



# AUDIT COMMITTEE



# AUDIT ANALYTICS TEAM

## SEMIANNUAL AUDIT ANALYTICS UPDATE

FEBRUARY 2024

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# AGENDA



- Continuous audit and risk analytics update.
- Project updates.
- Audit support.
- Outreach to the audit community and internal training.



# BACKGROUND

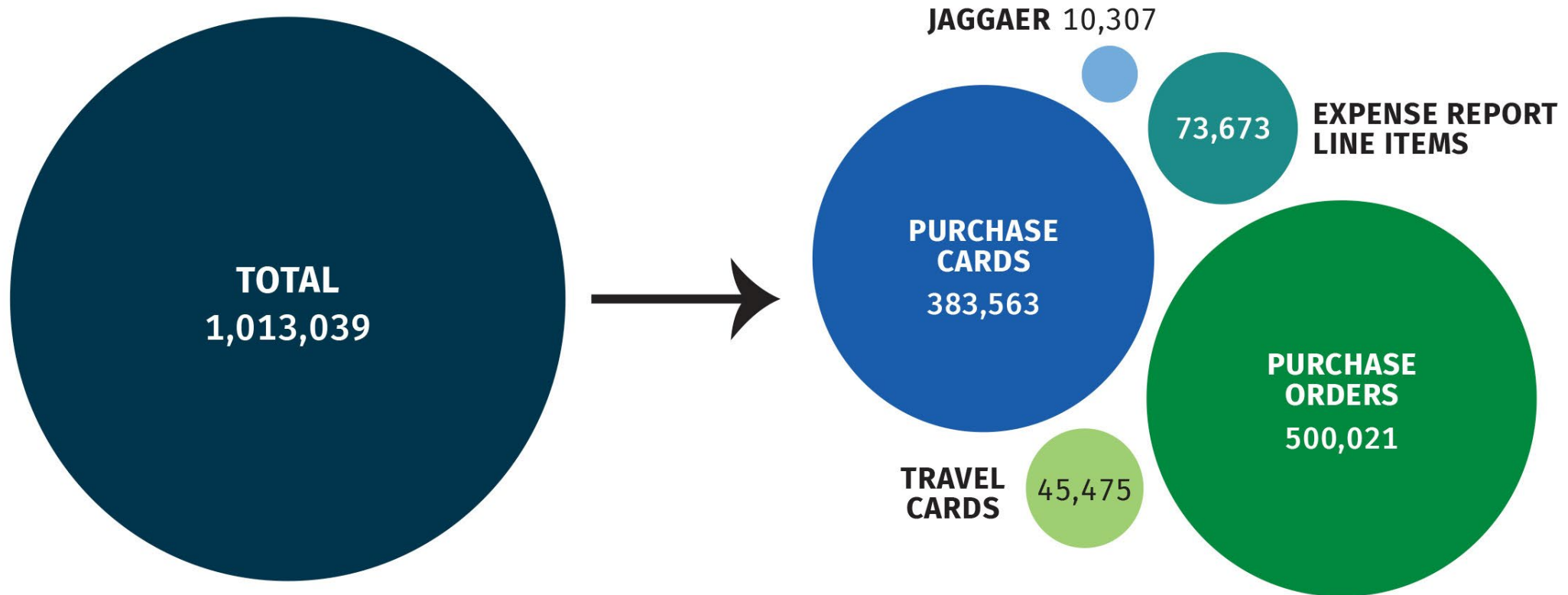
Continuous auditing is a method to identify and analyze risks through automated, scheduled analysis of the city's financial and process data.

Using this approach, we:

- Connect to and analyze information.
- Share results with Auditor's Office leaders.



# 2023 continuous audit and risk analytics number of records analyzed



Source: Auditor's Office illustration using information from the city's financial system of record, Workday, and the city's contract management system, Jaggaer.

