



GARLAND

INTERNAL AUDIT

Software Licensing

March 18, 2019

Report 201809

City Auditor:

Jed Johnson, CIA, CGAP

Major Contributor:

Alexander Proza, CISA

Contents

Executive Summary	1
Authorization.....	1
Objectives.....	1
Scope and Methodology	2
Background	3
Management Accomplishments*	4
Opportunities for Improvement	5

Executive Summary

Computer software, also known as software, is a set of instructions that tells a computer how to perform a task. Software makes up all of the programs on a computer, such as a web browser or a word processor.¹ City of Garland (COG) has two Information Technical (IT) service departments to handle the purchasing, implementing, and maintaining of software - COG IT and GP&L Technical Services (GP&L TS).

Internal Audit (IA) identified the following areas for improvement during this audit:

- There are software installed on COG computers that are either not critical to business operations or may not have a business purpose.
- A limited process is in place to manage all COG and GP&L software being used.
- Software contracts are not consistently completed and retained. In addition, COG is not in usage compliance with one contract. Also, two software payments did not agree to the contract terms.
- The Entitlement Report (used by COG to validate departmental access rights) does not include critical software, and is not being created and distributed timely. GP&L TS has a specialized software that can produce a user access rights report (similar to the Entitlement Report), but it is not currently configured for this purpose.

Management was also provided with additional opportunities for improvement to enhance internal controls. These were not considered significant to the objectives of the audit, but warrant the attention of management. Consequently, they do not appear in this report.

IA would like to express our appreciation to the management and staff of COG IT and GP&L TS for their time, assistance, and cooperation during the course of the audit.

Authorization

This audit was conducted under the authority of Article IV, Section 8 of the Garland City Charter and in accordance with the Annual Audit Plan approved by the Garland City Council.

Objectives

The objectives of this audit were to:

- A. Evaluate if COG and GP&L is utilizing software and in compliance with the terms and conditions listed in the software licensing contract.
- B. Identify if employees are using software that is unknown to COG IT or GP&L TS.
- C. Evaluate if COG and GP&L is accurately charged for software and adhering to the payment terms of the software contract.
- D. Determine if software contracts are retained in accordance with the Texas State Library and Archives Commission's Local Schedule GR requirements.

Scope and Methodology

IA conducted this performance audit in accordance with Generally Accepted Government Auditing Standards. IA plans and performs the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. IA believes that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The scope of this audit covered software currently installed on COG computers. For contracts and payment accuracy, the testing period was from January 1, 2015 through December 31, 2018. To adequately address the audit objectives and to describe the scope of our work on internal controls, IA performed the following:

- Obtained read-only access to COG IT's Sharepoint System. (Obj. D)
- Used the COG IT Sharepoint System, and obtained a report that lists all identified COG software. (Obj. D)
- Obtained the GP&L default application listing from GP&L TS. (Obj. D)
- Obtained a current listing of all software installed on every COG and GP&L employee computer workstations. (Obj. B)
- Used Cayenta and obtained a listing of all processed payments from February 2018 to July 2018. (Obj. B)
- Reviewed the processed payments to identify payments that were made for COG and GP&L software. (Obj. B)
- Obtained and reviewed COG City Council agendas from September 2016 to August 2017 using the COG website, to identify any software that was approved for purchase. (Obj. B)
- Obtained and reviewed a listing of submitted COG and GP&L help desk tickets from September 2016 to August 2017 to identify software. (Obj. B)
- Obtained a listing of all COG and GP&L employees to determine a random sample for survey testing. (Obj. B)
- Obtained and reviewed a listing of all COG and GP&L P-card transactions from October 2016 to September 2018 to identify software purchases. (Obj. B)
- Ensured Software Licensing contracts are retained. (Obj. D)
- Validated contract terms and conditions to actual payments. Note, contracts older than four years were eliminated from the scope since detailed invoice information was not available. (Obj. C)
- Compiled the software survey results to show software utilization. (Obj. A)
- Followed up on the survey responses for the software that was categorized by users as 'unknown'. (Obj. B)
- Obtained the most current Entitlement Report and determined that users are adhering to the contracted user limits. (Obj. A)
- Validated the completeness of COG and GP&L IT software. (Obj. A)
- Validated COG employees were required to sign the COG Email and Internet Access Agreement form. (Obj. A)

To assess the reliability of the COG and GP&L software listings, IA compared these listings to the following to identify any unknown software: accounts payable and purchasing card payments, COG City Council agendas, surveys, and help desk tickets. As a result of our testing, IA determined that the data provided and available was sufficiently reliable for the purposes of this report.

