

**Performance Audit:
Solid Waste Services**

April 2023

**City Auditor's Office
City of Atlanta**

File #22.11



Performance Audit:

Why We Did This Audit

We undertook this audit because the City Council's City Utilities Committee requested an audit of solid waste fees and services.

What We Recommended

To maintain service delivery standards, the Commissioner of Public Works should:

- develop a comprehensive solid waste staffing strategy including recruitment and retention of city staff, extra help staffing, and the use of contractors
- consider using more automated collection vehicles
- invest in its facilities
- develop incentives to improve staff morale
- follow through on its vehicle replacement plan
- develop a plan ensuring that equipment is replaced at the end of its life cycle

To improve data management, the Commissioner of Public Works should:

- identify critical data and develop a centralized database
- consistently track the reasons for overtime use
- develop a non-compliance enforcement plan for residents and staff

To evenly distribute workload, the Commissioner of Public Works should:

- conduct route optimization planning

For more information regarding this report, please use the "contact" link on our website at www.atlaudit.org

Solid Waste Services

What We Found

Solid Waste Services would benefit from investing additional resources into its operations. Despite its recruiting efforts and an increase in the number of allocated positions, the Office of Solid Waste has been unable to reach its target of being 90% staffed. Management procured almost \$12 million in emergency contracts for extra help staff, yard trimmings collection, bulk waste pickup, and cleanup at illegal dumpsites. The additional resources helped the department cover its collection routes, but high absences likely contributed to Solid Waste Services overspending its overtime budget by more than \$400,000 between fiscal years 2021 and 2022. Employees reported low morale and felt underpaid for the difficulty and physical demands of the work. During our observations of the department's facilities, we saw evidence of water damage in the ceilings, and peeling floors.

We also found that 60% of vehicles and 95% of equipment are beyond their life cycle, causing work delays because of mechanical failures. Most vehicles are assigned one collection route a day, but some vehicles must cover two routes, leading to additional wear and tear. For example, we observed crews that had been delayed because of mechanical failures with trucks and equipment.

Solid Waste Services does not have a centralized data system. The department tracks daily resources and performance using manual data entry, and file storage is limited to paper copies at different facilities. Also, support for overtime use is not consistently tracked. Leadership reported frustration about the paper filing and manual entry system, because it not only costs them unnecessary time to complete, but has also resulted in missing or incorrect information. The department also does not have an effective mechanism for tracking and reporting resident non-compliance city code provisions for curbside collections, such as the per-bag fee for excess bags or the annual service fee additional bins.

Management Responses to Audit Recommendations

Summary of Management Responses		
Recommendation #1: We recommend that the Public Works Commissioner develop a comprehensive solid waste staffing strategy including recruitment and retention of city staff, extra help staffing, and the use of contractors.		
Response: Agree	Status: Started	Estimated Completion Date (M/Y): Ongoing
Recommendation #2: We recommend that the Public Works Commissioner consider using more automated collection vehicles to reduce the number of collectors needed to deliver services.		
Response: Agree	Status: Partly Implemented	Estimated Completion Date (M/Y): March 2025
Recommendation #3: We recommend that the Public Works Commissioner invest in its facilities to improve work conditions.		
Response: Agree	Status: Started	Estimated Completion Date (M/Y): October 2023
Recommendation #4: We recommend that the Public Works Commissioner develop incentives to improve staff morale.		
Response: Agree	Status: Implemented	Estimated Completion Date (M/Y): March 2023
Recommendation #5: We recommend that the Public Works Commissioner follow through on its vehicle replacement plan to ensure enough vehicles are available during scheduled shift time.		
Response: Agree	Status: Started	Estimated Completion Date (M/Y): September 2023

Recommendation #6: We recommend that the Public Works Commissioner develop a plan to ensure that equipment is replaced when it reaches the end of its life cycle.		
Response: Agree	Status: Started	Estimated Completion Date (M/Y): June 2023
Recommendation #7: We recommend that the Public Works Commissioner identify critical data and develop a centralized database to store that data and generate reports to inform decision-making.		
Response: Agree	Status: Partly Implemented	Estimated Completion Date (M/Y): June 2023
Recommendation #8: We recommend that the Public Works Commissioner consistently track the reasons for overtime use to ensure necessary overtime is properly budgeted.		
Response: Agree	Status: Started	Estimated Completion Date (M/Y): June 2023
Recommendation #9: We recommend that the Public Works Commissioner develop a non-compliance enforcement plan for residents and staff.		
Response: Agree	Status: Started	Estimated Completion Date (M/Y): October 2023
Recommendation #10: We recommend that the Public Works Commissioner conduct route optimization planning to ensure that routes are balanced among crews' daily workloads.		
Response: Agree	Status: Started	Estimated Completion Date (M/Y): October 2023



CITY OF ATLANTA

AMANDA NOBLE
City Auditor
anoble@atlantaga.gov

STEPHANIE JACKSON
Deputy City Auditor
sjackson@atlantaga.gov

CITY AUDITOR'S OFFICE
68 MITCHELL STREET SW, SUITE 12100
ATLANTA, GEORGIA 30303-0312
<http://www.atlaudit.org>
(404) 330-6452
FAX: (404) 658-6077

AUDIT COMMITTEE
Danielle Hampton, Chair
Daniel Ebersole, Vice Chair
Donald T. Penovi, CPA
Dargan Burns, III

April 6, 2023

Honorable Mayor and Members of the City Council:

The City Council's City Utilities Committee requested an audit of solid waste fees and services. The city recently revised its solid waste fee structure to better align fees to services. These services include curbside collection of garbage, recycling and yard trimmings, bulk collection, street sweeping, mowing public rights-of-way, and emptying public trash receptacles.

Management agreed with our recommendations, which focus on increasing its investment in staffing, vehicles and equipment, and data management.

The Audit Committee has reviewed this report and is releasing it in accordance with Article 2, Chapter 6 of the City Charter. We sent a draft report to management on February 28, 2023, and received their response on March 24, 2023. We appreciate the courtesy and cooperation of city staff throughout the audit. The team for this project was Ijegayehu Jones, Zoe Geiger, and Myra Hagley.

Amanda Noble
City Auditor

Danielle Hampton
Chair, Audit Committee

Solid Waste Services

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Introduction

We undertook this audit at the request of the City Council’s City Utilities Committee. The city recently revised its solid waste fee structure to align fees and services. Services include curbside collection of garbage, recycling, and yard trimmings; bulk collection; street sweeping; mowing public rights-of-way; and emptying public trash receptacles. The audit assesses the cost-effectiveness of services provided.

Background

The Department of Public Works Office of Solid Waste Services is responsible for collection and disposal of solid waste. The department obtained accreditation from the [American Public Works Association](#) as meeting public works industry best practices. There are only 166 accredited public works agencies in the United States and Canada. For its 2021 reaccreditation, the department submitted a solid waste management plan from 2017, which contains metrics for waste generation, waste management, and waste reduction.

