

# **CAD Post Implementation Audit**

**September 2015**

Lori Brooks, City Auditor  
Susan Edwards, Assistant City Auditor  
Roshan Jayawardene, Internal Auditor



September 29, 2015

Honorable Mayor and Members of the City Council:

The City Auditor's Office has completed the Computer Aided Dispatch (CAD) Post Implementation Audit. The purpose of this audit was to evaluate the effectiveness and efficiency of the CAD Intergraph 9.1 implementation. The evaluation included assessing system reliability, comparing expected and actual results related to cost and scheduling, and determining if stated objectives were achieved.

Management's response to our audit findings and recommendations, as well as target implementation dates and responsible parties, are included in the following report.

We would like to thank the Arlington Fire Department, Arlington Police Department, Information Technology and Finance Department staff for their full cooperation and assistance during this project.

*Lori Brooks*

Lori Brooks, CPA, CIA, CGAP, CRMA  
City Auditor

Attachment

c: Trey Yelverton, City Manager  
Theron Bowman, Deputy City Manager  
Jim Parajon, Deputy City Manager  
Gilbert Perales, Deputy City Manager  
Don Crowson, Fire Chief  
Will Johnson, Police Chief  
Mike Finley, CFO  
Dennis John, CIO

# **CAD Post Implementation Audit Table of Contents**

	<b><u>Page</u></b>
Executive Summary .....	1
Audit Scope and Methodology .....	2
Background .....	2
Detailed Audit Findings.....	7
Management’s Response.....	16

## *Executive Summary*

The City Auditor's Office conducted a post implementation audit of the Computer Aided Dispatch System (CAD), Intergraph 9.1. The audit was conducted in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. The objectives of the audit were to ensure:

- The selection process included an assessment of costs, technical efficiency and business needs
- The system meets business and compliance needs and includes adequate internal controls
- System reports are available to increase productivity and compliance
- The CAD application includes security features that protect data and transaction integrity
- System testing was completed for all deliverable features, results were adequately documented, and corrective action was taken for test failures
- Adequate training was provided to system users prior to go live
- There is accurate data transfer between Intergraph and other systems, and records can be traced to the source

The City Auditor's Office noted the following:

- The system meets business and compliance needs
- System reports available to assess operational efficiencies are adequate
- Internal controls to protect data and transaction integrity are sufficient
- Training documentation retained by management is sufficient
- Documentation is maintained indicating completion of system testing for deliverable features, testing results, and outcomes of corrective action taken for noted failures

The following presents opportunities for improvements:

- The CAD system lacks application controls required to implement ambulance contract clauses
- An adequately robust load test was not conducted to assess stability of the Intergraph software
- GIS (Geographic Information Services) accuracy and reliability needs improvement
- Review of record totals transferred to Firehouse software from CAD is not performed
- Routine verification of employment status for ambulance services employees is not performed
- Quality assurance during CAD server setup and implementation could have been improved
- A critical CAD system feature was disabled
- Routine password change for MDC access was not required
- Appropriate due diligence is needed when utilizing cooperative purchasing programs
- Merchandise credit associated with MDC purchases was not processed appropriately

Audit findings and recommendations are discussed in the Detailed Audit Findings section of this report.

## ***Audit Scope and Methodology***

The audit was conducted in accordance with generally accepted government auditing standards. The following methodology was used in completing the audit:

- Interviewed Dispatch, Police, Fire, Ambulance and Information Technology staff members who use the system and/or assisted in implementation
- Observed Police and Fire first responders using the system in daily operations
- Observed the dispatch system in use at a special event in the AT&T Stadium
- Reviewed vendor contracts, financial costs and system procurement process
- Reviewed system reporting capability, audit trails and system performance compared to the Tiburon system used previously
- Examined system security, access rights and data security
- Examined data conversion and the system's ability to access and link historical data associated with prior calls for service
- Reviewed the system disaster recovery and business continuity plan
- Examined system test documentation during implementation and deliverability of system specifications outlined in the software contract
- Reviewed efforts to train end users, as well as participation by vendors in training efforts
- Examined data transfer from Intergraph to Police and Fire record retention systems

## ***Background***

Arlington Dispatch Services, a unit of the Arlington Fire Department (AFD), began the process to replace its aging Tiburon dispatch software in 2010. Tiburon dispatch software had reached its useful life, and the vendor had no plans to service its software after 2014. The old software was also not upgradable to include modern technology, such as Global Positioning System (GPS) enabled tracking. Also, changes to the existing customized dispatch software would have created compatibility issues with the Tiburon record management system used by the Police Department.

After securing federal grant funds to purchase the new system, AFD, with assistance from a software pilot team, selected the Intergraph CAD dispatch system to replace the Tiburon system. The implementation process began in November 2011, and the new system went live in March 2013.

