



**A Report to the
Audit Committee**

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**Metropolitan
Nashville
Office of
Internal Audit**

Audit of the Metropolitan Nashville Government Business Continuity and Disaster Recovery Program

November 3, 2023

Due to the sensitive information included in this report, which could detail vulnerabilities, weaknesses, and possible threats to the continuous operation of services and government, the distribution for the full confidential report is limited to management of the Metropolitan Nashville Office of Emergency Management, Information Technology Services, and others in the local government charged with overseeing the continuity program. This exemption is granted by Tennessee Code Annotated §10-7-504(i)(1) "Information that would allow a person to obtain unauthorized access to confidential information or to government property shall be maintained and confidential."

Sections of the public report are redacted or deleted to protect the security of continuity program infrastructure.

AUDIT OF THE METROPOLITAN NASHVILLE GOVERNMENT BUSINESS CONTINUITY AND DISASTER RECOVERY PROGRAM

EXECUTIVE SUMMARY

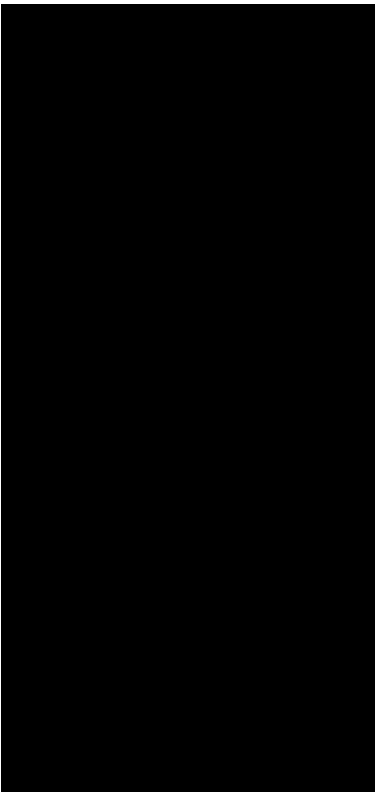
November 3, 2023



Why We Did This Audit

The audit was performed due to the importance of government services continuing when disasters or significant disruptions are experienced within Metropolitan Nashville.

What We Recommend



BACKGROUND

A Business Continuity and Disaster Recovery program can be defined as a structured plan that encompasses policies, procedures, technologies, and resources designed to ensure critical services continue when unforeseen challenges arise.

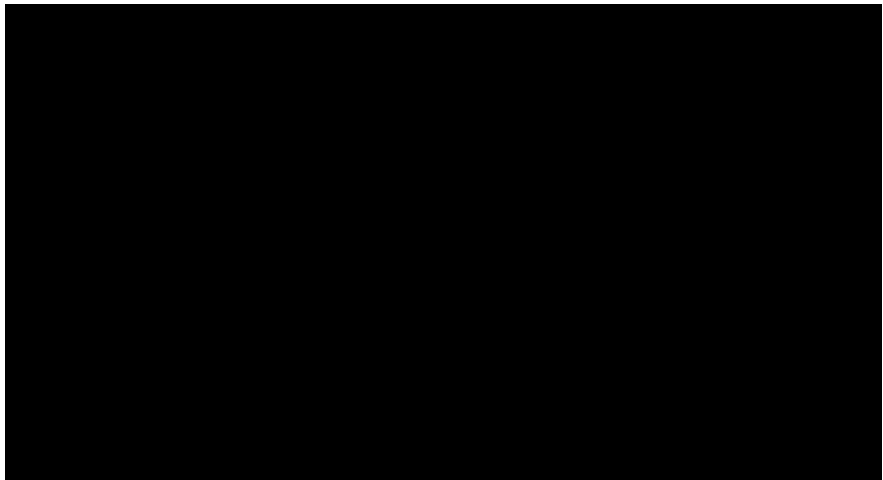
The May 2010 Nashville flood, December 2020 Christmas Day bombing, and March 2020 Nashville tornado outbreak are examples of disasters that took place within Metropolitan Nashville in recent years. The disasters highlight the importance of a business continuity and disaster recovery plan for the Metropolitan Nashville Government.