The office consists of two divisions: Curbside and Special Operations. Curbside collections crews handle residential garbage collection and disposal of solid waste, recycling, and yard waste (see Exhibit 1). Special operations services provides bulk item pickup and bin delivery, as well as “common good services” such as street sweeping, right-of-way mowing, Keep Atlanta Beautiful, dead animal removal, and cleanup of illegal dumpsites. The office is also responsible for landfill post-closure management, solid waste management and analysis, education and enforcement, and assisting with city-wide emergency operations.

Exhibit 1: Garbage Crew Using Rear-Loader to Empty Bins



Source: Photo taken during audit team observation on September 29, 2022

The Office of Solid Waste Services has an enterprise fund supported by revenues generated by nearly 100,000 single family residential accounts and 350 multifamily and city accounts. In June 2022, City Council approved ordinance [22-O-1281](#) to fund some of the solid waste services known as “common good” sanitary services through the city’s general fund, including street sweeping right-of-way mowing, trash receptacle collection, cleanup of illegal dumpsites, lot clearing, and illegal sign removal. In fiscal year 2023, the Office of Solid Waste Services’ budget was about \$87.3 million. Forty-one percent of the department’s budget is for personnel and related costs; the remaining 59% is dedicated to other expenses, such as contracted services, supplies, capital outlays, and debt service. The budget includes almost \$26 million for purchased or contracted services, \$20 million of which is from the city’s general fund.

[City Code Chapter 130](#) describes the collection and disposal services that the city provides, services that require extra fees, services that are not provided, and resident responsibilities. For example, collections crews are not responsible for picking up yard trimmings or construction debris generated by contractors. Also, residents must pay a service fee for excess bags left outside a garbage bin, overfilled bins, and excess yard trimmings.

City Commissioned a Study to Balance its Solid Waste Rate Structure

In November 2018 and June 2019, city council approved legislation ([18-O-1300](#) and [19-O-1297](#)) adjusting solid waste collection rates. Two separate lawsuits were filed (McKillips, *et al.* v. City of Atlanta and Melissa Stanford v. City of Atlanta) which alleged that the city's assessment of solid waste fees for multi-family and commercial properties was an illegal tax. The city settled the lawsuits and committed to complete a solid waste rate study. The city contracted with SCS Engineers Management Services to conduct the [rate study](#), which was completed in late 2021. The new [rates](#) went into effect July 1, 2022.

Audit Objectives

This report addresses the following objective:

- Is Public Works implementing efficient and cost-effective strategies for solid waste service delivery?
-

Scope and Methodology

We conducted this audit in accordance with generally accepted government auditing standards. We considered data from fiscal years 2021 and 2022.

Our audit methods included:

- Interviewing solid waste services management and staff to understand policies, procedures, and practices
- Observing solid waste services crews to understand the nature of collections activities
- Analyzing solid waste services staff and fleet data to understand staffing and fleet resources
- Researching best practices from the American Public Works Association and the US Environmental Protection Agency for solid waste services
- Reviewing emergency contracts for temporary help and yard trimmings to understand scope of work and cost

Generally accepted government auditing 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 objective.

Findings and Analysis

City Should Increase Investment in its Solid Waste Operations

The Department of Public Works has implemented aggressive recruitment efforts; however, the number of vacant positions in Solid Waste Services held steady during fiscal years 2021 and 2022, even as the overall number of positions increased. The department has been unable to meet its goal of being 90% staffed. In order to maintain even reduced service levels, the department procured \$12 million in emergency contracts for extra help staff, yard trimmings collection, bulk garbage pickup, and illegal dumpsite cleanup. Although the additional resources provide enough employees to cover each day's collection routes, the average daily attendance rate for Solid Waste collection crews was 77% between February and September 2022; 23% were absent due to sick leave, vacation, workers' compensation, or other leave. This likely contributed to Solid Waste Services increasing the use of overtime, overspending its fiscal year overtime budget by more than \$400,000 between 2021 to 2022.

Solid Waste employees reported feelings of low morale and felt underpaid for the difficulty and physical demands of their work. We observed water damage and peeling floors in the facilities. We also found that 60% of vehicles and 95% of equipment are beyond their life cycle, causing work delays because of mechanical failures. The condition of the facilities, vehicles, and equipment likely contributes to low morale. We recommend that the department invest in its facilities, vehicles, and equipment, to improve work conditions and develop incentives to improve employee morale, which may require additional funds. In order to meet its staffing targets, the department should develop a comprehensive staffing strategy that focuses on recruiting and retaining staff, and establishes guidelines for using overtime, extra help, and contractors most efficiently. The department should follow through with its vehicle replacement schedule and consider whether to purchase more automated collection vehicles to reduce the number of collectors.

City code prohibits customers from setting out overfilled waste bins but requires the city to pick up the waste and charge customers an additional fee. Although Solid Waste crews pick up the overfilled bins, the department does not track customers who violate the code. In order to follow the code, crews would be required to collect information on customer activity and the department would need to track the data over time; doing so would increase staffs' workload.

We recommend that the department develop a centralized database to capture resource usage, including staffing, vehicles, and equipment, and obtain route optimization software to more efficiently use available resources. We also recommend that Solid Waste Services put a process in place to track and charge customers who violate city code's waste restrictions.

Staffing Shortages Contributed to Increased Costs

The Department of Public Works' staffing goal for Solid Waste Services is 90% or higher; however, between fiscal years 2021 through 2022, has not been staffed beyond 84%, despite an increase in the number of positions. The department has supplemented its resources by procuring \$12 million in emergency contracts for extra help staff, yard trimmings collection, bulk garbage pickup, and illegal dumpsite cleanup. The additional resources provided enough employees to cover each day's collection routes – with reduced frequency of yard waste pickup – but Solid Waste Services staff reported feelings of low morale, and 23% of the collection crews were absent from work each day. We recommend that the department invest in its facilities to improve work conditions and develop incentives to improve employee morale. In order to meet its staffing targets, the department should develop a comprehensive staffing strategy that focuses on recruiting and retaining staff and establishes guidelines for using extra help and contractors.

Public Works is staffed at less than its 90% target. The Department of Public Works set a staffing goal for Solid Waste Services of 90% or higher that is measured in their performance metrics; however, from March 2022 to September 2022, the department was consistently below target. Across fiscal years 2021 and 2022, the percent of Solid Waste Services positions filled ranged from 76% to 84%, with an average of about 81%. As shown in Exhibit 2, this number appears to fluctuate in accordance with the number of positions allocated to the department, with the percent of filled positions trending lower as the number of positions allocated to Solid Waste Services increases, and vice versa. This suggests that, despite targeted and aggressive recruitment efforts, the department is not able to reach its staffing goals and is only hiring enough to replace departing staff.