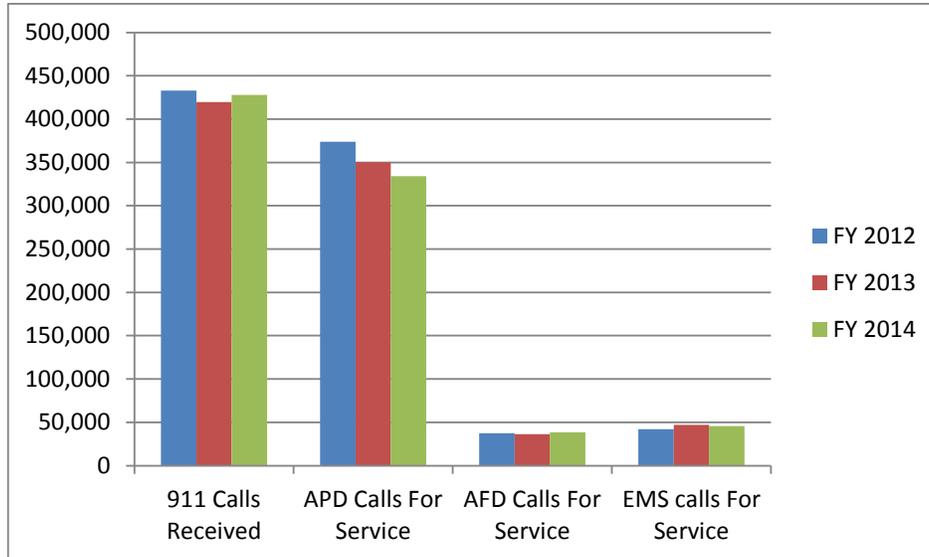
Emergency (911) calls received from Arlington citizens are entered into CAD software to dispatch Police, Fire and Ambulance Services as needed. Call details are transmitted to mobile data computers (MDC) in first responder vehicles.

The new Intergraph system also required that MDC units in Fire and Police vehicles be replaced, due to compatibility issues. Ambulance Services, which are outsourced to American Medical Response (AMR), did not require replacement of MDC units, as the existing units were compatible.

Arlington Dispatch Services receives calls when citizens dial 911 for emergency services. Based on the nature of the emergency, calls are routed to Police, Fire or Ambulance Services. Dispatch staff is divided into call intake, Police and Fire dispatch. Police and Fire dispatchers receive the call from

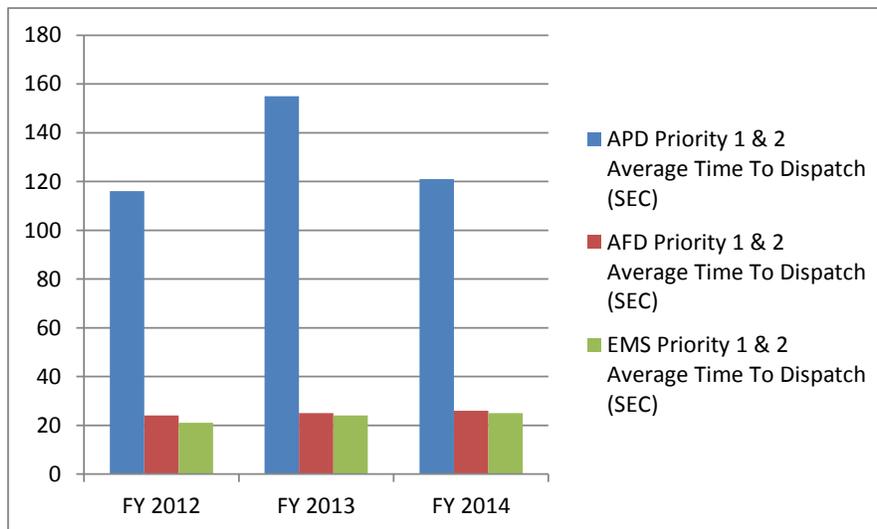
call intake. Dispatch for ambulance services is provided by the outsourced vendor, American Medical Response (AMR).

The volume of calls for service from Arlington citizens is shown below (FY2012 - FY2014)



Source: Arlington Dispatch Services

Once calls are received, they are prioritized based on established standards. The primary factor associated with call prioritization is threat to citizen lives and safety, as well as risk to property. City policy lists goals for time to dispatch priority Police, Fire and EMS calls at 120 seconds, 25 seconds and 30 seconds, respectively. Police calls take longer to dispatch due to the volume of calls and officer availability. Average time to dispatch priority calls during the last 3 fiscal years is listed below.



Source: Arlington Dispatch Services

## Project Budget

The cost of the Intergraph software was approximately \$2.622 million, which includes the hardware required to run the application. Police and Fire MDC costs were approximately \$1.663 million, resulting in total expenditures of \$4.285 million.

The system was funded using the following sources:

		Software	Application Hardware	MDC
Source	Amount			
2010 UASI Grant	\$1,000,000	X	X	
AFD non arbitrage fund	\$1,122,000	X	X	
AFD operating budget	\$400,000	X	X	
Dispatch operating budget	\$100,000	X	X	
2012 general fund	\$1,663,275			X

<b>Total</b>	<b>\$4,285,275</b>
--------------	--------------------

Source: IT Project Management

## Actual Cost

Costs associated with the new system are listed below.

	Software	Application Hardware	MDC
Intergraph Inc.	\$2,422,173		
Dell		\$199,827	
APD Panasonic			\$1,262,673
AFD Dell			\$362,430

<b>Total Cost</b>	<b>\$4,247,103</b>
-------------------	--------------------

Source: IT Project Management

## System Selection

The system selection process was managed by the Fire Department. Police staff members attended vendor demonstrations and subsequently participated during implementation, along with City Information Technology staff who participated in a technical role. An outside vendor was also hired as an advisor to the project implementation team. Based on a system requirements document, several vendor presentations were reviewed by the system selection team. Due to time constraints associated with the federal grant, a traditional competitive bidding process was not utilized. Instead, a State cooperative purchasing method was used to purchase the new system. With this method, vendors agree to special pricing for goods and services under State cooperative programs, which are used by many city and county governments, as well as school districts.