OBJECTIVES AND SCOPE

Ernst & Young LLP was retained to evaluate the Metropolitan Nashville Government's policies, processes, operations, supporting technology and documentation specific to business continuity and disaster recovery and determine alignment with the National Institute of Standards and Technology Special Publication 800-34 Revision 1, Contingency Planning Guide for Federal Information System (NIST 800-34).

The scope of the audit was a point in time evaluation at the time of the engagement.

WHAT WE FOUND



GOVERNMENT AUDITING STANDARDS COMPLIANCE

We conducted this performance audit 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 observations and conclusions based on our audit objectives.

METHODOLOGY

To accomplish our audit objectives, we performed the following steps:

- Ernst & Young LLP was hired to assist with this engagement.
- The detailed methodology employed by Ernst & Young LLP can be found in **Appendix A**.

AUDIT TEAM

Ernst & Young LLP, Consultant

Seth Hatfield, CPA, CIA, CFE, CCFO, Principal Auditor

Lauren Riley, CPA, CIA, CFE, ACDA, CMFO, Metropolitan Auditor

APPENDIX B – MANAGEMENT ACCEPTANCE AND CORRECTIVE ACTION PLAN

Ernst & Young LLP was hired to assist with this engagement. The firm issued a report to the Office of Internal Audit, with details on objectives, methodology, findings, and recommendations. The report begins on the next page.

The Metropolitan Government of Nashville and Davidson County

Report of Independent Auditors on Business
Continuity and Disaster Recovery Capabilities
for Fiscal Year 2023

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Sections of the public report are redacted or deleted to protect the security of continuity program infrastructure.





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Report of Independent Auditors on The Metropolitan Government of Nashville and Davidson County’s Implementation of Business Continuity and Disaster Recovery Capabilities for Fiscal Year 2023 Based on a Performance Audit Conducted in Accordance with *Government Auditing Standards*

Mrs. Lauren Riley
Metropolitan Auditor

EY (“We”) have conducted a performance audit of the implementation of Business Continuity and Disaster Recovery capabilities by the Metropolitan Government of Nashville and Davidson County (“Metro Nashville”) as of June 30, 2023, as defined in NIST Special Publication 800-34, *Revision 1, Contingency Planning Guide for Federal Information Systems* (“NIST 800-34”).

We conducted this performance audit 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.

This performance audit did not constitute an audit of financial statements in accordance with auditing standards generally accepted in the United States of America or *Government Auditing Standards*. The specific scope and methodology are defined in the body of this report.

Findings, Conclusions and Recommendations

The conclusions in the body of the report and our findings and recommendations, as well as proposed alternatives for the improvement of Metro Nashville’s implementation of Business Continuity and Disaster Recovery capabilities, were noted as a result of our audit. Management’s responses to our findings and recommendations are also included in this report.

This report is intended solely for the information and use of Metro Nashville leadership and the various departments tasked with executing the business continuity and disaster recovery capabilities, and Metro Nashville committees and is not intended to be and should not be used by anyone other than these specified parties.

October 27, 2023

Report of Independent Auditors on
The Metropolitan Government of Nashville and Davidson County’s
Implementation of Business Continuity and Disaster Recovery Capabilities

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Report of Independent Auditors on
The Metropolitan Government of Nashville and Davidson County's
Implementation of Business Continuity and Disaster Recovery Capabilities

Report in brief

Why we did this audit

Our audit objective was to evaluate the design of Metropolitan Government of Nashville and Davidson County's ("Metro Nashville" or "Metro") policies, processes, operations, supporting technology and documentation specific to business continuity and disaster recovery capabilities (collectively referred to as "Contingency Planning") at select departments to determine the extent of program alignment with government and public sector suggested practices as defined in National Institute of Standards and Technology Special Publication 800-34 Revision 1, Contingency Planning Guide for Federal Information Systems ("NIST 800-34").

How we did this audit

We reviewed standards and guidance for continuity of government and disaster recovery in National Institute of Standards and Technology Special Publication 800-34 Revision 1, Contingency Planning Guide for Federal Information Systems ("NIST 800-34"); gained an understanding of the current program in place at Metro Nashville; obtained and inspected policies, procedures, contracts, maintenance records and other documented evidence; assessed the current state compared to the standards and guidance; inquired of personnel within the Metro Nashville government.

