AUDIT ANALYTICS TEAM

Semiannual Audit Analytics Update
AUGUST 2022

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Dawn Wiseman, CRMA, Audit Director
AGENDA

• Continuous audit and risk analytics update.
• 2022 project updates.
• Audit support.
• Outreach to the audit community and internal training.
Continuous auditing is a method to identify and analyze risks through automated, scheduled analysis of the city’s financial and process data.

Using this approach, we:

• Connect to and analyze information.
• Report results internally.
2022 Continuous Audit and Risk Analytics
Number of Records Analyzed

- **GEN TAX**: 5,018,501
- **PURCHASE CARDS**: 249,657
- **TRAVEL CARDS**: 30,776
- **PURCHASE ORDERS**: 476,691
- **SUPPLIER INVOICES**: 340,273
- **EXPENSE REPORTS**: 39,989
- **JOURNAL ENTRIES**: 10,444,440

Source: Auditor's Office illustration using information from two city systems: GenTax and Workday.
CONTINUOUS AUDIT: GENTAX

Risk Analytics

• Timeliness of accepting tax returns.
• Write-offs.
Percent of sales tax returns processed within a week, by month

Source: Graphic created by Audit Analytics Team using data from GenTax.

*These metrics are used only for risk assessment purposes and may require additional audit work to validate.
No New Write-offs With Matching Names

In our 2021 mid-year update, we identified 10,665 write-offs with matching names of “batch.”

• This type of match has not appeared in the data since that time.

• Controls appear to be working.
Risk Analytics

• Time of day.
• Day of the week.
• Holidays.
• Risky words.
Journal entry risk analytics

10.4 million JOURNAL LINES

34,039

LINES WITH AT LEAST ONE RISK FLAG

2,316

LINES WITH TWO RISK FLAGS

208

UNIQUE JOURNAL ENTRIES

Source: Graphic created by Audit Analytics Team using data from Workday.
*These metrics are used only for risk assessment purposes and may require additional audit work to validate.
Developed Composite Risk Model

• Aggregates six risk flags to evaluate level of risk associated with transaction.

• Reduced initial population of purchase card transactions from 249,657 to 8,074 high risk transactions.
Purchase card average composite risk score, by month

Source: Graphic created by Audit Analytics Team using data from Workday.

*These metrics are used only for risk assessment purposes and may require additional audit work to validate.
CONTINUOUS AUDIT: TRAVEL CARDS

- 97% of travel card spending categorized as low-risk.
- Ratios of high-risk transactions in 2022 are similar to pre-pandemic levels.
Travel card purchases, by month

Source: Graphic created by Audit Analytics Team using data from Workday.

*These metrics are used only for risk assessment purposes and may require additional audit work to validate.
Composite Risk Model

Aggregates three risk flags:

• Top spender.
• Benford’s law.
• Even-dollar.
Expense Report Composite Risk Model

Source: Graphic created by Audit Analytics Team using data from Workday.

*These metrics are used only for risk assessment purposes and may require additional audit work to validate.
CONTINUOUS AUDIT: PURCHASE ORDERS

Risk Analytics

- Unauthorized purchases.
- Shipping addresses.
- Duplicate transactions.
- Even-dollar purchases.
Unauthorized Purchases

Purchase order transactions that violate the city’s procurement process by:

- Submitting after-the-fact orders.
- Committing fiscal rule violations for transactions under $10,000.
- Committing code violations for transactions over $10,000.
Unauthorized purchases, by month

- **Unauthorized – Fiscal Rule**
- **Unauthorized – After the Fact**
- **Unauthorized – Code Violation (+$10,000)**

Source: Graphic created by Audit Analytics Team using data from Workday.

*These results are used only for risk assessment purposes and may require additional audit work to validate.*
CONTINUOUS AUDIT: PURCHASE ORDERS

Shipping Addresses

In 2022, we updated our automated analysis to assess the risk of shipping locations.

• The risk assessment tool compares shipping addresses from purchase order data to known city addresses.

• We identified a group of high-risk addresses for further investigation.
Purchase Order Shipping Locations

Source: Graphic created by Audit Analytics Team using data from Workday and the city's Real Estate website.

*These results are used only for risk assessment purposes and may require additional audit work to validate.
Duplicate Transactions

Any pair of transactions with identical purchase amounts and similar supplier names from:

• Purchase orders.
• Purchase cards.
• Travel cards.
Even-Dollar Purchases

Transactions that end in whole numbers in increments of 100.

• Overall, about 10% of transactions qualify as even-dollar transactions.

• The total number of even-dollar transactions has increased since the end of 2021.
Checks Held for Pickup

Physical checks written by the city that are waiting to be picked up by the supplier.

• The number for checks held for pickup remains low.
• The total amount associated with checks is increasing.
Checks held for pickup, by month

Source: Graphic created by Audit Analytics Team using data from Workday.
*These results are used only for risk assessment purposes and may require additional audit work to validate.
AUDIT COMMITTEE
2022 PROJECT UPDATES

- LCP Tracker.
- Technology purchases.
- Data privacy desk procedure.
- Audit analytics capabilities.
LCP Tracker

Assess whether we can use payroll data to flag high-risk submissions to help Denver Labor target reviews.

• Collected data on 1,200 randomly selected payrolls.

• Applying machine learning to see if a model can identify payrolls with high-risk for wage violations.
Technology Purchases Risk Assessment

Develop risk analytics to identify transactions at risk of being out of compliance with Executive Order No. 18.

• Created five different analytics to flag high-risk transactions.
Technology Purchases Risk Assessment (continued)

• Evaluated success of analytics.

• Provided preliminary results to Internal IT Audit Manager.
Data Privacy Desk Procedure

Develop office-wide desk procedure to provide specific guidance on protecting sensitive data.

- Reviewed and incorporated best practices to document specific steps audit teams need to take.
- Provided final draft to Internal Audit Director.
Audit Analytics Capabilities

Published June 2022.

- Summarizes current state of audit analytics.
- Identifies areas where our office can further enhance the use of analytics.
AUDIT COMMITTEE

CITY AND COUNTY OF DENVER
AUDITOR

DENVERGOV.ORG/AUDITOR

TIMOTHY M. O'BRIEN, CPA, AUDITOR
AUDIT SUPPORT

- Solid Waste (in-progress).
- Homelessness Encampments (in-progress).
- Journal Entry Analysis Tool.
Journal Entry Analysis Tool

Create automated tool for audit teams to more efficiently learn about an auditee's financial information and potential high-risk transactions.

• Obtained input on tool from auditors with financial backgrounds.
Journal Entry Analysis Tool (continued)

• Completed a prototype.

• Updated final tool for office.
## 2022 Trainings and Outreach to Audit Community

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<th>Training</th>
<th>Conference</th>
<th>CPEs</th>
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<td>Annual Professional Development Training</td>
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*Presenting at Conference on Sept. 29, 2022.
## Audit Analytics Team 2022 Overview

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<th>Audit assistance</th>
<th>Continuous audit/risk analytics</th>
<th>Training/outreach to audit community</th>
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<td>Provided support for 2 audits</td>
<td>Ran 32 automated scripts looking at 16,600,327 records</td>
<td>Offered 5 training sessions, Presented at 3 conferences</td>
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**TIMOTHY M. O'BRIEN, CPA, AUDITOR**
NEXT STEPS

• Complete LCP Tracker and Journal Entry Analysis Tool projects.
• Begin next round of analytic projects.
• Continue to cross-train auditors to expand analytics skills.