

City of Royal Oak

Information Systems Projects, Priorities and Issues

Overview

It is a challenge to develop a technology plan that has enough foresight to envision the future. The plan needs to anticipate what new technology will be available and applicable to the City's needs, and to provide adequate funding for these improvements. It is important to review the plan periodically and to make it flexible enough to adapt to changes along the way.

Funding for technology projects is always an issue. Purchasing technology products (fixed assets) and charging for depreciation over a period of time is an acceptable accounting practice. A formalized charge-back system allows us to track usage and accountability to those departments utilizing the services. Planning to implement large-scale technology projects can only be accomplished by saving money year-to-year or if the project is big enough, you can try to treat it as a full capital improvement project and allocate the funds accordingly. Funds allocated but not spent on projects in any given year are considered retained earnings for investments in technology projects to be completed at a later date.

This list of projects, priorities and issues is divided into high, medium, and low priorities, based on the urgency of the issue. Some of the issues are closely inter-related and can be addressed at the same time (at least in the planning phases).

Specific department goals and objectives are as follows:

Goals:

- Provide the City with cost-effective, dependable and accurate information services, which support both current and future business needs and strategies.
- Provide in-house training for IT security and Computer User Policies, Content management system for web site updates, and document and email retention.
- Develop and maintain an effective telecommunications network (both data and voice).
- Encourage professionalism, development of skills and ownership of information systems both at the staff level and the end-user level.
- Utilize low-cost and free training opportunities for staff development.
- To proactively find ways to promote meaningful, open and respectful dialogue that ensures effective decision making.
- Maintain appropriate levels of network security to protect the City's critical business systems from security threats.

Objectives:

- Develop and maintain an organization structure that is technically and functionally competent to respond to information systems requirements.
- Prepare specifications for technology solutions, analyze proposals, make recommendations, and implement those solutions as deemed appropriate.
- Build a better understanding of information systems through IT security and user policy training.
- Work to promote efficient delivery of beneficial services during the City Hall modification plan by providing and facilitating responsive technology support before during and after the changes.
- Provide the capability for direct user access to information and resources on the City's website through content management system training and documentation.
- Work with community groups and neighborhoods through online resources, promotion, and publication of community events and family activities on the website.
- Promote customer feedback system on the City's Website on a continuous basis.
- Develop a centralized public notices area on the City's Website.
- Explore live streaming of various public meetings.

Planned projects (pending availability of budgetary resources) include:

- Internal training programs for IT security and computer usage, website content management system updates and procedures on email retention with document management.
- Replacement of core business financial application software.
- Web server upgrades for content management, addressing online service capabilities and improving public access for conducting business with the City of Royal Oak over the Internet.
- Active Directory migration, integrated email/notification/calendar/scheduling Software and automation of email archiving.
- Continued efforts to replace older servers, increase file storage capacity and upgrades/replacement of obsolete computers at all locations including the Library and the Senior Center training facility.
- Continued upgrades and replacements to internal network switch equipment with emphasis on increasing the bandwidth capacity of the infrastructure.
- Online Recreation program and class registration.
- Court digital audio recording system; Replacement of antiquated tape system.
- Fire station laptops and software application – enhancements over County System.
- Mobile workforce implementation for code and building department personnel.
- Improvements to document imaging and work-flow applications.
- PBX upgrades and Voice mail system replacement and unified voice and fax messaging capabilities.
- Implement City-owned wireless voice and data connectivity between City Hall and the senior centers, ice arena and the DPS. This would provide increased bandwidth and lower the overall cost of communication lines between buildings.

