ADVANCED POLICY ANALYSIS May 2024

Down in the Dumps: Exploring San Francisco's Approach to Illegal Dumping and Recommendations for Optimization

Conducted for the City and County of San Francisco's Office of Refuse Rate Administration

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The author conducted this study as part of the program of professional education at the Goldman School of Public Policy, University of California at Berkeley. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgements and conclusions are solely those of the author and are not necessarily endorsed by the Goldman School of Public Policy, by the University of California or by any other agency.

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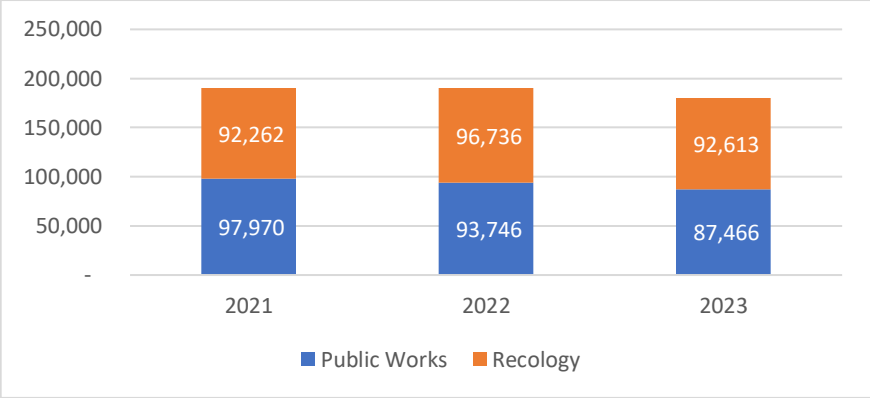
Executive Summary

Illegal dumping in San Francisco is not only a detriment to the city's aesthetic appeal but also to the health and safety of its residents. This report was commissioned by the Office of the Refuse Rates Administrator, a Division of the Controller's Office in the City and County of San Francisco, and had two primary objectives. The first was to document how illegal dumping collection and programs are administered within the City through the Department of Public Works and the City's waste contractor, Recology. This included documentation of the City's system and roles within that system and an analysis to determine if Recology is meeting the requirements of their Service Level Agreement for illegal dumping. The second objective was to research and provide recommendations for improving how the City's illegal dumping programming is administered.

Illegal Dumping Programs

Annually, the Department of Public Works and Recology jointly handle almost 190,000 complaints of illegal dumping collected via the City's 311 system.

Total 311 Request for Illegally Dumped Materials By Agency



In response, they clear over 12,000 tons of waste discarded in the streets, including proactive collection of illegally dumped material in the Bayview, Chinatown, Tenderloin, North Beach, and Financial District areas.

Public Works implements several programs to address illegal dumping through its Clean Streets Initiatives:

- Responds to 311 illegal dumping requests assigned to Public Works in 6 zones (i.e., Litter Patrol);
- Works with Recology to clean up the Bayview area;
- Provides public information, outreach, and enforcement services through the Outreach and Enforcement (OnE) team;
- Organizes hundreds of volunteer clean-up events each year including over 800 in 2023; and
- Manages the public garbage can sensor pilot to prevent overflowing cans.

Recology coordinates with Public Works and supplements these efforts with a suite of illegal dumping services outlined through Service Level Agreements outlined in the Refuse Rate Order:

- Maintains 6 illegal dumping routes that respond to 311 requests assigned to Recology;
- Operates 2 proactive routes in Bayview (with Public Works) and Tenderloin, Chinatown, North Beach, and Financial District area (Zone K);
- Operates 2 cardboard-only routes for abandoned clean cardboard;

- Administers the Bulky-Item Recycling (BIR) program for residents & businesses; and
- Services the City's 3,000+ public garbage cans through the Public Receptacle Collection (PRC) program.

Despite these efforts, the city continues to grapple with illegal dumping, a result of house move-outs, insufficient services, or financial and transportation constraints. Therefore, to ensure the cleanliness and safety of the city, developing a unified strategic approach between the City and Recology is vital for effectively tackling illegal dumping.

Findings and Recommendations

Findings from the qualitative and quantitative work from this report are described in this section with recommendations for each of the three findings sections: Alignment, Data Collection Protocols, and Performance Metrics. Alignment findings are high level and apply to the City's overall illegal dumping programs. Data Collection Protocol findings provide insight into issues with the City's 311 system and suggested improvements for better data in the future. Finally, Performance Metrics focus on improvements specific to the City's Abandoned Materials Collection Service Level Agreement with Recology and recommendations for updates and inclusion in future rate periods.

Alignment

Alignment recommendations are intended to be broad and frame the issue of illegal dumping specifically within San Francisco. Implementing the following will provide the City with an overarching goal specifically to illegal dumping (rather than all street cleanliness work) and consistent definitions that span across different departments to make it easier to track process, analyze data, and work in partnership.

Finding	Recommendation	Responsible Party
Definitions for illegal dumping and geographical boundaries for defining neighborhoods differ across City Departments.	Come to a clear consensus defining illegal dumping. Implement standardized terminologies and duties regarding illegal dumping.	This recommendation should be led by Public Works with input from City Administrators Office (311 team), Recology, and the City Performance Division within the Controller's office.
San Francisco does not have a framework to guide its illegal mitigation activities.	Establish a framework to advance current and future illegal dumping work. Adopting a framework such as the 3 E's (Education, Eradication, and Enforcement) can help coordination efforts, strategic planning, and identifying gaps in services.	This recommendation should be led by Public Works with input from Recology, the Controller's Office, and the Department of the Environment.
Recology is required to report performance metrics such as response times and number of tickets serviced as part of the SLA. Public Works currently has no requirement under the current Rate Order to track their efforts despite receiving rate funding.	Establish the same basic reporting measures for illegal dumping work conducted by Recology and Public Works to the Refuse Rates Administrator for future rate setting.	This recommendation should be led by Public Works and the Refuse Rates Administrator.

Data Collection Protocols

Data Collection Protocols recommendations are all in relation to the City's existing 311 system and how to utilize it more effectively to produce better quality data that reflects the realities of what is found on the streets related to illegal dumping. 311 can be used a highly useful tool for staff to understand illegal dumping patterns, material types, and hotspots that can be used to improve services.

Finding	Recommendation	Responsible Party
311 tickets are not updated after on-site personnel respond to illegal dumping tickets. This makes the data collected less reliable and leads to inaccurate records of material types, resolution reasons, and ticket transfers.	Establish a closure protocol for illegal dumping tickets that include 311 staff updating the following categories (as needed) based on on-site information documented in the Closure Description: Nature of Request, Request Type, and Closure.	This recommendation should be led by Public Works and City Administrator/311 Customer Service Center staff and with input from Recology.
Updating certain 311 categories to better track information is necessary. Labeling garbage sensor notifications to service cans as an "overflow" in 311 is misleading for reporting purposes and to the public.	Update 311 categories to better track information including creating a "Garbage Can Sensor Request" tag to delineate from overflows. Update "Case Resolved" to "Case Closed", and have discrete Closure Descriptions / Status Notes categories.	This recommendation should be led by Public Works and City Administrator/311 Customer Service Center staff.
There is very little data available of where illegally dumped material is coming from in the City. Any evidence is anecdotal and not collected through 311.	Create a new "Source" category in 311 and ask Public Works/Recology on-site personnel to input source of illegal dumping when completing 311 tickets. Identifying where illegal dumping originates (e.g., residential areas, commercial businesses, unhoused people, etc.) and whether it from within or outside the city is key to understanding and addressing the problem.	This recommendation should be led by Public Works and City Administrator/311 Customer Service Center staff and with input from Recology.

Performance Metrics

The following Performance Metrics are intended to be implemented through the Service Level Agreements (SLAs) with Recology. These recommendations are specific to additional reporting requirements that should be detailed in future agreements as well as the funding for future illegal dumping pilots.

Finding	Recommendation	Responsible Party
Recology is generally meeting the requirements of the Service Level Agreement and the Service Level Agreements are tracking Recology's performance adequately with minor adjustments to reporting.	Require Recology to report Abandoned Materials Collection customer calls coming directly to Recology, Separately report Abandoned Materials Collection tons (currently combined with street sweeping tons).	This recommendation should be led by Refuse Rates Administrator and Public Works and with input from Recology.

Finding	Recommendation	Responsible Party
However, the Service Level Agreement's performance metrics only cover the material collected by Recology from 311 requests and Public Receptacle Collection program. More resources are needed to prevent and capture unreported illegal dumping through piloting new strategies.	Add an annual budget for illegal dumping pilot projects to be agreed upon before the start of each Rate Period by the City and Recology.	
The "Daily Limit" requirement for Public Receptacle Collection (>241 request per day) includes both overflow tickets reported through 311 and Garbage Can Sensor Requests. This is causing the program to be more than the daily limit and negatively impacts cans in areas that get full towards the end of the day when the Service Level Agreement is no longer in effect.	Adjust the Daily Limit language in the Service Level Agreement to include a stated prioritization for completing overflowing containers requests over garbage can sensor requests is recommended. Include a provision to complete all overflowing container tickets received within two hours prior to the end of the SLA measurement period.	This recommendation should be led by Refuse Rates Administrator and Public Works and with input from Recology.
The Bulky-Item Recycling program is minimally reported on in the Abandoned Materials Collection Service Level Agreement. Bulky-Item Recycling is currently underutilized compared to prior years and is largely used by single-family residents.	Require Recology to report the total number of requests for Bulky-Item Recycling by account type and participation rate, and percent change in requests compared to prior year. Require annual outreach to residents for Bulky-Item Recycling service and publicize options for recycling/disposal in newsletter and social media channels. If requests for Bulky-Item Recycling are lower than 10% compared to prior year, Recology must put forward an outreach plan to address how it will publicize the program.	This recommendation should be led by Refuse Rates Administrator and Public Works and with input from Recology.

Introduction

If you were to take a walk on the streets of San Francisco today, you'd find a variety of opinions concerning the cleanliness of the City. Many argue that the state of the streets has never been worse[1], a sentiment echoed in the City's 2023 survey[2] where residents gave the City a "C" rating for cleanliness. Others argue the City can maintain cleanliness, as was evident during the Asia-Pacific Economic Cooperation conference held in November 2023[3]. Addressing illegal dumping is complicated given the many different definitions of the problem. Regardless, substantial illegally dumped material is left on City streets causing right-of-way obstructions, which contributes to a community perception that the City is not well run[4].

Street cleanliness is complex and multi-faceted. Street cleanliness can be broken down into several components: overflowing City trash cans, dumped large or loose trash (illegal dumping), feces and urine, street sweeping, leaves and branches, graffiti, and encampment-related material. Street and sidewalk cleanliness affects the aesthetics, health, and safety of San Francisco. Studies have shown the positive environmental impact of street sweeping[5] and the removal of debris can lessen the rate of vehicle accidents and improve driver, biker, and pedestrian safety, the likelihood of blocking stormwater conveyances, and reduce street flooding. Indirect impacts of street cleanliness on residents and the community at large also well studied around the world in[6,7] suggesting that when streets are cleaner, there are measurable co-benefits including, better health outcomes, increased feelings of safety, and more community pride[8].

In the context of street cleanliness and illegal dumping in San Francisco, experienced staff have shared that the notion of persistent cleaning can yield less overall dumping in the long term in some areas of the City. However, in many, especially in hot spots where illegal dumping is especially common, the dumping continues no matter how many times it is cleaned. This can be broadly attributed to overall street behavior witnessed in the City and social norms around littering and dumping and who should be responsible for cleaning it. While street cleanliness encompasses many facets, the focus of this paper will be specifically on dumped waste in the City's streets and near public waste containers.

This report was commissioned by the Office of the Refuse Rates Administrator, a Division of the Controller's Office in the City and County of San Francisco. The objectives of the report are two-fold. The first is to document how illegal dumping collection and programs are administered within the City through the Department of Public Works and the City's waste contractors, Recology San Francisco, Recology Sunset Scavenger, and Recology Golden Gate (collectively referred to as "Recology"). This includes documentation of the City's system and roles within that system and an analysis to determine if Recology is meeting the requirements of their Service Level Agreement for illegal dumping. The second object is to research and provide recommendations for improvement to how the City's illegal dumping programming is administered.

The report required a comprehensive review and analysis of existing available data related to illegal dumping. It included both qualitative and quantitative analysis and involved a thorough investigation of data from various sources including the City's 311 system, Recology's tonnage data, Recology Bulky-Item Recycling customer request data, and City Performance survey data. Supplementary data was provided by the Office of the Refuse Rates Administrator, City Performance, Public Works, and Recology. This included

[1] For brevity, the City and County of San Francisco will be referred to as the City in this report.
[2] Full 2023 City Survey Report: https://www.sf.gov/City-survey.
[3] https://www.sfchronicle.com/bayarea/article/sf-homeless-crisis-apec-clean-streets-drug-crisis-18509955.php
[4] 2023 City Survey Report indicated City Government received a "C" score from residents surveyed, the lowest score it has ever received in the survey's history.
[5] https://pubmed.ncbi.nlm.nih.gov/25367134/
[6] https://dirt.asla.org/2018/11/28/medellin-is-healing-itself-with-social-urbanism/
[7] Reductions in gun violence: https://www.publichealth.columbia.edu/news/how-reduce-crime-gun-violence-stabilize-neighborhoods-randomized-controlled-study and positive impacts on mental health: https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2688343
[8] https://www.cpted.net/

details related to operational, financial, and programmatic features of the City's abandoned materials programs, including illegal dumping, bulky item pick-up, and public refuse collection. An extensive review of relevant legislation, policies, and City codes was done and over 25 in-depth informational interviews were conducted with staff from five other jurisdictions to understand best practices.

Collection and clean-up of illegally dumped materials is a critical operation of a City. Residents and businesses expect streets and rights-of-way to be free of debris that would otherwise pose safety and environmental risks as well as negatively contribute to the aesthetics of an area. The Office of the Refuse Rates Administrator is responsible for regularly monitoring the rates and recommending adjustments. These programs are funded by the ratepayers of San Francisco and should be evaluated and improved to better meet the needs of residents and businesses in the City.

The findings are segmented into three categories: Alignment, Data Collection Protocols, Performance Metrics. Each category offers unique insights into the various aspects of illegal dumping in the City and provides actionable recommendations for improvement. Due to data limitations, this report focuses on the illegal dumping captured within the City's programs and documented in collection and tonnage data. **This is not a complete picture of all illegal dumping in the City.**

The detailed information obtained from the data examined in this report is highly valuable, yet its strength lies in its inputs. The 311 data, which is primarily used by the City to track illegal dumping, is subject to mis-categorizations, duplicates, and errors due to its collection method (user reporting). Moreover, the 311 system only provides data on reported instances of illegal dumping. It fails to capture unreported cases, leading to potential bias. That is not to say that the 311 isn't valuable. Choosing to rely on the 311 programs for addressing issues like illegal dumping demonstrates the City's commitment to responsiveness but also fosters a stronger sense of community engagement. This approach can significantly enhance the public's perception of local government, reinforcing trust and collaboration by showing that every report and follow-up leads to real, tangible solutions that benefit everyone.

This report does not include debris resulting from unsheltered homelessness in the illegal dumping analysis and recommendations because these clean-up efforts are operationally different than other illegal dumping and not funded by waste rates. This issue also arises from different root causes such as unaffordable housing, income inequality, institutional racism, untreated addiction and mental illness, and decades of federal disinvestment.

The review period for this report also covered a 3-year period from January 1, 2021, through December 31, 2023, coinciding with the peak of the COVID-19 pandemic. This timeframe may have led to atypical behaviors related to illegal dumping and its reporting.

Background

In 2024, the City's Department of Public Works and Recology will address almost 190,000 reports of illegal dumping in San Francisco, collecting more than 12,000 tons of waste abandoned on the streets. Despite illegal dumping only being one aspect of overall street cleanliness, 54% of respondents to the City's 2023 survey reported a decline in street hygiene. This issue is regularly highlighted as a significant concern throughout news outlets, local elections, and business groups. Effective coordination between the City and Recology is vital for swift, efficient cleanup operations and maintaining the cleanliness of San Francisco's streets.

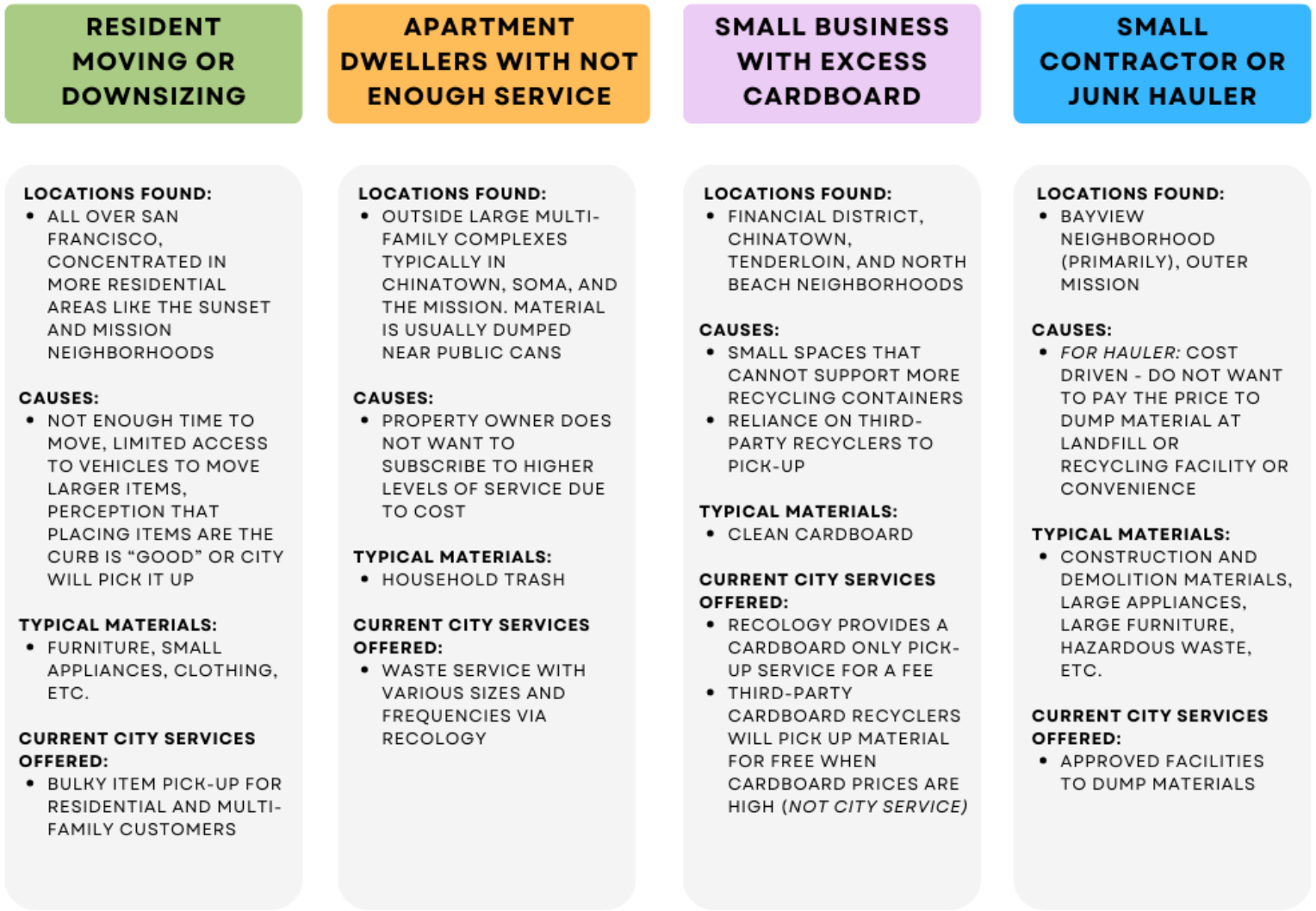
Understanding who is responsible for illegal dumping, their motives, and City actions is essential for assessing the problem and for formulating recommendations for improvement.

