2018 Continuous Audit and Data Analytics Report

PROCUREMENT CARDS

SHORT-TERM RENTAL

SALES-TAX

CONTRACTS

Procurement Card Analytics

Analyses to examine risks and test controls related to the City's procurement card program.

Objectives

Develop a continuous audit program of procurement card transactions to test controls and examine risks related to the City's procurement card program.

- Provide results to the 2018 Purchasing and Payment Processes Audit and other audits as needed.
- Continuously monitor purchase card activity to identify emerging risks for the Auditor's Office risk assessment process.

Top Spender and Vendor Analysis

Top Spenders: Defined as the cardholders who spend the most or use their P-cards most frequently, by department. Analysis shows the top spenders within agencies are fairly consistent across 2016 and 2017.

Top Vendors: Defined as the vendors with most transactions or greatest dollar amounts spent with a P-card, by department. Analysis shows the top vendor for each department by count, amount, and over time are not consistent. The analysis shows 38 percent of all departments' most frequent vendors in 2016 and 27 percent in 2017 were associated with a high-risk vendor (e.g., Amazon, PayPal, eBay, Square).

Results: Information will inform the Auditor's financial audits in 2019 and the Auditor's Office risk assessment process.

Even-Dollar Analysis

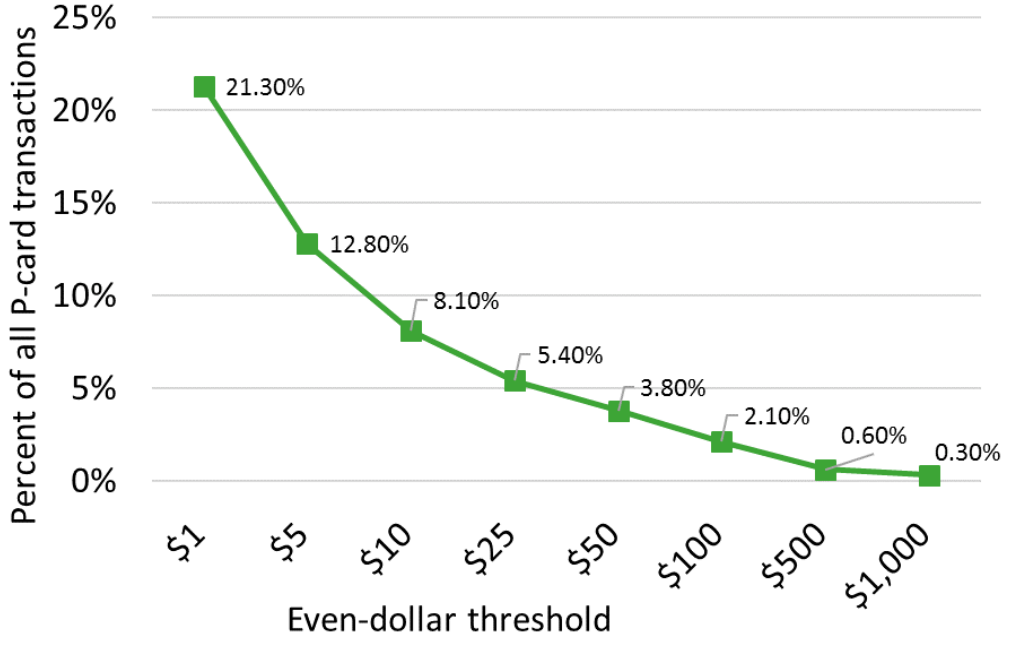
Even-dollar: Defined as a transaction ending with zero cents (e.g., $100.00). They are a risk indicator given the rare nature of zero-cent transactions.

- From the approximately 160,000 transactions analyzed between 2016 and 2017, we identified more than 34,000 even-dollar transactions.
- Sensitivity analysis completed to identify even-dollar transaction divisible by a range of values (e.g., $5 or $100).
- Sensitivity analysis completed to identify individuals with highest frequency of even-dollar transactions.

Results of the Even-Dollar Analysis

Analysis provided to the 2018 Purchasing and Payment Processes Audit team. The audit team identified a potential issue within the even-dollar analysis results, requiring additional audit work.

Figure 1. Percent of all P-card transactions at varying dollar thresholds.



Source: Auditor's analysis of purchase card transaction data.

Duplicate Transactions Analysis

Duplicate Transactions: Defined as multiple transactions with the same card, same vendor, and same price. A type of transaction at risk for pay-and-return and other billing schemes. We analyzed more than 160,000 records from 2016 and 2017. Transactions were divided into high- and low-risk transactions. High-risk transactions are those associated with retail, clothing, and miscellaneous stores, and those transactions without a bid number.

