Performance Audit

CITY INFORMATION SYSTEMS

Report by the
Office of City Controller

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July 21, 2011

To the Honorables: Mayor Luke Ravenstahl and
Members of Pittsburgh City Council:

The Office of City Controller is pleased to present this Performance Audit of ***City Information Systems (CIS)*** conducted pursuant to the Controller's powers under Section 404(c) of the Pittsburgh Home Rule Charter. This audit assesses the effectiveness of the CIS Help Desk, CIS contract usage and City network security.

EXECUTIVE SUMMARY

City Information Systems (CIS) is responsible for all City government information technology functions. CIS plans, acquires, installs and supports the City's proprietary and open computing environments, including personal and mobile computers. CIS also develops software programs for Public Safety, Finance and other departmental initiatives, provides network services, develops and maintains the official City website and trains City employees in Microsoft Office applications.

Findings and Recommendations

Budgetary Trends

Finding: The CIS budget for miscellaneous services has increased annually over the past 5 years from $1,137,515 in 2006 to $1,668,724 in 2010. The main reasons for the increase are IT (information technology) services outsourcing and money needed for supplies and equipment.

Recommendation: CIS should work with the Budget Office to revise its budgetary allocation for equipment and supplies. Reducing the miscellaneous services line item and increasing the line items for equipment and supplies would more accurately reflect the amount CIS spends in these categories.

Help Desk Performance Analysis

The Help Desk provides direct support to City computer users for a variety of hardware and software products.

Finding: In 2010, twenty five percent (25%) of help desk inquiries were resolved the same day. Two thirds (65%) of problems called into the Help Desk were resolved within one week.

Finding: Timeliness of problem resolution is in large part dependent on the type and complexity of the problem.

Finding: The wait time for an onsite technician is also a factor of departmental priority. Public Safety is the department with highest priority due to the possible life threatening nature of its calls for service and the only City department with 24/7 CIS support.

Finding: Help Desk performance data provided by CIS includes call number, date open, date closed and summary of the problem. 'Summary of the problem' is not described consistently or in the same format. As written, Help Desk performance data is not useful for identifying problem trends or problem frequency.

Recommendation: CIS should consider using a code system in addition to "summary of the problem" in its Help Desk database. Sorting by code would facilitate identifying problem trends and problem frequency.

Help Desk Response Time by City Department

Finding: In 2010 the CIS Help Desk received 4,970 inquiries from 27 Departments, and 15 calls from unknown Departments for a total of 4,985 inquiries. The Bureau of Police had the most calls with 1,546 calls for 31 % of the total calls.

Finding: In 2010 the percent of Police calls resolved the same day is higher than the City average. Forty percent (40%) of calls from the Police were resolved the same day compared to 25% of all City calls.

Help Desk Staffing

Finding: CIS currently has 4 employees assigned to the Help Desk. To comply with the industry median help desk staffing ratio, CIS should have 16 help desk staff available for the 1225 persons with "current licenses from Microsoft". Complying with this industry median would require assigning 33% of CIS computer staff to the Help Desk.

Recommendation: CIS should consider adding more staff to the Help Desk. Additional Help Desk support staff could shorten problem resolution times. Having additional staff to dispatch could shorten the queue of persons waiting for onsite assistance.

Finding: The Police Bureau Network Analyst 1 cannot address all network problems. A Network Analyst 3 from CIS must be dispatched 24/7 for network problems.

Recommendation: The Department of Public Safety should add a Network Analyst 3 (NA3) to the Police Bureau budget. Assigning the NA3 to a nighttime shift would expedite response time by eliminating the wait for a CIS staff to be dispatched from home.

CIS Staff Retention/Turnover

Finding: Over the last five years (2006-2010) CIS staff turnover greatly varied from 5% to 33% per year.

Finding: The year with the highest turnover rate was 2007. In 2007, thirty three percent (33%) of CIS employees left the department for a better job opportunity; transfer to another city department, retirement or for personal reasons.

Finding: In the last 5 years, nearly half (49%) of the 47 employees that left the CIS department did so for better employment.

Finding: Seeking better employment could be construed as seeking a higher salary. The percent of CIS staff that left for this reason is much lower than CIS' assertion that '99%'of people leave the department because of low pay.

City-County IT Compensation

Finding: County application developers are paid an average of $18,883.55 more than City employees but some comparable City positions have higher pay. The City Information Security Analyst is paid $17,298.35 more than the equivalent County position, the City Database Administrator is paid $7,759.06 more and the City Web Developer is paid $4,324.96 more than their County equivalents.

Finding: The County Chief Information Officer (CIO) is paid significantly higher ($8,313.08) than the City CIO and the County Deputy Chief Information Officer is paid more ($1,757.17) than the City Assistant Director.

City and Private Sector IT Compensation

Finding: The 2008-2009 average private sector annual base compensation for IT positions was higher than comparable average City salaries.

Finding: Annual bonuses widen the gap between private and public sector compensation.

Finding: The lack of private sector benefit information qualifies the above comparison.

Recommendation: CIS administration should emphasize the non-compensatory benefits of City employment to new hires that are offered in addition to base salary. Benefits that should be emphasized are health, dental, eye care insurance benefits with low or no employee monthly contribution, tuition benefits, defined pension, paid holidays, vacation and personal days and flexible work schedule at CIS.

Contract Usage Analysis

Finding: CIS does not have any formal cooperative agreements with the State or County that require CIS to use State or County contracts for specific services or commodities. However, CIS extensively piggybacks on existing State contracts in lieu of pursuing its own contractors.

Finding: Nearly three quarters (72.6%) of CIS 2009 contracts and over three quarters (77.7%) of CIS 2010 contracts were State contracts.

Finding: Cost savings from piggybacking onto State contracts are not limited to CIS. Other departments involved in the contracting process would also see cost savings such as the Department of Finance that composes the final contract document.

Finding: Equipment purchases from existing State contracts sometimes arrive with software and components not needed or already in stock. CIS pays for not needed components as part of the purchase price then purchases the appropriate software. Staff time is taken up to uninstall and install software.

Recommendation: Piggybacking on existing contracts can result in a variety of cost savings. However, CIS must ensure that the terms and specifications of State contracts meet the City's needs without requiring major modifications by CIS and additional costs.

Finding: CIS is not obligated to use State contracts for the remainder of the contract term.

Recommendation: To ensure the department is getting the best price, CIS should issue its own Request for Proposal or quote request for selected services and equipment and compare the prices to those in comparable State contracts.

Telecommunications Contract

In 2009 and 2010, CIS paid Verizon $ $238,823.14 and $ 233,393.58 respectively for telecommunications services.

Finding: Payments to Verizon for telecommunications services in 2009 and 2010 were made pursuant to a City contract that expired November 20, 2006.

Finding: For five years, CIS has been using the 'continuation of services' clause in the expired contract to purchase telecommunications services for the City on a month to month basis.