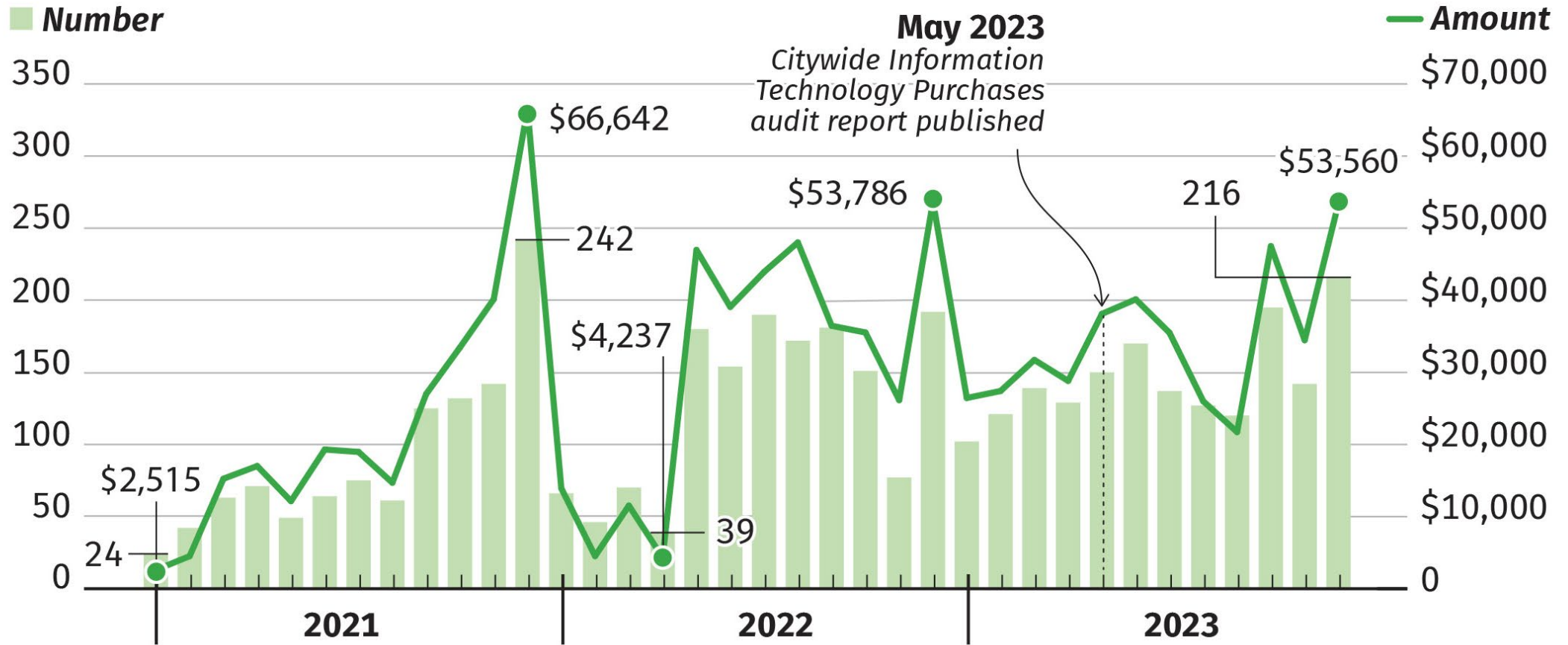
# CONTINUOUS AUDIT: TECHNOLOGY PURCHASES



- We identified high-risk purchase card transactions using a combination of five risk flags.
- We analyzed all purchase card transactions from January 2021 through December 2023.



# Technology purchases in possible violation of Executive Order No. 18, by month



Source: Graphic created by the 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 CARDS