Projects Budget Summary

Project / Work Description	Total Budget	FY 2008-2009	FY 2009-2010	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014
Content Management & Response Mgt	51,720	(26,000)	(10,000)	(15,720)	0	0	0
Financial Mgt System - Phase I	300,000	0	0	(300,000)	0	0	0
Financial Mgt System - Phase II	150,000	0	0	0	0	(150,000)	0
Financial Mgt System - Phase III	0	0	0	0	0	0	0
Computer Replacement Program	215,207	(57,937)	(17,270)	(35,000)	(35,000)	(35,000)	(35,000)
Server, Network, Cabling Infrastructure	187,200	0	0	(116,200)	(32,000)	(22,000)	(17,000)
PBX, Voice Mail, & T1 Strategy	140,000	0	0	(55,000)	(40,000)	(45,000)	0
Water Meter Rading Handhelds	21,000	0	0	(21,000)	0	0	0
Mobile Workforce	12,200	0	0	0	0	0	0
Digital Audio Recording System-Court	2,000	0	(2,000)	0	0	0	0
Recreation Class Registration	10,000	0	(2,000)	(2,000)	(2,000)	(2,000)	(2,000)
GIS, CAMS, Fire, Clerk, Eng and Misc.	143,000	0	0	0	0	0	(143,000)
	1,232,327	(83,937)	(31,270)	(544,920)	(109,000)	(254,000)	(197,000)

High Priority Issues

▪ **Embrace or Replace GEMS applications (Financial, H/R, Payroll, Water Billing, Vehicle Maintenance/Motor Pool).**

The primary City business software applications are part of the GEMS software package, which was purchased in 1998 and was a much needed replacement over the previous financial software system. GEMS has been patched and upgraded through the years including a server upgrade in the last quarter of 2004. While GEMS has been transitioned to a browser/web-based system making it easier to support in the technical sense, is still not an all encompassing solution for every pressing need the City has for automation or integration of business processes.

Employees from the original installation and training are no longer employed in the Finance department and current staff has not been adequately training in using the system. The system is very cumbersome to use and difficult to learn because of the sheer number of modules and applications. More than ten years of history and transactions are stored in the system which is contributing to poor performance, response and usability of the system. Users are frustrated with the performance and the ability of the system to easily provide adequate reporting and statistics. Many desirable features like printing, custom report generation, detailed account activity access, grant tracking, budget preparation, point-of-sale (POS) cash receipting, document imaging, and other business interfaces are simply lacking or not usable within the current system. Even a simple process like retiree W2 processing requires a great deal of manipulation to produce accurate results. Some key interfaces which should be seamless are missing between the (POS) operations in Treasurer and Clerk's office and the water billing operations and the cash receipting system in GEMS. Standard processes like budget processing and projections are not easily available and are a burden to manage within the system.

The Motor Pool department purchased Dossier Vehicle Maintenance software from Arsenault, because they could not continue to use the GEMS system efficiently, thus they no longer have any direct interface with GEMS for vehicle maintenance and work orders. Additional software application purchases in the recent past have been for permits, code enforcement, business licensing and dog licensing, which also do not directly interface with GEMS. This does cause some additional work to produce an accurate accounting of those functions.

The most important benefit of replacing the GEMS system can be realized by current employees gaining first-hand knowledge through direct involvement in training and conversion work. Converting to another system is a major commitment and employees will spend hundreds of hours learning and working with the new system, thus enabling them to be more proficient with the applications. The City's core business software applications should work for us, not against us.

Recommendation:

This implementation has been talked about for at least five years now, but the project has been delayed due to scheduling and priority changes, potential City Hall renovations and consolidation, and budget constraints. The annual licensing and maintenance contract expires March 2011, so the current plan is to have the software install, data conversion and training completed the end of January 2011 and testing completed by March 2011. This is an aggressive plan and will take a great deal of staff time and commitment to be successful. Current RFP results will be forthcoming and we will have current and accurate pricing information and application comparisons from software vendors. Core business software applications of this magnitude can cost upwards of \$3,000,000. \$300,000 is on the low end for estimates.

