Office of Internal Audit

Performance Audit 23-07:
Citywide Camera Management

July 2024

City Auditor
Stan Sewell, CPA, CGFM, CFE

Senior Auditor
Richard Walls, CPA, CIA, CMFO

OFFICE OF INTERNAL AUDIT
Stan Sewell, City Auditor

July 23, 2024

To: Mayor Tim Kelly
City Council Members

Subject: Citywide Camera Management Audit (Report #23-07)

Dear Mayor Kelly and City Council Members:

The attached report contains the results of our audit of Citywide Camera Management. Overall, we found the Department of Technology Services has internal controls over a substantial portion of camera management operations. However, opportunities exist for improvement. In order to address the noted areas for improvement, we recommended actions to establish citywide policies and procedures, best practices and improve overall camera management.

We thank the management and staff of Department of Technology Services, Department of Early Learning-Head Start, Department of Public Works – Street Maintenance Division, Department of Public Works – Fleet Management, and CPD's Real-Time Intelligence Center for their cooperation and assistance during this audit.

Sincerely,

Stan Sewell, CPA, CGFM, CFE
City Auditor

Attachment

cc: Audit Committee Members
Jermaine Freeman, Chief of Staff
Mande Green, Chief Operating Officer
Julia Bursch, Deputy Chief Operating Officer
Jerele Neeld, Chief Information Technology Office
Koren Sapp, Deputy Chief Information Technology Officer
Karitsa Jones, Administrator – Department of Early Learning
Ricky Colston, Director, Department of Public Works, Street Maintenance Division
Kenneth Howell, Director Fleet Management
Jim Arnette, Tennessee Local Government Audit

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AUDIT PURPOSE

This audit was conducted in accordance with the Office of Internal Audit's 2023 Audit Agenda. The objective of this audit was to determine if the City has effective and efficient controls to manage and maintain its network of cameras.

BACKGROUND

The City of Chattanooga (City) maintains a system of cameras that are used for public safety, security, monitoring operations, and safeguarding property and equipment.

Exhibit 1: Location: 10th & Lindsay (AXIS Q6155-E PTZ Dome Network Camera)

The following departments manage cameras:

Department of Technology Services (DTS)[1]	785
Early Learning – Head Start	202
Citywide Services	40
Fleet Management[2]	5
Total	1,032

The Chattanooga Police Department (CPD) manages mobile cameras to record interactions between police officers and the community they serve. These cameras were included in an audit engagement performed by the Office of Internal Audit (OIA): Performance Audit 20-04, Chattanooga Police Department Mobile Cameras. As a result, CPD's mobile cameras are excluded from this audit.

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[1] The DTS 785 includes Public Safety – Real Time Intelligence Center cameras.
[2] Subsequent to initiation of our audit, Fleet Management installed cameras managed by DTS.

Additionally, CPD collaborates with local businesses in the Dragonfly Community Connect program where CPD is authorized to access some or all of the business's cameras. Currently there are 94 business cameras linked to CPD's Real-Time Intelligence Center. The Dragonfly cameras are also excluded from this audit.

The capital budget includes $961,000 over five years for a citywide camera refresh. The funding will be used to maintain devices, refresh old equipment and schedule new installations. The annual budgeted amounts are listed below in the Financial Information section.

Financial Information

Citywide Camera Refresh – Capital Budget[3]

Fiscal Year 2024	$	161,000
Fiscal Year 2025	$	200,000
Fiscal Year 2026	$	200,000
Fiscal Year 2027	$	200,000
Fiscal Year 2028	$	200,000

Source: CABR 2024 - Capital Budget

FINDINGS AND RECOMMENDATIONS

Citywide Policies.

During our audit of citywide camera management, we found there are no comprehensive citywide policies to ensure effective and efficient controls to manage and maintain the network of cameras. However, Early Learning – Head Start, does have written procedures for security cameras regarding the ongoing monitoring of facilities and maintaining safety of children, parents, and staff. Additionally, the City's Record Retention Schedule includes a section for IT-Video which states: "The default for video retention is 30 days, unless the video is part of an ongoing investigation, record request, related to a hold, or necessary for an audit."