Who is Responsible for Illegal Dumping and Why Do They do It?

Illegal dumping can broadly be classified into "casual" and "illicit" categories[9]. Casual and illicit terms are used to delineate the differences in motive and material types that are typically dumped but both activities are considered illegal to dump. Figure 1 on the next page provides an insight into the types of dumping prevalent in San Francisco, as determined by 311 data and interviews with Recology and Public Works employees who manage the cleanup of such waste daily.

[9] Terms coined by the City of San Rafael's illegal dumping mitigation efforts.

Figure 1: Common Types of Illegal Dumping in San Francisco



Casual dumping is an all too common issue, where people dispose of smaller items, often mistakenly believing they'll be swiftly picked up or reused. The majority of casual dumping correlates with moving out, downsizing, or a lack of waste services. This usually involves household items like furniture, appliances, and textiles. Research conducted by Alameda County District 4 and the city of San Rafael reveals that 90% of illegally dumped items result from casual dumping.

Illicit dumping is quite distinct. Individuals engaging in this practice are typically aware that they are breaking the law. This activity frequently happens during the night in dimly lit or non-residential areas, often where lower-income residents live. The dumped materials are typically larger and require special treatment, such as asbestos and pressure-treated wood, which are not accepted at Californian landfills and must be handled in dedicated facilities at a higher cost. Small contractors or junk removal services may take these materials and illegally dump them in areas like Bayview during the night. Identifying the culprits behind these activities is challenging, leading to a prevalence of this issue in certain neighborhoods and therefore impacting some neighborhoods more than others.

For this report's purpose, debris and items related to encampments from the definition of illegal dumping is excluded. The clean-up process for encampments in San Francisco differs significantly from general illegal dumping, driven by the fact many items are personal belongings. While encampments, predominantly resulting from people living outdoors, impact the perceived cleanliness of streets, San Francisco follows court-detailed protocols and internal policies. These include offering shelter to those living in encampments, “bagging and tagging” personal belongings for 90-day storage and using specific methods to determine which materials can be disposed of. This process is coordinated by the City’s Healthy Streets Operation Center (HSOC).

Root Causes of Illegal Dumping

Residents and businesses in San Francisco typically dump for various reasons: they do not have the time or transportation to dispose of waste, they do not want to pay the money to dispose of larger or hazardous items, or they do not know about current programs or that the activity is illegal.[10] However, it is important to note that cities that have analyzed their illegally dumped material have proven their illegally dumped material is generated from the City in which it is dumped because most casual dumping is from residents. In addition to residents, illicit dumping may occur from people living or working in nearby cities, who know if certain areas where dumping is common, and enforcement is scarce.

Areas that typically experience the most illegal dumping are areas that are under-resourced, making the conditions ideal dumping grounds. These areas typically have inadequate lighting, have abandoned lots and/or near industrial-zoned area, and have little enforcement. Low-income or marginalized individuals often live in these areas of cities created by to institutional racism, which lack adequate environmental health, services, and social organization.[11] The presence of illegal dumping is a contributor to physical disorganization within these communities and residents and businesses face the consequences. Businesses are responsible for cleaning up dumping on their property and this dumping causes them to lose out on business, curb appeal, and market value.

How Does the City Address Illegal Dumping

The City’s illegal dumping education, abatement, and enforcement efforts are primarily housed within the Department of Public Works. Public Works implements many street cleanliness programs through its Clean Streets Initiatives[12]. For illegal dumping efforts specifically, Public Works:

[10] This was shared through interviews with Public Works OnE staff that work regularly in San Francisco to enforce illegal dumping.
[11] https://scholarworks.sjsu.edu/cgi/viewcontent.cgi?article=8382&context=etd_theses
[12] https://www.sfpublicworks.org/services/cleaning-programs

Table 1: Public Works Illegal Dumping Initiatives

Illegal Dumping Initiative	Description of Work
Litter Patrol	Respond to 311 illegal dumping requests assigned to Public Works in 6 zones throughout the City. Packers are used for larger debris.
Bayview illegal dumping initiative	Work in partnership with Recology to run proactive illegal dumping runs five days a week, Monday through Friday to clean-up illegal dumping in the Bayview area, which has been identified as an illegal dumping hot spot.
Enforcement programs	Managed by the Outreach and Enforcement (OnE) team, OnE provides public information and enforcement services largely in neighborhood commercial corridors to ensure that property and business owners comply with laws to keep their sidewalks clean and free of debris and maintain proper garbage services. OnE also works with Recology to conduct audits that identify non-compliance with the City's mandatory waste service requirements.
Volunteer programs	Managed by the OnE team who organizes hundreds of volunteer clean-up events each year including Neighborhood Beautification Day and Adopt-A-Street. In 2023, there were over 800 clean-up events around the City.
Education programs	Managed by Public Works and Department of the Environment. Uses multi-media approach including media drops, signage, and mailers.
Garbage can sensors program	Public Works manages the public garbage can sensor pilot to prevent overflowing cans. Over 900 sensors have been installed around the City in public garbage cans thus far.

San Francisco has a team of 6 enforcement officers as part of the OnE Division within Public Works, that are each assigned to a zone overseen by a supervisor. Their job is to inspect hot spots, responding to both 311 reports and conducting daily inspections. Enforcement protocols are consistent across all types of illegal dumpers, whether casual or illicit, and there is a three-step process that includes outreach, warning, and ultimately, issuing a citation if the offender is identified. Enforcement officers, despite having the power to act based on evidence of illegal dumping, prefer to adopt a non-punitive stance. For severe dumping cases, multiple addresses and video footage are used as evidence, with property owners being the prime providers of this footage. Public Works has recently installed cameras in some hot spot areas to aid in surveillance and evidence gathering. Despite the ongoing efforts, there are perceived opportunities for improvement, such as the need for more conclusive evidence and greater community involvement.

In addition to the efforts Public Works provides, the department contracts with Recology for a suite of illegal dumping services. Public Works and Recology have a strong working relationship and are highly coordinated through their joint work in cleaning up the Bayview area five days a week as well as meeting at least once a day for Public Works' Litter Patrol to transfer material collected into a Recology truck for disposal.

Through work outlined in the Service Level Agreements, Recology provides the following illegal dumping services:

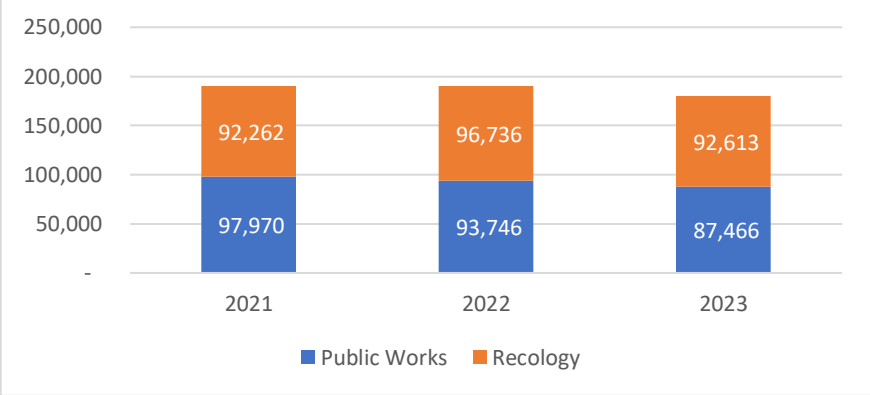
Table 2: Recology Illegal Dumping Initiatives

Illegal Dumping Initiative	Description of Work
Abandoned Materials Collection program	Maintains 6 illegal dumping routes that respond to 311 requests assigned to Recology, operates the Zone K proactive route in the Tenderloin, Chinatown, North Beach, and Financial District area, and 2 cardboard-only routes for abandoned clean cardboard.
Bayview illegal dumping initiative	Work in partnership with Public Work to run proactive illegal dumping runs five days a week, Monday through Friday to clean-up illegal dumping in the Bayview area, which has been identified as a hot spot.
Bulky Item Recycling program	Manages and administers this program for residents and businesses to get rid of unwanted large items.
Public Receptables Collection program	Services the City's 3,000+ public garbage cans. Most cans are serviced at least once per day.

Illegal dumping clean-up operations by the City are confined strictly to public spaces. Illegal dumping on private property falls outside of the City's jurisdiction for clean-up activities.

Figure 2 illustrates the share of work in responding to 311 illegal dumping tickets from January 1, 2021-December 31, 2023. Of the ticket identified as illegal dumping requests, Public Works responds to 50% of tickets (on average) while Recology handles the other 50%. These numbers do not include Recology's response to service public receptacles during this review period. These average change in total 311 illegal dumping tickets from 2021-22 and 2022-23 was 0.1% and -5.5% respectively.

Figure 2: Total 311 Request for Illegally Dumped Materials By Agency



Anyone in the City of San Francisco can report illegal dumping to the City to clean up through the City's 311 system. 311 is a platform for people to get help with any nonemergency City matter, not just illegal dumping. A user in the City of San Francisco can call, go online, or use the mobile app to report an illegally dumped item. Once reported to 311, the ticket is sent to either Public Works or Recology to complete the request based on the type of material that was reported. **Attachment 2** provides a process flow map of how 311 tickets are assigned and completed by either Recology or Public Works.

How are the City's Illegal Dumping Programs Funded?

Illegal dumping programs in San Francisco are primarily funded through the contributions of ratepayers. Recology, responsible for its portion of the work, utilizes these funds allocate trucks and drivers for illegal dumping routes and conducting illegal dumping sweeps. The expenses for this effort amount to $7.4 million in Rate Year 2024 and $7.6 million in Rate Year 2025. The funding for the Public Works Department's clean-up of illegally dumped material comes from a mix of the general fund, street cleaning funding, and Public Utilities Commission funding. Though not solely allocated to illegal dumping clean-up, Public Works' Street Environmental Services Division has an annual budget of $112.6 million for fiscal year 2024 to fund all of its activities (including illegal dumping clean-up) and maintains a workforce of over 300 full-time employees. Refuse Rates serves as a portion of this budget, accounting for approximately $12 million annually, which funds Outreach and Enforcement (OnE) Team, Litter Patrol, Trash Can Maintenance and Cleaning, and Mechanical Street Sweeping.

Illegal Dumping: Real-Time Scenario

On March 14, 2024, I visited Recology's Tunnel Road facility to carry out a waste audit on the contents of a truck assigned for illegal dumping. The aim was to record what exactly was collected on a typical day from route 843, servicing the primarily commercial and multi-family dwellings of the "Third Street Corridor". This snapshot study offers insights into what residents leave out on the streets, illuminating information that the 311 and Recology Tonnage data fail to capture due to inherent constraints in breaking down each load by material type. It's important to note, we can't depend solely on 311 material type data due to the prevalent issue of mis-categorization by requesters. We should also bear in mind that Recology only logs very general material types, owing to the limited processing of illegally dumped material and the requirement by the State of California to report certain materials like mattresses, tires, appliances, etc.

The audit process involved the driver emptying the truck load for us to sort, which included opening garbage bags to analyze their contents. Following this, a visual categorization of the material was conducted by myself and two Recology Waste Zero Specialists to the closest 5%. The result of this audit can be found in Table 3.

Table 3: Materials Categorization of Route 843

Material	Percentage
Mattresses	30%
Household Trash	30%
Construction and Demolition Debris	15%
Textiles	15%
Tires	5%
Christmas Trees	5%
Total	**100%**

While this information is based on observations, it provides insights into program deficiencies and possible customer education gaps. Despite the City offering disposal services for these materials through regular trash service or the Bulky Item Recycling service, individuals continue to dump materials on the streets due to lack of awareness or indifference. During our survey, we noticed three large cardboard boxes with mailing address stickers removed to evade fines and penalties associated with illegal dumping. Our categorization revealed patterns of casual dumping, featuring items such as general trash, mattresses, and Christmas trees presumably from house moves, as well as more serious instances of illicit dumping, like tires, construction materials, and boxes with stripped-off addresses. Refer to Figures 3 and 4 on the following page for a visual representation of the waste audit findings.

Figure 3: Full Pile from Illegal Dumping Route 843

Figure 4: Illegally Dumped Construction Materials with Addresses Removed

Current Program Trends

For the purposes of viewing data trends over time, the following tables and graphs depict data from a three-year period, January 1, 2021, to January 1, 2023. However, each Rate Period (October 1 to September 30) changes elements of the illegal dumping program slightly. These trends are helpful to better understand how illegal dumping changes over the course of a year, what types of materials are reported to 311 as illegal dumping, and where new programs can fill an identified need or gap. For additional analysis, please refer to **Attachment 3**.

Table 4 gives an overview of the volume of illegal dumping requests received by the City during the review period. These requests are addressed either by Public Works or Recology. Recology is tasked with upholding the response times specified in the Service Level Agreement, while Public Works strives to respond to 95% of street and sidewalk cleaning requests within a 48-hour timeframe. These ticket numbers were calculated using 311 and do not include duplicated, transferred, or cancelled tickets.

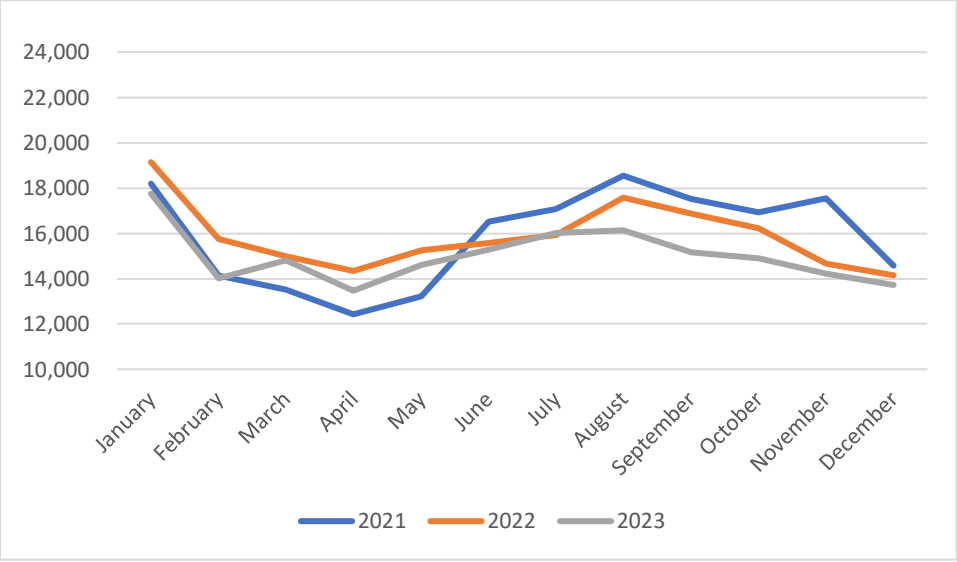
Table 4: Total Illegal Dumping Requests from 311

Responsible Agency	2021	2022	2023	Total
Public Works	97,970	93,746	87,466	279,182
Recology	92,262	96,736	92,613	281,611
Total	**190,232**	**190,482**	**180,079**	**560,793**

From 2021 to 2022, the total number of illegal dumping tickets were very similar and Recology and Public Works sharing similar number of tickets (52% Public Works in 2021, 49% in 2022). However, in 2023, there was a 5.5% decrease in total number of tickets of reported illegal dumping.

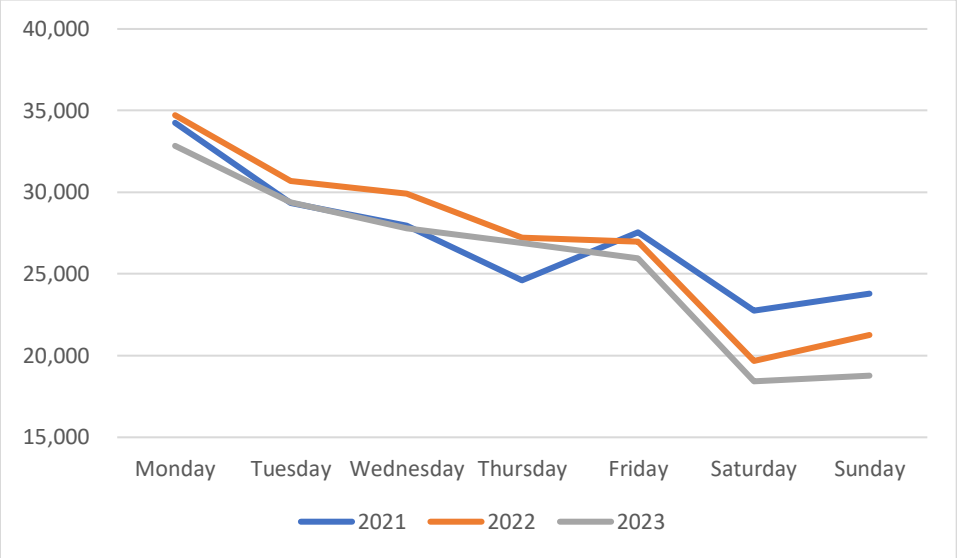
Over the review period, January, August, and September saw the highest rates of reported dumping. These months saw the highest number of tickets over the 3-year period with an average of 18,369 tickets in January, 17,419 in August, and 16,513 in September (compare to an overall average monthly ticket count of 15,578). This supports anecdotal evidence from interviews with Recology that many San Franciscans move out of the City at the beginning of the calendar year or at the end of summer.

Figure 5: Illegal Dumping Tickets By Month



Using data from the 3-year period (2021-2023), dumping is reported to 311 most on Mondays and decreases as the week goes on. There is a 37% percent change in total requests on Mondays compared to Sundays. This is likely a delayed effect in reporting with more dumping occurring on the weekends rather than weekdays.

Figure 6: Illegal Dumping Tickets By Day



From Figure 6, 311 requests are most frequent at the beginning of the month, decrease during the middle, and increase once more towards the latter part of the month. Interestingly, 2023 is lower than previous years for illegal dumping 311 overall and all years decrease in 311 requests as the month progresses suggesting that perhaps move outs have slowed or the program or there is less (reported) illegal dumping in the City.

To further show the effects of move-out, Bulky-Item Recycling tonnage and tonnage from collection of illegal dumping were analyzed. They have very common spikes at the beginning and end of the month showing a distinct “move out effect”. In both cases, dumping and legal disposal through Bulky-Item Recycling show an increase midway through the first week of the month. Based on conversations with Recology and Public Works staff, this is likely due to people moving into a new residence at the beginning of the month and needing to downsize larger furniture, boxes, and other items. The increase in tons is then seen again at the end of the month when people are likely packing to move out of a residence and needing to downsize household items. Figures 7 and 8 show this move out effect with days of the month displayed horizontally and average tonnage vertically. These figures are based on data from the 3-year period (2021-2023).

