Tracking California's Trash Project

Evaluation of Street Sweeping and Curb Inlet Screens as Measures to Control Trash in Stormwater

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1. INTRODUCTION

The State of California (State) has placed a high priority on the development and adoption of Total Maximum Daily Loads (TMDLs), National Pollutant Discharge Elimination System (NDPES) permit requirements and other policies designed to significantly reduce the levels of trash in freshwater creeks, rivers, lakes, bays and estuaries. Prioritization has spawned the development of baseline trash loading studies from stormwater and the implementation of enhanced control measures to reduce trash impacts in the Los Angeles region, San Francisco Bay Area, and other regions in the State. Information on the costs and benefits of these control measures, however, is limited and monitoring methodologies needed to accurately measure progress towards TMDL or NPDES permit reduction goals need further testing and evaluation.

In 2013, the Bay Area Stormwater Management Agencies Association (BASMAA) was awarded a grant by the State Water Resources Control Board (State Water Board) to implement the ***Tracking California's Trash (TCT)*** project. The project was designed to improve our collective knowledge about California's water quality concerns associated with trash and inform the actions that regulators, public agencies, and the concerned public can take to effectively resolve these concerns. Identified project outputs included the development of rigorous and repeatable trash monitoring methods, an assessment of the effectiveness and costs/benefits of specific trash control measures, and the development of a web-based portal that disseminates related information and recommendations to the public.

Specifically, the TCT project consisted of three major tasks:

1. Testing Trash Trends Monitoring Methods for:
    a. *Trash in Flowing Receiving Waters*
    b. *On-land Visual Trash Assessments*
2. Evaluating the Effectiveness and Costs of Trash Control Measures
3. Developing a Web-based Portal to Disseminate Related Information[1]

This report describes the results and conclusions of Task #2, ***Evaluating the Effectiveness and Costs of Trash Control Measures***. The study design and sampling and analysis methods were previously described in the Project's Monitoring Plan (Geosyntec and EOA 2014), submitted to the State Water Board in April 2014 and the Sampling and Analysis Plan (SAP) (Geosyntec et al. 2014) submitted to the State Water Board in December 2014. The detailed monitoring study design included in the SAP and described in this report was based on input from the Project's Technical Advisory Committee (TAC) members[2] and a review of worldwide literature on methods previously used by researchers to measure the effectiveness of street sweeping and/or curb inlet screening devices in reducing the transport of trash from urban streets to receiving water bodies via stormwater conveyance systems (EOA and 5 Gyres 2014).

[1] This task was later removed from the TCT project.

[2] TAC members included Dr. Robert Pitt (University of Alabama) and Dr. Eric Stein (Southern California Coastal Water Research Project), and staff from the State Water Resources Control Board and the City of Los Angeles, who are technical and scientific experts in the fields of stormwater control measure performance monitoring and trash monitoring/management. TAC members provided expert technical and scientific guidance on the design of the studies conducted via the TCT project.

1.1. Background

1.1.1. Definition of Trash

Litter (synonymous with trash) is defined in the California Government Code [Title 7.9. Recycling, Resource Recovery, and Litter Prevention, Section 68055.1(g)] as follows:

> *"Litter means all improperly discarded waste material, including, but not limited to, convenience food, beverage, and other product packages or containers constructed of steel, aluminum, glass, paper, plastic, and other natural and synthetic materials, thrown or deposited on the lands and waters of the state, but not including the properly discarded waste of the primary processing of agriculture, mining, logging, sawmilling or manufacturing."*

For the purposes of the TCT project, trash includes litter as defined by the California Government Code, but excludes sediments, sand, vegetation, oil and grease, exotic species and litter that can pass through a 5mm mesh screen. This more limited definition is generally consistent with TMDLs and municipal stormwater NPDES permits in the Los Angeles and San Francisco Bay regions (LARWQCB 2007, SFBRWQCB 2015), and the trash amendments to California water quality control plans (i.e., Trash Amendments) that were recently adopted by the State Water Board (SWRCB 2015).

1.1.2. Water Quality Impacts of Trash

Trash has become an increasingly serious waste management and environmental problem in urbanized areas in the United States and around the world (Laist 1987; Bjorndal et al. 1994; Laist and Liffmann 2000; Islam and Tanaka 2004; Sheavly and Register 2007; Moore 2008; von Saal et al. 2008). In 2012 over 250 million tons of trash was generated in the U.S. (USEPA 2014). An estimated 3.5 million tons of trash are annually generated in the San Francisco Bay Area (Bay Area). Urban trash includes food and beverage containers (e.g., plastic bags and bottles) and packaging, cigarette butts, food waste, construction and landscaping materials, furniture, electronics, tires, and hazardous materials (e.g., paint and batteries). Successful municipal recycling and composting programs have recently decreased the per capita generation rate, however each person in the U.S. still generates an average of more than 4 pounds of trash each day.

The vast majority of trash generated in the U.S. is collected, transported and disposed of properly through solid waste management processes and facilities. A portion of the trash generated, however, ends up on the urban landscape and makes its way to local creeks, rivers, lakes, bays and estuaries, and is eventually transported to the Pacific or Atlantic Oceans. While in these water bodies trash can adversely affect humans, fish, and wildlife (Bjorndal et al. 1994; Laist and Liffmann 2000; Islam and Tanaka 2004; Moore 2008; von Saal et al. 2008; Boergera 2010; USEPA 2016).

1.1.3. Stormwater Trash Load Reduction Requirements in California

Stormwater conveyance systems are one pathway that can transport trash to receiving water bodies. Trash load reduction requirements for stormwater that are currently in place in California are generally associated with three regulations/policies:

1. **<u>Trash TMDLs and the NPDES Municipal Stormwater Permit for the Los Angeles Region</u>** - Trash load reductions from stormwater conveyances are required for many water bodies in the Los Angeles region via trash and debris TMDLs. TMDL implementation plans vary slightly but are generally based on phased percent reduction goals that can be achieved through the implementation of trash control measures consistent with NPDES permits. Reductions are

documented based on the implementation of trash full capture systems and other types of control measures in combination with the assessment/quantification of trash reductions.

2. **San Francisco Bay Regional NPDES Municipal Stormwater Permit** - In the San Francisco Bay region, TMDLs for trash have not been established but through requirements included in the regional NDPES permit for municipal stormwater, Bay Area municipalities are required to achieve trash load reductions from stormwater conveyances over time. Reductions are based on phased percent reduction goals included in the permit, and are documented based on the implementation of trash full capture systems and other types of control measures in combination with the assessment/quantification of trash reductions.

3. **Statewide Trash Amendments** - On April 7, 2015, the State Water Board adopted the Trash Amendments that amend two statewide water quality control plans to include trash control requirements for owners/operators of municipal separate storm sewer systems. Beginning in 2017 and continuing through the next decade, applicable municipalities must comply with these requirements, which are designed to significantly reduce the discharge of trash to local water bodies from cities and counties throughout the State. Compliance strategies are similar to those employed in the Los Angeles and San Francisco Bay regions. Requirements will be administered through municipal stormwater NPDES permits.

1.1.4. Trash Accumulation and Generation

Trash accumulation and trash generation are terms used throughout this report and therefore it is worth defining up-front to avoid confusion in terminology:

- **Trash Accumulation -** the amount (volume) of trash that accumulates on streets, sidewalks, parking lots, and other land areas and is potentially transported to stormwater conveyance systems via stormwater runoff, wind or through direct dumping into storm drain inlets.
- **Trash Generation -** the amount (volume) of trash that enters storm drain inlets and is believed to be discharged from stormwater conveyance systems to receiving water bodies.

Reductions in amount of trash generated (i.e., discharged) via stormwater conveyances is the ultimate goal of the trash reduction requirements summarized in the previous section. Reductions in the amount of trash that accumulates onto land areas, is transported to storm drain inlets, and/or is discharged from the stormwater conveyance system can assist municipalities and other public agencies in addressing these requirements. Figure 1.1 illustrates the relationship between trash accumulation, control measure implementation, and trash generation.

Figure 1.1. Relationship between trash accumulation, reduction and generation.

1.1.5. Established Levels of Trash Generation

In response to the stormwater trash load reduction requirements in the Los Angeles and San Francisco Bay regions, public agencies conducted trash monitoring studies over the last decade to identify the levels of trash that are generated into their stormwater conveyance systems. Factors that may affect trash generation (e.g., land use, income, sources) were also evaluated as part of these studies. Based on the trash monitoring data collected, these studies concluded that the levels of trash entering a stormwater system is dependent on levels of trash that accumulate on streets and sidewalks (and other impervious surfaces), which is dependent on the extent and magnitude of trash sources, types of land use, and income levels within the land area draining to stormwater system. Additionally, the degree and effectiveness of trash control measures such as street sweeping also impacted the levels of trash observed in storm drains during these studies. The studies in the Los Angeles and San Francisco Bay regions generally concluded that the average volumes of trash entering stormwater conveyances systems on an annual basis can range between 0.5 and 150 gallons/acre yr^{-1}, depending on the factors stated above (County of Los Angeles 2004a, 2004b; BASMAA 2014).

Because of the large range in trash generated into the stormwater conveyance system annually (i.e. ~3 orders-of-magnitude) and the need to geographically identify trash generating areas on maps, San Francisco Bay Area municipalities developed "Trash Generation Categories" using the data generated through the Los Angeles and SF Bay Area trash generation studies. Each trash generation category is assigned a "best" trash generation rate that is based on the mid-point of the range of rates for that category. Ranges and "best" trash generation rates for each category are included in Table 1.1. Each trash generation category is associated with a color to allow illustration of trash levels on maps. "Best" trash generation rates, along with other monitoring and asessment tools, are currently used to evaluate the progress of municipalities in the San Francisco Bay area in reaching trash load reduction goals.

Table 1.1. Trash generation categories and associated "best/midpoint" rates and ranges (gallons/acre yr^{-1}).

Category	Low	Moderate	High	Very High
Trash Generation Rate (gallons/acre yr^{-1})	**2.5** (0-5)	**7.5** (5-10)	**30** (10-50)	**100** (50-150)

1.2. Trash Control Measures

1.2.1. Trash Full Capture Systems

A trash full capture system is defined as a single device (or a series of devices) that traps all particles that are 5 mm or greater, and has a design treatment capacity that is either: a) of not less than the peak flow rate, Q, resulting from a one-year, one-hour, storm in the subdrainage area, or b) appropriately sized to, and designed to carry at least the same flows as, the corresponding storm drain (SWRCB 2015; SFBRWQCB 2015; LARWQCB 2007). In California, a number of full capture systems have been certified/approved by the Los Angeles Regional Water Quality Control Board (LA Water Board) and the San Francisco Bay Regional Water Quality Control Board (SF Bay Water Board) as part of their TMDL implementation program and grant-funded projects.[3] Systems

[3] Based on the information available at the time of this report (SWRCB 2015), future approvals of trash full capture systems will be administered by the State Water Board through the implementation of the statewide Trash Amendments.

approved/certified to-date by these regulatory agencies include “end-of-pipe” and “in-line” netting and screening devices, and screening devices installed in storm drain vaults or catch basins.

To-date, municipalities and private entities have installed well over 50,000 full capture systems throughout California. Most of full capture systems are located in the Los Angeles and San Francisco Bay regions due to the stormwater trash regulations currently in place. Figure 1.2 illustrates one type of connector pipe screen (CPS) that screens trash before it exits the storm drain catch basin. This type of trash full capture system was utilized during the TCT project to evaluate the effectiveness of street sweeping and curb inlet screens as a trash control measure.

Figure 1.2. Example small full-capture device used as a monitoring site.

To avoid flooding and address hydraulic constraints, engineered stormwater treatment systems are generally designed to treat storm flows or volumes resulting from a certain size and intensity of storm event. Trash full capture systems are designed to trap all particles from the 1-year, 1-hour storm event that are >5mm in diameter. Although the rainfall depth associated with the 1-year, 1-hour storm event varies depending on geography, in California it equates to a storm size of between 0.1 and 0.6 inches in depth. Therefore, trash particles associated with storm events that generate rainfall depths greater than these are not generally treated by (i.e., bypass) full capture systems, nor are they required to by design.

1.2.2. Full Capture System Equivalency

Due to hydraulic constraints or configurations of stormwater conveyance systems, the installation of trash full capture systems may not be feasible in some instances. Additionally, municipalities may choose to implement alternative control measures due to community needs not aligned with full capture systems and/or unique situations regarding trash generation. The identification of alternatives to trash full capture systems that benefit water quality by reducing the trash discharged from stormwater conveyances are therefore desired by many municipalities.

Trash TMDLs, NDPES Permits, and the statewide Trash Amendments allow for the implementation of alternative control measures, so long as the trash reduction can be quantified with an acceptable level of scientific rigor. For example, the Trash Amendments allow for alternative equivalent controls (i.e., Track 2 Compliance Approach), only if the alternative controls can provide trash reduction equivalent to full capture systems. Additionally, the San Francisco Bay Water Board allows for trash loads reductions associated with alternative control measures to be claimed and credited towards load reduction goals if either on-land visual trash assessments or other credible evidence acceptable to the Water Board demonstrates that these control measures are indeed reducing trash at observable and quantifiable levels. Information on the trash load reduction benefits of alternative control measures, however, is limited.

Figure 1.3 illustrates the compliance tracks (i.e., Track 1 and 2) outlined in the State Water Board's Trash Amendments and the methods described in NPDES municipal stormwater permit for the San Francisco Bay region that municipalities currently utilize to determine the load reduction benefit of alternative trash control measures. Figure 1.3 also presents the trash reduction goals outlined in the Bay Area permit – trash full capture systems or equivalent alternative controls, or low trash generation (0-5 gallons/acre yr-1).

