges (PBX) to reduce centrex line costs. A private branch exchange (PBX) makes the City a miniature telephone company with the ability to add and delete telephone stations, select calling options and account for calls. Private branch exchange (PBX) switchboards relay incoming, outgoing, and interoffice calls within a single location.	The City utilizes Nortel PBX's at all major sites. For smaller sites, the City utilizes key systems. IMS currently utilizes Centrex services only in a few sites that don't justify the installation of a key system or PBX.	IMS meets the benchmark.	NA
The existing PBX network is IP ready and capable of supporting point-to-point IP based services on the Wide-Area Network.	One PBX (Forestdale) is ready and capable of supporting Point-to-point IP based services at this time.	IMS is well position to take advantage of VoIP technology.	IMS and the City should evaluate the feasibility of implementing VoIP technology.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Internet			
The City's web site is citizen centric and information is easy to find.	The City's web site is designed to provide readily accessible information to citizens as well as provide on line services for paying water bills, tickets, renewing business licenses, and other city business.	<p>The City's website is nationally recognized by the Center for Digital Government since 2000 as one on the top governmental web sites in the nation.</p> <p>Recognized as a Best of the Web</p> <p>Recognize by the State of Utah</p> <p>Ability to deliver streaming media content as well as live broadcasts.</p>	<p>Redesign of the pages to provide a more consistent look and feel on the site.</p> <p>Improve the process of creation, review, and publishing of the content.</p>
The City offers extensive on-line transactional capabilities on its web site to make doing business with the City much easier and more cost effective. The IMS has developed portals designed for particular business partners, or constituency-base, the City can target its service and product delivery in direct response to unique needs and requirements of the customer.	The City's website allows user to pay parking and traffic tickets online, apply for a job, renew business licenses and obtain business registration information, pay and view assessments, pay water bills, apply for permits and schedules inspections, and other services.	IMS has developed a number of on-line applications for various City Departments. These applications improve service to the public and improve Departmental operations.	Continue to develop additional services that will make it easier for the public to do business with the City 24/7/365.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Document Imaging			
IMS provides support in the planning, procurement, implementation and establishment of a City-wide technology for converting paper to electronic records to protect the City's information assets.	IMS works with departments to create an implementation team consisting of a champion at IMS and a champion in the departments. Overall strategy is discussed and the project implementation team works through the standardized methodology.	IMS provides leadership in planning, procurement, and implementation of document imaging technology.	IMS should take additional steps to implement an enterprise level document imaging and management system.

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Performance Target	Current Practice	IMS Strength	Potential Improvements
Document Imaging			
<p>IMS has fully developed standards for a document imaging system including:</p> <ul style="list-style-type: none"> Document Management Control System (standardize formats for written correspondence, control requisition printing and usage) Forms Management Program (forms inventory and analysis, elimination of duplicate forms, form responsibilities, form inventory control, electronic forms on the network, and periodic audits) Retention Requirements (identifies laws for legal compliance and litigation protection) Records Conversion (purging, inventory, record transfer to storage facility) Method of capture and storage (imaging using micrographics or optical disk) 	<p>Working with the assigned project team, IMS mentors and coaches the departmental champions through the implementation process spending time on each facet of the implementation.</p> <p>IMS devotes the technical resources to assist in database design to accommodate the custom forms, letters, and other document types to be addressed in the implementation.</p> <p>IMS works with the customer to perform conversions of existing databases where appropriate and the processes and procedures needed to capture, categorize, and index the documents.</p>	<p>IMS has taken a lead in developing a system to lay the groundwork for implementation of a document management system.</p>	<p>IMS and the City should implement and document management system. Needed steps include standardization of forms and forms inventories, and system implementation.</p>

6. ANALYSIS OF THE INFORMATION MANAGEMENT SERVICES DIVISION

This chapter presents the project team's analysis of the management, organization and services of the IMS Division. This chapter is organized into the following sections: 1. Organizational Structure; 2. Long Term Technology Plan; 3. Data Security; 4. System Acquisition and Analysis; 5. Communication Services; 6. Customer Satisfaction; 7. Adequacy of Support to End Users; 8. Level of Staffing; 9. Core Business Applications; 10. Facilities; 11. Technology Replacement; 12. Billing to Users.

1. ORGANIZATION OF INFORMATION MANAGEMENT SERVICES

(1) Information Technology Functions in the City Have Not Been Entirely Centralized.

The centralization of information technology services provides a number of benefits to organizations. By centralizing IT services, organizations can more effectively plan and coordinate service delivery, reduce system infrastructure costs by taking advantage of economies of scale, and reduce the potential for overlapping systems and duplicate technology. While the majority of the City's IT service delivery and oversight has been centralized within the IMS Division, there are some IT services being provided outside of IMS including:

- The Salt Lake City Airport maintains its own IT staff (with support from one software engineer from IMS) and manages its own architecture.
- The Police Department has technical personnel who administer and maintain laptops, radios, and the CAD system.
- The Fire Department also has an IT position which administers the Fire CAD/RMS system.

- The Public Utilities Department has technical personnel (in addition to support from IMS).
- GIS resources including technology and staffing are distributed throughout the City. GIS personnel are within the City's Engineering Division, Transportation Division, and Public Utilities.
- While IMS provides guidance to departments regarding buy versus build decisions and new applications, departments can purchase and implement new systems without IMS approval.

The table below shows the distribution of IT staff by position across these

Departments/Divisions:

Department/Division	Position	Number
Airport	Information Technology Manager	1.0
	Software Engineer II – Reports to IMS	1.0
	Telecom/Information Manager	1.0
	Network Administrator I	1.0
	Telecom Analyst II	2.0
	Telecom Fiber Tech	<u>1.0</u>
	Total	7.0
Community Development CD Administration Planning Division Transportation Division	Software Engineer – Reports to IMS	1.0
	GIS Specialist	1.0
	GIS Tech II	<u>1.0</u>
	Total	3.0
Fire Department		
Communications Division	Data and Information Administrator	1.0
Police Department Administrative Bureau	Senior Tech Support Specialist	1.0
	Technical Support Specialists	<u>5.0</u>
	Total	6.0
Public Services Department City Engineering Division	GIS Manager	1.0
	GIS Analyst	1.0
	GIS Specialist	1.0
	Eng Data/SID Specialist	1.0
	GIS Tech II	<u>1.0</u>
	Total	5.0

Department/Division	Position	Number
Public Utilities Department		
Administration	GIS Manager	1.0
	GIS Analyst	1.0
	GIS Specialist	2.0
	GIS Tech II	2.0
	Seasonal GIS Tech I	<u>0.6</u>
	Total	6.6
Total		28.6

The following points can be made regarding the information above:

- As shown above, there are approximately 29 "IT" staff members providing some form of information technology support who are not organized in IMS.
- However, it should be noted that the level of "IT" support provided by these personnel will vary significantly based on position and role within their organization. For example, a Technician is likely to provide a low level of IT support, generally related to gathering data, tracking hardware and software, and performing basic troubleshooting. Conversely, a Manager is likely to be engaged in activities more closely related to systems planning. However, without conducting a job evaluation for each of these positions it is difficult to determine staff would be covered by this qualification and which would not.
- The "IT staff" assigned directly to the Police Department are involved in information technology and support activities. However, they are also involved in other tasks and activities (such as the radio system). As a result, these staff could be excluded from the total.
- A number of these positions are GIS related which may entail a combination of data development, utilization of GIS technology to facilitate departmental planning, and systems maintenance or development.

While the function of these personnel may justify their organization under a separate Department, the potential exists for duplication of services or insufficient technology planning. The fact that IT services are not entirely centralized within IMS requires that effective coordination and planning take place to capture the benefits of enterprise level solutions, and provide consistent service levels to the City.

The project team evaluated the IT functions currently being provided outside of the Division to identify consolidation opportunities. The criteria utilized to make this determination included the following:

- The level of operational expertise needed to provide the IT service or function. For example, certain positions such as GIS positions within the Planning Department will require knowledge of city planning to develop GIS data. However network administration and general IT support does not require operational expertise.
- An assessment of whether consolidation is required to ensure effective IT planning including: centralization of data sources, the coordination of technical support, and network administration.
- Evaluation of the level of IT service provided and whether it is appropriate to consolidate the position in a full IT service organization.

Based on these criteria, the project team evaluated each IT function currently being provided outside IMS. The table below summarizes this assessment:

Department	IT Functions	Operational Expertise Needed?	Level of Coordination Needed
Airport	Network Administration Telephone Services Software Engineering (This position currently reports to IMS)	While knowledge of Airport operations is useful, network administration and telephone services do not require operational expertise.	A high level of coordination is needed to capture the benefits of systems planning, economies of scale, and cost effective technology replacement planning.
Community Development	GIS Services Software Engineering (This position currently reports to IMS and is located at IMS)	GIS services require knowledge of community development concepts and regulations.	GIS services require a high level of coordination to ensure data sharing and interoperability.
Fire Department	CAD/RMS Data Administration (This position currently reports to IMS and is located at IMS)	CAD/RMS system administration requires knowledge of Fire Department operations. However, no specialized fire education is needed.	A moderate level of coordination is needed to ensure proper data sharing between the Police Department and the Fire Department.

Department	IT Functions	Operational Expertise Needed?	Level of Coordination Needed
Police Department	User Support Records Management	Records management requires specific knowledge of Law Enforcement operations, retention policies, and criminal law. User support does not require operational expertise.	High level of coordination is needed to coordinate technology replacement and mitigate maintenance needs.
Public Services Department	GIS	GIS services provided by the City Engineering Division require specialized knowledge.	GIS services require a high level of coordination to ensure data sharing and interoperability.
Public Utilities	GIS	GIS service provided by Public Utilities requires some knowledge of public utility operations and infrastructure.	GIS services require a high level of coordination to ensure data sharing and interoperability.

Based on the analysis above, the project team makes the following recommendations regarding consolidation of IT services:

- Network administration and telephone services currently being provided by the Airport should be consolidated into IMS. These services do not justify their organization into a separate Department. While the physical location of personnel at the Airport is desirable, these functions should be organized under the Network Administration and PC Support unit of IMS. This approach would consolidate six positions (Information Technology Manager, Telecom/Information Manager, Network Administrator I, Telecom Analyst II, Telecom Fiber Tech) into IMS.
- GIS services currently housed at Community Development, Public Services, and Public Utilities should continue to remain within these Departments.
- CAD/RMS administration currently provided under the Fire Department should be consolidated under IMS. This position should be reorganized under software engineering since it is a database administration function. It should be noted that this person is current assigned an office at IMS, despite being funded by the Fire Department's budget.
- Technical support functions within the Police Department should continue to be organized under the Police Department. While coordination of hardware

purchases and software implementation is necessary, the project team believes that these positions provide a low level of IT support (e.g. hardware tracking and basic set-up). As a result, it would not be appropriate to consolidate these positions. Records management functions should remain within the Department. This would reorganize six personnel (1 Senior Support Specialist and 5 Technical Support Specialists) under the IMS Division.

