AUDIT TEAM
Jim Williamson, CPA, CIA, City Auditor
Matt Weller, CPA, Assistant City Auditor
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SURPLUS 500M DATA RADIO INVENTORY

SUMMARY OF FINDINGS

APRIL 29, 2014

MAYOR AND CITY COUNCIL

Mick Cornett	*Audit Committee, Mayor*
James Greiner	*Ward 1*
Ed Shadid	*Ward 2*
Larry McAtee	*Audit Committee, Ward 3*
Pete White	*Ward 4*
David Greenwell	*Audit Committee, Ward 5*
Margaret S. "Meg" Salyer	*Ward 6*
John A. Pettis Jr.	*Ward 7*
Patrick J. Ryan	*Ward 8*

The City of
OKLAHOMA CITY
Office of the City Auditor

Executive Summary

Special Project #191

April 29, 2014

The Mayor and City Council:

The Office of the City Auditor has completed procedures to identify the sequence of events and decisions leading to the surplus inventory of 500M Data Radios noted in the Oklahoma State Auditor and Inspector's report dated April 30, 2013.

In 2003, the City received proposals for a public safety Wireless Data Network enabling mobile access to City information systems from vehicles throughout the City. During contract negotiations, City staff proposed and the contractor contractually agreed to implement a Primary Wireless Data Network providing higher speed coverage using a network of towers covering over half of the City and a Secondary Wireless Data Network providing lower speed extended and back-up coverage using the City's new Voice Radio System and 500M Data Radios. This approach was different from that originally proposed by the contractor.

By late 2006, management received all 875 contracted 500M Data Radios and noted data and voice transmission concerns relating to the 471 500M Data Radios installed to-date. Therefore, management decided to use previously unavailable technology (instead of the 500M Data Radios) for the Secondary Wireless Data Network.

Results of our work revealed a number of factors contributing to the resulting surplus inventory of 500M Data Radios noted by the State Auditor:

- The 500M Data Radios were included in the contract base without defined user needs/ expectations. Inclusion in the base likely obligated the City to pay for the 500M Data Radios when the minimum speed and connection contract requirements were met and accepted. See **FINDING (1)**.

- Management authorized delivery of discontinued 500M Data Radios with manufacturer's support ending approximately 5 years prior to the end of their useful life. There is no evidence that alternative options or models were considered or related risks (e.g., market value and parts availability) were discussed. See **FINDING (2)**.

- The planned timing of 500M Data Radio deliveries was not adjusted for installation delays. Delivery adjustments could have provided management an opportunity to stop delivery and negotiate a return or credit when it was determined the radios would not be used. See **FINDING (3)**.

- Management decided to use previously unavailable technology instead of the 500M Data Radios before the contractor fully implemented the contracted Secondary Wireless Data Network. While this addressed noted data transmission concerns, the timing of the decision further diminished the City's ability to hold the contractor accountable for problems with data transmissions using the 500M Data Radios. See **FINDING (4)**.

- Management retained all 875 500M Data Radios for future system expansion, parts, and/or replacements without exploring other cost recovery and/or disposition options. See **FINDING (5)**.

- Meeting minutes do not reflect that the steering committee – created to provide executive leadership and oversight for public safety capital projects – was clearly informed by management that:

  - The City was likely obligated to pay the contractor for all contracted 500M Data Radios,
  - The City would retain and pay for all 875 500M Data Radios, or
  - Disposition and/or cost recovery options for the discontinued and partially used proprietary 500M Data Radios were potentially limited.

  See **FINDING (6)**.

The content and emphasis of items in this report have been discussed in detail with appropriate representatives from management. These discussions were held to ensure a fair, accurate and complete presentation of the findings arising from our work. Management's responses are attached to this report in their entirety.

Jim Williamson	Matt Weller	Brett Rangel
City Auditor	Assistant City Auditor	Audit Manager

SURPLUS 500M DATA RADIO INVENTORY
SUMMARY OF FINDINGS

BACKGROUND, SCOPE, AND METHODOLOGY

BACKGROUND

On **03/14/00**[1], the Oklahoma City voters approved a 32-month, ½-cent sales tax to fund several public safety capital improvement projects, including a new:

- City radio communications system (Voice Radio System) and
- City communications network to support City mobile data systems (Wireless Data Network).