When you compare the average illegal dumping tons by day to the overall average of 6,553 requests per day, Day 1, 6, and 28 are significantly above the average (by 969, 642, and 434 requests per day respectively). Similarly, the average bulky-item tonnage collected per day on average is 273 tons for the review period. There are similar peaks on Days 2, 8, and 28 with averages on those days exceeding the overall average tons per day by 34, 44, and 43 tons. While these numbers may appear to be small, when converted to pounds, there are variances of over 87,000 pounds compared to the average day.

Figure 7: Average Illegal Dumping Tons by Day

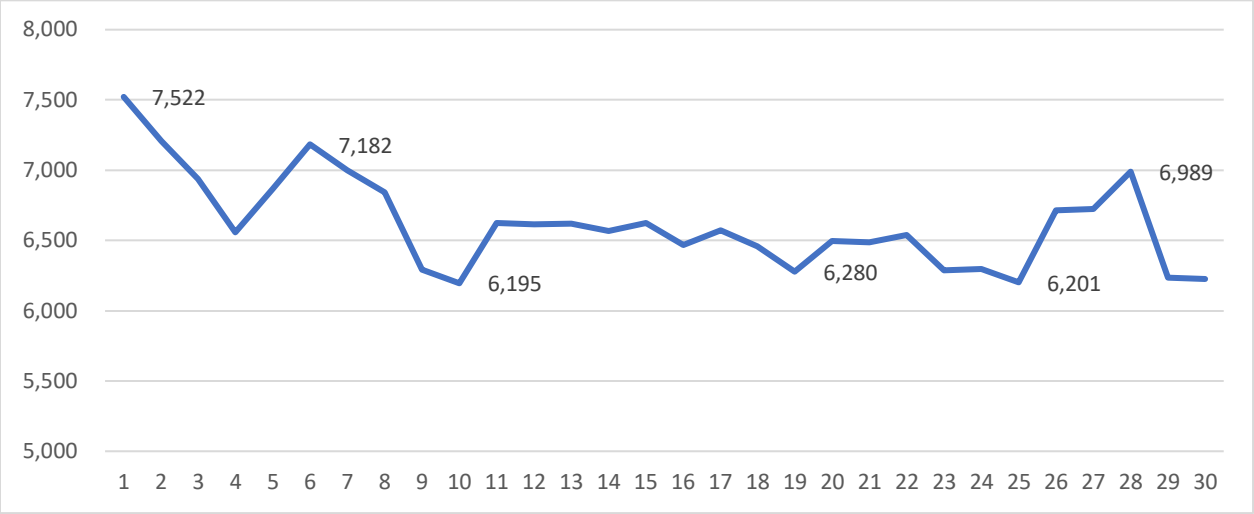


Figure 8: Average Bulky-Item Recycling Tons by Day

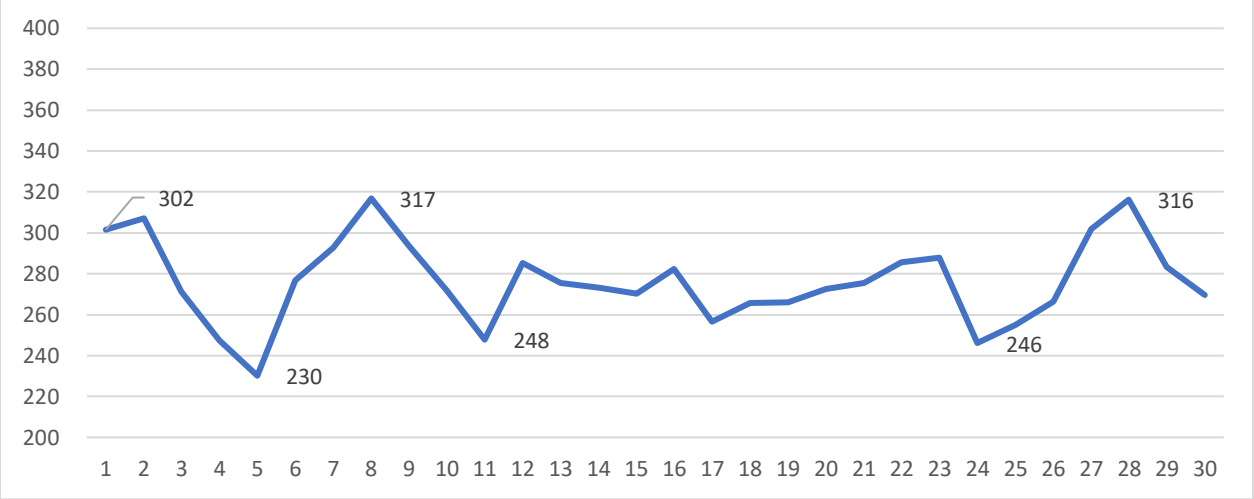
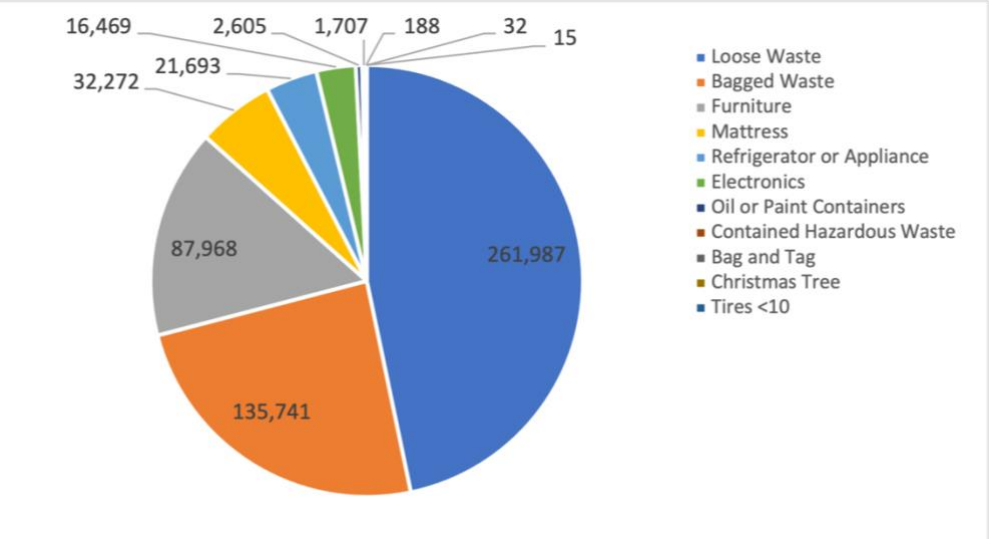


Figure 9 shows total 311 Requests by material category. When a customer submits a 311 request, they have the option to report what the dumped material is and submit a photo. These categories are not updated after the waste has been collected and the ticket has been closed and therefore may not be accurate. However, it does provide insight into what materials are dumped generally within the City.

Figure 9: 311 Requests By Material Type



Using data from the 3-year period (2021-2023), bagged and loose waste make up the majority (72%) of the waste collected and consists of general garbage that residents and business dump. This could be from moving or a lack of adequate garbage service. Furniture and mattresses represent about 20% of the total which are most likely attributed to moving out or downsizing. Paint, oil, electronics, and hazardous waste make up a small portion of waste overall but typically require specific recycling that is typically more expensive for residents and the City to dispose of than general waste. These materials are not accepted in Recology's regular waste service and residents must dispose of these materials through a Bulky-Item Recycling pick-up, bring these materials to the transfer station, or bring items like paint to a PaintCare[13] location for disposal. Residents and businesses may not be aware of these options or do not want to spend the time or money to bring materials to the proper disposal locations and choose to illegally dump instead.

The 311 system provides exact locational data collected from users when they submit their request. This is not only vital to respond but can be monitored to observe where illegal dumping is being reported in the City. It should be noted that Table 5 below is not where illegal dumping is most found but rather reported and therefore responded to by Public Works or Recology.

Table 5: Top 10 Neighborhoods for 311 Requests

Top 15 Neighborhoods for 311 Requests	2021	2022	2023
Mission	18,771	16,729	16,573
South of Market	6,086	4,188	5,332
Lower Nob Hill	5,437	4,692	4,484
Bayview	3,867	4,835	3,743
Outer Sunset	2,031	2,976	3,343
Outer Richmond	2,513	2,073	1,377
Inner Richmond	2,266	1,973	1,538
Portola	1,926	1,787	1,750
Tenderloin	3,563		1,857
Potrero Hill	2,034	1,704	1,649

[13] https://www.paintcare.org/

Over the course of three years, the Mission had the highest number of illegal dumping tickets with 52,073 or 9.3% of all 311 illegal dumping tickets in the City during the 3 year period. While this neighborhood has 36,467 tickets more than the next most popular neighborhood, representing only 9.3% of all 311 tickets shows that tickets are still spread throughout the City rather than in just one location. The South of Market (15,606) and Lower Nob Hill (14,613) neighborhoods come in as the second and third most popular requests for illegal dumping ticket requests. The top 10 neighborhoods represent 23% of all tickets during the 3-year period. This indicates that people that live and/or work in these neighborhoods are familiar with how to report these issues to the City. It can also be an indication of where new programs could be launched and where illegal dumping is commonly found.

Best Practices Findings

This project involved interviewing representatives from six cities to gather insights on how similar jurisdictions address the problem of illegal dumping. The cities chosen for the study either had geographic or demographic characteristics similar to San Francisco or demonstrated a high priority approach to new strategies against illegal dumping. The cities included Los Angeles, Oakland, San Jose, and San Rafael, along with Alameda County District 4 and the Portland Metro Area.

Interestingly, four out of six jurisdictions use 311.org as a primary tool to pinpoint the locations of illegal dumping. The City of Los Angeles stands out as it boasts a specific enforcement team concentrating on cases of illegal dumping, thereby relieving regular police forces from this duty. This unique approach proves beneficial as the nature of these cases often diverges from standard police work.

From the six interviews, four recurring themes emerged:

1. The majority had a defined framework or a set of goals for their efforts against illegal dumping (Three E's or PACE).
2. Many jurisdictions maintain a regular drop-off location for residents, which operates at least monthly. These events have reported high satisfaction levels from all jurisdictions.
3. The focus is predominantly on the enforcement against the worst offenders and there is a strong interest in incorporating technology to aid in evidence gathering. These worst offenders are often frequent dumpers in hot spot areas (illicit dumping). Techniques include license plate reading cameras, high-quality photos and videos, and the use of AI to track hotspots.
4. Most of the jurisdictions have expressed a need for additional resources to manage illegal dumping more effectively.

A detailed outline of the specific features of each jurisdiction's illegal dumping program can be found in **Attachment 4**.

These themes played a crucial role in shaping the formal recommendations for the City's consideration. With a predominant focus on framing the issue of illegal dumping amongst the interviewed jurisdictions, Table 6 is provided as an example of how the City could categorize its illegal dumping activities by both action (Education, Eradication, and Enforcement) and offender type (Casual or Illicit). Casual and illicit terms are used to delineate the differences in motive and material types that are typically dumped but both activities are considered illegal to dump.

Table 6: Example Actions for the City's Three E's

Dumping Type	Education	Eradication	Enforcement
Casual	• Bulky-Item Recycling outreach for MFD and SFD • 311 education campaign • Targeted outreach to residents and businesses near hot spots • Engagement with schools (via Recology visits)	• Pilot drop-off events for move-outs at the end of the month • Utilize service level from Recology to target large MFDs without adequate levels of service containers for large MFD complexes • Supporting and publicizing beautification events • Better understanding cardboard pricing to anticipate dumping trends	• Educate and send warning letters prior to enforcement actions • Options for volunteering for community clean-ups in lieu of fines for illegal dumping • Enforcement of property owners (rather than tenants) where there is not enough adequate service

Dumping Type	Education	Eradication	Enforcement
Illicit	• Publicizing enforcement efforts and convictions • Post and publicize penalties for dumping/resources in hot spots	• Continuation of proactive routes in Bayview areas • Analysis of hot spots through data	• Utilize better surveillance methods via cameras for egregious dumping • Establish a clear enforcement protocol for offenders • Options for volunteering for community clean-ups in lieu of fines for illegal dumping

This table could be used to track and update all of the City's current and future actions against illegal dumping. This perspective underscores the importance of differentiating between casual and illicit dumpers, due to the types of materials dumped and the reasons for the illegal dumping. For instance, enforcement measures for casual illegal dumping might be more education-based. This could differ from enforcement for a contractor who illegally dumps construction debris after each job in the Bayview area.

Findings

Findings from the qualitative and quantitative work from this report are described in this section with recommendations for each of the three findings sections: Alignment, Data Collection Protocols, and Performance Metrics. Alignment findings are high level and apply to the City's overall illegal dumping programs. Data Collection protocol findings provide insight into issues with the City's 311 system and suggested improvements for better data in the future. Finally, Performance Metrics focus on improvements specific to the City's Abandoned Materials Collection Service Level Agreement with Recology and recommendations for updates and inclusion in future rate periods.

I. Alignment

Finding: Different City Departments have different definitions for illegal dumping and geographical boundaries for defining neighborhoods.

Illegal dumping encompasses a range of waste types that are unlawfully discarded in public spaces. However, definitions of what constitutes an illegally dumped item and who bears responsibility for its collection and proper disposal may vary slightly across different jurisdictions. Even within a single City, there can be disparities in how Public Works, the Controller's Office, 311, and Recology define illegal dumping. 311 does not have an establish, documented category for what illegal dumping either making it difficult for different analysts to use the same categories when investigating trends. For example, are needles, shopping carts, or automobile parts included or excluded? The following table outlines these definition differences between City departments and Recology. Public Works was not able to provide a definition of illegal dumping by the publish date of this report.

Table 7: Comparison of Illegal Dumping Definitions

City Performance	311 (internal)	Recology
Automobile parts & accessories	Bag and Tag	Non-hazardous abandoned materials in the public right of way identified through the City's 311 reporting system, Public Works Radio Room and Recology personnel.
Bicycles (including parts & accessories)	Christmas Tree	**Recology does NOT collect:** Encampment material Human waste Hazardous waste (i.e. needles) Any items containing liquids Car parts Tanks with valves Any material on private property
Blankets, bedding & pillows	Electronics	
Boxed or bagged items (including whole boxes)	Furniture	
Clothing	Mattress	
Construction waste/debris (including cones, signs, etc.)	Other Bagged/Boxed/Contained Garbage	
Furniture	Other Loose Garbage, Debris, Yard Waste	
Loose/unbundled flattened cardboard boxes	Other Contained Hazardous Waste	
Luggage	Refrigerator/Appliance	
Mattresses, box springs & bed frames	Shopping Cart	

City Performance	311 (internal)	Recology
Miscellaneous household items	Tires (<10)	
Shopping carts	Oil or Paint Cans (no spills)	
Small electronics & appliances		
Large electronics & appliances		
Other (Including Bagged Materials with DPW label)		

*Refined from Nature of Request: Garbage_and_Debris

For the purpose of this report and analysis, a definition of illegal dumping specific to the City of San Francisco was created and provided below.

> *Illegal dumping is the disposal of any waste not owned by an individual that is dumped in public spaces including along streets, roadways, waterways, parks, or other unacceptable locations. Illegally dumped materials include abandoned appliances, furniture, tires, mattresses, electronics, construction debris, cardboard, paint and oil containers, hazardous waste, Christmas trees, overflowing public waste containers, and general bagged and unbagged waste. It does not include automotive parts, needles, and material from encampments and unhoused individuals.*

In addition to varying definitions, different departments use unique geographical boundaries to define neighborhoods within San Francisco. The City Performance team conducts the Street and Sidewalk Maintenance Standards report annually, providing valuable information about the reality of illegal dumping on San Francisco's streets during their survey periods. This data would be invaluable if it could be integrated with other data sources the City uses to manage and analyze its illegal dumping programs, such as 311. While both data sets gather geographical data and designate neighborhoods, they do not use the same names or boundaries for these areas in San Francisco. To circumvent differences in neighborhood designation, locational data (latitude and longitude points) could be used and overlayed to combine and plot hot spots and areas where additional resources are needed.

Finding: Unlike many other cities, San Francisco does not have framework to guide its illegal dumping mitigation activities.

San Francisco is unique in that illegal dumping collection is evenly split between two completely different entities – Public Works and a contractor, Recology. Of the City's surveyed in the best practices interviews as well as others studied as part of this report, most jurisdictions handle illegal dumping collection either completely internally or contract the work out to their waste hauler. Due to the City's setup, it is important that both parties are in communication daily and working together on coordination of work. While Public Works and Recology have a strong working relationship, work is still largely separated by tickets that go into either Public Works or Recology's 311 queue to complete (apart from the Bayview route that is jointly worked).

It became evident during the best practices interviews as well as CalRecycle's guidance on illegal dumping procedures[14], that adopting a framework or goal is common and valuable. This is especially when more important when more coordination is required as in the City's case. A framework for illegal dumping work can be valuable for coordination and strategic planning, identifying gaps in programming, and to communicate all of the illegal dumping work that Public Work does each day. Table 8 provides the frameworks or goals used by other jurisdictions. Interviews with staff, particularly San Rafael, underscored the importance of a stated goal to guide pilot programs, understanding their illegal dumping landscape, and benchmarking toward a goal.

[14] https://calrecycle.ca.gov/illegaldump/

Table 8: Goals or Frameworks Used by Best Practices Jurisdictions

Jurisdiction	Goal or Framework
City of San Jose	Adopted PACE – Prevention, Abatement, Clean-Up, Enforcement framework
City of San Rafael	Stated 5-year goal of reducing illegal dumping by 50% by 2025[15]
City of Oakland / Alameda County District 4	Adopted "3 E's – Education, Eradication, Enforcement" framework
City of Los Angeles	Adopted "3 E's – Education, Eradication, Enforcement" framework
Portland Metro	Goals established in the adopted Regional Waste Plan[16] containing an overall goal of "Address and resolve community concerns and service issues" and 7 subgoals.

While it is clear from the metrics stated in the Service Level Agreement with Recology around response times, the City does not have any goals or frameworks related specifically to illegal dumping around responsiveness nor reducing illegal dumping at large. If the City were to adopt a framework, Table 16 in the Best Practices section could serve as an example of what types of actions the City should track and implement.

Finding: Recology is required to report performance metrics such as response times and number of tickets serviced as part of the Service Level Agreement, but Public Works does not report metrics for the illegal dumping work conducted by the Department during the rate setting process.

Recology and Public Works respond to thousands of 311 requests for illegal dumping each year. When these tickets are dispatched from 311, it is known that smaller items are generally assigned to Public Works for Litter Patrol to clean-up and Recology is assigned larger items. Recology reports its response times each quarter to the Office of the Refuse Rates Administrator as part of the mandated reporting outlined in the Service Level Agreement. Public Works tracks its response times internally through its Street and Sidewalk Cleaning dashboard and reports response times for all street and sidewalk cleaning activities (inclusive of illegal dumping work, though not separated out). Response times should be reported out to the Office of the Refuse Rates Administrator as part of rate setting or performance tracking because much of the illegal dumping activities are funded by ratepayers. Table 9 highlights the difference in time between tickets assigned to Public Works versus Recology.

