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Cover photo by Denver Auditor’s Office staff.
June 16, 2022

The objective of our audit of Denver Water’s city services was to determine whether Denver Water charges the city correctly for water and billing services. Additionally, we assessed the city’s decision-making process to move billing of sewer services away from Denver Water and do it in-house. I am pleased to present the results of this audit.

The audit found the city’s General Services Department is not reviewing water bills to make sure the city is not overcharged. Furthermore, the Department of Transportation & Infrastructure is not checking how Denver Water calculates discounted governmental water rates charged to the city and monthly service fees for sewer billing services. Transportation & Infrastructure also has not properly evaluated its decision to bring sewer billing services in-house.

By implementing recommendations to review and confirm the accuracy of Denver Water’s information, Transportation & Infrastructure and General Services can ensure the city correctly pays Denver Water for the services it receives. Additionally, by implementing recommendations to improve Transportation & Infrastructure’s analysis to move sewer billing in-house, it can help make sure the decision is in the city's best interest.

This performance audit is authorized pursuant to the City and County of Denver Charter, Article V, Part 2, Section 1, “General Powers and Duties of Auditor.” 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.

We extend our appreciation to the personnel at Denver Water, the Department of Transportation & Infrastructure, and the Department of General Services who assisted and cooperated with us during the audit. For any questions, please feel free to contact me at 720-913-5000.

Denver Auditor’s Office

Timothy M. O’Brien, CPA
Auditor
Denver Water City Services

JUNE 2022

Objective

• To determine whether Denver Water charges the city correctly for water and sewer billing services.

• To determine whether Denver Water properly bills, collects, and sends sewer charges to the city.

• To assess the city's decision-making process to move billing of sewer services away from Denver Water.

Background

In 1918, Denver residents voted to purchase the Denver Union Water Company’s water system to form Denver Water. Although it is not a city agency, Denver Water provides water service to residents, businesses, and governments throughout the region.

The City and County of Denver contracts with Denver Water to provide sewer billing services on the city's behalf.

The City’s Dependence on Denver Water’s Price Setting Could Lead to the City Overpaying for Services

• The city does not check whether the discounted governmental water rate charged to the city is calculated in compliance with the Denver Charter.

• The Department of General Services does not adequately review the city's monthly water bills.

• The Wastewater Management Division does not adequately check the accuracy of Denver Water's fees for sewer billing services, which are done on the city's behalf.

The Ongoing Analysis to Potentially Discontinue Sewer Billing Services through Denver Water Is Flawed

Transportation & Infrastructure's analysis to bring sewer billing into its own system does not consider several factors based on government leading practices. Furthermore, its cost analysis does not include all relevant costs, the timing of cash flows, and the riskiness of cash flows.

WHY THIS MATTERS

Without adequate processes to review charges, the city could overpay Denver Water for the services it receives. Meanwhile, Transportation & Infrastructure cannot be certain that switching sewer service billing to an in-house service is the best method of providing billing services to Denver customers.
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BACKGROUND

In 1918, Denver residents voted to purchase the Denver Union Water Company’s water system to form a Board of Water Commissioners, creating Denver Water. Through this vote, Denver Water, a public entity controlled by the board, operates independently from city government and is not funded by taxes or city resources, but by water rates, hydropower revenues, and new water connection fees referred to as “tap fees.”

Denver Water

Denver Water provides water services to residents, businesses, and governments within the City and County of Denver and throughout the region.

The Denver Charter outlines the relationship between Denver Water and the city and gives Denver Water, through its board, complete control over the water system that supplies the city and residents. The charter also gives Denver Water all powers needed to operate independently from the city, including those necessary to operate and maintain the water system. Additionally, the charter provides the Auditor of the City and County of Denver with the authority to audit Denver Water.

Denver Water is not a city agency. It has its own chief executive officer, who executes the policies and decisions of the Board of Water Commissioners, gives direction to employees, and is responsible for ensuring Denver Water can provide an adequate supply of water to its customers.

Denver Water must also fulfill other requirements established by city charter. For example, the charter says how the board should set the rates it charges for water consumption, which must be uniform, fair, and equitable among all water users. The charter also says how the city should be charged for water service. Specifically, the city must receive a discounted governmental rate that is about equal to the cost of the water that is supplied, and this rate cannot include certain costs, such as capital improvements or debt.

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2 Denver Charter § 10.1.1.
3 Denver Charter § 10.1.5.
4 Denver Charter § 10.1.8.
5 Denver Charter § 10.1.10.
6 Denver Charter § 10.1.12.
Denver Water supplies and bills water to its residential, commercial, and government customers — including the city. Denver Water is also responsible for billing and collecting payments from the city's customers for sewer services. Sewer services include the collecting, treating, and disposing of wastewater from sinks, drains, and toilets.

This audit focuses on the services the city receives from Denver Water — shown in Figure 1 — and the amounts the city pays for those services.

The city's General Services Department and Department of Transportation & Infrastructure are heavily involved in the services Denver Water provides the city:

- **GENERAL SERVICES** – This department is responsible for paying the city's monthly water bills for all city properties except for those under the city's Parks and Recreation Department and at the airport. Because General Services receives and processes the city's monthly water bills, it has a direct relationship with Denver Water.
• **TRANSPORTATION & INFRASTRUCTURE** – Among its many responsibilities, this department oversees and maintains storm drains and sewers. The department has three administrative divisions — Project Delivery, Operations, and Utilities. Each of these administrative divisions are further subdivided, as shown in Figure 2. The Utilities Administration, through its Wastewater Management Division, has a direct relationship with Denver Water.

**FIGURE 2. Department of Transportation & Infrastructure Organizational Chart**

![Department of Transportation & Infrastructure Organizational Chart](image)

**Source:** Created by Auditor’s Office staff using information from the city’s annual budget.

**UTILITIES ADMINISTRATION** – This administration provides sewer and stormwater services through its Wastewater Management Division, and trash, recycling, and composting services through its Solid Waste Management Division. Its Wastewater Management Division specifically oversees the city’s wastewater functions: sewer and stormwater operations.