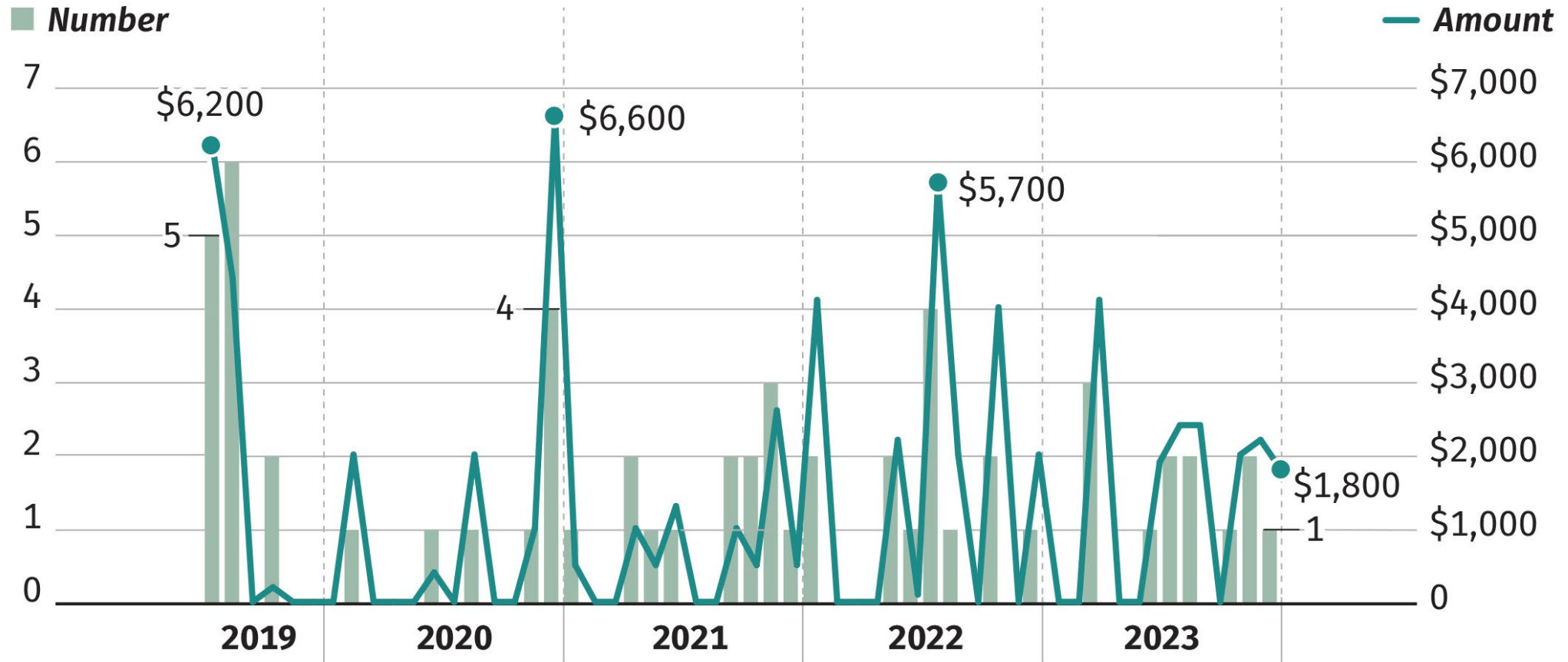
## Purchase card composite model

- We flag purchases tied to pass-through vendors, even-dollar amounts, recurring transactions, and split transactions.
- Of the 383,563 transactions, 132 (or 0.03%) had three or more risk flags.





# Purchase card transactions with three or more risk flags, by month



Source: Graphic created by the audit analytics team using data from Workday.

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

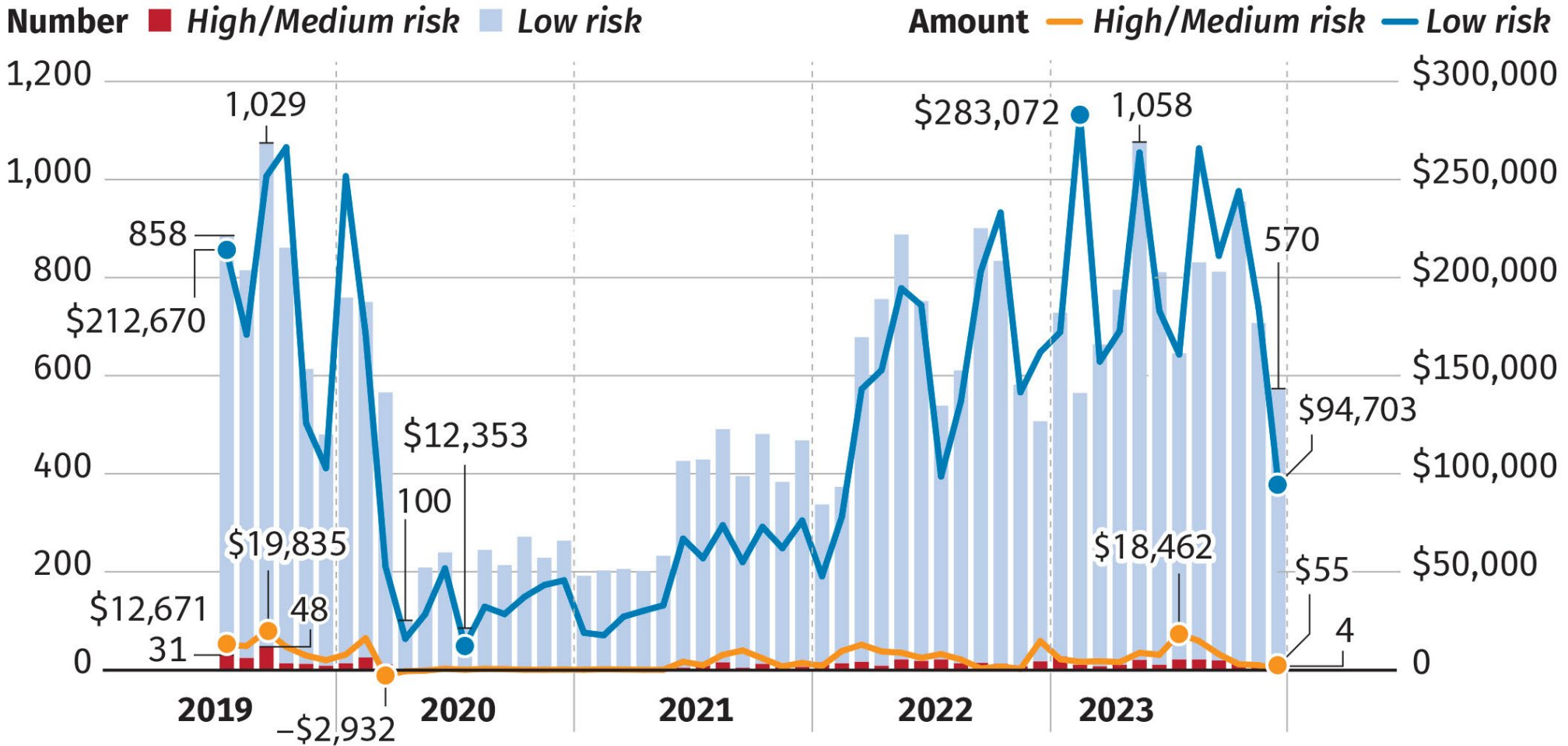
# CONTINUOUS AUDIT: TRAVEL CARDS



- 98% of travel card transactions are categorized as low risk.
- The number of transactions categorized as medium or high risk has stayed consistently low over the past four years.



# Travel card purchases, by month



Source: Graphic created by the 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: EXPENSE REPORTS



## Composite risk model

Aggregates three risk flags:

- Top spender.
- Benford's law.
- Even-dollar.