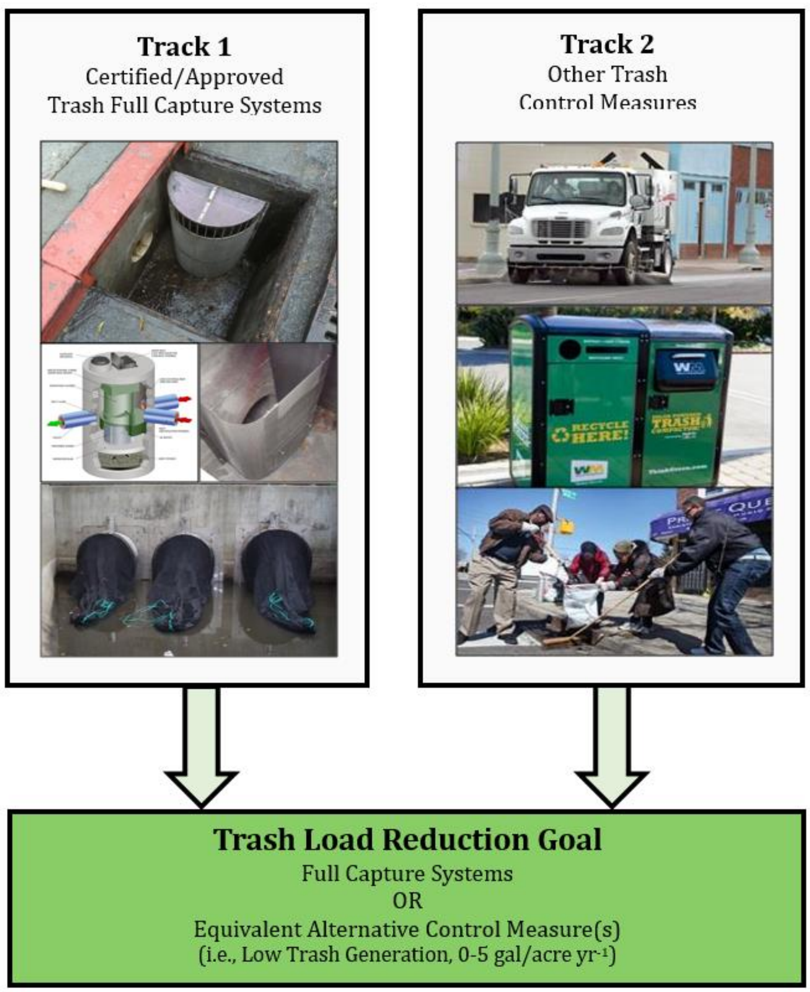

Figure 1.3. Compliance tracks outlined in the State Water Board's Trash Amendments and the trash load reduction goal for municipal stormwater in the the San Francisco Bay Area.

1.2.3. Street Sweeping

Scientists and engineers have conducted numerous studies designed to quantify the effectiveness of street sweeping at removing various pollutants over the last 30 years (EOA and 5 Gyres 2014). The vast majority of these studies have focused on evaluating the effectiveness of different types of street sweepers in removing sediments and pollutants associated with sediment, such as PCBs, metals (i.e., mercury, copper, lead, zinc, etc.), petroleum products, chlorinated and organophosphate pesticides, and polybrominated diphenyl ethers (PBDEs). In contrast, few have focused on their effectiveness in removing trash from street surfaces. Although lessons learned from studies focused on sediment and other pollutants may assist practitioners in evaluating the trash control benefits of street sweeping, there are considerable differences in densities and other characteristics of these substances.

Based on the results of the literature review conducted as part of the TCT project (EOA and 5 Gyres 2014), the effectiveness of street sweeping in removing trash and other pollutants from streets greatly depends on the following four factors:

- The type and condition of street sweeper;
- Sweeping frequency and timing in relation to rainfall events;
- Operator attentiveness and speed; and
- The presence of obstructions (e.g., parked cars) which hinder the ability of the street sweeper to reach the curb.

Street sweeping studies have shown that under ideal conditions, street-dirt removal rates can be up to 99 or 100 percent for trash and particles in the coarse size range (Sutherland 2011; Sartor et al. 1974). However, the relationship between street trash/dirt removal and improvement in stormwater runoff quality has not been decisively described. Early studies in the 1970s conducted with the National Urban Runoff Program (NURP) concluded that street sweeping was not effective in reducing stormwater pollutants measured by end-of-pipe runoff concentrations (Sartor and Garbory 1984). Improvements in sweeping equipment and practices have greatly improved experimental outcomes (Sutherland and Jelen 1997; Sartor and Garbory 1984; Pitt et al. 2004) thus making this original conclusion refutable.

Because early studies primarily focused on fine sediments and related pollutants, their findings are not necessarily applicable to the removal of trash. Further study is needed to determine the effectiveness of street sweeping as a control measure for trash pollution in stormwater conveyance systems.

1.2.4. Curb Inlet Screens

Partial-capture devices are treatment devices that have not been certified/approved as full capture systems by the Los Angeles or San Francisco Bay Regional Water Boards or the State Board, but have some level of trash reduction benefit. Curb inlet screens are one type of partial capture device. Curb inlet screens are perforated screens or evenly spaced bars that are designed to fit outside or immediately within the storm drain curb opening. Inlet screens may be fixed or retractable (Figure 1.4). Retractable screens open either manually or hydraulically when a storm flow/volume is detected. Since curb inlet screens block trash and debris from entering the storm drain inlet or storm drain, trash remains in the street and is removed by regular street sweeping or other measures.

Based on an evaluation of existing storm drain infrastructure and installed full-capture devices within the City of Los Angeles, the Watershed Protection Division (WPD) of the City of Los Angeles Department of Public Works, Bureau of Sanitation decided that the most practical and cost-effective approach for achieving TMDL compliance is the installation of catch-basin based full capture systems (i.e. connector pipe screens) in combination with curb inlet screens. A study conducted in the Los Angeles region by the City of Los Angeles observed that curb inlet screens alone (i.e., without full capture systems installed in the associated catch basin) removed approximately 86 percent of the trash that would have entered storm drain inlets during a combination of dry weather (via wind) and from storm events with rainfall depths >0.25 inches (City of Los Angles 2006). This is the only known study of the trash removal effectiveness of these types of devices.

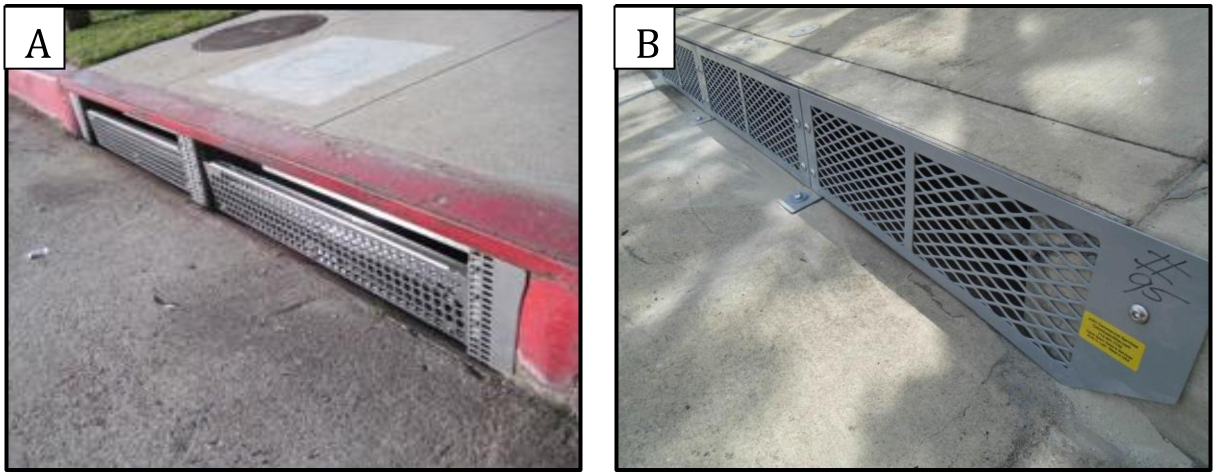

Figure 1.4. Auto-retractable (A) and fixed (B) curb inlet screens.

1.3. Objectives of the Street Sweeping and Curb Inlet Screen Evaluation

Task 2 of the TCT project, *Evaluating the Effectiveness and Costs of Trash Control Measures***,** was conducted to evaluate the benefits that street sweeping programs have in reducing trash from entering stormwater conveyance systems. Street sweeping programs were evaluated both with and without curb inlet screens to assess the added trash reduction benefit that the screens provide.

Monitoring questions that guided Task 2 included:

1. *What types of trash accumulate on streets, sidewalks and inlets?*
2. *At what rates does trash accumulate on streets and sidewalks?*
3. *What percentage of trash on streets and sidewalks is transported to storm drains under different street sweeping frequencies?*
4. *What percentage of trash on the street do street sweepers remove under different accumulation rates and street sweeping frequencies??*
5. *How quickly does trash accumulate again on streets and sidewalks after a street sweeping event?*
6. *To what extent does the amount of trash entering storm drain inlets change with curb inlet screens?*
7. *To what extent do street sweepers push trash into storm drain inlets, with and without curb inlet screens?*
8. *What are the costs associated with street sweeping programs and curb inlet screens?*

2. MONITORING DESIGN AND METHODS

2.1. Summary of Study Design

The monitoring associated with the street sweeping and curb inlet screen evaluation portion of the TCT project occurred between February 2015 and April 2016 (14 months) at seven study areas located in the cities of Fremont, Oakland and San Jose, California. Monitoring activities included the removal of trash from streets, sidewalks and drain inlets in three of the seven study areas (i.e., quantitative study areas) immediately before and after street sweeping events. The collected trash was quantitatively characterized in terms of weight, volume and item counts. Quantification events were supplemented with qualitative On-land Visual Trash Assessments (OVTAs), which were conducted at all seven sites before, after and between street sweeping and rainfall events.

2.2. Monitoring and Assessment Methods

The goals of the street sweeping and curb inlet screen study informed the types, frequency, and number of quantitative monitoring and qualitative assessment events conducted during the project. The three study areas where quantitative monitoring was conducted were comprised of two segments (#1 and #2), each approximately equivalent in length, trash rates, and other characteristics. This paired sampling approach allowed trash generation rates to be compared between the segments before and after street sweeping.

Directly prior to a sweeping event, trash was collected from the inlet(s), street, and sidewalk in segment #1. Trash was also collected from the inlet(s) in segment #2 prior the sweeping event. Following the sweeping event the trash remaining on the street and sidewalk in segment #2 was collected. All trash collected was bagged separately based on the type of sample (i.e., inlet, street or sidewalk) and segment.

Curb inlet screens are intended to block trash from entering the inlet. The effectiveness of inlet screens in reducing trash from entering the stormwater conveyance system were evaluated using both “paired watershed” and “before and after” study designs. The before and after design was employed at the Oakland site (OK-01), where inlet screens were installed halfway through the study period. For the paired watershed design, curb inlet screens in place in the San Jose (SJ-01) study area were compared to the Fremont study area (FR-01), which did not have screens installed. The curb inlet screens installed within the Oakland and San Jose study areas were designed to swing open (i.e., auto-retractable) to prevent flood if there is enough pressure from stormwater runoff.

Qualitative OVTAs were also conducted at the seven sites to provide additional data on the effectiveness of street sweeping and the rates at which trash accumulates at a site between street sweeping events. OVTAs were performed at all sites before, after and between street sweeping events. In addition, OVTAs were also conducted before and after rain events (> 0.25”) to better understand how rainfall affects the levels of trash observed on streets and sidewalks.

2.2.1. On-land Visual Trash Assessments

This study utilized the OVTA protocol developed by EOA, Inc (EOA 2015). The OVTA was developed to create a cost-effective reproducible method to quickly assess the level of trash generation on streets and sidewalks, where it may be available for transport to stormwater conveyance systems. The OVTA is a qualitative methodology that results in observations of trash levels on streets and sidewalks ranging from Low (A) through Very High (D) (Table 2.1). Example photos illustrating each OVTA score are provided in Figure 2.1

The OVTA method is currently being used by most municipalities in the San Francisco Bay Area, consistent with the regional NPDES municipal stormwater permit, to establish baseline trash generation levels and evaluate reductions in trash entering the storm drain system over time. Based on methodologies included in the regional permit, a consistent and stable OVTA score of "A" (Low) at a street/sidewalk location represents a low trash generation level, and therefore is equivalent to the performance of a trash full capture system.

Table 2.1. On-land visual trash assessment (OVTA) scoring categories and associated trash generation rates.

Trash Generation Category	OVTA Score	Best/Midpoint Trash Generation Rates (gallons/acre yr^{-1})	Description
Low	A	2.5	Effectively no trash can be observed on a city block or the equivalent. There may be some small pieces in the area, but they are not obvious at first glance and one individual could quickly pick them up. A low trash generation levels is the goal of stormwater trash control programs and is considered equivalent to the performance of a full trash capture system.
Moderate	B	7.5	Predominantly free of trash except for a few pieces that are easily observed along a city block, or the equivalent. The trash could be collected by one or two individuals in a short period of time.
High	C	30	Trash is widely/evenly distributed and/or small accumulations are visible on the street, sidewalks, or inlets. It would take a more organized effort to remove the litter.
Very High	D	100	Trash is continuously seen throughout the area, with large piles and a strong impression of lack of concern for litter in the area. There is often significant litter even along gutters that are swept.

Figure 2.1. Example photos of On-land Visual Trash Assessment scores.

2.2.2. Trash Characterization/Quantification

All trash collected via the TCT project was characterized at the Alameda County Public Works Department Corporation Yard in Hayward, CA. Trash collected was characterized using procedures described in the Project Sampling and Analysis Plan (SAP) (Geosyntec et al. 2014). The procedure consists of measuring the weight and volume of trash removed from inlets, streets and sidewalks, and counting the number of items within 13 trash categories (e.g., single use plastic carryout bags and plastic CRV beverage containers). The worksheet that documents the level of trash characterization that was implemented during the TCT project is included in the SAP. Table 2.2 includes the list of categories used to characterize trash during the street sweeping and curb inlet effectiveness evaluation.

Table 2.2. Trash and debris characterization categories and types used during the TCT project.

Characterization Category	Characterization Type	
	Weight & Volume	Item Count
Debris (e.g., vegetation, sediment, leaves)	X	
Trash		
Plastic - Recyclable Beverage Containers (CRV-labeled)	X	X
Glass - Recyclable Beverage Containers (CRV labeled)	X	X
Single Use Plastic Carryout Bags	X	X
Expanded Polystyrene (EPS) Disposable Food & Beverage Ware	X	
Rigid Plastic Disposable Food and Beverage Ware	X	
Mylar (Non-recyclable) Film Food Wrappers	X	
Other Plastic Items	X	
Paper Food/Beverage Ware	X	
Bulk Paper and Cardboard	X	
Cigarette Butts	X	
Other Glass Items	X	
Metal Items	X	
Miscellaneous Items	X	

2.2.3. Quality Assurance Controls

All quality assurance controls developed and implemented during the TCT project are described in the project's Quality Assurance Project Plan (QAPP) submitted to the State Water Board (Applied Marine Sciences 2014). The stringent procedures described in the QAPP were essential for obtaining unbiased, precise, and representative measurements and for maintaining the integrity of the trash samples during collection, handling, and analysis, as well and for measuring elements of variability that cannot be controlled. Stringent procedures were also applied to data management to assure that accuracy of the data is maintained.