Background

Computer software, also known as software, is a set of instructions that tells a computer how to perform a task. Software makes up all of the programs on a computer, such as a web browser or a word processor.¹ COG and GP&L uses software on all employee computers to help accomplish day-to-day tasks. In order for the COG and GP&L employees to be able to use the software it must first be purchased, implemented, and then maintained. COG has two IT service departments to handle these processes - COG IT and GP&L TS. COG IT manages all enterprise wide software for every COG department. It also manages departmental software for all departments except GP&L. Since GP&L has more regulations as an electric provider, it maintains its own IT department (GP&L TS).

All software purchases must comply with the *Software and Hardware* policy and *COG Directive #1, Purchasing Policies and Procedures* policy. For software purchases that require a contract, the contracts must be sent to the COG City Secretary's office for retention, to comply with the *COG Directive#5, Departmental Original Documental Filing* policy.

COG and GP&L employees do not have the ability to install software on their computers. This was implemented by IT to restrict employees from installing unapproved software. Purchased software can have restrictions, such as the number of users and computers the software can be installed on. These restrictions are part of the software license.

COG IT and GP&L TS both have limited processes in place to manage software. However, both groups do not utilize the same tools. COG IT uses SCCM, a Sharepoint listing, a software budget listing, and the Entitlement Report to help monitor software. GP&L TS uses KACE and monitors the two most critical software to comply with the North American Electric Reliability Corporation (NERC) standards.

Source: ¹ https://www.sciencedaily.com/terms/computer_software.htm

Management Accomplishments*

COG IT

The COG IT management team appreciates the work conducted by IA to improve COG IT's business processes. The COG IT management team employs a number of methods to ensure that the City is compliant with software licensing requirements. COG IT's scope of control extends to business applications that are used at the departmental or enterprise level. COG IT does not monitor the licensing of individual desktop applications acquired for a specific purpose and that generally exist on a single computer workstation. However, IT does maintain control over the desktop computing environment such that IT staff are required to install individual desktop applications and reserves the right to reject and remove software that does not serve a legitimate business purpose or may present a security. In certain cases, individuals with a valid business reason maintain more control of their individual desktop computing environment.

COG IT maintains a database of all supported business applications that are in use throughout the organization. From this database, the software maintenance and support costs are derived during budget preparation. Software removed from service is deleted and no costs are included in the following budget. All maintenance and support costs are paid against a vendor invoice that is validated against the software database.

License compliance is also enforced through the application's license management processes. These processes restrict usage to specific individual accounts or quantities of concurrent account login sessions.

COG IT also conducts user entitlement audits twice each year. These audits provide departmental managers an ability to review and adjust the access of the department's employees. This also provides a means by which department managers see a list of all business applications that are in use by the department. As noted in the findings, the audit was not conducted in FY18 due to problems with the system that have been resolved.

A bit of historical context is also helpful to note. For some of the applications acquired by the City many years ago, IT has been unable to find the original agreement documentation. In some instances, the application was acquired before IT was centralized as it is today and the document was lost. In other cases, we have reached out to the vendor only to find that they cannot produce the document either, often due to prior acquisitions of the software vendor during which the legacy documents were lost. Nonetheless, subsequent annual support and maintenance documents also include licensing information based on the terms of the original agreement.

*Please note that "Management Accomplishments" are written by the audited entity and that IA did not audit or verify its accuracy.