In sum, the project team believes that there are a number of IT functions current provided within other City departments that should be re-organized under IMS. This approach will ensure that effective management and coordination of IT support is achieved.

Recommendation: The City should consolidate IT support functions currently provided by the Airport and Fire Department.

(2) The Organizational Structure of the Division Does Not Promote Effective Collaboration and Long Term Planning.

The project team evaluated the current organizational structure in place within IMS. This assessment focused on the current reporting structure, the division of responsibilities, the relationships among units with similar or related functions, and the ratio of managers to staff. The project team makes the following observations regarding the current organizational structure:

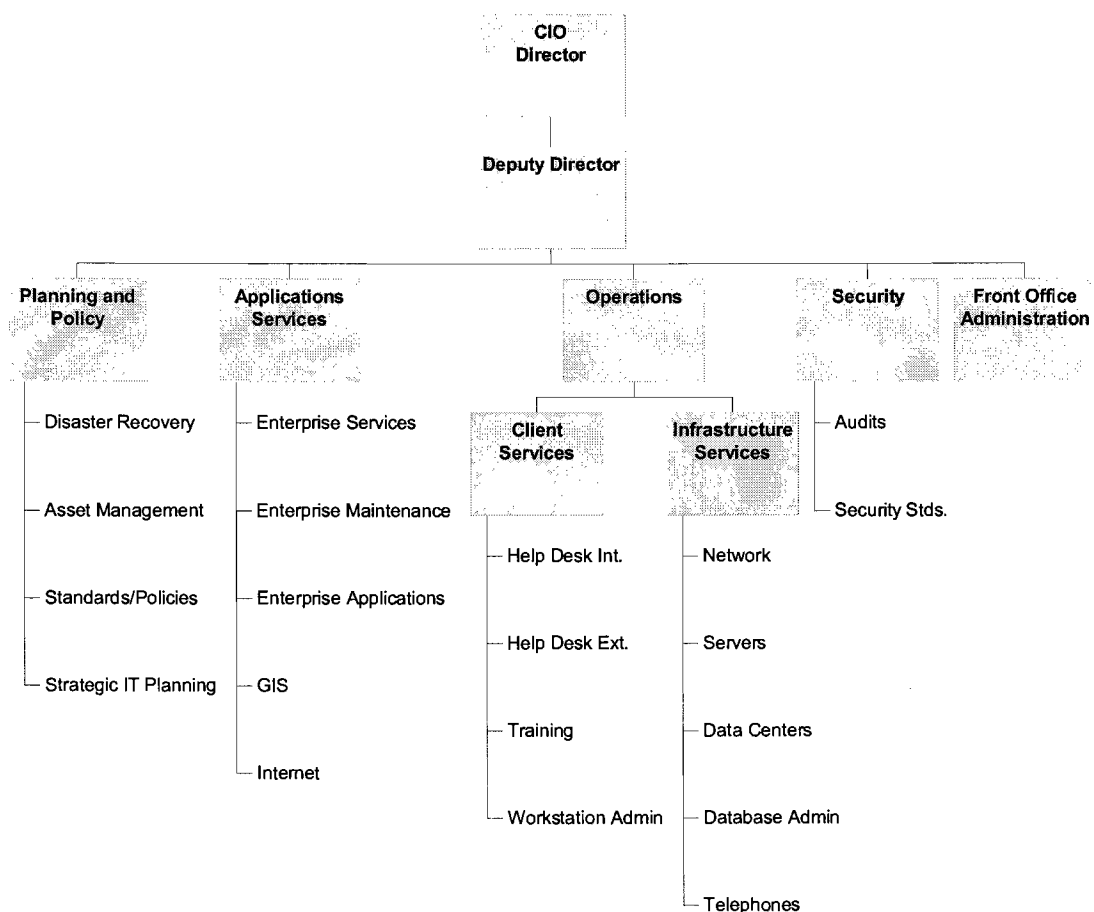
- **The Division's organizational structure is relatively flat.** There are six managers who report to the Deputy Director and Director/CIO: One Network Support Manager, one Help Desk Supervisor, one Technology Consultant Manager, one Software Engineering Manager, one Security Team Manager, one Office Manager, and one Communications Manager.
- **Spans of control within each team range from 1:3 within the Security and Communications teams, to 1:14 for the Technology Consulting Team.** Managers within these teams have disparate levels of responsibility due to this imbalance.
- **The Division has no dedicated unit or staffing for research and development or policy development.** These responsibilities are shared by managers, the Deputy Director, and Director. As a result, these areas receive less attention due to the need to manage day to day operations.

- **The current organizational approach creates barriers within applications development and acquisition.** Technology Consultants and Software Engineering are occasionally at odds over whether products should be developed in-house or purchased from an outside vendor. This was evident in the project team's interviews with personnel who indicated that there is often relatively little interaction between the Technology Consultant and Software Engineers during the development process.

Based on the above, the project team believes that several organizational changes should be made to improve coordination of service and increase accountability. The changes needed and reasons for these changes include the following:

- The Division does not have sufficient capacity to develop adequate long term planning documents, conduct research, and periodically update and review policies and procedures. Creation of a policy research and development unit would provide this capacity.
- The Division does not effectively coordinate software development and acquisition. The current approach creates two groups, one that advocates for Departments, and one that develops software. These groups should be consolidated to ensure a common objective is shared. Consolidation will also create better information sharing: Technology Consulting will have access to more technical information while Software Engineering will understand more of the operational and business logic behind department technology needs.

The project team believes that these issues will be resolved by changing the current organizational structure as shown in the organization chart below:



The following points summarize the organizational changes presented above:

- The creation of the Applications Services Section which consolidates Technology Consulting and Software Engineering into one group. This approach unifies the understanding of business processes (Technology Consulting) and technical knowledge (Software Engineering) to allow for more effective evaluation and development of technology solutions. Given the size of the current teams, both managers Software Engineering and Technology Consulting would be utilized to supervise the groups. An executive manager would oversee both groups and have final decision making authority. The estimated cost of the executive manager position will be approximately \$125,000 in salary and benefits.
- This approach also provides the Division with a research arm that focuses on planning and research on new technology. This new office will require the addition of a senior staff level position to coordinate the development of the technology plan. It is estimated that the cost of this position will be approximately \$90,000 to \$100,000 in salary and benefits.

- The new organizational structure moves the Communications Team under a new Operations Team comprised of Client Services and Infrastructure Services. This eliminates the low span of control within the Communications Team and presents an opportunity to utilize these personnel to provide additional support. This new Team centralizes all infrastructure management in one part of the Division.
- This structure leaves the security team as a specialized unit. While the span of control within this unit remains at 1:3, it is important for this team to be independent. In addition, this function focuses exclusively on system security which is functionally distinct from other units.
- Front office administration remains the same. Again, while this results in a low span of control, the Front Office Manager handles all financial reporting for the Department. As a result, less than half of her time will be spent managing front office personnel.

Overall, the revised organizational plan will reduce many of the Division's low spans of control, provide needed research and planning resources, and improve coordination of software acquisition and analysis.

Recommendation: The IMS Division should reorganize its operations as follows: (1) Consolidate the Communication Team into a new Infrastructure Team; (2) Consolidate Software Engineering and Technology Consulting into one unit and add one executive manager to oversee both teams; (3) Create a new policy and research unit initially staffed with one senior staff member to support technology planning, policy development, and research. The estimated cost of the two new positions is approximately \$215,000 in salary and benefits.

2. LONG TERM TECHNOLOGY PLAN

The Salt Lake City Corporation is, in large part, an information-based organization. If the Salt Lake City Corporation is to successfully respond to the challenges that lie ahead, support business goals and objectives, improve programs, measure performance, make good policy decisions, and respond to rapid changes in business requirements, it must continue to improve the way that it uses its technology and information resources.

The effective use of technology, given the financial resources available to the

City, necessitates the development of a long-term technology plan to address such areas as the integration of information from different databases, the level of IT expenditures for application development and priorities over the next few years, and managerial accountability for implementation and timeframes for implementation.

The long-term technology plan should identify both a vision for information technology as well as the specifics over the next three to five years that will be utilized to accomplish that vision. Not all of the vision will be realized over the three to five years; the plan should identify priorities for allocation of scarce financial resources and the costs of the prioritized technological expenditures over the next three to five years. For example, the vision of Maricopa County, Arizona for information technology, as identified in their 2003 information strategic plan, states, "Information Technology will champion Maricopa County into the Information Age by:

Enhancing Business Models By Moving From → To:

County Personal Services	→	On-Line Citizen Self Sufficiency
Internal Department Services	→	Employee Self Sufficiency
Paper/Phone-based Services	→	Electronic Government
Varying Technical Skills	→	Full Technology Literacy
Solid Departmental Boundaries	→	Flexible Public/Private Boundaries
8 x 5 Service	→	7 x 24 Service

Converting to a Digital Medium By Moving From → To:

Silo-Bound Paper Processes	→	Horizontal Digital Workflow & Forms
Paper Archiving	→	Electronic Document Image Archives
Videoconference Rooms	→	Desktop Video
Serial Comment and Approval	→	Concurrent Collaboration
Group Classroom Training	→	Real-time on-Line/Video Training.

Enabling a Mobile Workforce By Moving From To:

Dial – Up Services	→	Extensive Mobile Infrastructure
Discrete PDA/Pager/Cell Phone	→	Integrated Remote Device
Discrete Mail Systems	→	Integrated Voice, E-Mail and Publishing
Facsimile Machines	→	Interne-directed Retrieval and Printing

Increasing Efficiency By Moving From To:

Departmental data Centers	→	Shared Service Bureaus
Insourced Technology Services	→	External Service Providers
Multiple Microcomputer Vendors	→	Consolidated Purchasing Portal

Integrating Systems By Moving From To:

Discrete E-Mail/Web/GIS	→	Integrated Desktop Services
Discrete Resource Directories	→	Universal Resource Directory
Discrete Office Equipment	→	Networked Office Devices

The City does not currently have a technology plan in place. Planning materials consist of a five year business plan which is limited to goals and objectives for each Department. There is a limited discussion of IMS goals and projects underway. An effective, long-term technology plan should include guiding principles for the investment of scarce financial resources in information technology (such as utilizing these investments to eliminate inefficient tasks and duplicate data). For example, Maricopa County identified guiding principles that should be utilized in implementing their information strategic plan. Examples of these guiding principles include the following:

- **Significant investment in new technology will be integrated with process improvements which eliminate inefficient tasks and duplicate data.** Data will be entered into the information system only once at the point of origin.
- **Common systems will be used for similar business functions unless verifiable proof exists that some functions must remain different or unique.** Shared systems resources and common data repositories will be exploited wherever possible.
- **The preferred approach to new systems will be to integrate purchased applications that are based upon recognized industry standards --** modification of these systems should be kept to an absolute minimum. Custom development will be considered only as a last resort. New systems will be validated by the business unit in pilot implementations prior to full-scale deployment.
- **Technology resources will be leveraged effectively and efficiently through the adoption of common standards and shared information.** Data, voice, video, image, workflow and GIS information systems shall be standardized and interoperable among agencies. The IT infrastructure will define the interfaces between systems.

