



## Sewer Maintenance: Renewed attention to partnership needed to better serve ratepayers

Report



Wastewater goes through pipes owned by the Bureau of Environmental Services but the bureau pays another - the Bureau of Transportation - to maintain these pipes. This longstanding agreement has had mixed results. We make recommendations for both bureaus in our audit report.

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### Summary

When Portlanders drain their sinks or flush the toilet, the wastewater goes through a network of pipes owned by the Bureau of Environmental Services to a treatment plant. Other pipes carry rainwater to structures, such as drywells. More than 2,000 miles of pipes – some older than 100 years – crisscross the city.

Environmental Services pays another City Bureau, Transportation, to maintain these pipes. About 130 Transportation employees respond to sewer overflows,

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clear blocked pipes, and make repairs. Crews also inspect and clean pipes with robots, cameras, and special pumps.

Portlanders pay for these services – about \$23 million in Fiscal Year 2019-20 – through their sewer bill.

This longstanding agreement has had mixed results and comes with inefficiencies that cost rate payers. We make recommendations for both Bureaus to finetune staffing, finances, materials management, and to re-assess their decades-old arrangement.

## Transportation's performance has been mixed

Environmental Services and Transportation agree annually on the broad strokes of the sewer maintenance program and how much will be paid to Transportation for its work. Environmental Services sets annual targets, such as how many miles of pipes should be cleaned and how fast Transportation should show up to sewer overflows. Transportation provides the staff and day-to-day management to meet the targets. Transportation decides most work processes and deploys crews and vehicles.

We reviewed Transportation's achievement of key targets:

- **Repair and maintenance.** Environmental Services sets targets by structure and repair type. Transportation missed targets for repairing and lining sewer pipes and maintaining stormwater ditches. The program had more success repairing storm inlets over the last six years.
- **System inspection and cleaning.** Transportation crews inspect pipes with cameras attached to robots and clean them, as necessary. They send video to engineers to determine any structural repairs needed. Both inspections and cleaning have not met targets in the last six years, save inspections in 2019.
- **Timeliness of responding to emergency calls.** Environmental Services has a goal to quickly respond to calls for urgent sewer problems – 95 percent of the time, crews should arrive in two hours or faster. Transportation met or came close to this goal over the last six fiscal years.

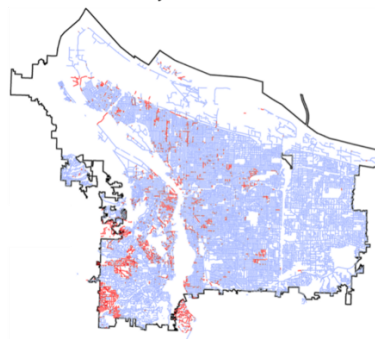
Some targets were **met** in the last six years.

Fiscal Year:	2015	2016	2017	2018	2019	2020
Repair sewer mains	●	●				
Repair sewer laterals	●					
Clean sewers					●	
Inspect sewers					●	
Repair/construct storm inlets		●	●	●	●	
Maintain drainage ditches				●	●	
Respond in 2 hours	●		●	●	●	●

Some targets were met in the last six years, like responding to sewer emergencies in two hours. Others, like inspecting and repairing sewers were met in only one of six years. This does not show how close crews came to meeting targets, only if they were met.

Environmental Services has a separate goal of cleaning and inspecting the entire system of pipes on a 12-year cycle. A full cycle has yet to pass since the goal was set in 2013. However, looking at the past 12 years, crews have cleaned 80 percent of sewer main pipes. Environmental Services said it plans to direct Transportation to cover the remaining areas in the next few years to meet the goal.

**Most pipes in system cleaned in past 12 years.**  
**Remaining pipes to be cleaned by 2025.**



When crews fall behind on repairs and cleaning, it makes it harder to keep the entire system in good condition. Falling behind also means work that Environmental Services had counted on gets pushed into the future.

## Staffing and fleet not used to full potential

Lack of funding was not a cause of Transportation's missing the production targets set by Environmental Services. Transportation spent about \$2 million less than the agreement allowed in each of the last six years. There were two key reasons for the underperformance:

- **Staffing.** Transportation assigned sewer maintenance crews to non-related work, such as landslide cleanups and snow/ice responses. There have also been staff vacancies on sewer maintenance crews.
- **Fleet services.** Specialized vehicles sat in the CityFleet repair shop, waiting for a mechanic or part to become available. Some of these waits lasted several weeks, making it harder or impossible for crews to do their work without their specially equipped trucks. Managers have known about this bottleneck in fleet repair, but the problem persists.



Image: Sewer maintenance requires vehicles with special pumps and tools.

## Indirect-cost calculation not specific to sewer maintenance

When Environmental Services pays Transportation for sewer services, it must also pay a portion of the overhead needed to support the sewer crews. The City's financial policies specify that indirect costs must be those necessary to support the delivery of the services, in this case sewer maintenance. This includes indirect costs for services, such as bureau administration, computer systems, facilities, and stores. Transportation applies a standard formula for allocating costs to all its contract or grant work, not just sewer work.