The system selection team had considered 3-4 vendor products prior to selecting Intergraph. Field visits to observe software under consideration had also been made. A total of 3 vendors had given the government/cooperative pricing for the software Arlington was seeking. Price negotiations began after Intergraph was selected. The contract for the software purchase was signed in November 2011. The overall system implementation timeline is listed below.



The system went live with the 9.1 version of Intergraph software. The version implemented was not the most current version of Intergraph software. The vendor presented the 9.2 version of Intergraph software when the product was demonstrated to Arlington in 2011. The 9.2 version was not officially released by Intergraph at the time of contract signing; therefore, the City’s Information Technology staff recommended use of the earlier version of the software, as the 9.2 version was a “beta” (untested, unused software) version. The 9.2 version of Intergraph was officially released in March of 2012; however, the City’s Information Technology group had already begun the system set-up and installation process, under a demanding timeline, and was unable to change to the newer version. A contributing factor was that the project was partially funded by UASI grant funds that had to be spent by October 2012.

**System Features**

Arlington dispatch services selected 1,404 system features they would like to see in the initial requirements document. Features were selected based on existing features in Tiburon, features found after conducting research on new dispatch software, new features that were being used by other cities, as well as features Police and Fire staff would like to see in new software. The vendor responded to this initial requirements document, and the response was included in the software contract.

System testing documentation maintained by Dispatch Services shows the final result of system features that was delivered by the vendor. They are summarized in the table below.

<b>Category</b>	<b>Number of Features</b>
Functional and delivered by vendor	1270
Vendor was unable to deliver functionality and compensated COA	54
Dispatch Services abandoned the feature due to low need	50
Dispatch Services came up with work-around	4
Duplicate features	9
Vendor responded system feature is unavailable	17
<b>Total</b>	<b>1404</b>

Additionally, 462 requirements were selected for the mobile computers (MDC) used by first responders. Summary of MDC requirements are shown below

<b>Category</b>	<b>Number Of Features</b>
Functional and delivered by vendor	367
Vendor was unable to deliver functionality and compensated COA	26
Dispatch Services abandoned the feature due to low need	21
Dispatch Services came up with work-around	1
Vendor responded system feature is unavailable	47
<b>Total</b>	<b>462</b>

The vendor compensated the City for the functionality it was unable to deliver. Intergraph initially indicated the feature is capable in its software, but during implementation they discovered that features could not be delivered. The compensation amounted to \$412,800, which was applied towards the software 9.3 version upgrade.

### **Intergraph 9.3 Upgrade**

As noted, Arlington went live with the 9.1 version of Intergraph software in March 2013. The vendor began to discontinue development support on its 9.1 version of software in April 2014. As a result, the City upgraded to the most current 9.3 version of Intergraph software, which was officially released in December 2014. Subsequent to completion of our audit fieldwork, the City's software upgrade went live in May 2015. As such, audit of the implementation of the 9.3 version was not included in the scope of this project.

## ***Detailed Audit Findings***

### **CAD System Lacks Application Controls Required to Implement Ambulance Contract Clauses**

The City's contract for ambulance services with American Medical Response (AMR) includes several contract performance clauses. The current system configuration prevents implementation of internal controls that would ensure specific contract clauses established for ambulance services are met.

The current ambulance contract specifies response times for high priority medical calls and includes monetary damages for exceeding set time limits established for response. Each medical call consists of several sequential steps, such as "in route", "on scene", "transport of patient begun" and "at medical facility." Currently, ambulance staff is able to change these status codes out of sequence. For example, "on scene" can be declared prior to "in route" status, or "on scene" status can be declared while the vehicle is still in motion. Currently, drivers have the ability to adjust actual performance documentation and potentially avoid payment of penalties related to contract requirements.

Currently, ambulance contract compliance is reviewed manually each month by the EMS Coordinator. Response times are verified by reviewing call text and time notated within the call text. GPS locations of ambulances are also reviewed to determine the validity of "on scene" codes. Manual verification is required, prior to monetary compensation by AMR for a slow response. Strong application controls that support enforcement of contract clauses will ensure validity of response data. After implementation of the needed application controls, ambulance staff will not be able to enter response codes out of sequence or enter "on scene" status while the vehicle is in motion.

#### ***Recommendation:***

- 1. The City Auditor's Office recommends that the Fire Chief ensure there are strong application controls in place to support enforcement of Ambulance contract clauses.***

### **An Adequately Robust Load Test Was Not Conducted To Assess Stability of the Intergraph Software**

The load test conducted by the software vendor did not include instances representative of those where the system may be subjected to greater stress levels, such as a mass casualty event. The basic software load test performed was contractually required prior to implementation.

The vendor's software implementation guidelines recommend a load test that represents optimum use of the software during peak operational demands. Conducting this testing requires specialized test facilities where load test software is capable of mirroring peak demands. The load test results can then be used to customize the software and accompanying hardware to meet maximum operational demands. During a major incident, more than 150 Police, Fire and Ambulance Services staff can be assigned to a call, thus creating a peak demand on dispatch software. A more realistic load test should represent an event, such as a mass casualty incident that could be encountered in Arlington.