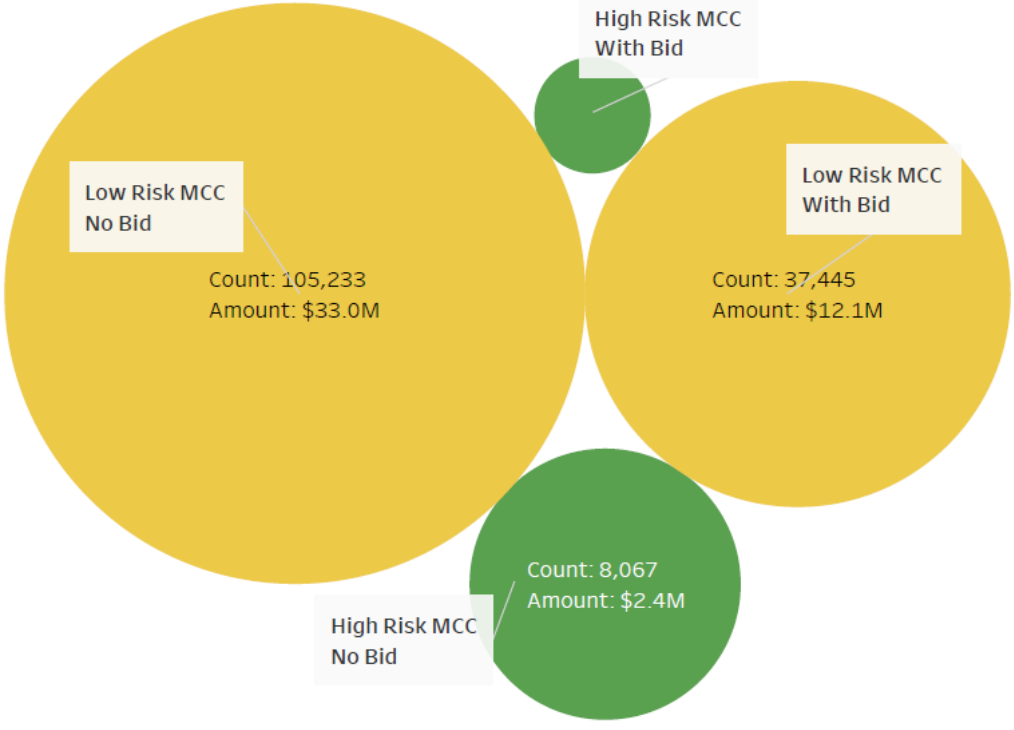
The analysis classified 11,885 of the 22,164 duplicate transactions identified as high-risk duplicates, totaling $3.5 million. Analysis also shows duplicates occur in nearly all departments with a P-Card. We provided these results to the 2018 Purchasing and Payment Processes Audit team.

Results of the Duplicate Transaction Analysis

The 2018 Purchasing and Payment Processes Audit team modified the analysis to identify *recurring transactions*.

- The audit team made the following recommendation:
  - Rec 1.6: Identify P-card transactions associated with Master Purchase Orders (MPOs) and use MPOs or other methods to reduce splits and recurring purchases.
  - Agency Response: Agree
  - Implementation Date: May 2019

Figure 2. Comparison of amount of high-risk duplicates to other transactions.[1]



Source: Auditor's analysis of Purchase Card transaction data.

[1] MCC, or merchant category code, classifies business by goods or services.