The *City of Chattanooga Internal Control Manual* and the Tennessee Comptroller of the Treasury's *Internal Control and Compliance Manual* both indicate management should implement control activities through policies. Policies are an important part of effective management and provide reasonable assurance the city's objectives will be achieved.

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[3] Public Safety Cameras are purchased through the Real Time Intelligence Center (RTIC) capital budget, which is $150,000 for fiscal year 2025.

The oversight, performance and control of citywide camera management is mostly informal and based primarily on institutional knowledge of staff. The lack of citywide policies could hinder citywide camera management effectiveness.
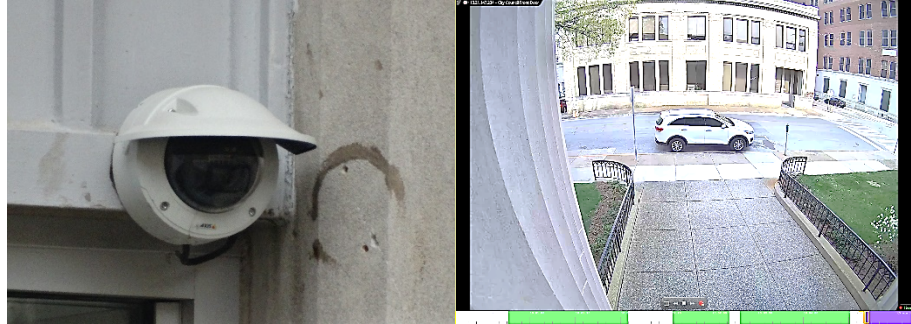

Exhibit 2: Location: Council Entrance (AXIS M3206-LVE Network Camera)

Recommendation 1:

We recommend DTS establish citywide written policies and procedures to manage and maintain its network of cameras. Input and feedback should be obtained from other relevant departments.

Auditee Response: We concur with the audit finding and recommendation.

Estimated Implementation Date: The City Technology Committee approved the written policies and procedures on June 10, 2024.The policy was implemented and shared with all department heads via email on July 3, 2024. This policy can be accessed from DTS Confluence and the Landing (intranet).

Priority Level: 1

Best Practices.

Best practices could help ensure the effective and ethical use of surveillance technology, while balancing privacy concerns. DTS indicates the camera placement standards they adhere to consist of "Any place where cash is collected, crime is present and child safety are a concern." These are excellent standards. However, several additional best practices could help ensure the effective and ethical use of surveillance technology, while balancing privacy concerns.

The National Institute of Standards and Technology defines best practices as "A procedure that has been shown by research and experience to produce optimal results and that is established or

proposed as a standard suitable for widespread adoption." Best practices are often recommended as a standard or benchmark for organizations to follow in order to achieve success, improve performance and mitigate risk.
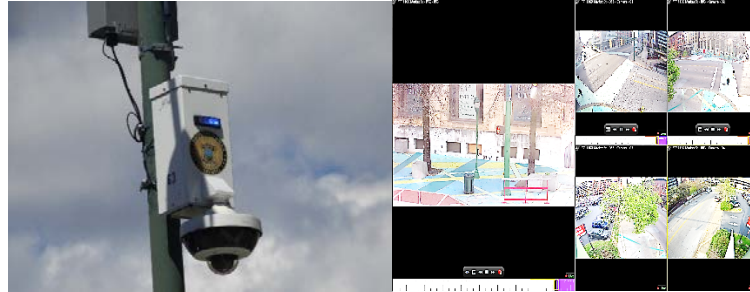

Exhibit 3: Location: 1100 Market Street (Hanwha PNM-9322VQP)

The Department of Homeland Security's (DHS) CCTV policy states: Developing Privacy Best Practices report specifies eight principles, which includes:

1. Purpose Specification

2. Transparency

3. Individual Participation

4. Data Minimization

5. Use Limitation

6. Data Quality and Integrity

7. Security

8. Accountability and Auditing

Examples of some best practices are as follows:

a. Purpose – The authority that permits the use of surveillance cameras and the purpose for which the cameras are intended should be set forth in the policies.