On **07/01/00**, the Public Safety Capital Projects (PSCP) Office was created under the City Manager's Office to manage and coordinate public safety capital projects with departments. A PSCP Steering Committee[2] was also created to facilitate project coordination and decision making and to provide executive leadership, oversight, and accountability during regularly scheduled monthly meetings.

On **09/14/04**, the City contracted with Affiliated Computer Services State and Local Solutions (ACS) to implement various public safety systems at a base cost of $18.9 million. The base cost included installation of a Wireless Data Network enabling mobile access to City information systems (e.g. computer aided dispatch, records management, etc.) from vehicles throughout the City. The total Wireless Data Network cost ($6,254,397) included:

- $5,217,966 for a Primary Wireless Data Network providing higher speed coverage using a network of towers covering over half of the City and routers installed in the trunk of each vehicle to connect employees' mobile computers to the network and
- $1,036,431 for a Secondary Wireless Data Network providing lower speed extended and back-up coverage using the new M/A-COM Voice Radio System[3] and M/A-COM 500M Data Radios[4] (500M Data Radios) in the trunk of each vehicle to connect employees' mobile computers to the network.

In late 2006, after receiving all 875 and installing 480 of the contracted 500M Data Radios in vehicles, the PSCP Steering Committee approved using City staff tested and recommended commercial third generation (3G) cellular telecommunications technology previously unavailable

[1] The dates used throughout this report are highlighted to provide a point of reference when reviewing the timeline in Attachment 1.
[2] The PSCP Steering Committee included representatives from the City Manager's Office; the PSCP Program Office; the Information Technology Department; Police, Fire, and other affected departments.
[3] The City contracted with M/A-COM on **01/15/02** to implement the Voice Radio System at a cost of $24.3 million (with additional implementation services, equipment and software licensing/maintenance costs, the total cost was approximately $26.1 million). The scope of the City's agreement with M/A-COM was strictly for implementation of the Voice Radio System for *voice* communications with no provision for wireless *data* communications.
[4] M/A-COM's Voice Radio System is proprietary technology requiring the use of M/A-COM radios.

for the Secondary Wireless Data Network. The 480 installed 500M Data Radios were removed from vehicles and placed in inventory along with 395 500M Data Radios that were never installed.

Around **07/01/07**, the PSCP Office was reorganized under the Information Technology Department and assigned responsibility for Radio Shop oversight.

On **10/02/12**, the City Council approved a resolution authorizing the Mayor to request an audit by the Oklahoma State Auditor and Inspector (SA&I) of the ACS contract. As a result, the SA&I issued a special audit report on **04/30/13**, which noted the surplus inventory of 824[5] 500M Data Radios purchased at a cost of $852,016.

SCOPE AND METHODOLOGY

The Office of the City Auditor has completed procedures to identify the historical sequence of events and decisions leading to the surplus inventory of 500M Data Radios noted in the SA&I report. Procedures performed included interviewing PSCP Office and Information Technology Department management; interviewing PSCP Steering Committee members; reviewing relevant requests for proposal (RFPs), vendor proposals, contracts, PSCP Steering Committee minutes, and inventory and financial records; and preparing a timeline of events and decisions relating to the 500M Data Radios (included in Attachment 1). Our work did not include performing an audit of PSCP Program operations.

RESULTS OF WORK PERFORMED

The findings included in this report are intended to describe the significant decisions and the resulting circumstances that ultimately led to the surplus inventory of 500M Data Radios. Each finding is immediately followed by *management's response*, which is attached to this report in its entirety.

FINDING 1: Specific Inclusion of the Secondary Wireless Data Network in the Contract Base without Defined User Needs/Expectations

Management stated that during ACS contract negotiations (**02/03/04** through **09/14/04**) City staff proposed using the new Voice Radio System for the Secondary Wireless Data Network to provide more funding to maximize the Primary Wireless Data Network coverage area. This approach was different than that originally proposed by ACS. On **09/14/04**, ACS contractually agreed to provide a Secondary Wireless Data Network using the Voice Radio System and 500M Data Radios installed in vehicles.