Data Quality Objectives (DQOs) were established to ensure that data collected are sufficient and of adequate quality for the intended use. DQOs include both quantitative and qualitative assessment of the acceptability of data. The qualitative goals include representativeness and comparability, and the quantitative goals include completeness, precision, and accuracy. Specific DQOs were based upon Measurement Quality Objectives (MQOs) identified for the TCT project and included in the project QAPP.

Approaches used for data quality assurance for assessments and characterizations of trash do not have the same application as more commonly-used chemical analyses. Instead of using the repeatable physical and chemical properties of target constituents to assess accuracy and precision, information and data collected on trash are quantified using personnel trained in the characterization and classification of data. Compounding the challenge between chemistry and quantification of trash is the inherent spatial and temporal variability in trash loading and transport. Unlike chemical data where replicate sampling and analysis of samples are expected to be similar, no such expectation exists for trash data. Hence, DQOs in the QAPP have a strong emphasis on training and oversight, with intercomparisons between performance of individual field team members participating in the various assessment and characterization efforts. In addition, chemical approaches that focus on accuracy do not apply to trash monitoring. For example, matrix spikes used for chemistry have no parallel for trash samples. Thus, a new approach using intercalibration amongst personnel conducting assessments/characterizations was the primary mechanism for assuring accuracy and precision.

2.3. TCT Study Areas

The seven study areas monitored or assessed as part of the TCT street sweeping and curb inlet screen study are illustrated in Figure 2.2. Characteristics of each study area are described in Table 2.3. The three areas where quantitative monitoring was conducted were selected due to their relatively high levels of trash generation, having at least one inlet in each segment, and different street sweeping frequencies. All of the inlets in these study areas were equipped with catch basin-based full capture systems (i.e., connector pipe screens) installed prior to the study. The four sites where only qualitative assessments occurred were selected because high or very high trash generation levels had been previously observed. No full capture systems were installed in the inlets in these four areas.

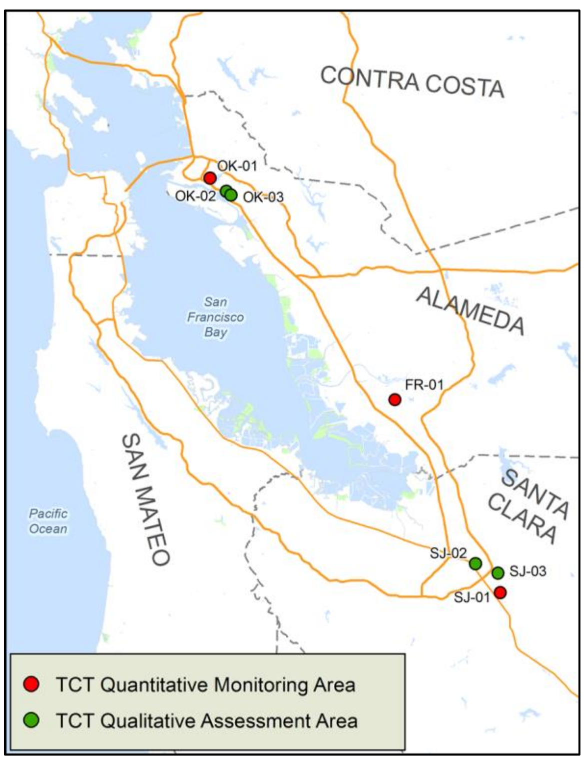

Figure 2.2. Study areas monitored or assessed as part of the TCT street sweeping and curb inlet screen evaluation.

Table 2.3. Characteristics of the seven study areas monitored/assessed as part of the TCT street sweeping and curb inlet screen evaluation.

Characteristic	Study Area						
	FR-01	**OK-01**	**OK-02**	**OK-03**	**SJ-01**	**SJ-02**	**SJ-03**
City	Fremont	Oakland	Oakland	Oakland	San Jose	San Jose	San Jose
Type of Study Area	Quantitative	Quantitative	Qualitative	Qualitative	Quantitative	Qualitative	Qualitative
Location	Fremont Blvd	14th Street	17th Avenue	23rd Avenue	Tully Road	McKee Road	Leeward Drive
Land Use	Commercial	Commercial	Mixed	Mixed	Commercial	Commercial	Residential
Street/Sidewalk Characteristics							
Street Area Assessed (acres)	0.90	0.79	NA	NA	0.54	NA	NA
Sidewalk Area Assessed (acres)	0.30	0.41	NA	NA	0.17	NA	NA
Stormwater Conveyance System Characteristics							
# of Inlets	3	3	NA	NA	2	NA	NA
Area Draining to Inlet(s) in Study Area (acres)	3.44	4.96	NA	NA	1.55	NA	NA
Curb Inlet Screen Installed	No	Halfway through Study	No	No	Yes	No	No
# Bus Stops	2	1	0	0	1	1	0
Street Sweeping Characteristics							
Sweeper Type	Regenerative Air	Mechanical Broom	Mechanical Broom	Mechanical Broom	Mechanical Broom	Mechanical Broom	Mechanical Broom
Sweeping Frequency	1x/month	5x/week	2x/month	2x/month	2x/month	2x/month	1x/month
Curb Parking Allowed	No	Yes	Yes	Yes	No	No	Yes
Quality of Pavement	Good	Good	Very Poor	Good	Poor, then re-paved during study	Good	Good

2.3.1. Quantitative Monitoring Areas

Fremont Boulevard - Fremont (FR-01)

The study area in Fremont (FR-01) is located along the west side of Fremont Boulevard between Mowry Beacon Avenues (Figure 2.3). Segment #1 was located on the northern portion of the study area, and Segment #2 on the southern end. This busy arterial road is swept monthly and has many retail stores adjacent to the study area, includng a gas station, cell phone store and restaurants. The amount of foot traffic is somewhat low relative to other TCT study areas. Each of the two segments in the FR-01 study area , however, contains a bus stop that appears to be a large source of trash to the study area. Additionally, there are commonly homeless in the area, which may also be a source of trash. The FR-01 study area contains three inlets which combined, drain roughly 3.4 acres of land.

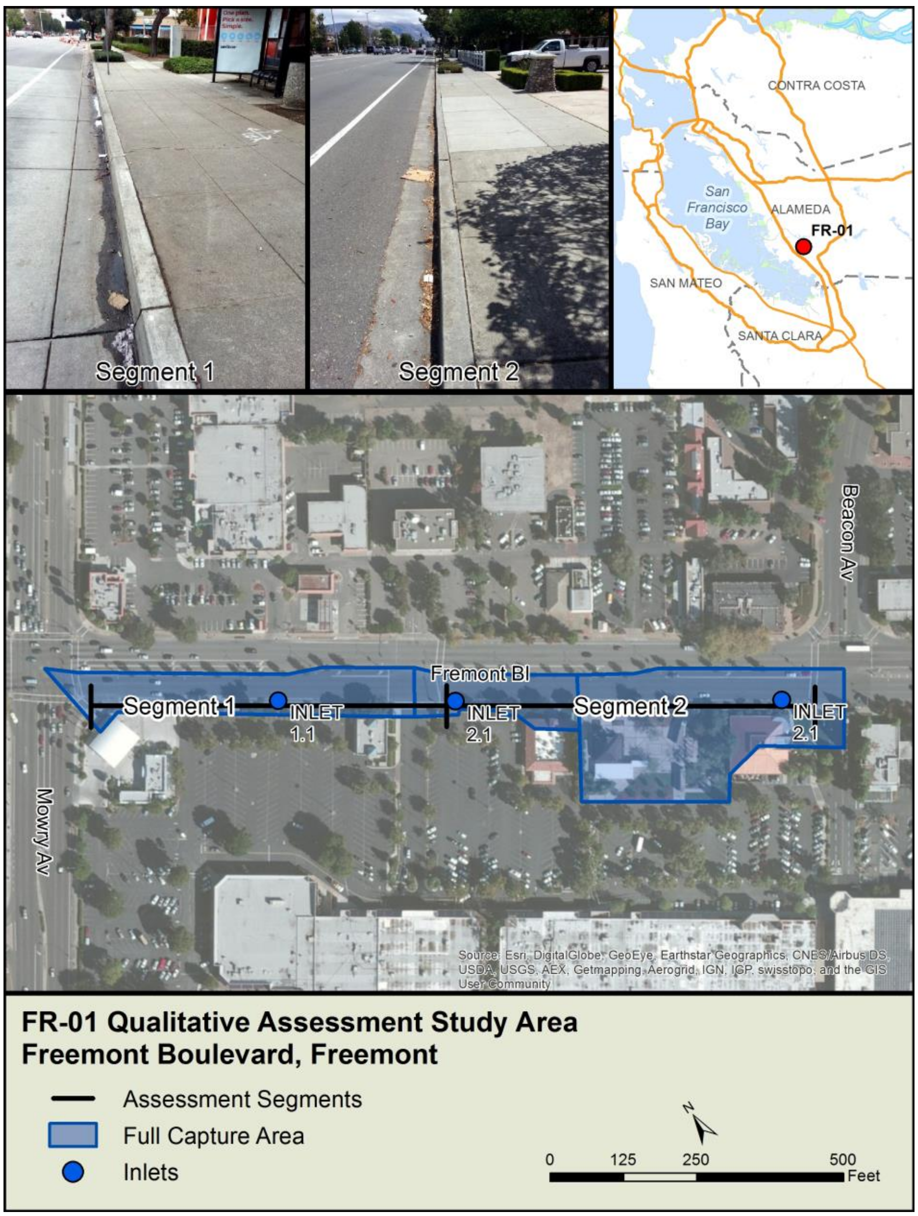

Figure 2.3. Location of Fremont Study Area (FR-01), segments (both facing south) and storm drain inlet catchments.

14th Street - Oakland (OK-01)

The OK-01 study area is located in Oakland on 14th Street between Webster Street and Alice Street (Figure 2.4). Segment #1 is between Webster and Harrison streets on both sides of the street, and segment #2 is located between Harrison and Alice streets on both sides of the street. The OK-01 study area is swept every weekday in the early morning. Quantitative monitoring events always occurred on Monday morning when the area had not been swept for 72 hours. Adjacent land uses include restaurants, convenience stores, bars and multifamily residential apartments. Trash sources include pedestrians, adjacent properties, and vehicles. Although no parking was posted, the site commonly had at least one car parking during monitoring events. The OK-01 study area contains three inlets which combined drain roughly 5.0 acres of land.

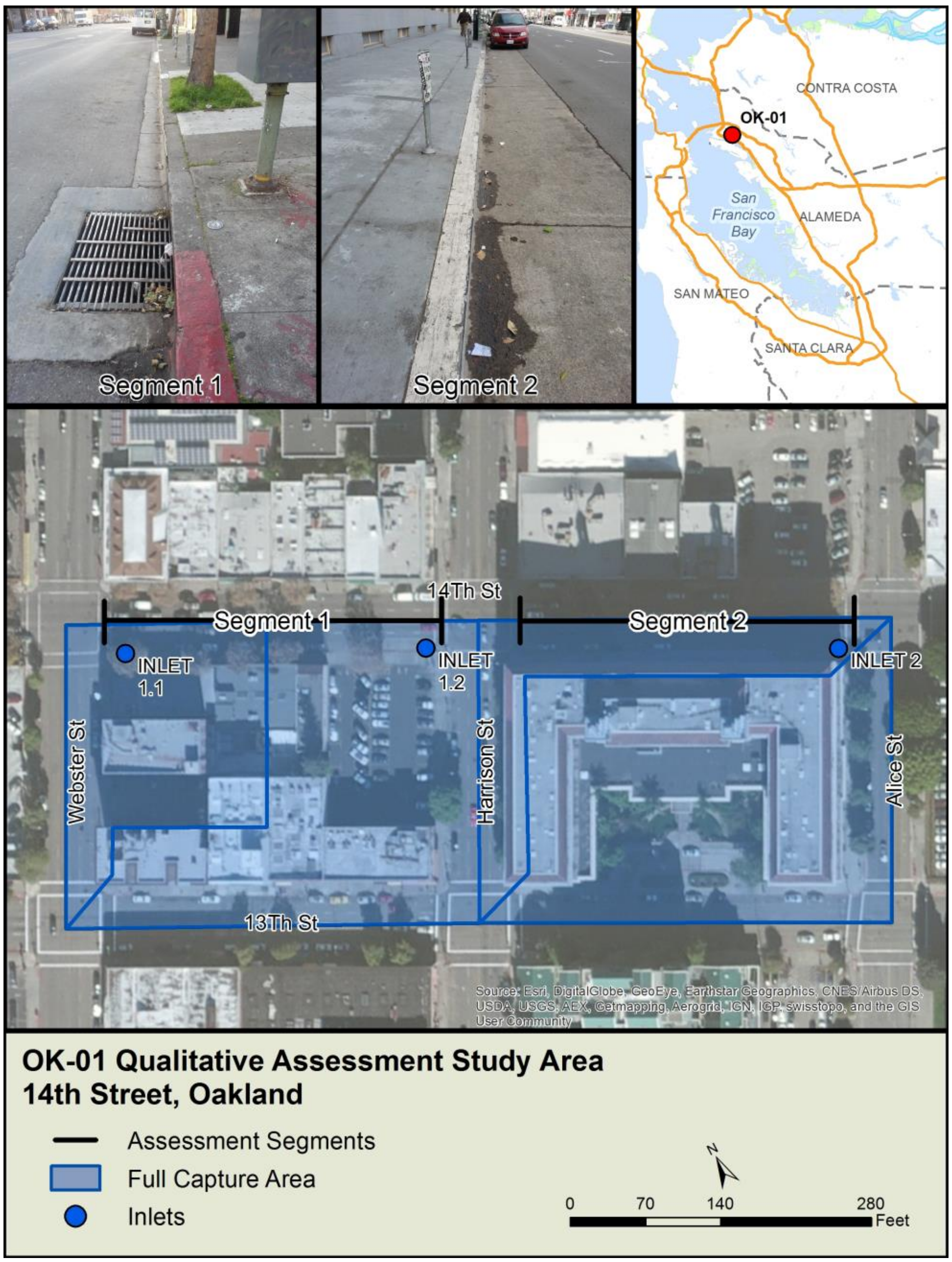

Figure 2.4. Location of Oakland Study Area (OK-01), segments (#1 facing east, #2 facing west) and storm drain inlet catchments.