Exhibit 2: Approximately 81% of DPW Solid Waste Positions are Filled

	FY21Q1 (11/20)	FY21Q2 (2/21)	FY21Q3 (5/21)	FY21Q4 (9/21)	FY22Q2 (2/22)	FY22Q3 (5/22)	FY22Q4 (8/22)
Allocated	457	457	457	462	507	507	437
Filled	377	379	382	377	383	383	358
Vacant	80	78	75	85	124	124	79
% Filled	82%	83%	84%	82%	76%	76%	82%

Note: The quarterly report for FY22Q1 was unavailable on City Council's website.

Source: Developed by auditors based on quarterly reports presented to the City Utilities Committee

Lack of staff led to \$12M in emergency contracts. The Department of Public Works has an active emergency extra help agreement with four contractors, with a total not-to-exceed amount of \$1 million. The department also has an active emergency yard trimmings collection agreement with two citywide landscaping contractors for just under \$2 million each. The department also has another active emergency contract with a not-to-exceed amount of \$7 million with one vendor to collect yard trimmings and bulk garbage pickup as well as to clean up illegal dumpsites. Each of these contracts was procured in response to the staffing shortages within the department stemming from the COVID-19 pandemic, and the consequential downturn in service quality. For this reason, the yard trimmings and bulk garbage collection agreements are meant to continue until the COVID-19 national emergency has been abated, whereas the extra help agreement is written to continue until the department is able to effectively service the City of Atlanta.

The emergency extra help agreement (EA-S-1220147 A-D) went into effect on December 4, 2021, for Georgia Works, Inc., and January 12, 2022, for Center for Employment Opportunities, Inc., Environmental Difference, LLC, and First Step Staffing, Inc. The total not-to-exceed amount for this agreement is \$1 million, broken down into \$250,000 per vendor (see Exhibit 3).

Exhibit 3: Department Spent About 75% of its Extra Help Contracts to Supplement Crews

Contractor	Contract Services	Contract Amount	Paid Invoices	Percent of Contract Paid
Center for Employment Opportunities, Inc. (CEO)	Extra help staffing	\$250,000.00	\$118,793.75	48%
Environmental Differences, LLC		\$250,000.00	\$241,291.83	96.5%
First Step Staffing, Inc.		\$250,000.00	\$135,703.61	54%
Georgia Works, Inc.		\$250,000.00	\$250,000.00	100%
	Total	\$1,000,000.00	\$745,789.19	74.5%

Source: Table developed by audit team based on Public Works contracts and Oracle data as of December 20, 2022

Contracted extra help workers are expected to work alongside and fulfill the same responsibilities as the City’s Solid Waste Service employees in the collection of trash, recycling, and yard trimmings; illegal dumpsite cleanup; and the performance of general right-of-way-maintenance. The hourly rate for a contracted extra help staff ranged from \$15 per hour to \$25 per hour, depending on the company. In comparison, the department’s crew staff earned an average hourly rate of \$15.19 for environmental service workers, \$19.73 for solid waste equipment operators, and \$21.27 for solid waste operator positions. City employees receive benefits in addition to their wages, so the cost for extra help staff from these four vendors is comparable to the cost of city employees. We recommend the department develop a comprehensive solid waste staffing strategy including recruitment and retention of city staff, extra help staffing, and the use of contractors. We also recommend that the department consider using more automated collection vehicles to reduce the number of collectors needed to deliver services.

The active emergency yard trimmings agreement (EA-S-1220132) went into effect for Ed Castro Landscape, Inc. (A) and Russell Landscape, LLC (B) on October 19, 2021, for an original not-to-exceed amount of \$667,600 (A) and \$684,000 (B), respectively. Since then, two installments of \$640,000 were allocated for both contractors, bringing their respective not-to-exceed totals to \$1,947,600 (A), and \$1,964,000 (B) (see Exhibit 4). The agreement outlines specific descriptions of the yard trimming services the contractors should be providing. The contractors charge daily, weekend, and holiday rates per crew for the completion of assigned routes. At the request of the City Utilities Committee, we will be completing a separate audit of landscaping contracts, and for this reason, do not cover them in detail in this audit.

Exhibit 4: Department Spent About \$2.5 Million on Two Contracts Related to Yard Trimming Collections

Contractor	Contract Services	Contract Amount	Paid Invoices	Percent of Contract Paid
Ed Castro Landscape, Inc. (A)	Yard trimmings	\$1,947,600	\$1,293,280	66%
Russell Landscape, LLC (B)		\$1,964,000	\$1,261,261	64%
	Total	\$3,911,600	\$2,554,541	65%

Source: Table developed by audit team based on Public Works contracts and Oracle data as of December 20, 2022

The third emergency agreement is with Ceres Environmental Services, Inc. (EA-S-1210023). The contract term was originally approved for 3 months, with the possibility of two 1-month extensions, effective as of August 12, 2020; however, this was later amended to be an emergency

contract effective from November 12, 2020, until the national emergency of the COVID-19 pandemic has been abated. The not-to-exceed amount for this contract was initially \$2 million, but \$5 million was later added to the contract not-to-exceed total in three separate installments (see Exhibit 5). Department staff told us that this contract is no longer active. This contract with Ceres Environmental Services, Inc. was meant to aid in the collection and management of residential yard trimmings, assistance in bulk waste, and cleanup of illegal dumpsites. The contractor charges by the ton of waste collected. Department staff provided us with scale tickets for tonnage collected that the contractor provides as supporting documentation with their invoices.

Exhibit 5: Department Spent About \$2.9 Million to Handle Yard Trimmings Collections, Bulk Waste, and Illegal Dumping

Contractor	Contract Services	Contract Amount	Paid Invoices	Percent of Contract Paid
Ceres Environmental Services, Inc.	Yard trimmings collection, bulk pickup, and illegal dump cleanup	\$7,000,000	\$2,936,980	42%

Source: Table developed by audit team based on Public Works contracts and Oracle data as of December 20, 2022

Departmental culture affects attendance and morale, which affect productivity. We reviewed employee attendance data for curbside collections staff from February 2022 to September 2022 and found that the average daily attendance rate was about 77%, with 23% of staff absent for various reasons (see Exhibit 6). Full-time city employees work a total of 260 days and earn 13 days of sick leave and between 12 to 25 days of annual leave, depending on tenure. Sick leave comprises 5% of an employee’s work days and annual leave may be 5-10% of an employee’s work days. Absences for sick leave among collections staff is slightly higher than 5% and is consistent with staff using all sick leave benefits that are accrued. Similarly, the rate of vacation leave is consistent with full-time staff using their vacation leave benefits each year.

Exhibit 6: 23% of Collections Staff Absent on Average Day

Absence Reason	% of Employees
Attended Work	77%
Absent from Work	23%
Sick Leave	7%
Worker's Comp/Injury on Duty	5%
Vacation Leave	5%
Leave Without Pay	4%
Admin Leave	1%
Limited Duty	1%
FMLA	1%

Source: Prepared by audit team from attendance logs, February 2022 to September 2022

On average, there were 57 drivers and 97 collectors present daily for curbside collections, including the extra help staff from the temporary staffing agencies. A collections crew comprises a driver and either one or two collectors. There are about 20 collection routes per day for garbage and about 20 routes per day for recycling. The department is committed to picking up yard trimmings every other week but may send crews out as they are available. Yard trimmings crews can complete multiple routes in a workday. At the current level of service, there are a minimum of about 40 routes to be served each day—20 for garbage collections and 20 for recycling collections, with variable additional yard trimmings collections. The average number of drivers and collectors is sufficient to cover each day's routes.