[5] The SA&I report noted 876 500M Data Radios evidenced in the PSCP inventory records, of which 40 had been repurposed and 12 had been used for spare parts at the time of their special audit.

The ACS contract included minimum speed and connection requirements for the Secondary Wireless Data Network that were ultimately attained and accepted by City staff.[6] However, there is no evidence of an assessment to define user needs/expectations for inclusion in the contract.[7] Despite the lack of contractually defined user needs/expectations, the 875 500M Data Radios ($905,275) and related costs ($131,156) to implement the Secondary Wireless Data Network were specifically included in the base amount of the ACS contract.

Inclusion of the 500M Data Radios in the contract base likely obligated the City to pay the entire base amount of the ACS contract when the speed and connection requirements were met and accepted. The lack of defined user needs/expectations limited the City's ability to hold ACS accountable for subsequent performance problems with data transmissions using the 500M Data Radios. See **FINDING 4**.

MANAGEMENT RESPONSE 1

Agree with modification. There was no single outstanding wireless data solution in the original proposals from any vendor. Covering 620 sq miles in 2004 with mobile data bandwidth sufficient to run desktop applications at low cost and with a long term technology solution proved to be very challenging. In development of the contract, City functional teams and Public Safety Capital Projects staff worked with M/A-COM and ACS to conceptualize a comprehensive solution to give public safety users the best possible wireless data connection while maximizing project funds. This solution sought to greatly expand the coverage area of the high bandwidth WiFi primary data solution proposed by ACS by using the data communication capabilities of the new EDACS trunked radio system for secondary data.

Since ACS negotiations and the cooperative design of the wireless data communication solution preceded the final acceptance testing of the Voice Radio system, performance and integration compatibilities were assumed without a specific contractual guarantee with ACS.

It is important to be aware that the mobile data solution was partly engineered and developed by internal City staff with assumption of some risk for the final overall system performance.

FINDING 2: Receipt of Discontinued 500M Data Radios

On **05/09/05**, M/A-COM distributed notice to customers that production of 500M Data Radios, which the City planned to use for the Secondary Wireless Data Network, was discontinued.[8] Though M/A-COM documentation of the discontinuation notice is available from current Radio Shop staff, exactly when the discontinuation notice was originally received and by whom could not

[6] Testing performed in accordance with the **10/12/05** Acceptance Test Plan verified that minimum speed and connection requirements specified in the contract were attained.
[7] The contract did not specify the mobile data computing applications desired to operate on the Secondary Wireless Data Network. Management stated that they relied upon verbal representations from ACS and M/A-COM that the Voice Radio System using the 500M Data Radios would meet City user needs/expectations.
[8] M/A-COM continued parts and service support through **05/09/10**, approximately half of the remaining useful life of the 500M Data Radios.

be determined. However, knowledge of the discontinuation notice was likely known among ACS and City staff.[9]

Management authorized delivery of the 500M Data Radios on **09/19/05**. There is no evidence that alternative options or models were explored or discussed at the PSCP Steering Committee. There is also no evidence the PSCP Steering Committee discussed the risks (e.g., market value and parts availability) related to delivery of the 500M Data Radios with manufacturer's support ending approximately 5 years prior to the end of their useful life.

MANAGEMENT RESPONSE 2

Agree with modification. There is no specific Public Safety Steering Committee documented discussion of the 500M solution relative to the discontinuation notice. However, because the Radio Shop is still able to produce the received documentation today, it is highly likely that nine years ago the key functional leads were aware of the discontinuation and discussed 500M alternatives outside of the monthly Steering Committee meeting.

In consideration of the discontinuation notice, functional leads would likely have evaluated options including the fact that no alternative mid-range data radio model to the 500M was available or planned by the radio vendor. As such, the 500M data radio would have continued to be the consensus solution for the secondary radio network in 2005 through Oct 2006 when the 3G commercial alternative was proposed by functional teams. In hind sight, a formal agenda item and formal recommendation to continue to proceed with the 500M model should have been presented to and discussed by the Steering Committee.