Tully Road - San Jose (SJ-01)

Study area SJ-01 is located along Tully Road from King Road to Huran Drive in San Jose (Figure 2.5). Segment #1 is between Huran and runs roughly halfway towards King Rd. Segment #2 begins where segment #1 ends and continues to King Rd. Tully Road is swept twice per month. Tully Road is a busy arterial road through the study area with adjacent land uses that include fast food restuarants, convenience stores, and automotive shops. Trash sources include pedestrians, vehicles and bus stops. Tully Road was re-paved on October 28th, 2015 leading to noticible improvement in the quality of the street surface. The two inlets in the study area drain roughly 1.6 acres of land.

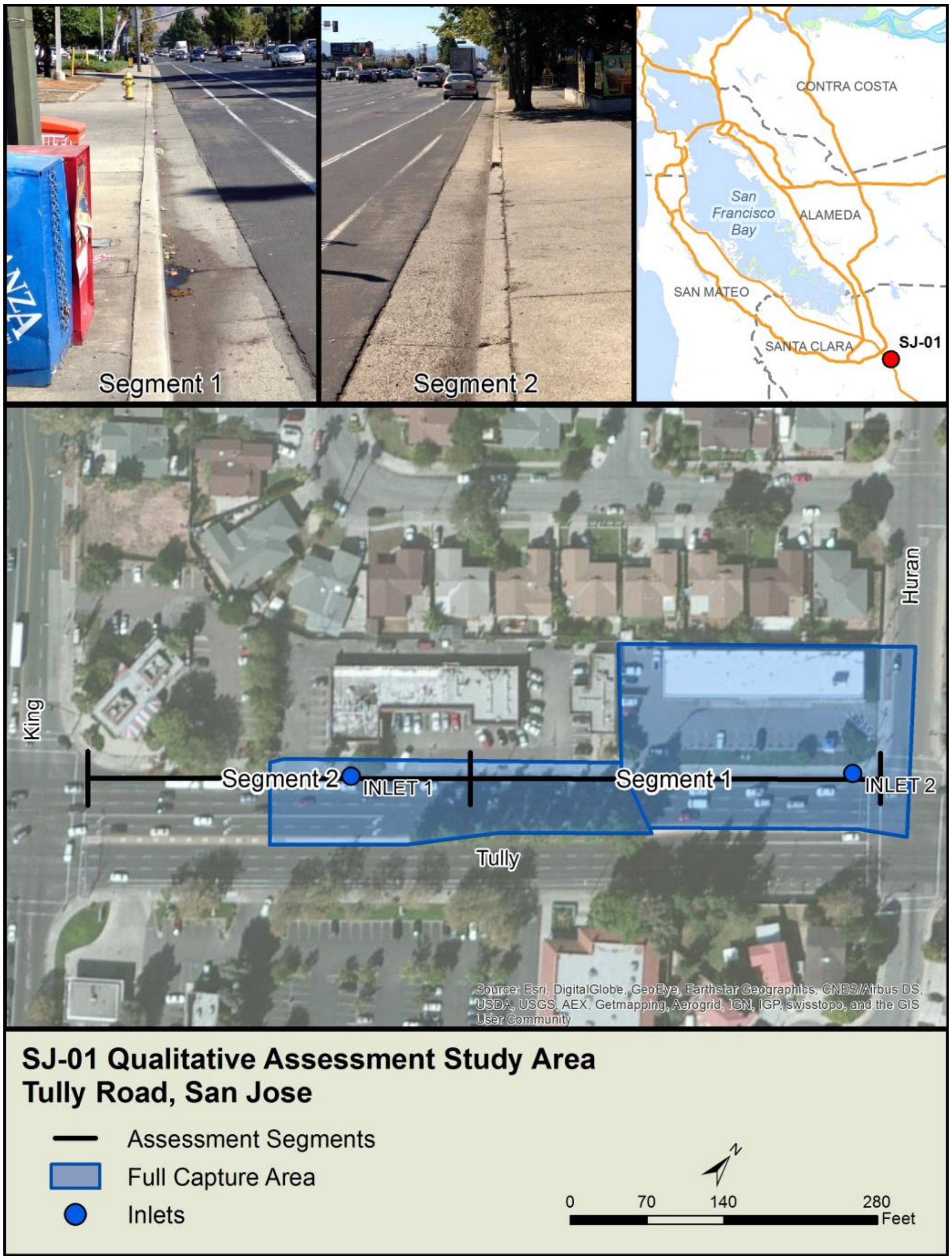

Figure 2.5. Location of San Jose Study Area (SJ-01), segments (#1 facing east, #2 facing west) and storm drain inlet catchments.

2.3.2. Qualitative Assessment Areas

17th Avenue, Oakland (OK-02)

Study area OK-02 is located along 17th Avenue between East 15th Street and East 12th Street (Figure 2.6). This area was selected because of the very high levels of trash consistently generated on the streets and sidewalks. Street sweeping occurs twice per month. Both segments have very poor asphault quality, and trash is commonly observed in the cracks and potholes.

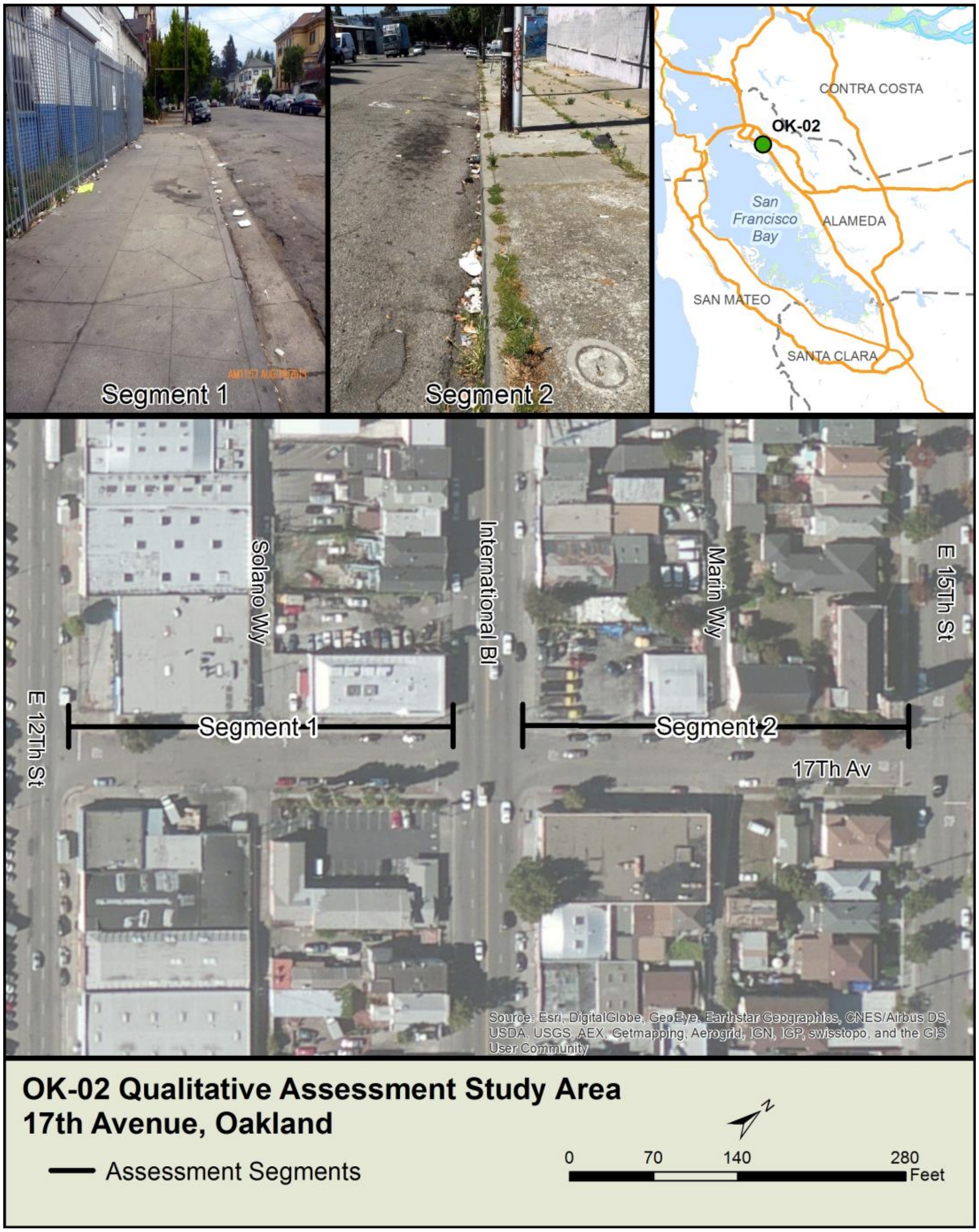

Figure 2.6. Location of Oakland Study Area (OK-02) and assessment segments (#1 facing east, #2 facing west).

23rd Avenue - Oakland (OK-03)

Study area OK-03 is located in Oakland along 23rd Avenue between East 15th Street and East 12th Street (Figure 2.7). Like OK-02, this site was selected because of the very high levels of trash consistently observed throughout both segments. This study area has relatively good pavement quality. Street sweeping occurs at a twice per month frequency.

Figure 2.7. Location of Oakland Study Area (OK-03) and assessment segments (both #1 and #2 facing east).

McKee Road - San Jose (SJ-02)

Study area SJ-02 is located in San Jose along the north side of McKee Road from King Road to North 33rd Street (Figure 2.8). Adjacent businesses include a grocery store, gas station, pharmacy, and several other retail establishments. The street has relatively high vehicle and foot traffic. A bus stop in the site appears to be a large source of trash. The SJ-02 study area is swept twice a month.

Figure 2.8. Location of San Jose Study Area (SJ-02) and assessment segments (both #1 and #2 facing west).

Leeward Drive - San Jose (SJ-03)

Study area SJ-03 in San Jose is located along the east side of Leeward Drive from Dumont Circle to Arden Way (Figure 2.9). The study area is in a residential area with an adjacent park and elementary school, both of which appear to produce a high volume of foot traffic of children in the neighborhood. The site was selected because of the high to very high levels of trash consistently observed. Sweeping occurred at a frequency of one time per month during the study.

Figure 2.9. Location of San Jose Study Area (SJ-03) and assessment segments (#1 facing south and #2 facing north).

3. MONITORING RESULTS AND DISCUSSION

3.1. Data Quality Summary

All quality assurance controls implemented during the TCT project for field monitoring/assessments, trash characterization, and data management tasks are described in the project's Quality Assurance Project Plan (QAPP). Approaches used to assure the quality of data collected as part of the TCT project do not have the same application as more commonly-used chemical analyses. Information and data collected on trash during the project were quantified using personnel trained in the assessment, characterization and classification of trash data.

A complete evaluation of the quality of data presented in this report is presented in Appendix A. In summary, the data presented in this report are of a quality that is consistent with the current state of the methodologies currently used to measure and characterize trash collected from streets, sidewalks, and in stormwater conveyance systems. As part of the TCT project, recommendations on how to improve methodologies currently used to measure, assess and characterize trash are provided (see Section 4). Due to the inherent variability in the sizes and structures of this "macro" water quality pollutant, however, the accuracy and precision of trash monitoring data may never adhere to Data Quality Objectives (DQOs) commonly used for chemical analytes. Appropriate considerations of the accuracy and precision of trash data presented in this report and trash data collected during future studies should therefore be taken when interpreting these data and drawing associated conclusions.

3.2. Overview of Results

A primary objective of this TCT task was to measure the effectiveness of street sweeping in reducing trash from entering stormwater conveyance systems, under different sweeping frequencies and trash generation levels. The effectiveness of street sweeping was evaluated in study areas that drain to storm drains inlets (with or without curb inlet screens) equipped with trash full capture systems (i.e., connector pipe screens).

In the 14 months that data were collected (March 2015 – April 2016), 32 quantitative monitoring events were conducted in three study areas - Fremont (FR-01), Oakland (OK-01) and San Jose (SJ-01). During these events, trash from streets, sidewalks and inlets was removed, characterized and quantified. A total of 328 qualitative OVTA events were performed at the three quantitative study areas and four additional areas in San Jose (SJ-02 and SJ-03) and Oakland (OK-02 and OK-3) to supplement the quantitative monitoring. OVTAs were conducted:

- As part of quantitative events (i.e., before and after quantitative street sweeping monitoring),
- Before and after street sweeping events where quantitative monitoring was not conducted,
- Between street sweeping events, and
- Before and after significant storm events (>0.25 inches).

The numbers of quantitative monitoring and OVTA events conducted at each of the seven study areas are presented in Table 3.1. The timeframes that monitoring and assessment events were conducted in comparison to storm events are presented in Figures 3.1 through 3.3.

Table 3.1. Number of quantitative and qualitative monitoring events conducted in each study area.

Site	# of Paired Quantitative/ Qualitative Monitoring Events	# Additional Qualitative Monitoring Events		
		# Paired Events Directly Before & After Sweeping Events	# Events Between Street Sweeping	# Paired Events Directly Before & After Rain Events
FR-01	8	3	20	4
SJ-01	8	4	14	2
OK-01 (Pre-ARS)	9	7[1]	3[1]	2
OK-01 (Post-ARS)	7			
OK-02	NA	10	22	4
OK-03	NA	10	22	4
SJ-02	NA	11	18	4
SJ-03	NA	6	15	4

[1]OK-01 is swept every weekday morning, and at this frequency it was not possible to perform three assessments in between sweeping events plus the before/after sweeping, which would have required five assessments per day. Instead, two assessm were performed per day (morning and late afternoon), which were designated as before/after sweeping events.

All characterization data generated through the street sweeping and curb inlet screen evaluation portion of the TCT project are included in Appendix B. The street sweeping effectiveness study yielded the measurement and characterization of 939 gallons of material (i.e., trash and debris) weighing approximately 1,943 pounds (Table 3.2; Appendix B). This material was collected from a combination of streets, sidewalks and storm drain inlets in the three study areas where quantitative monitoring occurred. As illustrated in Figure 3.4, for the material collected from storm drain inlets, 26% was trash by volume. The remaining portion was debris (e.g., vegetation, sand, sediment). Of all trash characterized from streets, sidewalks, and inlets, roughly 67% by volume was identified as plastic (i.e., single use plastic grocery bags, recyclable beverage containers, EPS foam food ware, and other miscellaneous plastic). These percentages are similar to those observed in recent studies in storm drains and receiving water bodies in the San Francisco Bay Area, U.S. and worldwide (Marais et al. 2004, Ocean Conservancy 2013, BASMAA 2014; ACCWP 2014; SCVURPPP 2016). A total of 89 recyclable beverage containers, 92 single use plastic grocery bags, and 172 EPS food service ware items were identified at the three quantitative study areas.