Although the city is responsible for offering Denver residents sewer, trash, and stormwater drainage services, it relies on Denver Water to bill, collect, and send fees and charges for its sewer service back to the city. This reliance on Denver Water to determine how much the city should charge a resident for sewer service is tied to Denver Water’s ability to measure water consumption.

Denver Water measures water consumption at properties by reading water meters at each property and then charges its customers for the amount of water they consume. This information is important to the city because the city uses these readings and, in most situations, assumes that the same amount of water consumed will enter the sewer system after it is used. As a result, sewer service charges are calculated based on those meter readings.

Because the city cannot determine sewer service charges without Denver Water’s meters, the city has a contract to pay Denver Water a monthly
service fee in exchange for use of and access to Denver Water’s billing system, the information needed to calculate sewer bills, and other billing activities.⁷

**BILLING FOR SEWER SERVICES** – In 2009, the city worked with Denver Water to implement a new billing system that would better help Denver Water continue providing comprehensive sewer billing services for the city. The city not only paid a portion of the costs to implement the new system, but it also continues to pay a monthly service fee to Denver Water for these billing services.

The fee Denver Water charges for these billing services is calculated based on a number of factors, including the number of bills produced, accounts maintained, and meters read.

Wastewater Management staff are responsible for ensuring the sewer portion of the bill Denver Water calculates, bills, and collects is correct. Staff use the same billing system Denver Water uses to review customer accounts, make account adjustments, and resolve issues. Each month, Denver Water sends customer payments it collects for sewer services to the city, and department staff reconcile these payments with the city’s records.

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**FIGURE 3. Sewer Billing Process**

1. The city reviews customer accounts to ensure sewer billings are accurate
2. A combined bill, which includes water and sewer charges, is generated, printed, and mailed by Denver Water to customers
3. Customers pay Denver Water for the entire bill
4. Denver Water sends sewer revenues to the city

*Source: Created by Auditor’s Office staff using information from the Department of Transportation & Infrastructure.*

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**The City’s Desire for a Consolidated Utilities Bill**

The city plans to move all city-operated utilities to one billing platform that management has said will provide the department with a number of improvements, including providing customers one consolidated utilities bill. This means, customer bills would include the services shown in Figure 4 on the next page. After this planned consolidation, Denver residents would still receive a separate bill from Denver Water for water

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⁷ City and County of Denver, Intergovernmental Agreement (December 2009).
consumption charges.

FIGURE 4. Consolidated City Services

![trash, composting, sewer, stormwater icons]

Source: Auditor’s Office staff.

PRIORITIZATION AND TIMELINE – Department management said it identified the need for new billing software to replace old and inefficient systems for stormwater and composting services. But what began as a plan to replace the outdated stormwater drainage billing system grew into an effort to modernize and consolidate billing for all city utility services — including the sewer billing services provided by Denver Water. Under this plan, the city would eventually move to billing its own sewer customers instead of Denver Water.

City utilities, such as composting and stormwater services, require billing at regular intervals with differing frequencies. For example, the city bills residents who use the city’s composting program quarterly, and most homeowners and businesses receive a bill for stormwater charges from the city twice a year.

FIGURE 5. Planned Timeline to Transition City Utilities Billing to a Consolidated System

![timeline chart]

Source: Created by Auditor’s Office staff using information from the Department of Transportation & Infrastructure.

The Utilities Administration recently bought licenses to use Zuora, a billing system it plans to use for all city utilities. The department plans to transition all four city utility services to Zuora by 2024. As shown in Figure 5, billing for composting transitioned to Zuora in 2021.

The department’s timeline also includes trash services, which the city does not currently charge residents for. This is because the department is
preparing to provide billing for trash services in the event the City Council approves a measure that will allow the city to charge customers for this service. In 2023, the department plans to transition stormwater services to Zuora. Department officials said the decision to consolidate these utility services under the Zuora billing system is final with one exception.

Management has not yet determined whether sewer services billing will also transition to Zuora, which would end the city’s agreement with Denver Water. Because the city is still assessing this decision at the time of our audit, we approached our evaluation of this issue as a readiness assessment. Government auditing standards formally call this “prospective” auditing, intended to provide information based on potential events and future actions.

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8 The Denver City Council has yet to determine whether trash services will become a Denver resident paid service in the future. Currently, there is no charge for most residential trash collection service.

FINDING 1 AND RECOMMENDATIONS

The City’s Dependence on Denver Water’s Price Setting Could Lead to the City Overpaying for Services

We found the city overrelies on Denver Water in three areas related to the rates and fees it is charged. Specifically, the city does not check that:

- The costs Denver Water uses to set the annual discounted governmental water rate are allowable under the city charter.
- Once the annual rate is set, the correct rate is properly reflected in the city's monthly water bills.
- Denver Water’s monthly service fees for sewer billing are accurate to ensure the city pays only its share of costs.

Both the departments of Transportation & Infrastructure and General Services rely on Denver Water’s rate and fee calculations for the services provided to the city without independent verification. These city agencies do not have adequate processes in place to review and verify information obtained from Denver Water to ensure that rates and fees charged to the city are accurate, appropriate, and in compliance with requirements.

This dependence on Denver Water puts the city at risk of overpaying for the services it receives. By not reviewing how Denver Water calculates the discounted governmental water rate, the city may be overpaying for its water consumption or paying for costs Denver Water is prohibited by city charter from charging.

The size of the city’s water consumption is so great, even small errors can have a large financial impact over time. In 2021 alone, Denver Water provided about 1.9 billion gallons of water to the City and County of Denver. By not reviewing the costs Denver Water uses to determine the city’s monthly service fee for billing, collecting, and remitting sewer fees, the city does not know whether shared costs are fair and proportionate. The city’s proportional share of sewer billing costs for 2022 is $2.3 million.

In 2021 alone, Denver Water provided about 1.9 billion gallons of water to the city and county of Denver.

