



Office of the City Auditor

**Report to the City Council
City of San José**

**STREET SWEEPING:
SIGNIFICANT INVESTMENT
AND RE-TOOLING ARE
NEEDED TO ACHIEVE
CLEANER STREETS**

**Report 16-02
February 2016**

February 29, 2016

Honorable Mayor and Members
of the City Council
200 East Santa Clara Street
San José, CA 95113

Street Sweeping: Significant Investment and Re-Tooling Are Needed to Achieve Cleaner Streets

Street sweeping is helpful in reducing pollution in local waterways, removing potentially harmful debris, preventing clogs in storm drains which can lead to ponding and flooding, and improving street appearance.

Currently, street sweeping is funded by rate payer revenue out of the Storm Sewer Operating Fund. Program expenditures totaled \$3.8 million in 2014-15. Department of Transportation (DOT) staff and equipment provide street sweeping along the City's commercial streets, while residential streets are swept by an outside contractor. DOT manages the overall street sweeping program while the Environmental Services Department (ESD) administers the residential street sweeping contract. This hybrid service delivery model has been in place since at least 2001.

Street Sweeping Operations Are Under-Resourced

DOT's in-house street sweeping crew is assigned to sweep 32,700 curb miles of commercial streets per year, but it suffers from staffing and equipment shortages that hamper reliability. In 2014-15, the in-house street sweeping crew swept only 20,300 (62 percent) of assigned curb miles. In 2014-15, contractors completed all of the 36,000 residential curb miles assigned.

To improve the reliability of in-house street sweeping, DOT would need to address shortages in street sweeper operators and street sweeper vehicles. However, addressing these problems would increase in-house street sweeping costs by \$805,000 and would raise the question of whether DOT should explore outsourcing existing in-house routes. We estimate an adequately equipped in-house operation would increase costs beyond what it would cost for the current contractor to serve the commercial routes under current contract terms. However, the cost differences are negligible and must be considered with the non-financial advantages of having an in-house operation, the requirements for pursuing alternative service delivery, and unknown future contract costs.

To complete in-house routes, we recommend that as funds become available, DOT address existing staffing and equipment shortages, and/or supplement existing efforts with additional contracted street sweeping services. We also recommend, going forward, DOT monitor the comparative effectiveness, costs, and efficiency of in-house and contracted street sweeping services, and the threshold at which alternative service delivery should be considered.

Whatever service delivery model is chosen, sustainable funding will be key. Like many other City services, San José's street sweeping is modestly funded compared to other jurisdictions.

The City Would Benefit From Improved Schedules and Routes

Many streets are particularly dirty, but because of constrained resources, streets are not swept as often as needed. While business districts are assigned to be swept twice per week, commercial arterials and bikeways are scheduled for only two sweeps per month. Residential streets are swept only once per month. These schedules remain constant year-round, even though certain times of the year may present conditions that warrant more street sweeping – for example, in autumn when tree leaves are likely to litter streets and clog storm drains.

Opportunities to make data-driven changes to street sweeping schedules are on the way, as DOT is currently launching an electronic street sweeping tracking and inspection system to replace its paper-based inspection forms. This system will allow DOT to better identify, track, and act on data related to street conditions, including dirty streets in need of extra attention. In addition to intelligence gathered through the street sweeping inspection process, ESD's watershed protection programs can inform planning for street sweeping. As DOT operates and improves on its electronic system, we recommend the department use the data to review and revise its street sweeping schedules and routes where possible.

The City Can Do More to Minimize Barriers to Street Sweeping

There are various obstacles that prevent both in-house and contracted street sweeping crews from performing complete sweeps. Parked cars are the most significant barrier. In San José, signs that prohibit parking during scheduled street sweeping are used on a limited basis, covering only 11 percent of curb miles. Where signs are posted and enforced, compliance appears high, but some signs need to be updated and repaired. In some instances, DOT has the contractor set up temporary "No Parking" signs to provide additional opportunities to clear curbs and gutters of parked cars without installing permanent signage.

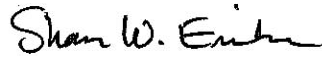
Other barriers to street sweeping include yard waste piles, garbage and recycling containers, and low hanging tree branches. The Municipal Code outlines specific rules on yard waste, garbage, and recycling set outs, but loose-in-the-street yard waste, in particular, sometimes hampers street sweeping. In addition, although DOT staff inspect routes, they don't always record and address barriers. This is partly due to the current paper-based inspection process which also makes it difficult for staff to record and refer issues to the appropriate parties. We recommend that DOT use its new system to better record barriers, which may inform future parking prohibition sign installations and enhanced sweeps, and modify and enforce yard waste, garbage, and recycling collection schedules.

The City Should Provide Better Information to the Public

Public education and outreach can communicate the importance of clean curbs and gutters in supporting the City's stormwater pollution prevention and storm sewer maintenance goals. In addition, outreach activities should include reminders and information on clearing barriers to street sweeping in order to maximize the effect of scheduled sweeps. Outreach responsibilities are currently spread between the City's residential street sweeping contractor (GreenWaste), ESD, DOT, and City Council offices. GreenWaste has the most outreach responsibilities and is primarily engaged in attending community meetings and mailing annual post cards to targeted populations. ESD has moved much of its outreach online through informational websites and an online collection day and street sweeping schedule look up tool; however, some of the information in the tool is outdated and incomplete. Also, DOT relies on Council staff for outreach regarding service delivery changes. In our opinion, given the variety of players, messaging should be better coordinated in order to ensure consistency across the City. We recommend DOT and ESD address these problems, issue more reminders to more residents to help clear obstacles, and ensure that residents are engaged and informed.

We would like to thank DOT, ESD, the Public Works Department, and the City Attorney's Office as well as GreenWaste Recovery for their time and insight during the audit process. This report includes 14 recommendations. We will present this report at the March 7, 2016 meeting of the Transportation and Environment Committee. The Administration has reviewed this report and its response is shown on the yellow pages.

Respectfully submitted,



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City Auditor

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This report is also available online at www.sanjoseca.gov/audits

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Introduction

The mission of the City Auditor's Office is to independently assess and report on City operations and services. The audit function is an essential element of San José's public accountability, and our audits provide the City Council, City management, and the general public with independent and objective information regarding the economy, efficiency, and effectiveness of City operations and services.

In accordance with the City Auditor's Fiscal Year 2015-16 Work Plan, we have completed an audit of the City's street sweeping. Following declines in street sweeping performance measures, low resident satisfaction with street cleanliness and street cleaning services, and a resident complaint to the City Auditor, we conducted this audit to assess the effectiveness and efficiency of street sweeping services.

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 limited our work to those areas specified in the "Audit Objective, Scope, and Methodology" section of this report.

The City Auditor's Office thanks the Department of Transportation (DOT), the Environmental Services Department (ESD), the Public Works Department, and the City Attorney's Office as well as GreenWaste Recovery for their time and insight during the audit process.

Background

Streets are designed to convey water to gutters and curbs, and then to storm drains. Gutters and curbs hold significant amounts of pollutants, sediments, and debris. Street sweeping programs use motorized vehicles equipped with bristle brushes and air-assisted vacuums to sweep and collect this material.

The benefits of street sweeping are widely accepted by experts and government agencies. They include:

- Preventing pollutants from entering waterways;
- Removing sediments and debris that can harm pedestrians, bicyclists, and motorists; and
- Reducing the accumulation of sediments and debris that could clog storm drains and lead to ponding and flooding.

Street Sweeping Supports the City's Compliance With Clean Water Regulations

The City of San José (City) has a municipal storm sewer system that discharges untreated stormwater to local creeks and the San Francisco Bay. To address threats from water pollution, the federal government, through the 1972 Clean Water Act, implemented the National Pollutant Discharge Elimination System (NPDES). This permit program is formal permission for municipalities to discharge stormwater to local waterways. The San Francisco Bay Area Regional Water Quality Control Board is the regional water board that issues permits to most of the Bay Area, including the City of San José (City), which has committed to street sweeping in support of its stormwater discharge permit.

Street Sweeping Is an Area of Community Concern

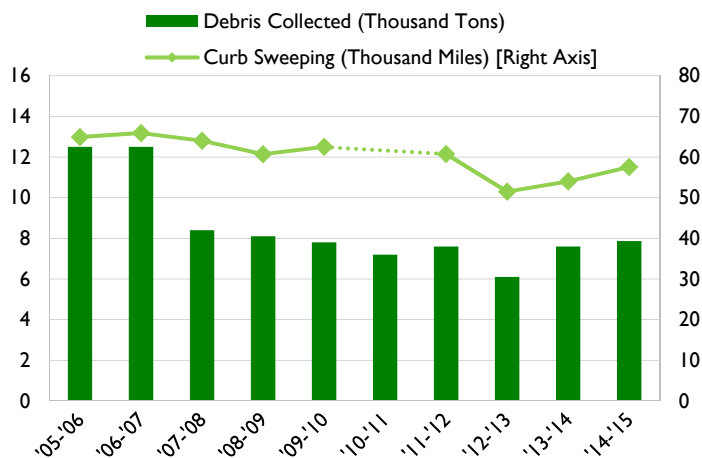
The National Citizens Survey™ (NCS) measures public opinion in several areas of community livability. 2015 marked San José's fifth year of participation in the NCS.¹ For the past 5 years, less than half of surveyed City residents have rated "street cleaning" as good or excellent, which is lower than satisfaction levels at other jurisdictions. Most recently, in 2015, only 35 percent of residents registered satisfaction with the service. Furthermore, looking broadly at San José appearance – which is at least partly affected by street sweeping – San Joseans registered much lower levels of satisfaction than did survey respondents from other jurisdictions. Opinions of "overall appearance of San José" have also steadily declined over the years, with 54 percent of respondents ranking it good or excellent in 2011, dropping to 34 percent in 2015.

Street Sweeping Output Has Declined

DOT reports street sweeping performance measures in its budget every year, including the number of curb miles swept and tons of sweeping debris collected. These are common performance measures for street sweeping programs. In 2014-15, DOT reported a total of 56,300 curb miles swept and 7,900 tons of sweeping debris collected. These indicators have dropped 11 and 37 percent respectively since 2005-06, when 65,000 curb miles were swept and 12,500 tons of street sweeping debris were collected.

¹ NCS survey participants were selected at random. Participation was encouraged with multiple mailings and self-addressed, postage paid envelopes. Surveys were available in English, Spanish, and Vietnamese. Results were statistically re-weighted to reflect the actual demographic composition of the entire community. Survey results are available on our website: <http://www.sanjoseca.gov/DocumentCenter/View/48412>.

Exhibit I: 10 Years of Street Sweeping Performance Measures



Source: Performance data reported by DOT and ESD.

Street Sweeping Is Supported by Multiple Departments

DOT is responsible for operating, maintaining, and improving San José streets – the largest municipal street network in northern California. In addition to sweeping routes in the City, DOT oversees general program management (e.g., posting and enforcing parking prohibition signs, inspecting routes, etc.) for street sweeping. Several divisions and sections are involved:

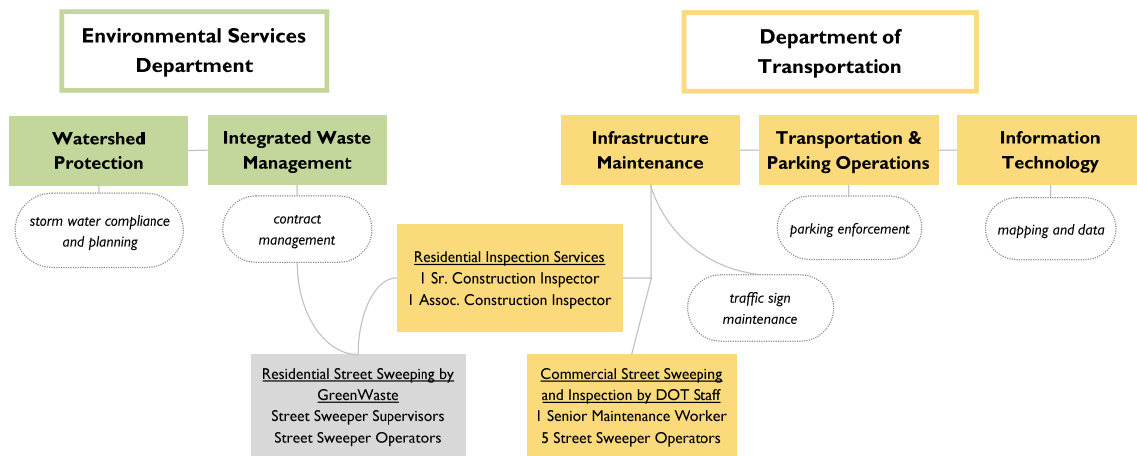
- The Infrastructure Maintenance Division’s Sanitary and Storm Sewer Maintenance section houses street sweeper operators who use City street sweeping vehicles to sweep commercial streets.
- The Infrastructure Maintenance Division’s Street Sweeping Inspection Services section has inspectors who ensure satisfactory sweeps and investigate complaints and service requests.
- The Infrastructure Maintenance Division’s Landscape Services and Traffic Maintenance Programs section houses staff who install and maintain parking prohibition signs.
- The Transportation & Parking Operations Division’s On-Street Parking Management section houses parking enforcement staff who monitor compliance with posted signs.

ESD also plays a significant role in street sweeping. Its Watershed Protection Division oversees permitting and compliance with federal, state, and local regulations, and may coordinate with DOT to meet trash reduction targets related to the aforementioned stormwater discharge permits.

While DOT’s in-house street sweeping crew serves commercial routes, residential street sweeping has been conducted by contractors since at least 2001. ESD’s Integrated Waste Management Division (IWM) oversees the street sweeping contract between the City and GreenWaste. IWM staff receive monthly, quarterly, and annual reports from GreenWaste to track activity, ensure compliance with contractual reporting requirements, and calculate monthly payments to the contractor based on curb miles swept, liquidated damages, and any special services.²

Exhibit 2 below outlines the organization of the street sweeping program.

Exhibit 2: Street Sweeping Organization Chart



Source: Audit team analysis of departmental organization structures.

In addition, the Public Works Department’s Fleet Maintenance Division maintains City-owned street sweeping equipment and assists with procuring new street sweeper vehicles.

San José’s In-House and Contracted Street Sweeping Operations Serve Commercial and Residential Areas

San José’s “commercial” areas are assigned to DOT street sweeper operators using City vehicles and equipment. A DOT Senior Maintenance Worker also supervises and inspects street sweeping on these routes. The following are descriptions of the three types of routes served by the in-house street sweeping operation:

- I. Central Business District: 3,300 curb miles per year in downtown San José.