Table 3.2. Volume (gallons) of material collected and characterized from streets/sidewalks and storm drain inlets/catch basins in the three quantitative study areas.

Material Type	Streets and Sidewalks	Storm Drain Inlets/Catch Basins
Debris	**NA**	**393.1**
Trash	**404.6**	**141.6**
Plastic	**204.6**	**94.4**
Mylar	*10.6*	*14.0*
Plastic Bag	*3.3*	*4.7*
EPS Foodware	*15.4*	*4.5*
Plastic Foodware	*77.9*	*3.2*
Plastic CRV	*3.8*	*1.5*
Plastic Other	*93.7*	*66.4*
Paper	**143.2**	**38.5**
Bulk Paper	*127.0*	*22.4*
Paper Foodware	*16.1*	*16.1*
Glass	**18.0**	**0.9**
Glass CRV	*2.9*	0.2
Glass Other	*15.2*	0.7
Cigarettes	**8.4**	**2.0**
Metal	**5.9**	**1.5**
Misc	**24.5**	**4.4**
Total (Debris & Trash)	**404.6**	**534.7**

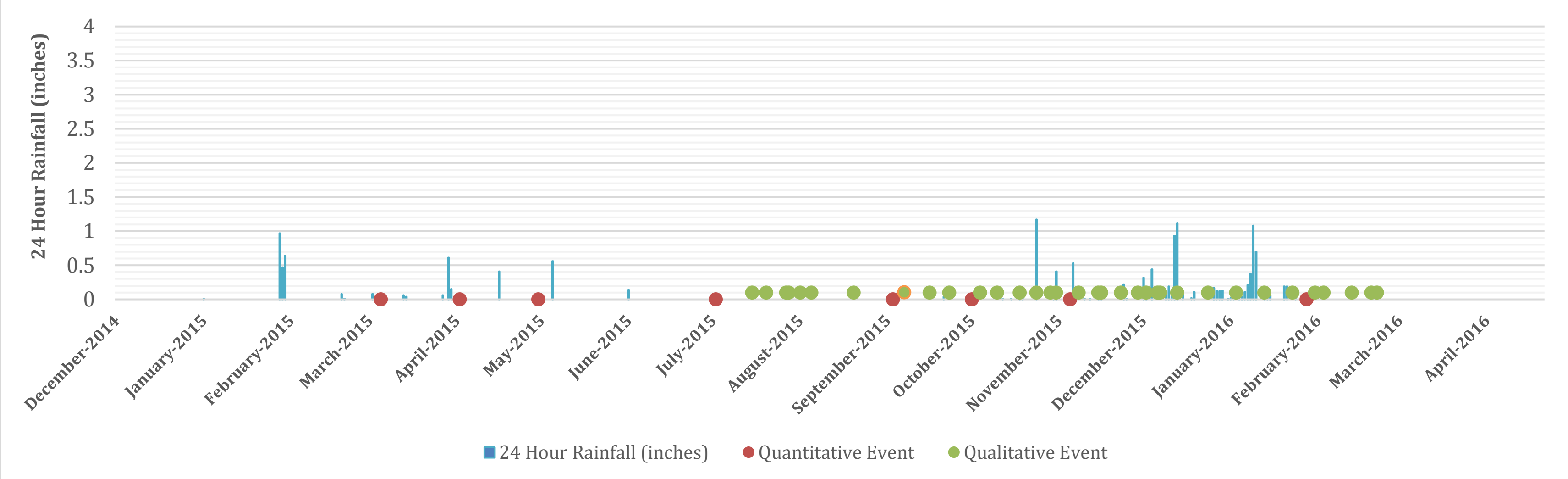

Figure 3.1. Timeframes of the quantitative and qualitative sampling/assessment events conducted at the **Fremont Study Area (FR-01)** and associated rainfall volumes (www.wunderground.com/personal-weather-station/dashboard?ID=KCAFREMO83).

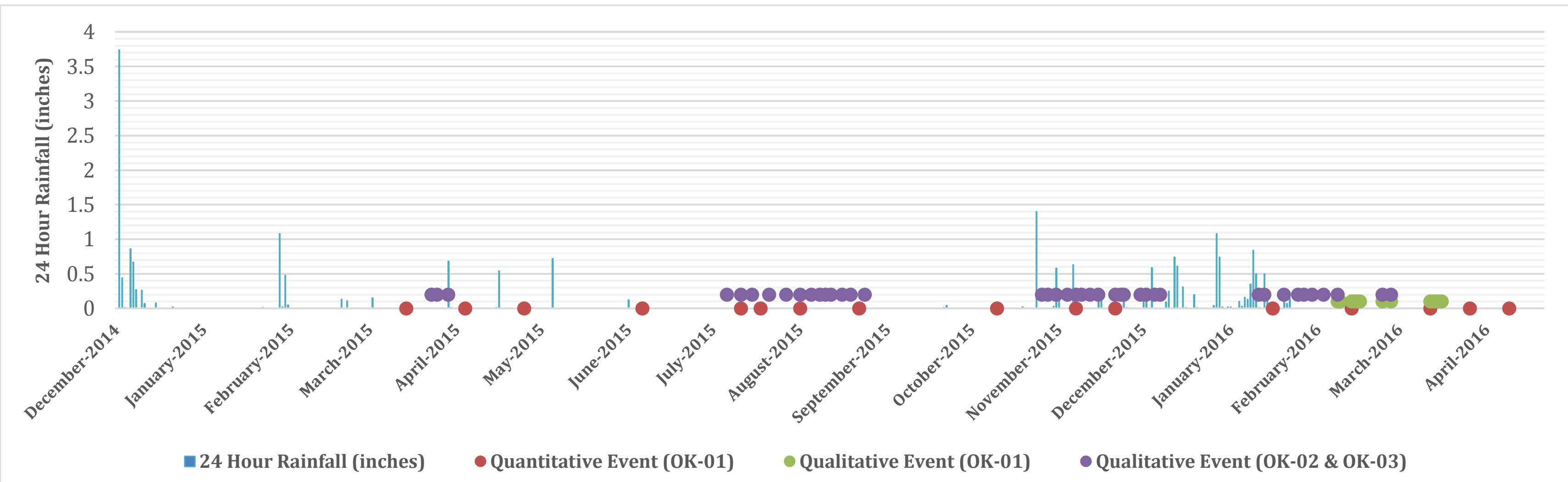

Figure 3.2. Timeframes of the quantitative and qualitative sampling/assessment events conducted at **Oakland Study Areas (OK-01, OK-02 and OK-03)** and associated rainfall volumes (www.wunderground.com/personal-weather-station/dashboard?ID=KCAOAKLA51).

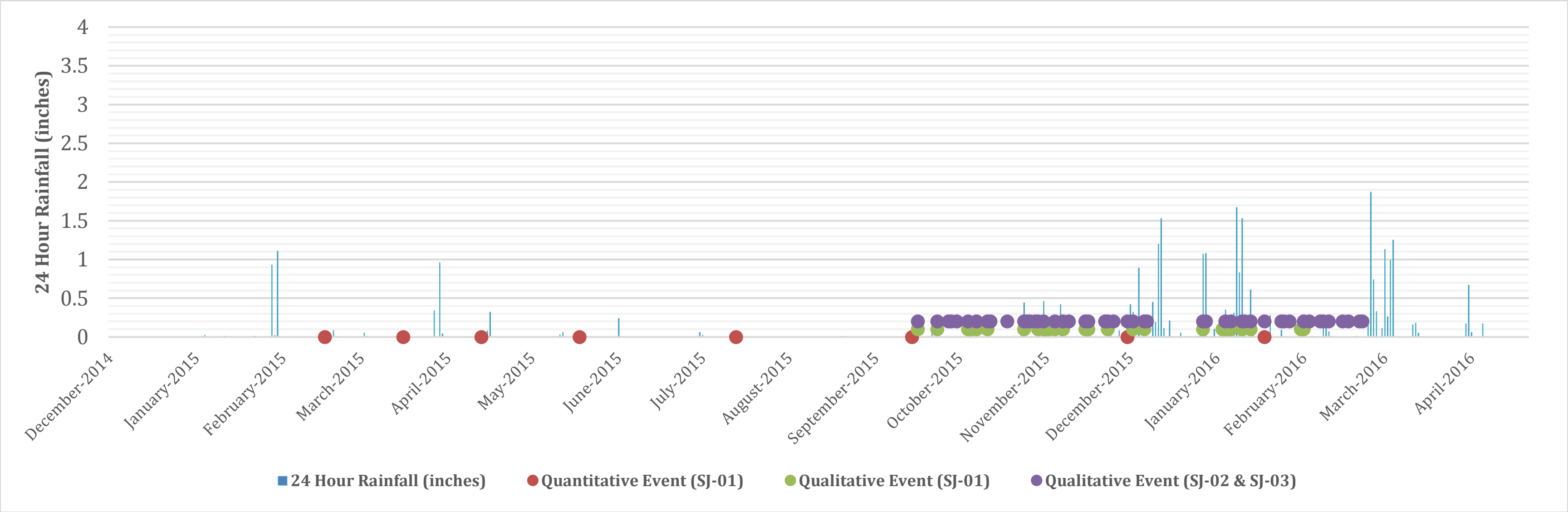

Figure 3.3. Timeframes of the quantitative and qualitative sampling/assessment events conducted at **San Jose Study Areas (SJ-01, SJ-02 and SJ-03)** and associated rainfall volumes (www.wunderground.com/personal-weather-station/dashboard?ID=KCASANJO17).

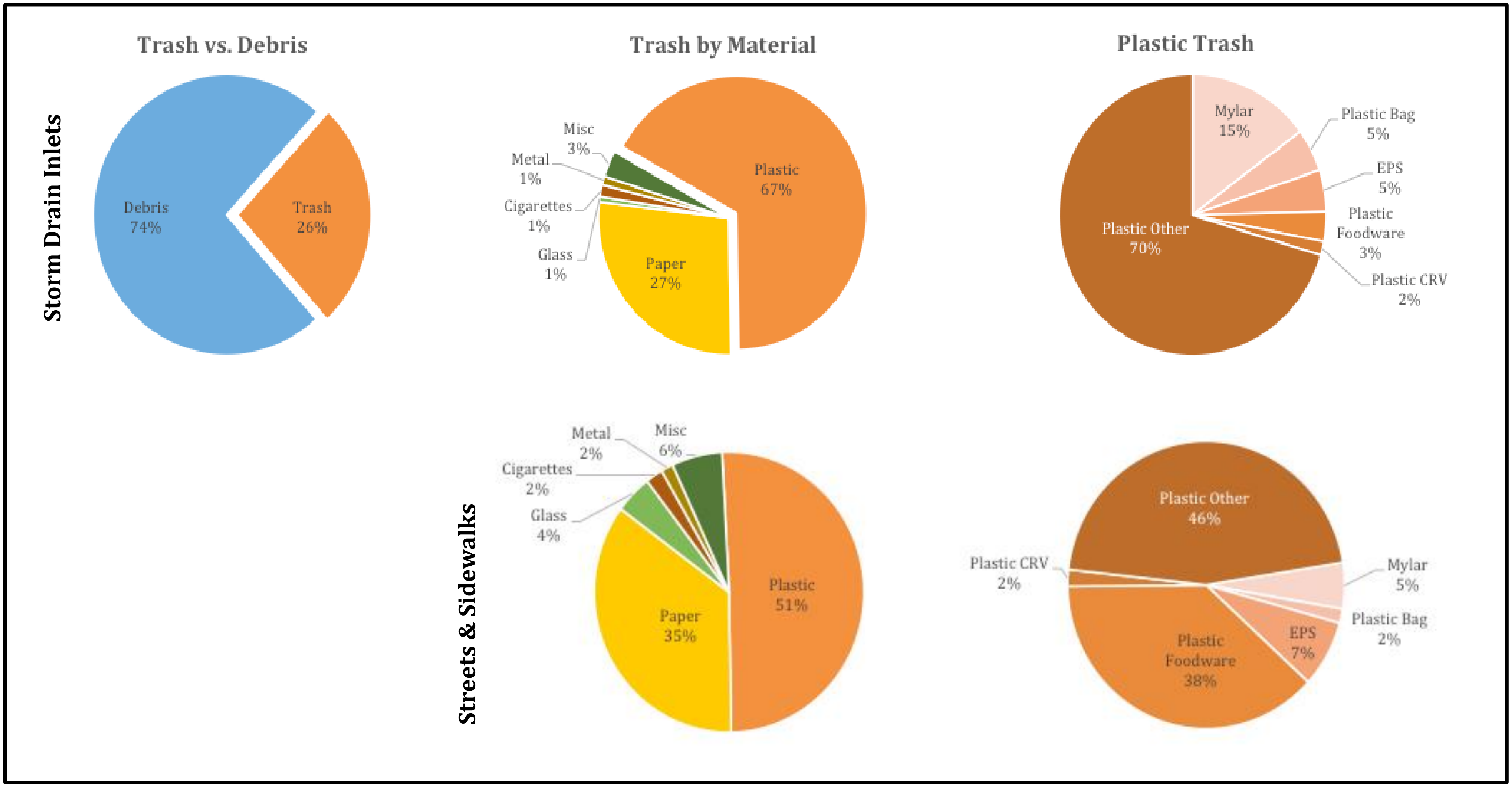

Figure 3.4. Percentages (by volume) of the material collected and characterized from storm drain inlets, streets and sidewalks that was debris, trash and plastic trash.

3.3. Trash Accumulation and Generation

3.3.1. Accumulation on Streets and Sidewalks

For the purpose of the TCT project, trash accumulation is defined as the rate at which trash accumulates on streets and sidewalks over time. Accumulation can be empirically measured and/or modeled. When empirically measuring trash accumulation, only the amount of trash removed and characterized from streets and sidewalks by the project team during monitoring events is considered. Trash removed via street sweeping or other control measures is not incorporated into the empirically-measured accumulation rate. When modeling accumulation, the estimated amount of trash removed via street sweeping or other controls is incorporated into the rate by applying the average daily generation rate to unmonitored time periods. Both empirically measured and modeled accumulation rates for streets are presented in this section for each TCT quantitative study area. Modeled rates were not calculated for sidewalks since the amount of trash on sidewalks is not directly affected by street sweeping.

