



Office of the Washington State Auditor

Pat McCarthy

Performance Audit

Opportunities to Improve the City of Anacortes' Information Technology Security

January 30, 2020

Table of Contents

Introduction	3
Audit Results	5
Recommendations	5
Auditor’s Remarks	5
Auditee Response	6
Appendix A: Initiative 900	7
Appendix B: Scope, Objectives and Methodology	9

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Provide citizens with independent and transparent examinations of how state and local governments use public funds, and develop strategies that make government more efficient and effective.

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Introduction

Critical government services depend on information technology systems with confidential information, which must be protected to avoid service disruptions and financial losses

Governments depend on information technology (IT) systems to deliver an array of critical functions. The security of IT systems and related data underpins the stability of government operations, and the safety and well-being of their residents. Therefore, protecting these systems is paramount to public confidence, because the public expects governments to protect these systems from IT security incidents that could disrupt government services.

These IT systems also process and store confidential data. Aside from the loss of public confidence, a data breach involving this information can cause governments to face considerable tangible costs, including those associated with identifying and repairing damaged systems and notifying and helping victims.

Government IT systems and data are attractive targets for cyberattacks

Government IT systems present a particularly tempting target to cyber criminals. In addition to selling stolen information for financial gain, attackers often target government systems with ransomware, essentially rendering IT systems and data unavailable until the attackers are paid. Because government IT systems support critical operations, attacked governments are often placed in the difficult position of either failing to deliver core services or paying an expensive ransom to the attackers.

Government organizations across the country and around the world have been critically affected by cyber crime. Since 2017, the United Kingdom's National Health Service, the cities of Atlanta and Baltimore, Garfield County in Utah, and 22 municipalities in Texas, to name a few, have been attacked with ransomware that crippled or disrupted their operations.

Washington governments have also been affected by cyberattacks. Since 2016, six government organizations have reported data breaches to the state Office of the Attorney General as a result of a cybersecurity attack. Multiple state and local governments have reported cyber-related incidents, including frauds, to the State Auditor.

To help Washington's local governments protect their IT systems, we offer them the opportunity to participate in a performance audit designed to identify opportunities to improve their IT systems.

The City of Anacortes chose to participate in this audit.

IT security incident

Any unplanned or suspected event that could jeopardize the confidentiality, integrity or availability of information assets.

Data breach

An IT security incident that results in the confirmed disclosure of confidential information to an unauthorized party.

This audit looked for opportunities to improve the City's IT security

To help the City of Anacortes protect its IT systems and secure the data it needs to operate, we conducted a performance audit designed to identify opportunities to improve IT security. This audit answered the following questions:

- Does the City have vulnerabilities in its IT environment that could lead to increased risk from external or internal threats?
- Do the City's IT security practices align with selected security controls?

Evaluating effective implementation of IT security practices

To determine if the City has implemented effective IT security practices, we conducted tests to determine if selected controls were implemented properly and functioning effectively.

Additionally, our subject matter experts conducted tests on the city's IT systems and ranked the identified weaknesses by the severity and ease in which the identified weakness could be exploited, based on those experts' experience.

Comparing the City's IT security program to leading practices

We assessed the City's IT security policies, procedures and practices against selected leading practices in this area to identify any improvements that could make them stronger. We selected leading practices from the Center for Information Security's *Top 20 Critical Security Controls*, which were developed by a broad community of private and public sector stakeholders after examining the most common attack patterns. The *Top 20 Critical Security Controls* are a prioritized list of control areas designed to help organizations with limited resources optimize their security defense efforts to achieve the highest return on investment.

We gave City management the results of the tests as they were completed, then conducted selected follow-up testing to determine if they had successfully mitigated weaknesses we identified.