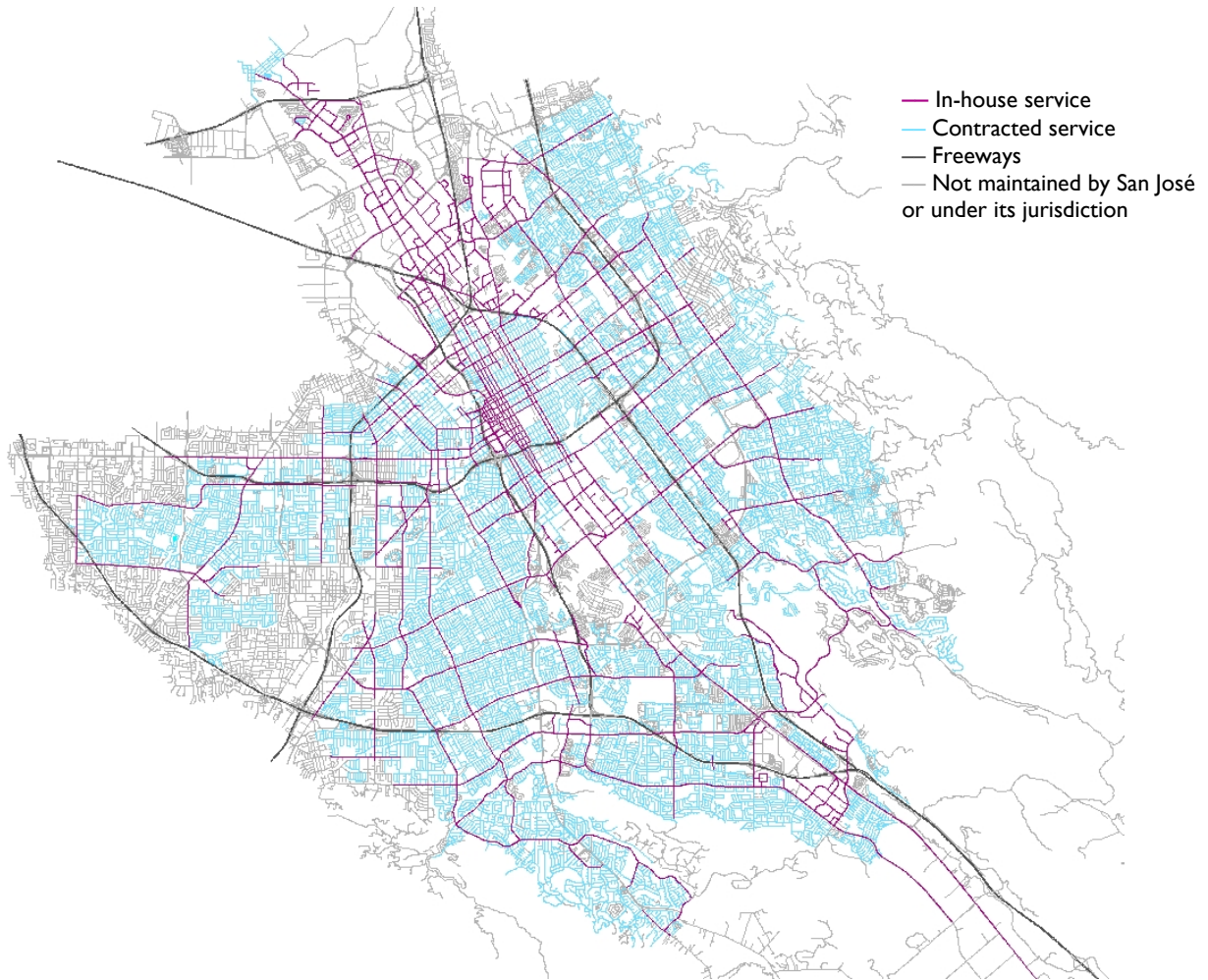
² Oversight of the street sweeping contract resides with ESD because street sweeping contract terms are formalized in the same contract agreement that outlines terms for yard waste collections.

2. Neighborhood Business Districts: 5,500 curb miles per year in the City's neighborhood business districts.
3. Arterials and commercial streets and bikeways: 23,800 annual curb miles of arterial streets, commercial streets, median islands, and bikeways.

GreenWaste has been the sole contractor providing residential street sweeping since 2007. The current contract between the City and GreenWaste began in July 2010 and expires in June 2021. Residential street sweeping routes total 36,000 annual curb miles. DOT staff inspect these routes and provide operational support.

Exhibit 3 below displays the areas assigned to the City's in-house crew and the contracted street sweepers.

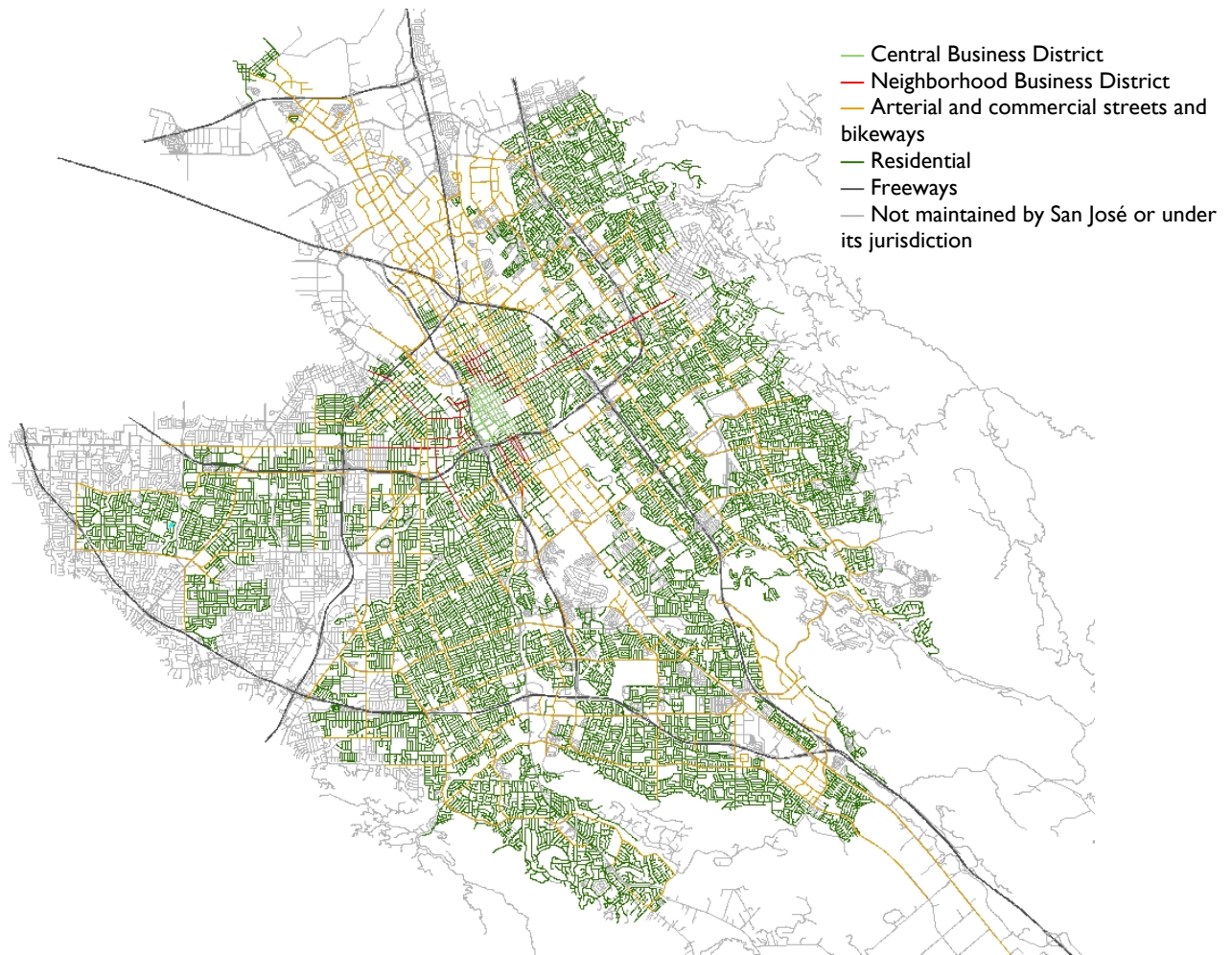
Exhibit 3: In-House and Contracted Street Sweeping Routes



Source: Audit team map based on DOT street sweeping route data.

Exhibit 4 displays the four different types of street sweeping routes.

Exhibit 4: Types of Street Sweeping Routes



Source: Audit team map based on DOT street sweeping route data.

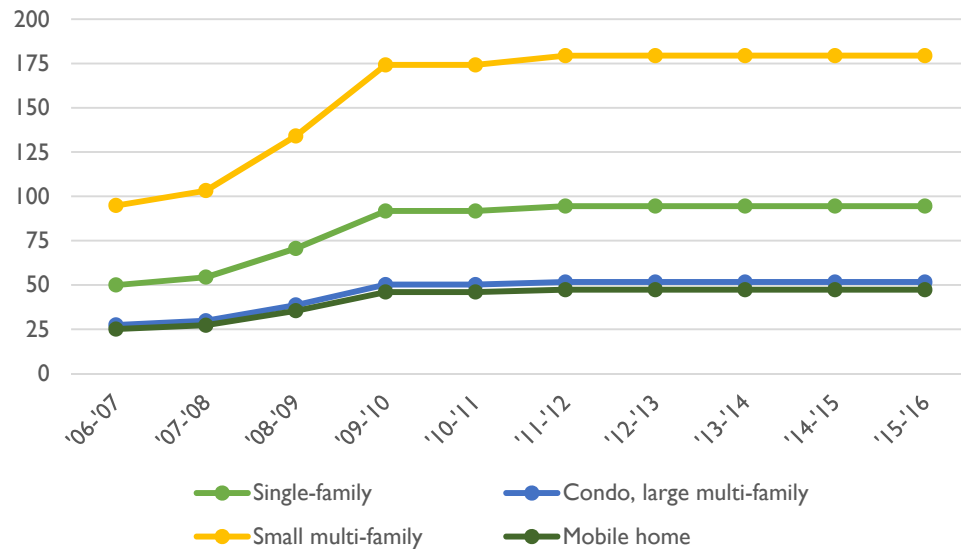
Street Sweeping Is Funded by Property Owners

San José property owners are assessed a Storm Sewer Service Charge placed on annual property tax rolls. This revenue goes to the Storm Sewer Operating Fund (Fund 446) which funds stormwater pollution control and permit compliance as well as the maintenance and management of the storm sewer system, including street sweeping.

Residential and commercial rates vary based on property type and size. In 2015-16, a single-family home will be charged \$94.44 in annual storm sewer charges. Commercial rates consist of a flat charge and an acreage charge; for example, a small commercial building would pay a flat annual charge of \$332.76 plus \$156.48 per acre.

The Storm Sewer Service Charge is reviewed annually by ESD and the City Council and is adjusted as costs and service demand levels change. Although rates have increased by 89 percent overall during the past 10 years (see Exhibit 5 for residential charges), they have remained unchanged since 2011-12. In 2014-15, \$32.6 million was collected in commercial and residential storm sewer service charges.³

Exhibit 5: Residential Storm Sewer Service Charges Since 2006-07



Source: Storm Sewer Service Charge rate resolutions.

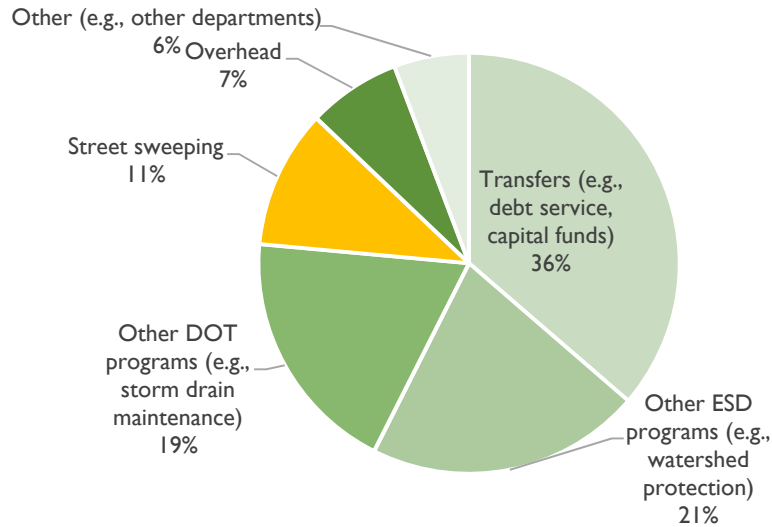
A Small Portion of the Storm Sewer Operating Fund Is Allocated to Street Sweeping

In 2014-15, Storm Sewer Operating Fund expenditures totaled \$34.6 million. As shown in Exhibit 6 below, street sweeping accounted for 11 percent of the total.⁴

³ About a quarter of the total was from commercial rate payers (\$8.3 million) and three quarters from residential rate payers (\$24.3 million).

⁴ In addition, \$17.1 million was set aside in reserves. Fund 446 reserves include two months of emergency funds, grant matching funds, storm sewer permit funds, and funds for new system implementations.

Exhibit 6: Breakdown of 2014-15 Storm Sewer Operating Fund Expenditures



Source: Records from the City's financial management system.

Until 2015-16, street sweeping was also funded by residential solid waste hauling fees through the Integrated Waste Management Fund (Fund 423).

California's Proposition 218

Approved by California voters in 1996, Proposition 218, the "Right to Vote on Taxes Act," requires property-related fees and charges be used for services that have a direct relationship to property ownership. Since storm sewer charges are applied on the basis of property ownership, to the extent that these services, including street sweeping, are funded from the property related charges, these services should have a direct relationship to property ownership.

Audit Objective, Scope, and Methodology

The objective of the audit was to assess the effectiveness and efficiency of street sweeping services. To do this, we evaluated procurement, operation, and utilization of street sweeping resources; street sweeping program outcomes; public awareness and outreach activities; and enforcement of street sweeping rules. We also sought to understand the relevant management controls, including inspection activities and general contract compliance.

Specifically, we:

- Reviewed resident opinion surveys conducted by ESD and the National Citizen Survey.

- Reviewed the City’s plans and reports on complying with local, regional, state, and federal laws and regulations.
- Reviewed the Municipal Code to understand rules related to street sweeping and the City’s enforcement of those rules. To understand the effectiveness of parking restrictions and whether certain locations are enforced more heavily than others, we analyzed and mapped street sweeping citations issued in 2013-14 and 2014-15.
- Compiled and analyzed records of routes, curbs miles swept, sweep waste tonnages, and other performance metrics in order to understand variances in activity across the City and over time.
- Compiled street sweeping costs by inventorying and compiling maintenance records, personnel time-keeping and pay data, and records from the City’s financial management system.
- Reviewed complaints and requests for signs submitted by members of the public, and reviewed corrective actions.
- Interviewed DOT staff including street sweeper operators, inspectors, and management to understand service delivery changes, criteria for new parking prohibition signs, monitoring of sweeps, outreach activities, and barriers to complete sweeps.
- Reviewed the contract between the City and GreenWaste and interviewed ESD’s contract management staff to understand how they ensure contractor compliance. We also spoke with Watershed Protection staff about activities related to stormwater permit requirements.
- Observed a sample of signed and unsigned street sweeping routes, and observed street conditions before and after sweeps in various parts of the City. We also participated in ride-alongs with inspection staff in order to understand street sweeping processes and barriers.
- Compared San José street sweeping (frequency, staffing, funding sources, etc.) against other California municipalities, including Los Angeles, San Diego, San Francisco, Long Beach, Oakland, San Bernardino, Santa Clara, Burbank, San Leandro, Palo Alto, and Costa Mesa.
- Compared the approach and features of San José’s street sweeping services against industry best practices and authoritative entities like the United States Environmental Protection Agency, the California Environmental Protection Agency, and the California Stormwater Quality Association.

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Finding I Street Sweeping Operations Are Under-Resourced

Summary

DOT's in-house street sweeping crew is assigned to sweep 32,700 curb miles of commercial streets per year, but it suffers from staffing and equipment shortages that hamper reliability. In 2014-15, the in-house street sweeping crew swept only 20,300 (62 percent) of assigned curb miles. In 2014-15, contractors completed all of the 36,000 residential curb miles assigned.