Due to differences in the frequencies of street sweeping and monitoring events among the study areas, the timeframe represented by each sample collected on streets and sidewalks varied. Similarly, due to the differences in the sizes of the study areas, the area represented by each sample collected also varied. To compare trash generation rates on streets and sidewalks between study areas, all material collected and characterized was normalized to per unit area and timeframes – either gallons/acre day^{-1} or gallons/acre yr^{-1}. Annual rates are the same unit used in previous trash generation studies conducted by BASMAA and other Bay Area stormwater programs (BASMAA 2014, ACCWP 2014, SCVURPPP, 2016).

Daily trash accumulation rates (both empirically monitored and modeled) for sidewalks and streets are presented in Figure 3.5 for each study area. The highest trash accumulation rates were consistently observed at the Oakland site (OK-1). Accumulation rates at the Fremont (FR-01) and San Jose (SJ-01) sites were comparable to each other. Depending on the study area, daily trash accumulation on streets and sidewalks varied by a factor of 5 to 10. Trash accumulation rates varied the greatest at the San Jose and Oakland study areas.

Annual trash accumulation rates calculated for the three quantitative study areas are presented in Table 3.3. Annual accumulation rates at the three sites ranged between 113 and 365 gallons of trash per acre yr^{-1} for sidewalks. This range is assumed to represent an average trash accumulation rates for sidewalks generating high to very high levels of trash. The accumulation of trash on sidewalks was similar in the Fremont (FR-01) and San Jose (SJ-01) areas, but the sidewalk area in Oakland (OK-01) accumulated roughly 3 times as much trash per unit area than the other two sites.

For streets, empirically monitored trash accumulation rates ranged between 29 and 254 gallons per acre yr^{-1}. Because trash removed via sweeping events is not taken into consideration, this range serves as a low estimate for the amount of trash that accumulates on street surfaces during a year in areas generating high to very high levels of trash. If the trash removed by street sweepers is considered, then trash accumulation on streets is far greater, ranging between 64 and 2,309 gallons per acre yr^{-1} for high to very high trash generating areas. This range, therefore, serves as an upper bound estimate for high or very high trash generating land streets. Regardless of whether trash removed via street sweeping events is taken into account, trash accumulation on streets in the Fremont and San Jose areas were similar. Similar to sidewalks, the streets in the Oakland study area accumulated a substantially higher level of trash than either the Fremont or San Jose areas.

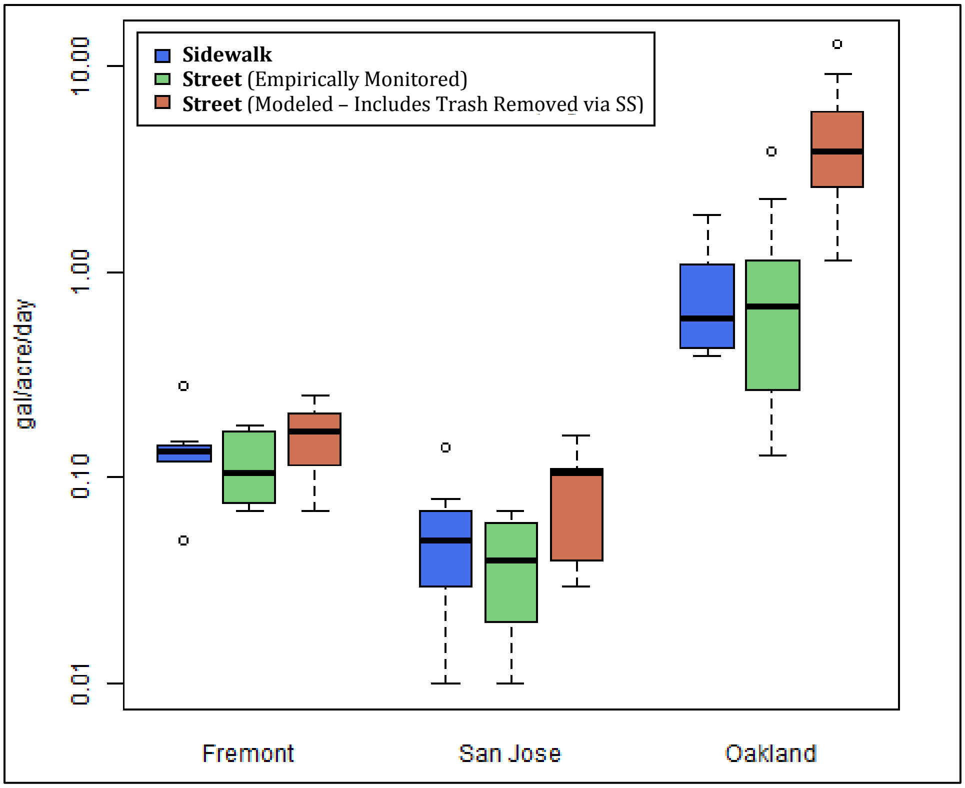

Figure 3.5. Ranges in daily trash accumulation rates for sidewalks and streets (both empirically monitored and modeled) at the three TCT quantitative study areas.

Table 3.3. Annual trash accumulation rates (gal/acre yr^{-1}) for sidewalks and streets (empirically monitored and modeled) in the three TCT quantitative study areas, which generate high or very high levels of trash.

Trash Accumulation Area	**Oakland (OK-01)**	**Fremont (FR-01)**	**San Jose (SJ-01)**
Sidewalks	365	113	113
Streets (Empirically Monitored)	254	38	29
Streets (Modeled – includes trash removed via street sweeping events)	2,309	64	86
Street Sweeping Frequency	*5x/week*	*Monthly*	*2x/month*

3.3.2. Stormwater Trash Generation

Trash generation is defined as the amount of trash that enters a storm drain inlet and is captured by an inlet-based full capture system that is maintained at a high frequency (i.e., 8-16 times per year). For the purpose of identifying trash generation rates, it is assumed that the amount of trash that is captured by an inlet-based system would have been discharged to a receiving water body if the full capture system were not in place. Trash generation can vary based on a number of factors, including the level of trash accumulation on streets and sidewalks, and the magnitude, extent and effectiveness of trash control measures implemented in the area draining to the inlet (BASMAA 2014).

Curb inlet screens can impede the flow of trash into storm drain inlets (City of Los Angeles 2006). During the TCT study, curb inlet screens were present on the inlets in the San Jose study area (SJ-01) during the entire study period. At the Oakland site (OK-01), curb inlet screens were added to inlets roughly half-way through the study. Curb inlet screens were not present on inlets in the Fremont study area (FR-01).

Over the course to the study a total of 535 gallons of trash and debris were removed and characterized from inlets (n=8) located within the three quantitative study areas. Annual generation rates based on the levels of trash observed in the inlets ranged from 2.9 to 25 gallons per acre yr^{-1} (Table 3.4). The generation categories associated with these levels are also presented in Table 3.4. The generation rates associated with each trash generation category were previously established as part of the *Regional Baseline Trash Generation Rates for the San Francisco Bay Area* project (BASMAA 2014) and are incorporated into the San Francisco Bay NPDES regional permit for storm water discharges (SFBRWQCB 2015).

Table 3.4. Estimated annual trash generation rates (gal/acre yr^{-1}) for stormwater discharges from the three TCT quantitative study areas.

	TCT Study Area			
	Fremont (FR-01)	**San Jose** (SJ-01)	**Oakland** (OK-01)	
Presence of Curb Inlet Screens	*No Screens*	*Screens*	*Prior to Installation of Screens*	*After Installation of Screens*
Trash Generation Rate (gal/acre yr^{-1})	8.9	2.9	25.0	8.0
Associated Trash Generation Category	*Moderate*	*Low*	*High*	*Moderate*

3.3.3. Comparison of Trash on Streets/Sidewalks to Trash in Storm Drain Inlets

By comparing the volume of trash that accumulated on streets and sidewalks to the volumes of trash observed in storm drain inlets (i.e., generated) over the same time period, the percentage of trash that accumulates on land and is transported to storm drain inlets can be estimated. For the three TCT quantitative study areas the amount of trash measured in storm drain inlets was substantially less than the amount estimated to accumulate on streets and sidewalks within the area draining to the inlets.[4] During the entire study period, between 6% and 17% of the trash (by volume) that accumulated in the drainage areas for the three quantitative sites was observed in storm drain inlets (Table 3.5). The highest percentages of trash reaching inlets was observed at sites with no curb-inlet screens (FR-01 & OK-01 pre-curb inlet screens). Figure 3.6 illustrates the range of trash that accumulated in each quantitative study area and reached a storm drain inlet.

Table 3.5. Estimated percentages of trash that accumulated in each of the three TCT quantitative study areas that entered storm drain inlets.

	TCT Study Area			
	Fremont (FR-01)	**San Jose** (SJ-01)	**Oakland** (OK-01)	
			Prior to Installation of Screens	*After Installation of Screens*
Trash Accumulation (gallons) on Streets and Sidewalks in the Area Draining to Inlet(s)	151.8	41.8	468.7	322.1
Trash (gallons) in Storm Drain Inlets	31.2	4.7	86.7	19.0
Total Trash (gallons) (Sidewalk & Streets + Inlets)	**183.0**	**46.5**	**555.4**	**341.1**
% Entering Storm Drain Inlets	***17.1%***	***10.1%***	***15.6%***	***5.6%***

[4] Because the drainage areas for the inlets monitored extended beyond the area where trash on the street and sidewalk were measured, the areas outside of the monitored street/sidewalk area was assumed to have the same modeled rate of trash generation as the monitored area. This assumption allowed the project team to estimate the percentage of trash generated in the drainage area that is transported to storm drain inlets.

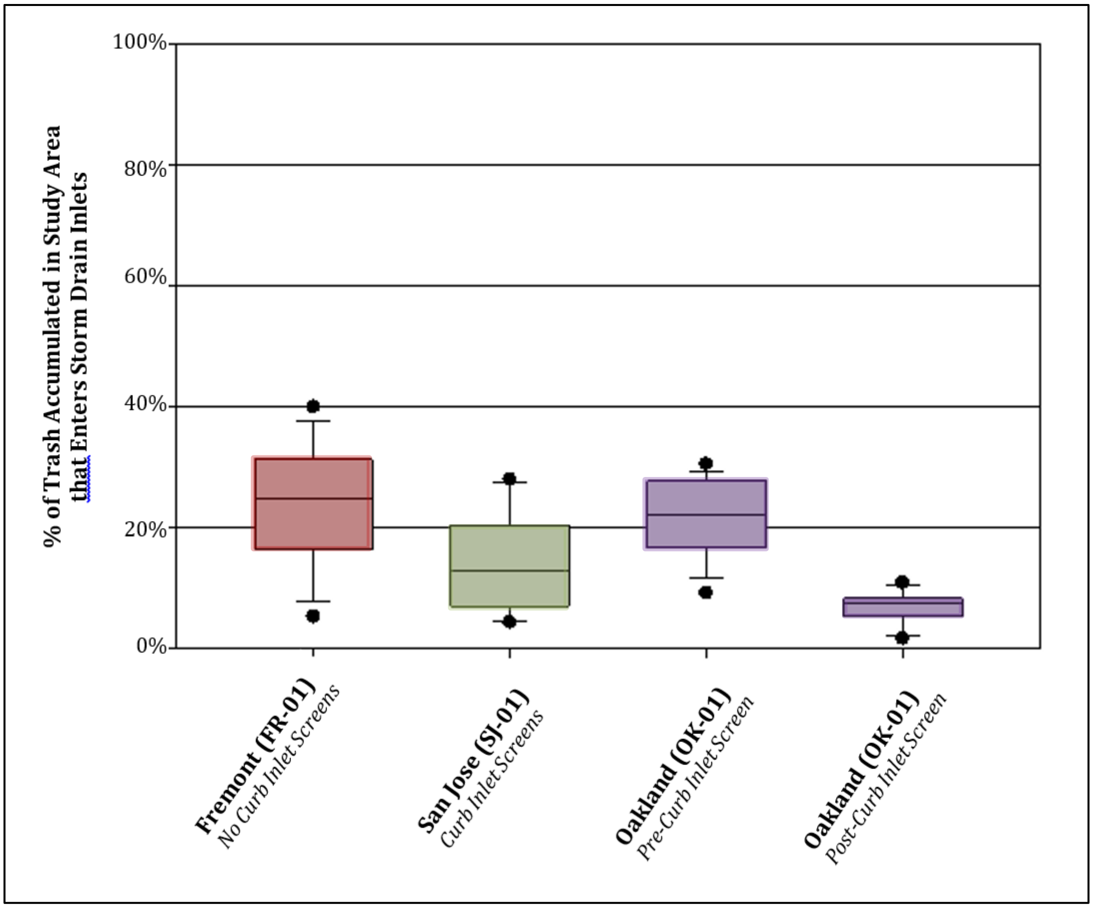

Figure 3.6. Estimated percentage of trash (by volume) that accumulated in each TCT quantitative study area and entered storm drain inlets.

A portion of the trash that accumulates on streets and sidewalks never makes its way to storm drain inlets for a number of reasons. The obvious reason is because trash is removed from the land via street sweeping or is cleaned up by hand. The trash remaining, however, still has to make its way to an inlet through some type of transport process (e.g., stormwater runoff or wind) that occurs during wet and/or dry weather periods.

During stormwater runoff events, the factors that likely govern the trash transport processes include the intensity of the runoff event, the gradients of streets and sidewalks, quality of pavement, and the mobility (i.e., densities) of different types of trash items. Trash can also be trapped during wet weather events by a parked vehicles (i.e., car tires), larger piles of trash/debris that are relatively immobile, or other objects that interfere with the wet weather transport process. Additionally, trash made of paper that becomes wet can solidify itself to pavement and other hard surfaces and become less mobile, or combine with other vegetative material and become “debris.”

During dry weather, the movement of trash on streets and sidewalks and the transport of trash items into storm drain inlets is likely governed by a combination of the intensity and frequency of high wind speeds, the level of dumping that occurs directly into inlets, or other transport mechanisms that can move trash into inlets (e.g., street sweepers or push brooms). Similar to stormwater events, the density/mobility of different trash items also likely play a role in transport during dry weather. For example, wind velocities may never reach the levels necessary to transport metal trash items to storm drains. Alternatively, wind speeds may not be strong enough to mobilize trash that is entrained in on-land vegetation.

For trash that does not get transported to storm drain inlets via stormwater runoff events or dry weather transport mechanisms, it likely becomes part of the natural background trash levels present in the urban environment. Due to its inability to be transported, this portion of the trash that accumulates on land is therefore less likely to impact the quality of local receiving water bodies.