If the city decides to bill wastewater services in-house and end its agreement with Denver Water, this shared expense will decrease significantly. However, Denver Water has still not determined for this scenario whether it will continue to charge the city for meter-reading costs — costs that represent a third of the total shared costs paid by the city.
The City Does Not Check the Calculation Denver Water Uses for Its Discounted Governmental Water Rate

The city does not have a process to verify whether the costs Denver Water uses to set the city's annual discounted governmental water rate comply with city charter requirements. While we did not identify any instances of non-compliance, the lack of a process to verify this calculation increases the risk of the city overpaying.

Under the charter, Denver Water must provide water to city properties at rates that are about equal to, but do not exceed, the cost of water provided.\(^\text{10}\) Additionally, certain operating costs are prohibited from being included in this cost total. Examples of prohibited costs include:

- Payments for debt or interest.
- Purchases of new buildings.
- Equipment depreciation.

Staff members in the city's Wastewater Management Division told us they do not request or review the information Denver Water uses to calculate the city's annual rate. Therefore, no one at the city is ensuring Denver Water sets annual governmental water rates that meet charter requirements.

To determine whether the rates comply with the city charter, we reviewed calculations and supporting documentation from Denver Water for the discounted governmental water rates used from 2020 through 2022. We found that for all three years, Denver Water did properly determine the city's rates in compliance with city charter requirements. However, the division's reliance on Denver Water to provide annual water rates — and not checking them before paying — puts the city at risk of paying too much for water in the future.

Given the Wastewater Management Division's long-standing relationship and familiarity with Denver Water, the Wastewater Management Division is in the best position to alleviate this city-wide risk by identifying an incorrectly calculated city water rate. Therefore, we address our first recommendation to them.

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\(^{10}\) Denver Charter § 10.1.12.
1.1 RECOMMENDATION  
Review Annual Discounted Governmental Water Rate

The Wastewater Management Division should develop and document a process to review the annual discounted governmental water rate provided by Denver Water to ensure it aligns with the Denver Charter and excludes prohibited costs. Specifically, the review should confirm:

- The rate charged to the city does not exceed Denver Water’s cost of water furnished to the city.\(^{11}\)
- The rate charged does not include costs for debt service, betterments, additions, or extensions per city charter.\(^{12}\)

In the event the rate is incorrect, the Wastewater Management Division should notify city agencies that receive water bills, including the Department of General Services, Denver International Airport, and Denver Parks and Recreation.

AGENCY RESPONSE: AGREE, IMPLEMENTATION DATE – JUNE 30, 2022
SEE PAGE 25 FOR THE AGENCY’S FULL RESPONSE TO OUR RECOMMENDATIONS.

The Department of General Services Does Not Adequately Review the City’s Monthly Water Bills

The city’s Department of General Services receives water bills for various city properties including libraries, cultural centers, and police stations. While General Services does review these bills, this is aimed at identifying unusual consumption volumes that may indicate errors in the amount of water the city is being charged for.

This review does not verify the type of service agreement on the account — which dictates the rate Denver Water charges. For example, a commercial account should be charged commercial rates, while a City and County of Denver property qualifies for the discounted governmental rate.

We reviewed all water bills General Services received for 2021. We then recalculated the amount charged for water consumption and compared our recalculated amounts to the corresponding water bills.

We identified three properties the city acquired in 2019 that Denver Water billed with the commercial rate rather than the correct discounted governmental rate. When we investigated further, we found this error began in 2019 — resulting in the city overpaying $11,000 through 2021 for water service on those properties.

\(^{11}\) Denver Charter § 10.1.12.
\(^{12}\) Denver Charter § 10.1.12.
After we brought this $11,000 error to the attention of both General Services and Denver Water, the amount was credited back to the city. This overpayment shows why General Services should review the rate applied to the city’s monthly water bills to ensure the city is charged the appropriate discounted governmental rate.

### 1.2 RECOMMENDATION

**Review Water Rates Charged on Monthly City Water Bills**

The Department of General Services should develop and document a process to review the type of service agreement on all water bills for city properties to ensure Denver Water has charged the correct discounted governmental water rate.

**AGENCY RESPONSE:** AGREE, IMPLEMENTATION DATE – JULY 6, 2022

SEE PAGE 23 FOR THE AGENCY’S FULL RESPONSE TO OUR RECOMMENDATIONS.

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### The Wastewater Management Division Does Not Adequately Review How Denver Water Calculates the Monthly Service Fee

The city is responsible for providing sewer service to Denver residents, but it relies on Denver Water to bill and collect payment for this service. This reliance on Denver Water to determine how much the city should charge a resident for sewer service is tied to Denver Water’s ability to measure water consumption. The city’s sewer service charges are based on the amount of water consumed, which Denver Water measures through meter readings.

We did not identify any issues with the 2022 cost estimate we examined, but the Wastewater Management Division’s overreliance on Denver Water to set the monthly service fee puts the city at risk of paying too much in the future.

The city’s agreement with Denver Water requires the city to pay Denver Water for its proportional share of costs to bill for sewer services. Denver Water determines the city’s share by taking all the shared costs of billing between the city and itself and then allocating those costs based on:

- The number of wastewater accounts.
- The number of meter readings performed.
- The amount of direct costs — that is, the costs related only to sewer

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**EXAMPLE OF HOW DENVER WATER SHARES COSTS WITH THE CITY**

If Denver Water takes 100,000 meter readings, and of those, 25,000 readings were on behalf of the city’s sewer service — the city’s proportional cost allocation would be 25% of Denver Water’s cost to read 100,000 meters.

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13 City and County of Denver, Intergovernmental Agreement (December 2009), § 8.
billings and not a shared cost with Denver Water.\textsuperscript{14}

The agreement requires Denver Water to provide the city with an annual estimated cost analysis by Oct. 31 for the upcoming year.\textsuperscript{15} This analysis must follow the calculation included in the agreement, it must detail the costs Denver Water expects to incur, and it must show how it will allocate those costs to the city. After receiving this estimate, the city then has 30 days to identify any costs it believes are incorrect.\textsuperscript{16}

For 2022, Denver Water’s cost estimate to the city is $2.3 million for sewer billing services. We reviewed this estimate to determine whether:

\begin{itemize}
  \item The calculation mirrored the methodology included in the agreement between the city and Denver Water.
  \item Denver Water included costs that are not eligible.
  \item Our recalculated number of city wastewater accounts from Denver Water’s customer database matched the number of accounts Denver Water used to allocate costs in its estimate.
\end{itemize}

We found that while the Wastewater Management Division performs a high-level review by looking at the overall amount Denver Water charges each year, this review is inadequate and places excess trust in Denver Water to prepare the annual calculation accurately. Division staff would not be able to identify errors in the fee calculation or whether those fees are different from the agreed-upon methodology.