What we found

Overall, through the evaluation of the Continuity and Disaster Recovery capabilities, it was determined that Metro Nashville's continuity program "Needs Improvement."

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What we recommend

Metro Nashville has responsive civil servants, and pockets of organizational maturity related to the capability to provide continuity of government and services during disasters. However, there were several findings and organization-wide gaps that should be remediated to help prevent or minimize a break in government or services due to significant disruptive events. To address the individual gaps identified in this audit, Office of Emergency Management ("OEM") should consider:

- creating a clear mandate for the ownership of the continuity program, adopt a standards-based framework, enhance governance, and appropriately fund the program,

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Executive Summary

Background, Audit Objectives, Scope and Methodology

Background

Natural disasters, terrorist attacks, cyber-attacks and other catastrophic events can disrupt an entire geographic region in addition to impairing the ability of a local government to continue operations and services. To address the risks presented by these events, local governments and departments invest in, design and implement business continuity and disaster recovery capabilities to support mission-critical operations when primary people and technology resources are not available.

Metropolitan Nashville and Davidson County have experienced multiple significant tests of its resiliency and ability to provide continuity of government and services in recent memory in form of a bombing adjacent to commercial telecommunications network building in downtown Nashville on December 25, 2020, an EF3-rated tornado that traveled through urban Nashville on March 2nd and 3rd, 2020, and a catastrophic flooding event on May 1st through May 3rd, 2010.

- On December 25th, 2020 an improvised explosive device targeting a commercial telecommunications building exploded, impacting telephone and internet service for Middle Tennessee, Kentucky, Alabama, and Georgia. The blast and subsequent events caused outages in both commercial and governmental services such as 911 hotlines until January 1st, 2021¹.
- The evening of March 2nd 2020 and into the morning of March 3rd, 2020, a powerful storm cell passed through Nashville city limits. An EF3-rated tornado traveled over 60 miles through Davidson, Wilson, and Smith counties, causing severe damage to government, commercial, and residential buildings, power transmission lines, and utilities. The total cost of this event was estimated at \$1.6B in damages by the Tennessee Emergency Management Agency (TEMA)².
- From May 1st 2010 through May 3rd, 2010, Nashville was inundated with unprecedented rainfall that caused rivers and tributaries to crest several feet above flood levels. In Davidson County alone there were 10 flood-related deaths and over \$2B in damage to property and infrastructure. Metropolitan government departments were tested as they responded to a high volume of emergency situations while simultaneously operating without the resources available during a non-disaster scenario. During the days of the flood and its immediate aftermath, Nashville Fire received over two thousand calls for help, the Office of Fleet Management responded to 70 distress calls, and ITS recovered backup tapes and relocated computers from buildings without power. Metro Water managed sandbagging, water plant damage and chemical protection, and coordinated with the National Weather Service, the US Army Corps of Engineers, and the Office of Emergency Management and Public

¹ Communications Dependencies Case Study: Nashville "Christmas Day" Bombing, a joint publication by SAFECOM of the Cybersecurity Infrastructure Security Agency (CISA) and the National Council of State Interoperability Coordinators (NCSWIC)

² Storm Events Database, National Oceanic and Atmospheric Administration

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Works to handle over 22 thousand calls to the Emergency Community Hotline and to inform the public of the ongoing response to the disaster^{3, 4}.

All these incidents required the coordination and creativity of first responders, civil servants, commercial providers, local, state, and federal government agencies, and others to successfully implement back-up and alternative services until regular operations and services were restored.

Engagement of Independent Accountants

The Metropolitan Nashville Office of Internal Audit engaged EY to evaluate the design of Metro Nashville’s policies, processes, operations, supporting technology and documentation specific to business continuity and disaster recovery capabilities. Within this report, we describe the results of our assessments of identifiable capabilities in place within selected Metro Nashville departments, as outlined in the objective, scope, and methods sections. The findings and recommendations that are presented are intended to assist Metro Nashville build on their existing business continuity and disaster recovery capabilities and identify additional areas for continued improvement.