FINDING 3: Planned Delivery of 500M Data Radios Not Adjusted for Installation Delays

The 500M Data Radios were part of a comprehensive installation[10] that was delayed. Management stated the delay was due to factors not associated with the 500M Data Radios. However, the deliveries of 500M Data Radios were not adjusted as installations were delayed:

- On **09/19/05**, management authorized delivery of the 500M Data Radios "just in time" for subsequent installations.
- By **12/16/05**, the City had received the first of four monthly deliveries of 500M Data Radios.
- On **01/08/06**, ACS' subcontractor began installing 500M Data Radios in vehicles.
- By **03/24/06**, the City had received delivery of all 875 500M Data Radios while only 65 had been installed in vehicles.
- On **10/26/06**, management authorized City staff to remove 471 500M Data Radios installed to date. (This decision was made after a **10/16/06** decision to use a commercial 3G provider instead of the radios. See **FINDING 4**.)

[9] The Wireless Data Network section of the ACS contract included a requirement that all equipment provided be of current design and manufacture.
[10] ACS was contracted to install several interrelated components in each vehicle (e.g., 500M Data Radios, voice radios, network routers, antennas, mobile computers, software, etc.).

Deliveries of 500M Data Radios more reasonably timed with installations could have provided management an opportunity to stop delivery and attempt to negotiate a return or credit for the 500M Data Radios when it was determined they would not be used.

MANAGEMENT RESPONSE 3

Agree with modification. As stated in the report, the 500M data radio was just one component of a much larger system installation in public safety vehicles. In an effort to minimize the out-of-service time for Police and Fire vehicles, staff recommended to install all voice radio and mobile data network equipment in those vehicles at the same time rather than taking vehicles out-of-service multiple times. The monthly delivery schedule was approved and communicated to the vendor as "just in time" based on the expected installation schedule. It should be noted that some of the installation delays were due to internal City functional team project deliverables and not due to the vendors.

It is possible that with a different original approved "just in time" delivery schedule that delivery of the 500M could have been changed as installations ran behind schedule. Since, at the time of approval of the delivery schedule, there was an expectation that installation would occur within the next several months, the original authorized schedule seems justifiable.

As installations were delayed unexpectedly, a different agreed delivery schedule of the 500Ms may have changed how many were in inventory at the IT Radio Shop when the decision was made to change to 3G in October 2006.

FINDING 4: Decision to Use a Commercial 3G Provider for the Secondary Data Network Instead of the Contracted 500M Data Radios on the Voice Radio System

On **10/16/06**, after City staff development and testing, management decided to use previously unavailable commercial 3G cellular telecommunications technology for the *Secondary* Wireless Data Network. This new *Secondary* Wireless Data Network solution (not contemplated in the ACS Contract) was implemented by City staff before ACS had fully implemented the contracted Secondary Wireless Data Network using the 500M Data Radios.

As detailed below, management's decision was made after noting data transmission concerns on the Voice Radio System while it was temporarily used as the *Primary* Wireless Data Network:

- A **10/12/05** Acceptance Test Plan[11] documented staff concerns over limited data transmission speeds and a recommendation to limit Secondary Wireless Data Network transmissions on the Voice Radio System to computer-aided dispatch data only.
- **05/19/06** and subsequent documentation evidenced increasing intermittent delayed and lost data transmissions using the 500M Data Radios as more users were connected to the Voice Radio System.

[11] The test plan only verified that minimum speed and connection requirements specified in the contract could be attained using the 500M Data Radios on the Voice Radio System.

- Management also stated there were concerns that saturation of the Voice Radio System by data transmissions might be impacting the quality of voice communications. However, an impact on voice communications, if any, was never definitively determined.