**REDUCED RISK OF OVERPAYING FOR DENVER WATER’S BILLING SERVICES**

If the city decides to use its own staff to bill for sewer services, as we discuss in Finding 2, the risk of overpaying Denver Water for its billing services would be reduced — because the amount the city pays Denver Water would be much less.

However, as of June 2022, Denver Water has not determined whether it would continue to charge the city for meter reads — which cost about $751,000 for 2022, or 33% of the total $2.3 million fee.

\textsuperscript{14} City and County of Denver, Intergovernmental Agreement (December 2009), Exhibit C.
\textsuperscript{15} City and County of Denver, Intergovernmental Agreement (December 2009), § 8.b.Step 2.
\textsuperscript{16} City and County of Denver, Intergovernmental Agreement (December 2009), § 8.b.Step 3.
1.3 RECOMMENDATION Review Denver Water’s Annual Service Fee Cost Estimate

The Wastewater Management Division should develop and document a process to review the annual cost estimate for billing service fees that Denver Water provides to ensure no erroneous costs are present before the city agrees to the annual fee.

This review should include, at a minimum, an evaluation of the direct costs allocated to the city and the number of accounts Denver Water has for the city to ensure costs are proportioned accurately.

AGENCY RESPONSE: AGREE, IMPLEMENTATION DATE – SEPT. 30, 2022
SEE PAGE 26 FOR THE AGENCY’S FULL RESPONSE TO OUR RECOMMENDATIONS.
FINDING 2 AND RECOMMENDATIONS

The Ongoing Analysis to Potentially Discontinue Sewer Billing Services through Denver Water Is Flawed

Based on our prospective analysis, we determined city officials are not evaluating their decision to perform sewer billing in-house in line with leading practices commonly used in the government sector. Furthermore, we found the evaluation tool management is currently using is incorrect, incomplete, and may not be the correct tool to use for this decision.

Deciding whether to perform the billing for sewer services in-house involves many variables, all of which could significantly impact the city staff who would be responsible for the process. Further, the decision also involves millions of dollars in annual city spending. Without proper consideration, the city risks making a decision that does not maximize the quality and quantity of its service at the lowest cost and best value.17

As discussed starting on page 4, the city is working to consolidate its city utility bills by 2024 under a new billing system called Zuora. Billing for composting services transitioned to Zuora in 2021, and the city is preparing to provide billing for trash services in the event the City Council approves a measure that will allow the city to charge customers for this service this year. Stormwater service is planned to be billed through Zuora starting in 2023, and the city anticipates sewer billing being added in 2024—if it decides to move those services away from Denver Water.

Wastewater Management Division staff said officials decided to make sewer billing the last city utility to move to Zuora because of the complexity of sewer billing and that other utilities, such as compost and trash, became a priority of Transportation & Infrastructure’s administration and the City Council.

Because the division has not yet finalized its decision to bring sewer billing in-house, we approached the second part of our audit objective as a readiness assessment. Therefore, this second finding addresses the current state of the division’s analysis as of March 2022.

According to leading practices, a readiness assessment — formally called a “prospective” audit — provides information based on potential events and future actions.18

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SEWER BILLING COMPLEXITIES AND THE DELAY IN SEWER CONSOLIDATION

Sewer billing is more complex than other city-billed utilities. The Wastewater Management Division must consider multiple billing cycles, a large customer base, and multiple customer types — like residential customers, commercial customers, and commercial customers that produce industrial waste that costs more to treat.

Although every water meter is read monthly, the exact date of the reading depends on where in the city the customer is — so customer billing cycles are staggered based on when during the month their meter is read. In all, the city has 20 distinct billing cycles for sewer.

In addition, customers are billed according to type. Residential customers are billed the same flat amount each month for sewer services. The rate charged to all residential customers is based on the number of gallons of water consumed in February, because customer water use tends to be lowest in the winter months. By contrast, businesses are billed based on their actual water consumption, which can vary month to month. In all, there are several service types — all of which can have differing fees and surcharges.

Other factors, including the size of the customer base and the sheer number of invoices and dollars involved, contribute to the complexity of the sewer billing process. In 2021, Denver Water’s sewer billing services produced about 2 million bills for more than 166,000 customers and collected over $110 million on behalf of the city.

Even if the Wastewater Management Division does ultimately decide to move sewer billing in-house, the city would still rely on Denver Water for its meter-reading services. As of April 2022, Denver Water has not decided whether it would continue to charge the city for meter-reading activity — a cost of about $751,000 in 2022, or 33% of the total $2.3 million fee.

THE IMPORTANCE OF PROPER EVALUATION OF CAPITAL BUDGETING DECISIONS

The Government Finance Officers Association says, “Governments are under constant pressure to reduce costs, increase revenues, and improve service quality.” The Wastewater Management Division can relieve some of these pressures by properly evaluating its decision to continue to pay Denver Water to bill for sewer services or bring this billing in-house.

Because budget decisions such as these are risky and “because of the long periods for which resources must be committed and the difficulty of measuring costs and benefits,” it is vital for the city to appropriately assess these decisions to avoid costly mistakes.

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Wastewater Management’s Existing Analysis Does Not Align with Government Leading Practices

We found the Wastewater Management Division’s existing analysis is missing several elements recommended by the Government Finance Officers Association. As shown in Table 1, the organization says governments should carefully analyze all aspects of a service-delivery option when evaluating new methods to perform a service and this should include evaluating the benefits of bringing a service in-house. Service-delivery options are simply different methods for performing a service — such as billing for sewer utilities.