According to documentation provided by Dispatch Services, the load test conducted for Arlington Dispatch services included forty-four events per minute for a period of one hour, with 15,000 total commands executed. The three agencies' (Police, Fire and Ambulance services) use of the system in a mass casualty event could exceed the test parameters used during the load test conducted by the vendor. Additionally, the load created by use of public safety MDC units was not adequately tested, due to funding limitations. Mobile user load can be significant, as users can query for situation updates, which consumes system resources.

According to Dispatch management, there have been two instances of MDC process failures since go live. One such instance was during the search of a murder suspect, while another was during an event involving an active shooting. Although certain issues, such as server configuration anomalies and a number of software changes, may have played a role, a definitive cause for the failures was not identified. It is important to note that in the event of a system failure, Dispatch Services uses a manual process to handle incoming calls and monitor ongoing progress.

Although robust load tests may require 3<sup>rd</sup> party assistance with Intergraph vendor coordination and are costly, this level of testing may be warranted, given the impact of a system failure to public safety operations.

***Recommendation:***

- 2. The City Auditor's Office recommends that the Fire Chief consider conducting a robust CAD software load test that is representative of a mass casualty event, and includes consideration of a high volume of mobile (MDC) use by public safety staff. A robust load test should be conducted with vendor assistance by a third party software load testing entity to ensure impartiality.***

**GIS (Geographic Information Services) Accuracy and Reliability Needs Improvement**

The CAD software uses the City's own GIS data, which undergoes a conversion process for use in the system, to populate maps and other system features used by first responders. Accurate GIS data is essential to ensure the software operates properly and reliably. Issues with the CAD software attributable to GIS data, identified during the audit, include:

- Some locations were not displayed on the maps
- One way roads were not displayed consistently
- There were inaccuracies in routing to destinations

Arlington GIS data is based on ESRI software. There are two other GIS products that are widely used, including Intergraph's own GIS product, Hexagon Geospatial. Even though Intergraph offers its own GIS product, they indicated in a press release they plan to make Intergraph software compatible with other GIS products, such as ESRI. It is currently not adequately compatible. Funding limitations with the CAD implementation project precluded using Intergraph's own GIS product.

The following associated issues were identified during the audit, related to GIS and/or CAD software:

- There is a lack of dedicated GIS staff for public safety applications, who are capable of managing and troubleshooting ESRI GIS data in CAD software and coordinating with Intergraph to ensure accuracy and operability
- Currently, the City's GIS staff resources are allocated among the Water, Community Development and Planning, and Information Technology Departments. There are no designated GIS staff resources in departments, such as Public Works and the Parks Department, that contribute necessary GIS data. Water Department GIS staff resources include six employees responsible for updating water related infrastructure (i.e. water lines, fire hydrants etc.) information. The Community Development and Planning Department has one dedicated staff member who updates the GIS system, based on new plat information. Adequate coordination between departments that currently update data and/or between the other two departments that need to contribute GIS data (i.e. Public Works and Parks) may not exist. Coordination will result in consistent operational policies and procedures and the implementation of a quality assurance methodology and operational objectives.
- The City does not currently use the routing feature in ESRI GIS software, as that has not historically been needed within the City's general environment. Lack of the GIS routing feature being uploaded to the Intergraph CAD application can result in incorrect routing, such as not recognizing one way streets or the shortest distance between two destinations. In order to address these issues, the City began using Tarrant County GIS data, when they upgraded to the Intergraph 9.3 version, which has resulted in a reduction of some of the previous routing issues.

Because of GIS related issues, dispatch staff may experience difficulty specifically identifying a location when a citizen calls for emergency services. For example, location issues are prevalent when an emergency occurs in un-platted areas of Arlington. Un-platted areas can be found in new and undeveloped areas of the city, as well as older neighborhoods. Un-platted areas are shown in GIS data associated with the nearest centerline street in place at the time the parcel was established. As such, depending on the size of the parcel, pinpointing a specific location in this parcel is difficult, considering its potential distance from the older centerline street. For example, the same parcel of land may now be closer to a more recently built street; however, un-platted land remains associated with the old centerline street.

When routing and address variances exist in CAD, first responders are able to navigate and locate based on their personal knowledge of streets and neighborhoods and other available resources.

Tarrant County GIS data is also based on ESRI software. Even though GIS data is obtained from Tarrant County, Arlington GIS staff originates address and street data within the City, through the platting process and other administrative changes; and then supplies Tarrant County with street data that can be pulled directly into their data set. Tarrant County processes this data prior to Dispatch Services' utilization of the GIS data. Coordinating and combining GIS resources throughout the City of Arlington into one organizational unit may result in more timely and accurate data updates to GIS data.

**Recommendations:**

3. *The City Auditor's Office recommends that the City Manager consider operating the City's GIS unit under a centralized management structure that is capable of oversight of the entire unit and coordinating efforts of all City entities that contribute to updating the City's GIS data.*
4. *The City Auditor's Office recommends that the Fire Chief consider adding a GIS related staffing resource to current Dispatch Services CAD System administration staff, who is capable of ensuring ESRI data operability in Intergraph CAD software.*
5. *The City Auditor's Office recommends that the Fire Chief request Dispatch Services to conduct research on the ESRI routing feature to determine if it is compatible with Tarrant County GIS data and Intergraph CAD software. If it is compatible and accurate, secure funding for inclusion of routing data layers in ESRI software, and coordinate with City Information Technology Staff to include the routing data layer in the Tarrant County GIS data file.*

**Review of Record Totals Transferred to Firehouse Software from CAD is not Performed**

Fire calls for service are assigned a report number by Intergraph, based on a code manually entered by either Dispatch staff or first responders, based on compliance requirements. These calls are then transferred from Intergraph to Firehouse software. There is a manual process to verify the timely completion of reports in Firehouse; however, there is no process to ensure calls, which require reports, are coded to reflect the requirement. Additionally, The CAD call number is not documented in the Firehouse software, which makes it difficult to reconcile records.