Finding: Effective March 24, 2011, CIS is piggybacking onto the State's contract with MCI (dba Verizon). The City will realize a monthly savings of $4.28 per phone line from using the State contract.

Finding: The State Verizon contract term is October 30, 2009 through October 30. 2016. Piggy backing onto the State contract in 2010 would have saved the City more money.

Recommendation: Five years is a long time to keep exercising a continuation of services clause when another contract is available at lower cost to the City. Timely 'piggybacking' on available State contracts will result in more cost savings for the City.

Reducing Telecommunications Cost by Phone Line Reduction and Usage

Finding: City Administration has previously attempted to reduce telephone costs by reducing the number of telephone lines and limiting long distance calling capabilities.

Finding: In 2003, the Mayor's Office sent a directive to all City departments to reduce the number of existing telephone lines assigned to them by 10%. The memo specified the number of phone numbers (lines) that must be eliminated at the department's discretion.

Finding: In a memo dated February 20, 2004, departments were ordered to reduce long distance on 25% of the telephone lines assigned to them.

Finding: Since 2003, the year when the number of telephone lines were reduced by 10%, the number of City employees has declined by 10.4 % (3628 employees on 12/31/03 and 3252 employees on 12/31/10). The City may be paying for unused telephone lines.

Recommendation: CIS should work with each City department to indentify the number of unused phone lines in each department. Reducing/eliminating the number of unused telephone lines will decrease the City's monthly telecommunications costs.

City Employee Internet Access

The City Electronic Communications Policy states that "City employees may use the City's electronic communications systems for performing lawful City business".
Finding: Internet site restrictions are not applied uniformly.

Finding: Prohibited websites must be accessed by the Police for job purposes such as uncovering cyber stalkers on social network sites.

Finding: Internet site access is controlled by all departmental directors who get restrictions to site categories lifted for specific employees.

Finding: Directors do not have to justify how access to generally restricted sites is needed to perform lawful 'City business'.

Recommendation: Deviations from stated policy must be justified in writing. Directors should explain how access to generally prohibited internet sites for selected employees is necessary for 'performing City business'.

City Software Applications Development and Maintenance

Finding: Thirty seven (37) of the 66 applications developed by CIS are used exclusively by the Department of Public Safety. CIS estimates that 80% of these 37 applications are used by the Bureau of Police.

Finding: The majority of CIS applications were developed with assistance of an outside contractor.

Finding: Proprietary software is maintained by the company that developed and owns the software. The licenses purchased for proprietary software includes maintenance for the term of the license.

Finding: CIS relies on outside IT consultants to maintain its own software.

Finding: The majority of software applications developed by CIS are used by the Bureau of Police. Writing new applications for Police software and maintaining Police software is done by consultant B Three Solutions. In 2010, B Three Solutions was paid $667,539.50 for a variety of information technology services.

Recommendation: CIS should determine what percent of $667,539.50 was paid to B Three Solutions for police software services. If at least half of the total paid was spent on Automated Police Reporting System (APRS) and other police software, CIS should pursue hiring additional staff at a competitive salary to perform these functions in house. Performing police software applications and maintenance in house could be cost effective and time efficient.

B Three Contract

CIS uses the State contract with B Three Solutions to obtain software development and maintenance services for all non-proprietary software obtained through CIS.

Finding: The State contract with B Three Solutions is a seven year contract but contains no hourly rates for services. Invoices submitted by the City to B Three indicate hourly charges of $75, $90 and $95.

Finding: Long term contracts can offer good cost containment when the agreed to rate is beneficial to the City. Contracts with no rate or cost information can put the City in a position of paying more for a service or product than is warranted.

Finding: Contracts without rate information cannot be audited for billing and payment compliance.

Recommendation: CIS should issue its own RFP for IT services to determine if better hourly rates can be obtained from B Three or from other IT service providers.

Bureau of Police Software Applications

Finding: Software applications developed for the Bureau of Police have increased the efficiency of police field operations and become models for other police departments.

Finding: The Automated Police Reporting System enables officers to save the collected data in the system and send it to other databases, thereby eliminating duplicate data entry and possible clerical errors.

Finding: The Modus Operandi (MO) application has allowed officers to spend more time in the field and focus more on crime fighting instead of administrative tasks.

Finding: Program applications for the Police Bureau are written by a consultant because CIS no longer has the in house capability to do so.

Finding: CIS' Public Safety Systems Division has been greatly reduced since the division's creation and no longer works exclusively on Police Bureau computer issues.

Network Security

In 2010, CIS partnered with Carnegie Mellon University (CMU) to conduct a network security assessment and formulate an information security strategic plan for the City network infrastructure and current policies.

Finding: CIS considers the final report proprietary and would not make a copy for the auditors. The auditors had to review the report in the presence of a CIS staff person.

Finding: The assessment was done at no cost to the City.

Recommendation: Future collaborative projects between CIS and CMU would benefit both parties and should be pursued.

Network Security Assessment Findings

The Executive Summary concluded that "Overall, the City has been taking the right focus in developing and managing its information system infrastructure."

Finding: CIS took immediate action to correct some of the vulnerabilities identified in the report. A new password policy was instituted and monthly security patches on all user computers are being performed.

Recommendation: Outdated software applications that are no longer supported by the manufacturer should be replaced with new or updated software as soon as possible.

Future Initiatives

Finding: City personal computers can be converted to Virtual Desktop Infrastructure (VDI) units at minimal cost. Conversion would increase efficiency and lower power consumption.

Recommendation: CIS should develop a plan for converting City personal computers to VDI units. Conversion should proceed according to the age of existing computers with the oldest being converted first.

Finding: CIS will be assuming all Jobs Training Partnership Act (JTPA) IT functions in the near future.

Recommendation: When CIS assumes JTPA IT functions, the two current JTPA computer personnel should be transferred to CIS. The transferred staff expertise in JTPA applications would facilitate CIS' assumption of JTPA IT functions.

Finding: CIS has assumed technology responsibilities for the Urban Redevelopment Authority (URA) internet connectivity and website. CIS is planning to offer expanded IT services to the URA and other City Authorities including disaster recovery capability through its offsite facility.

Recommendation: Providing disaster recovery for the URA and other City authorities would greatly benefit the authorities. The authorities should be responsible for all disaster recovery costs. All compensation and financial obligations should be clearly stated in a memorandum of understanding between the City and each authority receiving the service.

<u>City Government Generated Electronic Waste</u>

Finding: CIS is currently not using an EPA-certified recycler for computer hard drives. According to CIS administration "All City hard drives are degaussed, crushed, and discarded".

Finding: The degaussed and crushed hard drives are being stored in boxes until CIS decides what to do with them.

Finding: Storing crushed hard drives in boxes is not a safe way to prevent heavy metals contamination.

Finding: CIS appears to be responsibly disposing of unusable printers, monitors and other electronic equipment.

Recommendation: Computer hard drives contain toxic materials and must be treated as hazardous waste. CIS must find an EPA certified electronics recycler that will properly dispose of City computer hard drives.