<table>
<thead>
<tr>
<th>Decision Consideration</th>
<th>Decision Consideration</th>
<th>Included in the Wastewater Management Division’s Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Direction</td>
<td>The government should establish clear expectations and standards in analyzing service-delivery options.</td>
<td>✗</td>
</tr>
<tr>
<td>Stakeholder Input</td>
<td>The government should ensure stakeholders, such as employees, are appropriately involved.</td>
<td>✓</td>
</tr>
<tr>
<td>Service Requirement</td>
<td>The government should assess impacts to human resources when deciding whether to change services.</td>
<td>✓</td>
</tr>
<tr>
<td>Flexibility of the Arrangement</td>
<td>The government should consider that services provided by public employees may or may not be more flexible to change than those provided by a vendor.</td>
<td>✗</td>
</tr>
<tr>
<td>Reversibility of the Arrangement</td>
<td>The government should understand that an arrangement that cannot be more easily undone is more risky.</td>
<td>✗</td>
</tr>
<tr>
<td>Transition Costs</td>
<td>The government should evaluate costs for a smooth service-delivery transition.</td>
<td>✓</td>
</tr>
<tr>
<td>Communication</td>
<td>The government may need to consider a communication and change management strategy.</td>
<td>✗</td>
</tr>
<tr>
<td>Cost/Service Quality</td>
<td>The government’s decisions should focus on avoidable costs and consider relevant non-financial factors.</td>
<td>✗</td>
</tr>
</tbody>
</table>

Source: Auditor’s Office analysis based on guidance from the Government Finance Officers Association.

We compared the factors the Wastewater Management Division considered in its analysis with those recommend by the Government Finance Officers

Association, and we determined the city’s analysis lacks the following elements:

- **EXECUTIVE DIRECTION** – The division’s documentation lacks clear expectations and standards in analyzing service-delivery options. Additionally, most of the information we received was outdated and had not been updated since 2019.

- **FLEXIBILITY OF THE ARRANGEMENT TO BILL IN-HOUSE** – Even if the division decides to bill for sewer services in-house, it must still rely on Denver Water for meter-reading services and other data, which limits the flexibility of the proposed options. Furthermore, city employees may not possess the experience or knowledge to perform the tasks required if the city decides to stop having Denver Water bill for sewer services.

- **REVERSIBILITY OF THE ARRANGEMENT TO BILL IN-HOUSE** – It could be difficult to undo this decision once it is made because of the complexity and size of the process — and the division’s existing analysis does not acknowledge this. The finality of this decision makes it riskier than one that could easily be reversed. This places extra importance on the division’s analysis to identify the most favorable option for the city, before taking any action.

- **COMMUNICATION** – The Wastewater Management Division has not outlined how it would communicate with customers to notify them of the change or how it would directly impact their bills, levels of service, and who they would need pay for sewer service. The division has also not outlined how it would communicate these changes with the employees whose responsibilities would be affected.

- **COST AND SERVICE QUALITY** – The two types of impacts of any major decision can be classified as either “qualitative” or “quantitative.” Qualitative factors involve concepts or descriptive judgments, such as service quality, while quantitative factors involve measurable quantities and numbers, such as dollars.

  - **QUALITATIVE FACTORS** – The Wastewater Management Division’s analysis tool is the “net present value analysis.” This analysis considers only costs and cannot weigh the impacts of other relevant factors such as the benefit of increased financial reporting abilities, the impact on the relationship between the city and Denver Water, the level of customer satisfaction, or the level of satisfaction among the city personnel who would be affected by the billing switch.

  - **QUANTITATIVE FACTORS** – Division staff had identified several quantitative factors in memos and other communications, but these factors were not included in the division’s analysis.

Table 2 on the next page, lists examples of factors relevant to the city’s decision to perform sewer billing in-house, which we identified through our own professional judgment and by reviewing documented internal communication with city staff as well as external communication with Denver Water. The documented communication we reviewed covers 2016.
through 2019. Documented communication after 2019 does not exist, and we could not identify other evidence of discussions or continued analysis after that point.

Although staff for both the city and Denver Water discussed the items included in Table 2, they were never carried forward and incorporated into the Wastewater Management Division’s current analysis.

### TABLE 2. Qualitative and Quantitative Factors Identified by the Wastewater Management Division Missing from the Wastewater Management Division’s Analysis

<table>
<thead>
<tr>
<th>Quantitative Factors Identified but Not Included</th>
<th>Qualitative Factors Identified but Not Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing monthly costs for support and system integration to reconcile property and ownership changes for accurate billing.</td>
<td>Increased ease in financial reporting and accounting as a result of owning customer data directly.</td>
</tr>
<tr>
<td>Increased staffing costs for cashiering, call center, and support services.</td>
<td>Increased billing flexibility.</td>
</tr>
<tr>
<td>Costs to keep customer balances with Denver Water or convert them to the city system.</td>
<td>Ability to correct errors or make changes more quickly.</td>
</tr>
<tr>
<td>Costs to communicate the change to customers.</td>
<td>Increase in employee turnover or lowered morale as employees gain significant additional responsibilities.</td>
</tr>
<tr>
<td>Estimated costs incurred from resulting inaccurate billings or conversion errors.</td>
<td>Potential impacts on the relationship between the city and Denver Water.</td>
</tr>
</tbody>
</table>

**Source:** Auditor’s Office staff.

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**Wastewater’s Evaluation Tool Is Incorrect, Incomplete, and Does Not Align with Leading Practice**

Net present value analysis is a calculation that estimates what a series of future payments or cash inflows are worth in today’s dollars using a discount rate. The aim of using a net present value analysis is to identify which option would cost less or be more profitable over time in today’s dollars. A discount rate is a subjective rate based on various factors such as inflation, project risk, and market interest rates. The discount rate calculates the impact of time on the value of dollars, similar to an inflation rate.

Figure 6 on the next page illustrates this concept using a hypothetical 2% discount rate and how it might be used to make decisions. In the figure, the first option is considered best because it has a higher net present value.