Next steps

Our performance audits of local government programs and services are reviewed by the local government's legislative body and/or by other committees of the local government whose members wish to consider findings and recommendations on specific topics. Representatives of the State Auditor's Office will review this audit with the City's legislative body in Anacortes, Washington. The public will have the opportunity to comment at this hearing. Please check the City of Anacortes website for the exact date, time and location. The Office may conduct periodic follow-up evaluations to assess the status of recommendations and conduct follow-up audits at its discretion. See **Appendix A**, which addresses the I-900 areas covered in the audit. **Appendix B** contains more information about our methodology.

Audit Results

The results of our audit work and recommendations were communicated to the City of Anacortes' management for its review, response and action. We found that, while the City's IT policies and practices partially align with industry leading practices, there are areas where improvements can be made. The City of Anacortes has already addressed significant issues we identified, and is continuing to make improvements.

Because the public distribution of tests performed and test results could increase the risk to the City, distribution of this information is kept confidential under RCW 42.56.420(4), and under Generally Accepted Government Auditing Standards, Sections 7.40-7.43. We shared detailed results with the City.

Recommendations

To help ensure the City of Anacortes protects its IT systems and the information contained in those systems, we make the following recommendations:

- Continue remediating identified gaps
- Revise the City of Anacortes' IT security policies and procedures to align more closely with leading practices

Auditor's Remarks

The Washington State Auditor's Office recognizes the City of Anacortes' willingness to volunteer to participate in this audit, demonstrating its dedication to making government work better. It is apparent the City's management and staff want to be accountable to the citizens and good stewards of public resources. Throughout the audit, they fostered a positive and professional working relationship with the State Auditor's Office.

Auditee Response



Jose Cervantes
Information Systems Manager

CITY OF ANACORTES

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January 23, 2020

Peg Bodin
Assistant Director of IT Audit
302 Sid Snyder Ave SW
Olympia, WA 98504

Dear Ms Bodin:

The City of Anacortes appreciates the opportunity to respond to the "Opportunities to Improve The City of Anacortes' Information Technology Security" performance audit completed by the Washington State Auditors Office.

The information provided to our team was invaluable to ensure that the City of Anacortes is doing everything we can to keep our citizens and staff data safe and secure. The recommendations shared by the IT Audit team and your third-party partners has provided us actionable guidance that's already improved our IT operations and security.

It was a distinct pleasure to work with Melissa Cigledy, Michael Hjermstad, Keith Drake, Aaron Munn, Peg Bodin, Erin Laska, Laulile Sunia, and Nicholas Benfield from the State Auditors Office and Paul Underwood, Ishmael Malik and staff from Emagined Security. Their collaborative approach and expertise concerning IT security was greatly appreciated as we went through the IT audit process.

We also appreciate your teams' understanding of the unique IT security challenges that local governments face. Thank you for recognizing the measures we have taken to protect our technology environment from numerous threats. Moving forward, the City of Anacortes will continue to implement additional policies, procedures and security measures to align with leading IT security practices.

Sincerely yours,

A handwritten signature in black ink that reads 'Jose M. Cervantes'.

José M. Cervantes
Information Systems Manager
City of Anacortes

Appendix A: Initiative 900

Initiative 900, approved by Washington voters in 2005 and enacted into state law in 2006, authorized the State Auditor's Office to conduct independent, comprehensive performance audits of state and local governments.

Specifically, the law directs the Auditor's Office to "review and analyze the economy, efficiency, and effectiveness of the policies, management, fiscal affairs, and operations of state and local governments, agencies, programs, and accounts." Performance audits are to be conducted according to U.S. Government Accountability Office government auditing standards.

In addition, the law identifies nine elements that are to be considered within the scope of each performance audit. The State Auditor's Office evaluates the relevance of all nine elements to each audit. The table below indicates which elements are addressed in the audit. Specific issues are discussed in the Results and Recommendations sections of this report.