Split Transaction Analysis

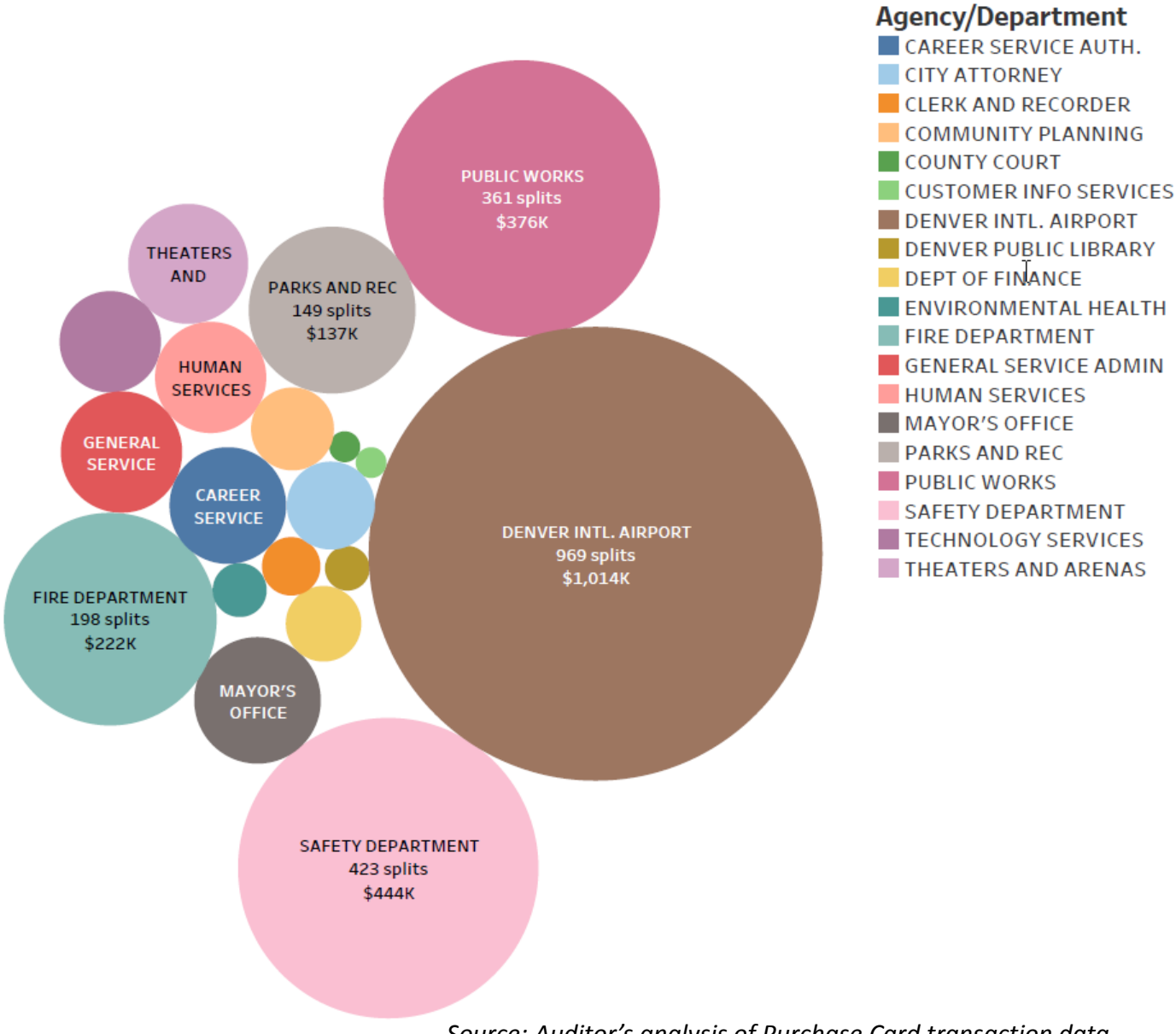
Splitting a transaction: Defined as the action of dividing transactions to circumvent the single-transaction limit. Our analysis examined more than 160,000 transactions from 2016 and 2017 for any set of multiple transactions associated with the same card with the same vendor on the same day, where total transaction amount is greater than the card's single transaction limit. We limited our analysis to only those transactions that did not have an associated bid number, indicating it was purchases using a Master Purchase Order.[2] Purchases that go through the bid process are excluded from the split transaction rules.

Our analysis identified 363 split in 2016 and 497 splits in 2017. The total value of these transactions totaled $1.1 million in 2016 and $1.6 million in 2017. We provided these results to the 2018 Purchasing and Payment Processes Audit team.

[2] At the time of this work, purchase card users who made purchases made under the new accounting system, Workday, are no longer able to indicate if a purchase is part of an MPO.

Split Transactions Occur across the City

Figure 3. Split transactions by department.



Source: Auditor's analysis of Purchase Card transaction data.

Split Transactions Are Seasonal and Increasing

2018 Purchasing and Payment Processes Audit found issues with split transactions.

- The team made the following recommendation:
  - Rec 1.6: Identify P-card transactions associated with Master Purchase Orders (MPOs) and use MPOs or other methods to reduce splits and recurring purchases.
  - Agency Response: Agree
  - Implementation Date: May 2019

Figure 4. Split transactions by month and year.

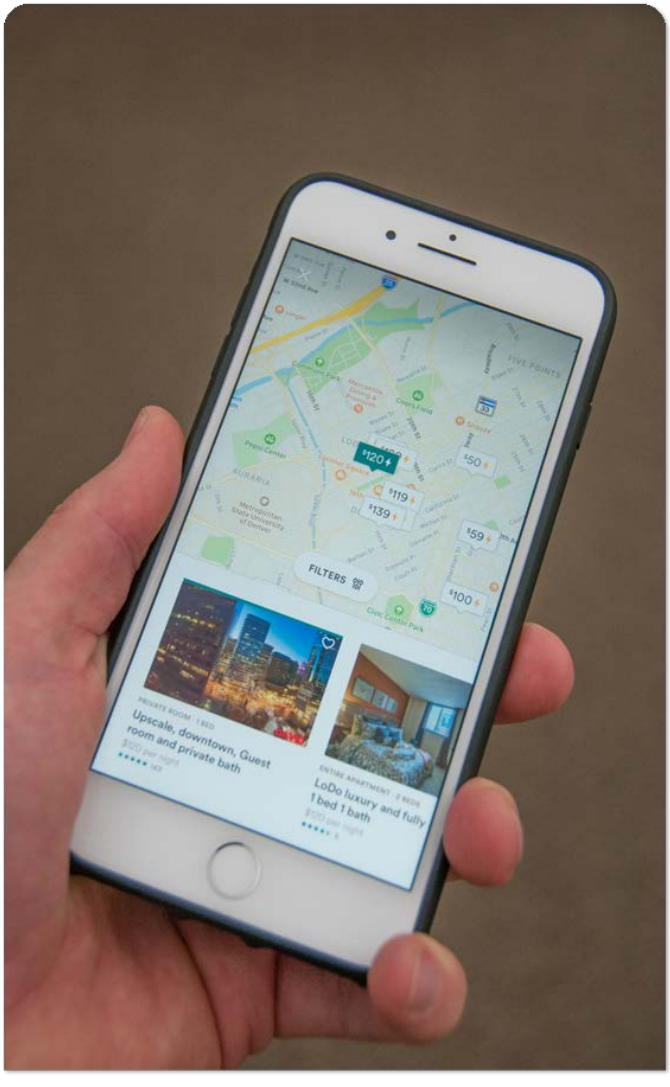
Source: Auditor's analysis of purchase card transaction data.