Solid waste services staff reported feelings of low morale. Curbside collections staff expressed feelings that they are underpaid for the difficulty and physical demands of their work. Crew members also shared that the quality and age of the vehicles and equipment they use are an issue and that the facilities they operate from are not well-maintained and need to be improved. During our observations in the solid waste services facilities, we saw evidence of water damage in the ceilings and peeling floors. Solid waste staff told us that there are plans around beautification of facilities. We recommend that the department invest in its facilities to improve work conditions. In addition, we recommend that the department develop incentives to improve staff morale.

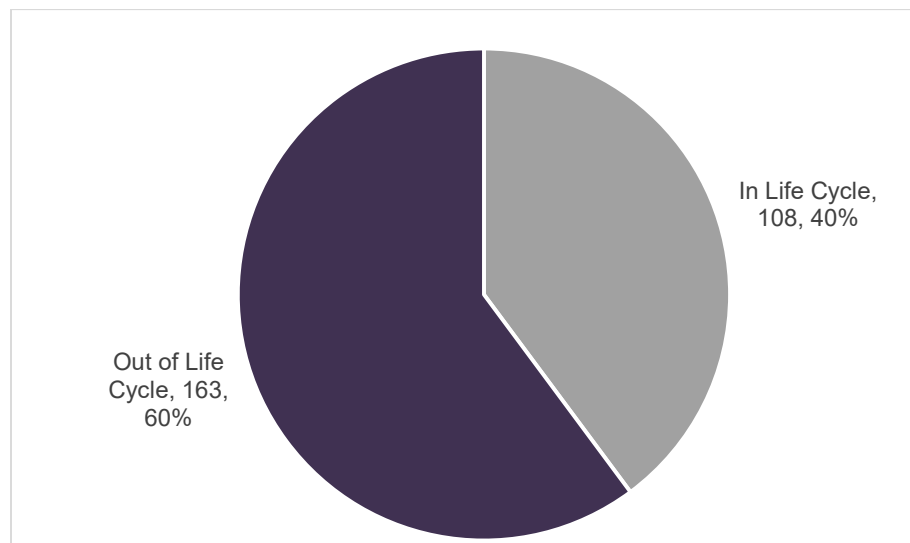
The Majority of Vehicles and Equipment are Past Life Cycle

We reviewed the age of all vehicles and equipment assigned to Solid Waste Services and found that 60% of vehicles and 95% of equipment used are beyond their life cycle. In addition to impacts on productivity,

an aging and malfunctioning fleet often leads to higher maintenance costs. We also observed crews that had been delayed because of mechanical failures with trucks and equipment. Best practices recommend that local governments adhere to equipment service lives to minimize life cycle costs and develop strategies to avoid service disruptions. Although the department of Public Works maintains a vehicle replacement plan, it has not yet replaced any of the vehicles slated for replacement in fiscal year 2022. We recommend that the department implement its vehicle replacement plan and consider using more automated collection vehicles; although these vehicles cannot be operated on narrower streets, they require fewer staff to operate. The department should also ensure that equipment is replaced when it reaches the end of its life cycle.

Sixty percent of all of Department of Public Works’ vehicles are past life cycle. Within the Department of Public Works, the Office of Fleet Services is responsible for managing the city’s fleet vehicles and construction and maintenance equipment, including vehicles and equipment used by the Office of Solid Waste Services. Each vehicle or equipment has a given useful life, beyond which total vehicle costs increase. We reviewed the ages and life cycles of Public Works’ vehicle and equipment inventory for Solid Waste Services in October 2022. There were 271 vehicles and 234 pieces of equipment assigned to solid waste services activities in October 2022. As shown in Exhibit 7, about 60% (163 of 271) of vehicles were past life cycle.

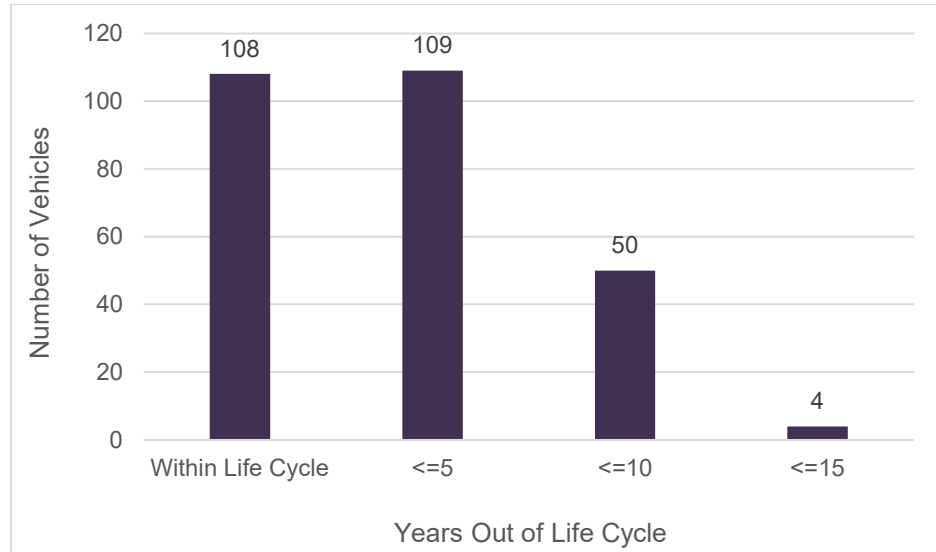
Exhibit 7: About 60% of Solid Waste Vehicles are Past Life Cycle



Source: Developed by auditors based on analysis of vehicle inventory as of October 2022

Of all 271 vehicles assigned to solid waste services, 40% were up to five years beyond their life cycle, 18% were between six and ten years out of life cycle, and 1% were between 11 and 15 years beyond their life cycle (see Exhibit 8). Of the 271 vehicles, 96 are rear loaders used for curbside collections with a life cycle of eight years; 40% of these were out of life cycle.