Although use of a commercial 3G provider addressed the noted data transmission concerns:

- The decision resulted in an inventory of 875 500M Data Radios that were no longer needed for data transmission and
- The timing of the decision (before ACS fully implemented the contracted Secondary Wireless Data Network) further diminished the City's ability to hold ACS accountable for problems with data transmissions using the 500M Data Radios.

MANAGEMENT RESPONSE 4

Agree with modification. City functional teams tested 10 units with CAD applications and data transmissions from mobile units during 2005. When the 500M data radios began to be installed in 2006 with the Voice system, they were initially used for Primary data communications since the WiFi Primary data communication system was not complete and delivered. There was an unexpected negative impact to Voice radio communications on the newly implemented trunked radio system.

Commercial technology and wireless data coverage had improved over the years since the contract execution. The City's Information Technology department began testing Sprint data cards that would provide a much higher bandwidth for secondary connection and not impact the Voice radio system. The 3G Sprint data cards were tested for coverage, speed, and compatibility with the WiFi system and proved to be a superior alternative to the use of the trunked radio system for data communications.

In October 2006, based upon the initial testing results, the recommendation was made to Public Safety Steering Committee to replace the data radios with Sprint commercial 3G service. This provided relief to the trunked radio system for its original, primary purpose of critical voice communications, and provided a better data communications capability for Public Safety mobile units.

FINDING 5: Untimely Determination of Reserves and/or Disposition of 500M Data Radios

As of **12/20/06**, all 480 previously installed 500M *Data* Radios had been removed from vehicles and placed in inventory along with 395 500M *Data* Radios that were never installed. The City had also been using 850 500M *Voice* Radios since **01/01/06** purchased under the M/A-COM Voice Radio System contract dated **01/15/02**. Management retained all of the 500M *Data* Radios to use for future system expansion or as future replacements or parts for the 500M *Voice* Radios.[12] The

[12] City Radio Shop employees could repurpose the 500M *Data* Radios to replace 500M *Voice* Radios and extend the lives beyond the manufacturer's **05/09/10** end of support. Management asserts the retention of all 875 500M *Data* Radios was reasonable given the unknown failure rate of the previously installed 850 500M *Voice* Radios.

market value of the partially used, unsupported proprietary 500M *Data* Radios would likely significantly diminish over time. However, management did not:

- Attempt to renegotiate the **12/21/06** payment of $270,031 for 261 500M *Data* Radios invoiced after the **10/16/06** decision to discontinue use of 500M Data Radios,[13]
- Determine a reasonable reserve of 500M *Data* Radios to use as replacements or parts, or
- Dispose of unneeded 500M *Data* Radios through a return to ACS for a refund, an exchange for credit with M/A-COM, or donation/sale to another government/entity using M/A-COM equipment.

The **04/30/13** SA&I special audit report noted that 52 of the 500M Data Radios had been used for replacements or parts. On **10/08/13**, City Council authorized the return of 700 500M *Data* Radios to Harris Corporation[14] in exchange for $114,700 of credit towards future voice radio purchases.

MANAGEMENT RESPONSE 5

Agree. The radios purchased for data communication purposes are essentially the same mobile radio as 760 other existing 500M voice radios servicing City departments. The City saves significant money annually by performing maintenance and repair of radios in-house for over 4700 radios which includes these 760. Portable and mobile radios have an expected useful life of 5-7 years, and parts are more difficult to obtain in the later years.

Therefore, the stock of unused 876 M/A-COM 500M radios was placed in the Radio Shop Inventory to be used as needed for as a supply of spare parts to be used in the repair of the 500M voice radios, to replace damaged 500M voice radio equipment, and for potential expansion of the system user base since only minor costs are associated with converting the 500M data radio for voice communications.

Retaining the 500M data radios as support inventory for the in-production 500M voice radios should have been formally discussed and approved with Steering Committee in late 2006. Additionally, on-going support inventory needs and resale/return value should have been evaluated on a regular basis.