I-900 element	Addressed in the audit
1. Identify cost savings	No. The audit did not identify measurable cost savings. However, strengthening IT security could help the City avoid or mitigate costs associated with a data breach.
2. Identify services that can be reduced or eliminated	No. The audit objectives did not address services that could be reduced or eliminated.
3. Identify programs or services that can be transferred to the private sector	No. We did not identify programs or services that could be transferred to the private sector.
4. Analyze gaps or overlaps in programs or services and provide recommendations to correct them	Yes. The audit compares the City's IT security controls against leading practices and makes recommendations to align them.
5. Assess feasibility of pooling information technology systems within the department	No. The audit did not assess the feasibility of pooling information systems; it focused on the City's IT security posture.
6. Analyze departmental roles and functions, and provide recommendations to change or eliminate them	Yes. The audit evaluates the roles and functions of IT security at the City and makes recommendations to better align them with leading practices.
7. Provide recommendations for statutory or regulatory changes that may be necessary for the department to properly carry out its functions	No. The audit did not identify a need for statutory or regulatory change.
8. Analyze departmental performance, data performance measures, and self-assessment systems	Yes. Our audit examined and made recommendations to improve IT security control performance.
9. Identify relevant best practices	Yes. Our audit identified and used leading practices published by the Center of Internet Security to assess the City's IT security controls.

Audit performed to standards

We conducted this performance audit under the authority of state law (RCW 43.09.470), approved as Initiative 900 by Washington voters in 2005, and in accordance with Generally Accepted Government Auditing standards (December 2011 revision) issued by the U.S. Government Accountability Office. 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: Scope, Objectives and Methodology

Scope

The audit assessed the City of Anacortes' IT security through external and internal security testing. The testing focused on judgmentally selected applications and networks. The audit did not test all internal or all external applications and network ranges. Applications were selected for testing based on several factors including, for example, criticality to the City's mission and the confidentiality of the data.

This audit also assessed the extent to which the City's IT security programs, including their implementation and documentation, aligned with selected Center for Internet Security (CIS) *Top 20 Critical Security Controls* and their supporting sub-controls. This audit did not assess the City's alignment with federal or state special data-handling laws or requirements.

Objectives

To help the City protect its IT systems and secure the data it needs to operate, we conducted a performance audit designed to identify opportunities to improve IT security. This audit answered the following questions:

- Does the City have vulnerabilities in its IT environment that could lead to increased risk from external or internal threats?
- Do the City's IT security practices align with selected security controls?

Methodology

To answer the audit objectives, we conducted technical testing of select internal and external applications and networks, and we compared the City's IT security programs to selected leading practices.

External and internal security testing

We conducted external and internal security testing of selected key applications, systems and networks. We completed this work between February and March 2019. This included identifying and assessing vulnerabilities and determining whether they could be exploited.

Comparing the City's IT security programs to leading practices

To determine whether the City's IT security practices align with leading practices, we interviewed key City IT staff, reviewed the City's IT security policies and procedures, observed City security practices and settings, and conducted limited technical analysis of City systems. This work was completed at the City between April and September 2019, with some additional follow-up afterwards.

We used selected controls from the *CIS Controls, version 6.1*, as our criteria to assess the City's IT security programs and to identify areas that could be made stronger.

CIS is a nonprofit organization focused on safeguarding public and private organizations against cyber threats. Its *CIS Controls* are a prioritized set of leading practices for cyber defense created to stop the most pervasive and dangerous attacks, are informed by analysis of real-world attack data, and are developed and vetted across a broad community of government and industry practitioners. Contributors to the *CIS Controls* have included the U.S. Department of Defense, the National Security Agency, the U.S. Department of Energy national energy labs, law enforcement organizations, Verizon, HP and Symantec.

Each control consists of a series of sub-controls that are distinct and measurable tasks; when the sub-controls are implemented together, they fully meet the requirements of the overall control. We assessed the City against all applicable sub-controls to determine the alignment with each of the overall controls assessed. We did this by assessing the extent to which the City met each sub-control in three areas:

1. **Implementing** the sub-control
2. **Automating or technically enforcing** the sub-control, which minimizes the possibility of the sub-control failing due to human error or inconsistent processes
3. **Maintaining documentation** to support the sub-control, such as policies or procedures

We also assessed the extent to which the City's IT management was **reporting** on the control to City leadership.