Compliance requirements, applicable to fire incident documentation, require that AFD personnel file a report in most cases, based on the nature of the call. A report is not required for calls having final disposition codes, such as "cancel" or "duplicate." Also, reports are not required for certain other types of call responses, such as holiday fireworks, animal assistance calls by Fire personnel, and some AT&T stadium events.

Because calls requiring reports are flagged manually, there is a risk that a call would not be assigned a report number, and therefore, not transferred to Firehouse software. The risk can be mitigated by performing a routine review to identify calls requiring a report that had not been assigned a report number, due to human error.

It is expected that the Firehouse software will be migrated to a cloud hosted solution in early fiscal year 2016. It is currently hosted internally by the City. A data field for the actual CAD number is necessary, and will require vendor assistance to modify the software. Introduction of an additional data field appears to be reasonable, once the migration is complete.

***Recommendations:***

6. *The City Auditor's Office recommends that the Fire Chief request the Firehouse software vendor to add a queryable data field to current software to accommodate the initial CAD call number.*
7. *The City Auditor's Office recommends that the Fire Chief request that Fire Prevention Services include routine review to identify calls requiring a report that had not been assigned a report number, due to human error.*

**Routine Verification of Employment Status for Ambulance Services Employees is not Performed**

Testing performed during the audit identified employees on the CAD American Medical Response (AMR) employee table that were not included on the active employee list provided by AMR.

The City has a contract with AMR for ambulance services. AMR employees are given access to the CAD system via their own mobile data computers. Employment status of AMR users, however, is not reviewed on a routine basis.

CAD access is limited to active employees of Police, Fire and Ambulance Services, as needed. Access must be restricted and monitored, due to sensitive data residing within the system. City employees' access is removed when notification of termination, based on employment status in the Lawson system, is received.

A formal process, however, has not been established to verify employment status or receive termination notification for AMR staff having system access. Assistance from AMR management is needed to ensure a designated CAD administrator, with authority to revoke access, is notified promptly when an employee terminates employment with AMR.

The risk of unauthorized access by a terminated AMR employee is somewhat lessened by the need to have access to an AMR remote terminal. It is understood that AMR physical security may prevent access to a terminal. However, with access to an AMR remote terminal, a former employee could gain access to CAD and individual health data, which is HIPAA protected.

***Recommendation:***

8. *The City Auditor's Office recommends that the Fire Chief require the ambulance services vendor to notify CAD dispatch staff when an employee terminates and ensure CAD access is terminated upon notification.*

## **Quality Assurance during CAD Server Setup and Implementation could have been Improved**

Due to project resource constraints, the City's Information Technology Department server team was responsible for setup of the CAD hardware, consisting mainly of servers, and networking requirements. The setup and hardware specifications were provided to the IT department by the CAD vendor, Intergraph, to ensure the CAD system would perform at an acceptable level. The vendor successfully performed two formal "health checks" of the system prior to 'go live.' This did not include testing of the configuration of hardware. An in-depth review to identify setup errors was not conducted. Additional costs associated with in-depth reviews must be specified within the software implementation contract. Therefore, it does not appear that a thorough review of server setup, to ensure vendor requirements, was conducted by either IT server management or another party.

Initially, users were experiencing slow performance after CAD 'go live,' and the system failed on two occasions. The system failures occurred during an active shooter police incident and a murder investigation, where the suspects were believed to be in an apartment complex. The system was used by over 150 Police, Fire and Ambulance personnel during these incidents, from mobile data computers, as well as through the application administratively, to obtain situation updates. The IT staff was not engaged to perform a root cause analysis; however, after the failures, Intergraph was asked to review its software. No issues related to application software were found; however, Intergraph identified the following server and data storage setup exceptions.

- The archive server only identified 4 of the 8 required central processing units (CPUs)
- The data storage units consisted of 7,200 RPM speed, rather than the required speed of 15,000 RPM

The setup errors may have contributed to system performance issues; however, there is no definitive cause. It appears remedial action taken after the configuration error was discovered rectified the system's slow performance, and there have been no failures since.

### ***Recommendation:***

- 9. The City Auditor's Office recommends that in future implementation projects the Chief Information Officer require quality assurance reviews of hardware setup conducted by IT staff in order to meet software setup requirements, and provide necessary expertise to conduct the needed review.***

## **A Critical CAD System Feature Was Disabled**

The new CAD system vehicle speed tracking feature was disabled for Arlington Police vehicles approximately three months after the go live date. The feature, however, remained functional for Fire and Ambulance vehicles.

The vehicle speed tracking feature is a key tool in the CAD system. The system uses GPS technology to determine vehicle speed at any given time and records the information within the system. The speed tracking feature is intended to give management a valuable tool to assess officer compliance

with policy and procedures, monitor safe use of Police vehicles and officer safety, and provide valuable data in the event of an accident.

The feature was disabled at the request of Police management, due to the lack of a policy on vehicle speed tracking methodology.