Sincerely,

Michael E. Lamb
City Controller

INTRODUCTION

This performance audit of City Information Systems (CIS) was conducted pursuant to section 404(c) of the Pittsburgh Home Rule Charter. This audit assesses the effectiveness of the CIS help desk; CIS contract usage and City network security.

OVERVIEW

City Information Systems (CIS) is responsible for all City government information technology functions. According to its website, CIS plans, acquires, installs and supports the City's proprietary and open computing environments, including personal and mobile computers. CIS also develops software programs for Public Safety, Finance and other departmental initiatives, provides network services, develops and maintains the official City website and trains City employees in Microsoft Office applications.

Organization

CIS is organized into seven divisions: administration, network security/maintenance, software development, public safety systems, TV production/voice and data communications, 311 response center and utilities management. This audit focuses on the following divisions:

The Public Safety Systems Division is responsible for application development, grant development and reengineering for implementation of the City's computerized public safety systems.

The Network Security/Maintenance Division is responsible for installing and supporting all end-user workstations and voice/data telecommunications. It is also responsible for the design, development and maintenance of the City's networks, computer systems administration and hardware support for all network servers. This division is responsible for providing Help Desk support to City department users and develops and maintains the City's website.

The Software Development Division is responsible for writing, installing and maintaining custom-built and commercial software such as PeopleSoft in City departments.

The TV Production/Voice and Data Communications Division is responsible for City cable television broadcasts and installing and supporting all end-user workstations and voice/data telecommunications, including the City telephone system.

Staffing

In 2011, CIS had 55 budgeted positions. Three positions were lost from the previous year. The losses reduced the number of computer services personnel. One client applications developer and two senior systems analyst positions were eliminated.

Current staffing:

TITLE	#
Director	1
Assistant Director	1
Senior Counsel-Information Technology	1
Public Safety Development Manager	1
Information Security Analyst	1
Database Administrators; 1 senior	2
Manager Client Technology	1
Webmasters 2; 1 web developer	3
Energy and utilities Manager	1
Sustainability Coordinator	1
Computer Support Analyst	1
Client Application Developers	4

TITLE	#
Exchange Administrator	2
Senior Systems Analysts	3
Telecommunications Analyst	1
Network Analyst	9
Clients Support Analyst	1
Financial Systems Manager	2
Lead Computer Operator	1
Clerks (2 Chief, 1 Part-Time)	3
Clerical Assistant	2
Videographer	2
TV production technician	2
311 (Mayor Response Center) (1 Supervisor, 1 Assistant Super, 3 Full Time, 4 Part Time)	9

METHODOLOGY

The auditors met with the City Information Systems (CIS) director, assistant director, financial system manager and security manager. CIS responsibilities, personnel turnover concerns, equipment, contract use and network security were discussed. The auditors requested the following information:

1. Organizational chart of CIS;
2. List of all contracts entered into by CIS in 2009 and 2010. Contracts were identified by vendor name, contract type, e.g., professional service, supplies, etc, description of service or equipment, dollar total compensation, if known, and source of contract, e.g., state of PA, CIS, etc.;
3. List of all current contracts in use by CIS;
4. Copy of CIS Network Security Assessment by CMU with proprietary information identified; contact information for the professor who oversaw the study;
5. Help Desk performance data for 2009 and 2010: including date of call or email, problem or request type, date entered into system and date of resolution;
6. List of redundant, duplicate City CIS and County Information System services;
7. Significant CIS security accomplishments in 2009 and 2010;
8. CIS staff turnover for 2009 and 2010 by position/title, salary, length of City employment and reason for leaving (if known).

All requested information except help desk performance data for 2009 and 2010 was hand delivered. Help desk performance data was received via email in an Excel spreadsheet format.

The auditors used the help desk data to quantify response time of help desk staff.

Selected contracts were reviewed for cost effectiveness.

Other documentation reviewed included the Network Security Assessment performed by CMU personnel and the 2009, 2010 and 2011 City Operating Budgets. Internet research on computer information systems was conducted.

Also interviewed were the manager of the Client Technology and Telecommunications Division and the acting manager of Public Safety Systems Division.

The auditors attended a software demonstration by CIS Public Safety Systems Division personnel. The Director of CIS, Police Commander in charge of public safety Systems Division, and a police officer who is involved with the operations of the system were also present. The auditors later met with a Police Commander to further discuss the impact of CIS technology on police operations.

The auditors requested a list of all software applications currently in use by City departments and information as to whether the software was developed by CIS, a third party or both and who is responsible for software maintenance. A list of all software licenses owned by the City and the number of licenses for each was requested.

OBJECTIVES

1. To assess the efficiency and effectiveness of the Help Desk services.
2. To assess CIS network security.
3. To assess CIS contract usage.
4. To assess salary and staff retention/turnover.
5. To make recommendations for improvement.

SCOPE

Audit scope is 2009 to April 2011. Audit scope for budgetary trends, staff retention and staff turnover is 2006 through 2010.

FINDINGS AND RECOMMENDATIONS

Budgetary Trends

Finding: The CIS budget for miscellaneous services has increased annually over the past 5 years. In 2006, CIS was budgeted $1,137,515 for these services. By the year 2010 the budgeted amount increased to $1,668,724. The main reason for the increase was that more IT (information technology) services were outsourced than performed by CIS staff.

Finding: Miscellaneous services also increased each year because more money was needed for supplies and equipment.

CIS administrators stated that not enough money is budgeted for supplies and equipment. Increasing the amount budgeted for miscellaneous service allowed CIS to purchase needed supplies and equipment.

RECOMMENDATION NO. 1:

CIS should work with the Budget Office to revise its budgetary allocation for equipment and supplies. Reducing the miscellaneous services line item and increasing the line items for equipment and supplies would more accurately reflect the amount CIS spends in these categories.

Help Desk Performance Analysis

The Help Desk provides direct support to City computer users for a variety of hardware and software products. City computer users call x2900 to speak with CIS help staff.

According to its website, CIS has developed “procedures to assist the help desk with troubleshooting PC and network problems”. Timely problem troubleshooting is necessary for timely problem resolution. The auditors reviewed help desk performance data for 2009 and 2010. Table 1 shows response time to problems by help desk staff in 2009 and 2010.

TABLE 1

CIS HELP DESK RESPONSE TIME FOR 2009 AND 2010				
	2009		**2010**	
RESPONSE TIME	**Number**	**Percent**	**Number**	**Percent**
Same day	1355	27%	1264	25%
1-7 Days	2002	39%	1982	40%
8-14 Days	498	10%	548	11%
15-21 Days	303	6%	255	5%
22 -31 Days	270	5%	221	4%
32-90 Days	568	11%	423	8%
Equal or greater than 90 Days	88	2%	110	2%
No response	2	*	182	4%
Totals	**5086**	**100%**	**4985**	**100%**

*percentage was .0004%

Finding: In 2009, twenty seven percent (27%) of help desk inquiries were resolved the same day. Two thirds (66%) of problems called into the Help Desk were resolved within one week.