Table 9: Average Response Time (in days)

Responsible Entity	2021	2022	2023	Average
Public Works	4.47	3.08	3.12	**3.56**
Recology	1.36	0.75	0.59	**0.90**

Public Works does handle illegally dumped materials that Recology does not accept (e.g., hazardous materials) and therefore may take longer to address those tickets. There is general knowledge of the types of materials that are assigned to each party and why differences in response times may occur but there is not clear, updated documentation of this. When averaging response times for all tickets assigned to Public Works over a three-year period, their response time is 3.56 days overall. Recology's equivalent response time (not Service Level Agreement specific) is 0.90 days, which is 296% faster. It is important to understand better why differences in response times between Public Works and Recology are different and establish simple tracking for the purposes of the Office of the Refuse Rates Administrator rate setting to ensure that all illegal dumping services provided and funded through rates are being tracked and monitored.

Recommendations:

[15] https://storage.googleapis.com/proudCity/sanrafaelca/uploads/2023/12/5.a-Marin-Sanitary-Service-Rates-2024.pdf
[16] https://www.oregonmetro.gov/sites/default/files/2019/06/06/2030_Regional_Waste_Plan.pdf

1. Come to a clear consensus for illegal dumping in San Francisco.
2. Establish a clear framework to advance current and future illegal dumping work.
3. Establish the same basic reporting measures for response times for illegal dumping work conducted by Recology and Public Works.

II. Data Collection Protocols

Illegal dumping clean-up efforts span across multiple departments in the City and its partners. Primarily the City's illegal dumping clean-up activities are dispatched through the City's 311 system. Anyone in the City of San Francisco report an illegally dumped item through the 311 system. Once reported to 311, the ticket is sent to either Public Works or Recology to complete the request based on the type of material that was reported. Public Works primarily handles smaller items that can be collected with a pick-up truck or are hazardous (paint, etc.) and larger items are sent to Recology who have vehicles and special equipment to collect and transport items like mattresses and big furniture. 311 will also dispatch requests that optimize routing if **Attachment 2** provides a process flow map of how 311 tickets are assigned and completed by either Recology or Public Works.

Finding: 311 tickets are not updated after on-site personnel respond to illegal dumping tickets. This makes the data collected less reliable and leads to inaccurate records of material types, resolution reasons, and ticket transfers.

311 is an extremely value tools for data collection on illegal dumping activities and is well utilized by San Franciscans in comparison to other cities with 311.[17] However, tickets in 311 for illegal dumping are not updated by 311 staff or by on-site personnel after they are completed. This means that the information that was provided by the customer (i.e., resident, business, etc.) is the information that is retained. Oftentimes, the initial information provided by the customer is incomplete or inaccurate. This is a known issue and therefore, 311 includes fields like Closure and Closure Description for on-site staff to provide more information on the request. Often, these fields will state that the waste was not found, is private property, is a different type of waste and needs different equipment, needs to be transferred to a different department it was assigned to, or is related to an encampment. This information is valuable for analysis, but the "Request Type", "Nature of Request", and "Closure" fields are typically not updated with the correct data points. On-site personnel need to respond and update 311 quickly and should not be responsible for data cleaning. See Table 10 below as examples of 311 tickets without updated fields.

Table 10: Example 311 Fields

Nature of Request	Request Type	Request Description	Queue	Closure	Closure Description
Garbage_and_Debris	Other_loose_garbage_debris_yard_waste	Trash left on sidewalk next to garbage container	DPW Ops Queue	Case Resolved	Nothing found
Garbage_and_Debris	Other_loose_garbage_debris_yard_waste		DPW Ops Queue	Case Resolved	Homeless encampment refer DP
Garbage_and_Debris	Bulky Items		Recology_Abandoned	Case Resolved - PRIVATE PROPERTY	

Currently, 311 has all the functionality to provide better data but it is not regular update process done by 311 staff. This missing step is crucial to making this data more accurate and valuable for future analysis.

In addition to the fields described above, 311 ticket closure reasons should be reevaluated and updated. While most tickets in 311 were marked as "Case Resolved" without issue, many with this denotation are not completed due to a variety of reasons (private property, encampment related material, couldn't locate waste, etc). In these cases, tickets should not be considered "Resolved" if they are not able to be completed because the issue has not in fact been solved. This nomenclature is used for public facing updates to 311 users as well that are sent after the ticket has been completed and can be downloaded by anyone from DataSF. Updating the language to say "Case Closed; <identified problem>" is much clearer to the public and for future analysis. For implementation, on-site staff should have discrete categories to select that

[17] https://moverdb.com/cities-and-zip-codes-where-residents-complain/

describe the problem if not resolved or fully completed. Table 11 provides a sub-sample of 88,000 Recology tickets during the review period that were hand-coded to reveal why the case was not resolved.

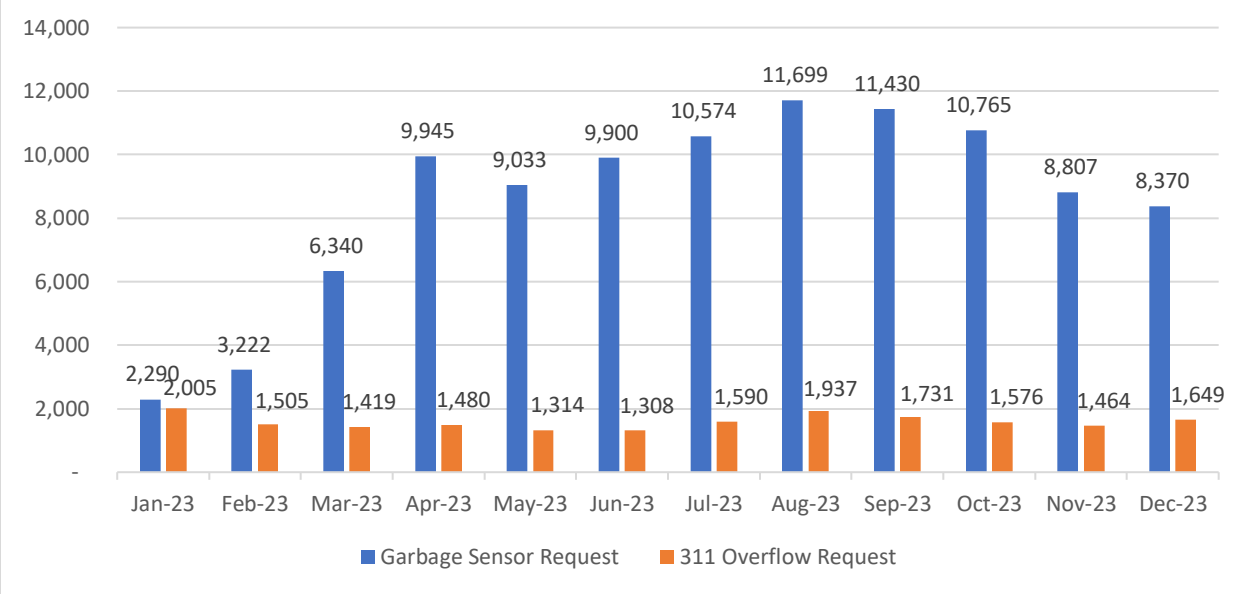
Table 11: Sample Closure Tags Reasons

Recoded Response Types	Occurrence
Case Resolved	81,257
Case Closed; Waste/Can not found	3,394
Case Closed; Other	1,670
Case Transferred / Reallocate	899
Case Closed; Homeless	814
Case Closed; Private Property	423
Open	160
Case Closed; Hazardous	144
Case Closed; Invalid Sensor	41
Total	**88,802**

Finding: Labeling garbage sensor notifications to service cans as an "overflow" in 311 is misleading for reporting purposes and to the public.

The City currently holds a contract with Nordsense for an on-going, multi-year pilot to install and implement sensors in over 900 of the City's 3,000+ public cans. The sensors use 16-point 3D optical lasers and 3D depth maps to analyze the contents of the bins and determine if the can is full. When a sensor identifies the bin as 80% full, it triggers a 311 request that is sent to Recology to service. The 80% threshold was used because it builds in time for Recology to service and empty the can before it begins to overflow. This sensor request is categorized in 311 as an "overflow" and is currently combined with overflow requests coming from users that report a can is overflowing. These are two very different notifications, but both are categorized as overflows for public facing 311 data.[18] See Figure 10 that shows the increase in requests are due to automatic sensor requests rather than reports of overflowing cans.

Figure 10: 311 Overflow Requests By Type



[18] 311 staff can separately pull garbage can sensor only requests that can be joined through Case ID to the larger 311 data set.

When overflows are isolated and do not include garbage can sensor request, they remain relatively stable with an average of 1,582 requests per month over this specific period (January-December 2023). This is in comparison to the 8,531 average garbage sensor requests during the same period. The current labeling leads to conflation in overflow tickets as currently displayed in publicly available data. This has led to misleading findings and analysis from non-staff including the San Francisco Chamber of Commerce reporting that overflowing trash cans in the City have increased dramatically.[19] 311 should categorize these requests separately with overflows requests received by users as "overflows" and garbage can sensor requests as "sensor requests".

Finding: There is very little data available of where illegally dumped material is coming from in the City. Any evidence is anecdotal and not collected through 311.

Understanding the origins of illegal dumping in terms of sectors (residential, commercial, apartments, unhoused/encampment-related, etc.) and location (within or outside of San Francisco) is key to comprehending the City's overall illegal dumping problem. It guides us in determining which sectors require additional education, eradication measures, and perhaps even enforcement. Data collection on this can be handled by on-site personnel using distinct categories and then inputted into the 311 system for tracking. This straightforward approach significantly enhances the data already collected by 311 for future policy making.

The Portland Metro RID Patrol[20], for instance, determines the source of waste at the time of collection and uses this information to formulate more targeted policies. This method effectively addresses the needs associated with illegal dumping. San Francisco could benefit from the same kind of approach, as this waste source information not only categorizes the response but also aids in proactively mitigating future illegal dumping. In Portland, for instance, approximately 60% of waste comes from residential sources. Therefore, policies like move-out events or an increase in Bulky-Item pick-up could be potential solutions. This is in stark contrast to the 27% of illegal dumping waste generated by unhoused individuals, where the response needs to be distinctly different.

Recommendations:

1. Establish a closure protocol for illegal dumping tickets that include 311 staff updating the following categories (as needed) based on on-site information documented in the Closure Description: Nature of Request, Request Type, and Closure (including transfers).
2. Update 311 categories to better track information:
    a. Create a "Garbage Can Sensor Request" tag to delineate from overflows; and
    b. Update "Case Resolved" to "Case Closed" and have discrete Closure Descriptions/Status Notes categories.
3. Create a new "Source" category in 311 and ask Public Works/Recology on-site personnel to input source of illegal dumping (Residential/Commercial/Unsheltered/Other) when completing 311 tickets.

III. Performance Metrics

The following findings and recommendations are specific to Recology, and the Service Level Agreements held between the City and Recology. These recommendations should be considered for inclusion in future Service Level Agreement negotiations set to begin in the Summer 2024.

Finding: Recology is generally meeting the requirements of the Service Level Agreement and the Service Level Agreements are tracking Recology's performance adequately with minor adjustments to reporting. However, the Service Level Agreement's performance metrics only cover the material collected by Recology from 311 requests and Public Receptacle Collection program. More resources are needed to prevent and capture unreported illegal dumping through piloting new strategies.

[19] https://sfchamber.com/resources/data-statistics/
[20] https://drcmetro.maps.arcgis.com/apps/dashboards/ab7f27b71fff4359812d7c147809a8e6

The Service Level Agreement mandates Recology to provide a specified suite of services and meet the response times for the City's program tackling illegal dumping, known as the Abandoned Materials Collection program, and the City's Public Receptacle Collection program. Recology is obligated to address tickets assigned to them from 311 (internally known as the Agency List), within the timeframes delineated in the Service Level Agreement, as documented in the 2023 Rate Order.

This Rate Order commenced on October 1, 2023, and data related to this rate period has been assessed both during this current rate period. The tables below provide a summary of Recology's performance in the present rate period as outlined in the Service Level Agreement.

Tables 12 and 13: Abandoned Materials Collection and Public Receptacles Collection Programs Comparison

Abandoned Materials Collection (AMC)	Q3 2023	Q4 2023	Change
Tons Collected	1,152	1,345	17%
Total AMC Calls Received	26,447	23,699	-10%

Public Receptacle Collection (PRC)	Q3 2023	Q4 2023	Change
Tons Collected	943	1,357	44%
Total Overflow Calls	5,427	4,770	-12%
Total Sensor Requests	786	28,009	3463%

The tables clearly depict an increase in tons of illegally dumped material collected by Recology, compared to the same quarter of the prior year. For Abandoned Materials Collection, there is a 17% increase in tonnage and a 10% decrease in call for illegal dumping incidents. The City has funded two additional routes for illegal dumping in this new rate period, which likely contributes to these positive results. For the public receptable collection program, there is a 12% decrease in overall call for overflowing material and a massive increase in sensor requests compared to Q3 2023 when the pilot program with Nordsense was just beginning.

The Service Level Agreement sets forth requirements for Recology to swiftly address instances of illegal dumping and Public Receptacle Collection requests; this is referred to as the Service Level Agreement Measurement Period. The Service Level Agreement Measurement Period for Abandoned Materials Collection is from 5:30am to 2:00pm, operating 7 days a week. The Measurement Period for Abandoned Materials Collection was previously studied by Public Works to determine optimal times for collection. More information is located in **Attachment 4**. During this period, Recology is required to respond to Abandoned Materials Collection requests (originating from 311) within four hours. If a request is received outside the Service Level Agreement period, on weekends, or on public holidays, the response time should not exceed 8 hours. Furthermore, if the total number of Abandoned Materials Collection requests exceeds 341 per day, any additional requests do not fall under the Service Level Agreement period requirements. This is termed as the Daily Limit. The table below provides an evaluation of Service Level Agreement compliance for thus far (October 1, 2023, through February 29, 2024).

Table 14: Abandoned Materials Collection Service Level Agreement Achievement

Service Level Agreement Achievement	Service Level Agreement Period	Percent
Achieved	16,158	82%
Not Achieved	3,606	18%
Total	**19,764**	
N/A (Not in Service Level Agreement Period)	18,419	48%

Recology is currently meeting the responsiveness outlined in the Service Level Agreement Measurement Period approximately 82% of the time for the Abandoned Materials Collection program. This means that they are responding to instances of illegal dumping on their six specified routes. Notably, this represents a substantial improvement compared to previous rate periods. However, direct comparisons between rate periods are challenging due to varying resources, such as the number of routes.

It's important to note that almost half of the total Abandoned Materials Collection tickets received fall outside the Service Level Agreement Measurement Period. This means these 311 requests either come in after 2pm and before 5am or when the City has reached its Daily Limit for Abandoned Materials Collection requests. Unlike Public Works, Recology does not operate a 24-hour crew and must adhere to fixed hours for drivers and routes. As a result, they currently process 52% of 311 requests during the Service Level Agreement Measurement Period.

Finding: The "Daily Limit" requirement for Public Receptacle Collection (>241 request per day) includes both overflow tickets reported through 311 and Garbage Can Sensor Requests. This is causing the program to be in excess of the daily limit and negatively impacts cans in areas that get full towards the end of the day when the Service Level Agreement is no longer in effect.

In addition to the Abandoned Materials Collection program, the Service Level Agreement also monitors and demands responsiveness from the Public Receptacle Collection program. The Service Level Agreement Measurement Period for Public Receptacle Collection runs from 10:00am to 6:30pm, 7 days a week. During the Service Level Agreement Measurement Period, Recology is required to respond to regular overflow requests, originating from 311, within two hours. For an overflow request coming from one of the City's 900 public containers equipped with sensors, the response time should not exceed 8 hours. Outside the Service Level Agreement Measurement Period, there are no mandated response times. Furthermore, if the total number of Public Receptacle Collection requests surpasses 241 per day, any additional requests do not fall under the Service Level Agreement period requirements (Daily Limit).

Table 15: Public Receptacle Collection Service Level Agreement Achievement

Service Level Agreement Achievement	Service Level Agreement Period	Percent
Achieved	15,692	80%
Not Achieved	3,845	20%
Total	**19,537**	
N/A (Not in Service Level Agreement Limits)	30,025	60%

As demonstrated with the Abandoned Materials Collection program, the Service Level Agreement's achievement rate in the current period stands at approximately 82%. Approximately 39% of the overflow and garbage can sensor requests are activated during the Service Level Agreement measurement period. Unlike the daily limit of the Abandoned Materials Collection program, however, the Public Receptacle Collection program consistently meets its daily limit. Table 16 illustrates the frequency with which the daily limits were met within the current rate period. While sensor requests and overflow requests differ significantly, both contribute to the Public Receptacle Collection program's daily limit. Out of 153 days thus far in this rate period, the daily limit was exceeded 146 days. This suggests that any requests exceeding this limit are not obligated to be addressed within any specified time limit and could adversely affect containers that frequently fill or overflow by day's end.

Table 16: Daily Limits Requirements

Rate Period 2023-24 (through 2/29/24)	Within Daily Limit	Over Daily Limit
Abandoned Materials Collection Tickets	130	23
Within Daily Limit (%)	85%	15%
Overflow Tickets (Combined Overflows and Garbage Sensor Requests)	7	146
Within Daily Limit (%)	5%	95%
Overflow Tickets without Sensor Requests	139	0
Over Daily Limit (%)	100%	0%

To look at a longer period than just the current rate period, the full 2023 calendar year was analyzed for Public Receptacle Collection in which the Daily Limit reached was still very high, 80%, but fully adequate if the Daily Limit did not include garbage sensor requests.

Table 17: Public Receptacle Collection Daily Limit Comparison

Calendar Year 2023	Within Daily Limit	Over Daily Limit
Overflow Tickets (Combined Overflows and Garbage Sensor Requests)	72	293
Over Daily Limit (%)	20%	80%
Overflow Limit without Sensor Requests	365	0

The thresholds for the Daily Limits are primarily driven by operational constraints on Recology's side based on the current funding for the PRC program. With the average number of PRC overflow requests being 332 per day in 2023, a threshold of about 420 tickets per day, would be sufficient to achieve an 80% completion rate per day. However, the issue lies within the difference between an overflow request of a garbage can currently overflowing and a garbage can sensor request that triggers a request at 80% full and not yet overflowing. Therefore, adjusting the Daily Limit language in the Service Level Agreement to include a stated prioritization for completing overflowing containers requests over garbage can sensor requests is recommended. Further, including a provision to complete all overflowing container tickets received within two hours prior to the end of the SLA measurement period should also be considered.

Service Level Agreement metrics and measuring periods play a significant role in monitoring the response to 311 tickets, but they don't encompass all instances of illegal dumping in San Francisco. Each Rate Period presents an opportunity to allocate funds to pilot projects aimed at dealing with unreported illegal dumping. These proactive routes are in Bayview and Tenderloin, Chinatown, North Beach, and the Financial District.

Pilot programs for illegal dumping are particularly important as they allow the City to experiment with new collection methods and options for residents and businesses. These methods could potentially offer better solutions for the disposal of items frequently dumped. Development of pilot design, outreach, and implementation should be garnered by Public Works and Department of the Environment staff. A pilot option for the City's consideration in future rate periods is provided in this report. The suggested pilot is modeled on similar successful programs in cities like Oakland, San Jose, San Rafael, and Los Angeles.