Financial Management System Replacement	Est. Cost	Total
Replace and upgrade City's Core Business Systems		
· Financial System; Ledger, A/P, A/R, Purchasing, Budget, Cash Receipt, etc. (Phase 1)	450,000	
· Payroll and H/R Systems (Phase 2)		
· Water Billing and Meter Inventory Systems (Phase 3)		
Total:		450,000

- **Infrastructure Replacement and Aging Servers**

All of the primary and backup domain controllers are more than 10 years old and are running unsupported operating system software, the hardware is unsupported, performance is poor, and disk space is inadequate. The department files have been migrating to another storage server over the last five years to accommodate adequate growth and storage limitations. Security enhancements are not available for the OS versions, which is the biggest risk. Portions of the network infrastructure at City Hall and the Police building are aging and are points of failure. Many instances during the day, the network traffic is bottlenecked due to bandwidth limitations, and causes interruptions and loss of connectivity and in some instances, loss of data and work.

Recommendation:

Eliminate the risk of using unsupported domain controllers which are also lacking in performance and storage. About two-thirds of the network is using 10 year old, 10 Mbps switches. Upgrading the switches is relatively inexpensive and requires no complex software reconfiguration.

- **Upgrade path for network OS, file/print and directory services**

Because Windows NT4 Server is no longer available with new server purchases, this project is closely tied to the Aging Servers issues. Installing Windows NT4 Server on new server hardware isn't an option, Microsoft and any hardware vendor would not support the configuration, and drivers for current hardware are not available. The City made a successful transition in 1998 from a mainframe and Netware 3.x network to a PC based Windows NT4 domain network. The end of life for Windows NT4 was passed as of the end of 2004.

Recommendation:

This issue must be addressed as soon as possible. The Windows NT4 flat domain structure provides limited capabilities as a directory server and has worked well for the Royal Oak network with less than 500 nodes. Mandatory server enhancements are missing with NT4 which is a major concern in regards to security and network performance. It is holding the City back from systems integration with unified messaging, email and voicemail systems.

A natural upgrade path would be a current Windows Server (2008). A Windows Server deployment (other than as a member server) requires use of the Microsoft Active Directory (based on LDAP) that brings with it new features and an increase in complexity and cost. Active Directory provides a scalable solution for very large business networks. Many of the newer software applications are written to take advantage of beneficial features of Active Directory.

There are several options available to the City regarding the platform strategy over the next 5 years. These include (but are not limited to):

1. Upgrade servers to Windows 2003/8 and Active Directory and DNS
2. Upgrade servers to Linux/Samba, which retains the NT4 domain structure.
3. Upgrade servers to an OpenLDAP directory, which integrates with Linux/Samba file and print servers.

Each of these choices will require upgrade, replacement and/or integration work to be done on all PC clients, the e-mail system, and existing windows servers.

- **Aging desktop PCs not being replaced**

The desktop replacement program has slowed due to budget constraints. Only 20 new desktops were ordered during the 2002-03 fiscal year and many have surpassed their end of life expectancy. We were fortunate enough to be able to purchase 29 computers for the Library in April 2004 and another 29 computers for the Court through a Judicial Information Systems grant program from the State of Michigan. All of those systems are in need of repair, replacement, or upgrades. Over the past three fiscal years, a total of \$75,000 was spent on 128 replacements; 78 units for \$58,000 and 50 units for \$17,000. Most of the replacements in the last fiscal year were recertified units purchased at a fraction of the cost of new.

Recommendation:

One of the primary goals stated by the I.S. committee in 1998 was that a 20% rolling desktop replacement program be initiated to prevent a future situation where wholesale PC upgrades would be required. Continue with the purchasing of recertified units and try to stay as close to the 20% upgrade program as (60-80 PCs/year) the budget allows.

▪ **Aging Desktop OS and Office software**

The older production desktops are running Windows NT4 or Windows 2000 and Office 97 or Office 2003. The goal is to standardize on one version of software whenever possible. Windows XP Professional sp3 and Office 2003 is currently the standard although this is still several versions behind. Supporting multiple versions of software is difficult. We are deploying file format software for compatibility issues between MS-Office releases allowing us to open 2007 and newer documents with our older releases, which will extend the life of our current software.