FINDING 6: Insufficient Discussion of Surplus 500M Data Radio Inventory with the PSCP Steering Committee

The PSCP Steering Committee was created to provide executive leadership for the PSCP program through monthly meetings where important information relating to project management decisions is communicated and discussed. PSCP Steering Committee meeting minutes reflect regular updates on the status of the 500M Data Radios and some discussion of the testing and

[13] The Purchase Agreement between ACS and M/A-COM provided for termination if the City terminated all or part of the corresponding provisions in the ACS Contract. Management stated that since the City was not a party to the Purchase Agreement, they were not aware of this provision.
[14] M/A-COM was purchased by Harris Corporation on **04/16/09**.

recommendation to use a commercial 3G telecommunications provider. The **10/16/06** minutes reflect a concerted effort by management to:

- Remind the PSCP Steering Committee of concerns with the 500M Data Radios,
- Ensure agreement regarding the recommendation to move to commercial 3G cellular telecommunications technology, and
- Emphasize the significance of this decision.

However, minutes do not reflect that the PSCP Steering Committee was clearly informed by management that:

- The City was likely obligated to pay ACS for all contracted 500M Data Radios due to:
  - Their specific inclusion in the base amount of the ACS contract without defined user needs/expectations beyond minimum speed and connection requirements attained and accepted by City staff (**FINDING 1**), and
  - The City's receipt of all 875 500M Data Radios (**FINDING 3**)
  - Non-use of the Voice Radio System and 500M Data Radios as the originally contracted *Secondary* Wireless Data Network (**FINDING 4**).

- The City would retain and pay for all 875 500M *Data* Radios (including $270,031 for 261 radios not yet invoiced or paid at the time) to use for future system expansion or as future replacements or parts for the 850 500M *Voice* Radios without exploring other cost recovery and/or disposition options (**FINDING 5**).

- Disposition and/or cost recovery options were potentially limited due to:
  - Increased financial and product support risks related to discontinued proprietary 500M Data Radios with manufacturer's support ending **05/09/10** (**FINDING 2**) and
  - Limited use of 480 of the radios (**FINDING 5**).

MANAGEMENT RESPONSE 6

Agree. There was insufficient formal discussion at the Public Safety Steering Committee level as to the approved return, retention, or disposition of the surplus 500M radio inventory. This finding references other findings with regard to communication with the Public Safety Steering Committee. In hind-sight, as a follow-up to the change in project scope for the secondary data communications, the disposition of the 500M radio inventory should have been formally discussed at Public Safety Steering Committee.