Next Steps for Procurement Card

Modify our scripts to reflect the refined analyses performed by the 2018 Purchasing and Payment Processes Audit team.

- Download and analyze 2018's purchase data using the presented scripts.
- Schedule data download for procurement card transactions and run scripts on schedule in 2019.
- Incorporate the results into the planned 2019 financial audits.

Short-Term Rental Continuous Audit



Automated analysis of short-term rental license data from Accela tables in the City's data warehouse.

Overall Objectives

Develop a continuous audit program of short-term rental licenses through a direct connection to the copy of Accela, the City's licensing software, in the City's data warehouse.

- Automate two analyses completed in the 2017 Short-Term Rental Enforcement Audit. First, data validation tests of licenses. Second, identify duplicate entries in the license database.
- Provide results to the short-term rental follow-up audit team.
- Inform the Auditor's Office risk assessment process.

Data Validation Analysis

Data Validation: To ensure that lodger's tax ID entries in the City's licensing database, Accela, were accurate, the 2017 Short-Term Rental Enforcement Audit team examined 1,642 active short-term rental licenses as of August 30, 2017. From our direct connection to the Accela tables in the data warehouse, we automated and updated the audit team's analysis and examined 2,182 active short-term licenses as of October 3, 2018.

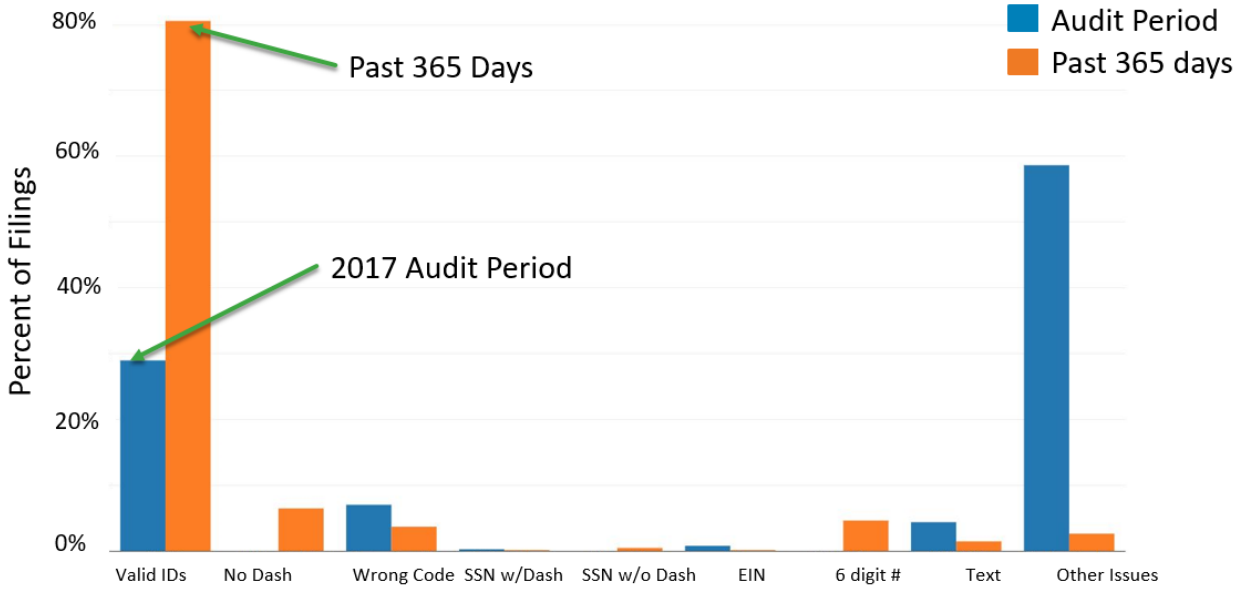
Our analysis shows an improvement in data integrity resulting in an increase of valid lodger's tax ID numbers.

Results of Data Validation Analysis

We found the data quality related to the lodger's tax ID records improved since the 2017 Audit.

- The total percent of compliant lodger's tax ID records in the database increased from approximately 29 percent to 90 percent between the audit period and October 2018.
- These results indicate the Department of Excise and Licenses has improved its data quality since the 2017 Short-Term Rental Enforcement Audit.

Figure 5. Comparison of lodger's tax ID formatting between the 2017 audit period and past 365 days.



Source: Auditor's analysis of purchase card transaction data.