The standard formula, however, may include costs that are not directly related to or in support of ratepayer-funded activities.

Looking at the indirect costs Transportation includes in this formula, we questioned including some activities that were not necessary to support the delivery of sewer maintenance services, such as: support and administration for parking enforcement and parking operations and operating and maintenance overhead for Portland Streetcar. At the same time, parking enforcement, parking operations, and the Portland Streetcar pay for costs related to sewer maintenance administration.

Allocating these administrative costs across all of Transportation's programs has been happening for years. Transportation said the practice of including these activities in its list of indirect costs that goes into the Citywide calculation is allowable but could be improved.

## Lax materials management problematic

Transportation did not enforce its procedures for tracking and reconciling the City's inventory of materials needed for sewer maintenance, an oversight that created the opportunity for misuse and inaccurate billing.

Crews occasionally took rock, asphalt bags, pipes, and other materials from the storage yard without documenting the materials and which job should be charged.

When Transportation employees found differences between actual quantities in the yard and what the computer records suggested should be there, they would try to track down which program most likely used the materials. After emailing the costs of the items to the correct crew, Transportation would accept a workorder number from that workgroup's supervisor to charge against the missing goods. To properly track costs of materials, crews should document who takes which supplies at the time they are obtained.

Transportation also stored expensive sewer lining supplies in an area away from the central supply yard with weaker controls over quantities of materials and

safeguards to access to them.

Without accurate inventory counts and billing records, management cannot assure sewer ratepayers that they are being charged appropriately for maintenance materials.

## Does the partnership still serve ratepayers?

The agreement between Environmental Services and Transportation has been in place for decades. We recommended in a 2010 audit that both Bureaus evaluate the advantages and challenges of maintaining the partnership. This continues to be relevant today as many of the same issues remain, including: Provision of sewer maintenance and repair is not aligned with Transportation's organizational goals and objectives; and each Bureau uses a separate data system to track the work on and condition of the sewers, drawing concerns about inefficiencies from staff in both Bureaus. While the Bureaus update performance targets annually, the substance of the agreement has not changed.

## Recommendations

1. To help meet maintenance targets, Environmental Services and Transportation should develop and implement alternatives to use staffing and vehicles to their full budgeted potential.
2. To ensure ratepayer funds are used only on services related to and necessary for sewer maintenance, Transportation should remove expenses included in its indirect costs that could be considered direct administrative costs for a specific program or service.
3. To ensure accurate charges and reduce the opportunity for misuse of materials:

Transportation should:

- properly document materials taken by crews;
- increase inventory safeguards for sewer lining materials; and,
- enforce existing procedures.

Environmental Services should:

- review and approve billings for any inventory discrepancies.

4. To determine whether the partnership between Environmental Services and Transportation best serves the interests of the public, the Bureaus should re-evaluate the pros and cons of the agreement for sewer maintenance.

## The Bureaus generally agreed with our recommendations

[View the joint response to the audit](#) from the Bureau of Environmental Services and Portland Bureau of Transportation.

## How we did our work

This audit's purpose was to (1) assess whether Transportation maintains the sewer and stormwater collection system in accordance with Environmental Services' goals, and (2) assess whether ratepayers are getting efficient services from Transportation. We focused on fiscal years 2014-15 through 2019-20. We include both sewer and stormwater systems in the term "sewer."

We interviewed management from both Environmental Services and Transportation. We toured Transportation's facility and rode with sewer repair crews, inspection/cleaning crews, and the emergency response truck.

We reviewed progress toward maintenance goals; financial issues, including the indirect-cost calculation; fleet charges; work processes including sewer repair, sewer inspection and cleaning, work order processes, computer systems' connections; and materials management. We did not extensively test data reliability, but our limited testing found the data's condition to suffice for our audit objectives.

Capital improvement projects are managed by Environmental Services and were not part of this audit.

We conducted this 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.

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## CITY OF PORTLAND

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September 8, 2021

Mary Hull Caballero  
City Auditor  
City of Portland  
1221 SW 4th Avenue, Room 310  
Portland, OR 97204

**Re: Sewer Maintenance Audit**

Dear Auditor Hull Caballero:

Thank you for the opportunity to respond to your most recent audit, "Sewer Maintenance: Renewed attention to partnership needed to better serve ratepayers." We appreciate the collaborative and thoughtful effort by your staff as well as the recommendations in the audit. While we can always improve our work and reach our targets more effectively, thank you for pointing out the importance of this work to Portland's ratepayers. Below we have addressed all of your recommendations and look forward to working with your staff on future updates to this audit.

**Responses to Recommendations****Recommendation**

To help meet maintenance targets, Environmental Services and Transportation should develop and implement alternatives to use staffing and vehicles to their full budgeted potential.