To improve the reliability of in-house street sweeping, DOT would need to address shortages in street sweeper operators and street sweeper vehicles. However, addressing these problems would increase in-house street sweeping costs by \$805,000 and would raise the question of whether DOT should explore outsourcing existing in-house routes. We estimate an adequately equipped in-house operation would increase costs beyond what it would cost for the current contractor to serve the commercial routes under current contract terms. However, the cost differences are negligible and must be considered with the non-financial advantages of having an in-house operation, the requirements for pursuing alternative service delivery, and unknown future contract costs.

To complete in-house routes, we recommend that as funds become available, DOT address existing staffing and equipment shortages, and/or supplement existing efforts with additional contracted street sweeping services. We also recommend, going forward, DOT monitor the comparative effectiveness, costs, and efficiency of in-house and contracted street sweeping services, and the threshold at which alternative service delivery should be considered.

Whatever service delivery model is chosen, sustainable funding will be key. Like many other City services, San José's street sweeping is modestly funded compared to other jurisdictions.

Street Sweeping Cost About \$3.8 Million Last Year

In 2014-15, citywide street sweeping expenses totaled \$3.8 million. About \$700,000 of this was attributed to supporting functions like inspection and parking enforcement. In 2014-15, direct expenses for in-house street sweeping operations totaled \$1.1 million, most of which were attributable to personnel and equipment; contractor-provided street sweeping totaled \$2 million. Exhibit 7 below details these expenses.

Exhibit 7: 2014-15 Comparison of In-House and Contracted Street Sweeping Costs (not including inspection and parking enforcement)

Program Elements	In-house Expenses	Contracted Expenses
<u>Nonpersonal:</u>		
Sweeping Services by GreenWaste	\$0	\$1,984,900
Dump Truck	\$4,000	\$0
Front Loader	\$15,000	\$0
Street Sweeping Vehicles	\$322,700	\$0
Dumping Services	\$27,100	\$0
<u>Personal Services:</u>		
Senior Maintenance Worker	\$88,600	\$0
Environmental Services Specialist	\$0	\$22,800
Heavy Equipment Operator	\$37,400	\$0
Maintenance Worker II	\$85,500	\$0
Street Sweeper Operator	\$533,600	\$0
Totals	\$1,113,900	\$2,007,700

Source: Audit team analysis of 2014-15 street sweeping costs as presented in the City's financial management system, Public Works' fleet operations and maintenance records, PeopleSoft personnel records, and Finance Department's indirect cost allocation plans. Program element costs are based on 2014-15 actuals, and audit team's estimates of staff time and equipment use attributable to street sweeping.

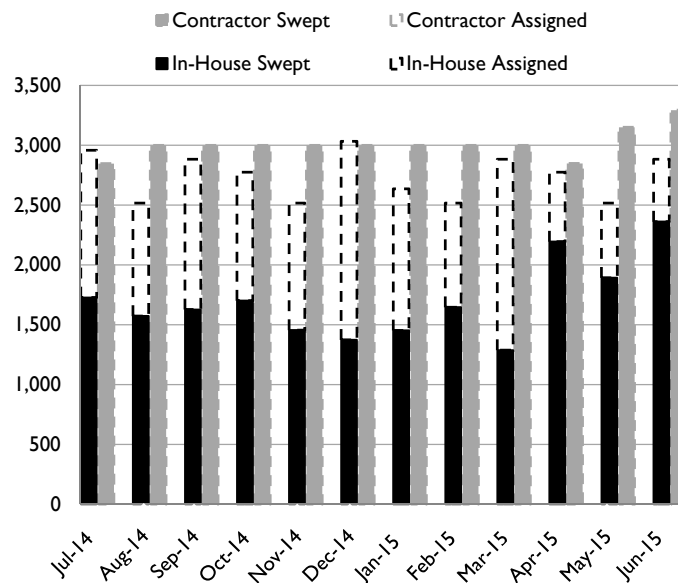
In 2014-15, the City's in-house street sweeping operation cost about half that of contractor-provided street sweeping (\$1.1 million compared to \$2 million); however, the difference narrows significantly when considering curb miles swept. In 2014-15, in-house and contracted sweeping operations swept 20,300 and 36,000 curb miles respectively. An analysis of per mile costs is shown later in this finding.

DOT's In-House Street Sweeping Operation Is Ill-Equipped to Reliably Complete Its Assigned Routes

The in-house street sweeping operation only swept 20,300 of the 32,700 curb miles assigned in 2014-15 (about 62 percent), while the contractor was able to complete all of its 36,000 assigned curb miles.

Exhibit 8 below shows that curb miles swept by DOT's in-house crew fluctuated significantly from month to month, with completion rates ranging from 45 percent in December 2014 and March 2015, to 82 percent in June 2015.

Exhibit 8: 2014-15 Street Sweeping Curb Miles Actually Swept vs. Assigned



Source: DOT street sweeping routes and 2014-15 performance records.

The in-house street sweeping operation's inability to complete its routes and significant monthly fluctuations in curb miles swept resulted from shortages in personnel and equipment.

Shortages in Street Sweeper Operators

In 2014-15, DOT had only four street sweeper operators to serve in-house commercial routes. Each street sweeper operator is assigned one route per night; routes are scheduled for Monday through Thursday, with Friday serving as a make-up shift to complete unassigned or incomplete routes. As a result, DOT could only schedule 16 in-house street sweeping routes per week. However, the department still struggled to reliably sweep these 16 routes. Absences were one reason. In 2014-15, street sweeper operators were absent about 20 percent of the time.⁵ Because there were only enough operators to cover the number of routes in DOT's schedule, each absence meant a route was skipped.

Difficulties Attracting and Retaining Operators

Moreover, only one of the four operators was a permanent employee. The other three were filled by temporary employees from the local Operating Engineers union hall. Turnover among the temporary employees is high and results in lost output

⁵The absence rate included only paid or unpaid absences and did not include holidays, training, weather-related postponements, or alternative duties.

during the time between operators leaving and others being on-boarded and trained to replace them. Furthermore, according to DOT, new operators are less productive than experienced ones while they undergo training and gain familiarity with City sweep routes and equipment. To facilitate this transition period, new street sweeper operators are assigned to arterial and bikeway routes. In 2014-15, arterial and bikeway routes, according to DOT records, were the least completed.

DOT reports that it is difficult to attract and retain operators. The department anticipates it might have better success in attracting candidates by hiring more general maintenance workers to operate street sweeper vehicles, instead of for a specific street sweeper operator position.

Recently, the in-house crew has been able to complete more routes because DOT brought on a fifth street sweeper operator. Up to five in-house routes can now be scheduled per night. Even so, the department continues to struggle to complete commercial routes as scheduled – particularly routes on arterials and bikeways. So far in 2015-16, DOT records show that the in-house street sweeping operation has increased its sweeping output. Midway through 2015-16 (July through December 2015), 11,600 curb miles were swept out of 16,600 assigned (70 percent) – compared to 9,500 swept out of 16,700 assigned (57 percent) for the same period a year before.

Maintenance Issues Threaten the Availability of Street Sweeper Vehicles

Street sweeper vehicles have many operating parts and systems. Even when operated in strict accordance to specifications, street sweeper vehicles are prone to maintenance problems, and are often out of service. As such, a reliable street sweeping program should have more vehicles than the number planned for deployment at any given time.

In 2014-15, DOT had nine sweeper vehicles in its fleet, but most of these were too old or ill-equipped to be consistently used. DOT records show that these street sweeper vehicles required over 1,200 hours of maintenance attention in 2014-15. More recently, on one particular day, August 20, 2015, four shifts were scheduled, but only two sweeper vehicles were available, and as a result, only two routes were attempted. Of these, only one of the three scheduled arterial routes was attempted.

The Street Sweeper Fleet Does Not Meet the City's Needs

Ideally, street sweeping programs deploy vehicles based on how specific vehicle features may handle unique conditions along specific routes. For instance, bristle-equipped sweeper vehicles may be better equipped to pick up larger debris, but vacuum street sweeper vehicles may be better equipped to pick up fine pollution particles. However, because of maintenance challenges, DOT often deploys vehicles based solely on their availability.

In addition, as is discussed later in this report, some of the City's street sweeping vehicles do not have features appropriate for proper disposal of sweep waste. Street sweeper vehicles can be equipped for "high-dumps" whereby street sweepings can be tipped into roll-off containers. Currently, only two of the five street sweepers the City has procured since 2009 have this capability (there are three high-dumps in total). DOT did not acquire the more expensive high-dump functionality during its vehicle procurements.

Replacement Planning for Municipal Vehicles

Best practices require municipalities to carefully plan vehicle replacements. Fleet experts encourage replacement planning, especially as vehicles age and accrue miles. More specifically, technological advancements may warrant the City's consideration of other types of street sweeper vehicles in the future. Street sweepers are becoming quieter, cleaner, and more efficient.

Public Works keeps a citywide vehicle replacement schedule, but street sweeper vehicles are not included in it. DOT and Public Works staff are deciding on how best to replace street sweeper vehicles. In some ways it makes sense to assign them the same replacement schedule as heavy trucks, which have a 15-year and 100,000-mile lifespan, but street sweepers do not accrue the same miles as heavy trucks. According to Public Works staff, existing work in vehicle replacement planning for street sweeper vehicles will consider utilization data and projected technological requirements.

DOT's Street Sweeping Crew Should Stop Emptying Sweepings Onto the Street

When their vehicles' hoppers are full, in-house street sweeper operators drive to pre-established sites throughout the City and empty their hoppers onto the road. Then later, DOT Maintenance Workers pick up the piles and take them to various storage locations (e.g. Mabury Yard and South Yard). After that, Heavy Equipment Operators pick up sweepings again and dispose of them at the Newby Island disposal facility.

This process is resource and time intensive, and is physically burdensome on staff assigned to pick-ups. It also may promote illegal dumping when people pile on additional trash. Moreover, emptying sweepings onto the ground results in plumes of dust, as does the subsequent pick-up of street sweeping piles. This practice also leaves remnants of street sweepings on the street (as shown in Exhibit 9), which can be stirred by wind, and conveyed to nearby storm drains. In our opinion, emptying street sweepings onto the ground and then picking them up again increases the risk of air, land, and stormwater pollution and reduces the environmental benefit that the street sweeping program is intended to provide.

Exhibit 9: The In-House Street Sweeping Operation's Roadway Dumpsites



↑ Dump site near Terraine and West Julian Street. Visible in the background are illegally dumped items unrelated to street sweeping that are often picked up during street sweeping pick-up assignments. September 29, 2015.



↑ DOT Maintenance Worker II shoveling and sweeping piles of sweepings at the dump site near Chynoweth Avenue and Fraschini Circle. This site is located 1.3 miles away from the City's South Yard which has temporary storage facilities. September 29, 2015.



↑ A storm drain adjacent to the dump site near Terraine and West Julian Street. September 29, 2015.



↑ Remnants of the sweeping piles remain at the site near Terraine and West Julian Street. September 28, 2015.

Source: Audit team photos.

The United States Environmental Protection Agency has provided the following guidelines on containing sweepings to minimize pollution:

“Storage locations should be equipped with secondary containment and possibly overhead coverage to prevent stormwater runoff from contacting the piles of sweepings. It is also recommended to cover the piles of sweepings with tarps to prevent the generation of

excessive dust. Storage locations should be sized accordingly to completely contain the volume of the disposed sweepings.”

As required by its contract with the City, GreenWaste uses sweeper vehicles equipped to dump sweepings into roll-off containers that are placed along routes.

Recommendation #1: DOT’s in-house street sweeping operation should stop emptying street sweepings onto the street.

In-House Street Sweeping Routes Are Too Long for Current Shifts

DOT’s standard operating procedures prescribe operating speeds of 5 miles per hour. DOT’s in-house street sweeper operators typically sweep for only 6 out of their 8 work hours because of their other duties.⁶

All the in-house street sweeping routes exceed the 30 curb mile length that can be swept within 6 hours at 5 miles per hour. In-house routes range from 30.5 to 53.5 curb miles in length. The average route is 38.5 curb miles long, which would require almost 8 hours to completely sweep at 5 miles per hour. These route lengths were more suitable when the street sweeper operators worked 10-hour shifts, but today, the route/shift length presents DOT with the choice to either skip some segments of routes, or operate sweeper vehicles at faster than recommended speeds; the latter diminishes the quality of the sweeping and presents additional safety risks.

Many of the residential routes swept by the contractor are also long, but the contractor deploys more street sweeper operators and vehicles to complete assigned routes.

With the existing street sweeping routes and operating procedures, we calculate that DOT needs to assign at least six routes per shift in order to cover the 150 average curb miles assigned per shift in the in-house street sweeping operation – adding two more Street Sweeper Operators than were employed in 2014-15.⁷

⁶ Every shift requires time for pre- and post-sweep equipment checks, equipment clean-up, breaks, travel time to routes and dumpsites, and other duties.

⁷ Route planning is dependent on the street sweeper vehicles used. Different street sweepers may be designed to perform at varying operating speeds. And different street sweeper vehicles may have different carrying capacities, which could necessitate higher or lower numbers of dumps along routes and would directly affect the time available for sweeping routes.

Properly Equipping the In-House Street Sweeping Crew Requires Significant Financial Investment

Addressing the aforementioned problems affecting the in-house street sweeping operation would improve reliability and performance. It would also increase the cost of the in-house commercial street sweeping operation. To quantify the increase, we used 2014-15 service and financial data to estimate the costs of a well-equipped in-house street sweeping operation. If DOT had the necessary staffing and equipment to satisfactorily complete its planned routes, we estimate in-house street sweeping expenses would have totaled \$1.9 million in 2014-15. This is \$805,000 more than the \$1.1 million actually incurred by the in-house operation in 2014-15.

As Exhibit 10 below outlines, the \$1.9 million includes the costs of providing six in-house routes per night. This includes renting, operating, and maintaining four additional high-dump street sweeping vehicles (for a total of seven), three additional street sweeper operators (for a total of seven), and other supporting expenses arising from these investments, including increased dump truck use, the purchase of six roll-off dumpsters, more use of Heavy Equipment Operators to operate the dump trucks, and more dumping fees from the additional weight of street sweepings. On the other hand, some expenses, like those associated with operating a front loader and the Maintenance Worker, would be eliminated.

Exhibit 10: 2014-15 Estimated In-House Street Sweeping Costs vs. Estimated Costs to Meet Service Commitments

Program Elements	2014-15 Expenses	Expenses from Recommended Additions	Explanation
<u>Nonpersonal:</u>			
Dump Truck	\$4,000	\$6,400	60 percent more dump truck usage to pick up roll-off carts
Front Loader	\$15,000	\$0	Front loaders would no longer be needed to pick up street sweeping piles from the streets.
Street Sweeping Vehicles	\$322,700	\$826,700	4 additional high-dump street sweeper vehicles each costing an estimated \$126,000 per year in rental fees, and operations and maintenance costs. In 2014-15 DOT had 3.
Dumping Services	\$27,100	\$43,360	60 percent more weight in street sweeping tonnage.
Roll-off Carts	\$0	\$60,000	6 roll-off carts for dumping street sweeping waste at \$10,000 apiece.
<u>Personal Services:</u>			
Senior Maintenance Worker	\$88,600	\$88,600	No change. DOT would continue to need 0.5 Senior Maintenance Worker to supervise routes.
Heavy Equipment Operator	\$37,400	\$74,800	Twice as much time of a Heavy Equipment Operator to pick up roll-off carts.
Maintenance Worker II	\$85,500	\$0	A Maintenance Worker II would no longer be needed to operate the front loader to pick up street sweeping piles from the streets.
Street Sweeper Operators	\$533,600	\$818,600	3 additional Street Sweeper Operators to complete scheduled routes. In 2014-15 DOT had 4.
Totals	\$1,113,900	\$1,918,460	

Source: Audit team analysis of 2014-15 street sweeping costs as presented in the City's financial management system, Public Works' fleet operations and maintenance records, PeopleSoft personnel records, and Finance Department's indirect cost allocation plans. Program element costs are based on 2014-15 actuals, and audit team's estimates of staff time and equipment use attributable to street sweeping.