The Wastewater Management Division’s analysis compared the cost of continuing the current arrangement with Denver Water with the cost of performing the billing in-house and concluded that bringing the billing in-house would save $4.4 million over 5 years. However, we found flaws in the division’s analysis.
**FIGURE 6. Net Present Value Decision Making**

![Diagram showing net present value decision making with cash flows and discount rates.

**Note:** 2% in this figure represents a hypothetical discount rate of 2%.

**Source:** Auditor’s Office staff.

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**Net Present Value Analysis Alone Is Not a Good Evaluation Tool for Government**

While net present value analysis can be useful in a variety of circumstances, research shows that only 3% of city and county governments report using this tool when evaluating capital budgeting decisions.22

As shown in Table 3, researchers found this method was overwhelmingly used by corporate entities while government entities preferred using the benefit-cost ratio analysis, which compares an investment’s possible benefits with its related costs. The goal is to pick the option that produces the greatest benefit over cost.23

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**TABLE 3. Capital Budgeting Tool Usage**

<table>
<thead>
<tr>
<th>Budgeting Tool</th>
<th>Governmental Responses</th>
<th>Corporate Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Rate of Return</td>
<td>1%</td>
<td>44%</td>
</tr>
<tr>
<td>Net Present Value</td>
<td>3%</td>
<td>47%</td>
</tr>
<tr>
<td>Benefit-Cost Ratio</td>
<td>38%</td>
<td>-</td>
</tr>
<tr>
<td>No Quantitative Evaluation</td>
<td>34%</td>
<td>-</td>
</tr>
</tbody>
</table>


23 Kee and Robbins, 291.
Unlike corporations, where decisions are made to maximize profits, city and county governments must make decisions that maximize the quality and quantity of its services at the lowest cost.

Among the governments researchers surveyed, most used a cost-benefit ratio analysis as their main tool. They also said being unable to incorporate qualitative factors and the difficulty in predicting future cash flows were the main reasons for not using the net present value tool.

Table 4 lists the main reasons governments gave researchers for not using net present value analysis. We noted similar issues with the Wastewater Management Division’s use of its net present value analysis.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Number of Respondents</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inability to incorporate qualitative factors</td>
<td>40</td>
<td>30%</td>
</tr>
<tr>
<td>Futility in projecting future cash flows</td>
<td>25</td>
<td>19%</td>
</tr>
<tr>
<td>Political factors.</td>
<td>54</td>
<td>41%</td>
</tr>
</tbody>
</table>


What Wastewater’s Net Present Value Analysis Is Lacking

We found the division’s analysis does not consider all relevant costs, the timing of cash flows, and the riskiness of cash flows. According to academic research, a net present value analysis is effective when it considers the following:

1. **ALL CASH FLOWS** – All relevant incremental costs should be included in the decision-making analysis. For example, the city will have to pay some amount for postage to bill other city utilities. Only the additional amount required to bill for wastewater services is considered an incremental cost because the costs for other services will be incurred no matter the final decision. Any incremental costs that are identified but not present in the analysis will result in an inaccurate estimate of the project cost.

As shown in Table 2 on page 17, the division and Denver Water identified various incremental costs through meetings and memos that were not part of their analysis. Some of these costs included increased staffing for cashiering and administration, system support, and potential billing inaccuracies.

24 Kee and Robbins, 293-294.
25 Kee and Robbins, 294.
2. **THE TIMING OF CASH FLOWS** – The effects of inflation on cash flows increases over time. While we found the division does consider the effect of inflation in its analysis, it does not consider the timing of when cash flows occur. The analysis assumes costs begin being paid immediately, when the first cash outflows for this project would likely take place in 2023 or 2024.

3. **THE RISKINESS OF CASH FLOWS** – Because of the natural uncertainty of estimates, there is always a risk that cost estimates are incorrect and actual costs are significantly different from those predicted. If actual costs to implement in-house billing significantly exceed the estimate, this option could result in less cost-savings than expected or potentially be more expensive than the current arrangement.

We found the division did not consider the riskiness of cash flows. According to research, there are two main methods for incorporating risk into the net present value analysis:

- Requiring a higher threshold for decision acceptance when there is significant risk.
  This means that a high-risk option might have to result in potential cost savings of $1 million whereas a low-risk option might only need to result in a $500,000 cost saving. Figure 7 illustrates how the level of project risk relates to the expected cost savings of a project.

- Basing calculations on a higher discount rate.
  Using a higher discount rate in the net present value analysis correlates to that money being less valuable today. For example, the net present value (in today’s dollars) of $500 per year for three years is $1,442 with a 2% discount rate but is $1,362 at a 5% rate. Figure 8 on the next page demonstrates the effect of discount rates on the net present value. In this scenario, the first option would be selected as it has the greater net present value.
FIGURE 8. Impact of Discount Rates on Net Present Value

Source: Auditor’s Office staff.

Because the Wastewater Management Division aims to bring sewer billing in-house in 2024, two years from now, it is urgent that the division improves its analysis to make a better-informed decision on whether to continue with its plan.

A number of important factors were identified by division staff and Denver Water from 2016 through 2019, but employee turnover and other billing priorities caused those cost factors to be disregarded.

The division’s existing analysis relies on a tool used in the private sector — one that is incorrect, incomplete, and not in line with best practice. While this tool does serve to assess the costs of the project, it is not enough on its own. Our two recommendations aim to make the division’s analysis more comprehensive and complete by improving on the cost analysis already in place and by supplementing that analysis with factors that are relevant in governmental decision making.
2.1 RECOMMENDATION
Revise the Decision Analysis for Sewer Billing to Align with Governmental Best Practice

The Wastewater Management Division’s analysis to move sewer billing in-house should align with city and county government best practice. At a minimum, this should include the consideration of the following:

1. Strong executive direction.
2. Stakeholder Input.
4. Flexibility of the arrangement to bill in-house.
5. Reversibility of the arrangement to bill in-house.
6. Transition Costs.
7. Communication.
8. Cost and Service Quality (consideration of qualitative as well as quantitative factors.)

AGENCY RESPONSE: AGREE, IMPLEMENTATION DATE – DEC. 31, 2022
SEE PAGE 27 FOR THE AGENCY’S FULL RESPONSE TO OUR RECOMMENDATIONS.