Recommendation:

This standardization problem is self-correcting over time if the desktop upgrade plan and funding continues. Another option is the use of Linux as a desktop OS and OpenOffice as a MS-Office replacement. This has the potential to save the City licensing fees in the future, but such a decision would risk compatibility issues and loss of certain advanced features currently used in the financial arena.

Computer Replacement-Aging Servers

	Est. Cost	Total
Server and Workstation Replacements: Hardware and software		
· Computer Equipment Replacement/Upgrade Program (6 years)	215,200	
· Migrate from NT4 domain to active directory domain authentication	40,000	
· Internal DNS server, Windows 2003/2008, Mail Server	60,000	

Router, Network, and Cabling Infrastructure

Network switch replacements/upgrades (age of equipment is a major factor):	87,200	
· Router upgrade and monitoring of connectivity issues		
· Replacement of 10mb switches with 100mb/1Gb switches		
· Cabling Replacement		
· VOIP expansion Capability		
Total:		402,400

Medium Priority Issues

▪ **PBX and Voice Mail System**

Recommendation:

Both pieces of this system are of the 1998 vintage and both are still running. If we have a major issue with our PBX, we will be required to apply mandatory PBX releases and updates to recertify the system before a qualified vendor will be able to provide service. This is one of the most important fixed asset systems within the Information systems fund. We are running a high-risk environment by letting the maintenance and service levels drop below acceptable standards, and this should not go unaddressed for much longer. The voice mail system is a very basic system and is not upgradable. Any request for additional features relating to modern uses or unified messaging, will require replacement of the voice mail system altogether and installation of the mandatory PBX updates.

▪ **T1 Strategy – City Owned Wireless System**

Recommendation:

The T1 strategy is closely related to the PBX system because about 50% of the cost for leased lines is for the phone system. Ideally, we would own all of our communication lines. Royal Oak owns fiber cabling connecting City Hall to the 44th District Court, Fire Station 1, and the Library. The Senior Community Centers (M&M, Salter), Ice Arena and the DPS are tied into the City's wide area network via leased T1 lines at speeds of 1.5mb. A wireless system purchased by the City would eliminate having to pay for leased lines. Cost pay-back could be realized in less than 4 years.

PBX & Voice Mail System	Est. Cost	Total
Mandatory PBX releases and updates	55,000	
Voice Mail replacement and upgrade:	40,000	
· Hardware replacement		
· Unified Messaging		
· Software upgrade		
T1 Strategy - City Owned Wireless	45,000	
· T1 for Internet Access, Web site, and email (independent vs TLN shared)		
· Voice and Data T1's to Senior, Ice, and DPS; capacity and speed issues		
· Combine Ice Arena and Senior Center voice and data connection		
· Digital wireless / Microwave; options with City radio dispatch system		
Total:		140,000

▪ **Water Meter Reading Handhelds**

Current units have failed to register accurate read dates. Manually initiated data conversion has to occur on a weekly basis to fix the erroneous read dates. The units are old and parts availability is limited by the manufacturer, who also recommends replacement.

Recommendation:

Units should be replaced as soon as possible with devices designed to record visual reads and wireless reads. Some amount of conversion and format work will occur to interface with existing billing system.

Water Meter Reading Handhelds	Est. Cost	Total
· Immediate Software application upgrade (Fix to date convert problem)	2,000	
· New handheld devices, attachments, billing software mods		
- 4 units @ 4,300 per unit + 1800 for software mods	19,000	
Total:		21,000

▪ **Social Media Networks**

Nationally, social media tools, such as Facebook, Twitter and other tools, provide immediate and responsive benefits to residents and businesses alike. Our strategy is to provide the community an inexpensive and highly effective tool for communication and feedback. Current successes with the Royal Oak Farmers Market, Royal Oak Public Library and the recent Google Fiber project have garnered positive and useful feedback.