If the in-house street sweeping routes were swept by the contractor in 2014-15, and the contract terms were the same as those for current residential sweeping, we estimate the contractor fees would have totaled about \$1.88 million.⁸ Again, we estimate that the fully equipped in-house street sweeping operation would cost \$1.90 million – practically the same.

⁸ For residential street sweeping, in 2014-15 GreenWaste charged the City \$52.10 per unsigned curb mile swept and \$79.08 per signed curb mile swept. The current contract between the City and GreenWaste is for residential street sweeping. Extending street sweeping services to in-house service areas would require negotiations and contract amendments.

Cost Per Curb Mile Swept

After factoring in the additional \$805,000 in needed program investments to the in-house street sweeping operation, we estimate in-house cost per curb mile would have increased above that of the contractor's cost per curb mile swept. Specifically, the City's in-house cost per curb mile would increase to \$58.72 from the \$54.95 per curb mile it actually incurred in its current state. Assuming the current contract terms in effect for residential street sweeping, contractor-provided street sweeping would have cost \$57.37 per curb mile in commercial areas.

Considerations for Contracting Out Street Sweeping or Keeping It In-House

One benefit from using contractors is that the City can hold them accountable to consistently provide excellent and timely service. The current contract between the City and GreenWaste outlines dozens of specific administrative charges that the City can assess if the contractor's performance in the residential areas falls short of expectations. Per the contract, the City can claim damages exceeding \$1,000 per incident if GreenWaste fails to complete assigned routes, unsatisfactorily sweeps routes, or fails to properly cover street sweepings in collection vehicles. Also, contractors take on the liabilities that arise from property damage and injuries that are certain to occur in a street sweeping function.

On the surface, these amounts would suggest that it would be cost effective to outsource street sweeping for commercial routes. However, numerous factors complicate the forecast of future contractor expenses. For example, the in-house street sweeping routes are swept during the graveyard shift. Contractors providing this service may demand a night differential pay that raises expenses.

Benefits from the existing hybrid service delivery model are also worth considering. For example, the current in-house street sweeping crew supplements broader storm sewer maintenance duties. If outsourced to contractors, this flexibility may be lost. In the immediate term, however, DOT may want to consider contractor assistance to help complete commercial routes that its in-house operation is currently unable to complete.

Recommendation #2: To complete commercial street sweeping routes and meet its service commitments, DOT should address existing staffing and equipment shortages and/or pursue contracted street sweeping services to supplement existing efforts. This will require additional funding.

Quantifiable Differences Between In-House and Contracted Street Sweeping Could Inform Future Service Delivery

The City's Public Private Competition Policy (City Council Policy 0-29), "sets forth a preference for using City employees to deliver City services." To outsource a service that is already being provided in-house, per Council Policy 0-29, considerations for outsourcing must include: cost savings exceeding 10 percent, responsiveness to customers, service delivery efficiencies, and service quality. Per the City's Service Delivery Evaluation Policy (Council Policy 0-41), a business case analysis must be developed that outlines the full costs of delivering an existing service differently.

DOT's existing performance measures include curb miles swept and tons of sweeping debris collected. For this audit, we used these measures to compare in-house and contracted street sweeping activities. We also considered the percentage of assigned street sweeping curb miles that were actually swept, and calculated cost per curb mile.

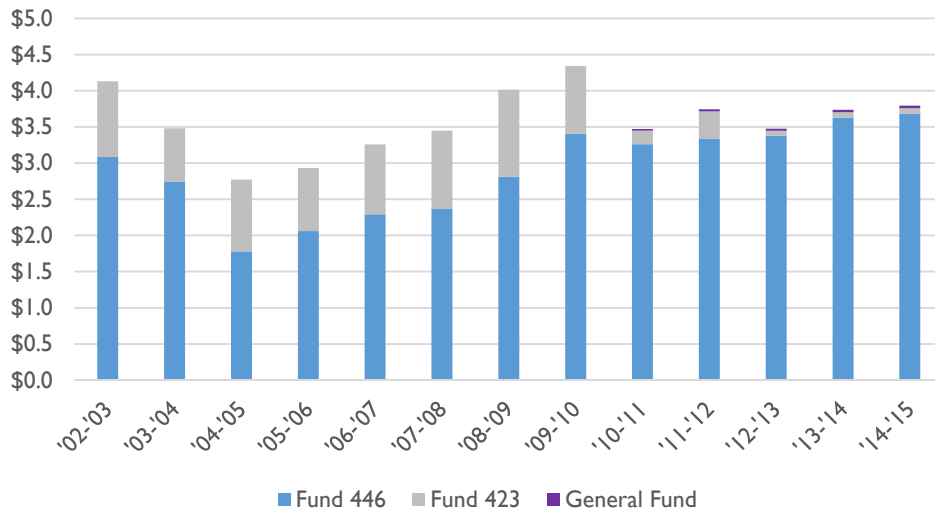
Recommendation #3: Going forward, DOT should periodically monitor the comparative effectiveness, costs, and efficiency of in-house and contracted street sweeping operations, and the threshold at which alternative service delivery should be considered.

San José Street Sweeping Is Modestly Funded

Over the years, funding for street sweeping has been modest and has not kept up with program goals. For instance, in 2003-04, the frequency of street sweeping service was reduced to cut costs. Also, as discussed later in this report, outreach activities and installation of parking prohibition signs have been limited in recent years due to insufficient staffing.

Exhibit II presents the last thirteen years of funding for street sweeping. Increases in spending since the 2003-04 program cuts have been driven by the GreenWaste contract (which provides for annual adjustments for inflation), added staff, and equipment and maintenance costs.

Exhibit 11: Street Sweeping Program Costs by Fund Since 2002-03 (in millions, adjusted for inflation)



Sources: Records from the City’s financial management system, Bureau of Labor Statistics Consumer Price Index for Wage Earners and Clerical Workers.

Some Cities Invest More in Street Sweeping

San José’s street sweeping expenditures (\$3.8 million in 2014-15), appear modest compared to those of other cities.⁹ For example, the much smaller City of Oakland spent an estimated \$7 million on its street sweeping operations in 2014-15. The City of Palo Alto, which has a population that is a fifteenth of San José’s and a land area that is a seventh of San José’s (and also has a hybrid service delivery model with in-house and contracted street sweeping), spent about \$1.4 million on street sweeping operations in 2014-15.

Funding Sources for Street Sweeping Vary

California cities use various funding sources for street sweeping. Some cities, like San José, have changed funding sources over the years. And some cities draw on multiple funds for street sweeping. Sources are diverse, and besides the ones that exist in San José, include special taxes, and fees assessed on new developments residing in special districts.

Some cities use their general funds for street sweeping, including San Diego and Costa Mesa which funded street sweeping entirely from their general funds. According to ESD, this was also the case in San José, where the General Fund

⁹ Drawing precise comparisons of San José’s street sweeping expenditures with those of other jurisdictions is difficult. Municipalities operate street sweeping in different bureaucratic structures, and fund street sweeping in different ways. Also scopes of services differ across cities. For example, in San José, street sweeping includes inspections, maintenance, parking signage, etc. In other cities, street sweeping may not include all of this, or may include more than these. Furthermore, service delivery and expenditure data are reported in different manners.

supported street sweeping through the early 2000s. Currently, as described in the background section of this report, and shown in Exhibit 11 above, the bulk of San José's street sweeping program is funded by the Storm Sewer Operating Fund.

Waste Related Fees Are a Common Source of Street Sweeping Funding

Debris from waste collection is a significant contributor to street sweeping collections. Accordingly, many cities including San José, schedule street sweeping to follow garbage, recycling, and yard waste collections to diminish the persistence of debris that is generated from pick-up service.

San José's street sweeping program used to be significantly funded by the Integrated Waste Management Fund but this was discontinued after 2014-15, when funding for the program was shifted to the Storm Sewer Operating Fund. These funds paid for a portion of the residential street sweeping contract with GreenWaste until 2011-12 and part of a street sweeping inspector position until 2015-16.

Other municipalities, such as Oakland, Santa Clara, and Palo Alto, use their solid waste funds to pay for street sweeping. These cities justified the use of these funds on street sweeping by acknowledging that remnants from refuse collection contribute to the need for street sweeping.

Additional Funding Is Needed

If the City considers street sweeping an important service, then in our opinion, significant financial investment is needed to address existing problems, just to bring the program up to the service levels that DOT has had in place for years. There are different forms that this investment can take, but in our opinion, it should reflect the full range of benefits that street sweeping provides – like reducing pollution in local waterways, removing potentially harmful debris, preventing clogs in storm drains, and improving street appearance.

Recommendation #4: The City should identify additional funding to improve street sweeping service citywide.

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Finding 2 The City Would Benefit From Improved Schedules and Routes

Summary

Many streets are particularly dirty, but because of constrained resources, streets are not swept as often as needed. While business districts are assigned to be swept twice per week, commercial arterials and bikeways are scheduled for only two sweeps per month. Residential streets are swept only once per month. These schedules remain constant year-round, even though certain times of the year may present conditions that warrant more street sweeping – for example, in autumn when tree leaves are likely to litter streets and clog storm drains.

Opportunities to make data-driven changes to street sweeping schedules are on the way, as DOT is currently launching an electronic street sweeping tracking and inspection system to replace its paper-based inspection forms. This system will allow DOT to better identify, track, and act on data related to street conditions, including dirty streets in need of extra attention. In addition to intelligence gathered through the street sweeping inspection process, ESD's watershed protection programs can inform planning for street sweeping. As DOT operates and improves on its electronic system, we recommend the department use the data to review and revise its street sweeping schedules and routes where possible.

Some Streets Get Particularly Dirty

DOT uses an objective and qualitative framework for assessing street cleanliness after a street is swept (i.e., to determine the effectiveness of the sweep). It is a five-point numeric system through which streets that show no visible debris are assigned the maximum score of "5." Unacceptably dirty streets that have excessive amounts of leaves and debris are scored a "1." This evaluation is performed on sampled route segments during street sweeping inspections by DOT staff. In 2014-15, based on inspection records, DOT estimated that 80 percent of curb miles were rated as good or excellent after they were swept.

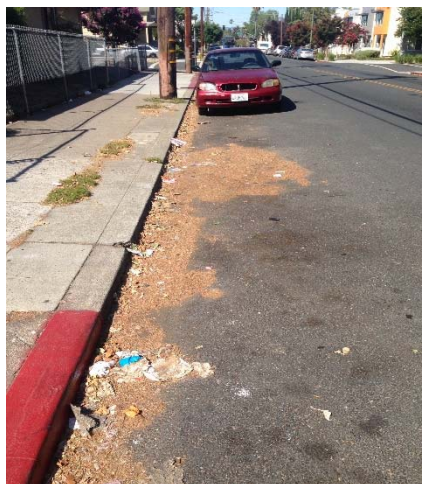
However, some streets get dirtier than others between sweeps. This was apparent from field observations, service requests, and complaints from the public.

Particularly Dirty Streets Should Have More Frequent Sweeps

Stormwater experts like the California Stormwater Quality Association¹⁰ suggest all streets should be swept at least once per month, but that some streets – based on their dirt and pollution levels – may need more frequent service. Physical attributes like the slope and width of streets, pavement condition, landscaping, and the number of stormdrains all factor into dirt and pollution levels. Human behavior also has an effect on sweeping needs. For example, walking around San José reveals that litter is common on sidewalks, streets, gutters, and storm drains in residential and commercial areas alike.

As part of its stormwater requirements, ESD has identified geographic areas that are sources of litter and pollution. The department has targeted trash reduction programs, including clean-ups in these areas. Similarly, more frequent street sweeping may be appropriate for particularly dirty areas.

Exhibit 12: San José Street Scenes



↑ Debris and bits of tree leaves along a route scheduled for street sweeping twice per week. May 29, 2015.



↑ Litter and rotted fruit from an adjacent tree along a route scheduled for bi-weekly street sweeping. May 29, 2015.

¹⁰ The California Stormwater Quality Association (CASQA) is a professional member association dedicated to the advancement of stormwater quality management through collaboration, education, implementation guidance, regulatory review, and scientific assessment.



↑ Litter and debris apparently conveyed to a storm drain from the previous day's rain. November 3, 2015.

Source: Audit team photos.



↑ Debris, litter, and organic material along a route scheduled for bi-weekly street sweeping. July 2, 2015.

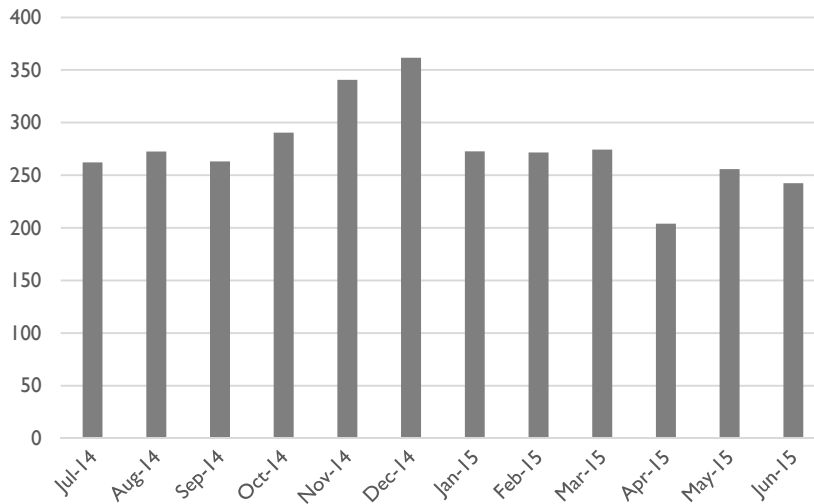
More Street Sweeping May Be Warranted at Different Times of the Year

Experts call for more frequent street sweeping during certain times of the year. For example, according to the Santa Clara Valley Urban Runoff Pollution Protection Program,¹¹ “frequent late fall sweepings are essential in areas with sustained winter rains.” This is the case in San José, where rain water can carry accumulated pollutants and debris into storm drains during the rainy season. Further, in San José, tree leaves make up a significant share of street sweeping collections. Scheduling should reflect the fact that there are more leaves on the streets during autumn. More frequent sweeps during the autumn and winter would pick up more leaves from the street, helping to prevent storm drain blockages.

Many cities including Los Angeles, and smaller local cities like Palo Alto, Union City, and Milpitas sweep more frequently during “leaf season.” Our in-house street sweeping operation does not, but observations suggest that late fall and early winter present higher needs of street sweeping. DOT’s street sweeping data shows that the pounds of waste collected per curb mile swept were highest in November 2014 and December 2014, when respectively an estimated 340 and 360 pounds of sweep waste were collected per curb mile swept. These rates are 25 and 32 percent higher than the year-round average of 270 pounds of street sweeping debris collected per curb mile swept. This is shown in Exhibit 13 below.