The strategic plan should also include a number of other relevant topics including the following:

- **The mission, goals and objectives of the IMS** identifying the managers responsible within the IMS responsible for implementation of the objective and the time frame for implementation. For example, an objective of the Division should be to create and update enterprise security policies and procedures. The

objective should specify that IMS will establish an internal policy security group that will create and update enterprise security policies, that these policies will be based upon needs identified by direct experience as well as requirements identified by Salt Lake City Corporation users and advisory groups, and that the IMS will work through the policy formation and adoption processes. A manager or supervisor should be identified as responsible for this objective and a timeframe for implementation assigned.

- **A description of the current information technology environment** – in terms of file servers, desktops, operating systems, telephone network, data network, video network, LAN support service, etc.;
- **A SWOT analysis** that presents the strengths, weaknesses, opportunities, and threats (such as technology obsolescence);
- **The planned information technology changes in response to the SWOT.** Employee and vendor self-service may replace current processes that are paper intensive and require numerous handoffs to complete.
- **A description of strategic issues.** Strategic issues could include information technology architecture (security, data network, voice systems, etc.), information technology management (disaster recovery, policy development, etc.), e-government, etc.
- **A work program for each strategic issue** that identifies the following:
 - The title of the initiative;
 - The priority of the initiative;
 - The business requirement of the initiative;
 - The information technology goals and objectives supported by this initiative;
 - A description of the initiative; and
 - Estimated resources or costs required by the initiative (broken down by hardware, software, staffing costs, communication services, training, software annual maintenance, and hardware annual maintenance).

The purpose of the information technology strategic plan is to provide a road map for the Salt Lake City Corporation and identify how to best allocate scarce financial resources given the inevitable competing demands.

To begin this process, the City should re-establish and re-constitute its IT Steering Committee composed of IMS leadership and key representatives of key user Departments including: Police, Fire, Public Services, Public Utilities, Airport, Management Services, and Community Development. Important roles for this committee in this process would be to:

- To facilitate a process which balances user service needs, IMS objectives for system integration and Salt Lake City Corporation cost effectiveness targets as these relate to system planning.
- To facilitate inter-departmental issues relating to systems which cross user boundaries.
- To increase the recognition among users that information systems are not 'free' but are critical resources for their efficient and effective operations.
- To make a coordinated communication of needs and budget to the City Council.

The new research and development unit recommended in the prior chapter can help coordinate this effort. This process should take between six months to one year to complete. Additional support can be obtained by contacting communities which have already undergone this process, such as Maricopa County, Arizona.

Recommendation: The IMS Division should spearhead the re-establishment of an IT Steering Committee composed of representatives from key Departments. The representatives should be leaders from each department, having the knowledge and a stake in the effective use of information technology in their operations.

Recommendation: The Information Management Service Division should develop a strategic plan for information systems and technologies.

3. DATA SECURITY

(1) The IMS Division Should Continue Efforts to Develop an Actionable Business Recovery Plan.

The IMS Division has already gone through the process of developing a business resumption plan. The Business Recovery Plan developed by the Division contains the following elements:

- An assessment of potential threats to the City system.
- An assessment of the probability of these events.
- Identification of the critical systems affected and priority for restoring these systems.
- Identification of preventive controls currently in place including back-up procedures, facilities controls and back-up, etc.
- A business recovery plan which outlines back-up sites, locations of servers and critical system infrastructure, IMS responsibilities and communications plan, and discussion of how to handle various scenarios.

A business recovery plan identifies challenges in resuming critical City functions in the event of a major disaster and outlines steps for dealing with each challenge.

Additional elements of an effective business recovery / resumption plan include:

- Business impact analysis and risk assessment.
- Mitigation strategies and safeguards.
- Identification of back-ups and off-site storage.
- Contingency plans for different types of disruption of information systems
- Organizational responsibilities for implementing the disaster recovery plan
- Multiple site storage of back-up documents.
- Plan tests and training of employees

The Division's plan covers a number of these elements. However, there are issues with respect to the IMS's efforts to date, including:

- Back up sites and plans to recover the City's financial City system are limited. The Division has identified two options:
 - Using Bi-Tech's facilities in Chico, California to restore the IFAS system.
 - Partnering with user groups such as Associated Students – CSU Chico, Clovis Unified School District, City of Aurora, and Sarasota County.

The options have not been tested and no formal agreements are in place.

- The Division has conducted a limited amount of testing to identify weaknesses with the current plan.
- The Division has not provided comprehensive training to staff members on disaster recovery procedures.

The Division should assign back-up site identification and agreement to the Deputy Director and the Security Team Manager. These individuals should also develop test plans and training materials for IMS employees. These plans should include:

- Development of exercises and tests for restoring critical systems based on various disaster scenarios. For example, a test of the procedure in place to restore the City's financial system. These tests should be planned for all major systems (e.g. Financial, Public Safety, Utilities, etc.) on a periodic basis to ensure system restore plans are effective.
- Develop and conduct training which provides IMS employees with information on procedures for responding to emergency situations including assignment of responsibilities, communications plans, etc.
- Revisions of plans and training materials based on feedback from training participants and the results of the business recovery simulations.

Overall, the Division can make improvements to the current business recovery plan in place.

Recommendation: The Division should work to identify sufficient back-up sites for business resumption in the event of a disaster. In addition, IMS should provide additional training to employees on disaster recovery policies and test elements of the plan periodically to identify weaknesses.

(2) The Division Utilizes a Number of Best Practices to Manage the City's Network and Ensure Data Security and Availability. However, Additional Steps Can Be Taken to Ensure Safe, Effective, and Efficient Delivery of Service.

One of the critical functions performed by the IMS Division is the administration of the City's network. This function ensures that data is available, reliable, and secure. The project team utilized a number of best practices to assess the Division's management of the network and data systems including:

- A multi-layered approach to network security is utilized including:
 - Internet perimeter protection consisting of a perimeter firewall and stand-alone intrusion detection system;
 - Subnet/router layer with firewall hardware and software at the subnet level; and
 - Desktop machine and file server layer with personal firewall and virus scanning software.
- E-mail is filtered and inappropriate file types are blocked (such as EXE, SCR, BAT, PIF).
- Security standards have been developed to include diagnostic tools, monitoring tools, intrusion detection systems, firewalls, encryption, secure e-mail, and anti-virus.
- Effective software licensing control procedures and software are in place to detect the presence of unlicensed software on personal computers, and to ensure compliance with licensing laws.
- Desktop lockdown software is utilized to avoid malware / spyware, allow enforcement of software standards, and simplify the support environment.
- A centralized anti—virus server is utilized to allow central management of desktop virus protection for more efficient, reliable desktop virus protection.

- A centralized patch server is utilized to allow centralized management and distribution of software patches.
- The enforcement of password security including periodic changes to passwords.
- Utilization of virtual area networks (VLAN's) to separate traffic by department and function to enhance network performance and ensure the integrity and segregation of sensitive data between different departments and segments by creating logical barriers that isolate information access only to authorized users.
- Data centers are deployed with physical and environmental controls with a comprehensive backup system in place.
- Utilization of centralized back up servers for desktops and file servers, and routine back ups of desktops and file servers.
- The implementation of a secure data sharing system to allow for efficient and secure file sharing.
- IMS uses SNMP (Simple Network Management Protocol) agents in network devices to provide monitoring and alarms for the network.
- IMS developed a fault tolerant network through redundancy.

IMS has implemented and utilizes the majority of the elements above. However, the project team has identified the following areas of improvement to enhance data availability and security.

- Improving the security of data by implementing additional internal firewalls. This measure will protect the network from internal threats. Additional firewalls should be added around servers that house confidential or sensitive data. Depending on the level of throughput needed and the number of servers protected, additional firewalls will cost between \$4,000 and \$17,000.
- The implementation and use of virtual networks to manage access to sensitive data and improve network performance. New firewall technology has the capacity to virtually manage access to network data sources. Firewalls with security context software will cost between \$15,000 and \$25,000 depending on throughput and licensing requirements.
- Improving fault tolerance by increasing redundancy and back-up systems. Providing additional redundancy through the use of back-up servers and additional server clustering will improve fault tolerance. In addition, the use of storage area networks will improve data availability and simplify the back-up

process. Adding additional back-up servers will cost approximately \$5,000 per server, while setting up a storage area network will depend on the level of capacity desired and configuration of the network.

The Network Support Team should continue to work towards improving network redundancy, data availability, and fault tolerance. The Team should focus on making these improvements within the next year.

Recommendation: The IMS Division should take additional steps to improve data security and availability including: adding additional internal firewalls, improving fault tolerance by increasing redundancy, utilizing Storage Area Networks, and the implementation and use of virtual networks. The estimated cost of these changes will vary based on the technology utilized and the configuration of firewalls and virtual networking devices.

(3) Policies and Procedures Are Comprehensive and Contemporary. However, the Division Can Make Improvements to the Current Security Measures and Policies in Place.

The project team documented and assessed the Division's policies and procedures related to acceptable use, e-mail, virus protection, passwords, and other measures to identify opportunities to improve data security. A detailed description and summary of these policies is shown in the descriptive profile (see Chapter 2). Based on our review of current policies and procedures in place, the project team has the following observations / findings:

- The Division has effective systems in place to monitor network attacks and intrusions. These include Intrusion Prevention Systems, Intrusion Detection Systems, Spam Filters, Firewalls, and an ISA server.
- The Division has designated a Chief Information Security Officer and established a special unit to assess security issues.
- While the Division has a fairly comprehensive set of policies and procedures related to acceptable use, viruses, security measures, passwords, security, etc.
- The Division has developed security plans and has performed some testing of security measures in place. However, additional test plans should be developed and routinely tested. Additional security testing allows organizations to identify

weakness in their security systems and modify systems and policies based on those tests. Examples of these tests include intrusion attempts from outside the City's firewalls, and virus screening. These tests should be conducted regularly by the Security Team.