Opportunities for Improvement

During the audit, IA identified certain areas for improvement. The audit was not designed or intended to be a detailed study of every relevant system, procedure, and transaction. Accordingly, the Opportunities for Improvement section presented in this report may not be all-inclusive of areas where improvement might be needed.

#1 – Utilization of Software (Obj. A)

CONDITION (THE WAY IT IS)

IA requested software logs from COG IT and GP&L TS to identify the usage of software. Both were unable to provide the logs since logging is only used on a limited basis. Consequently, IA was provided the SCCM software listing from COG IT and the KACE software listing from GP&L TS. The SCCM software listing consisted of all software installed on, and identified to, specific COG employee computers. The KACE software listing consisted of GP&L software that are either installed or available for installation, but did not identify the specific users for each software. KACE has the ability to identify specific user, but the reporting was not configured to produce that information.

COG has two types of software groups - enterprise and non-enterprise software. Enterprise software includes software that the vast majority of COG employees use and have stricter controls, such as Microsoft Office and the City finance system (Cayenta). Non-enterprise software is departmental specific software with less controls.

IA removed enterprise wide software, computer drivers, and free software from the SCCM software listing that resulted in 313 software available for testing. IA also identified 39 software from the KACE software listing available for testing. IA sent email surveys to the software users to gain additional usage information on the 313 SCCM software and 39 KACE software.

The tables below represent a summary of the survey responses showing the usage and criticality (based on user criteria, not from a business continuity and disaster recovery perspective) of software from the SCCM and KACE software listings. The highlighted portion of the tables indicates software that are being rarely or never used and not critical to the operations of COG and GP&L.

COG Software Criticality and Usage

Criticality / Usage	Daily	Often (Weekly, Monthly, Quarterly)	As Needed	Rarely	Never	Usage Unknown	Fully Unknown	Total
Extremely Critical	60	20	6	1		1	0	88
Critical	64	8	17			1	0	90
Not Critical	4	7	6	16	10	1	0	44
Criticality Unknown	13	2	10	2	5	48	0	80
Fully Unknown	0	0					11	11
Total	141	37	39	19	15	51	11	313

GP&L Software Criticality and Usage

Criticality / Usage	Daily	Often (Weekly, Monthly, Quarterly)	As Needed	Rarely	Never	Usage Unknown	Fully Unknown	Total
Extremely Critical	2	2	0	0	0	0	0	4
Critical	13	3	2	1	0	0	0	19
Not Critical	2	0	2	2	2	0	0	8
Criticality Unknown	0	0	0	0	4	3	0	7
Fully Unknown	0	0	0	0	0	0	1	1
Total	17	5	4	3	6	3	1	39

CRITERIA (THE WAY IT SHOULD BE)

According to the *Standards for Internal Control in the Federal Government Policy*

- *Section 2 OV2.19* - “Effective operations produce the intended results from operational processes, while efficient operations do so in a manner that minimizes the waste of resources.”
- *Principle 8.03* - “In addition to fraud, management considers other forms of misconduct that can occur, such as waste and abuse. Waste is the act of using or expending resources carelessly, extravagantly, or to no purpose.”

CAUSE (DIFFERENCE BETWEEN CONDITION & CRITERIA)

- COG IT and GP&L TS has a limited software monitoring process in place.
- Software that are no longer needed are not being removed by COG IT or GP&L TS in a timely manner.
- COG & GP&L employees may be purchasing software without adhering to the COG *Purchasing Policies and Procedures* policy.

EFFECT (SO WHAT?)

- Unnecessary software can cause potential security issues.
- Employees may use unnecessary software that can cause business interruptions.
- Financial resources are potentially being wasted on unnecessary software.

RECOMMENDATION

COG IT and GP&L TS management should:

- Further evaluate the identified software usage and criticality and remove any unnecessary software.
- Periodically run reports to validate the usage and criticality of software installed on COG and GP&L computers.
- Further educate COG and GP&L employees regarding the risk and potential impact of using unauthorized software and the importance of adhering to the COG *Purchasing Policies and Procedures* policy.

