Audit Committee
Audit Analytics Team

2021 Semi-Annual Audit Analytics Update
February 2022

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Continuous auditing is a method to identify and analyze risks through automated, scheduled analysis of the city’s financial and process data.

- Connect to and analyze information.
- Report results through an internal dashboard and memos.
Agenda

- Continuous audit and risk analytics update.
- Risk-finding analytics and benchmarking.
- Audit support.
- Outreach to the audit community and internal training.
2021 Continuous Audit and Risk Analytics

Number of Records Analyzed

- GEN TAX: 4,637,989
- PURCHASE CARDS: 276,726
- TRAVEL CARDS: 28,358
- PURCHASE ORDERS: 423,443
- SHORT TERM RENTALS: 2,170
- SUPPLIER INVOICES: 404,456
- EXPENSE REPORTS: 33,251
- JOURNAL ENTRIES: 12,832,662

- TIMEKEEPING RECORDS: 12,877
- SYSTEM ACCESS RECORDS: 13,342
- PAYROLL: 14,536
- TERMINATIONS REPORT: 15,979
- HUMAN RESOURCES: 14,356
Continuous Audit: GenTax

• Timeliness of accepting tax returns. About 97% of tax returns are accepted within seven days.

• Write-offs. No new anomalies found, showing separation of duties controls are working as intended.
Continuous Audit: GenTax, Returns Processed within Seven Days

Source: Auditor’s Office analysis of GenTax records.

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No new write-offs with matching names.

- At the mid-year update we identified 10,665 write-offs with matching names of “batch.”
- Department of Finance suggested to the Treasury Division to clear low-value penalty and interest balances.
Purchasing and Accounts Payable: COVID-19 Impact on Business Process

- Gauging the impact of the pandemic two years later.
- Spending continues to be impacted although agencies are starting to rebound.
Continuous Audit: Purchase Cards

- Split transactions continued to decrease through 2021.
- Pass-through vendor spending decreased about 5% in 2021. However, proportionally Amazon spending is similar to pre-pandemic spending.
Purchase Card Pass-Through Vendors*

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

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Continuous Audit: Travel Cards

- Travel card spending declined by over 50%.
- 97% of travel card spending categorized as low-risk.
Travel Card Purchases Over Time*

Source: Auditor’s Office analysis of purchase card data.
*These metrics are used only for risk assessment purposes and may require additional audit work to validate.
Physical checks held for pickup:

- Number for checks held for pickup remains low.
- Three checks held for pickup exceeded $1,000,000.
Checks Held for Pickup

Source: Auditor’s Office analysis of supplier invoice data.

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

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Unauthorized Purchases:

• After-the-fact and code violations have decreased from their relative high point in April and June of 2018.

• Fiscal rule violations have decreased in total number for the year but continue to be the most frequent violation.
Count of Unauthorized Purchases

Source: Auditor’s Office analysis of standard comments report.

*These metrics are used only for risk assessment purposes and may require additional audit work to validate.
Purchase Orders

- Duplicates with purchase cards and travel cards.
- Even dollar analysis.
- Results reported internally.
Short-Term Rentals

- Lodger’s tax ID number compliance levels have reached 99%.
- Active licenses increased from 800 licenses by June 30, 2021, to 2,170 licenses by Dec. 31, 2021.
Expense Reports

Used composite model of three risk factors.

Source: Auditor’s Office analysis of expense reports.
*These metrics are used only for risk assessment purposes and may require additional audit work to validate.

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Project Update, 2021

- First half of 2021.
  - GenTax collection activities analysis.
  - Journal entry risk quantification analysis.
- Second half of 2021.
  - Expense reports audit.
  - Ghost employee risk model.
  - Audit analytics benchmarking.
Expense Report Process Audit

• Our risk finding analytics identified issues with how expense reports were classified and documented.

• A full audit examined the controls and found deficiencies in the internal approval process.

• Provided seven recommendations.

• Audit report was issued November 2021.
Ghost Employee Risk Model

- Used composite model of 10 risk factors.
- Model identifies abnormal system use and uncommon employee activity.

23 employees were flagged for abnormal system use.

Flagged for:
- Timesheet without approval (3)
- Employee has PTO that is maxed out (3)
- Employee with no active directory entry (2)
- Employees who are inactive in active directory (1)
- Duplicated bank account (2)
- Duplicated Address
  - Three or more employees share an address (1.5)
  - Two or more employees shared an address and at least one did not have deposit information (2)
- Duplicated name (4)
- Duplicate Social Security Number (5)
- Ratio of Gross to Net Pay (4)
- Comparison of termination date to last pay date (5)

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Our model could identify unique circumstances among the data such as:

- Employees preparing to leave city service.
- Those working for agencies or organizations who do not use city systems as frequently as a traditional employee.
- Employees who do not frequently use computers.
Analytics Benchmarking

- Partnered with the Association of Local Government Auditors to survey other audit shops regarding their use of analytics.
- Over 100 audit shops responded.
- Few audit shops have dedicated resources for analytics.
- Those that do are more likely to apply advanced methods to identify risks and control failures on municipal systems.
- Denver is among the leaders in local government audit analytics.
## 2021 Audit Assistance

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<tr>
<th>Category</th>
<th>Data Analysis</th>
<th>Sampling</th>
<th>Surveys</th>
<th>Other</th>
<th>Embedded Resource</th>
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### 2021 Trainings and Outreach to Audit Community

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Audit Analytics Team 2020 Overview

Audit assistance
Provided support for

**12** audits and

**2** Follow-ups

Continuous audit/risk analytics
Ran

**37** automated scripts looking at
**18,750,145** records

Training/outreach to audit community

- Offered
- **4** training sessions
- Presented at
- **2** conferences
- Published **1** article
Next Steps

- Complete 2022 project plan to examine high-risk areas in the city.
- Continue to cross-train auditors to expand analytics skills.