Audit Objectives, Subject Matter, and Criteria

Our audit objective was to evaluate the design of Metropolitan Government of Nashville and Davidson County’s (“Metro Nashville” or “Metro”) policies, processes, operations, supporting technology and documentation specific to business continuity and disaster recovery capabilities, collectively referred to as “Contingency Planning” (the “Subject Matter”) to determine the extent of program alignment with government and public sector suggested practices as discussed in *National Institute of Standards and Technology Special Publication 800-34 Revision 1, Contingency Planning Guide for Federal Information Systems* (“the Criteria”), in all material aspects.

In planning and conducting the performance audit, we considered Metro Nashville’s internal control associated with the Continuity Planning that are appropriate in the circumstances for achieving the audit objective. However, this performance audit did not constitute an audit of internal control over financial reporting in accordance with auditing standards generally accepted in the United States, nor did it constitute an evaluation of Metro Nashville’s cybersecurity program, IT general controls, nor of any other subject matter related or adjacent to Contingency Planning except as described in this report.

³ Severe Flooding May 2010 After Action Report and Improvement Plan for the Metropolitan Government of Nashville and Davidson County

⁴ This report does not attempt to analyze the impact of historical or future events, nor to assess the adequacy and appropriateness of the actions taken by government officials, civil servants, or others in response to the events. These events are referenced in this report to provide the reader with current examples of the challenges faced by government officials, civil servants, and others as they respond to events that damage, destroy, or otherwise affect the primary technology and tools used to carry out the functions of local government.

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Scope

With the assistance of Metro Internal Audit and input from individual departments, we selected a sample of departments with operations critical to the continuity of the local government and services:

- Office of Emergency Management (“OEM”)
- Nashville Fire Department (“Fire”)
- Metro Water Services (“Water”)
- Information Technology Services (“ITS”)
- General Services
- Metropolitan Nashville Police Department (“MNPd” or “Police”)

While the scope of the report covered a sample of departments, the findings and recommendations are addressed to OEM since they are tasked with coordinating emergency management across all Nashville Metro departments.

Within each department, we used the NIST 800-34 framework to determine the specific policies, procedures, and operations in scope for our assessment procedures. We limited our procedures to the departments listed above, and to the controls found at the departments within the framework.

Our assessment was conducted as of a point in time and included assessing policies, processes, and operations supporting technology and documentation specific to business continuity and disaster recovery capabilities that were in place at the time of our fieldwork.

Please refer to Appendix B for the department contacts we met with and Appendix C for the types of documentation inspected as part of our assessment.

Audit Methodology

To accomplish the objectives of the performance audit, we conducted our assessment in accordance with guidance based on the control families and controls included in NIST 800-34 (the “Criteria”), and by incorporating the audit methodology and guidance within section 3.5 *Contingency Planning (CP)* of the US Government Accountability Office’s (GAO) *Federal Information Systems Controls Audit Manual (FISCAM)*. We conducted interviews with officers and civil servants, we obtained and inspected policies, procedures, plans, and evidentiary matter related to the individual capabilities in place within a sample of Metro Nashville departments. We tested the design of each control as a point of time during our assessment.

In addition to evaluating the governance and operating model of the program, we evaluated the business continuity and disaster recovery areas related to the Control Categories and the Critical Elements for Contingency Planning (the “Subject Matter”) as defined within FISCAM (a control category represents groupings of related controls pertaining to similar types of risk; a critical element represents tasks that are

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essential for establishing adequate controls within the category). FISCAM includes mapping of each critical element to the related NIST controls. These FISCAM critical elements related to contingency planning included:

- Assessing the criticality and sensitivity of operations and identify supporting resources.
- Taking steps to prevent and minimize potential damage and interruption.
- Developing and documenting comprehensive contingency plans.
- Periodically testing the contingency plan and adjust it as appropriate.

We conducted this performance audit 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.

This report addresses the extent to which Metro Nashville has identified and implemented internal controls in alignment with the subject matter. Because of their nature and inherent limitations, the internal controls may not prevent, or detect and correct, all deficiencies that may be considered relevant to the audit objectives. Further, the projection of any evaluations of effectiveness to future periods, or conclusions about the suitability of the design of the internal controls to achieve the related audit objectives, is subject to the risk that internal controls may become inadequate because of changes in conditions or that the degree of compliance with such internal controls may deteriorate.