3.3.4. Trash Reductions by Street Sweepers - Quantitative Monitoring

Each TCT quantitative study area contained two segments (#1 & 2). Each segment within a study area had similar trash accumulation rates (see OVTAs in Appendix B). The volume of trash collected in segment #1 was used to establish the amount of trash that had accumulated "before" a street sweeping event. The volume of trash collected in segment #2 was used as the amount left by the sweeper "after" the sweeping event had occurred. The volumes collected on streets directly before and after sweeping events were compared to evaluate the removal efficiency of street sweepers in the three quantitative study areas.

Trash volumes observed on streets before and after quantitative street sweeping events are illustrated in Figure 3.7. As previously described, trash accumulation was greatest at the Oakland site (OK-01). Trash accumulation on streets in the Fremont (FR-01) and San Jose (SJ-01) sites were similar to each other. Sweepers at the Fremont and San Jose sites were consistently able to reduce the volume of trash on streets to less than 1 gallon per segment. Sweepers reduced trash at the Oakland site to < 3.0 gallons during all 16 monitoring events.

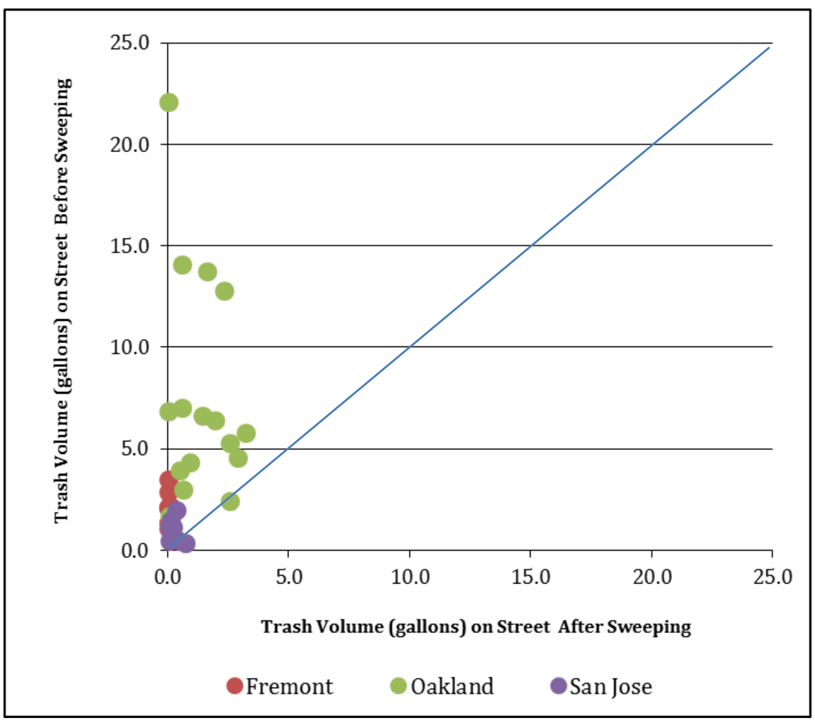

Figure 3.7. Trash volumes (gallons) observed on streets segments in the three quantitative study areas before and after street sweeping events. Blue line indicates no trash removal.

From a "percent reduction" perspective, the greatest reduction of trash that had accumulated on streets was observed in the Fremont study area (Figure 3.8). Sweeping at 1x per month at the Fremont site resulted in an average removal efficiency of 99.0% (median of 99.7%). These high removal efficiencies were likely related to the average speed (2.8 mph) of the sweeper, the quality of pavement (good), and the consistent lack of cars parked along the street at this site.

Trash removal efficiencies of sweepers in the Oakland and San Jose study areas were less than in Fremont, but relatively high nonetheless. Average removal efficiencies of 75.3% (median of 82.0%) and 67.2% (median of 85.4%) were observed for Oakland (5x per week) and San Jose (2x per month), respectively. Higher average sweeper speeds (5.6 mph) and the number of cars consistently parked along the curb at the Oakland site were likely responsible for the lower removal efficiencies observed. In San Jose, 2 of 8 sweeping events had very low efficiencies due to a lower quality/malfunctioning sweeper being used and the poor quality of the pavement near the intersection of Tully and King Road. Average sweeper speed (4.6 mph) and parked cars did not appear to be an issue at the San Jose site.

Trash volumes removed from segments #1 & #2 and removal efficiencies are presented in Table 3.6. Trash volumes present on sidewalks were not affected by street sweepers during the study and therefore are not presented in Table 3.6.

Figure 3.8. Percentages of trash removed from streets by street sweepers in the three TCT quantitative study areas.

Table 3.6. Trash volumes (gallons) removed before (segment #1) and after (segment #2) sweeping events and the estimated removal efficiencies for each of the three TCT quantitative study areas.

Study Area	# of Quantitative Monitoring Events	Trash Volume on Streets (gallons)		Total % Reduction	Mean % Reduction	Median % Reduction
		Prior to Sweeping (Segment #1)	After to Sweeping (Segment #2)			
Fremont (FR-01)	8	17.3	0.1	99.2%	99.0%	99.7%
Oakland (OK-01)	16	120.8	21.9	81.9%	75.3%	82.0%
San Jose (SJ-01)	8	8.2	2.0	75.2%	67.2%	85.4%

3.3.5. Re-accumulation of Trash Following Street Sweeping Events – Qualitative Assessments

In the Mediterranean climate of Northern and Southern California, trash accumulates onto streets and sidewalks year around, and is transported to storm drain inlets during both dry and wet weather seasons (BASMAA 2014; County of Los Angeles 2004a, 2004b). Both the Los Angeles and Bay Area studies indicated that trash is found in inlets at similar volumes during both seasons. Conceptually, more frequent and effective sweeping of roadways should reduce the risk of trash making its way to storm drain inlets, if streets are the primary transport pathway to the stormwater conveyance system (i.e., as opposed to wind or direct dumping into inlets). The rate at which trash accumulates on street surfaces is therefore a critical factor in determining the frequency of sweeping that would be needed to remove trash from street surfaces at levels that achieve trash load reduction goals for stormwater discharges (e.g., 0-5 gallons/acre yr^{-1}).

To adequately evaluate the rate at which trash re-accumulates on streets following sweeping events, numerous observations of trash levels on street surfaces are likely needed due to the potential high degree of temporal variability in trash accumulation rates at a site. Although the removal and quantification of trash from streets (and sidewalks) is the ideal method to establish trash re-accumulation rates, resources to quantify trash from in between sweeping events were not available as part of the TCT project. As an alternative to quantification, OVTAs were conducted directly before, in between, and directly after sweeping events at the two of the three quantitative study areas.[5] OVTAs were also conducted at similar intervals at four additional (qualitative) study areas located in San Jose and Oakland. OVTAs were conducted at approximately one-quarter, halfway and three quarters between sweeping events. OVTA scores (i.e., A, B, C, D) were compared to evaluate how quickly and to what extent, trash re-accumulates in each study area following a sweeping event. To allow easier comparison of trash accumulation over time, OVTA scores (i.e., A, B, C, D) were converted to numeric scores (i.e., 0, 1, 2, 3) for the purpose of this evaluation.

[5] OVTAs were not conducted one-quarter, half-way and three-quarters between sweeping events at the Oakland quantitative study area (OK-1) because sweeping occurred five times per week, making this frequency of OVTAs impossible.

Appendix C includes the results of OVTAs conducted on sidewalks, streets and overall (streets and sidewalks combined) at each study area directly after sweeping, at intervals between, and directly before sweeping. Average changes in OVTA scores observed for all six study areas combined are presented in Figure 3.9.

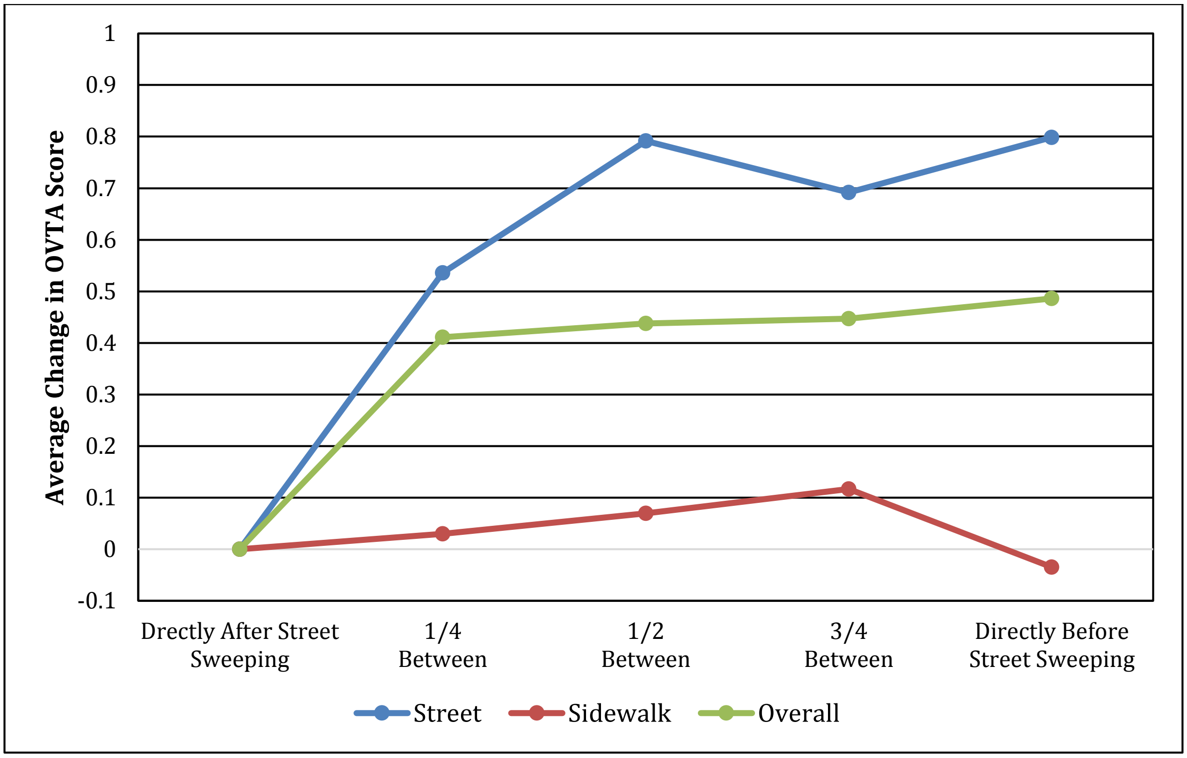

Figure 3.9. Average changes in OVTA scores over the course of a street sweeping cycle at the three quantiative and four qualitative study areas combined.

For the six sites where sweeping is conducted 1x or 2x per month, overall OVTA scores worsened on average by 0.5 (i.e., half a letter grade) within a few days (1 to 7) after sweeping. This increase was largely, if not entirely, a result of the re-accumulation of trash on the street (as opposed to the sidewalk). OVTA scores continued to worsen until roughly halfway between sweeping events (i.e., 7-14 days). At that time, street and overall OVTA scores stabilized until the next sweeping event occurred.

The level of trash on sidewalks, in contrast, remained relatively stable during nearly all street sweeping cycles assessed. This result suggests that (on average) the volumes of trash observed on sidewalks may not substantial change over the course of a street sweeping cycle, or possibly over the course of a year. Even if trash is blown into the street or removed via cleanups, new trash that is deposited on sidewalks takes its place. This creates a consistent (steady state) level of trash on sidewalks, a portion of which is conceptually available for transport to storm drain inlets under the necessary transport conditions (see discussion in section 3.3.3).

3.5. Trash Reductions via Curb Inlet Screens

Curb inlet screens in combination with inlet-based full capture systems are currently used as trash control measures by many municipalities throughout California. Because they are not approved/certified as full capture systems, curb inlet screens are typically used to supplement inlet-based systems by blocking trash and debris before entering inlets, which reduces the frequency of inlet maintenance. The ability of curb inlet screens alone to achieve full capture equivalency (i.e., low trash generation) has not been fully evaluated.

Similar to other institutional trash controls, the extent to which curb inlet screens can reduce trash in stormwater discharges can be evaluated by:

- Calculating the percent of trash reduced before and after installation/application of the control measure in the same study area;
- Comparing the volume of trash entering inlets within two study areas, one with and one without curb-inlet screens, that have similar levels of trash accumulation on streets and sidewalks; or,
- Comparing the amount of trash entering inlets equipped with curb inlet screens to a trash reduction goal (i.e., low trash generation).

The trash load reduction goal for municipal stormwater discharges as outlined in the Statewide Trash Amendments is "no adverse impacts" associated with trash in stormwater discharges (SCBRWQCB 2015). Methods currently being used to demonstrate achievement of the "no adverse impacts" goal include the installation and maintenance of trash full capture systems or equivalent alternative controls (SWRCB 2015; SFBRWCQB 2015), and the demonstration that a land area generates an extremely low level of trash (SFBRWQCB 2015). The Bay Area NPDES permit defines low trash generation as 0-5 gallons per acre, per year (SFBRWQCB 2015), which is based on trash generation studies conducted in the San Francisco Bay Area (BASMAA 2014) and Los Angeles regions (County of Los Angeles 2004a, 2004b).

For the purpose of evaluating the ability of curb inlet screens to reduce trash in stormwater discharges, both the percentage of trash reduced as a result of curb inlet screen installation and the ability of curb inlet screens to achieve the "no adverse impacts" goal (i.e., 0-5 gallons/acre yr^{-1}) were evaluated. Annual trash generation rates were calculated for each quantitative event by developing daily generation rates (i.e., volume of trash removed from the inlet during a quantitative event divided by the number of days since the last maintenance/cleanout event) and then multiplying each by 365 days. For the purpose of this evaluation, the trash generation rate of 2.5 gallons per acre, per year (i.e., the midpoint of the low trash generation category) or 0.007 gallons per acre, per day were used as the provisional definition of "no adverse impact" from stormwater discharges.

Based on the results of OVTAs and quantitative monitoring (see Table 3.3), trash accumulation rates on streets and sidewalks were comparable in the Fremont and San Jose study areas. Both study areas consistently received OVTA scores of either B (moderate) or C (high) for assessments that were conducted in between and directly before street sweeping events. The volumes of trash measured in the storm drain inlets at the San Jose site (with curb inlet screens), however, were significantly lower ($p<0.05$) than the trash measured in the inlets at the Fremont study area (no curb inlet screens).[6] Figure 3.10 illustrates the annual rates at which trash entered storm drain inlets in these comparable study areas.

[6] The results of a student's T-test indicate that the mean trash generation rate at the Fremont site exceeded the mean trash generation rate for the San Jose site by an amount that is greater than would be expected by chance ($p = 0.003$).