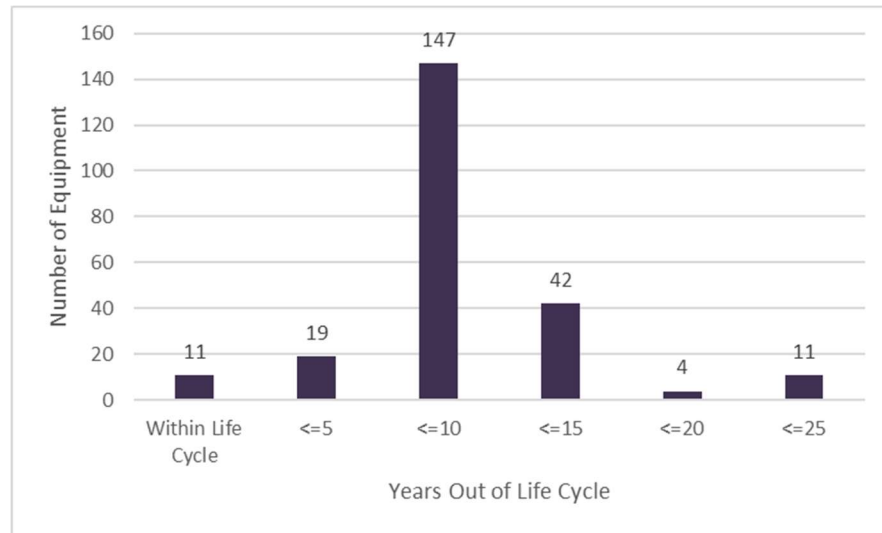
Exhibit 8: About 20% of Solid Waste Vehicles are More Than 6 Years Past Life Cycle



Source: Developed by auditor based on analysis of vehicle inventory as of October 2022

Only 5% of the department’s solid waste equipment is in life cycle. The department uses equipment such as mowers, leaf blowers, and weed trimmers to deliver various solid waste services. Of the 234 pieces of equipment assigned to solid waste services, 8% were up to 5 years out of life cycle, 63% were between 6 and 10 years beyond life cycle, 18% were between 11 and 15 years beyond life cycle, 2% were between 16 and 20 years beyond life cycle, and 5% were between 21 and 25 years beyond life cycle (see Exhibit 9).

Exhibit 9: Only 5% of Solid Waste Equipment is Within Life Cycle



Source: Developed by auditor based on analysis of vehicle inventory as of October 2022

Vehicle and equipment unavailability affects productivity. Several staff reported issues with truck malfunctions and breakdowns interfering with the department’s ability to send out all crews at the beginning of the shift. In our observations of a yard trimmings collections crew, the crew was delayed by nearly two hours due to mechanical issues with several different trucks at the substation. During our observation of a right-of-way maintenance crew, the crew’s mower experienced a mechanical issue and broke down. The crew then had to complete the grass cutting with weed whackers and divert their intended route to the maintenance station to have the mower repaired or replaced.

Best practices recommends that local governments should budget for and develop equipment and labor backup strategies that enable them to complete their services and should adhere to equipment service lives that minimize life cycle costs associated with collection equipment. The Department of Public Works maintains a vehicle replacement plan that identifies and prioritizes specific vehicle needs for the department; however, all 61 solid waste vehicles to be evaluated for replacement in fiscal year 2022 were still in inventory as of October 2022, and have been in use since 2014 or earlier. It appears that none of the solid waste vehicles up for replacement in fiscal year 2022 were replaced. Maintaining and replacing vehicles and equipment within their given life cycle will help control the overall cost of operation and maintenance and ensure necessary equipment is available to meet service delivery needs. The vehicle replacement plan includes a list of vehicles to be replaced each fiscal year from fiscal year 2022 through fiscal year 2029, to be updated annually. Of the 271 vehicles that were assigned to solid

waste services as of October 2022, all but 44 are slated to be replaced by fiscal year 2029.

If vehicles are not available at the beginning of the shift, this can delay available crews from starting their shifts and may lead to more overtime use. Additionally, department staff explained that each truck is intended to cover one collection route a day, but when there are not enough working trucks to cover all the day's routes, some of the working trucks will be sent out on two routes, which can lead to additional wear and tear on the functioning vehicle. We recommend that department leadership follow through on its vehicle replacement plan to ensure enough vehicles are available during scheduled shift time. We further recommend that department leadership develop a plan to ensure that equipment is replaced when it reaches the end of its life cycle.

Department Could Improve Resource Planning by Refining Data Management

Solid Waste Services increased its overtime use from 2021 to 2022, overspending the department's fiscal year overtime budget by more than \$400,000. Although the use of overtime appears justified due to staffing shortages and vehicle and equipment failures, the division is not tracking the reasons for overtime. Also, some aspects of the division's work could be more efficiently managed—collection routes are not planned with a consideration of workload (amount of waste collected) and instead appear to be based on mileage. This increases the amount of time needed to complete the routes and creates workload imbalances between crews. To better match resources to workload, we recommend that the department develop a centralized database to capture resource usage, including staffing, vehicles, and equipment, and obtain route optimization software to use available resources more efficiently.

Section 130-37(b)(5)(c) of city code prohibits customers from setting out overfilled waste bins but requires the city to pick up the waste and charge customers a \$12 fee per bag each time it happens. If customers set out overfilled bins more than four times within a year, the property owner would be provided an additional bin, but charged an additional service fee of \$409.45 per year. Although Solid Waste crews pick up the overfilled bins, the department does not track customers who violate the code. Compliance would require crews to collect information on customer activity and the department would need to track the data over time; doing so would increase staffs' workload. We recommend that Solid Waste Services put a process in place to track and charge customers who violate city code's waste restrictions.

Staff does not have a centralized data system. The department tracks its performance through daily and monthly reports and spreadsheets. Solid Waste staff provided our team with examples of their performance tracking. There may be issues with the transparency and reliability of some of the performance metrics—different Solid Waste Services staff calculating the metrics arrived at different results. The department also tracks resources, such as daily staffing of crews and vehicle use. Interviews with department staff indicated that file storage is limited to paper copies at different facilities; any digital data are manually entered by supervisors and chief staff. Leadership reported frustration over the paper filing and manual entry system, stating that it not only cost them unnecessary time to complete, but at times resulted in missing or incorrect information. We recommend that department leadership identify critical data and develop a centralized database to store that data and generate reports to inform decision-making.

The Office of Solid Waste Services is not consistently tracking the reasons for overtime use. Department staff expressed concerns regarding the use of overtime. The typical work schedule for curbside collections is from 7am to 3:30pm, Monday through Friday. Overtime work includes work done after 3:30 on scheduled workdays or work done on Saturdays. Employees are paid time and a half for their regular hourly rate for time worked beyond 40 hours in a workweek. Solid waste services staff reported that overtime is used to assist crews that have not yet completed their routes, cover heavier yard trimmings collection workloads that arise during leaf season, clean up waste set out off-schedule, and complete any work that could not be completed during scheduled hours due to a lack of staff or available vehicles.

We reviewed the department's overtime use and expenditure data for fiscal years 2021 and 2022. In fiscal years 2021 and 2022, divisions related to Solid Waste Services operations overran their individual allotments for overtime. During fiscal years 2021 and 2022, these operations were funded by the solid waste enterprise fund but following the approval of Ordinance 22-O-1281 in June 2022, common good sanitary services including street sweeping right-of-way mowing, trash receptacle collection, illegal dumping, lot clearing, and illegal sign removal will be funded from the city's general fund. In fiscal year 2021, we found overruns of \$50,657 in recycling collections and \$72,257 in trash receptacles collection; other divisions maintained available funds in their respective overtime budgets. In fiscal year 2022, there were overruns in curbside collection, yard trimming collections, recycling collections, backyard services, bulk collections, and trash receptacles collections, with the highest deficits in recycling, yard trimming, and trash receptacles collections. In fiscal year 2022,

overtime expenditures in Solid Waste Services divisions exceeded budgets by \$440,250.