Duplicate Record Analysis

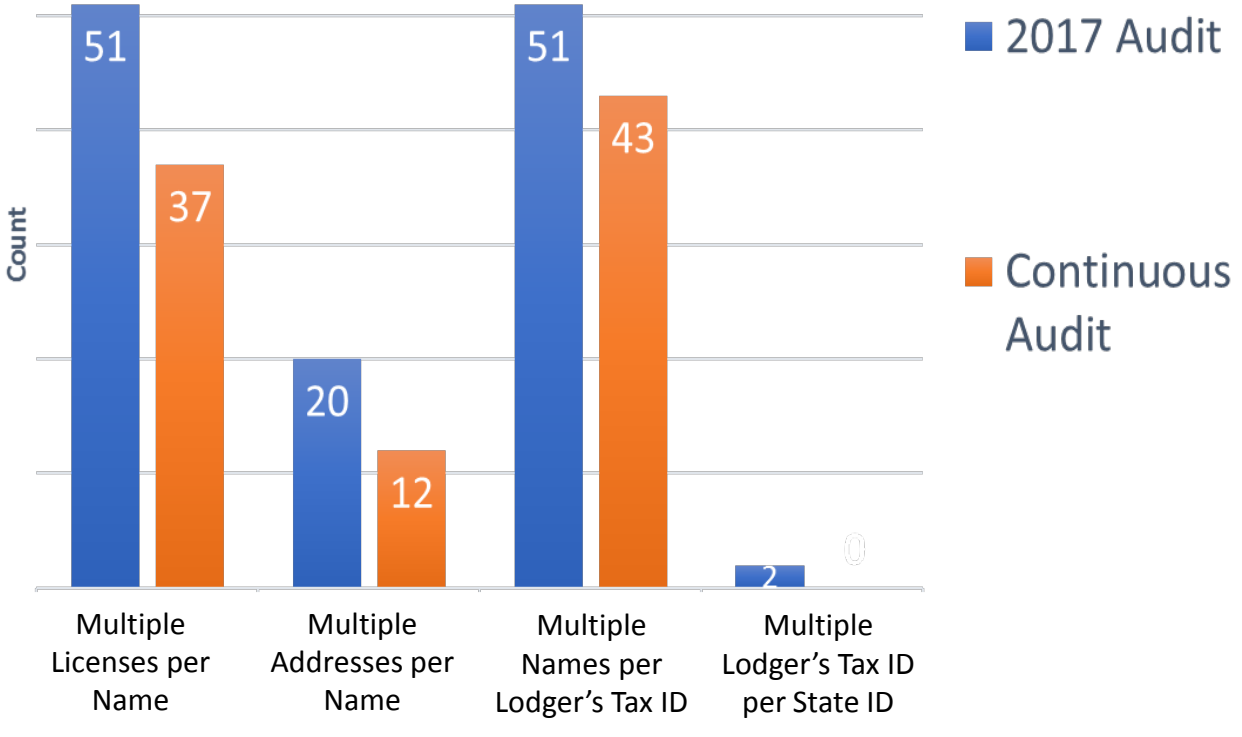
Duplicates: Duplicate entries, such as names, addresses, or more than one person sharing the same short-term rental number could indicate an individual attempting to circumvent the City's rules surrounding short-term rentals.

The 2017 audit team's initial analysis examined 1,642 active short-term rental licenses as of August 30, 2017. We automated those analyses on the updated data set of 2,182 active short-term rental licenses as of October 3, 2018. Our analysis shows a decrease in the number of duplicate entries since the 2017 audit.

Result of Duplicate Record Analysis

We found the data contains fewer duplicate entries when compared to the data used in the 2017 audit. While the data shows improvement, we found potential control issues related to short-term rental applicants holding multiple lodger's tax IDs or being associated with multiple addresses.

Figure 6. Comparison of duplicate records between the 2017 audit period and past 365 days.



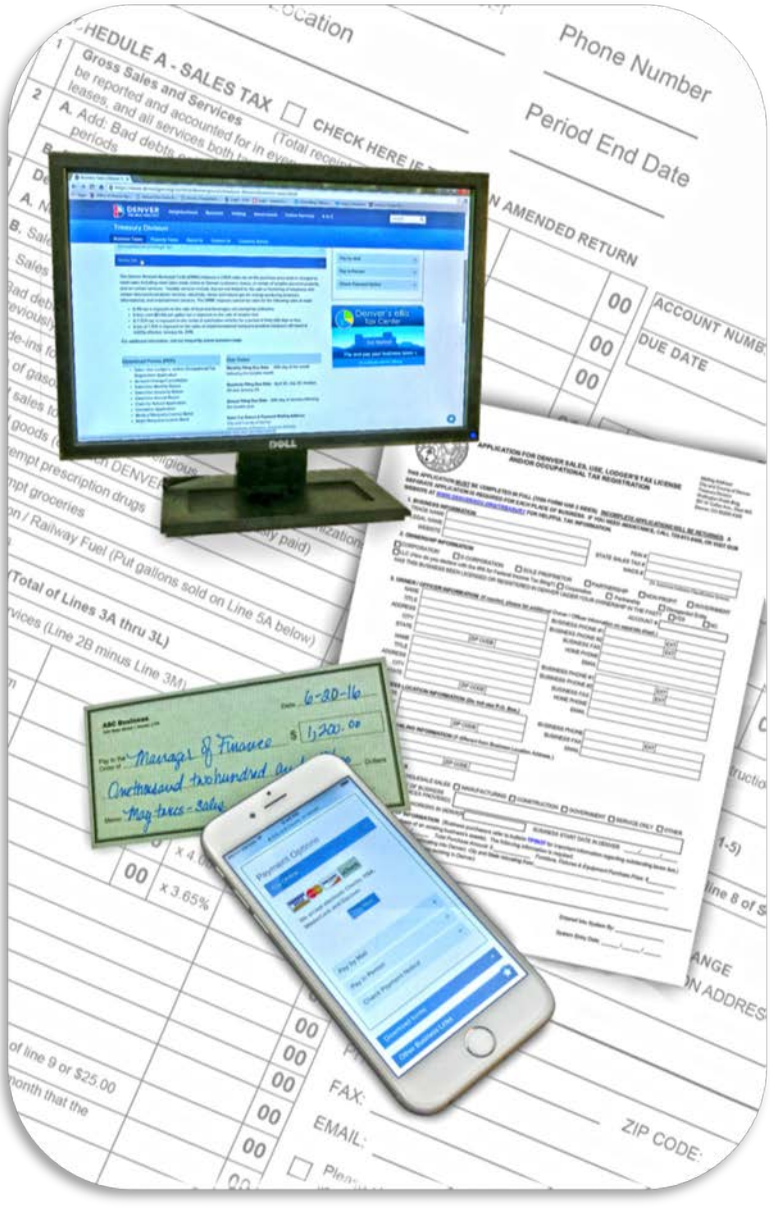
Source: Auditor's analysis of short-term rental data.