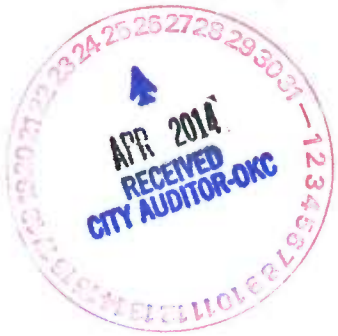
TIMELINE OF SIGNIFICANT EVENTS AND DECISIONS RELATING TO 500M DATA RADIOS

ATTACHMENT 1

CUMULATIVE COUNT OF 500M DATA RADIOS Received:	CUMULATIVE COUNT OF 500M DATA RADIOS Installed:			YEAR
0	0	– **03/14/00**	Oklahoma City voters approved a 32-month, ½ cent sales tax to fund several public safety capital improvement projects, including a new City radio communications system (Voice Radio System) & City communications network to support City mobile data systems (Wireless Data Network).	2000
0	0	– **01/15/02**	City Council approved a contract with M/A-COM for the Voice Radio System.	2002
0	0	– **08/06/03**	A 21-member Evaluation Committee began a 5-month review of proposals, including proposed Wireless Data Network options.	2003
0	0	– **02/03/04**	City Council authorized management to negotiate a contract with ACS.	2004
0	0	– **09/14/04**	City Council approved a contract with ACS. During contract negotiations, management proposed and ACS subsequently contractually agreed to provide a Secondary Wireless Data Network using the Voice Radio System and 500M Data Radios installed in vehicles. ACS signed a Purchase Agreement with M/A-COM to provide 875 500M Data Radios, related equipment, and services for the Secondary Wireless Data Network.	
10	0	– **05/09/05**	M/A-COM distributed notice to customers that production of 500M Radios would be discontinued (with parts & service support continuing through 05/09/10).	2005
10	0	– **09/19/05**	Management authorized ACS to deliver the 500M Data Radios to the City "just in time" for installations in vehicles.	
10	0	– **10/12/05**	Acceptance Test Plan completed documenting a recommendation by City staff to limit data transmission on the Voice Radio System using 500M Data Radios to computer-aided dispatch because of concerns over limited data transmission speeds.	
230	0	– **12/16/05**	The City had received the first of 4 monthly deliveries of 500M Data Radios from M/A-COM.	
230	0	– **01/01/06**	City users began using the M/A-COM Voice Radio System, including 850 500M Voice Radios.	2006
230	1	– **01/08/06**	ACS' sub-contractor began installing 500M Data Radios in vehicles.	
875	65	– **03/24/06**	The City had received the final delivery of 500M Data Radios.	
875	82	– **05/19/06**	Intermittent delayed and lost data transmissions were documented by users when connecting to the network with Voice Radio System using 500M Data Radios.	
875	261	– **08/16/06**	Management had begun testing previously unavailable commercial third generation (3G) cellular telecommunications technology for mobile connection to the network.	
875	355	– **09/18/06**	Management discussed using commercial 3G cellular telecommunications technology for the Secondary Wireless Data Network and the Voice Radio System using 500M Data Radios as a third connection option at the Public Safety Capital Projects Steering Committee meeting.	
875	433	– **10/16/06**	Management decided to use commercial 3G cellular telecommunications technology for the Secondary Wireless Data Network, noting improved data transmissions when combined with removal of the 500M Data Radios from vehicles.	
875	471	– **10/26/06**	Management authorized City staff to remove 500M Data Radios from vehicles.	
875	480	– **11/06/06**	Implementation of the Primary Wireless Data Network was complete and use of commercial 3G cellular telecommunications technology for the Secondary Wireless Data Network began.	
875	0	– **12/20/06**	City staff completed the removal of previously installed 500M Data Radios from vehicles.	
		– **12/21/06**	The City paid the last invoice from ACS for 500M Data Radios which was for 261 500M Data Radios costing $270,031.02.	
		– **04/16/09**	M/A-COM was purchased by Harris Corporation.	2009
		– **05/09/10**	Harris Corporation (formerly M/A-COM) discontinued service & parts support for the 500M Data Radios.	2010
		– **10/02/12**	City Council approved an audit by the Oklahoma State Auditor & Inspector.	2012
		– **04/30/13**	City Council received the Oklahoma State Auditor & Inspector's special audit report.	2013
		– **10/08/13**	City Council authorized return of 700 500M Data Radios in exchange for $114,700 of credit towards future radio purchases from Harris Corporation (formerly M/A-COM).	

MEMORANDUM

The City of
OKLAHOMA CITY



TO: James Williamson
City Auditor

THROUGH: James D. Couch
City Manager

FROM: Schad Meldrum
Information Technology Director

DATE: April 24, 2014

SUBJECT: Management Response to Surplus 500M Data Radio Inventory Summary of Findings

Please find the following responses to the findings to the Surplus 500M Data Radio Inventory Summary of Findings. If you have any questions, please feel free to contact me.

Management Response #1. Agree with modification:

There was no single outstanding wireless data solution in the original proposals from any vendor. Covering 620 sq miles in 2004 with mobile data bandwidth sufficient to run desktop applications at low cost and with a long term technology solution proved to be very challenging. In development of the contract, City functional teams and Public Safety Capital Projects staff worked with M/A-COM and ACS to conceptualize a comprehensive solution to give public safety users the best possible wireless data connection while maximizing project funds. This solution sought to greatly expand the coverage area of the high bandwidth WiFi primary data solution proposed by ACS by using the data communication capabilities of the new EDACS trunked radio system for secondary data.

Since ACS negotiations and the cooperative design of the wireless data communication solution preceded the final acceptance testing of the Voice Radio system, performance and integration compatibilities were assumed without a specific contractual guarantee with ACS.