Given the workload for solid waste services, vehicle and equipment issues, and staffing shortages, the Office of Solid Waste Services' overtime use appears to be justified; however, overtime pay is more costly than pay for work completed during scheduled shift times and should not be overused. Department staff told us that overtime use is not tracked for special operations staff, and the curbside collections branch recently implemented sign-in crew sheets for overtime work, but support for overtime use is not consistently tracked by the department. The recent overtime crew sheets used for curbside collections note the crew members and truck numbers, but do not always note the type of work completed. To ensure that necessary overtime is properly budgeted for, we recommend that the department consistently track the reasons for overtime use.

Staff does not have an effective mechanism for tracking and reporting resident non-compliance. Chapter 130 of city code describes several restrictions and fees regarding non-compliant waste for curbside collections. Some ordinances state that Public Works is not required to collect certain items, such as yard trimmings over four inches in diameter or four feet in length, or yard trimmings generated by contractors; others state that noncompliant waste will be collected for an additional fee. City ordinance states that the Department of Public Works will collect excess bagged garbage, excess yard trimmings, and overfilled bins at a fee of \$12 per bag per occurrence, and that if an overfilled bin or excess bagged garbage is set out by a resident more than four times in a 12-month period, the property owner will be provided an additional bin at no cost but will be charged an additional annual service fee.

Department staff informed us that residents are not being charged the per-bag fee for excess bags or the annual service fee additional bins, and crew members no longer report residences with non-compliant waste because they are still expected to collect it. In our observations of a yard trimmings collection crew, we saw the crew collect large branches and trunks of trees larger than four feet in length or four inches in diameter and some instances of residences that had more than one bin (see Exhibit 10).

Exhibit 10: Yard Trimmings Crews Collect Non-Compliant Yard Trimmings Waste



Source: Photos taken by auditor during observations of yard trimmings collections

Collecting non-compliant or excess waste creates additional work for collections staff and can slow down their progress on a route. It also exposes them to potential injury from lifting large or heavy items left by the curb. We recommend that the department develop a non-compliance enforcement plan for residents and staff.

We found that collections routes appear to be based on mileage and not optimized for tonnage collected. We reviewed all curbside collection routes. There are 100 routes that were originally developed for the department by a consultant in 2018, covering over 100,000 stops total. From March 2022 through June 2022, we compared the average time it took to complete three routes and average tonnage collected and found that although each route is the same distance, the number of stops, average completion time, and average tonnage collected vary quite a bit (see Exhibit 11). The routes range from 418 stops to 1,299 stops, with an average of 1,002 stops per route. The average tonnage for these three routes ranged from 7 tons to 12.6 tons. Additionally, from March 2022 to June 2022, crews completing route G3R2 had to drop off collected waste at the processing plant before completing the route on two occasions, and the crews completing route G2F2 had to do this on four occasions. This increases the time it takes for crews to complete a route and indicates that the routes may not be well-balanced.

Exhibit 11: Collection Routes are Imbalanced by Tonnage

Route	Number of Stops	Average Completion Time	Average Tonnage
G5R4	418	4h 58m	7.1
G2F2	1,002	5h 9m	12.6
G3R2	1,299	4h 30m	9.5

Source: Prepared by audit team from daily tonnage reports

Best practices recommend that waste collection routes balance workload between crews, and optimizing collection routes can reduce labor costs, fuel costs, and vehicle maintenance costs. Additionally, balancing routes establish a fair day’s work for all crews and could improve morale. Department of Public Works leadership told us that they are in the process of procuring a route optimization study to look at current routes and future growth to ensure routes are balanced. We recommend that the department conduct route optimization planning to ensure that workload is balanced across all routes so that workload is evenly distributed among crews.

Recommendations

To ensure that the department maintains its productivity and its service delivery standards, we recommend that the Commissioner of Public Works

1. develop a comprehensive solid waste staffing strategy including recruitment and retention of city staff, extra help staffing, and the use of contractors.
2. consider using more automated collection vehicles to reduce the number of collectors needed to deliver services.
3. invest in its facilities to improve work conditions.
4. develop incentives to improve staff morale.
5. follow through on its vehicle replacement plan to ensure enough vehicles are available during scheduled shift time.
6. develop a plan to ensure that equipment is replaced when it reaches the end of its life cycle.

To improve efficiency and reliability in data management, we recommend that the Commissioner of Public Works

7. identify critical data and develop a centralized database to store that data and generate reports to inform decision-making.
8. consistently track the reasons for overtime use to ensure that necessary overtime is properly budgeted.
9. develop a non-compliance enforcement plan for residents and staff.

To ensure that tonnage collection is evenly distributed among crews' daily workload, the Commissioner of Public Works should

10. conduct route optimization planning to ensure that routes are balanced among crews' daily workloads.

Appendices

Appendix A: Management Review and Response to Audit Recommendations

Report # 22.11	Report Title: Solid Waste Services	Date: April 2023
Recommendation 1: We recommend that the Public Works Commissioner develop a comprehensive solid waste staffing strategy including recruitment and retention of city staff, extra help staffing, and the use of contractors.		
Risk Category: Planning and Budgeting		Response: Agree
Related Findings: <ol style="list-style-type: none"> 1. The department had not met its staffing goal for the Solid Waste Services division of 90% or higher. Across fiscal years 2021 and 2022, the percent of Solid Waste Services positions filled ranged from 76% to 84%. 2. Lack of staff led to \$12 million in emergency contracts. Contractors provided extra help crew staff, yard trimmings collections, bulk garbage pickup, and cleanup of illegal dumpsites. 		
Proposed Action: DPW's department-wide strategic plan focuses on employee recruitment and retention. The Solid Waste division has worked closely with Human Resources to onboard and recruit employees in an efficient streamlined process. This process will continue to increase our staffing goals. The recent addition of team members has allowed the department to self-perform many functions previously performed by outside contractors. Bulk collections were performed by an outside contractor. The service is now performed by Special Operations, which handles the same amount of daily requests of 150, with the same week availability for service. DPW continues to review all contract agreements and plans to make any necessary changes in operational needs regarding contract services.		Current Status: Started
Business Owner: Commissioner Wiggins and Deputy Commissioner Sothsavath		Estimated Implementation Date (M/Y): Ongoing
Additional Comments:		