MANAGEMENT RESPONSE:

- COG IT - Concur
- GP&L TS - Concur

ACTION PLAN:**COG IT**

- COG IT will evaluate the information provided by IA to determine if additional action is necessary. Going forward, COG IT will run yearly reports to validate the usage and criticality of software.
- COG IT will provide further education regarding the policy for COG employees.
- The primary control to prevent unauthorized access to enterprise business systems is to remove network login and system login access which prevents the user from gaining access to the COG IT network and to the respective application. Some software is part of the enterprise standard desktop deployment and access is controlled by user account configuration.

GP&L TS

- GP&L TS has started evaluating and identifying software usage and criticality. GP&L TS will remove any unnecessary software.
- GP&L TS will run a periodic report to validate the criticality of the software installed on GP&L computers.
- GP&L TS will communicate to GPL employees the importance of not using unauthorized software.

IMPLEMENTATION DATE:

COG IT - Evaluation will be completed by May 31, 2019 and additional action will be determined following the evaluation.

GP&L TS - March 31, 2019

#2- Non-Business Purpose Software (Obj. B)

CONDITION (THE WAY IT IS)

During review of the SCCM software listing and KACE software listing, IA noted software that may not have a business purpose. The table below summarizes the software:

COG and GP&L Software with Non-Business Purpose

Software Type	Number of COG Software With Non-Business Purpose	Number of GP&L Software With Non-Business Purpose	Total
Books	1	2	3
Emulator	0	1	1
Exercise	1	0	1
Religious Software	0	3	3
Shopping	1	2	3
Video Camera	0	5	5
Video Games	35	16	51
Total	38	29	67

While all of the above software raises concern, one software (Emulator) in particular creates a significant concern. An emulator enables one computer system to behave like another system. In the case of the emulator found on the KACE software listing, the emulator is for a video game console. Emulators are usually legal to use, but the way to play video games on emulators is to download pirated video games, which may cause potential security and legal concerns.

CRITERIA (THE WAY IT SHOULD BE)

According to the *COG IT Software and Hardware Policy*

- *Section 6.1*- “Hardware devices, software programs, and network systems purchased and provided by the City of Garland are to be used only for creating, researching, and processing of City of Garland-related materials. By using the City of Garland’s hardware, software, and network systems you assume personal responsibility for their appropriate use and agree to comply with this policy and other City of Garland policies.”
- *Section 6.2.4* - “No outside software may be installed onto any City of Garland computer systems without Information Technology Services written permission.”

CAUSE (DIFFERENCE BETWEEN CONDITION & CRITERIA)

- Even though COG IT and COG TS have blocked the installation of software, certain employees may have a workaround.
- Software may have been installed by employees prior to the implementation of the policy to block unauthorized software.

EFFECT (SO WHAT?)

- Unauthorized and unnecessary software may cause potential security and legal issues.
- The use of non-business purpose software may impact productivity and resources.

RECOMMENDATION

COG IT and GP&L TS Management should:

- Review and remove all current software with a non-business purpose.
- Going forward, review software every six months and remove any non-business software.
- Further educate COG and GP&L employees regarding the risk and potential impact of using unauthorized software and the importance of adhering to the *COG Purchasing Policies and Procedures* policy.

MANAGEMENT RESPONSE:

- COG IT - Concur
- GP&L TS - Concur

ACTION PLAN:

COG IT

- COG IT will evaluate the information provided by IA and remove unsupported software. Going forward, COG IT will run yearly reports to validate the non-business related software.
- COG IT will provide further education about the policy for COG employees.
- There are a limited number of employees that have a justifiable business purpose to have sufficient privileges to install software.

GP&L TS

- GP&L TS has begun removing non-business purpose software. Going forward, GP&L TS will randomly select computers to monitor for compliance on non-business related software. This random selection will be based on scientific method and minimum 5% of the computers will be selected and audited per year.
- GP&L TS will inform GP&L employees on section 6.1 and 6.2.4 of COG IT Policy.

IMPLEMENTATION DATE:

COG IT - Evaluation will be completed by May 31, 2019 and additional action will be determined following the evaluation.