Finding: In 2010, twenty five percent (25%) of help desk inquiries were resolved the same day. Two thirds (65%) of problems called into the Help Desk were resolved within one week.

Finding: Timeliness of problem resolution is in large part dependent on the type and complexity of the problem.

For example, password reset problems can be resolved quickly by a help desk technician. Problems that require a technician to travel to a different site would go into a queue. Waiting for a technician to arrive increases the problem resolution time.

Finding: According to CIS, the wait time for an onsite technician is also a factor of departmental priority. Public Safety is the department with highest priority due to the possible life threatening nature of its calls for service.

Finding: The Department of Public Safety is the only City department with 24/7 CIS support.

Finding: Help Desk performance data provided by CIS includes call number, date open, date closed and summary of the problem. 'Summary of the problem' is not described consistently or in the same format. As written, Help Desk performance data is not useful for identifying problem trends or problem frequency.

RECOMMENDATION NO. 2:

CIS should consider using a code system in addition to "summary of the problem" in its Help Desk database. Sorting by code would facilitate identifying problem trends and problem frequency.

Help Desk Response Time by City Department

The auditors received Help Desk performance data for 2009 and 2010 from CIS on February 17, 2011. The data was sorted by requesting City Department and by response time. The auditors analyzed the data to identify the Departments with the most problems and the Departments with the best resolution time. Tables 2 through 7 illustrate resolution time for City Departments.

Finding: In 2009, the CIS Help Desk received 5068 inquiries from 27 Departments, and 18 calls from unknown Departments for a total of 5086 inquiries. Unknown Departments are entries that are blank under the department heading because the technician forgot to enter the department name.

Table 2 shows the resolved time for fourteen City Departments that made more than 100 calls to the Help Desk with a total of 4605 calls.

Finding: In 2009, the Bureau of Police had the most calls with 1,369 calls or 27 percent of total calls. (This is bolded in Table 2.)

TABLE 2

2009 RESPONSE TIME FOR DEPARTMENTS WITH MORE THAN 100 HELP DESK INQUIRIES									
	RESPONSE TIME								
Department	**Same Day**	**1-7 Days**	**8-14 Days**	**15-21 Days**	**22-31 Days**	**32-90 Days**	**Greater than 90 Days**	**No response**	**Totals**
BBI	34	89	23	10	10	18	4	0	188
CIS	41	93	19	14	9	15	4	0	195
Controller	50	97	20	10	9	17	2	0	205
Council	54	86	27	4	13	14	2	0	200
Planning	44	114	29	16	22	30	3	0	258
E&C	27	54	12	10	9	23	7	0	142
Finance	118	158	35	37	30	52	6	0	436
Fire	120	136	31	18	11	48	7	0	371
Law	39	55	13	6	5	18	3	0	139
Mayer	86	136	15	17	9	23	2	0	288
Parks	35	117	51	20	16	40	3	2	284
Personnel	60	102	30	15	12	34	4	0	257
Police	**458**	**519**	**112**	**73**	**61**	**121**	**25**	**0**	**1,369**
DPW	62	89	28	24	24	43	3	0	273
Totals	**1228**	**1845**	**445**	**274**	**240**	**496**	**75**	**2**	**4,605**

BBI = Bureau of Building Inspection, CIS = City information System,
E&C = Engineering and Construction, DPW = Department of Public Works.

Finding: Thirty three percent (33%) of the Police calls (458) were resolved the same day and thirty eight percent (38%) (519 calls) were resolved within one to seven days. The auditors were unable to determine how many (if any) same day responses needed on site remediation.

TABLE 3

2009 RESPONSE TIME FOR DEPARTMENTS WITH 50 TO 99 HELP DESK INQUIRIES									
	RESPONSE TIME								
Department	**Same Day**	**1-7 Days**	**8-14 Days**	**15-21 Days**	**22-31 Days**	**32-90 Days**	**Greater than 90 Days**	**No response**	**Totals**
City Clerk	25	26	3	4	2	8	0	0	68
EMS	10	30	7	4	9	12	2	0	74
G. Services	22	24	19	5	5	17	5	0	97
311 Center	21	18	6	3	1	4	1	0	54
Totals	**78**	**98**	**35**	**16**	**17**	**41**	**8**	**0**	**293**

EMS = Emergency Medical Services, G. Services = General Services

TABLE 4

2009 RESPONSE TIME FOR DEPARTMENTS WITH 1 TO 49 HELP DESK INQUIRIES									
	RESPONSE TIME								
Department	**Same Day**	**1-7 Days**	**8-14 Days**	**15-21 Days**	**22-31 Days**	**32-90 Days**	**Greater than 90 Days**	**No response**	**Totals**
C. P. R. B.	3	6	1	3	1	2	1	0	17
Human Relation	8	9	3	1	4	7	0	0	32
EMA	2	2	1	1	0	0	1	0	7
EOC	1	3	0	0	0	0	0	0	4
EORC	4	11	3	3	2	5	0	0	28
Magistrate Courts	2	1	2	0	0	1	0	0	6
OMI	12	12	4	4	3	11	2	0	48
Weed &seed	0	1	0	0	0	0	0	0	1
Pension	6	10	2	1	2	4	2	0	27
Blanks	10	5	2	1	0	0	0	0	18
Totals	**48**	**60**	**18**	**14**	**12**	**30**	**6**	**0**	**188**

C.P.R.B. = Citizen Police Review Board, EMA = Emergency Management Agency, EOC = Emergency Operation Center, EORC = Equal Opportunity Review Commission, OMI = Office of Municipal Investigation

Finding: In 2010, the CIS Help Desk received 4,970 inquiries from 27 Departments, and 15 calls from unknown Departments for a total of 4,985 inquiries.

Table 5 shows resolved time for the fifteen City Departments that made most inquiries in 2010 with 4,631 calls.

TABLE 5

2010 RESPONSE TIME FOR DEPARTMENTS WITH MORE THAN 100 HELP DESK INQUIRIES									
	RESPONSE TIME								
Department	**Same Day**	**1-7 Days**	**8-14 Days**	**15-21 Days**	**22-31 Days**	**32-90 Days**	**Greater than 90 Days**	**No response**	**Totals**
BBI	23	48	29	8	11	14	7	9	149
CIS	60	143	44	16	18	38	13	16	348
Controller	23	63	14	4	3	13	3	3	126
Council	52	123	14	6	2	15	3	3	218
Planning	33	101	47	36	0	18	8	4	247
E&C	28	90	29	22	7	22	2	2	202
EMS	14	56	16	6	5	7	1	4	109
Finance	60	155	31	8	13	33	8	14	322
Fire	81	98	37	15	9	24	5	9	278
G. Services	21	60	8	9	5	15	3	4	125
Mayer	57	120	19	16	7	19	9	1	248
Parks	33	99	50	15	17	37	11	7	269
Personnel	44	90	19	12	17	9	3	3	197
Police	**618**	**467**	**114**	**64**	**66**	**125**	**40**	**52**	**1,546**
DPW	50	94	36	14	14	27	2	10	247
Totals	**1197**	**1807**	**507**	**251**	**194**	**416**	**118**	**141**	**4,631**

BBI = Bureau of Building Inspection, CIS = City information System,
E&C = Engineering and Construction, EMS = Emergency Medical Services,
G. Services = General Services, DPW = Department of Public Work.