<p>Recommendation 2:</p> <p>We recommend that the Public Works Commissioner consider using more automated collection vehicles to reduce the number of collectors needed to deliver services.</p>	<p>Risk Category:</p> <p>Process Improvement</p>	<p>Response:</p> <p>Agree</p>
<p>Related Findings:</p> <ol style="list-style-type: none"> The department had not met its staffing goal for the Solid Waste Services division of 90% or higher. Across fiscal years 2021 and 2022, the percent of Solid Waste Services positions filled ranged from 76% to 84%. 		
<p>Proposed Action: DPW has evaluated our solid waste operations and our strategic goal is to transition towards automated collections using automated side load trucks to provide safe, efficient, and lower overall cost of solid waste services.</p> <p>The implementation of an automated collection program is preferably implemented in a series of planned steps. DPW phased approach is currently underway:</p> <ol style="list-style-type: none"> Vehicle Replacement Plan – Acquisition of Automated Side Loader Refuse Trucks. DPW placed an initial order of five (5) in July 2022 with the estimated delivery on April 2023. We currently have 9 ASL Refuse trucks in DPW. Future vehicle transition plan will utilize funding from the sale of older surplus refuse trucks to acquire ASL refuse trucks. Route Optimization Study – Started February 2022, with findings from the study presented on July 2022 allowing up to 88% of customers to be automated. The study provides our clear future goal of transitioning towards automation. Education Program – DPW’s success of the automated collection program is dependent on the deployment of successful education and outreach program. DPW will work with our internal Communications team to successfully communicate with residents. <p>Phase II: Goal of 18-24 months dependent on funding and vehicle availability.</p> <ol style="list-style-type: none"> Acquire 42 ASL Refuse Trucks to fully automate 88% of routes Continue Education Program Transition Crew size from 3 Crew members (1 Driver and 2 Helpers) to either a 1 or 2 Crew Member Team. <p>DPW has a Safety Team which provides CDL Training opportunities to all of our team members who have to meet a certain performance requirement. The program’s success rate is over 95%, allowing the department the ability to hire within promoting our collectors to potential driver’s role.</p>		<p>Current Status:</p> <p>Partly Implemented</p>
<p>Business Owner: Commissioner Wiggins, Deputy Commissioner Sothsavath</p>		<p>Estimated Implementation Date (M/Y):</p> <p>March 2025</p>
<p>Additional Comments:</p>		

<p>Recommendation 3:</p> <p>We recommend that the Public Works Commissioner invest in its facilities to improve work conditions.</p>	<p>Risk Category:</p> <p>Planning and Budgeting</p>	<p>Response:</p> <p>Agree</p>
<p>Related Findings:</p> <p>1. Solid waste facilities are not well-maintained and need to be improved. During our observations in the solid waste services facilities, we saw evidence of water damage in the ceilings and peeling floors.</p>		
<p>Proposed Action:</p> <p>DPW is working closely with each senior leadership manager at each facility to resolve many of the issues at each location from plumbing concerns to roof leaks.</p> <p>The department is working closely with DEAM on finalizing a Facility Condition Index Assessment for all DPW Facilities. The report findings will be available in the upcoming 45-60 days, which will provide a thorough facility assessment that will provide the necessary planning steps for future capital improvement projects. This will allow us to properly prioritize, plan and budget for the necessary capital repairs at each DPW facility.</p>		<p>Current Status:</p> <p>Started</p>
<p>Business Owner: Deputy Commissioner Robinson and Deputy Commissioner Sothsavath</p>		<p>Estimated Implementation Date (M/Y):</p> <p>October 2023</p>
<p>Additional Comments:</p>		

<p>Recommendation 4:</p> <p>We recommend that the Public Works Commissioner develop incentives to improve staff morale.</p>	<p>Risk Category:</p> <p>HR Management</p>	<p>Response:</p> <p>Agree</p>
<p>Related Findings:</p> <ol style="list-style-type: none"> 1. Solid waste services staff reported feelings of low morale. Curbside collections staff expressed feelings that they are underpaid for the difficulty and physical demands of their work. 		
<p>Proposed Action:</p> <p>DPW's culture prioritizes employee morale as a priority endeavor. We have implemented new programs to boost team morale.</p> <ol style="list-style-type: none"> 1. DPW's creation of the Commissioner's Advisory Board, allows selected team members G19 and below from each facility and division to represent the voices of our 684 team members. 2. Quarterly DPW Town-Hall meetings to communicate and inform all team members on major projects and vital departmental updates. 3. Recognizing our team members through the Commissioner's Award and Shining Star Recipients <p>The programs listed above along with our planned approach to investing in our employees through future potential pay incentives, facility improvements, updated equipment, and consistent leadership direction will help improve team morale over the upcoming months.</p>		<p>Current Status:</p> <p>Implemented</p>
<p>Business Owner: Commissioner Wiggins</p>		<p>Estimated Implementation Date (M/Y):</p> <p>March 2023</p>
<p>Additional Comments:</p>		

<p>Recommendation 5:</p> <p>We recommend that the Public Works Commissioner follow through on its vehicle replacement plan to ensure enough vehicles are available during scheduled shift time.</p>	<p>Risk Category:</p> <p>Planning and Budgeting</p>	<p>Response:</p> <p>Agree</p>
<p>Related Findings:</p> <ol style="list-style-type: none"> 1. About 60% (163 of 271) of solid waste vehicles were past life cycle. 2. Each truck is intended to cover one collection route a day. Some of the working trucks will be sent out on two routes, which can lead to additional wear and tear on the functioning vehicle. 		
<p>Proposed Action:</p> <p>DPW agrees on adhering to the Vehicle Replacement Plan, however, the related findings portray a total number count of vehicles in DPW and not just a representation of rear loader refuse trucks. The department currently has 88 refuse trucks in our fleet, the in-depth vehicle condition of the 88 units is below:</p> <ol style="list-style-type: none"> 1. Excellent Condition – 6 Units all under 9,300 miles 2. Good Condition – 75 Units average miles of unit are 56,262 miles 3. Fair Condition – 5 Units average miles are 117,121 miles (Reserve Units) 4. Consider Reassignment – 2 Units <p>DPW has implemented the following strategies to help augment the challenges in maintaining and maintenance our SWS Fleet. The challenges with acquiring skilled mechanic positions have moved our team to request special procurement for SWS Repairs with outside vendors for repairs beyond our current list of vendors. This will allow our Fleet team to utilize additional vendors to perform the necessary repairs. The plans are to continue to replace our older units and purchase new ASL Refuse trucks. Having additional vendors approved will allow quicker turn-around times for repairs with our maintenance units.</p> <p>The department will continue to adhere and follow the vehicle replacement strategy based on financial funding, however, one of the biggest constraints is the timelines to acquire newly purchased which can sometimes take 18 months to acquire.</p>		<p>Current Status:</p> <p>Started</p>
<p>Business Owner: Commissioner Wiggins and Deputy Commissioner Sothsavath</p>		<p>Estimated Implementation Date (M/Y):</p> <p>September 2023</p>
<p>Additional Comments:</p>		