Pilot Program Option: Monthly Move Out Events

A resident bringing items to Oakland's Bulky Block Party that occurs monthly at 7101 Edgewater Drive

The aim of this project is to offer an efficient and free service to residents who are either moving out or downsizing. This pilot is modeled after the move out events in the cities of Oakland, Los Angeles, San Jose, and San Rafael. Based on conversations with staff, all of these cities have seen success with these programs. The City of San Jose now offers this in its District 7 every Saturday. Many cities also use these as events to provide outreach to residents regarding other services like Bulky-Item Recycling and way to reuse and properly recycle items they no longer need.

This initiative should target neighborhoods that are most prone to casual illegal dumping. These can be identified partially through 311 data and in partnership with Public Works and Recology staff. Based on other programs, these events are most popular on the last Saturday of each month and held typically between 8am and 4pm. Many cities mentioned that having a consistent location for these events is key to success as residents come to rely on set locations rather in rotating sites. Many cities also require proof of residency to utilize the free service. Staffing per site can be scaled up but at a minimum should be staffed by one supervisor and three crew members. This estimate is based on staffing information from the city of San Rafael.

There is an opportunity with this program to collect valuable data regarding total tons of material collected, changes in illegal dumping in the area before and after events (through 311 reports and visual reporting), and changes in Bulky-Item Recycling requests, and cost per cubic yard/ton for disposal. The city of San Rafael is actively tracking many these metrics to prove long term viability for their program.

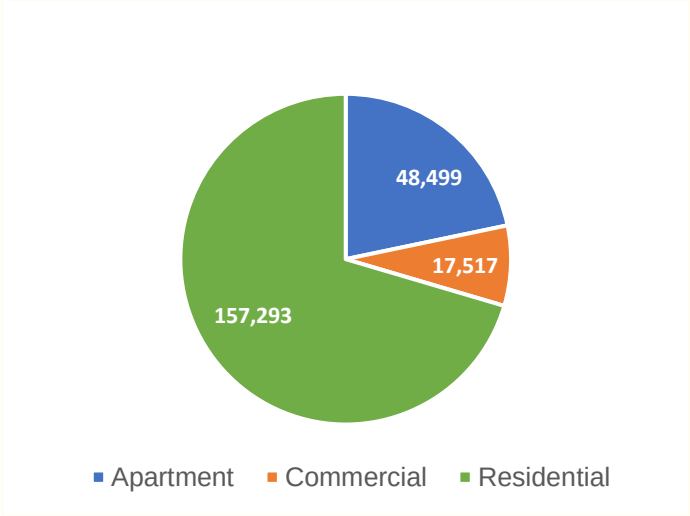
To successfully implement this program, these are the steps to be followed:

- Identification of target neighborhoods and locations for events: Areas with high instances of casual illegal dumping are primarily targeted for this service.
- Staff scheduling: One supervisor and three crew members will be delegated to handle these events.
- Procurement of resources: Necessary materials such as debris boxes and transportation of collected material by Recology will be organized for successful waste collection and disposal.
- Public outreach: The event will be publicized with a particular emphasis on apartment residents to ensure maximum participation.
- Waste collection and disposal: On the determined day, the staff will proactively collect waste from the mentioned areas and responsibly dispose it off.
- Data Collection: Analysis of illegal dumping, program costs (to understand if there are economies of scale if the program grows), Bulky-Item Recycling requests, and documented outreach should be conducted to document outcomes of this pilot.

This methodology is designed to not only clean the neighborhoods but also to prevent illegal dumping before it happens, making it a proactive and efficient solution to tackle waste management issues.

Finding: The Bulky-Item Recycling program is minimally reported on in the Abandoned Materials Collection Service Level Agreement. Bulky-Item Recycling is currently underutilized compared to prior years and is largely used by single-family residents.

Figure 11: Bulky-Item Recycling Requests by Sector



The Bulky Item Recycling Program is an important initiative to mitigate illegal dumping, particularly from the residential sector. Its design enables the pick-up of large household items that cannot fit into regular trash containers. Both single-family and multi-family residents can request two Bulky-Item Recycling pick-ups per year, with a maximum of 10 items per request. Commercial customers can also utilize this service for a fee. The adjacent chart shows residential customers, particularly those in single-family houses, as the leading users of the Bulky-Item Recycling service, accounting for 70% of all requests in the last three years. Apartment residents make up 22% of requests, while commercial requests account for the remaining 8%. This information is based on Bulky-Item request during the review period (January 1, 2021 to January 1, 2024).

Despite most housing units in San Francisco being apartments, apartment dwellers use the Bulky-Item Recycling service less frequently than single-family residents. The reasons for this could be varied, including a lack of targeted outreach to apartment residents. Previously, Recology provided bill inserts (information included with the customer's bill in paper or online forms) and newsletters for outreach. However, most apartment residents do not receive this information as they typically do not pay the refuse bill directly to Recology; the property owner usually holds the account. Therefore, more targeted outreach to these customers is required to ensure they understand and utilize the Bulky-Item Recycling program. This is particularly important considering apartment dwellers already have this service included in their refuse rates but are least likely to use it. Neglecting this service could lead to increased casual dumping, especially during move-outs.

Although apartment dwellers are less likely to use Bulky-Item Recycling compared to single-family residents, overall usage has seen a reduction since 2021. Table 18 illustrates the percentage change in Bulky-Item Recycling requests over the past three years.

Table 18: Bulky-Item Recycling Program Trends 2021-2023

Year	2021	2022	2023
Total Bulky-Item Recycling Requests	86,784	78,774	80,071
Percent Change Per Year		-9.2%	+1.6%
Total Bulky-Item Recycling Tonnage	9,906	8,638	8,000
Percent Change Per Year		-12.8%	-7.4%

In 2022, there was a notable decrease of 9.2%, potentially due to the mass exodus from San Francisco in 2021 resulting from the COVID-19 pandemic. Although Bulky-Item Recycling requests in 2023 are comparable to, if not slightly more than, those in 2022, the overall tonnage figures for both years remain lower. It's necessary to scrutinize this fall further to ensure the Bulky-Item Recycling program continues to meet the community's needs given the current routing and staffing levels. Should Recology report on its Bulky-Item Recycling programs as part of their Service Level Agreement with the City, the analysis of usage trends and changes over time would offer insights into whether extra program outreach or resources are

required. This is to ensure San Franciscans are well-informed about Bulky-Item Recycling, encouraging them to opt for it over illegal dumping.

Recommendations

1. Abandoned Materials Collection:
    a. Report Abandoned Materials Collection customer calls coming directly to Recology
    b. Separately report Abandoned Materials Collection tons (currently combined with street sweeping tons)
    c. Add annual budget for illegal dumping pilot projects to be agreed upon before the start of each Rate Period by the City and Recology
2. Public Receptacle Collection:
    a. Assuming pilot continues into the next Rate Period, update Daily Limit to 420 tickets per day (achieves ~80% within Daily Limit)
3. Bulky Item Recycling Program:
    a. Report total number of requests for Bulky-Item Recycling by account type and participation rate, and percent change in requests compared to prior year.
    b. Require annual outreach to residents for Bulky-Item Recycling service and publicize options for recycling/disposal in newsletter and social media channels. If requests for Bulky-Item Recycling are lower than 10% compared to prior year, Recology must put forward an outreach plan to address how it will publicize the program.

Recommendations

Informed by the findings documented in the prior section, the following recommendations are restated below for the City's consideration. Recommendations were informed by the analysis of the available data related to illegal dumping, interviews with stakeholders in and around the illegal dumping programs in the City, and interviews of best practices with different jurisdictions. These recommendations can be implemented internally or through the Rate Order future rate periods to document and codify agreed upon changes. The following recommendations are listed below under three categories, and each provide information regarding who is the suggested responsible party for implementation.

Alignment

Alignment recommendations are intended to be broad and frame the issue of illegal dumping specifically within San Francisco. Implementing the following will provide the City with an overarching framework specifically for illegal dumping (rather than all street cleanliness work) and consistent definitions that span across different departments to make it easier to track process, analyze data, and work in partnership.

Recommendation: Come to a clear consensus for defining illegal dumping in San Francisco.

Responsible Party: This recommendation should be led by Public Works with input from 311, Recology, and the City Performance team within the Controller's office.

The City should introduce a unified definition of illegal dumping across all departments. The implementation of standardized terminologies and duties regarding illegal dumping, essentially clarifying which waste materials fall under this category and assigning responsibility for their collection and disposal, is recommended. This will not only streamline operations but also ensure future analysis from different departments is useful and relevant to the City's identified illegal dumping program. To circumvent differences in neighborhood designation, locational data (latitude and longitude points) could be used and overlayed to combine and plot hot spots and areas where additional resources are needed.

Recommendation: Establish a clear goal to advance current and future illegal dumping work.

Responsible Party: This recommendation should be led by Public Works with input from Recology, the Controller's Office, and the Department of the Environment.

San Francisco should adopt a clear and guided framework for its illegal dumping mitigation activities. Other jurisdictions surveyed in this report have demonstrated the viability and benefits of adopting a framework and the absence of such a guiding policy in San Francisco is a missed opportunity. This is especially important in the City because illegal dumping activities are split almost evenly between two distinct parties (Public Works and Recology) while most cities utilize their hauler for all illegal dumping work or implement their programming completely internally.

The current operating model, whereby activities are split between Public Works and Recology, does emphasize the need for daily communication and effective coordination. Despite the strong working relationship between these two entities, their duties remain divided through a ticketing system, which underlines the need for an overall framework. It would be beneficial for San Francisco to implement a specific framework to guide its activities and policies related to illegal dumping. Such an approach will not only enhance coordination efforts and identify gaps in programming but can also be used to set realistic goals and measurable objectives to reduce illegal dumping.

Recommendation: Establish the same basic reporting measures for illegal dumping work conducted by Recology and Public Works to the Office of the Refuse Rates Administrator for future rate setting.

Responsible Party: This recommendation should be led by Public Works and the Refuse Rates Administrator.

In light of the differences in performance metrics reporting between Recology and Public Works, the City should establish identical basic reporting measures for both entities. Currently, Recology is required to submit detailed reports of their illegal dumping services to the Office of the Refuse Rates Administrator for rate setting, while Public Works does not. Both agencies respond to tens of thousands of 311 requests for illegal dumping annually, yet only Recology's response times and unresolved tickets are tracked and evaluated on a regular basis by the Office of the Refuse Rates Administrator. To ensure all services funded through rates are efficiently monitored, there needs to be a broader understanding of why response times differ between the two entities and implement simple tracking for rate setting purposes.

Data Collection Protocols

Data Collection Protocols recommendations are all in relation to the City's existing 311 system and how to utilize it more effectively to produce better quality data that reflects the realities of what is found on the streets related to illegal dumping. 311 can be used as a highly useful tool for staff to understand illegal dumping patterns, material types, and hotspots that can be used to improve services.

Recommendation: Establish a closure protocol for illegal dumping tickets that includes 311 ticket updates.

Responsible Party: This recommendation should be led by Public Works and City Administrator/311 Customer Service Center staff and with input from Recology.

This recommendation is to ensure a robust closure protocol for illegal dumping tickets using the 311 system. The current system is flawed, with many tickets not being updated after site personnel respond, leading to a lack of reliability and accuracy in data collection. It is recommended that the "Request Type", "Nature of Request", and "Closure" fields be updated to reflect the correct data points after receiving feedback from staff on-site. This small but vital step can substantially improve the data's precision and value for future analysis.

Recommendation: Update certain 311 categories to better track information including:

- Creation of a "Sensor Request" tag to delineate garbage can sensor requests that generate a 311 ticket when the container is 80% full compared to 311 requests for servicing cans that are overflowing.
- Updating 311 closure language from "Case Resolved" to "Case Closed" and have discrete Closure Descriptions/Status Notes categories for easier analysis and updating. This is beneficial to internal tracking and analysis as well as providing updates to the person that created the 311 request.

Responsible Party: This recommendation should be led by Public Works and City Administrator/311 Customer Service Center staff.

Due to reports inaccurately indicating a dramatic increase in overflowing trash cans in the City, the recommended course of action is to update the labeling system for certain 311 data categories. Specifically, it is proposed that sensor-based requests for garbage can servicing, currently labeled as "overflows", be re-categorized as distinct "sensor requests". This would help to accurately track and represent the source of service requests, distinguishing between user-reported overflows and sensor-triggered service requests, thus avoiding any misleading impact on reporting data.

In addition, it is recommended that a reevaluation and update of the reasons for ticket closure within the 311 system occurs. It's been noted that many tickets marked as "Case Resolved" are not completed due to various reasons. The language used should be clearer and more accurate, such as "Case Closed; <identified problem>". This will not only benefit the public but also enhance future analyses.

Recommendation: Create a new 311 category for on-site personnel to estimate the source of illegal dumping when completing 311 tickets.

Responsible Party: This recommendation should be led by Public Works and City Administrator/311 Customer Service Center staff and with input from Recology.

San Francisco should implement a new 311 category that enables on-site personnel to estimate the source of illegal dumping when filling out 311 tickets. Identifying where illegal dumping originates (e.g., residential areas, commercial businesses, unhoused people, etc.) and whether it from within or outside the City is key to understanding and addressing the problem. This information will allow the City to tailor education, eradication, and enforcement efforts to the right sectors. This would be modeled after Portland Metro's RID Patrol where on-site staff identify and document the source of waste during collection and use this data to inform targeted policies.

Performance Metrics

The following Performance Metrics are intended to be implemented through the Service Level Agreements (Service Level Agreements) with Recology. These recommendations are specific to additional reporting requirements that should be detailed in future agreements as well as the funding for future illegal dumping pilots.

Recommendations:

1. For the Abandoned Materials Collection program:
    a. Recology should be required to provide Abandoned Materials Collection customer calls coming directly to Recology in its quarterly reporting to the City.
    b. Separately report Abandoned Materials Collection tons (currently combined with street sweeping tons) in its quarterly reporting to the City.
    c. Add annual budget for illegal dumping pilot projects to be agreed upon before the start of each Rate Period by the City and Recology.

2. For the Public Receptables Collection program and assuming pilot continues into the next Rate Period:
    a. The Daily Limit language in the Service Level Agreement should be adjusted to include a stated prioritization for completing overflowing containers requests over garbage can sensor requests is recommended. Include a provision to complete all overflowing container tickets received within two hours prior to the end of the SLA measurement period.

3. For the Bulky-Item Recycling program:
    a. Recology should be required to provide the total number of requests for Bulky-Item Recycling by account type and participation rate and percent change in requests compared to prior year in the existing Quarterly Abandoned Materials Collection Reports.
    b. Require Recology to provide annual outreach to residents for Bulky-Item Recycling service and publicize options for recycling/disposal in newsletter and social media channels. If requests for Bulky-Item Recycling are lower than 10% compared to prior year, Recology must put forward an outreach plan to address how it will publicize the program.

Responsible Party: Recology would be responsible for any implementation efforts if included in future Service Level Agreements. However, Public Works and the Office of the Refuse Rates Administrator must work together to include recommendations in future Service Level Agreement negotiations with Recology. The next period for Service Level Agreement negotiation is set to begin this summer.

Conclusion

Public Works and Recology are doing a good job of responding to illegal dumping requests driven by 311 and it's the proactive routes that help address the needs neighborhoods with persistent illegal dumping. However, if the City chooses to focus its efforts on reducing illegal dumping on the streets overall, including what is **not** reported through 311, more programming is needed. This will require much more resources and leveraging both data and qualitative information from employees that clean up and see this material every day. This may include strategies like engaging the community by encouraging residents to report any instances of illegal dumping they encounter to significantly enhance detection efforts. Implementation of proactive measures like regular monitoring and strategically positioned surveillance equipment in high-risk areas can contribute to early detection and intervention. Leveraging data analytics and machine learning algorithms to analyze patterns and predict future instances of illegal dumping can enable more efficient resource allocation and intervention strategies. These activities get at answering what amount of illegal dumping material remains after the City's primary strategies to abate illegal dumping (responding to 311 tickets and two proactive routes) are completed.

This comprehensive report emphasizes the necessity for a more targeted approach to illegal dumping in San Francisco. It spotlights the disparity in definitions and lack of structured goals amongst City Departments, the underutilization of the Bulky-Item Recycling program, particularly by apartment residents, and the decrease in usage of said program over the past few years. It calls for increased awareness and usage of the Bulky-Item Recycling program, clearer tracking and reporting protocols, and greater alignment between departments to define and combat illegal dumping effectively. The report also underscores the importance of adopting best practices from other jurisdictions to improve our City's approach to illegal dumping. The future of San Francisco's cleanliness and environmental health is contingent on implementing these recommendations and making use of the proactive programs for education, eradication, and enforcement to address illegal dumping effectively.

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Attachments

Attachment 1: Process Flow of 311 Requests

Attachment 2: Additional Graphics and Analysis: Tonnage, 311, and Bulky-Item Recycling

Tonnage Analysis

Measuring what is ultimately collected is another way to evaluate the illegal dumping program in San Francisco though tonnage data is an input measure rather than a measure of the whole problem. Recology is responsible for disposal of nearly all illegal dumped materials regardless of if it was initially cleaned by Public Works. Recology and Public Works meet multiple times per day to offload material picked up from Public Works staff in a pick-up truck to a larger Recology truck for disposal. It is not possible to assign tonnage specifically to Public Works and Recology for illegal dumping activities, but this could be done in the future by weighing an empty and full Public Works pick-up truck and using the difference of that weight to quantify the amount of material that is collected by Public Works.

Looking at the tonnage collected from all illegal dumping clean-ups by both Recology and Public Works, the same trend as the 311 requests is observed with tonnage highest in January and August likely due to move outs. The trends are consistent across all three years as well. The primary solution for residents to legally dispose of large items like furniture and mattresses is using the Bulky-Item Recycling service provided by Recology. Tonnage for this service follows the same trend with peaks in Bulky-Item Recycling tonnage in January, August, and a final peak in December. 2023 is lower in Bulky-Item Recycling tonnage than 2021 and 2022 and may indicate that more people moved around or out of San Francisco and used the Bulky-Item Recycling service on those year than 2023. This can also indicate a need for more outreach to residents about the service for getting rid of larger items instead of illegally dumping them on the streets. The following graphs highlight the trends for Bulky-Item Recycling and illegal dumping tonnage over the three-year period and encapsulate all tonnage collected in the City of San Francisco's streets specific to illegal dumping and through the Bulky-Item Recycling program available to all residents. These tonnage findings are similar to trends in 311 requests in the main report.