Finding: In 2010 the Bureau of Police had the most calls with 1,546 calls for 31 percent of the total calls.

Finding: In 2010 the percent of Police calls resolved the same day is higher than the City average. Forty percent (40%) of calls from the Police were resolved the same day compared to 25% of all City calls.

TABLE 6

2010 RESPONSE TIME FOR DEPARTMENTS WITH 50 TO 99 HELP DESK INQUIRIES									
	RESPONSE TIME								
Department	**Same Day**	**1-7 Days**	**8-14 Days**	**15-21 Days**	**22-31 Days**	**32-90 Days**	**Greater than 90 Days**	**No response**	**Totals**
City Clerk	12	37	7	6	4	0	0	2	68
Law	19	40	9	4	2	8	2	3	87
Totals	**31**	**77**	**16**	**10**	**6**	**8**	**2**	**5**	**155**

TABLE 7

2010 RESPONSE TIME FOR DEPARTMENTS WITH 1 TO 49 HELP DESK INQUIRIES									
	RESPONSE TIME								
Department	**Same Day**	**1-7 Days**	**8-14 Days**	**15-21 Days**	**22-31 Days**	**32-90 Days**	**Greater than 90 Days**	**No response**	**Totals**
C. P. R. B.	1	9	6	2	1	4	0	0	23
Human Relation	5	10	0	3	0	1	0	0	19
EMA	0	5	3	0	2	2	1	2	15
EOC	0	4	1	0	0	0	0	0	5
EORC	5	9	2	0	0	1	0	0	17
Magistrate Courts	4	2	0	0	0	2	0	0	8
OMI	6	17	7	1	1	1	2	1	36
Weed &seed	1	8	0	2	0	0	0	0	11
Pension	2	7	1	0	0	0	0	0	10
311 Center	9	20	4	4	1	1	1	0	40
Blanks	3	8	1	0	0	3	0	0	15
Totals	**36**	**99**	**25**	**12**	**5**	**15**	**4**	**3**	**199**

C.P.R.B.=Citizen Police Review Board, EMA=Emergency Management Agency, EOC=Emergency Operation Center, EORC=Equal Opportunity Review Commission, OMI=Office of Municipal Investigation

Help Desk Staffing

According to a 2009 survey of 300 companies of various size conducted by Computer Economics, the median staffing ratio between help desk employees and the total number of employees supported by the Help Desk is 1.3% . This equates to 13 help desk support personnel for every 1,000 employees.

In response to the auditors question about the number of City employees that are internal end users, CIS stated that the City has 1225 "current licenses from Microsoft". It should be noted that the number of licenses does not indicate the number of actual users. For example, the computer at Magee Community Center in Greenfield is used by multiple staff.

Finding: CIS currently has 4 employees assigned to the Help Desk. To comply with the industry median help desk staffing ratio, CIS should have 16 help desk staff available for the 1225 persons with "current licenses from Microsoft". Complying with this industry median would require assigning 33% of CIS computer staff to the Help Desk.

As noted previously, in 2010, twenty five percent (25%) of Help Desk calls were resolved the same day, 40% percent of calls were resolved in 7 days or less and 35% took 8 or more days to be resolved.

RECOMMENDATION NO. 3:

CIS should consider adding more staff to the Help Desk. Additional Help Desk support staff could shorten problem resolution times. Having additional staff to dispatch could shorten the queue of persons waiting for onsite assistance.

Police Network Analyst 3

Help desk data shows that the most requests are made by the Police. One Network Analyst 1 currently stationed at the North Side Police Headquarters can be dispatched throughout the bureau for lower level help desk requests such as installing updates and new profiles.

Finding: The Police Bureau Network Analyst 1 cannot address all network problems. A Network Analyst 3 from CIS must be dispatched for network problems 24/7.

RECOMMENDATION NO. 4:

The Department of Public Safety should add a Network Analyst 3 (NA3) to the Police Bureau budget. Assigning the NA3 to a nighttime shift would expedite response time by eliminating the wait for a CIS staff to be dispatched from home.

CIS Staff Retention/Turnover

CIS Administration maintains that frequent staff turnover negatively impacts department operations and states that poor pay is the reason for '99%" of staff turnover.

The auditors received a document from CIS showing staff turnover from the years 2006 to present. The document listed position/title, salary, length of city employment, and reason for leaving. Under the reason for leaving category, four different outcomes were listed: better employment, retirement, personal, and transfer.

Table 8 shows how many employees left CIS each year and the percentage of budgeted positions vacated. It should be noted that all Mayor's 311 response center, videographer, and T.V. production jobs were not included in the calculation.

TABLE 8

CIS STAFF TURNOVER 2006 – 2010			
YEAR	**# OF EMPLOYEES**	**# OF BUDGETED POSITIONS**	**% OF BUDGETED POSITIONS VACATED**
2010	9	45	20%
2009	2	44	5%
2008	9	47	19%
2007	17	52	33%
2006	10	57	18%
Totals	**47**	**245**	**20%**

Finding: Over the last five years (2006-2010) CIS staff turnover greatly varied from 5% to 33% per year.

Finding: The year with the highest turnover rate was 2007. In 2007, thirty three percent (33%) of CIS employees left the department for a better job opportunity; transfer to another city department, retirement or for personal reasons.

Reasons for Leaving CIS

Table 9 lists how many employees left the CIS department and the reason for leaving from the years 2006 to 2010.

TABLE 9

REASONS FOR LEAVING 2006 - 2010		
REASON FOR LEAVING	**# OF EMPLOYEES**	**PERCENTAGE**
Better Employment	23	49%
Transfer	13	28%
Personal	2	4%
Retirement	9	19%
Totals	**47**	**100%**

Finding: In the last 5 years, nearly half (49%) of the 47 employees that left the CIS department did so for a better employment.

Finding: Seeking better employment could be construed as seeking a higher salary. The percent of CIS staff that left for this reason is much lower than CIS' assertion that '99%'of people leave the department because of low pay.

To test CIS' assertion that low pay is a prime reason for staff turnover, the auditors wanted to compare the City salaries with those of similar public sector employees. Salaries vary according to geographic region and type of employer. Public sector jobs historically pay lower than comparable positions in the private sector but offer better benefits such as more time off and pensions.

To compare the City to a comparable public employer, 2011 salary information for County computer personnel was obtained from the Allegheny County Controller. The auditors selected City IT positions with comparable job duties for salary comparison.