2.2 RECOMMENDATION
Improve Upon the Net Present Value Analysis Tool

In addition to Recommendation 2.1, the Wastewater Management Division should improve upon its net present value analysis to include all incremental costs identified and to ensure cost estimates and discount rates reflect the most current available information. Additionally, the analysis should consider the riskiness of estimated future cash flows. This can be accomplished in two ways:

1. Requiring a higher cost-savings threshold for project acceptance for riskier projects.
2. Using higher discount rates for more risky cash flows.

AGENCY RESPONSE: AGREE, IMPLEMENTATION DATE – DEC. 31, 2022
SEE PAGE 28 FOR THE AGENCY’S FULL RESPONSE TO OUR RECOMMENDATIONS.
June 6, 2022

Auditor Timothy M. O'Brien, CPA
Office of the Auditor
City and County of Denver
201 West Colfax Avenue, Dept. 705
Denver, Colorado 80202

Dear Mr. O’Brien,

The Office of the Auditor has conducted a performance audit of Denver Water City Services.

This memorandum provides a written response for each reportable condition noted in the Auditor’s Report final draft that was sent to us on May 14, 2022. This response complies with Section 20-276 (c) of the Denver Revised Municipal Code (D.R.M.C.).

AUDIT FINDING 1
The City’s Dependence on Denver Water’s Price Setting Could Lead to the City Overpaying for Services

RECOMMENDATION 1.2
The Department of General Services should develop and document a process to review the type of service agreement on all water bills for city properties to ensure Denver Water has charged the correct discounted governmental water rate.

<table>
<thead>
<tr>
<th>Agree or Disagree with Recommendation</th>
<th>Target date to complete implementation activities (Generally expected within 60 to 90 days)</th>
<th>Name and phone number of specific point of contact for implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>07/06/2022</td>
<td>Tom Ochtera, Energy Manager, Department of General Services</td>
</tr>
</tbody>
</table>

Narrative for Recommendation 1.2
Although the General Services’ Energy Office understood the audit to be focused on Denver Water, and not entities that interact with Denver Water, we nevertheless agree with the finding and have taken steps to address the recommendation. More specifically, the Energy Office has added a monthly review of the listed water rate type during bill processing and have embedded the practice into the water bill processing training documentation. In addition, the Energy Office has established a procedure for
addressing any misapplied rates directly with Denver Water staff, including reimbursement, if necessary, of any overpayments. These steps will help ensure no further issues arise.

Please contact Tom Ochtera, General Services’ Energy Manager at 720-913-5708 with any questions.

Sincerely,

Tom Ochtera | Energy Manager
General Services | City and County of Denver
Pronouns | He/Him/His
phone: (720) 913-5708

cc: Valerie Walling, CPA, Deputy Auditor
    Dawn Wiseman, CRMA, Audit Director
    Patrick Schafer, CPA, CFE, CIA, MBA, Audit Manager
June 7, 2022

Auditor Timothy M. O’Brien, CPA
Office of the Auditor
City and County of Denver
201 West Colfax Avenue, Dept. 705
Denver, Colorado 80202

Dear Mr. O’Brien,

The Office of the Auditor has conducted a performance audit of Denver Water City Services.

This memorandum provides a written response for each reportable condition noted in the Auditor’s Report final draft that was sent to us on May 14, 2022. This response complies with Section 20-276 (c) of the Denver Revised Municipal Code (D.R.M.C.).

AUDIT FINDING 1
The City’s Dependence on Denver Water’s Price Setting Could Lead to the City Overpaying for Services

RECOMMENDATION 1.1
The Wastewater Management Division should develop and document a process to review the annual discounted governmental water rate provided by Denver Water to ensure it aligns with the Denver Charter and excludes prohibited costs. Specifically, the review should confirm:

• The rate charged to the city does not exceed Denver Water’s cost of water furnished to the city.
• The rate charged does not include costs for debt service, betterments, additions, or extensions per city charter.

In the event the rate is incorrect, the Wastewater Management Division should notify city agencies that receive water bills, including the Department of General Services, Denver International Airport, and Denver Parks and Recreation.

<table>
<thead>
<tr>
<th>Agree or Disagree with Recommendation</th>
<th>Target date to complete implementation activities (Generally expected within 60 to 90 days)</th>
<th>Name and phone number of specific point of contact for implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>6/30/22</td>
<td>Loretta DuPree 303-446-3505</td>
</tr>
</tbody>
</table>

City and County of Denver — Department of Transportation & Infrastructure
2000 W. 3rd Ave., Denver, CO 80223 | Denver, CO 80202
www.denvergov.org/doti
Phone: 720-865-8630

311 | POCKETGOV.COM | DENVERGOV.ORG | DENVER TV
Narrative for Recommendation 1.1
The Wastewater Management Division, in conjunction with Denver Water, will create a process whereby Wastewater will analyze the composition of the water rate for government entities to ensure it includes only the cost of water and no administrative or other fees. We will document this process and perform it annually in January when rates are established. The review will be documented and confirm:

- The rate charged to the city does not exceed Denver Water’s cost of water furnished to the city.
- The rate charged does not include costs for debt service, betterments, additions, or extensions per city charter.

In the event there appears to be incorrect charges on any of these accounts, Wastewater will notify the agency or agencies affected, and notify Denver Water of the discrepancy before the next billing cycle.

RECOMMENDATION 1.3
The Wastewater Management Division should develop and document a process to review the annual cost estimate for billing service fees that Denver Water provides to ensure no erroneous costs are present before the city agrees to the annual fee.

This review should include, at a minimum, an evaluation of the direct costs allocated to the city and the number of accounts Denver Water has for the city to ensure costs are proportioned accurately.