- IMS should continue to monitor and update security policies and plans. Again, based on security tests, documented breeches, and research on new security threats, the Security Team should periodically review and update security policies and plans.

Recommendation: IMS should provide additional training on security policies to City employees. In addition IMS should ensure that security plans are tested on a regular basis and policies and procedures are regularly updated.

4. SYSTEM ACQUISITION AND ANALYSIS

(1) The Division Does Not Have an Effective Technology Approval and Evaluation Process in Place.

The evaluation of technology needs and solutions to improve City-wide business processes is a critical element of any technology plan. An effective technology approval and evaluation process includes the following elements:

- An initial assessment of business process weaknesses or efficiencies to be gained from the implementation of new technology.
- Development of specifications and key functionality needed.
- Identification of the potential costs and benefits of implementing an enterprise level solution to improve business operations of the organizations city-wide.
- Assessment of the costs and benefits of purchasing existing technologies or developing systems in-house.
- Submission to an IT Steering Committee or group that evaluates IT needs, costs and benefits, and priority of implementing new systems.

IMS has taken a customer oriented approach to technology development and acquisition. The following points summarize the approach taken by IMS for system acquisition and analysis:

- This process includes the use of technology consultants who act as business analysts for their assigned Departments.
- The technology consultant will identify technology needs and develop specifications.
- The technology consultant will identify solutions with the client department and advise them on the costs and benefits of developing a solution in house or purchasing a third party package.
- A Technology Group of personnel from IMS (Technology Consulting & Software Engineering) discusses the status and priority of projects and the staffing resources available.
- Meetings are also held with the respective Department and IMS Managers to discuss system requirements, timelines, priorities, and resources available.
- A technology committee composed of representatives from Departments is not currently utilized to evaluate technology projects, costs, priorities, and other issues. However, there are departmental steering committees in Public Utilities, Fire Department, and Police Department that are formed from department management personnel and IMS.

In the project team's view, this approach creates a number of issues associated with it, including:

- **Weaknesses in identifying enterprise level solutions to City business process improvement.** This is evident in the large number of maintenance management systems utilized throughout the City. An enterprise solution would integrate data related to maintenance of the City assets and provide for effective planning.
- **Lack of an accurate cost / benefit analysis of buy versus build considerations due to the charge back model.** Software Development costs are not billed directly to Departments except for enterprise funds (e.g. Public Utilities, Airport).
- **Duplicate systems that create problems with integrating data and utilizing metrics to plan and coordinate City wide functions.** For example, Financial Management and Planning, Maintenance Management, and Human Resources applications are fragmented and not completely integrated and duplicate systems are in place (see Assessment of Core Business Applications for details).

Overall, the process utilized by IMS and the City to evaluate technology project is not effective. The project team recommends the following changes to improve this process:

- **Re-establish the Technology Steering Committee with key representation from the major Departments and IMS Managers.** This approach will foster discussion of utilizing technology city-wide and facilitating a cross departmental focus to system integration and cost effectiveness. At least one senior representative from each Department – Airport, Public Utilities, Community Development, Public Services, Police, Fire, and Management Services should constitute the Steering Committee. This committee will make recommendations the City Administration and the City Council and set priorities regarding technology projects. The Committee should also have authority to approve large scale projects (e.g. Financial Systems). Meetings should be held every two months to monitor progress on projects.
- **Continue to utilize technology consultants to identify technology solutions and preparing recommendations to the Technology Steering Committee for major systems.** Despite the reorganization of the technology team, technology consultants will continue to provide advice and support to user departments. However, large projects will require the approval of the Technology Steering Committee. Technology consultants will provide recommendations to the committee.
- **Change the current cost allocation model.** This will allow the Steering Committee to evaluate the true costs and benefits of developing in house systems or purchasing third party solutions. The cost allocation model is discussed in more detail in Section 12. The objective for this should not be full cost recovery of services provided by IMS. Rather, the technology committee should establish cost recovery targets which serve to underscore 'a' cost associated with these services. The project team recommends that IMS be consistent in how it evaluates the cost of software development and purchased packages so that the committee considers the cost of development in decisions to build or purchase systems.

Recommendation: The City should change the current software acquisition process to capture the benefits of enterprise level solutions and ensure cost effectiveness.

Recommendation: Prior to establishing a charge back system, the City should re-establish the technology steering committee comprised of key department representatives and IMS managers. This committee should be charged with establishing a focus on cross-departmental cooperation and system integration which meets the balanced needs of the City.

(2) The Division Can Improve Management of the Current Software Development Process.

The effective management and coordination of software development projects is critical to capturing the full benefits of technology solutions and ensures smooth implementation. Elements of an effective software management system include:

- Establishing a clear business objective for new systems.
- Establishing timelines for development including critical phases and deliverables.
- Providing clear product specifications and system requirements.
- Documenting staff and resource utilization.
- Documentation of system development and changes.
- Development of QA/QC test plans.

While the IMS Division utilizes a number of these elements to manage software development projects, there are a number of improvement opportunities including:

- **Inconsistency in the use of project management tools.** Interviews with software engineering personnel indicate that there are projects in which there are few specifications developed and key deliverables are not clearly defined. In addition, testing typically consists of user testing and there is limited use of peer (software engineer) testing done.
- **Timelines change frequently as the list of projects is re-prioritized.** The current backlog of projects is relatively large and many start and anticipated completion dates are not updated.
- **Staff time spent on projects is not measured or analyzed to assess the efficiency of in-house developed applications.** The Division does track time spent on projects using DP Time, however, reporting capabilities are limited and is not routinely used. This limits the ability of managers to effectively plan project develop and establish clear timelines.

IMS should take a number of steps to improve the software development process including:

- Documenting employee utilization and time spent on each project. The Division has a system in place (DP Time) which tracks employee time. The Division should utilize this system to evaluate the efficiency of developing in house applications and for developing accurate project timeframes.
- The Division should standardize project planning materials to ensure consistency across projects. This includes a formal document stating business objective or purpose, critical functionality, timelines and key deliverables, and estimated budget based on staff time. These materials should be used to measure performance of the software engineering unit and ensure that customers have a clear understanding of the costs and benefits of developing solutions in-house versus purchasing an outside system.

Recommendation: The IMS Division should develop standardized project management tools to document business objectives, timelines, key deliverables, peer test plans and code audits, and track actual personnel utilization on development projects. This approach will provide an accurate picture of costs and benefits of developing software in house. The re-constituted information technology user committee would have an important role to play in this process.

(3) IMS Should Work Toward Increased Training of Software Engineering Personnel to Ensure Consistent Service Levels.

As information technology advances take place, IT professional must continually update their skills and knowledge to effectively leverage new technology. Through interviews with IMS staff and review of training plans and resources, the project team identified the following issues with respect to skills enhancement and continuing education:

- While IMS staff are encouraged to learn about new technology and are provided manuals, books, are sent to training courses within and outside of the City, there are no continuing education requirements or standards in place.
- There is an imbalance of skills among software engineering staff. This creates problems with assigning projects, which require use of new development platforms, particularly the new .Net platform.

Given the constantly changing environment of information technology, the Division should develop training objectives and assess an individual's performance based on evidence of skill enhancement and continuing education. As a guide, the

project team recommends developing a policy which requires 24 hours of continuing education per staff member annually. IMS estimates that staff is receiving this level of training already and has a database set up to monitor continuing education. IMS should utilize this system to measure progress towards training objectives.

IMS typically spends approximately \$130,000 for training courses, certifications, seminars, and conferences within and outside of the City for fiscal year 05-06. Given the number of IT staff (56 excluding the front office), this amounts to approximately \$2,000 per employee for career development/continuing education. The Division has clearly made a commitment to providing resources for staff to learn new technologies. The Division should however, formalize the process to ensure all IT staff are taking advantage of these opportunities.

Recommendation: The IMS Division should develop requirements for staff continuing education. As a guideline, the Division should target a minimum of 24 hours per staff member each year.

5. COMMUNICATION SERVICES.

(1) The Division Should Continue Efforts to Revamp City Web Sites and Streamline the Content Management Process.

Salt Lake City has been recognized by the Center for Digital Government since 2000 as one of the top governmental web sites in the nation. The City has also been recognized as a 'best of the web", and has been recognized by the State of Utah for its website. The City also provides a host of online services, bulletins, and streaming video.

However, based on interviews with user Departments as well as IMS staff, the project team has identified the following improvement opportunities to enhance web services:

- The City should streamline content management process. The current approach relies on Department contacts to create new content, seek design support from IMS, submit the content to the Mayor's Office for approval, and finally request posting of the new content to the City's website. There are several issues associated with this approach including:
 - Some departments do not have a dedicated contact person. In addition, Departmental personnel are not always well trained in website design tools such as front page.
 - The City does not utilize a content management system which allows standardization of format (i.e. templates), and quick review of updates and changes. Departments would need to be trained on the use of these systems.
- Departments indicated they would like additional video streaming of City events such as City Council meetings, Mayoral Addresses and speeches, and other live events. While this is an attractive service for city residents, this would require additional resources in terms of staffing and equipment. The Division just added staffing and equipment costs in the FY 05-06 budget of approximately \$120,000 to provide current SLC TV services. In addition, the utilization of streaming video service is not likely to be high.

Overall, minor improvements can be made to web services.

Recommendation: The City should streamline the content management process currently used to update the City website.

(2) The City Has Developed an Efficient Data and Voice Network. The City Should Continue to Pursue Enhancements to the Communications Infrastructure Including Voice Over IP.

The project team evaluated the adequacy of the City's data and voice network.

The following points summarize the project team's findings related to data and voice communications:

- Network connectivity is provided to all City buildings and work sites.
- The City has developed or is in the process of developing a number of wireless solutions for field access for such applications as citation processing, field inspections, fire and police field inquiries, service dispatch and status updates.

- The City has developed a standard citywide approach for those employees that need remote access to the City's network (such as from their home) using a VPN remote access system.
- The City employs practices that provide consistently available and fully operational file servers. However, system "uptime" is currently tracked on web servers only.
- IMS provides a ratio of 500 workstations to 1 e-mail/calendaring server.
- IMS provides a ratio of 250 workstations to 1 file/print server.
- IMS is in the process of moving from LSS (45 Megabit, full-duplex), to QMOE, (100 Megabit full-duplex), raw Ethernet. However, internet connectivity to fire stations and golf courses are limited and not yet T-1 level.
- Concentrators (hubs) provide for device monitoring, isolation of faulty ports or segments, and fault tolerance capability for the concentrator.
- The concentrators (hubs) have the capacity for intelligent monitoring, "virtual" high speed individual networks segments, and switching technologies.
- Land line telephone costs are routinely audited to assure proper billing of costs.
- In larger buildings with more than 100 centrex lines, the City utilizes private branch exchanges (PBX) to reduce centrex line costs. A private branch exchange (PBX) makes the City a miniature telephone company with the ability to add and delete telephone stations, select calling options and account for calls. Private branch exchange (PBX) switchboards relay incoming, outgoing, and interoffice calls within a single location.
- The existing PBX network is IP ready and capable of supporting point-to-point IP based services on the Wide-Area Network.