TABLE 10

CITY- COUNTY 2011 IT SALARY COMPARISON			
City Job Title	**County Job Title**	**City Salary**	**County Salary**
Chief Information Officer	Chief Information Officer	$93,687.00	$102,000.08
Assistant Director	Deputy Chief Info Officer	$74,318.00	$76,075.17
Database Administrator	Database Manager	$68,790.00	$61,030.94
Info Security Analyst (position includes management duties)	Security Analyst	$68,790.00	$51,491.65
Web Developer	Web Developer	$47,411.00	$43,986.04
Client Application Developer 1&3	Senior Developer	$46,179.50*	$65,063.05*

***these figures were an average salary**

Finding: County application developers are paid an average of $18,883.55 more than City employees but some comparable City positions have higher pay. The City Information Security Analyst is paid $17,298.35 more than the equivalent County position, the City Database Administrator is paid $7,759.06 more and the City Web Developer is paid $4,324.96 more than their County equivalents.

Finding: The County Chief Information Officer (CIO) is paid significantly higher ($8,313.08) than the City CIO and the County Deputy Chief Information Officer is paid more ($1,757.17) than the City Assistant Director.

City and Private Sector IT Compensation

Table 11 below shows the average 2008-2009 salary for IT private sector jobs that are similar to City CIS positions. The data was compiled by the Pittsburgh Technology Council (PTC) and obtained by CIS. This was most recent salary data available from PTC. Employee benefits such as time off, holiday pay, medical and dental insurance, pensions and tuition benefits were not included in the report.

The auditors compared these salaries to analogous average 2008-2009 City salaries. City salary information was obtained from the 2008-2009 City operating budgets.

TABLE 11

PRIVATE SECTOR and CITY AVERAGE 2008-2009 ANNUAL BASE PAY COMPARISON			
Private Sector Job Title	**City Job Title**	**Private**	**City**
Analyst programmer 1	Network analyst 1	$ 50,400	$ 44,577
Analyst programmer 2	Network analyst 2	$ 65,200	$ 47,919
Analyst programmer 3	Network analyst 3	$ 93,100	$ 54,142
Software developer 1	Client Application developer 1	$ 52,000	$ 41,545
Software developer 2	Client Application developer 2	$ 68,600	$ 44,577
Software developer 3	Client Application developer 3	$ 87,700	$ 48,490
Software developer manager	Software development manager	$ 96,500	$ 63,964

Table 12 compares analogous average City IT salaries to total average private sector compensation (salary +bonus).

TABLE 12

PRIVATE SECTOR and CITY AVERAGE ANNUAL COMPENSATION including AVERAGE PRIVATE SECTOR BONUS			
Private Sector job Title	**City job Title**	**Private**	**City**
Analyst programmer 1	Network analyst 1	$ 52,100	$ 44,577
Analyst programmer 2	Network analyst 2	$ 71,700	$ 47,919
Analyst programmer 3	Network analyst 3	$ 97,400	$ 54,142
Software developer 1	Client Application developer 1	$ 52,700	$ 41,545
Software developer 2	Client Application developer 2	$ 70,100	$ 44,577
Software developer 3	Client Application developer 3	$ 91,400	$ 48,490
Software developer manager	Software development manager	$ 98,400	$ 63,964

Finding: The 2008-2009 average private sector annual base compensation for IT positions was higher than comparable average City salaries.

Finding: Annual bonuses widen the gap between private and public sector compensation.

Finding: The lack of private sector benefit information qualifies the above comparison.

RECOMMENDATION NO. 5:

CIS administration should emphasize the non-compensatory benefits of City employment to new hires that are offered in addition to base salary. Benefits that should be emphasized are health, dental, eye care insurance benefits with low or no employee monthly contribution, tuition benefits, defined pension, paid holidays, vacation and personal days and flexible work schedule at CIS.

Contract Usage Analysis

Finding: CIS does not have any formal cooperative agreements with the State or County that requires CIS to use State or County contracts for specific services or commodities. However, CIS extensively piggybacks on existing State and County contracts in lieu of pursuing its own contractors.

Table 13 shows the number of State and County contracts that CIS has chosen to piggyback on in 2009 and 2010 as well as the number of contracts entered into directly by CIS (City contracts). 'Amount' is the anticipated total or maximum contract cost at the time the contract was entered into.

TABLE 13

	2009			2010		
Contracts	**Number**	**Amount**	**Percent**	**Number**	**Amount**	**Percent**
City	12	$553,798	22.4 %	8	$441,899	16.4 %
State	26	$1,788,891	72.6 %	23	$2,085,184	77.7 %
County	7	$118,124	4.8 %	8	$157,324	5.9 %
PAT*	1	$5,000	0.2 %	**	**	**
Totals	**46**	**$2,465,813**	**100.0%**	**39**	**$2,684,407**	**100 %**

***** indicates contract with Port Authority

Finding: Nearly three quarters (72.6%) of CIS 2009 contracts and over three quarters (77.7%) of CIS 2010 contracts were State contracts.

CIS maintains that piggybacking onto State contracts results in lower costs to the City. Lower costs include obtaining better prices for commodities or services and eliminating the costs of contracting. Costs of contracting include the time spent on writing contract specifications, writing and issuing Requests for Proposals, evaluating proposals and advertising costs.

Finding: Cost savings from piggybacking onto State contracts are not limited to CIS. Other departments involved in the contracting process would also see cost savings such as the Department of Finance that composes the final contract document.

Finding: Equipment purchases from existing State contracts sometimes arrive with software and components not needed or already in stock. CIS pays for not needed components as part of the purchase price then purchases the appropriate software. Staff time is taken up to uninstall and install software.

For example, computers purchased through a State contract come with Original Equipment Manager, a version of Windows not used by the City. A $105 per computer fee for the software is included in the cost. CIS Network Analysts must remove the pre-installed software and load in Volume License Key, the software used by the City. CIS must also pay an additional license fee for the new software. Each computer includes a Nic Card at a cost of $20 while the City has a large inventory of Nic Cards that could be used.

RECOMMENDATION NO. 6:

Piggybacking on existing contracts can result in a variety of cost savings. However, CIS must ensure that the terms and specifications of State contracts meet the City's needs without requiring major modifications by CIS and additional costs.

Finding: CIS is not obligated to use State contracts for the remainder of the contract term.

RECOMMENDATION NO. 7:

To ensure the department is getting the best price, CIS should issue its own Request for Proposal or quote request for selected services and equipment and compare the prices to those in comparable State contracts.

TV Production/Voice and Data Communications Division

This Division is responsible for City cable television broadcasts and installing and supporting all end-user workstations and voice/data telecommunications, including the City telephone system. Additional responsibilities include the design, development, and maintenance of the City's networks.

Telecommunications Contract

In 2009 and 2010, CIS paid Verizon $ $238,823.14 and $ 233,393.58 respectively for telecommunications services.

Finding: Payments to Verizon for telecommunications services in 2009 and 2010 were made pursuant to a City contract that expired November 20, 2006.