# CONTINUOUS AUDIT: EXPENSE REPORTS



- 523 transactions (0.7%) triggered all three risk flags.
- There was slight increase for this group of transactions compared to prior periods.
- We reviewed a sample of 20 high-risk transactions to learn more.

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# CONTINUOUS AUDIT: PURCHASE ORDERS



## Risk analytics

- Unauthorized purchases.
- Shipping addresses.



## Unauthorized purchases

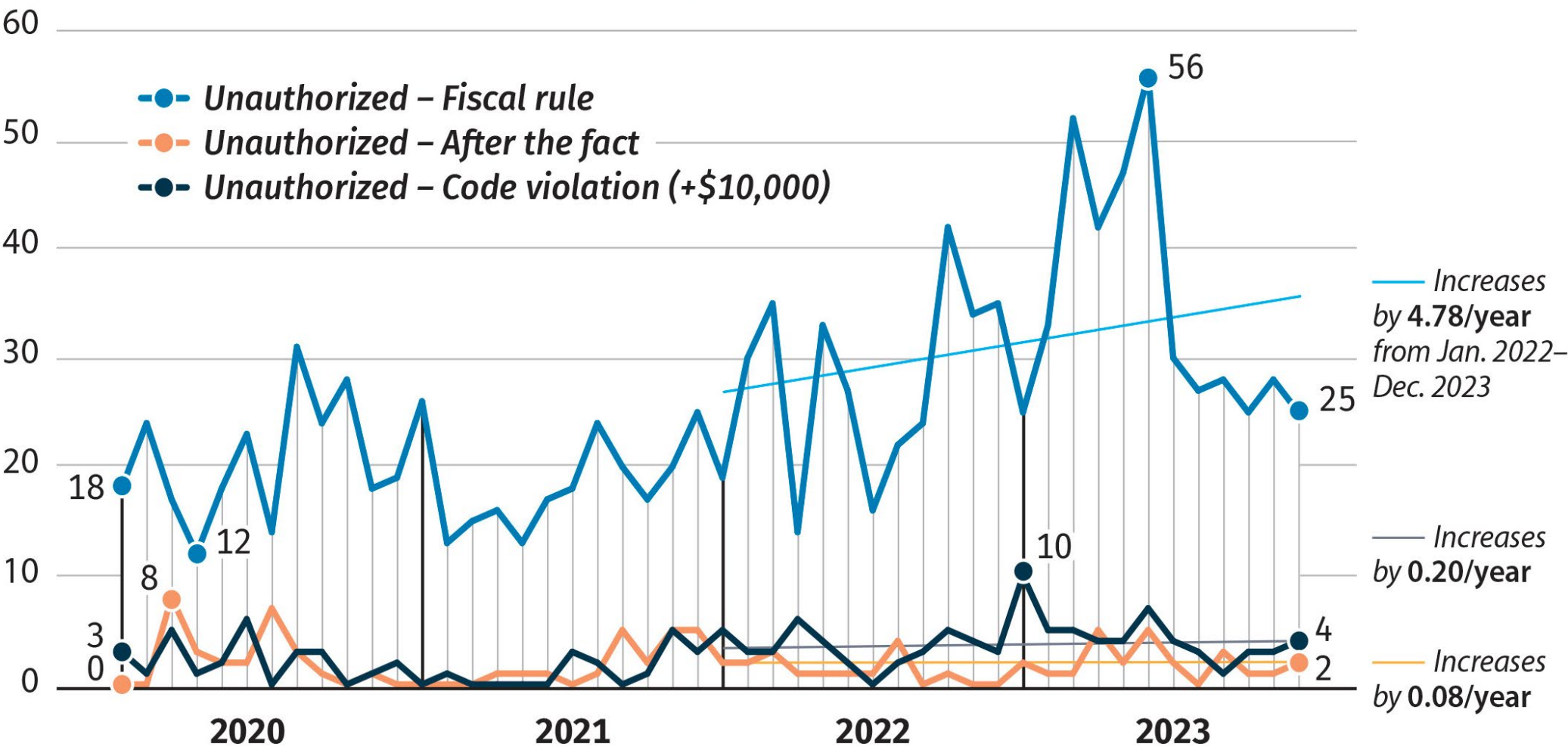
Purchase order transactions that violate the city's procurement process by:

- 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

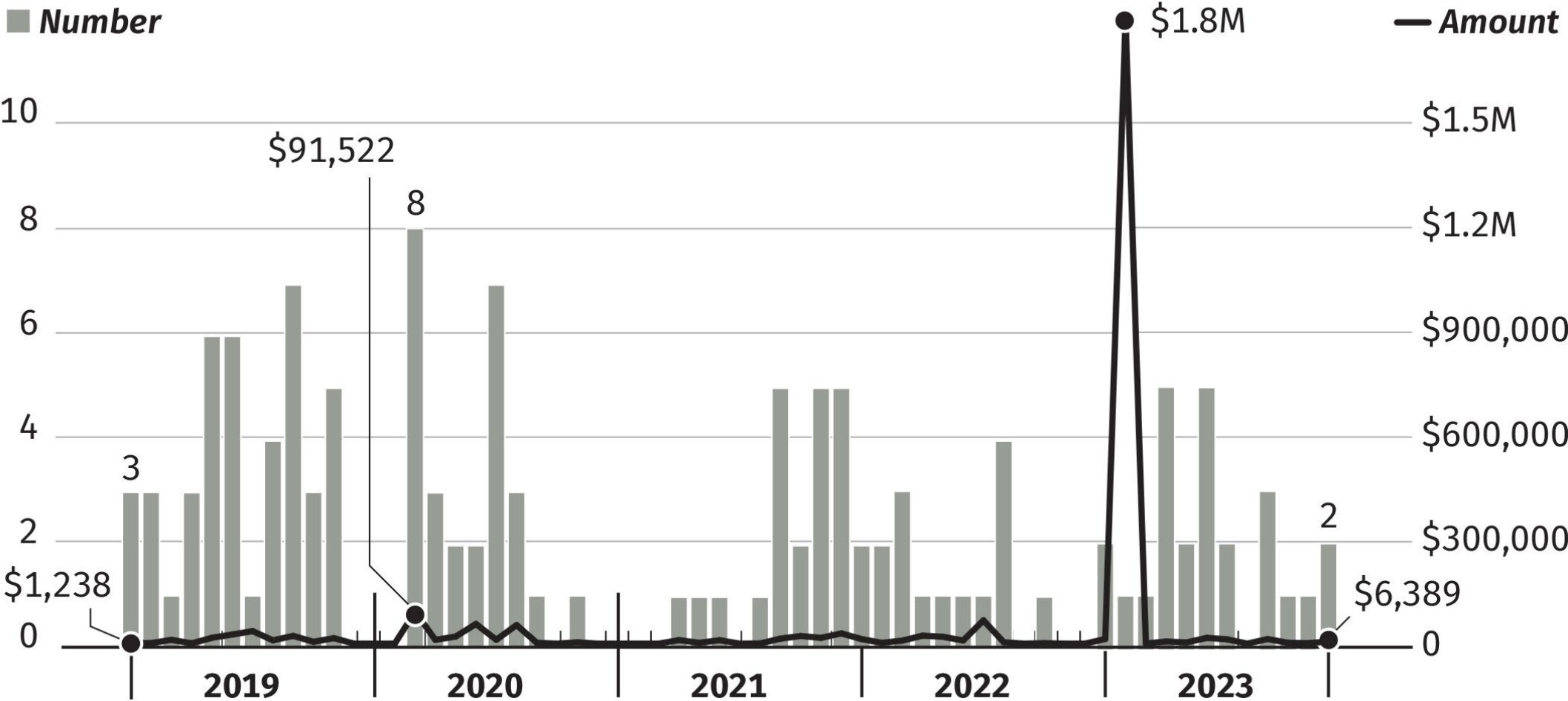


Source: Graphic created by the audit analytics team using data from Workday.