GP&L TS - March 31, 2019

#3 – Software Management (Obj. B)

CONDITION (THE WAY IT IS)

COG IT and GP&L TS have a limited process in place to manage all COG and GP&L software being used.

- COG IT has a Sharepoint database with a listing of software managed by COG IT and provides limited information about the software. However, it does not contain critical information such as contract duration and the number of users permitted. In addition, this Sharepoint listing does not contain certain critical software.
- GP&L TS has a specialized software that can be used as a Sharepoint alternative but is not currently configured for this purpose.

CRITERIA (THE WAY IT SHOULD BE)

According to the *Standards for Internal Control in the Federal Government Policy Principle 16.01* - "Management should establish and operate monitoring activities to monitor the internal control system and evaluate the results."

CAUSE (DIFFERENCE BETWEEN CONDITION & CRITERIA)

- COG IT has a delay in developing a more comprehensive software managing system.
- GP&L TS has not configured specialized software to enable a software managing mechanism.

EFFECT (SO WHAT?)

- Unknown software can cause potential security and legal issues, in addition to impacting financial resources.
- Contract terms may be violated without proper managing.

RECOMMENDATION

COG IT and GP&L TS management should develop and implement a comprehensive software managing mechanism.

MANAGEMENT RESPONSE:

- COG IT - Concur
- GP&L TS - Partially Concur

ACTION PLAN:

COG IT - COG IT is adding licensing information for enterprise business systems to the recently updated IT Service Management (ITSM) system. This will provide a more comprehensive license management function.

GP&L TS - GP&L TS manages their two most critical systems. Going forward, GP&L TS will start an internal process to manage the non-critical systems on a periodic basis.

IMPLEMENTATION DATE:

COG IT - May 31, 2019

GP&L TS - July 31, 2019

#4 – Software Contracts and Payments (Obj. C & D)

CONDITION (THE WAY IT IS)

Contract Retention

Based on the survey results, COG users identified 56 software and GP&L users identified three software that should have a written contract. In order to obtain these contracts IA researched the City record retention database, and contacted the City Secretary's Office, COG IT, GP&L TS, and respective departments. Based on this research and inquiry only 35 COG and three GP&L contracts were located.

Contract Completeness

IA reviewed the 35 COG and three GP&L contracts and noted the following missing information:

COG

- 12 contracts are missing the original payment amount information.
- 22 contracts are missing the renewal and maintenance payment amount information.
- 14 contracts are missing the software licensing information, such as number of licenses permitted to use.

GP&L

- One software contract is missing the original payment amount information.
- Three software contracts are missing the renewal and maintenance payment amount information.
- One software contract is missing the software licensing information.

Software License Compliance

IA reviewed COG adherence to software licensing for the available software contracts. Since the logs were not provided, IA compared the software licensing information in the contract to the total number of users indicated in the COG Entitlement Report. Based on this comparison, COG is in compliance with terms of the eight software tested.

GP&L TS does not have their specialized software configured to be used as an Entitlement Report alternative, consequently this test could not be performed.

Payment Accuracy

COG IT and GP&L TS both have a manual budget listing that itemizes the budgeted payments for software and is updated during the year as payments occur. IA reviewed the COG and GP&L software payments (only on the ones where the payment information is documented in the contract) to determine if the original and renewal and maintenance payments were accurately paid.

COG

- Two renewal and maintenance payments are different than the contracted amount.
- Five renewal and maintenance payments are not adequately documented to determine the accuracy of the payment.

CRITERIA (THE WAY IT SHOULD BE)

According to the *COG Directive#5, Departmental Original Documental Filing* policy General Administration Section 3 - "Individuals who are entitled to enter into the agreement on behalf of the City of Garland are responsible (1) for obtaining required signatures; (2) for ensuring the documents transferred to the City Secretary's Office are accompanied by the exhibits and/or attachments referenced in the document; (3) for timely transferring the documents to the Office of the City Secretary."