Implementation is not without implications, so these tools must be deployed in a responsible manner. Proper policies and procedures and use of social networking sites must be adhered to.

Recommendation:

Continue with implementing these tools for the City, Recreation, Police, and Senior Community Center. Assign the main responsibility as a lead role and priority for continued development and sponsorship to the IT person well versed in this area. This project has minimal monetary cost associated to implement.

▪ **Content Management and Response Management Systems – Web Server**

Internal training for website content management will provide the necessary skills to end-user departments to directly access and update their own content instead of relying on IT personnel to do it for them. The public response management system hosted by WebQ&A has been a great step in the right direction for allowing residents and businesses the ability to submit and track their own questions and service requests. The back-end process needs work and at time can be extremely cumbersome and slow to the point where it is unusable.

Recommendation:

Continue with using existing 3rd party vendor, while implementing and customizing a better tool which can be integrated with the website and perform much faster.

Content Management & Response Mgt - Web Server	Est. Cost	Total
· Web Server - Upgrade and Migration 80% completed	0	
· Content Management Development & Training	0	
· Citizens Response Management solutions	9,720	
· Redundant access and availability / Backup solution	6,000	
Total:		15,720

Low to Medium Priority Issues

▪ **Mobile Workforce Application**

Mobile workforce implementation for ordinance enforcement and building department personnel was designed around laptop usage in the field. The idea is to increase access to database systems and increase productivity by allowing inspectors and enforcement personnel to remain in the field longer.

Mobile Workforce	Est. Cost	Total
· Upgrade BS&A to new dot net version - Summer 2010 Release (should be provided with original agreement)	No charge	
· Mobile / Wireless Broadband implementation with Laptops for inspectors and enforcement officers. Field Printing. Wireless cost = \$50-60/Month per unit; 10 units = \$600 - 720 / mo. Annual cost for 10 units: \$7,200 - \$8,640	7,200	
Laptops: netbook with extended warranty ~ \$500 x 10 = 5000	5,000	
Total:		12,200

- **Court Digital Audio Recording System**

Recommendation:

Replace antiquated tape library system with digital system.

Court Digital audio recording system

2,000

- 2 workstations; one for each court room to interface with audio system
- Equipment interface and software installation and employee training

- **Online Recreation Program and Class Registration System**

Recommendation:

Provide online class registration and payment system. Implementation is in progress.

- **Fire Station laptops and software application**

Additional laptops are being requested for assistant chief and EMS coordinator. 4 laptops for fire software application via grant funds have been purchased.

Recommendation:

Provides some enhancements over current County System. Implementation is in progress, pending staffing and funding availability.

Fire Station Requests

- Laptops for assistant chief and EMS coordinator.
- 4 Laptops for fire software application (toughbooks).

	Cost Est.	Total
	3,000	
	10,000	
Total:		13,000

- **Improvements to Document Imaging and work-flow process**

This project involves process review of key functional areas as identified by user review. One such area identified has been the accounts payable processing and work-flow process.

Recommendation:

Depending on time availability and commitment, the paper trail in the A/P process could be improved and become more efficient. Documents such as invoices can be scanned into the system and be automatically routed for approval and filing. Auditors can easily locate these documents at a later date without the manual process of retrieving or accessing physical filing systems. Digital storage systems take up much less space.

Long Term Strategic Goals

▪ **Migration of data to open formats**

The State of Michigan mandates that data stored in document imaging systems be stored in a open, documented, industry standard format so that it will not be lost if the vendor goes out of business, if the software becomes too expensive to maintain, and other reasons. This philosophy should be applied to data in the City.