¹¹ The Santa Clara Valley Urban Runoff Pollution Protection Program is a multi-jurisdictional cooperative effort among the County, the Santa Clara Valley Water District, and thirteen north county cities, all working to improve the water quality of south San Francisco Bay and the streams of Santa Clara County

Exhibit 13: 2014-15 Street Sweeping Pounds Per Curb Mile by Month



Source: Audit team analysis of DOT monthly street sweeping records. Auditor calculation: $(\text{DOT estimated monthly tonnages} * 2,000) / (\text{DOT estimated monthly curbs miles})$.

In addition to increased frequency, autumn may require the deployment of more resources per route. According to GreenWaste staff members, during the “leaf season,” more sweepers per route are needed to address the increase in leaves on the street. In addition, GreenWaste deploys more debris boxes to accommodate anticipated increases in sweeping volume. Similarly, other cities like San Leandro assign workers to supplement scheduled street sweeping with manual sweeps during autumn. Other cities, like Santa Clara and Hollister have leaf-collection efforts before scheduled street sweeping to improve the effectiveness of sweeps, as heavy leaf cover can overwhelm sweeping efforts. DOT’s in-house program would be challenged to consistently employ any of these resource-intensive measures.

Exhibit 14: Autumn Leaves Persist on City Streets



Left: Leaves pile up along the curb on the Central Business District route scheduled for two sweeps per week. December 4, 2015. Right: Leaves and leaf matter on the street, hours after the scheduled street sweeping occurred along a commercial route. This segment is scheduled for bi-weekly street sweeping. November 17, 2015.

Source: Audit team photos.

The City May Not Be Sweeping Enough Overall

DOT has established varying street sweeping frequencies based on the department's route classifications. While business districts are assigned to be swept twice per week, commercial arterials and bikeways are scheduled for only two sweeps per month. Residential areas are swept only once per month. Prior to implementing cost-saving service cuts in 2004, some arterials and bikeways were swept weekly as needed, and residential streets were swept bi-weekly.

While desirable, more frequent street sweeping would significantly raise costs. For example, if the City was to return to bi-weekly residential street sweeping and implemented a weekly sweeping along arterials and bikeways, we estimate residential and commercial street sweeping costs would increase by \$2 million and \$1.4 million, respectively.¹²

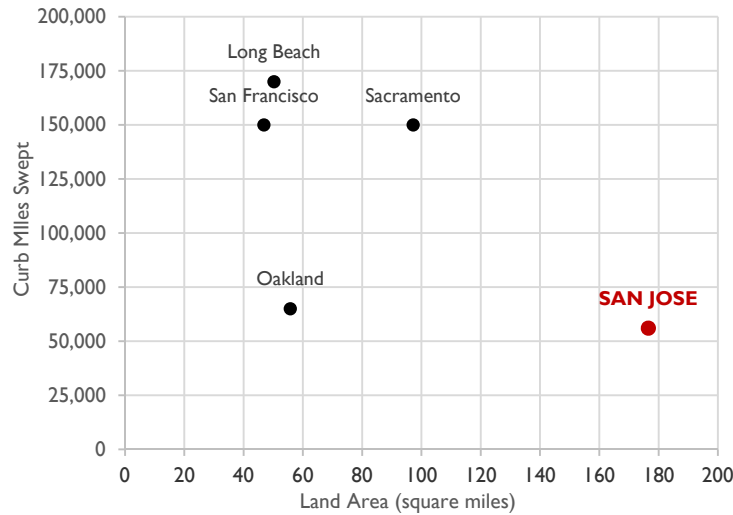
San José Sweeps Less Than Its Peers

Other cities sweep more frequently than San José. This is apparent from comparing curb miles swept at other large California cities. San Francisco reported sweeping 150,000 curb miles in 2014-15. Oakland, whose downtown streets are swept daily,

¹² Estimates for more frequent residential street sweeping is based on the current rates charged by the contractor. Increasing residential street sweeping frequency may require negotiations, a contract amendment, and may have different rates. Estimates for the more frequent commercial street sweeping was based on 2014-15 cost per curb mile, as calculated by the audit team.

reported sweeping over 65,000 curb miles per year. San José swept only 56,300 curb miles in 2014-15. Exhibit 15 below shows that San José swept fewer curb miles than other large California cities, even though it has a far greater land area.

Exhibit 15: Curb Miles Swept vs. Land Areas in Select California Cities



Source: Audit team summary of curb mileage as reported by select California cities, and land areas provided by the U.S. Census Bureau’s 2010 American FactFinder data.

DOT Is Making Strides in Gathering Route Intelligence Through Its New Tracking and Inspection System

DOT inspects street sweeping performance by sampling swept routes and evaluating them with the aforementioned evaluation framework. The department uses this inspection process primarily to ensure that sweeps are satisfactorily performed. Within the in-house street sweeping crew, inspections are conducted by a DOT Senior Maintenance Worker who also serves as crew supervisor. Inspections in the contracted residential street sweeping are assigned to two DOT staff, a Senior Construction Inspector and an Associate Construction Inspector.

In 2014-15, DOT began transitioning from its paper-based inspection process to an online inspection system. With the GPS tracking devices the department is deploying, the system will help DOT “cover” the routes that currently inspectors are too over-extended to complete.¹³ In the city of Costa Mesa, such a system has already been implemented. Costa Mesa staff say that they use their tracking system to obtain live updates on the location and speed of street sweeper vehicles, as well as the live status of the vehicles’ water systems and brooms, and further report that this ability is helpful in supervising street sweeping operations.

¹³ Inspectors randomly inspect routes. DOT seeks to inspect 50 percent of commercial routes and 30 percent of residential routes. The department seeks to inspect 100 percent of routes with parking prohibition signs.

The new system may also assist DOT in achieving secondary goals of inspection. Specifically, it is expected to better assist DOT staff in describing and documenting route conditions, and providing insight on City streets and routes. For example, through the outgoing paper-based inspection system, inspectors are prompted to report street cleanliness, and noteworthy conditions on specific routes, but routes are over 30 curb miles in length. As a result, variable conditions cannot be easily described, nor can specific locations of noteworthy conditions. Staff may be able to use the electronic system to report street cleanliness on specific route segments; the new system can record, store, and report the exact location and time of the report.

The electronic inspection system has been implemented by the residential inspection team and is in the process of being adopted by the in-house sweeping management team. The GPS tracking is being piloted on in-house street sweeping vehicles. The new system can help the department get information to more efficiently plan and deploy street sweeping resources. For instance, if specific route segments are consistently reported and recorded as dirty, DOT can adjust the frequency of sweeps in those areas, or schedule supplemental or enhanced sweeps. This might be especially useful since the current routes and schedules have not been changed in recent memory.

Recommendation #5: DOT and ESD should deploy the new electronic inspection system and GPS-tracking devices to:

- a) Enable supervisory staff to track vehicle location, speed, and activity remotely;
- b) Link route conditions and problems, and street cleanliness to specific locations along street sweeping routes; and
- c) Include electronic tracking and inspection compatibility in future bids for contracted street sweeping services.

Recommendation #6: Based on staff input, route data, the results of past studies, and equipment needs, DOT should:

- a) Review and revise street sweeping schedules and routes;
- b) Consider additional enhanced sweeps in particularly dirty areas as funds and resources become available; and
- c) Develop a plan to periodically review street sweeping schedules and routes that consider street conditions.

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Finding 3 The City Can Do More to Minimize Barriers to Street Sweeping

Summary

There are various obstacles that prevent both in-house and contracted street sweeping crews from performing complete sweeps. Parked cars are the most significant barrier. In San José, signs that prohibit parking during scheduled street sweeping are used on a limited basis, covering only 11 percent of curb miles. Where signs are posted and enforced, compliance appears high, but some signs need to be updated and repaired. In some instances, DOT has the contractor set up temporary “No Parking” signs to provide additional opportunities to clear curbs and gutters of parked cars without installing permanent signage.

Other barriers to street sweeping include yard waste piles, garbage and recycling containers, and low hanging tree branches. The Municipal Code outlines specific rules on yard waste, garbage, and recycling set outs, but loose-in-the-street yard waste, in particular, sometimes hampers street sweeping. In addition, although DOT staff inspect routes, they don’t always record and address barriers. This is partly due to the current paper-based inspection process which also makes it difficult for staff to record and refer issues to the appropriate parties. We recommend that DOT use its new system to better record barriers, which may inform future parking prohibition sign installations and enhanced sweeps, and modify and enforce yard waste, garbage, and recycling collection schedules.

Parked Cars Are a Significant Barrier to Street Sweeping

According to observations, DOT staff, and inspection records, parked cars are the biggest barriers to street sweeping in San José. In addition, each parked car has a compounding effect because Street Sweeper Operators must allow for up to three car lengths around every parked car.

Exhibit 16: Scenes of Parked Cars Blocking Street Sweeping



Left: A residential street packed with parked cars during scheduled street sweeping. Right: Another view of the same street minutes later shows tracks left by a contractor's street sweeper vehicle. Parked cars blocked the curbs from being swept. October 6, 2015.

Source: Audit team photos.

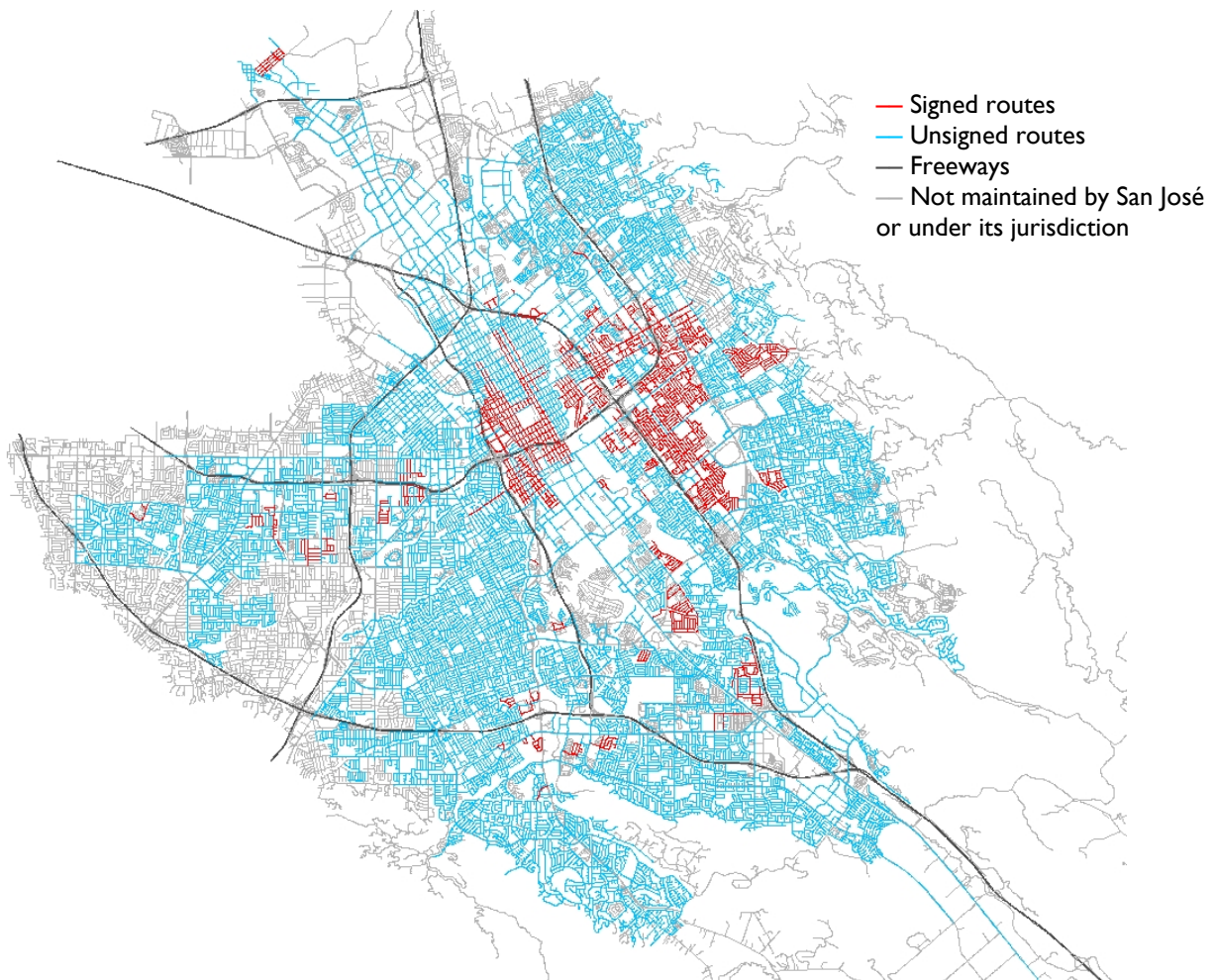
The Municipal Code authorizes the City to prohibit parking “where use of street is necessary for cleaning, repair or construction of street or installation of underground utilities.”¹⁴

Parking Prohibition Signs Are Used on a Limited Basis in San José

Back in 2003, DOT provided a street sweeping program update to the City Council. The department cited a survey that indicated that several large California cities utilized parking prohibitions more widely than San José. At that time, Los Angeles, Anaheim, San Francisco, San Diego, Santa Ana, Long Beach, Sacramento, and Oakland had higher percentages of their streets signed with parking prohibitions. Since then, San José has installed more signs. Between 2003-04 and 2008-09, the City installed about 228 curb miles of new signs and between 2012-13 and 2013-14, another 44 curb miles were added. Nonetheless, today, parking prohibition signs continue to be less utilized in San José than in other California cities. Currently, only 456 of the City's 4,000 curb miles (11 percent) of street sweeping routes have parking prohibition signs installed.

¹⁴ San José Municipal Code 11.36.190

Exhibit 17: Signed and Unsigned Street Sweeping Routes



Source: Audit team map based on DOT street sweeping route data.

The main trigger for new parking prohibition signs are requests by residents, neighborhood groups, or Councilmembers.¹⁵ All requests are considered and result in DOT inspectors confirming the need for signs based on their assessments of parking impacts.¹⁶ As of February 2016, there were 70 requests for new locations in the queue. Due to limited resources, DOT considers installing signs only in those areas where at least 40 percent of curbs miles is impacted by parked cars.

If an area exceeds the parking impact threshold of 40 percent, additional considerations determine if parking prohibition signs are installed, and the priority of their installation. These include neighborhood support and compliance,

¹⁵ New parking prohibition sign installations can also result from inspector field assessments.

¹⁶ In 2012-13, trash load conditions were also considered in selecting which streets would see new signs.

contractor capacity for an expansion of signed sweeps, and parking enforcement availability.

Parking Prohibition Signs Appear to Be Effective

Based on our observations of City streets during scheduled street sweeping, parking prohibition signs effectively discourage parking during scheduled street sweeping. DOT staff also confirm that parking signs effectively clear cars from assigned routes.