Figure 12: Illegal Dumping Tons By Month

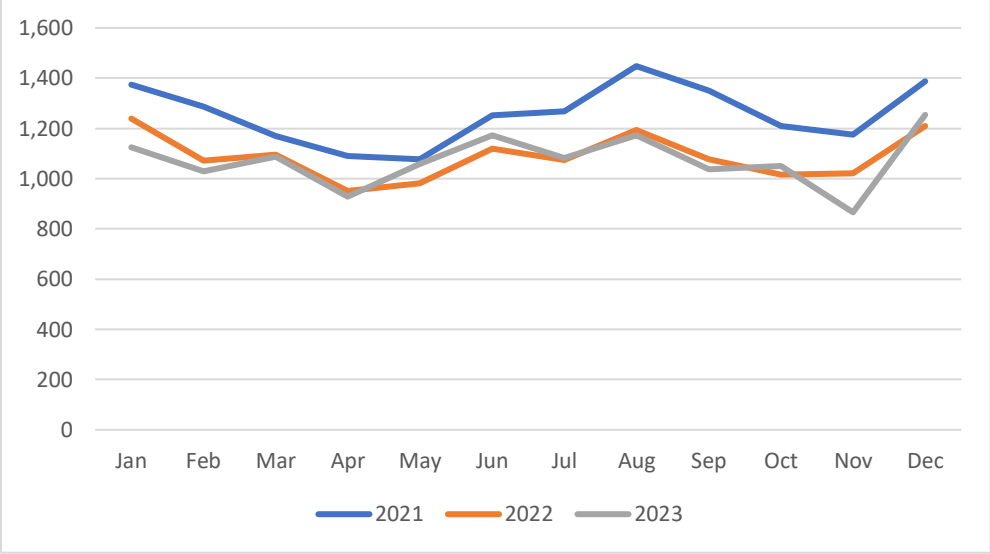


Figure 13: Bulky-Item Recycling Tonnage By Month

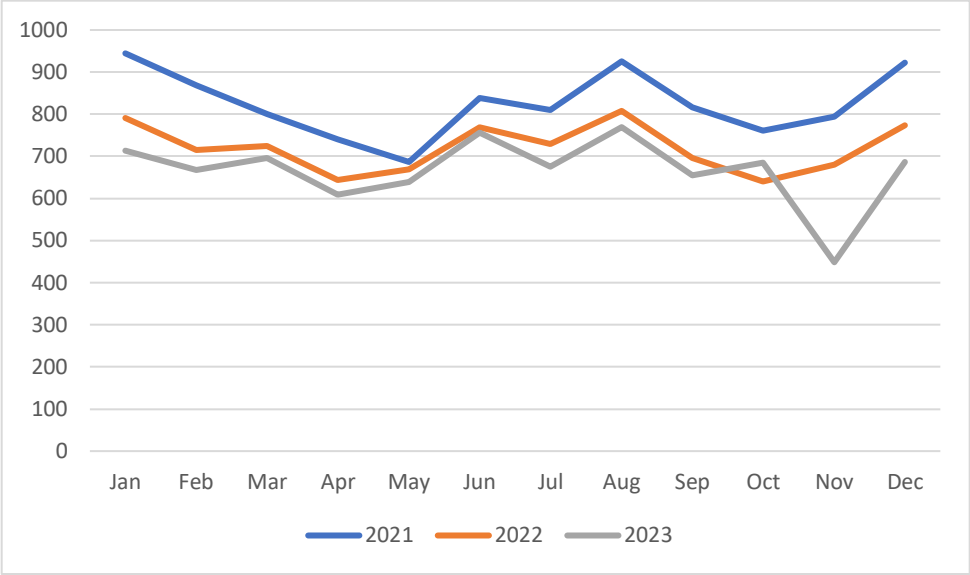
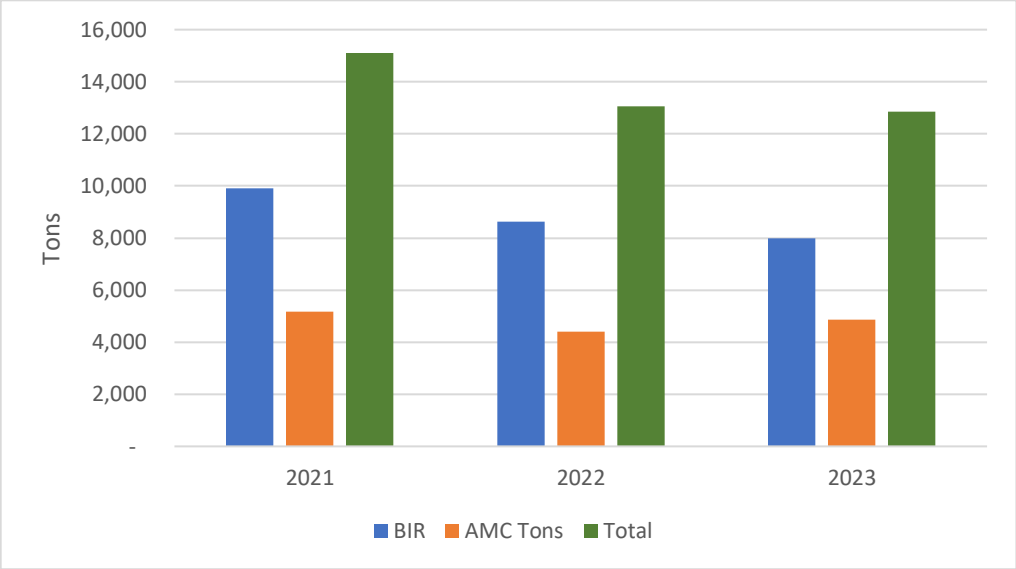
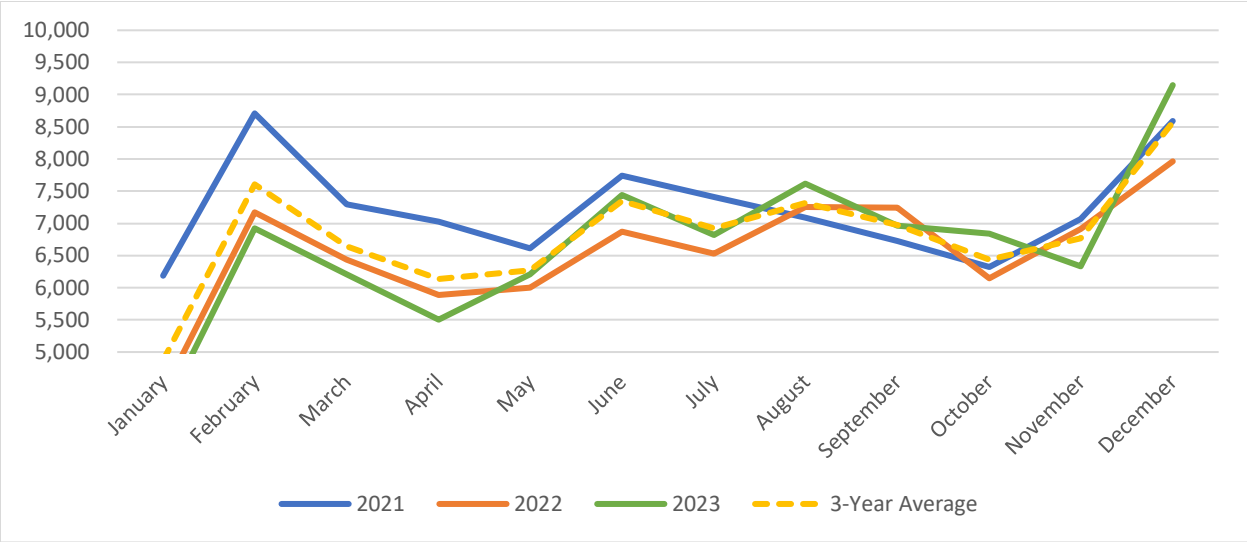


Figure 14: Illegal Dumping Tons and Scheduled Bulky Item Pick-Up



Bulky-Item Recycling Trends and Utilization

Figure 15: Bulky-Item Recycling Tonnage By Month



Bulky-Item Recycling in Figure 15 shows that there are clear "seasons" for Bulky-Item Recycling where more or less resources may be needed to meet demand. There are increases in tonnage in February, June, and December. This varies slightly from analysis done on Bulky-Item Recycling requests by month but the spike in June is likely due to Bulky-Item Recycling tonnage collected through informal Bulky-Item Recycling clean-ups at college campuses around San Francisco when students move out.

Figure 16: Bulky-Item Recycling Tonnage Day of the Month (3-year average)

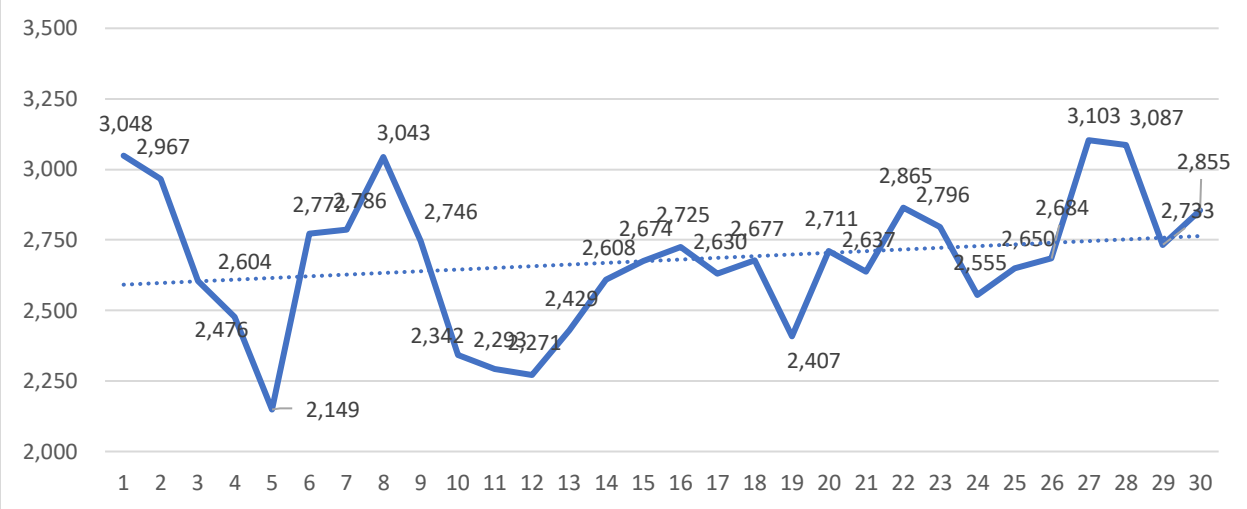
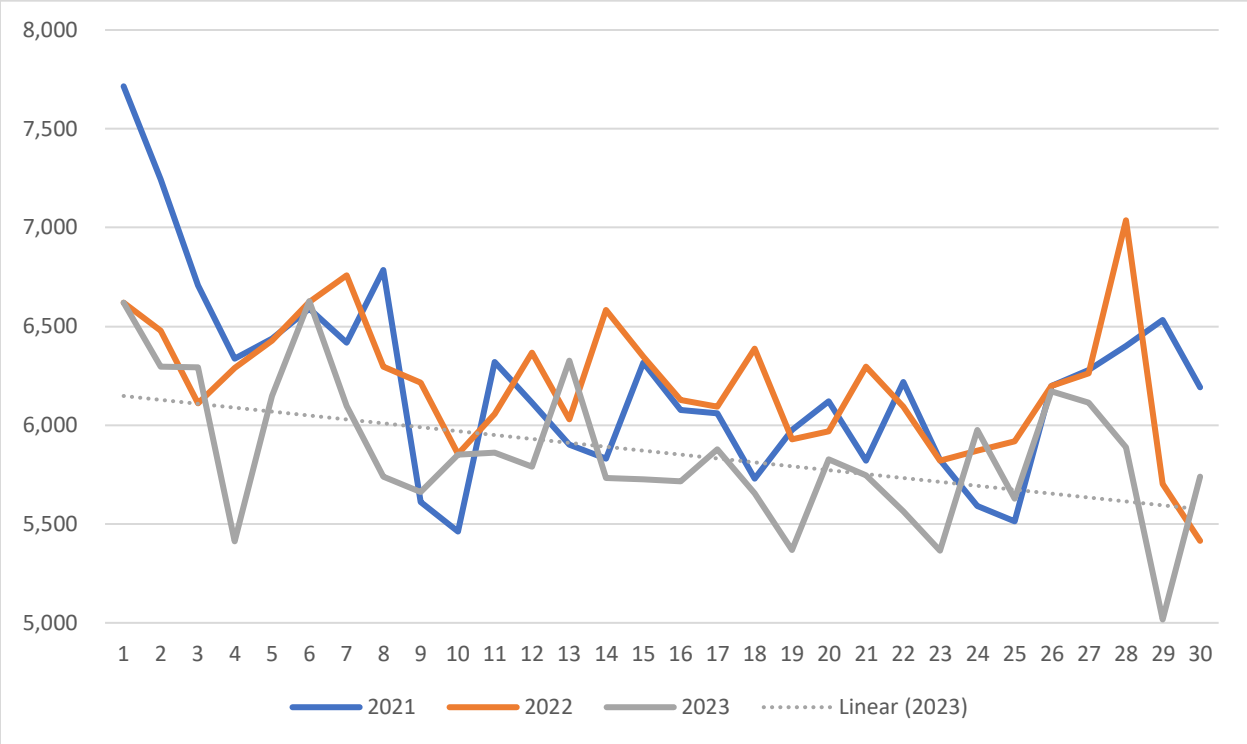


Figure 16 highlights Bulky-Item Recycling tonnage over the course of the month. There are spikes in the first of the month, middle of the first week, and during the last few days of the month. This is to be expected as most people are using Bulky-Item Recycling for moving or downsizing. This figure highlight trends in tonnage rather than requests so there is a delay in when a customer calls to request a Bulky-Item Recycling pick-up and when it is actually collected and therefore captured in the tonnage data.

Figure 17: Illegal Dumping Requests Over Month Long Period



From this figure, over 2021, 2022, and 2023 there is a consistent trend. There is a decrease in illegal dumping 311 requests at the month continues overall but clear spikes on the first day of the month, at the end of the first week, and at the end of the month. This further highlights the “move out” effect.

Attachment 3: Table of All Best Practices from Interviews with Jurisdictions

City	Program Features of Note	Future Work	Staff Interviewed
San Rafael, CA	• Formally established a 5-year program to reduce illegal dumping by 50% by 2025 • Illegal dumping strategy is defined by "Access, Education, & Enforcement" • Developed a mini grant program for businesses to buy cameras to reduce illegal dumping • Established a bulky drop-off program for residents to dispose of waste that would otherwise be dumped once a month • Focused on equitable distribution of services by removing some Bulky-Item Recycling for single-family and moving them to multi-family • Found about 90% of illegal dumping is casual and 10% is illicit	• Building better baseline data for program management • Incorporate more community feedback through surveying • Expanding options for people with illegal dumping citations to have option for community service rather than paying fine • Exploring options for better technology for enforcement • Hiring a full-time employee to manage illegal dumping programs	Cory Bytof
San Jose, CA	• Implemented the Prevention, Abatement, Cleanup, and Enforcement (PACE) program • Have an unlimited Bulky-Item Recycling program for single and multi-family residents • Implemented a "Dumpster Day" program for people to dispose of waste every Saturday around the City (consistent in District 7) • Implemented a pilot to reduce mattress dumping through cameras. Found that cameras were effective in deterring dumping in the pilot areas but moved the elsewhere in the City	• Focusing on outreach to inform residents of programs • Invest in better technology to enforce illicit dumping (cameras with license plate readers, AI to track hot spots, etc.) • Need more staff to implement more proactive programs	Olympia Williams, Ed Ramirez
Oakland, CA	• Utilize the Education, Eradication, and Enforcement framework for illegal dumping strategies • Recently updated the City's municipal code to better enforce construction/contractor illegal dumping. Now tracking all building permits and citing illegal haulers that often dump illegally • Running a pilot with Waste Management that provides free waste service and upgrades for businesses. Initial results show less dumping when businesses and residents have adequate service • Run a monthly "Bulky block party" bulky item drop off for residents	• Plan to focus on illicit construction dumping • Enforce/cite property owners for lack of adequate service rather than resident • Have a bigger emphasis on education • Expanding options for people with illegal dumping citations to have option for community service rather than paying fine	Wanda Redic
Alameda County (District 4)	• Created a Road Map of stages of illegal dumping and interventions for each stage and proactive and reactive program recommendations for Education, Eradication, and Enforcement framework • Created a partnership with law enforcement that was effective are reducing dumping and blight • Found that 90% of illegal dumping is casual and 10% is illicit	• Focusing on enforcing existing illegal dumping laws • Fostering cross-sector/agency partnerships through establishment of Illegal Dumping Working Group and Illegal Dumping Conference	Erin Armstrong

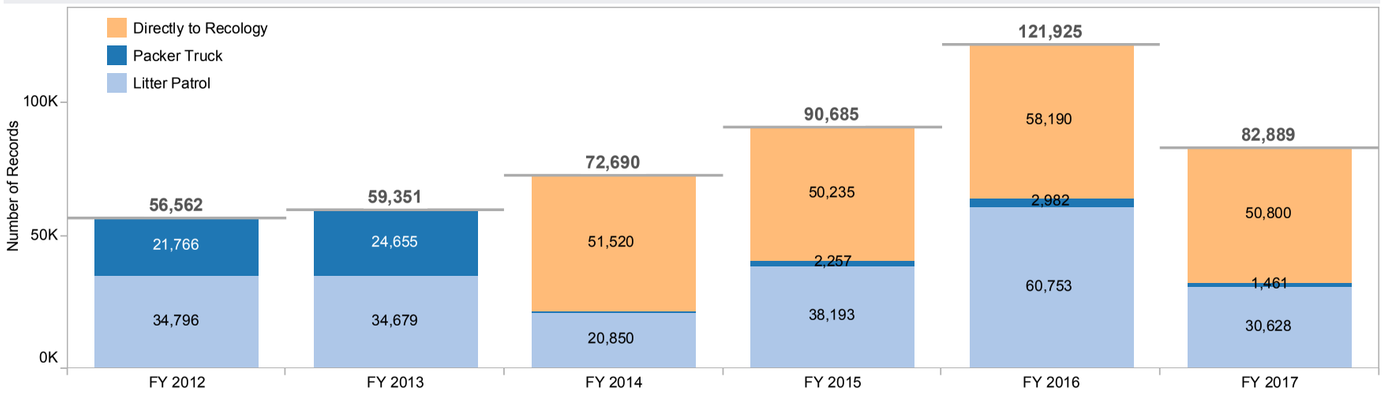
City	Program Features of Note	Future Work	Staff Interviewed
	• Created partnerships with businesses affected by illegal dumping to provide free pick-ups of material once collected by businesses • Visual cues of deterioration like graffiti, poor lighting, and existing trash signal that a location is uncared for, and that illegal activities can take place with little regard for being caught		
Portland Metro Area, OR	• Program includes illegal dumping clean-up and management of transfer stations, landfill, and hazardous materials facility and can collect almost all types of waste under illegal dumping programs • Strong integrated data system – staff report at sites of illegal dumping: material type, source of waste (residential, commercial, industrial), and location	• Complete a Regional Waste Plan for 2030, which include illegal dumping and support of statewide EPR measures • Need more resources to implement future projects	Abigail Herrera and Stephanie Rawson
City of Los Angeles	• Use the Education, Eradication and Enforcement framework • Focus is on illicit dumping enforcement: employ 18 staff in enforcement, 3 in outreach and education, and approximately 26 in solid waste collection • Approved 18 surveillance cameras and equipment for $300,000 to support enforcement efforts • Every quarter, street-by-street assessments are conducted using the CleanStat data system. Streets are scored based on litter, weeds, bulky items, and illegal dumping. Data from CleanStat is used to coordinate resources including neighborhood cleanups, alley cleanups, bulky item pickups, and placement of 5,000 new public trash bins throughout the City	• Focusing on catching and prosecuting the most egregious dumpers (hazardous, large items, etc.) • Investing in better technology for enforcement including solar-powered cameras with license plate readers • Investing in additional resources for more enforcement and arrests	Gary Harris