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



# After-the-fact unauthorized purchases, by month

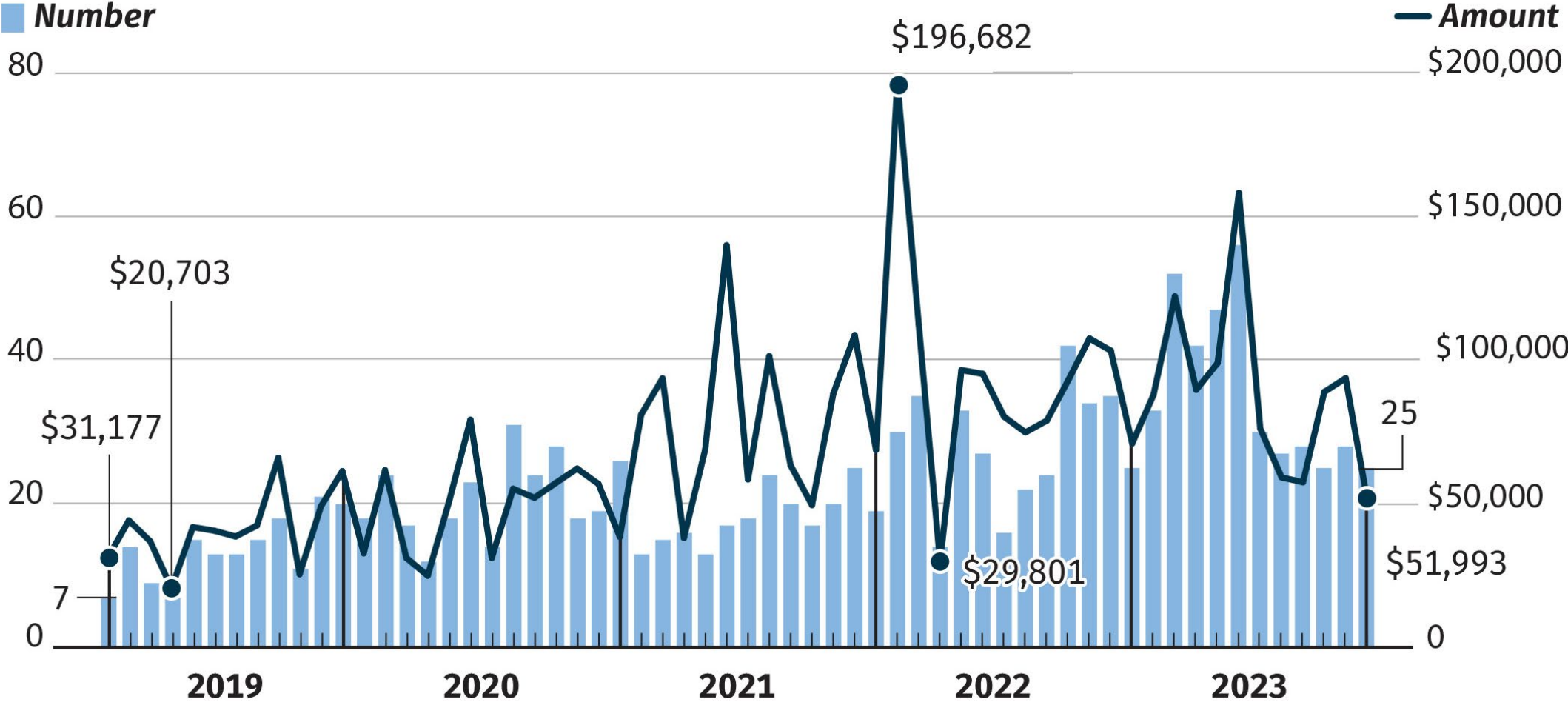


Source: Graphic created by the audit analytics team using data from Workday.

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



# Fiscal rule unauthorized purchases, by month



Source: Graphic created by the audit analytics team using data from Workday.

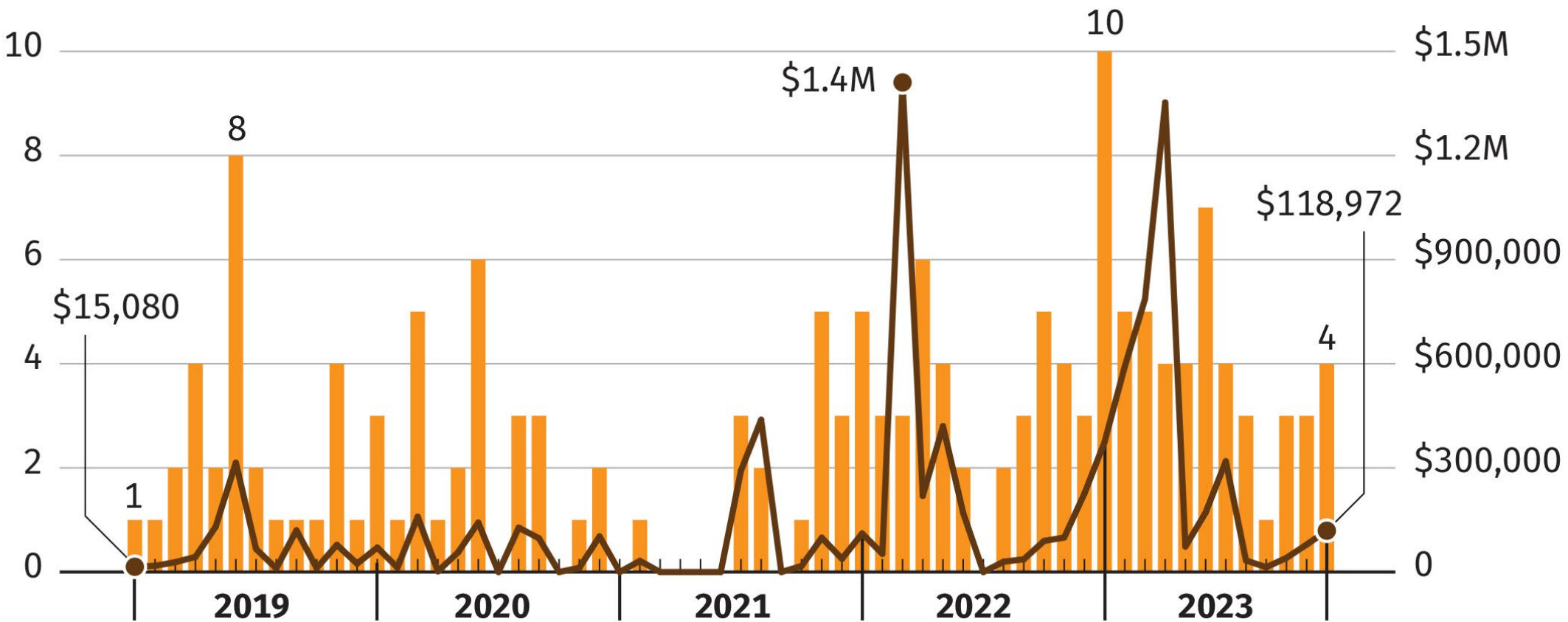
\* These results are used only for risk assessment purposes and may require additional audit work to validate.



# Code violation unauthorized purchases, by month

Number

Amount



Source: Graphic created by the audit analytics team using data from Workday.