Once parking prohibition signs are installed, the City can enforce street sweeping parking prohibitions through citations and fines pursuant to San José Municipal Code 11.36.190. To this end, DOT deploys Parking and Traffic Control Officers to enforce street sweeping parking prohibitions.¹⁷

In San José, parking prohibition signs prohibit parking for up to 5 hours. Limiting street sweeping to strict timeframes presents logistical challenges, and raises costs.¹⁸ In addition, one-time equipment and labor are needed to install the signs. Past DOT and ESD proposals for additional signs have included very significant ongoing costs. For example, in a September 2011 proposal, DOT and ESD estimated that the installation of 100 curb miles of parking prohibition signs would cost \$704,000 to \$804,000; this included between \$175,000 and \$225,000 of ongoing enforcement and inspection expenses.

Parking Citations Appear to Be Somewhat Effective

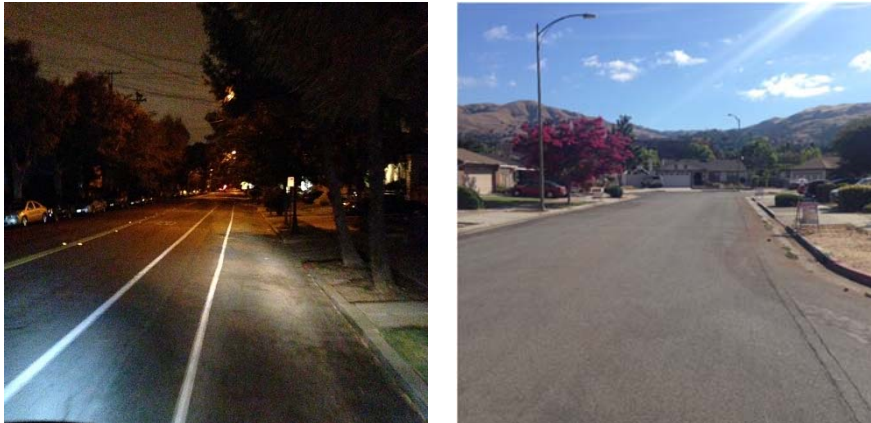
In 2014-15, DOT officers issued about 204,000 parking citations. Of these, about 45,750 (22 percent) were street sweeping-related.¹⁹ Of the 45,750 street sweeping-related citations, 28,900 (63 percent) were issued to vehicles with unique license plates, which suggests that citations may have effectively encouraged compliance. This was the same rate observed in 2013-14.

¹⁷ DOT's Parking Services Division manages parking, implements policies and regulations, and ensures understanding and compliance with policies and regulations. Officers are assigned to patrol the City in parking enforcement zones which are aligned with SJPD districts.

¹⁸ The contractor's compensation rate for sweeping along signed routes is \$79.08 per curb mile – over 50 percent higher than the regular non-signed rate of \$52.10 per curb mile.

¹⁹ 649 of the 45,754 citations issued were contested. Of these, 490 (76 percent) were upheld.

Exhibit 18: Drivers Abide by Parking Prohibition Signs



Left: A commercial route with parking prohibition signs is completely cleared of parked cars during regularly scheduled street sweeping on August 20, 2015. Right: A residential route posted with temporary day-long parking prohibition signs is completely cleared of parked cars during an enhanced sweep on August 14, 2015. Source: Audit team photos.

Between January 1, 2011 and June 30, 2015, street sweeping parking citation amounts in San José were \$50. This seemed generally in line with other California cities. For example, 2014-15 street sweeping fines were \$66 in San Francisco; \$52.50 in San Diego; and \$73 in Los Angeles. In 2015-16, street sweeping fines in San José increased to \$60.

In addition to being an effective means to address parking barriers to street sweeping, citations contribute to the General Fund. The City receives \$47.50 of each \$60 street sweeping citation. If past citation trends continue, this will amount to a total of \$2.1 million in 2015-16.²⁰ On the other hand, DOT estimates that it costs \$36 to issue and adjudicate each citation. This does not include the cost of signage.

Enhanced Sweeps Temporarily Remove Cars Without Installing Permanent Signage

For routes without parking prohibition signs, supplemental or “enhanced” sweeps may be used to address parked cars that prevent thorough sweeps. The City’s contract with GreenWaste allows for up to 14 special sweeps covering a total of 42 curb miles per month throughout the City. These enhanced sweeps enable DOT to supplement its existing street sweeping schedule by setting up temporary and enforceable “No Parking” signs during 9-hour timeframes. Enhanced sweeps are also used to verify neighborhoods’ fit for permanent signage.

²⁰ \$12.50 of each street sweeping citation goes to jail fees and court fees.

Enhanced sweeps are currently primarily initiated by request and implemented after street sweeping inspectors verify that more than 40 percent of the street is obstructed by parked cars during scheduled sweeps.

Enhanced Sweeps Are Expensive

Expanding the use of enhanced sweeps may be a viable option for neighborhoods opposed to the installation of permanent parking prohibition signs. However, enhanced sweeps present significant costs. For example, GreenWaste charges \$282.60 per curb mile for enhanced sweeps in 2014-15 and 2015-16.²¹ This is more than triple the rate for GreenWaste's signed street sweeping service (\$79.08 per curb mile) and quintuple the rate for regular sweeps (\$52.10 per curb mile).²² The City performed 25 curb miles of enhanced sweeps in 2014-15.

Additional Signs Are Needed

Additional signage would help clear these streets for sweeping. Maintaining the status quo makes it difficult for street sweepers to efficiently carry out their responsibilities, and risks inefficient use of limited resources.

Recommendation #7: DOT should install additional permanent parking prohibition signs and/or expand enhanced sweeps based on need, as funds become available.

Ensuring Accurate and Legible Parking Prohibition Signs

Where they are posted, street sweeping parking prohibition signs can be a useful form of outreach. Ideally, they provide up-to-date street sweeping schedules. However, DOT does not regularly inspect the condition and accuracy of these signs.

While some parking prohibition signs provide very specific timeframes for street sweeping (e.g. first and third Wednesday of the month between 1:00am and 6:00am), some signs do not reflect changes in service frequencies. For example, we observed a few commercial routes that have signs prohibiting parking every week, even though street sweeping is scheduled only on a bi-weekly basis. These incorrect signs can misinform members of the public about street sweeping schedules and unnecessarily constrain parking during times when street sweeping is not scheduled. We also saw, along the same routes, parking prohibition signs

²¹ When GreenWaste posts temporary "No Parking" signs. There is another, lower, fee if DOT staff post the temporary signs, but this is rarely used.

²² The City's contract with GreenWaste also includes special rates for tow-enforced street sweeping service, but this only used when there are abandoned vehicles.

that were damaged by accident, vandalism, and wear-and-tear – some to the point of being illegible.

DOT's staff intend to inspect 100 percent of signed routes. Since signed routes already get more inspection coverage, perhaps DOT could include a review of the parking prohibition signs as part of regularly-scheduled inspections.

Recommendation #8: DOT should: a) have inspectors review and report problems with the parking prohibition signs as part of their routine inspections, and b) update and maintain parking prohibition signs as needed.

Yard Waste and Solid Waste Set Outs Present Challenges

Unlike most other cities, San José allows residents to place yard trimmings “loose-in-the-street” instead of in containers. In 2012, ESD reported on the results of pilot studies it conducted to assess its collection methods, including loose-in-street. According to ESD:

“Overall, cart collection resulted in higher levels of debris accumulation in the catch basins than in areas with [loose-in-the-street] collection. This may be attributed to the lack of a mechanism to collect leaf debris in the street gutter, whereas with [loose-in-the-street] collection the claw tractor removes most leaf debris from the street surface. This is particularly problematic in areas with dense foliage. During heavy leaf fall, the claw tractor can clear each side of the street of leaves accumulated in the gutters.”

Based on ESD's determination that loose-in-the-street resulted in more yard waste being collected – thereby resulting in less organic material in storm drains – the department continued the status quo. Nonetheless, yard waste is spread around, and creates dirty street conditions and hazards to the public.

Exhibit 19: Effects of Residential Loose-in-the-Street in San José



Left: “Loose-in-the-street” allows residents to set out more yard waste than can fit into containers. July 12, 2015. Right: Yard waste debris left behind shortly after the loose-in-the-street pick-up, and eight days before scheduled monthly street sweeping. September 28, 2015.

Source: Audit team photos.

Yard Waste Can Present Barriers to Street Sweeping

In residential areas, weekly yard waste collection is scheduled one day before street sweeping, so remnants can be swept up, but as mentioned in Finding 2, residential street sweeping occurs only monthly, while loose-in-the-street collection occurs weekly. Furthermore, residents do not always adhere to pick-up schedules, and as a result, yard waste is set out on any day of the week.

As discussed earlier, street sweeping vehicles are delicate and can easily be damaged by hidden branches and other objects. During enhanced sweeps performed by GreenWaste, DOT staff precede street sweeper operators with rakes and hand brooms to manually pick up piles of yard waste that the street sweeper cannot pick up. This, however, is resource intensive and generally DOT does not manually pick up yard waste during regularly scheduled street sweeping routes.

DOT staff estimate that yard waste makes up about 20 percent of the barriers that street sweepers face. Exhibit 20 below shows examples.

Exhibit 20: Yard Waste Interferes With Scheduled Sweeps



Yard waste manually collected by DOT staff in advance of a GreenWaste enhanced sweep. The cumulative yard waste collected along this residential route was significant enough to fill the bed of a pick-up truck. August 14, 2015.

Source: Audit team photographs.



A small pile of leaves along a residential route that was scheduled for street sweeping. August 14, 2015.



A pile of twigs and palm fronds that a GreenWaste operator avoided during a scheduled residential sweep. August 14, 2015.

ESD and the Department of Planning Building and Code Enforcement can enforce restrictions on yard waste set out by deploying inspectors, but this is resource-intensive.

In addition, as currently written, the Municipal Code allows uncontainerized yard waste to persist during scheduled street sweeping times. Specifically, yard waste piles are allowed until the “day immediately following the scheduled collection day.” That is when street sweeping is scheduled.

Moreover, along some routes, street sweeping schedules may conflict with garbage collection days. Dumpsters and garbage and recycling carts set out at the curb for collection subsequently present additional obstacles to thorough sweeps. These conflicts could be results of long-standing collection schedules not being adjusted to street sweeping schedules and vice versa.

Recommendation #9: DOT and ESD should use the new electronic inspection system to identify and resolve conflicts between street sweeping, yard waste, garbage, and recycling schedules.

The City Would Benefit From Improved Reporting of Issues for Follow-Up

Chapter 9 of the Municipal Code tasks property owners and occupants with keeping tidy sidewalks and public places. Specifically, occupants are prohibited from sweeping or depositing “*any solid waste in any gutter, street or other public place within the city. Persons owning or occupying property shall keep the sidewalk in front of their premises free of solid waste.*” Street sweeping would be supported if property occupants adhered to all of the Municipal Code provisions, such as keeping gutters clear.

Another area where better compliance to the Municipal Code is needed is trimming street trees. The Municipal Code tasks property owners to provide “*a minimum eight-foot vertical pedestrian clearance from the top of the sidewalk and a minimum fourteen-foot vertical vehicle clearance from the pavement, to any part of a street tree.*” Nonetheless, street trees are occasional barriers to street sweeping.

Trash and dumped items are also occasional barriers to street sweeping. One DOT staff member reported that dumped items are on the rise throughout the City.²³ Another DOT staff member identified uneven and lifted sections of pavement as the most worrisome barriers to street sweeping. Not only do these prevent the operators from sweeping the curb, but they can be difficult to see and can damage street sweeping vehicles.

²³ In 2016, the City began a pilot program to address illegal dumping. On January 2, GreenTeam of San José, one of the City’s contracted haulers, cleaned 62 sites and removed 4.6 tons of illegally dumped material from City streets, including about 80 pieces of furniture and 70 bags of trash. Following the pilot, staff will evaluate the program to determine the most effective and efficient ways to keep streets and neighborhoods clean.

Exhibit 21: Various Barriers to Street Sweeping



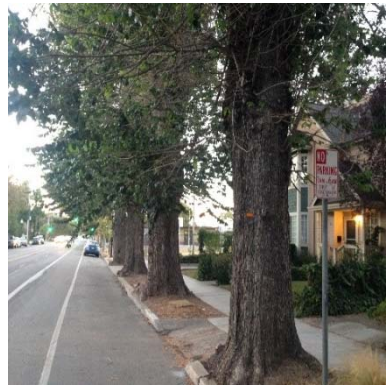
↑ Disregarded items along a residential street during scheduled contracted street sweeping on August 14, 2015.



↑ Items dumped curbside along a commercial street on July 12, 2015.



↑ A lifted concrete slab along the Central Business District route during scheduled street sweeping on August 20, 2015.



↑ A block-long segment of a commercial street blocked by protruding tree limbs that hang within 14 feet from the street level on August 21, 2015.



↑ Palm fronds straddle the curb during an in-house sweep on August 20, 2015.



↑ A segment of the Central Business District route with dumpsters blocking the curb during in-house street sweeping on August 20, 2015.

Source: Audit team photos.

The Outgoing Paper-Based Inspection Process Complicated Reporting and Tracking of Problems

Both the contractor and in-house street sweeping crews can report to the inspectors or their supervisors obstacles encountered along their routes that need to be addressed. The inspectors and supervisors then go to the relevant routes to verify problems, before referring issues to other City staff for resolution. Inspectors and supervisors record their own observations on inspection forms, which contain a section on route conditions. This may include weather, trees, parked cars, curb and gutter conditions, and pavement conditions that might impact sweeper performance.

However, the current paper-based inspection process does not facilitate easy archiving for future reference, or easy referral to appropriate parties that can address issues. Furthermore, completed inspection records revealed that these property-based barriers were not always recorded, and hence may not be referred to responsible parties.

Recommendation #10: DOT should use its new electronic inspection system to streamline recording and referring barriers and violations.

Complaints About Parking Citations

DOT aims to coordinate sweeping schedules with its parking enforcement officers to the extent possible so as not to issue citations when a sweep did not occur. However, some service changes, such as absences in the in-house crew, are difficult to predict.²⁴ DOT, GreenWaste, and Council staff often receive complaints from car owners about receiving citations when street sweeping did not occur. However, most cases are dismissed after complaints are investigated and scheduled sweeps are confirmed to have occurred.

Based on existing records, it is difficult to accurately calculate the true extent to which citations are issued during cancelled or incomplete sweeps. Our review of 2014-15 citation data revealed a few instances of vehicles being cited for street sweeping violations even when scheduled street sweeping never occurred. Even though that is the City's prerogative, DOT reports this is not its intent, and that it will, where possible, continue to avoid enforcement on days when sweeps did not occur.

²⁴ GreenWaste is required by its contract to have backup sweeper operators in order to fulfill its contract. In cases where inspection staff determine re-sweep is necessary, GreenWaste is called for a re-sweep.

Finding 4 The City Should Provide Better Information to the Public

Summary

Public education and outreach can communicate the importance of clean curbs and gutters in supporting the City's stormwater pollution prevention and storm sewer maintenance goals. In addition, outreach activities should include reminders and information on clearing barriers to street sweeping in order to maximize the effect of scheduled sweeps. Outreach responsibilities are currently spread between the City's residential street sweeping contractor (GreenWaste), ESD, DOT, and City Council offices. GreenWaste has the most outreach responsibilities and is primarily engaged in attending community meetings and mailing annual post cards to targeted populations. ESD has moved much of its outreach online through informational websites and an online collection day and street sweeping schedule look up tool; however, some of the information in the tool is outdated and incomplete. Also, DOT relies on Council staff for outreach regarding service delivery changes. In our opinion, given the variety of players, messaging should be better coordinated in order to ensure consistency across the City. We recommend DOT and ESD address these problems, issue more reminders to more residents to help clear obstacles, and ensure that residents are engaged and informed.