b. Privacy - Surveillance cameras must comply with laws and respect citizens' privacy. Ensure individuals are aware of the presence of surveillance cameras and obtain consent when necessary. Determine if audio recording is permitted.

c. Installation and Placement – Installation should be performed by a qualified professional. Potential security threats should be evaluated in order to determine the best placement for cameras and avoid areas that might infringe on privacy.

d. Maintenance – Be diligent about service and maintenance. What good is a camera if it does not work? While malfunctions may occur, repairs should be made timely so the camera continues to record.

e. Retention and Storage – Establish guidelines for the retention and storage of surveillance video, including how long the video will be kept and how it will be stored securely.

f. Cyber Security – Surveillance camera systems are potential targets for cyberattacks. To safeguard these systems, local governments should implement robust cybersecurity measures.

Recommendation 2:

We recommend DTS establish best practices to enhance the effectiveness of their surveillance camera systems. Best practices can be implemented through policies and procedures.

Auditee Response: We concur with the audit finding and recommendation.

Estimated Implementation Date: The City Technology Committee approved the written policies and procedures on June 10, 2024.The policy was implemented and shared with all department heads via email on July 3, 2024. Best practices have been and will be addressed through policy revisions.

Priority Level: 2

Testing of Surveillance Cameras.

Verifying the existence of and functionality for all departments that manage surveillance cameras revealed opportunities for improvement. Facts observed and test results were as follows:

- Of the 58 cameras selected for testing, six were offline for various reasons. Three were out for repair or on the refresh list, two were in buildings being torn down or being renovated, and one had intermittent connectivity issues. After an issue is identified, troubleshooting ideally takes place within 24 hours. If the issue is not resolved in-house, an on-site visit is made within 72 hours to diagnose and correct the issue. If a replacement is required, a new camera is ordered and installed as soon as possible.

- A review of the management system revealed, there were 57 camera work tickets generated by DTS between the beginning of 2024 and April 15, 2024. Of those 57 work tickets, nine are

still unresolved. The other 48 work tickets were open an average of 11.75 days before the issues were resolved. Performance measures related to the City's cameras downtime are included in the overall DTS metrics within the City's performance measurement tool, ChattaData.

- Of the 52 cameras (online) we were able to test, all were functioning properly with proper placement. All DTS and Citywide Services cameras had 30 days of archived data, while Early Learning – Head Start had nine cameras with less than 30 days of archived data. This happens when there is an issue with the camera that causes a loss of video feed, such as a power outage.

- DTS had 36 cameras with gaps in the video data archives. Power outages, maintenance, updates, connectivity or network issues cause the gaps. The gaps can be anywhere from seconds to one hour or more. Unfortunately, gaps in surveillance coverage are inevitable.

- During testing, we discovered all city cameras, except Early Learning – Head Start (Head Start), only record video. Head Start surveillance cameras record video and audio. Parents and guardians give signed consent to photos and videos when enrolling their child in the Head Start Program. However, consent has not been given for audio recording. Tennessee is a one-party consent state, which means one party must consent to a recording.

- We were unable to test the surveillance cameras located at the City of Chattanooga Fleet Management Division (Fleet). Fleet's cameras were not managed by DTS and the former (retired) management did not provide new management with their passwords for the surveillance camera system. When a former employee withholds passwords and online access to resources, it increases the risk of asset loss and safety. Fleet has now installed new cameras managed by DTS.

- While verifying the surveillance cameras, we did not find signage indicating the areas are under surveillance. While signs are not a legal requirement, it is best practice to avoid privacy issues. In public areas, prominent signs indicating surveillance is in process should be adequate to establish implied consent for security camera recording.

Exhibit 4: Location: Edney Building 3rd Floor Elevator (Axis M3046-V)

- We also noted some cameras are on automatic "guard tour", where the video displays from different preset positions and then repeats the preset positions repeatedly. From a forensic perspective, there is a risk an incident may not be captured in the video while the camera is recording one of the other camera views. On the other hand, using a camera with a static view will always record an incident in the camera view.