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Summary of Audit Results

Key Themes and Recommendations

Several areas were identified wherein the Metro Nashville government or departments did not have a capability that was defined by the NIST control framework, either in part or in whole. We discussed our summary and detailed results with the Office of Internal Audit and relevant government representatives within Metro Nashville. This section of the report includes our key themes and recommendations, and the following section of the report includes the detailed findings and recommendations that support the overall themes.

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Detailed Findings and Recommendations

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Appendix A – Management's Acceptance and Responses

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Appendix B - Participant List

This appendix lists the primary participants interviewed as part of this assessment.

Department	Name	Job Title
Fire	William Swann	Director Chief of the Nashville Fire Dept & OEM
Fire	Frederick Smith	Deputy Director EMS Operations
Fire	Jamie Summers	Executive Administrator / HR
Fire	Jerry Tomlinson	Deputy Director Fire Operations
Fire	Lawrence Hutchinson	Deputy State Fire Marshal
Fire	Leigh Anne Burtchaell	Executive Administrator / Finance
Fire	Robert McAlister	Deputy Director EMS Operations
Fire	Wendell Toney	Fire Operations Chief
Fire	Angie Goins	Administrative Services Manager
General Services	Velvet Hunter	General Services Director
General Services	Dianna Atwood	Finance Manager
General Services	Stacey Wall	General Services Assistant Director
General Services	Randall Jones	Maintenance and Operations
General Services	Brandon Vanatta	Master Tech, General Services
ITS	Keith Durbin	CIO / Director of IT Services
ITS	Donald Enfinger	IS Division Manager, Data Center/Server Infrastructure Mgt and Support Services
ITS	Margaret Keck	Assistant IT Director
ITS	Erin Weathers	SAN and Systems Administration
ITS	John Griffey	CISO / Assistant Director, Info Security Services
ITS	Nathanial Brindley	Advisor, Business Applications Solutions/Support
ITS	Dawn Clark	Assistant Director, Business Applications Solutions and Support
OEM	Heidi Mariscal	Planning, Training, Exercise Program Manager
OEM	Kelly Caffrey	Operations Manager
Police	Sebastian Gourdin	Deputy Chief
Police	Dayton Wheeler	Commander, Midtown Hills Precinct
Police	John Singleton	Director, Information and Technology Division
Police	Stephen Lewis	Police Lieutenant
Water	Scott Potter	Metro Water Services Director
Water	Brent Freeman	Assistant Director
Water	Casey Quin	IT Analyst
Water	David Tucker	Assistant Director – Operations
Water	Scott McPencow	Information Systems Division Manager
Water	Shannon Frye	Assistant Director

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Appendix C – Documents Reviewed

This appendix lists the primary types of the documentation and evidence that we inspected and reviewed as part of the assessment.

- Governance documents, organizational structure diagrams, etc.
- Asset registries and inventories
- Various policy and procedure documents including:
 - Business and IT recovery policies/procedures
 - Information classification policy
 - Vulnerability management policies/procedures
 - Physical and environmental controls policy
 - Change management policies, procedures, and guidance including licensing standards
 - Various other relevant information security policies/procedures
- Previous internal/external assessments relevant to the subject matter of this assessment
- Contracts with key vendors and service providers
- Third party certifications for key vendors and service providers
- Service level agreements and plans and various metrics reports
- System security plans
- Building and system maintenance schedules
- Business continuity, disaster recovery, and security training documentation/records
- Various types of business continuity plans including:
 - Business continuity plans
 - Emergency management plans
 - Hazard mitigation plans
 - Continuity of operations plans
 - Evacuation Plans
 - Other related plans, such as, fire drill plans and guidance
- Disaster recovery exercise plans and testing documentation and related documents including:
 - Meeting Minutes from Coordination Meetings
 - Exercise Impact Analysis

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APPENDIX B – MANAGEMENT ACCEPTANCE AND CORRECTIVE ACTION PLAN

We believe that operational management is in a unique position to best understand their operations and may be able to identify more innovative and effective approaches and we encourage them to do so when providing their response to our recommendations.

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