*As of the date of this report, a policy, along with procedures associated with vehicle speed tracking, has now been developed. Vehicle speed tracking is now enabled.*

### **Routine Password Changes for MDC Access was not Required**

Panasonic mobile data computers (MDC) are utilized by Arlington Police staff to access the CAD dispatch system from their vehicles. The units are set up for two-point authentication of user (a magnetic card and a strong password requiring periodic change). However, the requirement for periodic password change was disabled.

MDC terminals are used by Public Safety staff to access criminal record databases and motor vehicle information, as well as to transmit personal information to dispatchers. Agencies that provide criminal and motor vehicle information, such as Criminal Justice Information Service (CJIS) and Texas Crime Information Center (TCIC), require routine password changes, two-point authentication, as well as other defensive mechanisms, such as data encryption.

It appears the password change process was excluded during initial system implementation, when officers were training to use the new CAD dispatch system.

Password compliance for MDC access to criminal databases is mandatory. For example, a lost magnetic access card can be used to access the system or hack the system, when a MDC is unattended.

*As of the date of this report, routine password change has now been enabled and is required.*

### **Appropriate Due Diligence is Needed When Utilizing Cooperative Purchasing Programs**

Goods and services related to the CAD implementation project were acquired using the Department of Information Resources (DIR), a State cooperative purchasing program. Texas cooperative purchasing programs are utilized as an alternative to the traditional competitive bidding process. When using cooperative purchasing programs, adequate oversight is needed to ensure the procurement method and pricing are appropriate for the types of goods and services secured.

Texas cooperative purchasing programs allow municipalities, such as the City of Arlington, to share in special pricing and discounts negotiated by the State of Texas for goods and services. Goods include computers and electronic equipment manufactured by Dell and Panasonic, as well as a large number of other manufacturers, for example. The State of Texas negotiates pricing directly with the manufacturers and enters into contracts. The manufacturers use authorized resellers of their products.

Resellers are required to comply with the negotiated contract terms when selling to the end users. For the CAD equipment and *data center upgrades (which were not directly related but driven by the CAD project)* the City utilized an authorized reseller for Panasonic and Dell products. Products purchased included laptops and associated service plans, as well as HVAC and power supply equipment for use in the City's data centers. The contract associated with the data center also included construction related to the installation of a new fire suppression system.

To ensure resellers' compliance with cooperative purchasing contracts, the City needs to verify pricing and terms submitted by the authorized resellers. The City's Purchasing Division operates under a decentralized model. They assist departments with traditional competitive bid procurement. They are also responsible to review cooperative program contracts utilized by City departments, to ensure appropriateness. However, due to lack of resources associated with a decentralized model, City departments using cooperative programs are primarily responsible to manage their own process, including assessing compliance with cooperative programs and verifying pricing and other contractual clauses. A lack of adequate training for department staff may lead to inappropriate use of State cooperative purchasing contracts.

Internal Audit attempted to obtain support for the pricing charged by the vendor. Additionally, documentation supporting the appropriateness of construction expenses on a DIR contract was requested.

The vendor was unable to provide sufficient detail for Internal Audit to verify that the price charged was the DIR contracted price and no documentation related to the construction expenses was received.

It appears that a lack of oversight in the use of cooperative purchasing programs for the CAD implementation resulted in the following deficiencies.

- Pricing noncompliance resulting in possible overcharges
- Construction related expenses, which do not appear to be specifically included in a cooperative purchasing program, were included in invoices and purchased without competitive bidding.

Additionally, it does not appear that management considered an alternative to DIR purchasing, such as using existing city contracts for computer purchases, installation, and associated services. As stated in the City's purchasing policy, "Public purchasing has the responsibility to obtain the most value for the tax dollar in a fair, efficient and equitable manner."

***Recommendations:***

***10. The City Auditor's Office recommends that the Purchasing Division revise the purchasing manual to clarify requirements related to DIR contracts. The manual may specifically require that departments, when attempting to purchase goods and or services from a DIR contract, verify that specific DIR contracts exist for the goods/services being purchased, and that the***

*pricing quoted from DIR vendors is at the agreed upon DIR contract pricing, prior to issuing the purchase order.*

- 11. The City Auditor's Office recommends that the Chief Financial Officer ensure adequate oversight is provided by the Purchasing Division when departments use cooperative purchase programs, and ensure (1) appropriate training is provided to departments, if they are expected to assess vendor compliance with the programs and contracts, and (2) that departments have considered all viable alternatives to assure that the best pricing is attained.*
- 12. The City Auditor's Office recommends that Dispatch Services attempt to verify that the pricing received was in fact the contracted price; and if any discrepancies are noted, the department should consult with the City Attorney's Office to assist with resolution of the discrepancies.*

### **Merchandise Credit Associated with MDC Purchases was not Processed Appropriately**

A merchandise credit, totaling \$60,000, originating from returned DVD drives associated with a mobile data computer (MDC) purchase, was not processed appropriately. The original purchase was made from general funds, but the credit was applied to a purchase made with federal grant funds, approximately 14 months after the original purchase. The credit was applied to a federally funded police camera project. Documents submitted to City Council for the police camera project do not include an expected credit from the general fund.

Returns are usually processed by vendors, either by reducing the amount due on the current invoice or by issuing a credit memorandum that will be applied to a future invoice. The City follows a guideline that requires applying credits to the same funding source, which is processed by accounting staff.