<p>Recommendation 6:</p> <p>We recommend that the Public Works Commissioner develop a plan to ensure that equipment is replaced when it reaches the end of its life cycle.</p>	<p>Risk Category:</p> <p>Planning and Budgeting</p>	<p>Response:</p> <p>Agree</p>
<p>Related Findings:</p> <p>1. About 95% of equipment used are beyond their life cycle. For example, we observed crews that had been delayed because of mechanical failures with trucks and equipment.</p>		
<p>Proposed Action: DPW revised the comprehensive vehicle replacement plan in 2022 due to the 12 – 18-month production backlog for new solid waste vehicles caused by the national parts and labor shortages associated with COVID-19. The production delay has created significant challenges with maintaining the timing of equipment purchases before the conclusion of the expected lifecycle. New vehicles must be purchased via a staggered cycle to prevent the sudden expiration of vehicle parts and fleet reliability. The department will utilize two funding strategies to purchase new equipment from the City's GMA vehicle financing program and the other will be budgeting through the enterprise fund. Several vehicles purchased in 2022 will allow the department to add 38 vehicles to the fleet in the 2nd quarter of 2023. The vehicles acquired will be part of the vehicle replacement program.</p>		<p>Current Status:</p> <p>Started</p>
<p>Business Owner:</p> <p>Deputy Commissioner Sothsavath</p>		<p>Estimated Implementation Date (M/Y):</p> <p>June 2023</p>
<p>Additional Comments:</p>		

<p>Recommendation 7:</p> <p>We recommend that the Public Works Commissioner identify critical data and develop a centralized database to store that data and generate reports to inform decision-making.</p>	<p>Risk Category:</p> <p>Planning and Budgeting</p>	<p>Response:</p> <p>Agree</p>
<p>Related Findings:</p> <p>1. The department uses a paper filing and manual entry system, which is time consuming and at times results in missing or incorrect information. For example, different staff calculating performance metrics arrived at different results.</p>		
<p>Proposed Action:</p> <p>The recent authorization of the Rubicon software contract, which began in May of 2022, will allow the department to leverage software technology tailored to meet our department's needs. The Rubicon software offers an all-in-one solution, that completely digitizes our operations, and enhances customer service workflow, operational cost savings, and service verifications.</p> <p>The software will allow input from our drivers via a cab interface to reduce the manual entry from our team members. The collection of information will be stored on our cloud-based servers allowing real-time issues reporting, weight ticket reporting, route completion, and many additional features previously manually tracked and entered. All of this will be collected and easily generated from the software.</p>		<p>Current Status:</p> <p>Partly Implemented</p>
<p>Business Owner: Deputy Commissioner Sothsavath</p>		<p>Estimated Implementation Date (M/Y):</p> <p>June 2023</p>
<p>Additional Comments:</p>		

<p>Recommendation 8:</p> <p>We recommend that the Public Works Commissioner consistently track the reasons for overtime use to ensure necessary overtime is properly budgeted.</p>	<p>Risk Category:</p> <p>Planning and Budgeting</p>	<p>Response:</p> <p>Agree</p>
<p>Related Findings:</p> <ol style="list-style-type: none"> 1. The average percentage of overtime hours used increased between fiscal year 2021 to fiscal year 2022, from an average of 5% to an average of 9% of hours per month. In fiscal years 2021 and 2022, we found overtime budget overruns in recycling, yard trimming, and trash receptacles collection. 2. Curbside collections recently implemented sign-in crew sheets for overtime work, but support for overtime use is not consistently tracked, and special operations use of overtime is not tracked. 		
<p>Proposed Action:</p> <p>The Department of Public Works is implementing Smart Technology in our vehicles. This will give the department the ability to track tonnage and route coverage to track productivity for overtime. Additionally, the DPW Performance Management Team is developing a data repository system as another method to track data and productivity.</p> <p>The uptick in overtime from FY 2021 to FY 2022 can be attributed largely to:</p> <ul style="list-style-type: none"> • COVID Impacts • Labor Shortages • Equipment Availability 		<p>Current Status:</p> <p>Started</p>
<p>Business Owner:</p>		<p>Estimated Implementation Date (M/Y):</p> <p>June 2023</p>
<p>Additional Comments:</p>		

<p>Recommendation 9:</p> <p>We recommend that the Public Works Commissioner develop a non-compliance enforcement plan for residents and staff.</p>	<p>Risk Category:</p> <p>Legal/Regulatory Compliance</p>	<p>Response:</p> <p>Agree</p>
<p>Related Findings:</p> <ol style="list-style-type: none"> 1. Staff does not have an effective mechanism for tracking and reporting resident non-compliance with City Code Chapter 130 for curbside collections. Solid waste crews collect waste without charging residents the per-bag fee for excess bags or the annual service fee additional bins. 		
<p>Proposed Action:</p> <p>As part of our implementation of the Rubicon software which will allow our drivers to properly notate and document any exceptions on their service routes. Drivers will have the ability to take a time-stamped photo along with flagging the address with the exception of excessive bags. The information stored will allow our SWEET team to develop reports and educate residents on proper disposal methods. The software will have the ability to document each address with known exceptions which will allow our internal finance team to bill for the excess bag service.</p>		<p>Current Status:</p> <p>Started</p>
<p>Business Owner: Deputy Commissioner Sothsavath and Deputy Commissioner Robinson</p>		<p>Estimated Implementation Date (M/Y):</p> <p>October 2023</p>
<p>Additional Comments:</p>		

<p>Recommendation 10:</p> <p>We recommend that the Public Works Commissioner conduct route optimization planning to ensure that routes are balanced among crews' daily workloads.</p>	<p>Risk Category:</p> <p>Process Improvement</p>	<p>Response:</p> <p>Agree</p>
<p>Related Findings:</p> <ol style="list-style-type: none"> 1. Collection routes appear to be based on mileage and not optimized for tonnage collected. A small sample of routes showed variance between number of stops, average completion time, and average tonnage. 		
<p>Proposed Action:</p> <p>The implementation of Rubicon software will allow a fleet route optimization, which is a complex process to comprehensively optimize the City's current routes. Rubicon will employ mapping tools such as ArcGIS, ESRI and proprietary software to achieve the City's goal of:</p> <ul style="list-style-type: none"> • Optimize the Number of Trucks • Optimize the Number of Collection Stops Per Route • Balance Route Hours • Reduce Overtime Hours • Improve Customer Service • Optimize Miles Driven <p>The approach will consist of the following to complete in the upcoming months:</p> <ol style="list-style-type: none"> 1. Collecting Baseline Data from the deployment of the software 2. Establishing Project Goals 3. Establishing Parameters and Constraints 4. Fleet Optimization 5. Test New Routes and Finalize and Go-Live <p>The steps presented will allow better deployment of our fleet for the collection routes along with other service requests.</p>		<p>Current Status:</p> <p>Started</p>
<p>Business Owner: Deputy Commissioner Sothsavath</p>		<p>Estimated Implementation Date (M/Y):</p> <p>October 2023</p>
<p>Additional Comments:</p>		