Next Steps

These results supported the Auditor's Office Short-term Rental Enforcement Audit follow-up, completed in December, 2018.

We will set a schedule to automate the analysis performed here every month.

Sales-Tax Continuous Audit



Automated analyses of Denver's sales-tax data to test controls and risks related to sales-tax information and processes

Overall Objectives

Develop the capabilities of the Auditor's Office Continuous Audit Program by connecting to and reading data from the City's tax processing software, GenTax.

- Automate analyses completed in the 2016 Municipal Sales Tax Audit related to sales-tax return processing time and the separation of duties for tax write-off requests.
- Schedule the scripts to run periodically so the results of our analyses may inform the Auditor's Office risk assessment process.

GenTax Analysis

The Continuous Audit Team successfully connected to GenTax and developed scripts to read tables into our audit software, Arbutus. The team worked with Technology Services and the Treasury Department to make a secure, read-only connection between our audit software and GenTax and develop scripts to analyze data within GenTax.

- With this connection, the team used our audit analytics software to review more than 364,000 tax returns for tax filing periods between January 1, 2015 and July 1, 2018 ***for timeliness***.
- We also used this connection to review the 741 sales-tax write-off request records for tax filing periods between January 1, 2015 and July 1, 2018 ***for separation of duties***.

Tax Return Processing Time Analysis

The 2016 Municipal Sales Tax Audit identified the time to process a tax return as a risk. Based on this assessment, the audit manually tested a sample of tax returns for the timeliness of processing.

The Continuous Audit Team wrote scripts to replicate most of the scope of the original analysis but applied the analysis to *all* tax returns, more than 364,000, for filing periods between January 1, 2015 and July 1, 2018. Based on the results of the analysis, the time to process tax returns has decreased since the time of the audit period.

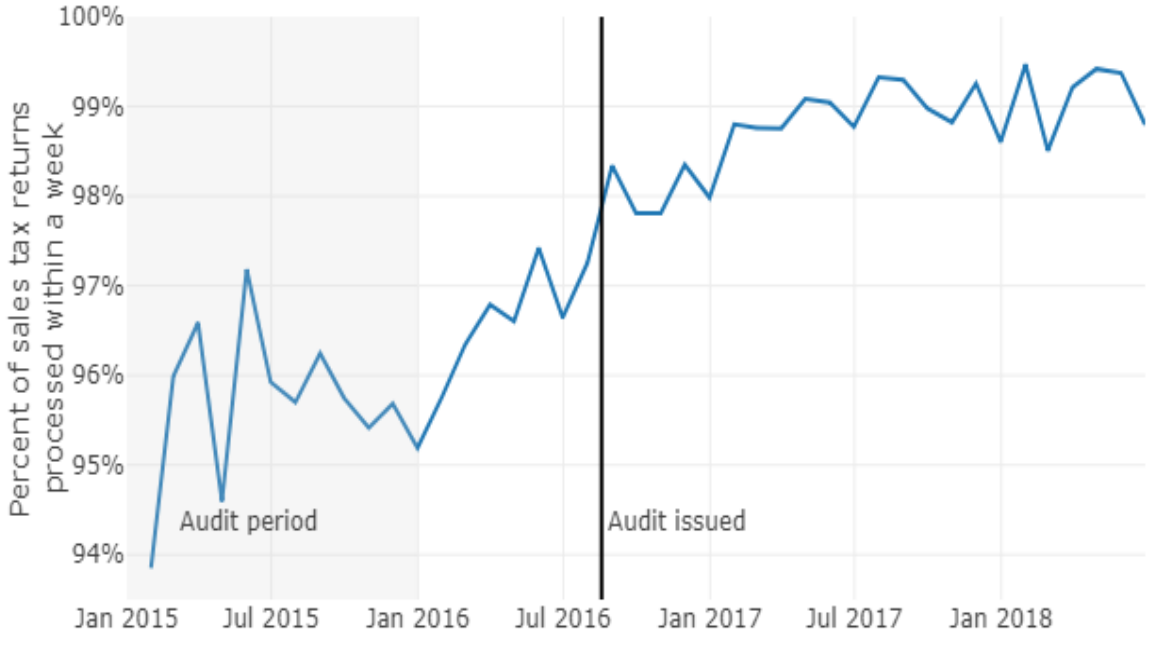
Result: The Treasury Department has improved its tax return processing time since the 2016 Audit. The Auditor's Office will continue to consider this information in its risk assessment.