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



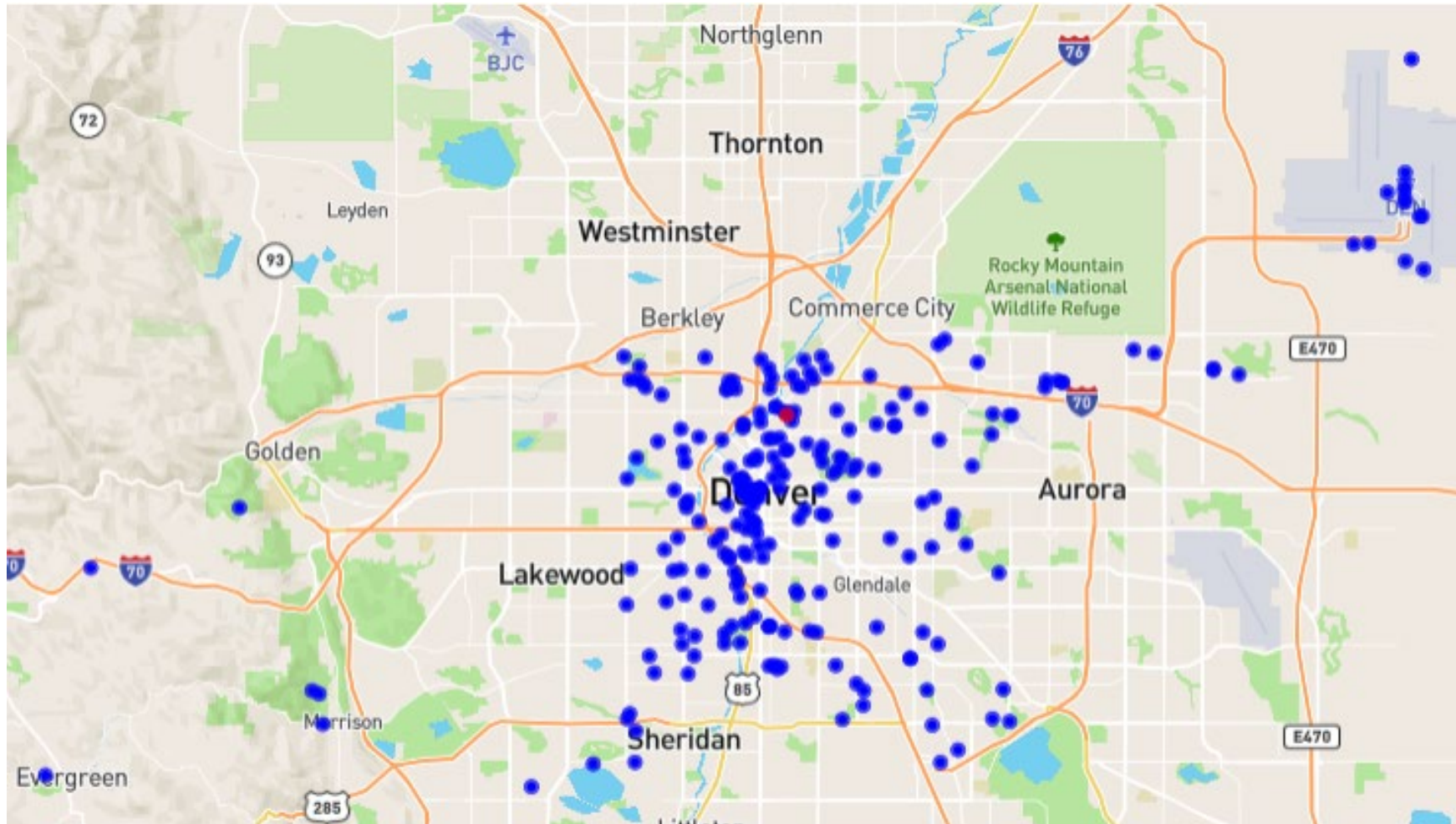
## Shipping addresses

The address listed in a purchase order that directs the location of shipments.

- We identified a risk population of shipping addresses that do not correspond with verified city addresses or vendors.
- We reviewed the entire risk population to determine the effectiveness of the analytic.
- Overall risk decreased compared to previous updates.



# Purchase order shipping locations



- Safe Locations
- Risky Locations

Source: Graphic created by the 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.



## Shipping addresses

- The analytic looks at whether the city's employee addresses are the same as purchase order addresses.
- It assigns and compares addresses based on latitude and longitude coordinates.
- We found one address that matched employee addresses.

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# 2024 PROJECT UPDATES

- Eligible earnings for the Denver Employees Retirement Plan.
- Contract and procurement analysis.
- Denver Golf's player profile balance analysis.



# 2024 PROJECT UPDATES

## Contract and procurement analysis

**Objective:** To help inform the scope of contract-related audits on the 2024 Audit Plan.

- Requested by audit director.
- Completed November 2023.



# 2024 PROJECT UPDATES

## Denver Golf's player profile balance analysis

**Objective:** To determine whether Denver Golf accurately transferred all player profiles and balances from its old systems to the new system, MemberSports.