Businesses and governments across the country are beginning to leverage Voice over IP (VoIP) technology to reduce telephone line charges and better integrate the delivery of voice, data, and video services. The IMS Division has already begun to research and evaluate the benefits of Voice over IP technology to reduce costs and improve service. The City is well positioned to take advantage of Voice over IP technology to improve its communications network. IMS should evaluate the feasibility of implementing voice over IP technology.

Recommendation: The City should establish a committee, spearheaded by IMS, to evaluate the feasibility of implementing Voice over IP technology.

6. CUSTOMER SATISFACTION

In addition to the customer survey data present in Chapter 4, the project team also evaluated mechanisms in place to ensure customer satisfaction. While a number of measures can be utilized to promote customer satisfaction, high service level communities utilize specific methods to evaluate and ensure high levels of customer satisfaction. These elements include:

- **The use of an IT Steering Committee** comprised of key representatives of IT customers and Executives from the City IT Department/Division. This group provides a forum for a discussion of service level issues, identification of IT needs, and evaluation of technology plans and solutions. This group also acts as an accountability mechanism to ensure IT service standards are met. The committee's principle role in the customer satisfaction process is to facilitate an orientation of high customer service while balancing the overall needs of the City for system integration and cost effectiveness.
- **The use of formal service level agreements** which outline key service provision elements including:
 - A description of services provided to user Departments.
 - A description of services not provided to user Departments.
 - A description of standard business procedures including business hours, methods for service requests, and dispute resolution procedures.
 - A description of service level objectives or requirements. This may include identification of time frames for responding to work orders and service requests based on urgency. These objectives will be measured and performance against standards will be evaluated on a periodic basis.
 - A description of costs and service charges broken out by function/service type. This will also include a description of the process utilized to develop the Department's budget, the factors utilized to allocated costs, and identification of the budget review process.
 - Identification of dispute resolution procedures and governance authority.

Based upon a review of Department policies and procedures, the IMS Division does not have formal service level agreements in place. In addition, the City does not utilize an IT Steering Committee to allow user to have input on IT service levels and projects. While some service description details are provided within the Corporate Rental Program Agreement, including covered software, hardware, peripherals, and costs, the majority of service agreements are informal. IMS addresses service level agreement issues through meetings between technology consultants and user departments and meetings between IT managers and department personnel (informal or formal). User interviews indicate that not all departments have the same level of input and influence on IT decision making. In addition, many departments do not understand how the City allocates IT charges and cost recovery.

The project team believes that the City should develop formal mechanisms to ensure high levels of customer service including the development and use of an IT Steering Committee and formal service level agreements.

Recommendation: The City and IMS should formalize its approach to IT customer service. This includes the re-establishment of an IT Steering Committee with a cross-departmental focus and the development of service level agreements with user departments.

7. ADEQUACY OF SUPPORT PROVIDED TO END USERS.

The IMS Division provides three levels of IT support to end users:

- The first level consists of help desk personnel (Help Desk Tech & Net Admin I) who track work orders and attempt to resolve issues over the phone and with remote control functions of LanDesk (Network Administration Software).
- The second level consists of field technicians (Net Admin II) who provide physical support to user.
- The final or third level consists of support from Network Administrators (Net Admin III). All work orders are track utilizing the Remedy system.

The PC Support Unit is currently undergoing changes to the allocation of staff across functions. This change will essentially assigned five personnel to fixed field locations (level II support) within the City/County building (1), Public Safety Building (2), and Public Utilities (2). Nine personnel will remain at the help desk. These assignments will be rotated to ensure cross-training and skills development. The Division also has a Training Coordinator, with assistance from PC Support personnel, who schedules, provides instruction, and develops training courses for City employees. A list of training services is provided in the descriptive profile in Chapter 2.

The project team has the following observations / findings regarding the level of end user support:

- The PC Support Unit has established service level objectives for response time to work orders based on priority/urgency including:
 - Urgent calls (e.g. server is down, communications system is down, critical application is down) receive a response within 15 minutes.
 - High priority calls (critical hardware, software effecting multiple users) should receive a response within 1 hour.
 - Medium priority calls (problems affecting a single user) are responded to within 8 working hours.
 - Low priority calls (upgrade request, installation) are responded to within 5 working days.
- The Help Desk handles approximately 14,707 support requests each year, or approximately 60 calls per day. Based on a typical staffing level of 11 (after considering leave), this results in an average of 6 calls handled per IT support staff per day.
- The PC Support Unit tracks all work orders in Remedy and measures the time needed to resolve help desk tickets. Based on statistics kept by the help desk, the following response times were achieved during 2004 and 2005:
 - Approximately 73% of tickets were handled within one business day.

- Approximately 7% of tickets were handled the next business day.
- Approximately 10% of tickets were handled in 2 to 5 business days.
- Approximately 9% were handled within 5 business days.
- IMS has implemented "best-of-breed" applications such as LanDesk, NetScout, Barracuda, WebSense, McAfee, Sabari Antigen, etc. These systems automate the management of updates, filter spam, audit the system, etc.
- The Division has the tools in place to effectively administer desktop settings through imaging and remote control tools available in LanDesk.
- An up to date inventory of hardware and software (licensed and unlicensed) is maintained utilizing LanDesk. In addition, the Division has centralized software distribution (Operating System and Office Suite) through its master agreement with Microsoft.
- The Division has developed minimum qualifications and certifications for IT support personnel, which ensures consistent service levels.
- The Division conducts a customer service survey every quarter to assess customer satisfaction with IMS services including: PC Support, Software Engineering, Training, Technology Consulting, Web Services, and Communications. Customer satisfaction trends are evaluated to identify changes in service levels from quarter to quarter. Survey results indicate that users are consistently satisfied with IT support provided by IMS.
- The Division also conducts surveys of training participants to identify additional training opportunities and overall satisfaction with training services provided by IMS.

As shown above, the Division has taken a number of steps to ensure high levels of support to end users. It should also be noted that the Division is pursuing the addition of in-house computer and printer repair as an additional function of the PC Support team. This service is currently being contracted to Compucom and under warranty with HP. The Division is not planning on adding staffing to handle this workload as the workload generated from these activities (approximately 50 hours in

2005) is not significant. However, these services will provide PC support staff with additional skill development opportunities.

Overall, the Division provides a high level of user support.

Recommendation: Make no changes to current staffing and service levels provided by the help desk.

8. CORE BUSINESS APPLICATIONS

The project team evaluated the current business applications in place which support the City's core business processes. This analysis, shown on the following page, includes a description of the ideal business application, benefits of the system, existing applications utilized by Salt Lake City, and an assessment of improvement opportunities for each of the following business processes:

- Financial Management
- GIS
- Human Resources
- Maintenance Management
- Permit Management
- Public Safety Dispatch & Records
- E-Government
- Customer Relationship Management

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Assessment of Core Business Applications Utilized by Salt Lake City

Financial Management	
Ideal Application Description	This application supports the recording, management, reporting, and analysis associated with the organization's assets and liabilities. In includes support of accounts payable, accounts receivable, payroll, purchasing, treasury, debt tracking, cashiering, activity based costing, capital project management and cost accounting, timekeeping/labor distribution and all levels of budget development. It allows "what-if" analysis, and supports forecasting based on user input combined with trend analysis.
Benefits	More timely and accurate information about the organization's financial position. Improved access to information. Enables the organization to flexibly structure financial operations and accounts to meet diverse reporting requirements. Improved budget tracking.
Existing Applications	IFAS, Bank Reconciliation (module within IFAS), Budget Resource and Planning, CAMP, Cash Receipt, Cash Register, DP Time (project time tracking), Kronos, OSL (officer hours and secondary employment tracking), Airport Time Keeping System (this system is being phased out), Fixed Assets, Journal Entry, Lock Box, POPs, PROMIS, PUBs, Register Reporting, Revenue Management (Airport), Salary Approval. Bank Reconciliation – have utilized IFAS module. Looking at applications every six months. Fixed Assets and Cash register not licensed.
Analysis / Improvement Opportunities	IMS has developed a number of programs to interface with the IFAS system and is working to implement a web based version (implementing work flow module – will take place of salary approval). However, there are several features available in the current version of IFAS that provide similar functionality. In addition, duplicate time systems are utilized to track employee hours. The City has a maintenance agreement with Sungard Bi-Tech for all modules except fixed assets and the cash register. IMS should continue to evaluate the need for in-house modules as enhanced functionality is provided within IFAS.

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Human Resources	
Ideal Application Description	<p>This application provides online processing and maintenance of employee records. It stores current and historical data related to demographics, academic and professional credentials, compensation, benefits, assignments, attendance, etc., and provides standardized reporting on these attributes. It supports training, recruiting, labor control negotiations, grievance tracking, regulatory compliance, safety compliance, and environmental mandates related to the organization's employees. May also allow for employees to access information about themselves and perform some transactions such as time keeping, change of name and address reporting, and similar information updates, without the assistance of specially trained staff. Interfaces with Financial Management.</p>
Benefits	<p>Provides "one-stop-shopping" for retrieving and updating employee data. Eliminates redundant data entry, decreasing inconsistencies among systems and effort required to maintain systems. Facilitates summary reporting for long-term human resources decision making. Automates the recording of an individual's time keeping, training hours, licenses, and certifications. Reduces staff workload by allowing employees to view their own records with appropriate security in place.</p>
Existing Applications	<p>IFAS (financial), CAMP (Employee Contacts), Performance Impact (tracks employee goals and evaluations), Job application (online application), Job Descriptions, Job History, Police Personnel Entry, POPS (cost of personnel projections), Time Keeping (PD time keeping), Kronos (time keeping), Airport Time Keeping, DP Time (IMS time keeping), Salary Approval (online salary adjustments), Training ETC (employee training), Training HR (training class scheduler), Training IMS (training class scheduler), Training Officers (PD training). Training systems are front-end systems that use LMS – Learning Management System.</p>
Analysis / Improvement Opportunities	<p>As with Financial Management, IMS has developed a number of applications that integrate with IFAS and other HR systems. Many of these features are available in the current version of IFAS. Again, there are duplicate time keeping systems in place.</p>

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Customer Relationship Management	
Ideal Application Description	This application supports a single point of contact for citizens in their dealings with local government. Captures all steps in the service request process, as well as relevant information for the organization's tracking and reporting requirements, including routing, work breakdown, resolution, and trend analysis. All actions taken with regard to requests or complaints are tracked and the work process is electronically updated. Among the data elements captured are relevant dates, issues, corrective actions, and alternative dispute resolution information. Supports several channels of contact, including phone, fax, email, and Web. Interfaces with Maintenance Management, Financial Management, GIS, Email, and Web.
Benefits	Encourages cross-departmental cooperation; assures requests are processed in a timely manner in relation to priority status guidelines; allows the organization to more easily measure and report on performance measures.
Existing Applications	Constituent tracking (requests for service), Tree maintenance requests, Signs Inventory and Word Order Management, Housing and Zoning Enforcement Area System (calls re: zoning, housing, etc.), Trash can Maintenance System, Community Action Team System (Community Problems and Resolution System).
Analysis / Improvement Opportunities	The current systems in place provide some tracking of citizen requests for service. The City should consider implementing an enterprise level customer relationship management application.
Geographic Information Systems (GIS)	
Ideal Application Description	This application efficiently captures, stores, updates, manipulates, analyzes, and displays all forms of geographically referenced information. It provides an accessible, coherent set of information about the organization's geospatial entities.