<table>
<thead>
<tr>
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<th>Target date to complete implementation activities (Generally expected within 60 to 90 days)</th>
<th>Name and phone number of specific point of contact for implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>9/30/22</td>
<td>Doug Lazure 303-446-3472</td>
</tr>
</tbody>
</table>

Narrative for Recommendation 1.3
Wastewater Management Division agrees with recommendation 1.3. The Division will implement and document a formal review of the annual cost estimate for billing services that Denver Water provides to the city. This review will include an analysis of the direct costs allocated to the city, number of accounts served, meter reading activity, and bill processing costs.
AUDIT FINDING 2
The Ongoing Analysis to Potentially Discontinue Sewer Billing Services through Denver Water Is Flawed.

RECOMMENDATION 2.1
The Wastewater Management Division’s analysis to move sewer billing in-house should align with city and county government best practice. At a minimum, this should include the consideration of the following:

1. Strong executive direction.
2. Stakeholder Input.
4. Flexibility of the arrangement to bill in-house.
5. Reversibility of the arrangement to bill in-house.
6. Transition Costs.
7. Communication.
8. Cost and Service Quality (consideration of qualitative as well as quantitative factors.)

<table>
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<tr>
<th>Agree or Disagree with Recommendation</th>
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<th>Name and phone number of specific point of contact for implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>12/31/2022</td>
<td>Jessica Lally 303-446-3409</td>
</tr>
</tbody>
</table>

Narrative for Recommendation 2.1

Wastewater Management Division agrees with recommendation 2.1. While we have taken proactive steps to analyze sanitary billing, including developing a governance framework, creating an Executive Sponsor Team, and retaining the former CIO of Denver Water as a consultant, we have not finalized the sanitary analysis and need to have further discussions with Denver Water. We had to prioritize composting and Volume Based Pricing (VBP) in our launch sequence of the new billing system, so we had to temporarily delay our sanitary analysis. We will incorporate items 1 – 8 in our analysis.

RECOMMENDATION 2.2
In addition to Recommendation 2.1, the Wastewater Management Division should improve upon its net present value analysis to include all incremental costs identified and to ensure cost estimates and discount rates reflect the most current available information. Additionally, the analysis should consider the riskiness of estimated future cash flows.

This can be accomplished in two ways:
1. Requiring a higher cost-savings threshold for project acceptance for riskier projects.
2. Using higher discount rates for more risky cash flows.

<table>
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<tr>
<th>Agree or Disagree with Recommendation</th>
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</thead>
<tbody>
<tr>
<td>Agree</td>
<td>12/31/22</td>
<td>Doug Lazure 303-446-3472</td>
</tr>
</tbody>
</table>

**Narrative for Recommendation 2.2**
Wastewater Management Division agrees with recommendation 2.2 and will document a more in-depth net present value analysis that identifies and includes incremental costs, uses the most current cost estimates and discount rates, and considers the riskiness of future cash flows.

Please contact Doug Lazure at 303-446-3472 with any questions.

Sincerely,
Doug Lazure
Wastewater Finance Manager

cc: Valerie Walling, CPA, Deputy Auditor
    Dawn Wiseman, CRMA, Audit Director
    Patrick Schafer, CPA, CFE, CIA, MBA, Audit Manager
OBJECTIVE

To determine whether Denver Water’s rates and fees are accurate for both its water and sewer billing services, and whether it properly bills, collects, and sends sewer fees to the city. And to determine whether the city has adequately evaluated the decision to move sewer billing in-house and away from Denver Water.

SCOPE

We reviewed the city's relationship with Denver Water. This relationship involves the Department of General Services and the Wastewater Management Division — a division of the Department of Transportation & Infrastructure.

We reviewed the city’s discounted governmental water rates set by Denver Water spanning the period of 2020 through 2022. Additionally, we reviewed all of calendar year 2021 water bills received by General Services. Lastly, we reviewed sewer service fee estimates that will be charged by Denver Water during 2022.

Additionally, we evaluated the Wastewater Management Division’s in-process evaluation of moving sewer billing, collecting, and remitting away from Denver Water and bringing it in-house through the lens of a prospective assessment.

METHODOLOGY

We used several methodologies to gather and analyze information related to the audit objectives. These methodologies included but were not limited to:

- Interviewing leadership, management, and personnel from Denver Water, the Wastewater Management Division, the Department of Transportation & Infrastructure, the Department of General Services, and the Department of Finance.
- Reviewing the following criteria:
  - The Denver Charter and city ordinances.
  - The Wastewater Management Division’s internal policies and procedures.
  - City and County of Denver Fiscal Accountability Rules.
- Academic and industry guidance and publications.
- Reviewing and analyzing the following:
  - Charges for water consumption at city facilities that are paid by the Department of General Services and the Department of Parks and Recreation.
  - Reconciliations for sewer revenues received from Denver Water from January 2021 through December 2021.
  - Adjustments made to sewer customer accounts in 2021.
  - Wastewater Management Division processes related to rate testing.
  - Denver Charter Article X, which governs the relationship between the city and Denver Water.
  - The contract between Denver Water and the city for Denver Water to perform sewer service billing on behalf of the city.
  - Documented correspondence between various city and Denver Water employees regarding impacts of changes to the sewer billing arrangement.
  - Water rate schedules for 2021 and 2022.
  - Pamela Peterson and Frank Fabozzi, “Capital Budgeting: Theory and Practice.”
  - Billing cycles and processes required for sewer billing.
  - All calendar year 2021 city water bills received by General Services for water consumption on city government properties.
  - Denver Water’s calendar year 2022 service fee cost estimate for shared billing costs for sewer billing.
  - The city water rate calculation for calendar years 2020 through 2022.
  - The Department of Transportation & Infrastructure's net present value analysis for moving sewer billing in-house.
The Auditor of the City and County of Denver is independently elected by the residents of Denver. He is responsible for examining and evaluating the operations of city agencies and contractors for the purpose of ensuring the proper and efficient use of city resources. He also provides other audit services and information to City Council, the mayor, and the public to improve all aspects of Denver's government.

The Audit Committee is chaired by the Auditor and consists of seven members. The Audit Committee assists the Auditor in his oversight responsibilities regarding the integrity of the city's finances and operations, including the reliability of the city's financial statements. The Audit Committee is structured in a manner that ensures the independent oversight of city operations, thereby enhancing residents' confidence and avoiding any appearance of a conflict of interest.

Our Mission

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