According to the *COBIT 4.1 Section DS1.6* - "Regularly review SLAs and underpinning contracts (UCs) with internal and external service providers to ensure that they are effective and up to date and that changes in requirements have been taken into account."

According to the *COBIT 4.1 Section ME2.1* - "Continuously monitor, benchmark and improve the IT control environment and control framework to meet organizational objectives."

According to the *COBIT 4.1 Section AC3* - "Ensure that transactions are accurate, complete and valid."

CAUSE (DIFFERENCE BETWEEN CONDITION & CRITERIA)

- A review process is not in place to ensure software contracts state all pertinent information and proper retention.
- Software payments are not being monitored to ensure they are paid accurately and timely.
- A periodic review process is not developed to ensure COG and GP&L are in compliance with software contracts.

EFFECT (SO WHAT?)

- Unknown software compliance can cause potential legal issues.
- COG IT & GP&L IT could potentially be taking financial loses on inaccurate payments and late fees.

RECOMMENDATION

COG IT and GP&L TS management should:

- Develop and implement a process that ensures the original software contract and any amendments include payment and licensing information, and are submitted to the City Secretary's Office for retention.
- Develop and implement a periodic process to determine if COG and GP&L are within contract specifications for software usage.
- Enhance the current software payment review process to require review of the contract's payment before payment.

MANAGEMENT RESPONSE:

- COG IT - Concur
- GP&L TS - Concur

ACTION PLAN:

COG IT

- COG IT will review the information provided by IA regarding missing data.
- COG IT's current practice is to store all contracts in the City's document management system and to provide the City Secretary with a copy of the contract.
- COG IT management reviews maintenance and support costs, including software licensing information, annually prior to budget preparation and again when invoices are received from the vendor.

GP&L TS will develop an internal process that includes IA recommendations.

IMPLEMENTATION DATE:

COG IT - May 31, 2019

GP&L TS - July 31, 2019

#5 – Inadequate Entitlement Report (Obj. B)

CONDITION (THE WAY IT IS)

The Entitlement Report is used to help COG departments track and validate employee access to various COG software. COG IT is supposed to distribute the Entitlement Report to each COG department every six months.

IA reviewed the COG Entitlement Report and noted the following:

- The Entitlement Report does not include all critical software used by COG employees.
- The Entitlement Report was not created for more than a year as of the date of this report.

GP&L TS has a specialized software in place that could be used as an Entitlement Report alternative, but is not currently configured for this use.

CRITERIA (THE WAY IT SHOULD BE)

According to the *Standards for Internal Control in the Federal Government Policy Principle 16.01* - “Management should establish and operate monitoring activities to monitor the internal control system and evaluate the results.”

According to the *Standards for Internal Control in the Federal Government Policy Principle 11.11* - “Management designs control activities for security management of the entity’s information system for appropriate access by internal and external sources to protect the entity’s information system.”

CAUSE (DIFFERENCE BETWEEN CONDITION & CRITERIA)

- COG IT does not monitor all software using the Entitlement Report.
- Technical issues prevented COG IT from developing the Entitlement Report.
- GP&L TS has not configured specialized software to enable user access rights reporting.

EFFECT (SO WHAT?)

COG and GP&L employees could have access to unnecessary software that can cause potential security and legal issues.

RECOMMENDATION

COG IT and GP&L TS management should develop Entitlement Reports that includes all critical systems and provide to departmental management for review on a semi-annual basis.

MANAGEMENT RESPONSE:

- COG IT - Concur
- GP&L TS - Partially Concur

ACTION PLAN:

COG IT

- COG IT will review the Entitlement Report to determine if additional enterprise business systems should be included. Going forward, COG IT will send the Entitlement Report to the COG departments yearly.
- The problems with the COG IT Entitlement Report have been corrected.

GP&L TS

- GP&L TS reviews GP&L employee access for their two most critical systems.
- GP&L TS will develop an internal process to review GP&L employee access for non-critical systems on an annual basis.

IMPLEMENTATION DATE:

COG IT - May 31, 2019

GP&L TS - July 31, 2019