Attachment 4: Prior Public Works Analysis on Service Level Agreement Measurement Periods

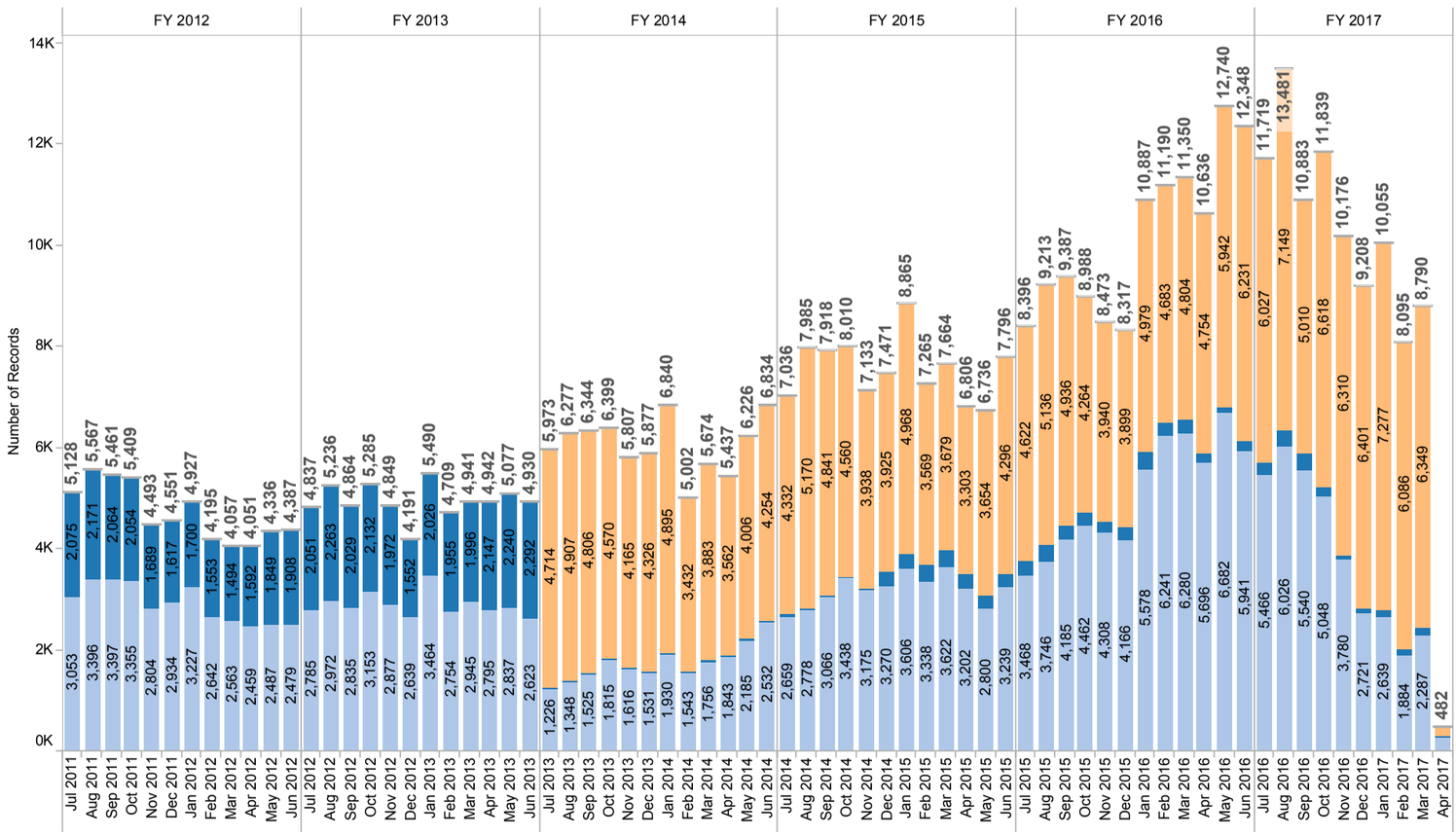
Abandoned Waste (3/30/17 data request)

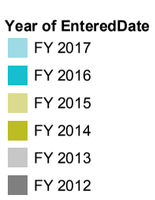
Abandoned Waste Service Requests Received by Public Works and Recology by Fiscal Year

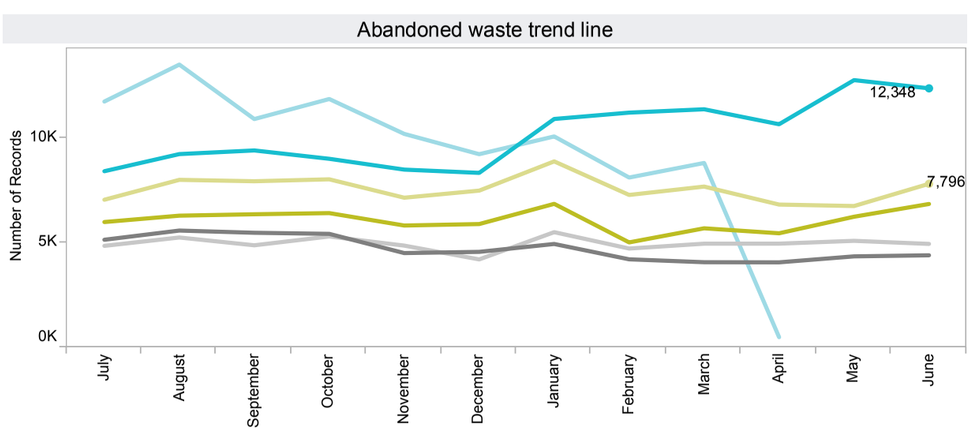
(FY16-17 as of 3/30/17 or 75% of FY elapsed; includes packers and litter patrols; sources: 311 and 28Clean)
Directly to Recology includes Public Works transfers, estimated at 7K/yr
***This data source joins 311 and 28Clean and may not be including CMMS data. FY16-17 volume data needs to be checked to confirm its completeness and accuracy as source system changed from 28Clean to CMMS for Public Works' work for that period. Street cleaning dashboards are currently transitioning to new sources. It is possible that 30,100 service requests of litter patrol for FY17 could be under reported, as of 3/30/17.



Sub Category	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
Directly to Recology		17	51,520	50,235	58,190	50,800
Packer Truck	21,766	24,655	320	2,257	2,982	1,461
Litter Patrol	34,796	34,679	20,850	38,193	60,753	30,628
Grand Total	56,562	59,351	72,690	90,685	121,925	82,889



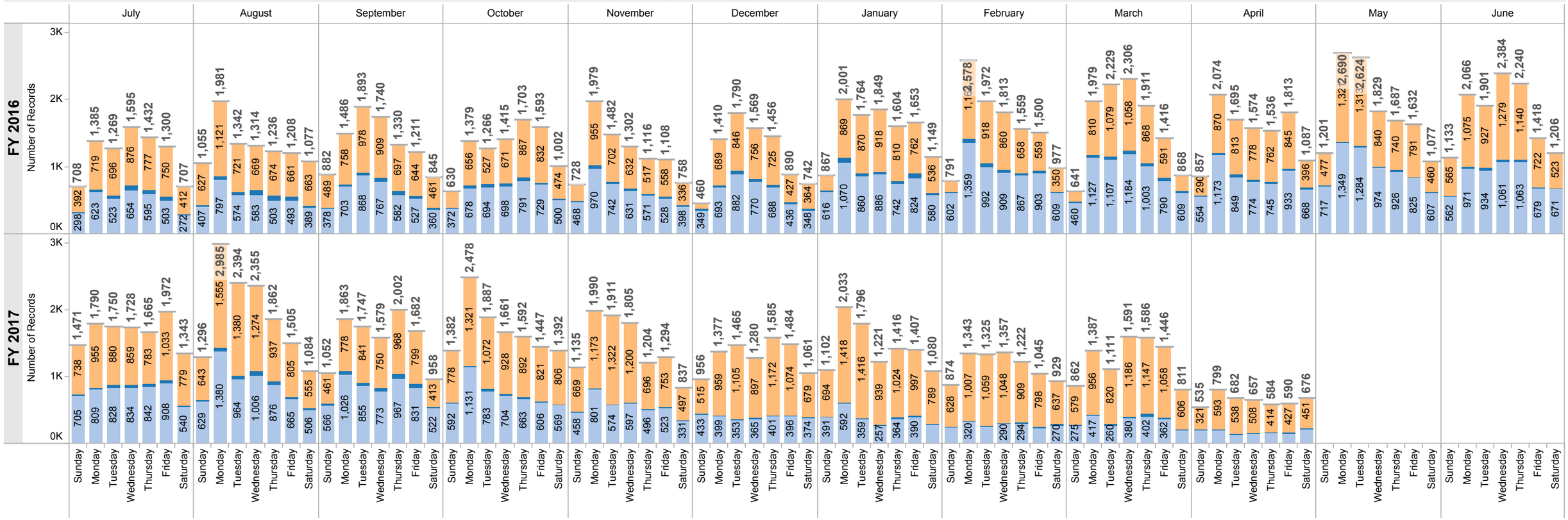




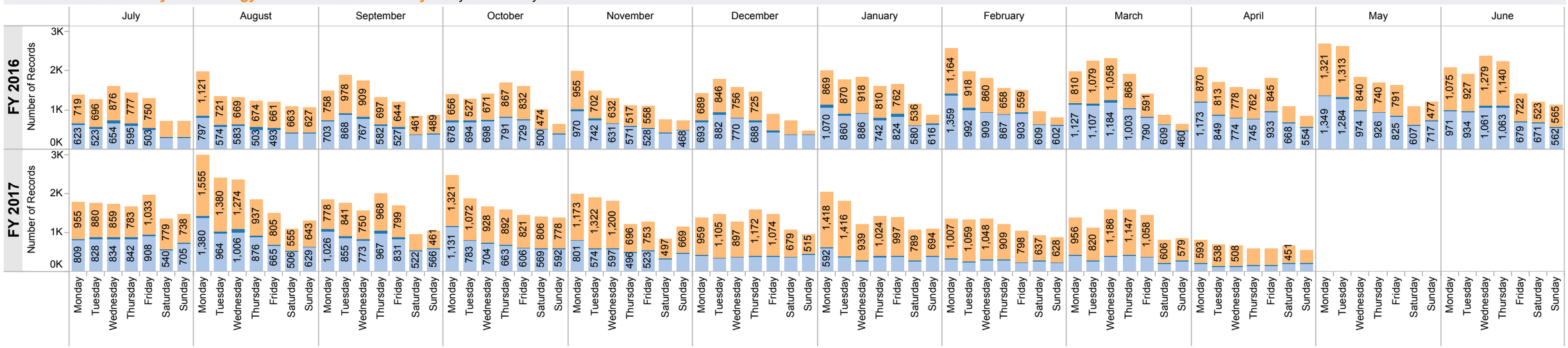
Abandoned Waste (3/30/17 data request)

Directly to Recology | Packer Truck | Litter Patrol

Service Orders for Litter Patrol, Packer Truck, and Directly to Recology Abandoned Waste - Day of Week by Month and Fiscal Year



Service Orders Directly to Recology Abandoned Waste Only - Day of Week by Month and Fiscal Year



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PublicWorksStat 04/13/2017 San Francisco Public Works

Abandoned Waste (3/30/17 data request)

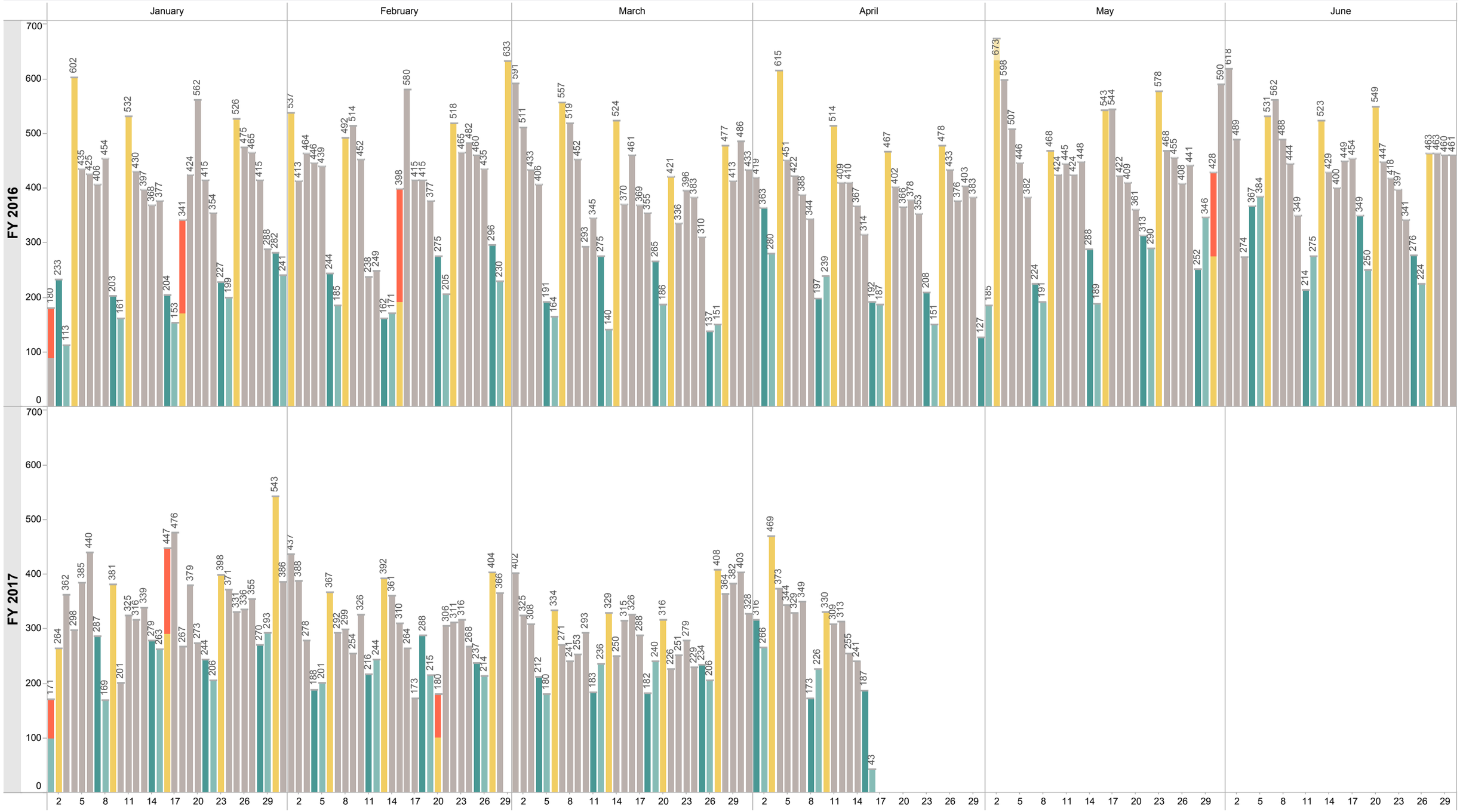
Volume of Service Orders by Day of Week (Jul-Dec)

Packer Truck, Directly to Recology, Litter Patrol - Day of Month by Month and Fiscal Year

Abandoned Waste (3/30/17 data request)

Volume of Service Orders by Day of Week (Jan-Jun)

Packer Truck, Directly to Recology, Litter Patrol - Day of Month by Month and Fiscal Year



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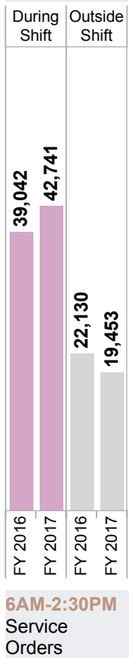
PublicWorksStat 04/13/2017 San Francisco Public Works

Hourly Analysis of Abandoned Waste (Recology Data ONLY)

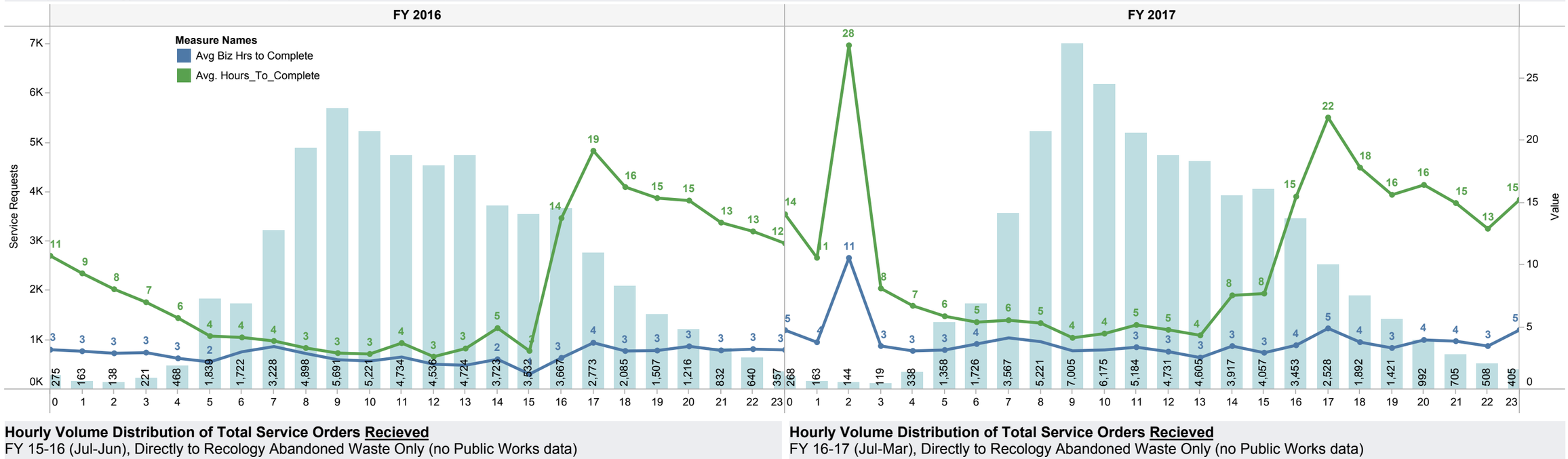
Summary: The following dashboards indicate that during the current shift (8AM-4:30PM), about 2,300 more calls are recieved than during the proposed shift (6AM-2:30PM). Switching to the proposed shift may be more efficient in two ways. A larger portion of calls will come in after outside of shift hours, allowing for more calls to be routed. Additionally, operating during a time when less calls are coming in will give the crews more time to focus on the routed calls.