Finding: For five years, CIS has been using the 'continuation of services' clause in the expired contract to purchase telecommunications services for the City on a month to month basis.

The purpose of a 'continuity of services' clause in a contract is to facilitate the transition from one contractor to another while allowing continued performance of services at the rates specified in the now expired contract.

Finding: Effective March 24, 2011, CIS is piggybacking onto the State's contract with MCI (dba Verizon). The City will realize a monthly savings of $4.28 per phone line from using the State contract.

Finding: The State Verizon contract term is October 30, 2009 through October 30. 2016. Piggy backing onto the State contract in 2010 would have saved the City more money.

RECOMMENDATION No. 8:

Five years is a long time to keep exercising a continuation of services clause when another contract is available at lower cost to the City. Timely 'piggybacking' on available State contracts will result in more cost savings for the City.

Reducing Telecommunications Cost by Phone Line Reduction and Usage

Finding: City Administration has previously attempted to reduce telephone costs by reducing the number of telephone lines and limiting long distance calling capabilities.

Finding: In 2003, the Mayor's Office sent a directive to all City departments to reduce the number of existing telephone lines assigned to them by 10%. The memo specified the number of phone numbers (lines) that must be eliminated at the department's discretion.

Finding: In a memo dated February 20, 2004, departments were ordered to reduce long distance on 25% of the telephone lines assigned to them.

Finding: Since 2003, the year when the number of telephone lines were reduced by 10%, the number of City employees has declined by 10.4 % (3628 employees on 12/31/03 and 3252 employees on 12/31/10). The City may be paying for unused telephone lines.

RECOMMENDATION NO. 9:

CIS should work with each City department to indentify the number of unused phone lines in each department. Reducing/eliminating the number of unused telephone lines will decrease the City's monthly telecommunications costs.

City Employee Internet Access

The City Electronic Communications Policy states that "City employees may use the City's electronic communications systems for performing lawful City business". Electronic communications include electronic and telephone communications, including E-mail, Internet/Intranet and voice mail.

To facilitate adherence to this policy, CIS purchased an application from Web sense to block City employee access to 'unproductive' "social networking' 'streaming video' and 'tasteless' websites. Restricted site categories are determined by Web sense.

Finding: Internet site restrictions are not applied uniformly.

Finding: Prohibited websites must be accessed by the Police for job purposes such as uncovering cyber stalkers on social network sites.

Finding: Internet site access is controlled by all departmental directors who get restrictions to site categories lifted for specific employees.

Finding: Directors do not have to justify how access to generally restricted sites is needed to perform lawful 'City business'.

RECOMMENDATION NO. 10:

Deviations from stated policy must be justified in writing. Directors should explain how access to generally prohibited internet sites for selected employees is necessary for 'performing City business'.

City Software Applications Development and Maintenance

City departments perform diverse functions ranging from tax collection and accounting to responding to public safety concerns. Various software applications are used to assist in the performance of these functions. According to CIS, software applications are either purchased by the individual department or obtained through CIS. Peachtree is an example of software purchased directly by a City department.

Sixty six (66) software applications purchased or developed by CIS are currently in use by City departments. Proprietary software such as City Law, OnBase and Accela are purchased from the respective company.

Finding: Thirty seven (37) of the 66 applications developed by CIS are used exclusively by the Department of Public Safety. CIS estimates that 80% of these 37 applications are used by the Bureau of Police.

Finding: The majority of CIS applications were developed with assistance of an outside contractor.

Finding: Proprietary software is maintained by the company that developed and owns the software. The licenses purchased for proprietary software includes maintenance for the term of the license.

Finding: Licenses for proprietary software are purchased annually or for a number of years. License purchases for multiple years locks in the price of the license for those years.

Finding: CIS relies on outside IT consultants to maintain its own software.

Finding: The majority of software applications developed by CIS are used by the Bureau of Police. Writing new applications for Police software and maintaining Police software is done by consultant B Three Solutions. In 2010, B Three Solutions was paid $667,539.50 for a variety of information technology services.

RECOMMENDATION NO. 11:

CIS should determine what percent of $667,539.50 was paid to B Three Solutions for police software services. If at least half of the total paid was spent on Automated Police Reporting System (APRS) and other police software, CIS should pursue hiring additional staff at a competitive salary to perform these functions in house. Performing police software applications and maintenance in house could be cost effective and time efficient.

B Three Contract

CIS uses the State contract with B Three Solutions to obtain software development and maintenance services for all non-proprietary software obtained through CIS.

Finding: The State contract with B Three Solutions is a seven year contract but contains no hourly rates for services. Invoices submitted by the City to B Three indicate hourly charges of $75, $90 and $95.

CIS administrators stated that these charges are “prevailing rates contingent upon experience and complexity of project”. Prevailing rates as defined by the State Department of Labor and Industry are applicable only to certain construction projects. There are no ‘prevailing rates’ recognized by the State for IT services.

Finding: Long term contracts can offer good cost containment when the agreed to rate is beneficial to the City. Contracts with no rate or cost information can put the City in a position of paying more for a service or product than is warranted.

Finding: Contracts without rate information cannot be audited for billing and payment compliance.

RECOMMENDATION NO. 12:

CIS should issue its own RFP for IT services to determine if better hourly rates can be obtained from B Three or from other IT service providers.

Bureau of Police Software Applications

Finding: Software applications developed for the Bureau of Police have increased the efficiency of police field operations and become models for other police departments.

CIS, in collaboration with B Three Solutions and the computer Liaison Unit of the Bureau of Public Safety, has developed various computer systems and applications such as Automated Police Reporting System, (APRS) and Modus Operandi Application, (MO) that are being used by the police bureau.

Automated Police Reporting System (APRS) is the electronic version of reports and forms that police officers used to write in the field. Since 2006 this system has enabled police officers to generate official police reports electronically. In 2007 the Lite version of APRS was developed and being used by police officers in the field via Mobile Data Terminal (MDT). MDT is a lap top computer located inside the police car that the officer uses to type reports. APRS Lite application is an easy step by step process where the report is typed into different stages or categories. These stages include offense, location of crime, victim, victim vehicle, persons, weapons, incident vehicle, suspects, arrests, property and narrative.

Finding: The Automated Police Reporting System enables officers to save the collected data in the system and send it to other databases, thereby eliminating duplicate data entry and possible clerical errors.

Modus Operandi (MO) is an application that allows police officers or investigators to search on all data currently available in the various databases. This system has made the process of writing up a report faster and more efficient. Once data is typed into one stage, it auto populates the same data required for the next stage. For example, a criminal's address will only have to be typed in once, then it would be auto populated every time throughout the report. This has saved police officers an incredible amount of time especially if they have to generate several documents for each incident. Once the report is finished it is sent electronically to a supervisor within minutes. In the past the report was written up on paper, sent back to headquarters, typed into the computer by clerk then sent to a supervisor for review.