Recommendation:

For now, much of the City data is stored in proprietary formats like Microsoft Office (Word / Excel / Access / Powerpoint). Often, conversion utilities are available to convert existing data from one format to another, but loss of formatting or loss of actual data can occur. The ultimate goal is separate the data from the program that produces it. This frees the City to choose among different tools and different platforms to manipulate the data in the future, and in many cases, makes it easier to exchange the data with other governments, businesses, and residents. The following are examples of open, well-documented formats:

JPEG, TIFF, PNG (images)
ASCII TEXT
OpenOffice XML
Adobe PDF
HTML
MySQL or Postgres DB

▪ **Move data to a Storage Area Network (SAN)**

Storage Area Networks technology allows the separation and sharing of physical storage (disks) from the servers. Data is typically served across a very high-speed network. This separation allows much more flexibility in performing backup and restores operations, server upgrades, and space management.

Recommendation:

The cost of SAN products has been steadily dropping and it is very feasible to implement a SAN for the City. This application works best over high-speed connections. Begin testing the application at the Fire station for case/incident picture storage.

▪ **Geographical Information System (G.I.S.)**

Royal Oak has been able to take advantage of the County's investment in GIS. (Oakland Co. - Mid 1990's Invested tons of money; Rochester & Waterford - Developed independently and spent a lot of money as well). Some of the tasks that Oakland County completed were:

- Remonumentation
- Aerial Photography - The county has completed two fly-overs.
- Standarization of Data Formats - across agencies
- Standardization of Data Layers -
 - Property Ownership
 - Water system - mains, shutoff's, service locations
 - Sewer system - manholes, drain relief, cross-connects to other systems
 - Street lights
 - Intersections
 - Law enforcement
- Example of data layer: Parcels / Properties data; the data format is the property information - owners name - Last name, first name; addressing - street name spelling (12 Mile Rd, Twelve Mile Road, 12 Mile, etc.)

Royal Oak's commitment of resources to GIS can be as much as we want it to be, but it does come with a cost/benefit ratio. The benefits are great, but it costs money. We are currently using GIS in the Planning department and in Information Systems on a very limited basis. More and more application requests come to the Planning department either for mapping of instances (i.e. rat sightings), DDA issues, Zoning Board issues, and Plan Commission issues on a regular basis. The Engineering department has an almost unlimited use for GIS applications, but has had little or no time to commit to it. Many cities have a dedicated person or a small staff to develop, maintain, and implement GIS applications and the infrastructure to deliver it.

Recommendation:

With adequate funding the City should expand and upgrade its current investment in GIS and build on the relationship with Oakland County.

G.I.S.- Geographical Information Systems commitment of resources:

130,000

- ESRI Software upgrades
- Planning department computer upgrade
- CAMS integration with Oakland County
- Engineering GIS training

▪ **Information Systems - Formalized Chargeback System / Cost Allocation**

Information Systems is an internal service fund. It was established to account for the financing of automated goods and services of all City Departments and agencies, on a cost-reimbursement basis. Some of the benefits of operating Information Systems as an internal service fund are:

- Provides the ability to track the total cost of computer information systems
- Provides the ability to cost and price individual component services
- Provides the ability to accumulate resources/funding for equipment replacement

There are two ways to treat the cost of the IS function:

- Part of overhead cost: General shared expense (previous method) or
- Chargeback system: Units charged for services

A chargeback system isn't perfect, but including a ticket tracking or cost tracking system will assist in building a better chargeback system. This will allow us to be better prepared to organize the cost of Information Systems services.

Reasons for implementing chargeback:

- Encourages departments to utilize Information Systems efficiently. They'll be able to determine and identify specific costs associated for each service they use.
- Establish cost recovery methods that are incurred from outside service providers (data communications, Internet, telephone, software licensing, etc) and accurately spread the cost based on usage.
- Build recovery cost for replacement of fixed assets, especially for larger cost items and projects.

Recommendation:

Continue developing strategy and rate structure that will be competitive and cost-effective.