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Benefits	Allows users to view and locate most of the organization's managed infrastructure, area of management/influence, and related documented functions such as assessments, licensed areas, permitted areas, etc., through a geographic display of data. Supports geo-based analysis of the organization's related information. Enhances analysis and management of organizational resources.
Existing Applications	ESRI, GIS Core, GIS Map, Engineering Map (maintains City's GIS base map). Tree inventory, Sign Inventory, Zoning Enforcement (HAND), Incident Mapping (police incidents), CAT (Community Action Team), Online Tree Application.
Analysis / Improvement Opportunities	IMS has developed applications which allow users to conduct geographic analysis and incorporate data from different Departments. The City has also developed standards for situs based data (addressing and other geospatial data). The City may want to consider increasing the centralization of GIS staffing resources within IMS. Current these personnel are employed by Planning, Public Utilities, Engineering, and Community Development.

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eGovernment	
Ideal Application Description	<p>This application (or group of applications) provides access to government functions and information via the Internet with a customer centric presentation. Published information can be automatically or remotely updated. Application provides processes for filing applications with e-signature technology, accepts payments for fines and fees, accommodates public records searches, and enhances two-way communications with elected officials. Links to many systems, including Citation Management, Maintenance, Utility Customer Information Management, Financial Management, GIS, and Permit Management.</p>
Benefits	<p>Provides an alternative to "brick and mortar"-based City services for customers. Greatly simplifies task of conducting transactions with the organization, especially when the customer is located at some distance from business offices. Reduces need for staff to field phone calls and work customer service counters by increasing ability of public to find information or complete transactions on their own. More timely information updates.</p>
Existing Applications	<p>City Web Site, online transaction systems including: water bill payments, traffic/parking ticket payments, business license renewals, building inspection scheduling, pay and view assessment, bid opportunities, job applications, request tree service, jury scheduler, event calendars, bike route maintenance, voting precinct information, and others.</p>

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Analysis / Improvement Opportunities	<p>IMS has developed several transactional systems that allow users to conduct business with the City electronically. The City has also been recognized by the Center for Digital Government since 2000 as one of the top governmental web sites in the nation, in addition to recognition as a Best of the Web, and by the State of Utah.</p> <p>The City should continue to pursue improvements such as redesign of city and departmental web pages to ensure a consistent look and feel. The City has begun implementation of a content management system (Bridgeline). IMS and the City should continue this implementation and streamline the content management process.</p>
Document Management	
Ideal Application and Description	<p>This application allows for the automated control of documents, electronic or otherwise, throughout their life cycle at the organization, from initial creation through production storage and use to final archiving and destruction. Functions include: document identification, indexing and searching; workflow automation and record retention rules; document imaging, storage and retrieval; and document tracking and version control.</p>
Benefits	<p>Provides greater control over the production, storage, distribution, archiving, and destruction of the organization's documents and electronic records. Yields greater efficiencies in the ability to reuse information, and reduces document production time. Provides improved security/access control, including better control over the legal discovery process. Reduces errors by helping to ensure that only one version of a document remains current at any time and that all concerned parties have the latest approved revisions and/or releases. Reduces loss of documents and ensures compliance with document archiving policies and laws.</p>
Existing Applications	<p>Hummingbird (document management), Alchemy (scanning, imaging, archiving, storage and retrieval)</p>

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Analysis / Improvement Opportunities	Although approximately 2 million images are captured in the Alchemy system, the City has not fully implemented a document management system. The Division and City Department have developed retention policies, but have not created standardized forms. The City should work to fully implement a document management system.
Public Safety Dispatch/RMS	
Ideal Application Description	<p>This application collects data from the departments' key operational information systems, and allows management to analyze this data from a variety of perspectives. The application distills business meaning from large volumes of data by providing a unified view of the outputs of operationally distinct systems. Has linkages to all of the Department's business-critical applications.</p> <p>The application supports the maintenance, completion, and submission of reports and records regarding incidents involving fire response. Tracks information related to response incidents from the initial call-in through summarization for national reporting. Supports standard fire reporting codes (e.g., NFIRS), department specific reporting, and internal performance measures. Maintains records of hazardous materials. Supports the City's provision of urgent care, ambulance service, first aid, fire response, and other services that require an emergency response. Includes tracking capability for staff scheduling and training. Interfaces with CAD.</p> <p>This application tracks information related to incident responses – from the initial call-in through summarization for federal reporting. Supports standard police and fire reporting codes, organization-specific reporting, and internal performance measures. Collects incident information through a link with CAD, and geo-coding information through a link with GIS.</p>

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Benefits	<p>Supports all public safety agency response (e.g., police, fire, ambulance, rescue, etc.) and tracking of 911 and other calls for help in a timely manner.</p> <p>Automates workflow of report preparation. Establishes a uniform location for documents and related paperwork. Increases efficiency and frees staff to perform other work. Supports reporting to state and federal agencies.</p> <p>Facilitates post-incident reporting and follow-up. Supports as-needed queries and searches related to an incident for internal and external reporting purposes.</p>
Existing Applications	<p>FDM (Fire Dispatch and records), First Watch (trend analysis), ProQA (dispatch protocols – not being used), FATPOT (automatic vehicle locator – not being used), Quick Access Plan (Fire building access plan information), Versadex (Police CAD/RMS).</p>
Analysis / Improvement Opportunities	<p>The City has two distinct CAD systems for Police and Fire, which creates potential problems for incident trend analysis. The Fire Department has indicated that it is pursuing a new CAD/RMS system due to issues with “user friendliness” and functionality. The City should evaluate the potential to integrate Fire dispatch into the Versadex application or ensure that systems are integrated. In addition, future deployments of AVL should incorporate both Police and Fire.</p>

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Maintenance Management	
Ideal Application Description	This application automates the management of the organization's fixed assets throughout their life cycle. It supports regulatory compliance, certification, and maintenance information, and generates work orders and preventive maintenance schedules. It can assign personnel, equipment, and inventory to specific jobs. Can interface with the organization's wireless devices for dispatch, tracking, asset records, and plans/drawings, and with Financial Management and Human Resource systems.
Benefits	Longer asset life and reduced repair costs. Assists in planning short-term equipment replacement needs and long-term budgeting for ongoing maintenance, repair, and replacement. Ensures that equipment is tested regularly for safety and structural integrity. Assists in the scheduling of maintenance personnel. Improved tracking of costs related to ownership of various organizational assets.
Existing Applications	Cityworks (Public Utilities Maintenance System), Fleet Faster System (Vehicle Maintenance) – tied to fuel use system, parts inventory, time tracking, online piece, Famtrack (Public Services Work Orders), City Vehicles (tracks City vehicle accidents), Fixed Assets (city assets inventory and depreciation), Infrastructure Management System (pavement network maintenance), Quest (Parks Maintenance), Tree Inventory (Tree Maintenance), Real Property (City Property Maintenance), Wo's – Maint. – Worker Requests (Airport work order system). Kronos (activities module) – tracks equipment and materials used in maintenance.
Analysis / Improvement Opportunities	The City should evaluate the need for numerous maintenance management systems. The City should also pursue enterprise level systems that integrate asset maintenance data.

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Permit Management	
Ideal Application Description	<p>This application supports the entry and tracking of permit, inspection, and code compliance data, and issues permits. It supports calculation and management of impact fees and credits, tracks information specific to specialized permit issuance such as fire prevention, hazardous materials and pyrotechnics, schedules inspections, and tracks results. Supports the organization's code enforcement activities. Includes a Land Information System interface and a link to Financial Management for billing, cost recovery, and payment of credits. Takes advantage of GIS resources to locate properties and retrieve related information. Also supports an interface to CAD to transmit safety-related permit information to public safety response personnel. Supports coordination of permit activities among departments.</p>
Benefits	<p>Integrates and streamlines permit processing from initial application through completed construction and maintenance of facility. Provides faster permit turnaround service to customers. Improves access to records for incident response purposes. Automates inspection scheduling.</p>
Existing Applications	<p>Engineering Permit, Engineering Permit Inspections (www), Engineering Permit Online Application, Building and Housing Permit, Building & Housing IVR System (scheduler and status), Planning Project (planning project planning system).</p>
Analysis / Improvement Opportunities	<p>IMS has implemented IVR which allow user to schedule building inspections and integrates with the City website for scheduling and status reviews. The City should evaluate the need for separate engineering and building permit systems. Planning, Building, and Engineering should also utilize the same system to ensure appropriate information flow. The City should evaluate and implement an online building permit application feature.</p>

As shown in the preceding exhibit, the City should evaluate its current application portfolio to identify enterprise level solutions that will improve integration of critical management data, eliminate duplicate systems, and potentially reduce maintenance costs. To summarize, the following areas require additional evaluation:

- **Financial Management:** The City should evaluate the need for in-house developed modules and systems designed to provide functionality currently available through IFAS. The IMS Division has developed and continues to develop modules that are available in the current version of IFAS. The reliance on in-house developed software inflates the number of software development and support personnel needed.
- **Human Resources:** The City should stream line employee time tracking systems to eliminate duplicate systems and reduce support and maintenance needs. In addition, IMS has developed a number of systems in house which are available in IFAS.
- **Document Management:** IMS should continue to work towards implementing Hummingbird and Alchemy as a city-wide document management system. Additional steps needed to implement this system include standardizing and creating an inventory of forms used by each Department and linking electronic documents and applications data to paper or imaged documents.
- **Public Safety CAD/RMS:** The City should evaluate the need for distinct Police and Fire CAD/RMS systems and ensure that systems are well integrated to provide incident trend analysis, implement consistent AVL programs, and management personnel deployment and other operational issues. The City should also work towards implementing a single CAD system for Fire and Police incident tracking.
- **Customer Relationship Management:** The City should evaluate and work towards the implementation of a customer relationship management system. The current systems in place do not effectively integrate data regarding citizen requests for service or standardize performance metrics on city provided services.
- **GIS:** While IMS and the City have taken a number of positive steps to ensure data compatibility and centralization of GIS data, the City should evaluate current GIS data production methods to ensure that all geographic data is readily accessible for city wide applications.
- **Permit Management:** IMS should ensure that there is proper information flow and integration of building and engineering permit systems. Planning, Building,

and City Engineering should have access to the same information to ensure effective planning and coordination.