It is important to be aware that the mobile data solution was partly engineered and developed by internal City staff with assumption of some risk for the final overall system performance.

Management Response #2. Agree with modification:

There is no specific Public Safety Steering Committee documented discussion of the 500M solution relative to the discontinuation notice. However, because the Radio Shop is still able to produce the received documentation today, it is highly likely that nine years ago the key functional leads were aware of the discontinuation and discussed 500M alternatives outside of the monthly Steering Committee meeting.

In consideration of the discontinuation notice, functional leads would likely have evaluated options including the fact that no alternative mid-range data radio model to the 500M was available or planned by the radio vendor. As such, the 500M data radio would have continued to be the consensus solution for the secondary radio network in 2005 through Oct 2006 when the 3G commercial alternative was proposed by functional teams. In hind sight, a formal agenda item and formal recommendation to continue to proceed with the 500M model should have been presented to and discussed by the Steering Committee.

Management Response #3. Agree with modification:

As stated in the report, the 500M data radio was just one component of a much larger system installation in public safety vehicles. In an effort to minimize the out-of-service time for Police and Fire vehicles, staff recommended to install all voice radio and mobile data network equipment in those vehicles at the same time rather than taking vehicles out-of-service multiple times. The monthly delivery schedule was approved and communicated to the vendor as "just in time" based on the expected installation schedule. It should be noted that some of the installation delays were due to internal City functional team project deliverables and not due to the vendors.

It is possible that with a different original approved "just in time" delivery schedule that delivery of the 500M could have been changed as installations ran behind schedule. Since, at the time of approval of the delivery schedule, there was an expectation that installation would occur within the next several months, the original authorized schedule seems justifiable.

As installations were delayed unexpectedly, a different agreed delivery schedule of the 500Ms may have changed how many were in inventory at the IT Radio Shop when the decision was made to change to 3G in October 2006.

Management Response #4. Agree with modification:

City functional teams tested 10 units with CAD applications and data transmissions from mobile units during 2005. When the 500M data radios began to be installed in 2006 with the Voice system, they were initially used for Primary data communications since the WiFi Primary data communication system was not complete and delivered. There was an unexpected negative impact to Voice radio communications on the newly implemented trunked radio system.

Commercial technology and wireless data coverage had improved over the years since the contract execution. The City's Information Technology department began testing Sprint data

cards that would provide a much higher bandwidth for secondary connection and not impact the Voice radio system. The 3G Sprint data cards were tested for coverage, speed, and compatibility with the WiFi system and proved to be a superior alternative to the use of the trunked radio system for data communications.

In October 2006, based upon the initial testing results, the recommendation was made to Public Safety Steering Committee to replace the data radios with Sprint commercial 3G service. This provided relief to the trunked radio system for its original, primary purpose of critical voice communications, and provided a better data communications capability for Public Safety mobile units.

Management Response #5. Agree:

The radios purchased for data communication purposes are essentially the same mobile radio as 760 other existing 500M voice radios servicing City departments. The City saves significant money annually by performing maintenance and repair of radios in-house for over 4700 radios which includes these 760. Portable and mobile radios have an expected useful life of 5-7 years, and parts are more difficult to obtain in the later years.

Therefore, the stock of unused 876 M/A-COM 500M radios was placed in the Radio Shop Inventory to be used as needed for as a supply of spare parts to be used in the repair of the 500M voice radios, to replace damaged 500M voice radio equipment, and for potential expansion of the system user base since only minor costs are associated with converting the 500M data radio for voice communications.

Retaining the 500M data radios as support inventory for the in-production 500M voice radios should have been formally discussed and approved with Steering Committee in late 2006. Additionally, on-going support inventory needs and resale/return value should have been evaluated on a regular basis.

Management Response #6. Agree:

There was insufficient formal discussion at the Public Safety Steering Committee level as to the approved return, retention, or disposition of the surplus 500M radio inventory. This finding references other findings with regard to communication with the Public Safety Steering Committee. In hind-sight, as a follow-up to the change in project scope for the secondary data communications, the disposition of the 500M radio inventory should have been formally discussed at Public Safety Steering Committee.