- During testing, we observed camera views are not actively monitored in real-time. As a result, the video footage is recorded and stored for investigating incidents after the fact. If an incident is not reported timely, there is a risk that video evidence of a crime or important event might be deleted after the 30-day retention requirement. This risk could be mitigated by the use of AI-enabled cameras that can be intuitive about what is happening and analyzing it in real-time. Artificial Intelligence can spot anomalies and bring critical events to the attention of decision makers in real-time or flag an event for future review.

Recommendation 3:

We recommend Head Start cease audio recordings.

Auditee Response: We concur with the audit finding and recommendation.

Estimated Implementation Date: This recommendation was immediately implemented.

Priority Level: 1

Recommendation 4:

We recommend departments comply with the security camera policy by posting signage informing the public of surveillance cameras.

Auditee Response: *We concur with the audit finding and recommendation.*

Estimated Implementation Date: *August 31, 2024: Procedures for camera signage have been included in the policy. Signage has been approved and purchased and the facility division has been provided locations for deployment.*

Priority Level: *3*

Recommendation 5:

We recommend the policies and procedures state static cameras are the default to ensure full coverage of areas that have been identified as warranting the expense of surveillance and additionally state the factors/criteria necessary to justify cameras being on tour mode.

Auditee Response: *We concur with the audit finding and recommendation.*

Estimated Implementation Date: *The policy was updated on June 27, 2024 to include this recommendation. Additionally, the Real Time Intelligence Center (RTIC)has tested PTZ model cameras and will continue to make camera recommendations.*

Priority Level: *3*

Recommendation 6:

We recommend DTS implement the use of AI-driven video analytic solutions for surveillance cameras. By leveraging artificial intelligence technology, DTS may be able to enhance the capabilities of their surveillance system, improve security monitoring, and potentially automate certain surveillance tasks.

Auditee Response: *We concur with the audit finding and recommendation.*

Estimated Implementation Date: *December 31, 2024: The City AI committee is currently drafting a policy, manual and framework for the use of AI tools in city business. The city will be limited to the use of AI functions on cameras that have the feature available.*

Priority Level: *3*

Exhibit 5: Location: Citywide Services Entrance (Avigilon Video Intercom)

Centralized Management

As mentioned previously, the oversight, performance and control of the citywide camera management is informal and based primarily on institutional knowledge of staff. The issues identified during testing could hinder camera management effectiveness.

Recommendation 7:

We recommend DTS assume responsibility for administration of all citywide surveillance cameras. This would include consultation on the proper camera, installation and placement, maintenance and repair, giving proper permissions, login and password management, retention and storage, as well as cybersecurity. Departments using Avigilon cameras would maintain their cameras while coordinating management oversight with DTS.

Auditee Response: We concur with the audit finding and recommendation.

Estimated Implementation Date: December 31, 2024: DTS is working with departments with other systems to maintain documentation and access to those systems.

Priority Level: 3

Exhibit 6: Location: Avondale Classroom 103 (Avigilon 3mp H5SL)

APPENDIX A: SCOPE, METHODOLOGY AND STANDARDS

Based on the work performed during the preliminary survey and the assessment of risk, the audit covers Citywide Camera Management operations from January 2024 to February 2024. When appropriate, the scope was expanded to meet the audit objectives. Original records as well as copies were used as evidence and verified through physical examination.

To accomplish our audit objectives, we reviewed available policies and procedures, interviewed staff, analyzed the camera listing, documented and evaluated the internal control process, and sampled cameras for compliance with established procedures. We compared available departmental policies and procedures to operations.

The sample size and selection were statistically generated using a desired confidence level of 90 percent, expected error rate of 5 percent, and a desired precision of 5 percent. Statistical sampling was structured in order to infer the conclusions of test work performed on a sample to the population from which it was drawn and to obtain estimates of sampling error involved. When appropriate, judgmental sampling was used to improve the overall efficiency of the audit.

We conducted this performance audit from December 2023 to June 2024 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.

APPENDIX B: PRIORITY LEVEL DEFINITIONS

Priority 1: Critical control weakness exists that exposes the City to a high degree of risk. Noncompliance with federal, state or local law, regulation, statute, charter or ordinance will always be considered a priority 1.

Priority 2: Control weakness exists that exposes the City to a moderate degree of risk.

Priority 3: The opportunity for improved efficiency or reduced exposure to risk exists.

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