- Requested by Auditor O'Brien.
- Completed February 2024.

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# 2023 audit assistance

	Data analysis	Sampling	Technical support
AFFORDABLE HOUSING	X	X	
RESIDENTIAL PERMITTING	X	X	X
CITY COUNCIL OPERATIONS	X	X	
SELF-FUNDED HEALTH PLAN	X	X	X
CONSTRUCTION CONTRACTOR PREQUALIFICATION PROCESS		X	
EMPLOYEE SEPARATION <i>(in-progress)</i>	X		
PARAMEDIC RESPONSE TIME <i>(in-progress)</i>	X		
NATURE AND SCIENCE MUSUEM <i>(in-progress)</i>	X	X	
FLEET MANAGEMENT <i>(in-progress)</i>	X		

# AUDIT SUPPORT

*continued*

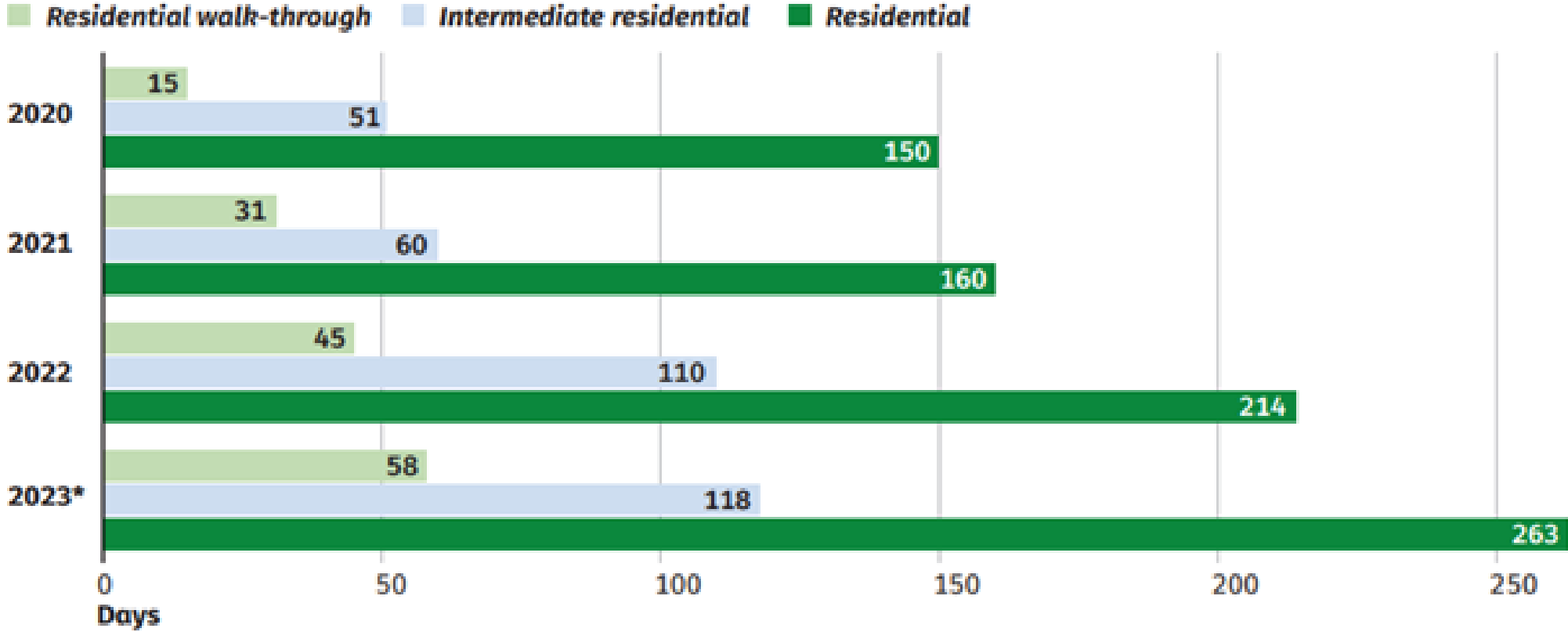


## Residential permitting

- Sampling methodology.
- Data analysis.
- Appendix.



**FIGURE 4. Average days for permit review, by year**



\* Permits approved before May 1, 2023.

**Note:** This counts the time from when the intake team accepts an application through when all review teams have approved a project's permits. This figure does not include review times for walk-through applications submitted in-person through March 2020.

**Source:** Auditor's Office analysis of length of permit review process.



# TRAININGS

- Microsoft Excel – Data Analysis.
- Arbutus – Data Analysis.
- Leading a workshop and presentation at the Association of Local Government Auditors 2024 conference.






# Audit analytics team 2023 overview

**Audit assistance**

Provided support for



**9** audits

**Continuous audit/  
risk analytics**


Ran



**18** scripts  
looking at  
1,013,039 records

**Training/  
community  
engagement**

Offered



**2** training  
sessions



# NEXT STEPS

- Provide analytic support for in-progress audits such as the Nature and Science Museum and the Paramedic Response Time audits.
- Develop new material for internal trainings.
- Prepare material for the Association of Local Government Auditors 2024 conference.



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