#### ***Recommendation:***

- 13. The City Auditor's Office recommends that the Chief Financial Officer develop a policy, and procedures, requiring credits for merchandise returns are applied to the original funding source, ensuring proper transparency.*

**CITY OF ARLINGTON  
CAD POST IMPLEMENTATION AUDIT  
AUDIT RECOMMENDATIONS AND RESPONSES**

AUDIT RECOMMENDATION	CONCUR/ DO NOT CONCUR	MANAGEMENT'S RESPONSE	RESPONSIBLE PARTY	DUE DATE
1. <i>The City Auditor's Office recommends that the Fire Chief ensure there are strong application controls in place to support enforcement of Ambulance contract clauses.</i>	Concur	The Optima project, a third party resource management application, is currently in the beginning stages of implementation. Optima will automate the majority of dispatch functions for EMS. Dispatch Services has already engaged Intergraph to determine the feasibility of setting up a separate instance of Intergraph MDT Server specific to EMS mobile units and a quote is forthcoming.	Jim Self Rhonda Shipp Jeremy Hensley	Final date to be determined based on Optima implementation and funding availability.
2. <i>The City Auditor's Office recommends that the Fire Chief consider conducting a robust CAD software load test that is representative of a mass casualty event, and includes consideration of a high volume of mobile (MDC) use by public safety staff. A robust load test should be conducted with vendor assistance by a third party software load testing entity to ensure impartiality.</i>	Concur	Additional load testing outside of a CAD load test will require additional funding for a third party to evaluate the efficacy and efficiency of a computer aided dispatch and mobile environment during peak utilization. A third party organization should be able to provide feedback to the health and stability of the public safety communication system. The Dispatch team will investigate service and cost options regarding this issue and provide feedback to the City Manager's Office	Jim Self Rhonda Shipp CAD Assessment Team	December 2015
3. <i>The City Auditor's Office recommends that the City Manager consider operating the City's GIS unit under a centralized management structure that is capable of oversight of the entire unit and coordinating efforts of all City entities that contribute to updating the City's GIS data.</i>	Concur	Staff will evaluate options for reorganizing the components of the City's overall GIS resources into a centralized or more integrated approach. The analysis will look at cost/benefit, legal requirements, and	Gilbert Perales, Deputy City Manager	3/31/16

AUDIT RECOMMENDATION	CONCUR/ DO NOT CONCUR	MANAGEMENT'S RESPONSE	RESPONSIBLE PARTY	DUE DATE
		operational needs/efficiencies		
<p>4. <i>The City Auditor's Office recommends that the Fire Chief consider adding a GIS-specific staffing resource to current Dispatch Services CAD System administration staff, who is capable of ensuring ESRI data operability in Intergraph CAD software.</i></p>	Concur	<p>A staffing study conducted in 2013 made the same recommendation, and the Fire Department has included such a request for consideration in each budget year since. The request to add technical resources has been denied every year. The budget request for 2016 has now been approved. As such, hiring will begin in the first quarter of FY2016.</p>	<p>Jim Self Rhonda Shipp HR</p>	November 2015
<p>5. <i>The City Auditor's Office recommends that the Fire Chief request Dispatch Services to conduct research on ESRI routing feature to determine if it is compatible with Tarrant County GIS data and Intergraph CAD software. If it is compatible and accurate, secure funding for inclusion of routing data layers in ESRI software, and coordinate with City Information Technology Staff to include the routing data layer in Tarrant County GIS data file.</i></p>	Concur	<p>Although there has been discussion within Intergraph to incorporate the ESRI Routing service as an option, currently there is no solution for using the ESRI Routing Service within the Intergraph suite of products. Dispatch Services will evaluate the various available routing options compatible with the Intergraph software suite and incorporate the best option for meeting the City of Arlington public safety needs.</p>	<p>Jim Self Rhonda Shipp Jeremy Hensley</p>	<p>Complete for current environment but there will be an ongoing assessment of the Intergraph software to evaluate system capability with ESRI software.</p>
<p>6. <i>The City Auditor's Office recommends that the Fire Chief request the Firehouse software vendor to add a queryable data field to current software to accommodate the initial CAD call number.</i></p>	Concur	<p>The Fire Department's Firehouse administrator will work with the Firehouse RMS vendor to determine a methodology to capture the CAD call number in an additional data field, once migration to a hosted environment is complete. Final implementation may be cost-prohibitive if there is a fee for software customization.</p>	<p>Jim Self Janice Williams Michael Lark</p>	<p>March 2016? (Final date TBD pending IT work plan schedule)</p>
<p>7. <i>The City Auditor's Office recommends that the Fire Chief request that Fire Prevention Services include routine review to identify calls requiring a report that had not been assigned</i></p>	Concur	<p>Prevention staff has received briefings on a methodology to manually audit Firehouse incident records to ensure all CAD calls that</p>	<p>Jim Self Stephen Lea Mary Nicholls</p>	September 2015