Outreach and Public Education Communicate the Value of Clean Gutters and Curbs

According to the United States Environmental Protection Agency (EPA):

Because stormwater runoff is generated from dispersed land surfaces – pavements, yards, driveways, and roofs – efforts to control stormwater pollution must consider individual, household, and public behaviors and activities that can generate pollution from these surfaces.

The EPA also identifies public education and outreach as one of six best management practices for stormwater management. Public education and outreach is needed in San José, where a 2014 ESD survey found that only 49 percent of residents understand that any substances that get washed down streets and gutters end up in the bay without treatment.

Street sweeping outreach and public education should include teaching residents about street sweeping's role in stormwater management, as well as maintaining storm drains.

Outreach Responsibilities Are Spread Across GreenWaste, City Departments, and the City Council

In addition to educating people of the importance of clean streets, outreach is important in informing and reminding people of their street sweeping schedules.

Green Waste

GreenWaste, which is required by its contract to prepare and implement a Public Education and Outreach Program (PEOP) every year, has the most direct outreach responsibilities in the street sweeping program. Per the contract, the PEOP must include a minimum of four campaigns and be designed to increase diversion and participation and/or target problem areas in the contractor's service district.²⁵ In 2014 and 2015, one out of its four campaigns was dedicated to street sweeping; specific outreach methods included attending community meetings, posting truck signs, and distributing targeted post cards for neighborhoods with recurring problems. GreenWaste proactively identifies community meetings and neighborhoods for targeted post cards (see Appendix A for the post card).

GreenWaste's contract also includes a provision to distribute flyers or door hangers up to two times per month as a sweep day reminder. According to ESD, this provision has been used a few times before, and was last used in 2012 in neighborhoods where GreenWaste had complaints (see Appendix B).

Environment Services Department

ESD's role in outreach involves working with GreenWaste to develop and approve its annual PEOP; monitoring and advising on outreach activities during the year; developing and distributing multi-lingual mailers, post cards, signs, and flyers; and maintaining webpages on keeping streets clean and street sweeping's role in watershed protection. ESD discontinued its annual citywide collection and sweep day calendar and street sweeping mailer over four years ago; an online collection day look up tool is now used instead.

Department of Transportation

DOT relies on ESD and GreenWaste for developing and distributing outreach material to residents. DOT's primary form of outreach is through installing and enforcing parking prohibition signs. Parking prohibition signs, discussed in Finding 3, can serve as outreach in that they are permanent fixtures reminding residents the days and hours when street sweeping occurs. Although inspectors answer questions from residents during the course of their regular duties, they are not able to dedicate more time to outreach. At times, DOT street sweeping inspectors

²⁵ In addition to residential street sweeping, the City has contracted with GreenWaste for collecting yard trimmings, public litter containers, and neighborhood cleanups, and processing recycling. GreenWaste's outreach activities address these other services as well.

have independently distributed flyers as a reminder of street sweep days as well as service change notifications.

Due to limited resources, when new signs are planned for installation, DOT relies on Council staff to conduct outreach to areas identified for signage. Typically, DOT develops a flyer and sends it to Council staff for translation and review, and Council staff distribute the flyers (see Appendix C).

Existing Outreach Resources Can Be Enhanced

ESD and DOT should maximize existing contract provisions and request that GreenWaste more regularly distribute reminders of sweep days in areas where signs are not posted. Without enforcement and the threat of tickets, and with limited reminders, periodic reminders throughout the year may help inform and remind residents to move their cars on sweep days, reschedule yardwork, trim trees, etc.

Although outreach may not be as effective as permanent signage, reminders may also be more cost effective than paying for enhanced or signed sweeps (see Finding 3).

Additionally, as apparent in Appendices A, B, and C, street sweeping outreach materials distributed across the City vary in design. ESD has dedicated communications and design staff that support many of the department's outreach functions; DOT, on the other hand, does not, and at times has relied on line staff to develop materials. As a result, messaging in these materials may not be consistent and may not seem official to the residents who receive them.

Recommendation #11: DOT and ESD should fully utilize existing contract provisions to distribute more flyer and door hanger reminders to facilitate cleaner sweeps.

Recommendation #12: DOT and ESD should collaboratively update and standardize outreach materials for distribution (e.g., flyers, messaging).

ESD's Online Collection Day Look Up Tool Should Be Improved

To replace the annual street sweeping mailers and calendars, ESD uses its street sweeping website to provide program information to the public. As part of this, ESD maintains an online look up tool for neighborhoods.²⁶ Residents are referred

²⁶ www.sjenvironment.org/lookup

to the tool through annual mailers from the garbage and recycling haulers, GreenWaste's targeted post card, or by the City's call center.

However, due to system limitations, the existing online look up tool does not include sweep days for businesses or residences served by the in-house street sweeping crews. Over 11,200, or 5 percent of residential addresses in the look up tool return "N/A" instead of a specific day and time. In addition, the data behind the look up tool may be out of date. For example, we noted a discrepancy between one neighborhood's parking prohibition signs and what is stated online.

In July 2015, the City replaced the garbage and recycling billing system that provided much of the data behind the look up tool. As a result, the tool was not being updated. However, City staff expect to have a new tool online shortly.

Recommendation #13: DOT and ESD should update the collection day look up tool to include all residences and businesses receiving street sweeping services.

The City Should Standardize How It Engages and Informs Residents of Service Changes

As discussed in Finding 3, DOT considers requests for the installation of new parking prohibition signs. When a request is received, an inspector will first conduct a parking assessment, then schedules eligible neighborhoods for an enhanced sweep to test how effective permanent signage might be. The final step involves assessing funding availability and coordinating parking enforcement, GreenWaste, and inspector schedules.

DOT also seeks feedback from Councilmember offices to proceed with sign installations; however, there does not appear to be a way to gauge community support. The decision used to be informed at public community meetings. Due to staffing shortages, community meetings have not occurred in recent years to gauge support or opposition to new signs.²⁷

As mentioned earlier, after deciding to install new signs, DOT relies on the Councilmember offices to handle outreach in specific areas affected by street sweeping service changes. DOT prepares standardized flyers, timelines, and maps for Council offices to use, but the Council offices can adopt varying forms of

²⁷ Other cities have formal processes. For example, the city of Santa Clara requires a 50 percent-plus-one majority before signs can be installed. The city of San Diego requires a 75 percent agreement among potentially affected residents. These rules tend to make it more difficult for additional signs to be installed, and may run counter to stormwater pollution priorities.

outreach ranging from physical distribution of flyers to online postings in community newsletters, to notices on the social network site, “Nextdoor.”

While Council offices may be the best entities to provide specifically targeted information to residents, in our opinion, a centralized communication process should be used to ensure consistent messaging throughout the City. DOT should follow up with Council offices to ensure that timely outreach has occurred. This could help preserve opportunities for residents to voice their concerns before service changes occur, and reduce the possibility of residents unwittingly violating parking prohibitions.

Recommendation #14: DOT should ensure that prior notification is given to neighborhoods where signs will be installed.

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Conclusion

The City of San José's street sweeping program provides an important service, but it is under-resourced. More investment in street sweeping is needed to ensure the program is achieving its goals of preventing pollutants from entering waterways; removing debris and sediments that can harm pedestrians, bicyclists, and motorists; preventing clogged storm drains which can lead to ponding and flooding; and preserving tidy street appearances.

RECOMMENDATIONS

Recommendation #1: DOT's in-house street sweeping operation should stop emptying street sweepings onto the street.

Recommendation #2: To complete commercial street sweeping routes and meet its service commitments, DOT should address existing staffing and equipment shortages and/or pursue contracted street sweeping services to supplement existing efforts. This will require additional funding.

Recommendation #3: Going forward, DOT should periodically monitor the comparative effectiveness, costs, and efficiency of in-house and contracted street sweeping operations, and the threshold at which alternative service delivery should be considered.

Recommendation #4: The City should identify additional funding to improve street sweeping service citywide.

Recommendation #5: DOT and ESD should deploy the new electronic inspection system and GPS-tracking devices to:

- a) Enable supervisory staff to track vehicle location, speed, and activity remotely;
- b) Link route conditions and problems, and street cleanliness to specific locations along street sweeping routes; and
- c) Include electronic tracking and inspection compatibility in future bids for contracted street sweeping services.

Recommendation #6: Based on staff input, route data, the results of past studies, and equipment needs, DOT should:

- a) Review and revise street sweeping schedules and routes;
- b) Consider additional enhanced sweeps in particularly dirty areas as funds and resources become available; and
- c) Develop a plan to periodically review street sweeping schedules and routes that consider street conditions.

Street Sweeping

Recommendation #7: DOT should install additional permanent parking prohibition signs and/or expand enhanced sweeps based on need, as funds become available.

Recommendation #8: DOT should: a) have inspectors review and report problems with the parking prohibition signs as part of their routine inspections, and b) update and maintain parking prohibition signs as needed.

Recommendation #9: DOT and ESD should use the new electronic inspection system to identify and resolve conflicts between street sweeping, yard waste, garbage, and recycling schedules.

Recommendation #10: DOT should use its new electronic inspection system to streamline recording and referring barriers and violations.

Recommendation #11: DOT and ESD should fully utilize existing contract provisions to distribute more flyer and door hanger reminders to facilitate cleaner sweeps.


Recommendation #12: DOT and ESD should collaboratively update and standardize outreach materials for distribution (e.g., flyers, messaging).

Recommendation #13: DOT and ESD should update the collection day look up tool to include all residences and businesses receiving street sweeping services.

Recommendation #14: DOT should ensure that prior notification is given to neighborhoods where signs will be installed.

APPENDIX A

Post Cards for Targeted Outreach (front and back)



For a clean sweep, clear the street!

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY
Environmental Services

greenwaste
a brighter shade of green

Streets are swept monthly on the day after garbage collection. Street sweeping protects our environment by removing harmful pollutants and metal particles from the street. Although virtually invisible, these particles enter storm drains, creeks, and our Bay, where they harm fish and wildlife. Moving your car on sweep day is very important to ensure clean streets for San José.

Find your sweep day at
www.sjenvironment.org/lookup.

Here are a few tips for a clean sweep!

- Move your vehicle on sweep day by 6:00 am – One parked car prevents about three car lengths of curb from being swept.
- Prune overhanging tree branches – branches must be at least 13 feet above the street for the sweeper to reach the curb. Pruning street trees is the property owner's responsibility and requires a free permit, available by emailing arborist@sanjoseca.gov or calling 408.794.1901.
- Rake up leaves or remaining yard trimmings – Don't re-pile; set them out on your next collection day.

Visit www.sjenvironment.org/lookup to look up your monthly street sweeping day.

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY
Environmental Services

greenwaste
a brighter shade of green

APPENDIX B

Sweep Day Reminders: Flyer

**This street
will be swept on:**

Day & Date

Please move your vehicle.



Thank You!
For cleaner streets, it's your move!

The flyer features a blue and white street sweeper truck on the left, with grey lines representing swept paths extending to the right. The entire graphic is set against a white background with a green grass border at the bottom and a blue decorative border at the top.

APPENDIX C

DOT Flyer for New Parking Prohibition Signs (front)



YOU ARE PART OF THE SOLUTION
IN BEAUTIFYING YOUR NEIGHBORHOOD BY PREVENTING UNNECESSARY DEBRIS
AND RUNOFF OF HARMFUL MATERIALS FROM ENTERING THE BAY.

RESIDENTS ON YOUR STREET HAVE REQUESTED PERMANENT "NO PARKING" STREET
SWEEPING SIGNS.

THIS WILL:

- CREATE MORE EFFECTIVE STREET SWEEPING.
- REDUCE TRASH AND DEBRIS CURRENTLY UNSWEPT BY SWEEPERS
AVOIDING PARKED CARS.
- BE REGULATED IN A 5 HOUR, ONE DAY A MONTH SCHEDULE (EITHER, 7:00
a.m. to 12:00 p.m. or 12:30 p.m. to 5:00 p.m.).

FAILURE TO REMOVE YOUR CAR FROM THE STREET IN A SIGNED AREA WILL RESULT
IN A CITATION.

YOUR STREET SWEEPING DAY IS:

3rd THURSDAY OF THE MONTH

YOUR ASSISTANCE IS APPRECIATED. THROUGH YOUR COOPERATION, WE WILL
HAVE CLEAN STREETS.

FOR MORE INFORMATION, CALL THE CITY OF SAN JOSE DEPARTMENT OF TRANSPORTATION
(408) 794-1902

**SIGN INSTALLATION WILL OCCUR:
May-June, 2015**

DOT Flyer for New Parking Prohibition Signs (back)

USTED ES PARTE DE LA SOLUCION EN HACER MAS BELLA SU COMUNIDAD, PREVIENIENDO QUE LA BASURA INECESARIA Y MATERIALES DAÑOSOS ENTREN LA BAHIA.

LOS RESIDENTES EN SU COMUNIDAD HAN SOLICITADO ANUNCIOS PERMANENTES QUE INDICAN "NO PARKING" (NO ESTACIONAR) EN DIAS DE LIMPIEZA.

ESTO RESULTARA:

- EN UN MEJOR MANTENIMIENTO DE LAS CALLES
- REDUCCION EN BASURA NO RECOGIDA A CAUSA DE CARROS ESTACIONADOS
- UN HORARIO FIJO, UN DIA AL MES POR 5 HORAS (de 7:00 AM a 12:00PM o de 12:30 PM a 5:00 PM)

AL NO MOVER SU CARRO DE LA AREA INDICADA "NO PARKING" EN DIAS Y HORAS DE LIMPIEZA, RESULTARA EN UNA INFRACCION

SU DIA DE LIMPIEZA SERA:

Tercer Jueves del mes

SU COOPERACION SERA APRECIADA. CON SU ASISTENCIA PODEMOS MANTENER LAS CALLES LIMPIAS

Para [mas](#) información llame a la Ciudad de San José Departamento de Transporte al 408.794.1902

INSTALACION DE ANUNCIOS:

Mayo-Junio, 2015

QUY VI GOP PHAN TRONG GIAI PHAP LAM DEP KHU PHO CUA QUY VI BANG CACH NGAN CHAN RAC RUOI VA CAC VAT LIEU NGUY HAI CHAY VAO VINH.

DAN CHUNG YEU CAU DUNG CAC BANG QUET DUONG CO DINH VOI HANG CHU "NO PARKING/CAM ĐAU XE".

ĐIỀU NÀY SẼ:

- LÀM CHO CÔNG TÁC QUÉT ĐƯỜNG HIỆU QUẢ HƠN;
- GIẢM BỚT VIỆC RÁC RỐI KHÔNG ĐƯỢC QUÉT VÌ XE ĐẬU;
- ĐƯỢC ÁP DỤNG TRONG 3 GIỜ, MỘT THÁNG MỘT NGÀY (từ 9 giờ sáng đến 12 giờ trưa hoặc từ 1 giờ đến 4 giờ chiều);

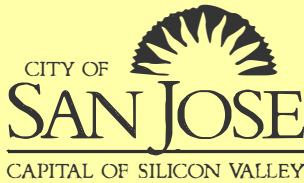
NHẬN ĐƯỢC GIẤY PHẠT NẾU QUY VỊ ĐẬU XE TRÊN ĐƯỜNG CÓ BANG CÂM

NGÀY QUÉT ĐƯỜNG CỦA QUÝ VỊ LÀ:

CẢM ƠN SỰ HỢP TÁC CỦA QUÝ VỊ. CHÚNG TA SẼ CÓ NHUNG ĐƯƠNG PHỒ SẠCH SẼ NHỚ SỰ HỢP TÁC NÀY.