Results of Tax Return Processing Time Analysis

Our analysis shows the tax return processing time is decreasing.

- More than 99 percent of returns are processed within one week.
- Ninety-five percent of returns are processed within two days.

Figure 7. Percent of sales tax returns processed within one week.



Source: Auditor's analysis of Denver's GenTax tax return data.

Segregation of Duties Analysis

The 2016 Municipal Sales Tax Audit recommended the write-off request approver be different than the requester. The audit noted a separation of duties reduces the risk of accidental or intentional inappropriate write-offs.

We used computer-aided audit techniques to assess the 741 approved sales-tax write-off requests made between January 1, 2015 and July 1, 2018, for sales tax records in the same time period.

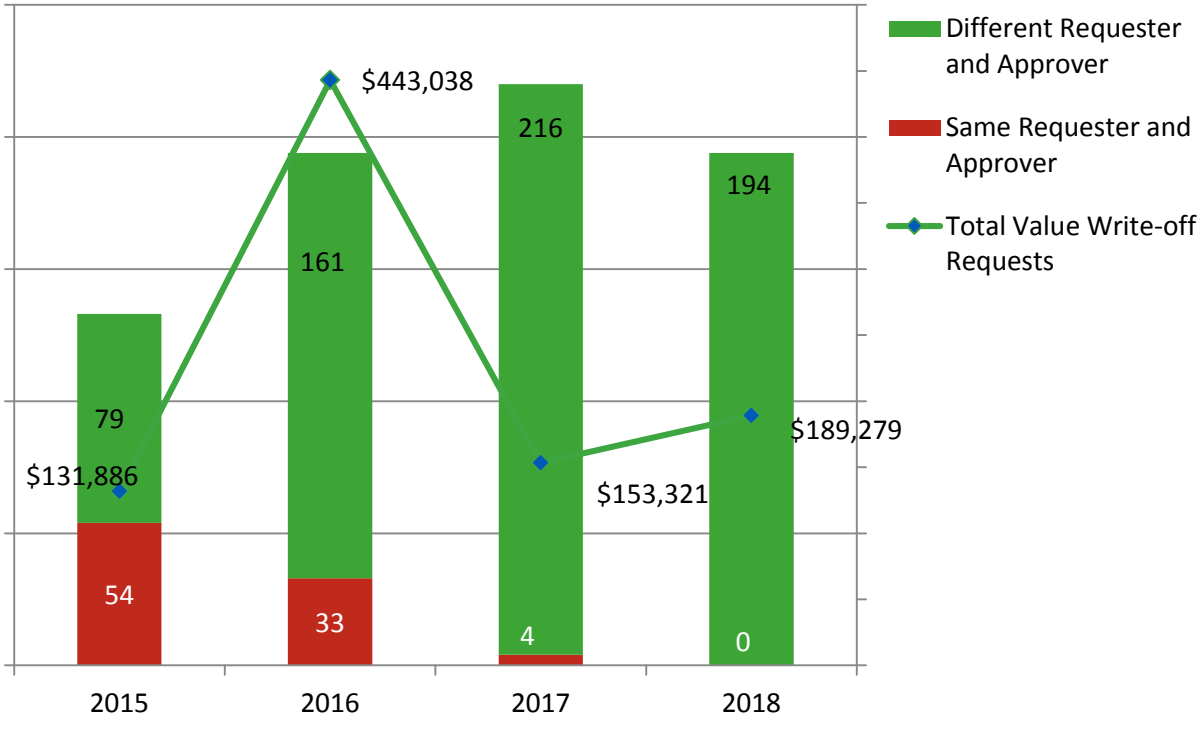
The analysis shows an improvement in separation of duties for write-off request approvers and requesters.

Segregation of Duties Analysis Results

The analysis shows an improvement in separation of duties for write-off request approvers and requesters.

Results: The Treasury Department has improved its separation of duties for sales-tax write-off requests since the 2016 Municipal Sales Tax Audit. The Auditor's Office will continue to consider this information in its risk assessment.

Figure 8. Count of write-off requests with and without segregation of duties.



Source: Auditor's analysis of Denver's GenTax tax return data.

Next Steps

The Continuous Audit Team will incorporate the scripts for assessing tax return processing time and the segregation of duties of write-off requests into continuous scripts. The ongoing results will inform the Auditor's Office risk assessment and planning of future audits.