Finding: The Modus Operandi (MO) application has allowed officers to spend more time in the field and focus more on crime fighting instead of administrative tasks.

The MO system has gotten great reviews from other police departments. Miami Dade, Florida police officials recently participated in a video conference call with Pittsburgh police officials and watched a demonstration of the program. Miami Dade police officials were so impressed with the MO application that they have recently tried to secure grants for funding on this project.

CIS Public Safety Systems Division

According to the CIS website "The Public Safety Systems Division is responsible for application development, grant development and reengineering for implementation of the City's computerized public safety systems".

A Police Lieutenant with supervisory capacity is stationed at the CIS Department and works directly with CIS employees. He gets feedback from officers throughout the City on how they are benefiting from APRS and what improvements can be made to the system to make their jobs more efficient. This information is relayed to the CIS Public Safety Systems Division so future programs can be written that adapt to the needs of the officers.

Finding: Program applications for the Police Bureau are written by a consultant because CIS no longer has the in house capability to do so.

Finding: CIS' Public Safety Systems Division has been greatly reduced since the division's creation and no longer works exclusively on Police Bureau computer issues.

Network Security

City government deals with sensitive information such as police reports, property tax and personal income tax records and personal data such as employee birthdates and social security numbers. Being responsible for all City information systems, CIS must ensure that the integrity of this information is secure from unauthorized access and use.

Information Security Strategic Plan Objectives

In 2010, CIS partnered with Carnegie Mellon University (CMU) to conduct a network security assessment and formulate an information security strategic plan for the City network infrastructure and current policies. The plan was to "identify system vulnerabilities and the tools and techniques for combating system threats; ensure compliance with federal laws and regulations; and prepare a comprehensive roadmap for the future". The assessment was done by five CMU students with faculty guidance. Internal and external network penetration tests were conducted; the City information systems infrastructure was evaluated and City information systems policies were thoroughly reviewed.

Finding: CIS considers the final report proprietary and would not make a copy for the auditors. The auditors had to review the report in the presence of a CIS staff person.

Finding: The assessment was done at no cost to the City.

RECOMMENDATION NO. 13:

Future collaborative projects between CIS and CMU would benefit both parties and should be pursued.

Network Security Assessment Findings

The study found compliance with relevant laws and regulations and found the City Electronic Communications Policy to be well written. The Executive Summary concluded that "Overall, the City has been taking the right focus in developing and managing its information system infrastructure. The recommendations outlined in this strategic plan offer suggestions in order to better the City's information system security stance".

Various network vulnerabilities were identified that pose security risks and become targets for attackers. These weaknesses include use of weak or default passwords, out of date servers and applications, unpatched applications and unsupported versions of servers. For example, software manufacturers will not provide security patches for old, out of date software.

Finding: CIS took immediate action to correct some of the vulnerabilities identified in the report. A new password policy was instituted and monthly security patches on all user computers are being performed.

In addition to new, expanded password requirements, the number of attempts to log on is limited.

RECOMMENDATION NO. 14:

Outdated software applications that are no longer supported by the manufacturer should be replaced with new or updated software as soon as possible.

The report commended CIS for its disaster recovery capability that includes an offsite facility where equipment is stored that replicates all critical information from the main City system.

Future Initiatives

Virtual Desktop Infrastructure

Virtual Desktop Infrastructure (VDI) is a new technology that replaces Personal Computers (PC). VDI increases speed and reduces power consumption. Total conversion to VDI requires significant expansion of existing infrastructure.

In addition to the cost of unit ($300.00), capital is needed to upgrade and purchase hardware, more server and licenses. CIS is in the process of replacing PC with Virtual Desktop Infrastructure. Some City Departments such as the Finance Department are already using a few VDI instead of PC.

Finding: City personal computers can be converted to VDI units at minimal cost. Conversion would increase efficiency and lower power consumption.

RECOMMENDATION NO. 15:

CIS should develop a plan for converting City personal computers to VDI units. Conversion should proceed according to the age of existing computers with the oldest being converted first.

JTPA Computer Functions

City Personnel and Civil Service Commission administers the Jobs Training Partnership Act (JTPA) program for City residents. JTPA is a federal program to improve the employment status of disadvantaged young adults, displaced workers and individuals facing barriers to employment through on-the job training, job search assistance, basic education, work experience and occupational skills. Two employees in the Personnel Department are responsible for all JTPA IT functions.

Finding: CIS will be assuming all JTPA IT functions in the near future.

RECOMMENDATION NO. 16:

When CIS assumes JTPA IT functions, the two current JTPA computer personnel should be transferred to CIS. The transferred staff expertise in JTPA applications would facilitate CIS' assumption of JTPA IT functions.

Expanding Disaster Recovery Services and Other IT Services to City Authorities

As noted above, CIS was commended by CMU for its offsite disaster recovery capability. The Pittsburgh Water and Sewer Authority and Urban Redevelopment Authority currently do not have disaster recovery capability.

Finding: CIS has assumed technology responsibilities for the Urban Redevelopment Authority (URA) internet connectivity and website. CIS is planning to offer expanded IT services to the URA and other City Authorities including disaster recovery capability through its offsite facility.

RECOMMENDATION NO. 17:

Providing disaster recovery for the URA and other City authorities would greatly benefit the authorities. The authorities should be responsible for all disaster recovery costs. All compensation and financial obligations should be clearly stated in a memorandum of understanding between the City and each authority receiving the service.

Electronic Waste

Electronic waste (e-waste) is unwanted electronic equipment such as televisions, computers, monitors, printers and audio equipment. Electronic equipment such as computer hard drives contains hazardous metals such as cadmium, lead and mercury. If electronic equipment is discarded in landfills, these toxic substances can leach into the land or be released into the atmosphere, negatively impacting nearby communities and the environment.

City Government Generated E-Waste

A 2009 performance audit of the City Refuse Division found that the City had a policy for recycling old City owned computers. After the hard drives were cleared of confidential data, unusable City computers were sent to an EPA-certified electronics recycler.

Finding: CIS is currently not using an EPA-certified recycler for computer hard drives. According to CIS administration "All City hard drives are degaussed, crushed, and discarded".

Degaussing is a process used to remove confidential data by demagnetizing the hard drive. A reverse magnetic field is used to scramble the electronic data and make it unreadable. This process also makes the hard drive unusable.

Finding: The degaussed and crushed hard drives are being stored in boxes until CIS decides what to do with them.

Finding: Storing crushed hard drives in boxes is not a safe way to prevent heavy metals contamination.

Finding: CIS appears to be responsibly disposing of unusable printers, monitors and other electronic equipment.

According to CIS, printers, monitors and other audio equipment are cannibalized for useful parts and the remaining parts are discarded to Goodwill. Unlike other companies that charge for this service, Goodwill removes these parts at no cost to the City.

RECOMMENDATION NO. 18:

Computer hard drives contain toxic materials and must be treated as hazardous waste. CIS must find an EPA certified electronics recycler that will properly dispose of City computer hard drives.