ĐỂ BIẾT THÊM TIN TỨC, XIN GỌI SỐ GIAO THÔNG VẬN TẢI THÀNH PHỐ SAN JOSE 408.794.1902

**BẢNG QUÉT ĐƯỜNG SẼ DÙNG VÀO:
, 2015**



Memorandum

TO: SHARON ERICKSON
CITY AUDITOR

FROM: Jim Ortbal
Kerrie Romanow

**SUBJECT: RESPONSE TO THE AUDIT OF
STREET SWEEPING**

DATE: February 26, 2016

Approved

D. OSyL

Date

2/26/16

The Administration has reviewed the *Audit of Street Sweeping* and is in overall agreement with the recommendations identified in the report. The following are the Administration's responses to each recommendation.

BACKGROUND

San Jose streets are swept to remove pollutants and debris from our streets and prevent them from entering our waterways. The Departments of Transportation (DOT) and Environmental Services (ESD) manage the hybrid street sweeping program in which DOT uses in-house maintenance crews to sweep major streets (referred to in the audit as commercial streets), and ESD manages a contract with GreenWaste Recovery, Inc. (GreenWaste) for the sweeping of local neighborhood and residential streets, which are inspected by DOT staff. ESD, DOT and GreenWaste provide general outreach and targeted outreach through multiple avenues, informing residents about the benefits of street sweeping and reminders on ways to ensure a clean sweep.

RECOMMENDATIONS AND ADMINISTRATION'S RESPONSE

Recommendation #1: DOT's in-house street sweeping operation should stop emptying street sweepings onto the street.

Administration Response to Recommendation #1: The Administration agrees with this recommendation and will evaluate operational and cost impacts of various options to this current process.

When street sweeping, debris is picked up by the sweeper and collected in a hopper on the vehicle. A hopper will fill up and need to be emptied two to five times per night – sometimes more during the leaf drop season – depending on the amount of debris being picked up. Currently, DOT's in-house street sweeping crews empty their hoppers for temporary storage at various remote street locations or undeveloped City property sites along or closely near assigned

routes. These locations do not have any containment facilities or coverage for the dumped debris. A large single truck subsequently picks up the debris at all of the locations, typically on the same day during the following dayshift or soon after. The use of temporary collection sites minimizes the time it takes to empty the debris hoppers and resume sweeping a route. Options to this method include having DOT's sweeper operators return to one of the City's three maintenance yards where debris can be dumped, or deploying storage containers (dumpsters) at remote locations where the debris can be dumped, contained, and later taken to one of the City's maintenance yards or the land fill.

The City has utilized the practice of emptying the debris at locations throughout the City to minimize the costs or operational impacts of the other options due to limited staffing, equipment and funding. Breaking off of a route and often driving a long distance to a maintenance yard each time the hopper must be emptied is very inefficient and would greatly reduce the number of street miles swept each night and further reduce the number of routes completed as scheduled unless more staffing and equipment were obtained. The use of containers located throughout the City is a better alternative, although it also has operational and cost impacts. For example, only three of the City's street sweeper vehicles are able to dump their hopper contents into a container. There are also challenges in terms of where and when to place and pick up the containers, and added costs associated with deploying and emptying them. Regardless, DOT agrees that alternatives need to be considered and will evaluate operational and cost impacts of various options to the current process being used.

Yellow – To implement this recommendation, the reallocation or addition of resources will likely be required. DOT will evaluate the operational and cost impacts of the recommendation in the next 6-12 months. Results from this assessment may need to be evaluated by the Administration as part of a future budget process in light of the City's budget outlook and other city-wide and utility funding priorities.

Recommendation #2: To complete commercial street sweeping routes and meet its service commitments, DOT should address existing staffing and equipment shortages and/or pursue contracted street sweeping services to supplement existing efforts. This will require additional funding.

Administration Response to Recommendation #2: The Administration agrees with this recommendation and the importance of completing all major (commercial) street sweeping routes on schedule. However, as the City Auditor stated, additional resources are required for DOT to accomplish it. Nonetheless, DOT will continue to evaluate and implement program efficiencies and other changes within existing resource levels that enable DOT to more fully and consistently sweep the City's major streets.

Yellow – To implement this recommendation, the reallocation or addition of resources will be required. This will need to be evaluated by the Administration as part of the 2016-2017 or a

future budget process in light of the City's budget outlook and other city-wide and utility funding priorities.

Recommendation #3: Going forward, DOT should periodically monitor the comparative effectiveness, costs, and efficiency of in-house and contracted street sweeping operations, and the threshold at which alternative service delivery should be considered.

Administration Response to Recommendation #3: The Administration agrees with this recommendation. DOT has previously performed this evaluation and will now periodically complete an evaluation during which performance data and other relevant information will be collected and analyzed to evaluate the effectiveness, costs, and efficiency of the in-house sweeping program. The results of the evaluation will be used to compare the in-house and contracted sweeping operations.

Green – The Administration has already implemented this recommendation. DOT has previously evaluated the comparative effectiveness, costs, and efficiency between the in-house program and contracted sweeping operations. DOT will now complete the analysis every two years or when significant events occur, such as large changes to funding or service levels, major revisions to regulatory requirements, or work to establish a new residential street sweeping contract.

Recommendation #4: The City should identify additional funding to improve street sweeping service citywide.

Administration Response to Recommendation #4: The Administration agrees that additional funding could improve street sweeping services; however, given the competing priorities of utility funds, a rate increase of 3-10% to fund the needed resources is not recommended at this time.

Yellow – To implement this recommendation, the reallocation or addition of resources will be required. This will need to be evaluated by the Administration as part of a future budget process in light of the City's budget outlook and other citywide and utility funding priorities.

Recommendation #5: DOT and ESD should deploy the new electronic inspection system and GPS-tracking devices to:

- a) Enable supervisory staff to track vehicle location, speed, and activity remotely;
- b) Link route conditions and problems, and street cleanliness to specific locations along street sweeping routes; and
- c) Include electronic tracking and inspection compatibility in future bids for contracted street sweeping services.

Administration Response to Recommendation #5: The Administration agrees with this recommendation and that technological innovations such as the electronic inspection system and GPS deployment will enhance efficiency.

- a) DOT participated in the City's pilot program to evaluate the use of GPS tracking devices and has a tracking device installed on one of its in-house sweepers that enable supervisory staff to track vehicle location, speed and activity remotely. Results from the pilot program were positive and Public Works is working to procure a GPS tracking system that would allow DOT to continue and expand the program in the future. DOT will need to identify additional resources needed to permanently implement the system. The current agreement with GreenWaste does not include GPS monitoring of street sweeping vehicles for the contractual residential sweeping program.

Yellow – To implement this recommendation, the reallocation or addition of resources may be required. The costs and operational impacts to implement the GPS tracking system are being evaluated by DOT in the next 6-12 months. This will need to be evaluated by the Administration and could be part of a future budget process in light of the City's budget outlook and other citywide and utility funding priorities.

- b) The Administration agrees that the newly implemented electronic inspection system will help capture a more accurate snapshot of major (commercial) and residential street sweeping effectiveness. The system currently provides a generalized assessment of an individual route, including parking impacts, curb and gutter conditions, yard waste debris, and tree clearance concerns. Work to expand the capability of the system to provide data for specific street segments within the routes is being considered; however, the priority and timing of this project must be weighed against the many other data and information system needs of DOT given the limited technology resources currently available. Other major data analytic and technology projects with critical service improvement implications, such as traffic safety (Vision Zero), sanitary sewer maintenance, and streetlight repairs and innovations, are currently being given a higher level of priority.

Green – DOT can implement this recommendation in the next 2 years.

- c) ESD can incorporate electronic inspection and GPS tracking and management capabilities into future residential street sweeping services agreements. A Request for Proposals for the next round of hauler contracts is expected to be released in 2017-2018, with new services beginning July 1, 2021.

Yellow – ESD can implement this recommendation as part of the next residential street sweeping service agreement with new services beginning July 1, 2021.

Recommendation #6: Based on staff input, route data, the results of past studies, and equipment needs, DOT should:

- a) Review and revise street sweeping schedules and routes;
- b) Consider additional enhanced sweeps in particularly dirty areas as funds and resources become available; and
- c) Develop a plan to periodically review street sweeping schedules and routes that consider street conditions.

Administration Response to Recommendation #6: The Administration agrees with this recommendation, although the reallocation or addition of resources is required to implement.

- a) DOT is currently reviewing the major street (commercial) routes to maximize efficiencies and curb miles that can be swept with existing resource levels. Any revisions to street sweeping schedules and routes that further increase the amount of miles swept by DOT in-house crews would require additional resources. The frequency of residential sweeping routes is determined by the current hauler contract with GreenWaste and revisions to street sweeping schedules and routes that increase the amount of miles swept by GreenWaste would require modifications to the contract and additional resources.
- b) If additional resources become available, DOT and ESD will consider performing additional enhanced sweeps.
- c) Due to the complexity of altering street sweeping routes and schedules, ongoing periodic review of this information for the purpose of optimizing sweeping routes will be challenging without the addition of staff to perform this analysis. The Civil Engineer I/II position in DOT that was previously used to perform this analytical was eliminated from this program.

Yellow – To implement this recommendation, the reallocation or addition of resources will be required. This will need to be evaluated by the Administration as part of the 2016-2017 or a future budget process in light of the City’s budget outlook and other citywide and utility funding priorities.

Recommendation #7: DOT should install additional permanent parking prohibition signs and/or expand enhanced sweeps based on need, as funds become available.

Administration Response to Recommendation #7: The Administration agrees with this recommendation and will consider installing additional permanent parking prohibition signs and/or expanding the use of enhanced sweeps if funding becomes available. One-time funding would be necessary to install new parking prohibition signs, and certain terms in the contract with GreenWaste would need to be negotiated to compensate them for the additional operational costs associated with more signed streets or enhanced sweeps. Additional parking compliance officers and sweeping inspectors could be necessary to adequately enforce and inspect more streets with parking prohibition signs.

Yellow – To implement this recommendation, the reallocation or addition of resources will be required. This will need to be evaluated by the Administration as part of the 2016-2017 or a future budget process in light of the City’s budget outlook and other citywide and utility funding priorities.

Recommendation #8: DOT should: a) have inspectors review and report problems with the parking prohibition signs as part of their routine inspections, and b) update and maintain parking prohibition signs as needed.

Administration Response to Recommendation #8: The Administration agrees with this recommendation and DOT has assigned a team to address current signage inconsistencies, which are estimated to be corrected in the next three months. Through its in-house and contractual teams, DOT will ensure that signs are regularly updated when routes are changed and as needed.

Green – DOT can implement this recommendation in the next three months.

Recommendation #9: DOT and ESD should use the new electronic inspection system to identify and resolve conflicts between street sweeping, yard waste, garbage, and recycling schedules.

Administration Response to Recommendation #9: The Administration agrees with this recommendation. DOT, ESD and GreenWaste will identify and resolve any conflicts between street sweeping, garbage, recycling, and yard waste schedules.

Green – DOT and ESD can implement this recommendation in the next 6-12 months.

Recommendation #10: DOT should use its new electronic inspection system to streamline recording and referring barriers and violations.

Administration Response to Recommendation #10: The Administration agrees with this recommendation, and it has been partially implemented by DOT. Prior to this audit, DOT developed a system for electronically capturing street sweeping inspection data. The system provides a way for the inspector to enter data directly into a database rather than filling out written inspection forms, which is a significant improvement. The fields that currently exist enable a generalized assessment of an individual route, including parking impacts, poor curb and gutter conditions, low hanging trees, incorrect yard waste set out, and the presence of tree barriers. Information regarding these barriers can then be provided to the appropriate DOT section or another department for resolution, but the system does not currently have an automated way to make these referrals. As stated above under Recommendation #5b, work to

expand the capability of the system to provide data for specific street segments within the routes is being considered; however, the priority and timing of this project must be weighed against the many other data and information system needs of DOT given the limited technology resources currently available.

Additionally, while the system has the potential to be able to collect and manage more detailed and location-specific information, the inspector would have to spend a significantly greater amount of time recording all of it, thereby reducing the number of miles that can be inspected with existing staffing levels or requiring more inspectors to maintain critical and current inspection levels.

There are also other significant impacts to consider when collecting and referring information about barriers and violations, including an increase in tree work, sidewalk and curb and gutter work, and code-enforcement cases, among other impacts. DOT's current practice is to selectively refer identified barriers and violations based on the severity of the situation and the funding and workload capacity of the service areas receiving this information. Recording and referring more detailed barrier and violation information, while desirable, will have budget and workload implications and may cause backlogs in other core service areas.

Yellow – DOT can improve the electronic tracking system to automatically refer its current level inspection results related to sweeping barriers to other DOT sections within two years. Collecting and referring more detailed information, as implied in the audit, would require additional resources to inspect and resolve. This will need to be evaluated by the Administration as part of the 2016-2017 or a future budget process in light of the City's budget outlook and other citywide and utility funding priorities.

Recommendation #11: DOT and ESD should fully utilize existing contract provisions to distribute more flyer and door hanger reminders to facilitate cleaner sweeps.

Administration Response to Recommendation #11: The Administration agrees with this recommendation. DOT, ESD and GreenWaste will ensure that the contract provisions are utilized.

Green – DOT and ESD will implement this recommendation in the next 6-12 months.

Recommendation #12: DOT and ESD should collaboratively update and standardize outreach materials for distribution (e.g., flyers, messaging).

Administration Response to Recommendation #12: The Administration agrees with this recommendation. DOT, and GreenWaste will work to update and standardize outreach materials to the extent existing budget resources allow.

Green – DOT can implement this recommendation in the next 6-12 months.

Recommendation #13: DOT and ESD should update the collection day look up tool to include all residences and businesses receiving street sweeping services.

Administration Response to Recommendation #13: The Administration agrees with this recommendation. The existing look up tool currently provides information for the properties that have an account for garbage collection on residential street sweeping routes. The variability of sweeping frequency on major street (commercial) routes results in some inaccuracies for sweeping days for those properties. DOT and ESD staff have begun work on an enhanced look up tool to include accurate street sweeping information and mapping features for all properties throughout the city. This tool is expected to roll out in early 2016-2017.

Green – DOT and ESD can implement this recommendation in the next 6-12 months.

Recommendation #14: DOT should ensure that prior notification is given to neighborhoods where signs will be installed.

Administration Response to Recommendation #14: The Administration agrees with this recommendation and DOT has developed a procedure that will strengthen its coordination and involvement with Council Offices to ensure that prior notification is provided to impacted neighborhoods.

Green – This recommendation is implemented. DOT has developed a procedure to ensure prior notification is provided to neighborhoods where signs will be installed and will utilize it for all future sign installation projects.

CONCLUSION

DOT and ESD staff will begin coordinating the implementation of this report's recommendations. ESD staff will begin planning for the next phase of hauler contracts in 2017. As part of that process, staff will take into account the recommendations from this audit.

We thank the City Auditor and her staff in recommending ways to improve the street sweeping program.

/s/
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Director, Department of Transportation

/s/
KERRIE ROMANOW
Director, Environmental Services

SHARON ERICKSON

February 26, 2016

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