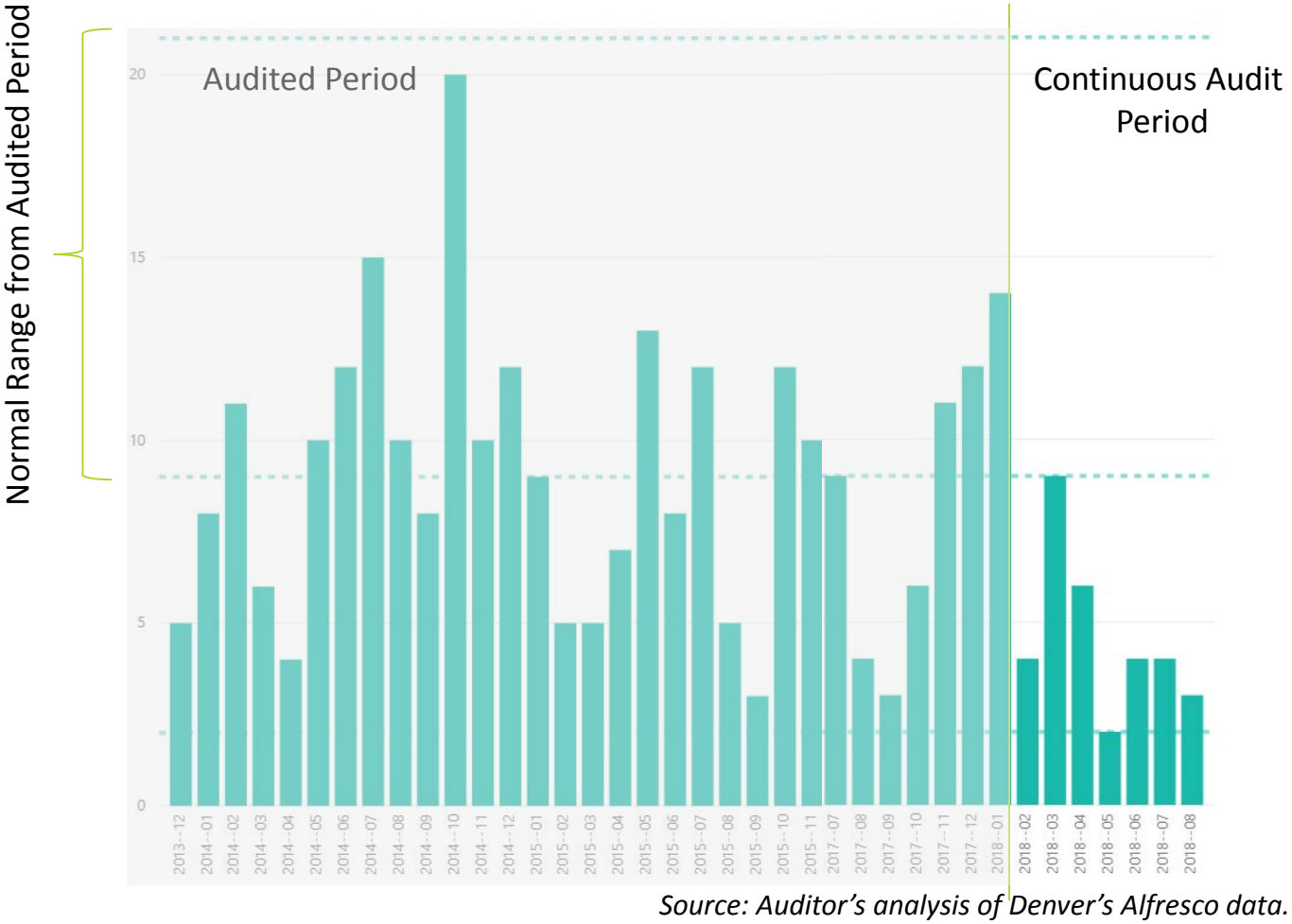
Alfresco Continuous Audit

Monitor all contracts on a monthly basis for potential contract splits to avoid city council oversight and for data reliability.

Alfresco Continuous Audit Results

The analysis shows no increase in risk for contract splitting.

Figure 9. Count of potential splits [1, 2]



Source: Auditor's analysis of Denver's Alfresco data.

[1] The 2017 Contract Controls In Alfresco audit found no issues with the potential splits. These potential splits are considered a risk indicator.

[2] No potential splits identified after September 2019, hence no bar in the graph.

Next Steps

The Continuous Audit Team will continue to run scripts on the Alfresco data for potential splits and data reliability. The ongoing results will inform the Auditor's Office risk assessment and planning of future audits.

Data Analytics Team

Katja Freeman, Audit Manager

Sam Gallaher, Audit Analytics Administrator

Brad Harwell, Lead Auditor

William Morales, Senior Auditor

Robert Persichitte, Senior Auditor

Our Mission

We deliver independent, transparent, and professional oversight in order to safeguard and improve the public's investment in the City of Denver. Our work is performed on behalf of everyone who cares about the City, including its residents, workers, and decision-makers.