8AM-4:30PM
Service Orders Recieved

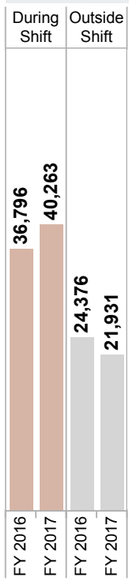


Hourly Volume of Service Orders Recieved by Average Business Hours to Complete and Average Hours to Complete

Directly to Recology Abandoned Waste Only (no Public Works data)

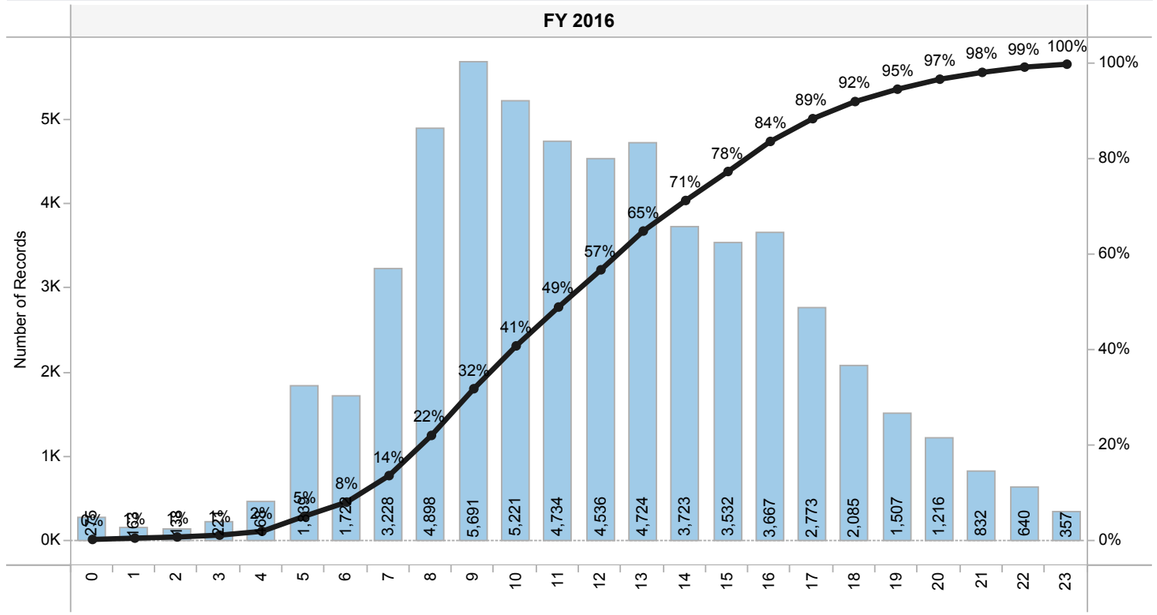


6AM-2:30PM
Service Orders Recieved



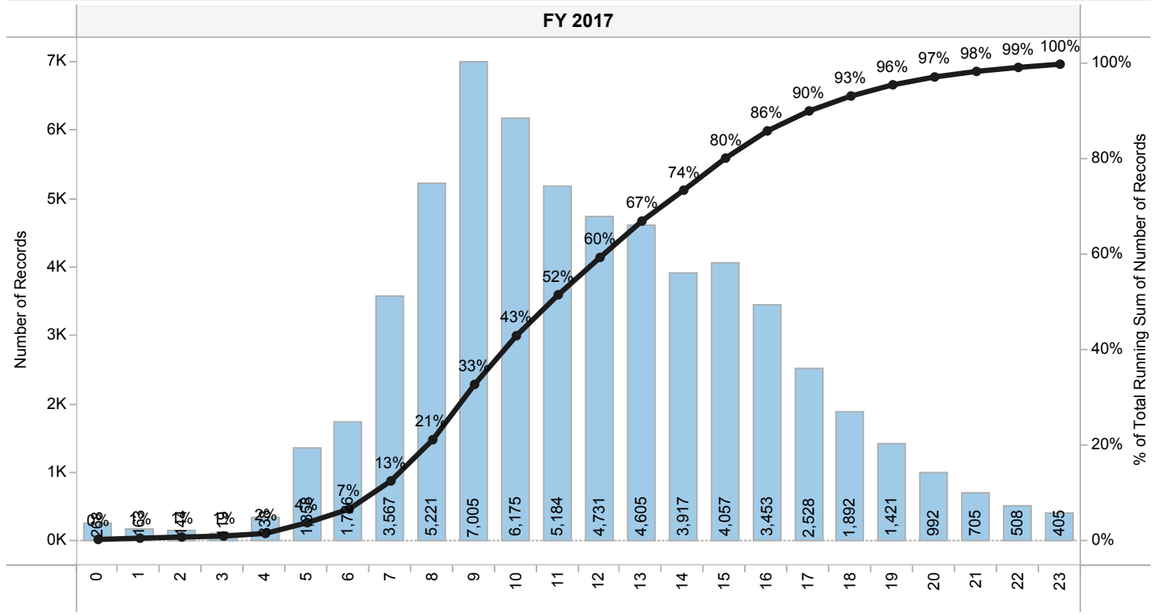
Hourly Volume Distribution of Total Service Orders Recieved

FY 15-16 (Jul-Jun), Directly to Recology Abandoned Waste Only (no Public Works data)



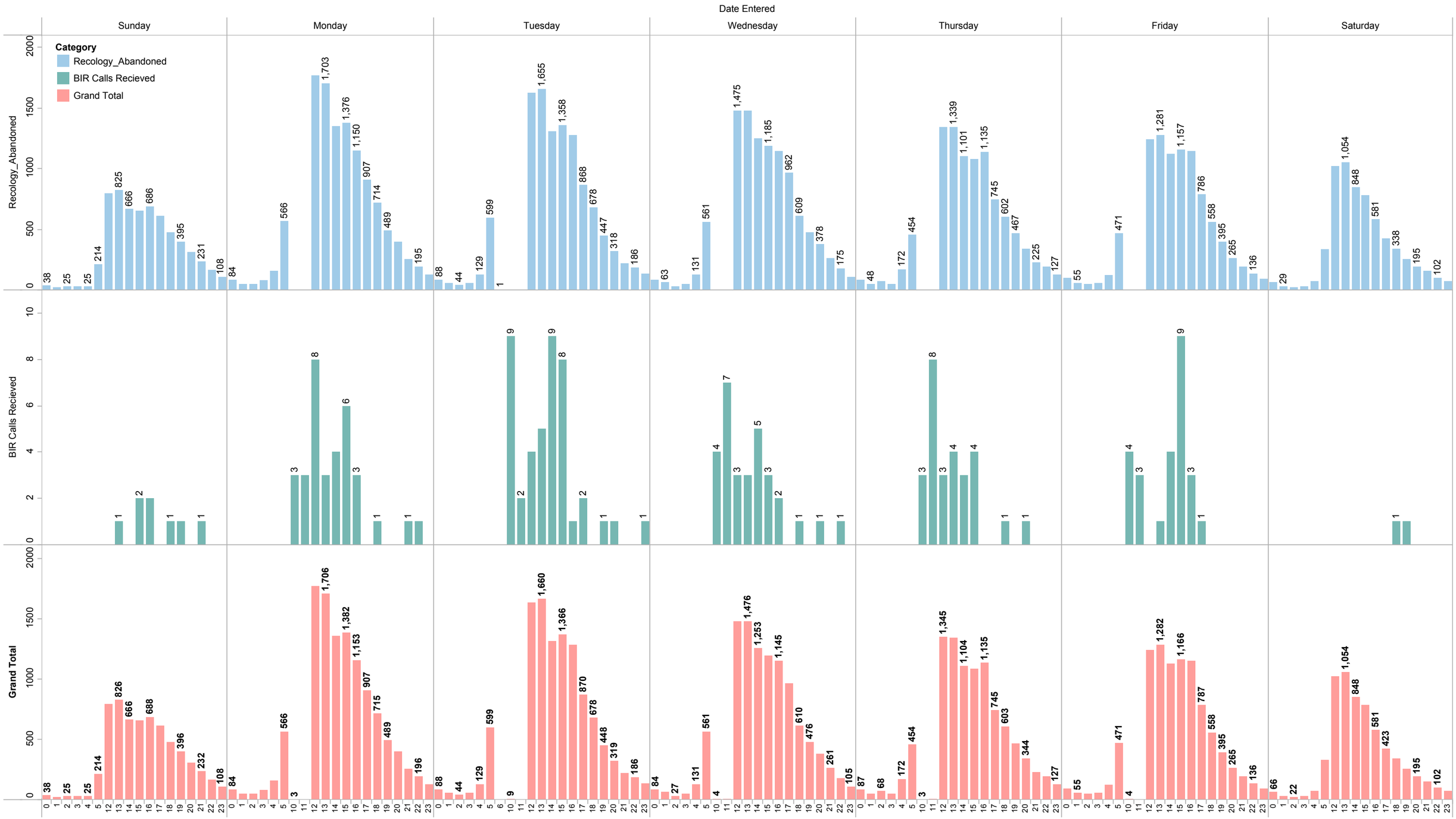
Hourly Volume Distribution of Total Service Orders Recieved

FY 16-17 (Jul-Mar), Directly to Recology Abandoned Waste Only (no Public Works data)



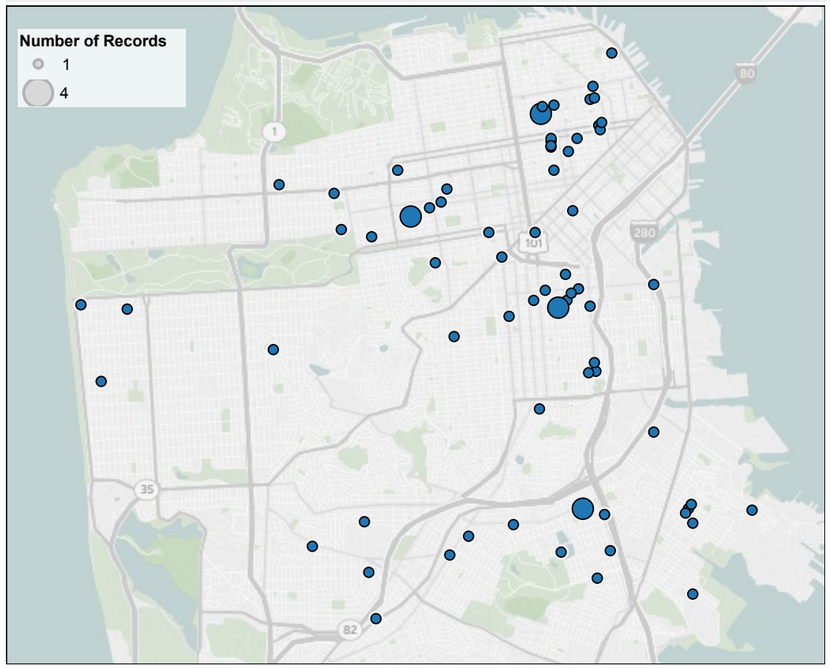
Hourly Analysis of AMC and BIR Calls Recieved

AMC and BIR Calls Recieved, by day of week and time of day (Recology AMC 311 data and Recology BIR data, no Public Works data)

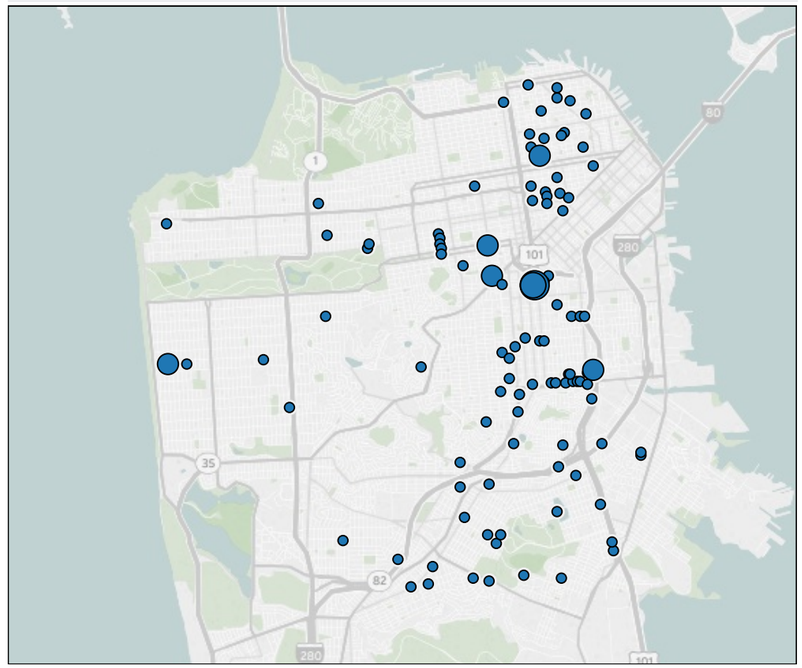


Abandoned Waste (3/30/17 data request)

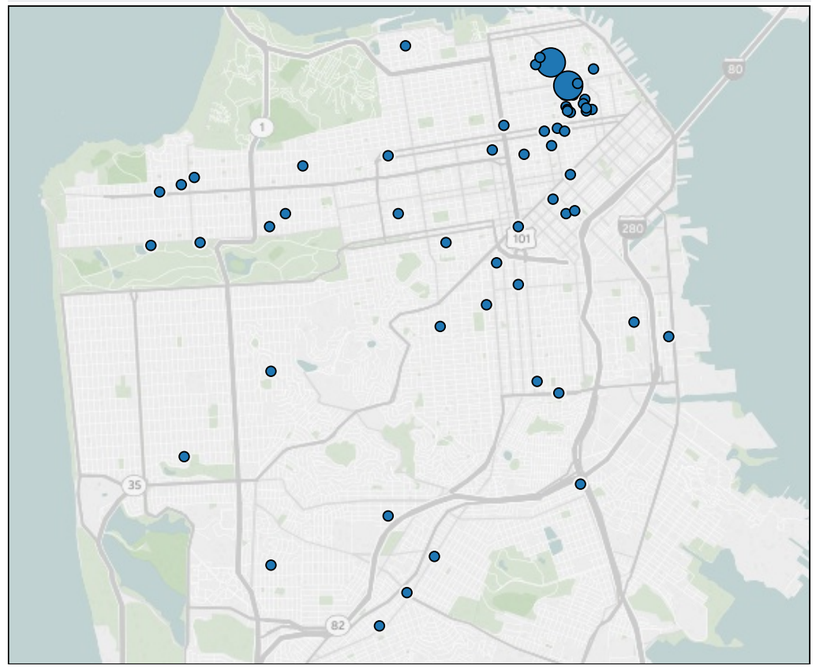
Volume of Service Orders During 12:00 Hour



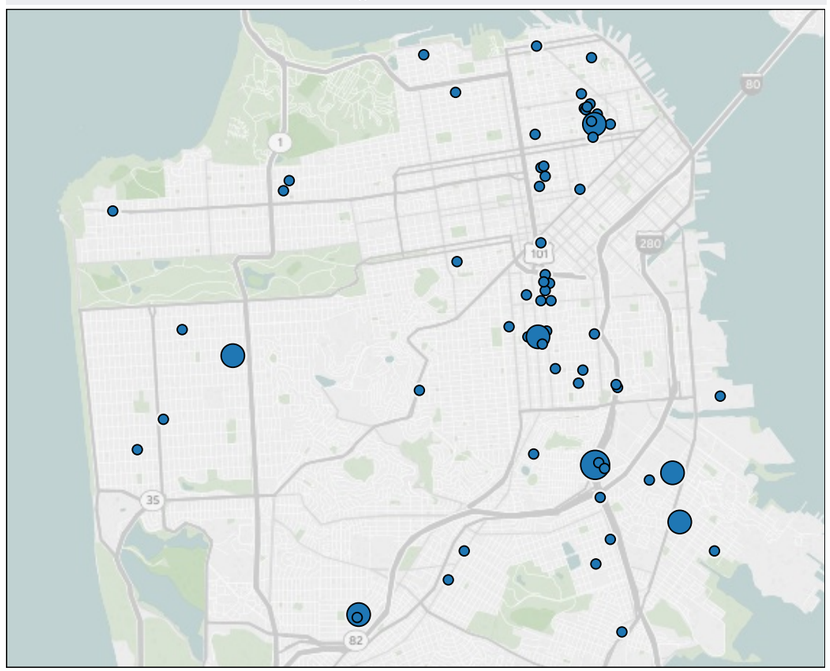
Volume of Service Orders During 13:00 Hour



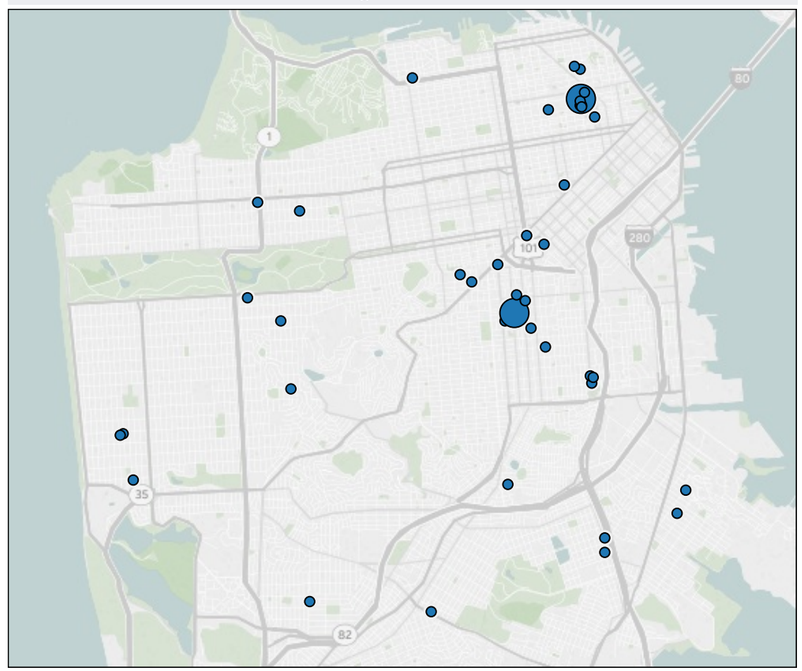
Volume of Service Orders During 14:00 Hour



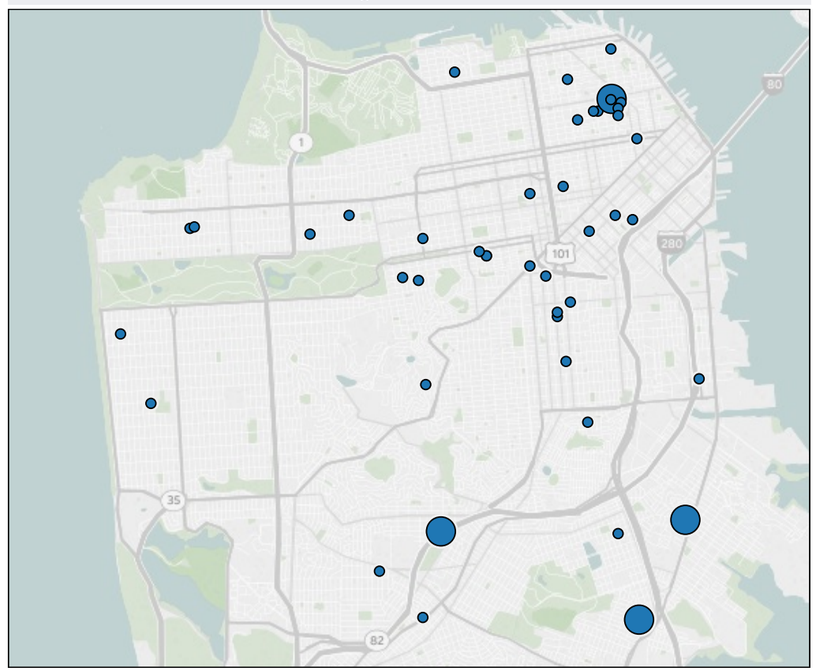
Volume of Service Orders During 15:00 Hour



Volume of Service Orders During 16:00 Hour



Volume of Service Orders During 17:00 Hour



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