Overall, there are a number of systems in place that are either duplicative or that are available in packages currently owned by the City or available in the market place. IMS and the City should change the current process for application development and acquisition to ensure that the true costs and benefits of “buy vs. build” are examined. In addition, the City should streamline the number of applications utilized for maintenance management, timekeeping, and financial managements. Streamlining these systems will reduce the need for current staffing levels, free up existing personnel to pursue other projects (such as document management), and provide a more efficient allocation of IT personnel.

Recommendation: The City and IMS should evaluate the core business applications discussed in this section to ensure appropriate levels of integration, eliminate duplication and enhance management information.

9. LEVEL OF STAFFING

There are a number of IT research and consulting organizations that utilize benchmarks to assess the adequacy of an organization's staffing levels. Matrix Consulting Group utilizes benchmarks developed from its experience conducting management audits around the United States. In addition, benchmarks have been developed by and are compared to other industry leaders such as Gartner Group as a point of reference. These benchmarks include the following:

- Gartner reports that the average ratio of staff to users for private and public organizations is approximately 5 IT staff to 100 users (“Benchmarks can help determine staff sizes”, February 2005). Gartner also indicates that IT staff are typically allocated amongst functional assignments as follows:
 - Software application development averages 25% of total staff across all industries.

- Software application support and maintenance averages 15% of total staff across all industries.
- Database administration averages approximately 6% of total staff.
- IT production/operations average 15% of total staff.
- Network/Security average 15% of total staff.
- Planning and architecture average approximately 4%.
- Relationship management averages approximately 3%.
- IT administration averages approximately 9%.
- Help desk functions average 8% of total staffing.

It is important to note that the ratios and percentages above represent all industries (i.e. private enterprises, government, and non-profit) and include IT contractors and external service providers.

- Matrix Consulting Group has identified a Best Management Practice for IT staffing for municipal governments which was developed through our experience with local governments across the country. This measure calls for IT staffing to represent between 2% to 3% of total City employment.
- The main difference between the ratio utilized by the Gartner Group and Matrix Consulting Group is that Gartner's survey encompasses organizations in several industries, not just local government. As a result, software production companies and other corporate service organizations are included in Gartner's figure. Matrix's ratio includes only local governments across the United States.

Since the ratios identified above include all City IT staff not just IMS employees, the project team determined the total city-wide IT staffing. Note that IMS employees are broken down by function; other Department IT staffing is listed by position.

CITY OF SALT LAKE CITY, UTAH
Final Report of the Management and Performance Audit of the IMS Division

Department/Division	Function / Position	Staffing Levels
IMS	Application Development Application Support & Maintenance Database Administration Production/Operations Network/Security Planning & Architecture Help Desk Relationship Management IT Administration Total	8.0 8.0 3.0 12.0 11.0 2.7 6.5 2.3 <u>7.5</u> 61.0
Airport	Information Technology Manager Software Engineer II Telecom/Information Manager Network Administrator I Telecom Analyst II Telecom Fiber Tech Total	1.0 1.0 1.0 1.0 2.0 <u>1.0</u> 7.0
Community Development		
CD Administration	Software Engineer	1.0
Planning Division	GIS Specialist	1.0
Transportation Division	GIS Tech II	<u>1.0</u>
	Total	3.0
Fire Department		
Communications Division	Data and Information Administrator	1.0
Police Department		
Administrative Bureau	Senior Tech Support Specialist	1.0
	Technical Support Specialists	<u>5.0</u>
	Total	6.0
Public Services Department		
City Engineering Division	GIS Manager	1.0
	GIS Analyst	1.0
	GIS Specialist	1.0
	Eng Data/SID Specialist	1.0
	GIS Tech II	<u>1.0</u>
	Total	5.0

CITY OF SALT LAKE CITY, UTAH
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Department/Division	Function / Position	Staffing Levels
Public Utilities Department		
Administration	GIS Manager	1.0
	GIS Analyst	1.0
	GIS Specialist	2.0
	GIS Tech II	2.0
	Seasonal GIS Tech I	<u>0.6</u>
	Total	6.6
Total IT Staffing		90.6

As shown above, approximately 36% of the City-wide IT staffing is located outside of the IMS Division. It should be noted, however, that several of the staff listed in the table above, especially GIS and police support staff, could be considered non-IT staff rather than true information technology staff. As a result, for purposes of the staffing calculation, the project team considered only those positions, which have a substantial IT role including: systems planning, development, maintenance, IT related administration, or is primarily involved in troubleshooting or providing help desk type support. Based on these criteria the project team revised the city-wide "IT" staffing numbers:

Department/Division	Function / Position	Staffing Levels
IMS	Application Development	8.0
	Application Support & Maintenance	8.0
	Database Administration	3.0
	Production/Operations	12.0
	Network/Security	11.0
	Planning & Architecture	2.7
	Help Desk	6.5
	Relationship Management	2.3
	IT Administration	<u>7.5</u>
	Total	61.0

CITY OF SALT LAKE CITY, UTAH
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Department/Division	Function / Position	Staffing Levels
Airport	Information Technology Manager	1.0
	Software Engineer II	1.0
	Telecom/Information Manager	1.0
	Network Administrator I	1.0
	Telecom Analyst II	2.0
	Telecom Fiber Tech	1.0
	Total	7.0
Community Development CD Administration	Software Engineer	1.0
Fire Department Communications Division	Data and Information Administrator	1.0
Public Services Department City Engineering Division	GIS Manager	1.0
Public Utilities Department Administration	GIS Manager	1.0
Total IT Staffing		71

The next table below compares current city-wide IT staffing levels to the benchmark ratios identified above:

SLC Users /Employees	Benchmark Ratio	Staffing Needs
1,896/2,917	Gartner Group: 5:100 users	95
1,896/2,917	Matrix Consulting Group: 2% – 3% of total City Employment	58 – 87.5

SLC Users /Employees	Benchmark Ratio	Staffing Needs
Application Development – 13% Application Support & Maintenance – 13% Database Administration – 5% Production/Operations – 20% Network/Security – 18% Planning & Architecture – 4% Help Desk – 10% Relationship Management – 4% IT Administration – 12%	Application Development – 25% Application Support & Maintenance – 15% Database Administration – 6% Production/Operations – 15% Network/Security – 15% Planning & Architecture – 4% Help Desk – 9% Relationship Management – 3% IT Administration – 8%	NA

It is important to note the following regarding the above:

- As shown above, depending on the benchmark ratio used, staffing needs range from approximately 58 personnel to 95 personnel. Based on actual city-wide IT staffing Salt Lake City is within this range. Note that IT staffing is within the range suggested by the Matrix Consulting Group benchmark but understaffed according to the Gartner Group benchmark. It is critical to note that the Gartner Group standard is a cross industry benchmark and is not specific to local government.
- Based on surveys conducted by Gartner the IMS Division has personnel under allocated in application development, support and maintenance, database administration, and relationship management. However, the Division is also over allocated in production operations, network/security, help desk, relationship management, and IT administration.
- While benchmarks are useful for gauging the relative staffing of information technology organizations, staffing is largely a product of service level commitments. For organizations that seek to provide a high level of service to its customers, support a large number of products, and administer a complex system architecture, staffing needs will be higher.

In addition to utilizing staffing benchmarks, the project team evaluated several workload elements to assess the adequacy of current staffing levels. These areas include:

- **The backlog of work within IMS for software development projects.** Based on review of the Department software engineering project list, there are a number of projects outstanding including the migration of the Informix databases to SQL Server. A list of the current backlogged projects is shown in the descriptive profile in Chapter 1.

- **The responsiveness of help desk personnel to work order requests.** IMS tracks responsiveness to customer requests on a regular basis. Data indicate that the help desk is resolving approximately 73% of work orders within one day, 7% of work orders within two days, 10% within two to five days, and 9% over five days. The results of the user surveys also indicated that the majority of users are satisfied with the level of support received from IMS.
- **Staffing levels compared to systems architecture.** IMS supports over 150 in-house developed and vendor procured software programs. While this is a very high number of systems to support, many of these “programs” are reports or queries which interface with other systems. In addition, the number of systems in place is also a product of the software development and acquisition process which is discussed later. In addition, the ratio of computers to help desk support personnel is approximately 337 to 1 (2,192 PCs and 6.5 Help Desk FTEs). This is outside the best practices range of 200 to 1.

Overall, the project team believes that the IMS Division is appropriately staffed given its current service philosophy and workloads. There are however, a number of changes that can be made to application development and acquisition process that can reduce the current workload and need personnel. These include the elimination of duplicate systems currently in place, a change in emphasis to purchasing third party packages instead of developing software in-house, and changing service level targets for desktop support (e.g. changes in the target % of work orders resolved in one business day).

Recommendation: Current staffing levels are a result of the Division’s service philosophy and service commitments relating to applications development. Long term, the City should alter the applications development and acquisition process.

10. FACILITIES

The project team evaluated the current facilities in use by the Division to house IT staff, equipment and infrastructure. This assessment included an analysis of the following issues:

- Identification of current space utilized by the City for IT support, storage, and operations.

- Assessment of the centralization or distribution of IT infrastructure and potentials for consolidation.
- Identification of environmental controls and controlled access to data centers.
- Assessment of the availability of back-up sites with back-up power supplies, internet and network connectivity, and communications systems.
- Assessment of City owned space and leased space utilized for IT support and the potential for cost savings.

The IMS Division utilizes a number of sites to house IT infrastructure. The Division does not however, lease space to provide IT service. Facilities used by the Division are listed in the table below:

Location	Card Access	Keyed	UPS	Generator
Airport	√		√	√
Arts Council		√	√	
Cemetery		√	√	
City & County		√	√	√
Gallivan Center		√	√	
Golf (Forest Dale)		√	√	
Parks		√	√	
Plaza 349	√		√	√
Public Safety	√		√	√
Public Utilities		√	√	√
Sorensen Center		√	√	
Streets/Fleet		√	√	
Water Rec.		√	√	

The project team makes the following observations and findings regarding the use of facilities by IMS:

- All sites utilized by the City for IT support are City owned. The City does not lease any space.
- The City utilizes thirteen locations to house IT staff and equipment. All of these facilities have uninterrupted power supplies and controlled access. In addition, five sites have emergency generators.
- The City has backup internet connections at some of these facilities with routers and firewalls ready.