**Response**

Although PBOT has missed several maintenance targets, significant improvement has been made in recent years. The table below shows the actual completion percentage toward the target. The major reasons for missing the targets are unfilled staffing vacancies, unavailability of key equipment, impacts of severe winter weather, and most recently COVID 19.

	FY15	FY16	FY17	FY18	FY19	FY20
Repair Sewer Mains			77%	70%	92%	73%
Repair Sewer Laterals		71%	68%	78%	93%	97%
Sewer Cleaning	92%	92%	67%	84%	84%	90%
Sewer Inspection	88%	95%	95%	87%		97%
Repair Construct Storm Inlets	78%					69%
Drainage Ditch Maintenance	76%	34%	82%			57%

**Weather Impacts:**

The impacts of winter weather range from supporting Citywide snow and ice efforts, emergency response work to keep stormwater facilities functioning in large storm events, and landslide response in winters with significant rainfall. As examples, FY17 was significantly impacted by landslides across the city, many of which impacted collection system facilities and required actions by PBOT Environmental Services Division (ESD) crews to mitigate. In FY18, the city experienced multiple snow and ice events that directly impacted ESD crew work, as many of the vehicles are outfitted with snowplows and are vital to the City's overall response. Finally, during the last quarter of fiscal year 2020, reduced daily staffing levels and work procedures, dictated by COVID-19, impacted our ability to complete work.

Although the bureaus cannot control severity of winter weather, we do agree to review the current practices and develop strategies that minimize the impact to ESD during weather related events.

**Staffing:**

We agree that staffing vacancies directly impact our ability to complete daily work towards established maintenance targets. The bureaus commit to working with the Bureau of Human Resources to identify a series of recruitment and hiring strategies that will minimize the amount of time vacant positions remain unfilled. Additionally, PBOT agrees to focus on expanding training and development opportunities for staff that will increase the qualified candidate pool and provide for temporary position upgrades to fill critical needs, particularly in specialized programs such as pipe inspection and cleaning.

**Fleet:**

Vehicles out of service for repair directly impact PBOT's ability to accomplish work and meet BES maintenance targets, this is particularly true in the sewer cleaning program where the vehicles are specialized and contain many mechanical and electrical systems. Last fiscal year, the City retained three turned-in vehicles as spares to ensure sewer cleaning activities could continue when production vehicles were out of service for repairs. In addition, PBOT is evaluating whether to expand the use of rental equipment when extended repair times are expected.

Aside from the cleaning program, the bureaus will continue to review fleet utilization across the ESD and look for opportunities to improve overall program performance.

**Recommendation**

To ensure accurate charges and reduce the opportunity for misuse of materials:

Transportation should:

- properly document materials taken by crews;
- increase inventory safeguards for sewer lining materials; and,
- enforce existing procedures.

Environment Services should:

- review and approve billings for any inventory discrepancies.

**Response**

ESD's Material Distribution Center processed more than 40,000 transactions during the past three years. During that time, 84 transactions did not follow procedures, or 0.2 percent. While this is a small percentage, the bureaus agree to take the following steps:

- ESD management will continue to stress the need for employees to follow internal material procurement procedures. Supervisors will perform more oversight to ensure these procedures are followed and offer training to appropriate staff.
- The PBOT Material Distribution Center will have taken over management of the sewer lining material from the ESD as of Sept. 1, 2021.
- Environmental Services and PBOT will jointly review and approve billings for any inventory discrepancies on a routine basis.

### **Recommendation**

To ensure ratepayer funds are used only on services related to and necessary for sewer maintenance, Transportation should remove expenses included in its indirect costs that could be considered direct administrative costs for a separate specific program or service.

### **Response**

PBOT agrees to review costs included in its indirect model to determine if any of those costs could be allocated directly to specific programs or services. PBOT will share the results of the review with BES and work collaboratively on any subsequent changes needed in the Cooperative Work Agreement to update the indirect rate for future years. The bureaus commit to completing this work within the next year.

### **Recommendation**

To determine whether the partnership between Environmental Services and Transportation best serves the interests of the public, the Bureaus should re-evaluate the pros and cons of the agreement for sewer maintenance.

### **Response**

PBOT and BES agree to perform a review of the Cooperative Work Agreement (CWA) that includes an assessment of the current service delivery model and its advantages and disadvantages within the context of bureau priorities and obligations. The review will include an organizational assessment and an evaluation of major business processes focusing on ways to increase operational efficiencies, deliver better service to our customers, and support both bureaus long term commitment to asset management. The Bureaus agree to initiate this work in the coming year.

Thank you again for the opportunity to work with your staff and we look forward to working on these follow-up items in the year to come.

Sincerely,

**Michael  
Jordan** Digitally signed  
by Michael  
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Date: 2021.09.08  
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Director Michael Jordan  
Bureau of Environmental Services  
City of Portland

**Christopher  
Warner** Digitally signed by Christopher  
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Director Chris Warner  
Portland Bureau of Transportation  
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