AUDIT RECOMMENDATION	CONCUR/ DO NOT CONCUR	MANAGEMENT'S RESPONSE	RESPONSIBLE PARTY	DUE DATE
<i>a report number, due to human error.</i>		require an incident report are assigned an incident number and transferred to Firehouse. Additional training and documentation of procedures will be necessary to formalize the process.		
8. <i>The City Auditor's Office recommends that the Fire Chief require the ambulance services vendor to notify CAD dispatch staff when an employee terminates and ensure CAD access is terminated upon notification.</i>	Concur	Dispatch Services will create a procedure that will require timely notifications be made by AMR to dispatch staff on employee separations. The procedure will include monthly correspondence with the ambulance service to ascertain compliance.	Jim Self Rhonda Shipp Dana Craig	August 2015
9. <i>The City Auditor's Office recommends that in future implementation projects the Chief Information Officer require quality assurance reviews of hardware setup conducted by IT staff in order to meet software setup requirements, and provide necessary expertise to conduct the needed review.</i>	Concur	In September, 2014, the IT Department modified its system build procedures with a formal Quality Advocate System Engineer role in addition to the Primary System Engineer Role when building servers. IT has also improved system build documentation with an improved uniform Server Request Form for the requestors and Server Build Form for IT System Engineers and the process has been centralized in COA's Microsoft SharePoint system. The Server Request Form includes a checklist for the Primary System Engineer and Quality Advocate System Engineer which assist management to ensure staff is following the build checklist with documentation and reduce errors. IT has also formalized documentation during the handover process requiring written acceptance of the delivered hardware and configuration.	IT Network Infrastructure Manager	Completed September, 2014

AUDIT RECOMMENDATION	CONCUR/ DO NOT CONCUR	MANAGEMENT'S RESPONSE	RESPONSIBLE PARTY	DUE DATE
		Depending on the requestor's skillset, the requester can make that assessment or have their vendor analyze the built system for that determination.		
<p>10. <i>The City Auditor's Office recommends that the Purchasing Division revise the purchasing manual to clarify requirements related to DIR contracts. The manual may specifically require that departments, when attempting to purchase goods and or services from a DIR contract, verify that specific DIR contracts exist for the goods/services being purchased, and that the pricing quoted from DIR vendors is at the agreed upon DIR contract pricing, prior to issuing the purchase order.</i></p>	Concur	The policy sections related to department responsibilities and use of cooperative contracts will be revised to specify department responsibilities and requirements when using the DIR contract, especially related to documentation of process, options, pricing, and follow-up in the payment process and the Purchasing Division's responsibilities prior to issuance of the Purchase Order(s).	Debra Carrejo, CPPO, CPPB Purchasing Manager	November 15, 2015
<p>11. <i>The City Auditor's Office recommends that the Chief Financial Officer ensure adequate oversight is provided by the Purchasing Division when departments use cooperative purchase programs, and ensure (1) appropriate training is provided to departments, if they are expected to assess vendor compliance with the programs and contracts, and (2) that departments have considered all viable alternatives to assure that the best pricing is attained.</i></p>	Concur	<p>1) Department quarterly training will be modified to reflect the policy additions addressed in item #10. This is due to be completed in first quarter of 2016, so the training will begin occurring during first quarter training cycle and continue thereafter in the form of a new "contracts management class."</p> <p>2) Training will also be provided to departments on the newest policy requirement to document in the bid file all other alternatives the department considered before choosing the DIR contract.</p> <p>NOTE: Although Finance concurs with the finding in practical applicability, this</p>	Debra Carrejo, CPPO, CPPB Purchasing Manager	<p>TRAINING: November 15, 2015</p> <p>FOLLOW-UP CHECKS: Begin September 15, 2016</p>

AUDIT RECOMMENDATION	CONCUR/ DO NOT CONCUR	MANAGEMENT'S RESPONSE	RESPONSIBLE PARTY	DUE DATE
		<p>finding also suggests an element of oversight (follow-up, price checking, verification on DIR contract requirements) by the Purchasing Division that is usually found in a more centralized model of purchasing--- but is currently built in to neither the current decentralized process or current division staffing levels. The position that would normally perform this function in a centralized model is called a Contracts Specialist. The purchasing division does not currently have this position in-house.</p> <p>Logically, this type of oversight can be interpreted to include post-PO oversight of all cooperatives, and the City has 20+ such agreements with potential effect on hundreds of POs and this will require workload redistribution. In order to facilitate the follow-up implementation of this finding long-term and still maintain current workload output, it is likely that staff will need to be augmented to add a specialist for this particular aspect of centralization to meet this audit requirement perfectly.</p>		
<p>12. <i>The City Auditor's Office recommends that Dispatch Services attempt to verify that the pricing received was in fact the contracted price; and if any discrepancies are noted, the department should consult with the City Attorney's Office to assist with resolution of the discrepancies.</i></p>	<p>Concur</p>	<p>Dispatch project leads will verify that individual project element(s) pricing is in fact at the contracted price. If not, Dispatch will contact the City Attorney's office and/or Finance to address the issue.</p>	<p>Jim Self Rhonda Shipp Jeremy Hensley</p>	<p>September 2015</p>

AUDIT RECOMMENDATION	CONCUR/ DO NOT CONCUR	MANAGEMENT'S RESPONSE	RESPONSIBLE PARTY	DUE DATE
<p><i>13. The City Auditor's Office recommends that the Chief Financial Officer develop a policy and procedures requiring credits for merchandise returns are applied to the original funding source, ensuring proper transparency.</i></p>	<p>Concur</p>	<p>Page 8 of the current P-card Policy states:</p> <p>“If an item has been returned and a credit voucher received, the Cardholder shall allocate the credit to the same account number as the original debit so that the financial system shows both postings.”</p> <p>Applicable policy and procedures will be updated to expand language to include other forms of purchasing and detail the proper accounting treatment for processing credits for merchandise returns.</p>	<p>Debra Carrejo, CPPO, CPPB Purchasing Manager</p> <p>Amy Trevino, CGFO Controller</p>	<p>Will complete as part of FY16 Business Plan Item: Review Citywide Financial Policies</p>