- The Division has ample space to house its IT staff and equipment and has consolidated the majority of its IT infrastructure.
- While the Division utilizes a number of facilities to house equipment, these locations are needed to provide network services to City Departments.
- While the distribution of resources provides some buffer in the event of a disaster or other emergency, the Division needs an adequate back-up site located outside of the City in the event of a disaster. This site should have internet connectivity, environmental controls, a back-up power supply, and ample space to house operations.

Overall, the City makes effective use of facilities to provide IT services. The Division should however, continue to identify appropriate back-up facilities. With the addition of the new public safety building, the City will have additional sites available for back-up servers and hardware. However, the City and IMS should continue to pursue agreements with agencies outside of the City for a back-up site. The Deputy Director and Security Officer should be charged with this responsibility.

Recommendation: The Division should continue to work to identify potential back-up locations for disaster recovery and secure use agreements.

11. OVERALL, THE DIVISION HAS DEVELOPED AN EFFECTIVE INFRASTRUCTURE ENHANCEMENT AND REPLACEMENT PLAN.

IT organizations need to plan for the routine maintenance and replacement of hardware, software, and infrastructure to provide high levels of service to customers. This requires organization to prepare near term and long term planning documents to estimate costs and equipment needs. Additional elements of an effective technology plan include:

- Developing replacement costs for network infrastructure including: application and file servers, physical wiring, and communications equipment.
- Developing replacement costs for PC hardware, software, peripherals, and other equipment.

- Developing appropriate replacement cycles to ensure advances in technology can be leverage and system maintenance can be mitigated.
- The Development of timeframes and schedules for acquisitions.
- Prioritization of infrastructure replacement needs.

The following describes the current process utilized to plan for technology replacement in Salt Lake City's Information Management Technology Division:

- The Division has established a Network Architecture Committee which develops a 5 year architecture replacement plan which includes:
 - Identification of hardware/software in need of replacement with cost estimates.
 - Identification of communications and physical wiring in need of replacement.
 - Identification of development technology needed to improve developed systems.
 - Identification of additional functionality needed including network maintenance and monitoring tools and other enhanced functionality.
 - Prioritization of the plan.
- IMS has standardized the PC environment through implementation of the PC Rental Program. Approximately 95% of City users participate in this program. This program also provides a PC refresh system which replaces desktops every 3 years, printers are replaced every four years, and monitors every five years.
- The Division has effective policies and procedures in place to track purchasing and inventory of computer equipment and other hardware.

While the City has a number of effective methods in place to replace technology infrastructure, workstations, and peripherals, the Division does not routinely conduct lifecycle analysis of existing systems. There are some systems in place that have outlived their useful life cycle. For example, the City still uses a C prompt work order system (Burke Work Order System), and has a large list of applications which may not

have been reviewed for years. Consequently, the project team recommends implementing an application review process consisting of the following elements:

- Technology Consultants should document systems in place within each Department and their level of utilization.
- Every two years, the Technology Consultants and or Software Engineers should review the list of systems utilized with each Department to evaluate its usefulness. Systems that have been in place for extended periods of time (e.g. 10 years) will be identified for replacement based on customer needs.
- Technology Consultants and or Software Engineers will make recommendations on new software solutions and prioritize these replacements.
- Large systems that potentially impact multiple Departments should be reviewed and approved by an IT Steering Committee.

In sum, the City and IMS should formalize the current approach to software replacement.

Recommendation: The IMS Division should formalize its approach to software replacement and lifecycle analysis. The Division should establish timelines for reviewing software in use by Departments and evaluate system usefulness. The Division should make recommendations for replacement of outdated systems.

12. BILLINGS TO USERS

The IMS Division operates as an internal service fund. This means that personnel, operating, and capital costs are allocated to the user Departments within the City to recovery costs. Cost allocation models or “charge back” systems are effective ways to provide service and ensure accountability for IT spending. The current charge back system utilized by IMS operates as follows:

- The IMS Division operates the Corporate Computer Equipment Rental Program whereby city departments can pay monthly fees for desktop computers, monitors, printers, and other equipment. These charges are billed directly to the respective departments. Each piece of hardware has a replacement cycle: PCs are replaced every three years, laptops every three years, monitors every five years, printers every four years, etc. IMS purchased inventory directly from the vendor and

charges a rental fee to each Department. Examples of the current costs for various equipment is as follows:

- Flat Panel Monitor (17") \$8.50 per month (\$102 per year) including maintenance.
 - HP DC7600 Desktop (3 year term) \$34.00 per month (\$408 per year) including maintenance.
 - HP DC 7600 Desktop (2 year term) \$50.00 per month (\$600 per year) including maintenance.
 - HP Laser Jet Printers (4 year term) \$42.00 to \$69.00 per month (depending on model) including maintenance.
 - Maintenance is provided on equipment purchased directly by Departments at a cost of \$12 per month for PCs and \$5 per month for printers.
- IMS personnel time allocation reports are generated to determine the percentage of time spent providing network services and software engineering for general fund or non-general fund departments (e.g. Public Utilities, Airport, Fleet, Golf, Sanitation, and Redevelopment).
 - Network Administration cost allocations are determined by summarizing all costs for Network Administration (salaries, benefits, equipment, services, etc.) and then allocating these costs based on number of PCs supported by division. Costs are allocated to the general fund as a lump sum, while costs to enterprise funds are allocated by department.
 - Software Engineering costs are allocated based on percentage of time spent by IMS personnel engaged in software engineering (this may include technology consultant, web team personnel, software engineering, and security/UNIX personnel). Personnel assigned to the Airport and Public Utilities are broken out separately. The total number of hours spent servicing the general fund, and non-general fund departments are calculated and multiplied by the annual labor rate (typically the network annual labor rate which is equivalent to total annual network costs divided by the sum of employees providing network support).
 - Annual telephone cost allocations are done as follows: An updated report is generated from Order Pro for each Salt Lake City Division/Department identifying all lines, modems, equipment, special circuits, DSL, T-1 maintenance, or time and materials associated with the Division/Department. Charges are allocated directly to each Division/Department.
 - Other support costs are allocated directly to Departments/Divisions based on usage and or benefit. Examples of these additional services provided include:

imaging, support of non-core software, support of hardware not purchased through the Computer Equipment Rental Program, training on non-core software, and others.

The project team makes the following observations and findings regarding the current cost allocation model:

- **The current approach of leasing computer equipment is effective.** The current approach makes computer equipment replacement predictable and easier to budget for, and provides Departments with a consistent estimate of computer replacement costs. It also minimizes maintenance needs and ensures that each department makes use of current technology. It is also important to note that this approach was recently improved to ensure that equipment was fully depreciated to provide adequate reserves for continuing purchase of new equipment.
- **While it is appropriate to charge network services to a non-department specific line item in the general fund, software development typically benefits a specific department, while network services benefits the City as a whole.** Network services typically consist of maintaining servers, user accounts, and connectivity to the City's network. As a result, there are general benefits from network administration. However, software development typically benefits one Division or Department. As a result, software development costs should be born by the Department receiving the service.
- **The current approach creates an incentive for general fund Departments to have software developed in-house since they are not directly charged for Software Engineering projects.** When Departments are presented with the option of developing an application in house or purchasing a solution from an outside vendor, they are presented with the option of budgeting for additional dollars for purchasing a package system or not incurring any costs by developing a system in house. As a result, there is an incentive to build vs. buy.
- **The Division does not utilize actual time spent on Software Engineering to calculate Department allocations.** The IMS Division uses estimates of time spent working on various projects for Department and allocates personnel costs based on those estimate. However, the Division has a timekeeping system in place which tracks actual time spent on projects. If Departments were charged directly, the Division would need to begin utilizing actual time spent on projects. This approach would also ensure that accurate buy vs. build costs are available and timelines are accurate.
- **All other charges are billed directly to users.** These include telephone services, repair charges not covered by the PC rental program, specific

equipment purchases, and maintenance agreements for software used by specific Departments.

The Division should change the current cost allocation model to bill the direct cost for software development. This approach will improve accountability for software development by accurately reflecting the true costs of in-house development systems and provide accurate measurements of time spend on projects. The table below shows the estimated direct costs of software development and support to each Department/Division in the City.

Department/Division	Hours	Billing Rate	Amount	Percentage
Airport	1,558.41	61.10	95,222.92	5%
Attorney	99.00	61.60	6,098.40	0%
Community & Economic Development	1,754.50	61.89	108,579.08	6%
Council	40.00	61.60	2,464.00	0%
Fire	350.25	61.60	21,575.18	1%
Management Services - Access Maintenance	479.00	61.92	29,659.58	2%
Management Services – Accounting	1,354.00	61.99	83,933.56	4%
Management Services - Admin Enf. Office	416.00	61.90	25,751.18	1%
Management Services - City Justice Courts	1,131.00	61.64	69,719.28	4%
Management Services – Dir. of Mgt. Services	31.00	61.58	1,909.00	0%
Management Services - Human Resources	577.00	61.77	35,639.80	2%
Management Services - IMS***	13,450.00	61.81	831,319.22	42%
Management Services - Policy & Budget	8.00	61.60	492.80	0%
Management Services – Purchasing	972.00	61.98	60,245	3%
Management Services - Real Property	27.00	62.47	1,687	0%
Management Services - Recorder's Office	8.00	61.60	492.80	0%
Management Services – Treasurer	596.50	61.68	36,789.22	2%
Mayor	87.00	61.73	5,370.24	0%
Police	4,573.75	61.79	282,618.26	14%
Public Services	1,047.50	61.90	64,837.44	3%
Public Utilities	3,150.10	61.76	194,538.30	10%
Total	31,710.01	61.78	1,958,941.96	100%

*** Include vacation, sick, training, meetings, administration and other leaves

As shown above, the potential cost increases range from \$492.80 for the Recorder's Office to \$282,618 for the Police Department. Note that Airport and Public

Utilities are shown in the table above. However, these Departments are already directly charged for software development services.

Recommendation: The City should modify the current cost allocation model for software engineering costs. Software engineering costs should be billed directly to user Departments (both General Fund and Enterprise Funds). The current charge back model should be changed to eliminate incentives to developing software in-house. This approach will make the Division more accountable for providing this service by identifying the true cost of in-house software to Departments.

Recommendation: The overall level of 'cost recovery' targeted should be determined by the City in conjunction with the re-constituted user committee.