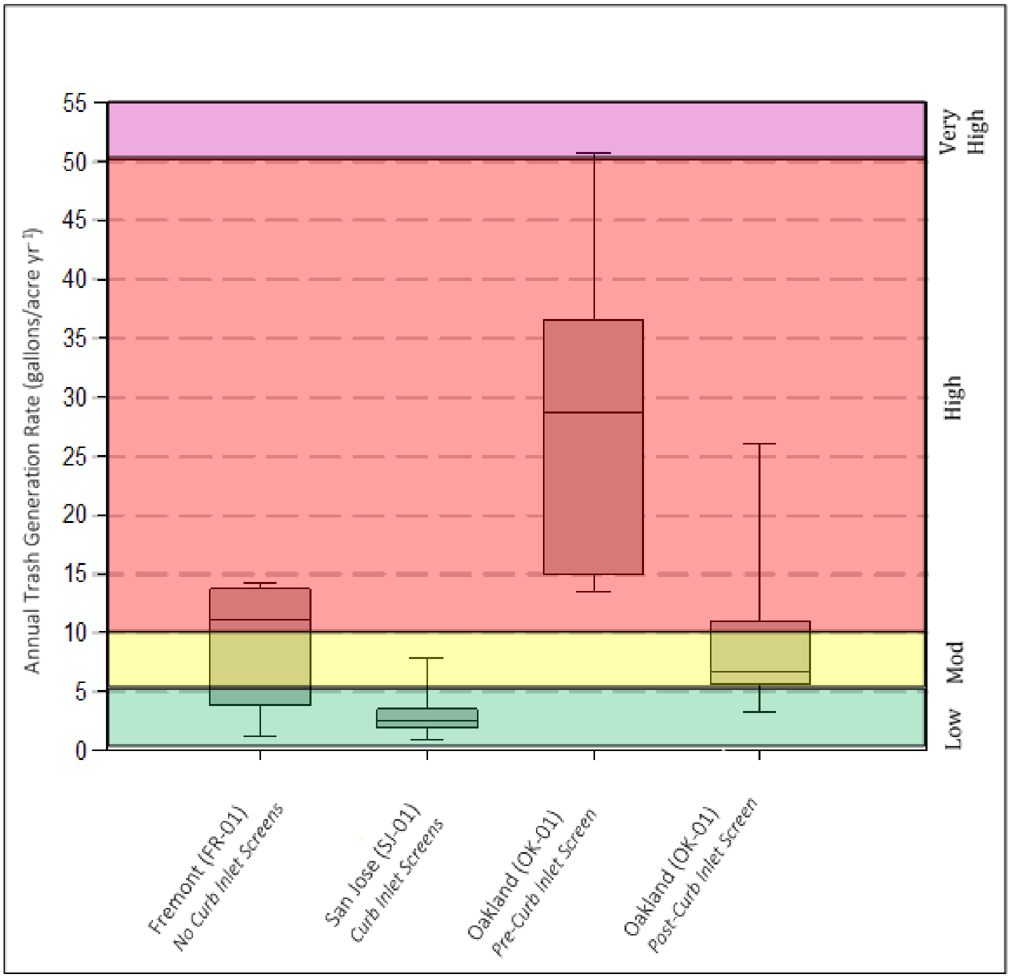

Figure 3.10. Ranges in annual trash generation rates observed at the three TCT quantiative study areas. Box plots represent medians (horizontal lines near center of boxes), 25th and 75th percentiles (lower and upper bounds of boxes), and roughly 10th and 90th percentiles (lower and upper whiskers).

A total of 67% less trash (by volume) entered the inlets in the San Jose study area during the study period, compared to inlets in Fremont (Table 3.7). Trash generation rates for the San Jose site were also consistently in the "low" generation category, suggesting that the combination of street sweeping 2x per month and curb inlet screens in land areas subject to moderate or high trash accumulation can achieve the "no adverse impacts" trash reduction goal (0-5 gallons per acre yr^{-1}).

Table 3.7. Comparison of trash generation rates for TCT quantitative study areas with and without curb inlet screens.

Study Area	Trash Accumulation Category	Street Sweeping Frequency	Curb Inlet Screen	# Quantitative Monitoring Events	Trash Generation Rate (gal/acre yr^{-1})	Trash Generation Category	% Reduction
Fremont (FR-01)	High/Mod	1x/month	No	8	8.9	Moderate	67%
San Jose (SJ-01)	High/Mod	2x/month	Yes	8	2.9	Low	
Oakland (OK-01)	Very High	5x/week	No	9	25.0	High	69%
			Yes	7	8.0	Moderate	

For the Oakland quantitative study area (OK-01), daily trash accumulation rates for streets and sidewalks were relatively consistent over the course of the TCT project (see Figure 3.5). On average, trash accumulated on streets and sidewalks at the Oakland site at a rate of 1.0 gallon/acre day^{-1}. Additionally, the Oakland study area consistently received overall OVTA scores of either C (high) or D (very high) for assessments conducted between and directly before street sweeping events. Trash volumes observed in the three inlets at the Oakland site, however, decreased significantly ($p<0.05$) after the installation of curb inlet screens.[7] Figure 3.10 illustrates the annual rates at which trash entered storm drain inlets at the study area prior to and after the installation of these partial capture devices. Figure 3.11 provides and illustration of the amount of trash generated daily at the Oakland site both before and after the installation of the screens.

A total of 69% less trash (by volume) entered the inlets at the Oakland site after the installation of the screens (Table 3.7). Trash generation rates at the Oakland study area were also consistently in the "moderate" generation category after the installation, suggesting that for land areas subject to high or very high trash accumulation on street and sidewalks, the combination of street sweeping 5x per week and curb inlet screens in can reduce trash to a "moderate" generation level (5-10 gallons per acre yr^{-1}).

[7] The results of a student's T-test indicate that the mean trash generation rate for the Oakland site prior to the installation of curb inlet screens exceeded the mean trash generation rate at the site after the installation by an amount that is greater than would be expected by chance ($p = 0.002$).

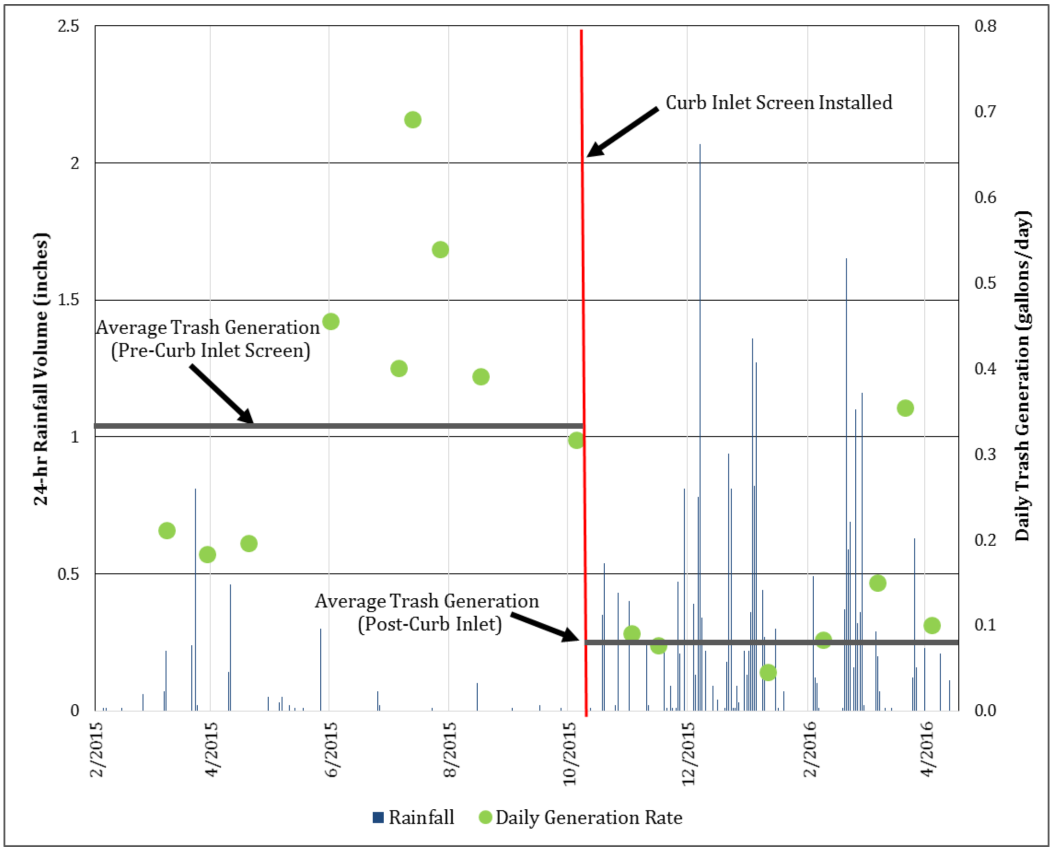

Figure 3.11. Changes in daily trash generation rates following the installation of curb inlet screens at the quantiative study area in Oakland (OK-01).

3.6. Contributions of Stormwater Trash from Street Sweepers

Because trash generation rates observed by BASMAA (2014) and the City Los Angeles (2004a, 2004b) were comparable during dry and wet seasons, street sweepers were suggested as a mechanism by which trash could be transported to storm drain inlets (i.e., sweepers may push trash into inlets during routine sweeping). In an effort to assess whether sweepers likely contribute trash to inlets, all inlets in the three TCT quantitative study areas were cleaned prior to and directly after each monitored street sweeping event.

Effectively no trash was observed in the inlets following the sweeping events, suggesting that sweepers are not likely transporting trash to inlets. It should be noted, however, that the TCT study did not likely replicate real world conditions because field crews would move trash and debris from on top of the inlet grate in order to clean out the inlet before the sweeper swept the segment. That said, the results from the TCT study indicate that sweepers themselves are not likely high priority transport mechanisms that need to be addressed as part of trash load reduction programs, and other transport mechanisms (e.g., wind or direct dumping into inlets) are more important.

3.7. Costs of Street Sweeping and Curb Inlet Screens

3.7.1. Street Sweeping Cost Summary

Costs associated with street sweeping are presented in three general cost categories - equipment, operating and reporting. To the extent possible, street sweeping cost data were developed for each of these cost categories from literature sources, equipment manufacturers, direct inquires of staff from San Francisco Bay Area municipalities and additional information in applicable government reports. Best professional judgment was used to identify and report cost data that were most applicable to potential street sweeping programs implemented by Bay Area municipalities.

Cost estimates are summarized in Table 3.8. Equipment (sweeper) costs, which range from $80,000 - $410,000 ($2 - $8/curb-mile) are highly dependent on the type/brand of sweeper and whether the sweeper was purchased new or used. As reported by EOA and Geosyntec (2011), municipal staff estimate that a typical sweeper may sweep approximately 7,000 curb miles per year with a lifespan of about ten years, totaling 70,000 curb-miles swept per life span of a sweeper. Lifecycle costs, as reported by a many (see Table 3.8), range between $21 and $81 per curb mile swept. SPU and Herrera (2009) provided the only cost estimate found by the project team that reported on the implementation of a sweeping program enhancement and performance tracking, which was based on best professional judgment of 15% added to the lifecycle cost per curb-mile.

Table 3.8. Comparison of costs for municipal street sweeping programs in the San Francisco Bay Area (California) and other areas in the U.S. for TCT quantitative study areas with and without curb inlet screens.

Source of Cost Data	Equipment ($ per sweeper)	Operating ($/curb-mile)	Lifecycle Costs ($/curb-mile)[3]	Notes:
City of Cupertino, CA[2]			$21	Annual contract budget of approximately $137,000. Annual curb miles swept is 6,408.
City of Foster City, CA[2]			$23	Annual contract budget of approximately $93,400. Annual curb miles swept is 4,134.
City of Irvine, CA[2]			$24	Annual contract budget of approximately $148,300. Annual curb miles swept is 6,180.
City of Oakland, CA[1]			$33	Annual budget of $4.5 M, 20 mechanical broom sweepers; assumes annual mileage of 7,000/sweeper.
City of Palo Alto, CA[2]			$32	Annual contract budget of approximately $560,000. Annual curb miles swept is 17,272.
City of Richmond, CA[1]			$81	Annual budget of $1.7 M, 3 regenerative air sweepers; assumes annual mileage of 7,000/sweeper.
City of San Mateo (2015)			S49	Total estimated annual program cost in FY 14-15 was $605,887. Annual curb miles swept is 12,417.
USEPA (1999)[1] Schilling (2005)[1]	$120,000	$48	$50	Mechanical Broom Sweeper; lifecycle costs calculated by factoring both equipment and operating costs over 10 years.[4]
USEPA (1999)[1] Schilling (2005)[1]	$240,000	$24	$29	Vacuum-Assisted Dry Sweeper; lifecycle costs calculated by factoring both equipment and operating costs over 10 years.[4]
Olympia, WA; Blosser et al. (2003)[1]	$390,000		$50	EV1 High Efficiency Vacuum Sweeper operated 6 months of the year; assumes 3,328 curb-miles swept per year.
Seattle, WA; SPU & Herrera (2009)[1]			$64	Regenerative Air Sweeper, every other week; Lifecycle costs included 15% for implementing the enhanced program, including performance tracking and $15/curb-mile for disposal costs.
Partland (2001)[1]	$80,000 - $160,000			Mechanical Broom - Regenerative Air Sweepers
	$320,000 - $410,000			EV1 High Efficiency Vacuum Sweeper
EOA & Geosyntec (2011)[1]	$177,000 - $208,000			Regenerative Air Sweeper
	$260,000 - $291,000			Dustless Regenerative Air
Range of Cost Estimates	**$80,000 - $410,000 OR $2 - $8/curb-mile**	**$24 - $48**	**$21 - $81**	

[1] Cost data was adjusted to 2013 dollars using http://www.usinflationcalculator.com. [2] Street sweeping is outsourced to an independent contractor. Costs per curb mile include street sweeping costs only. [3] Lifecycle costs include 25% mark-up where administrative costs were not included. [4] Based on 7,000 curb-miles swept per year over a ten year lifespan, 8% annual interest.

3.7.2. Curb Inlet Screen Cost Summary

Curb inlet screens (i.e., fixed inlet screen and automated retractable screens) are perforated stainless steel screens that are designed to fit outside or immediately within the storm drain curb opening. They are either fixed screens or screens that manually or hydraulically open when storm flows of a predetermined rate are detected. Water passes through the screen, while debris, trash and litter are prevented from entering, unless predetermined storm flows are exceeded. Screens are installed to keep trash and debris on the street thus reducing the volume of trash and debris that typically enters the inlet. Regular street sweeping is necessary to keep trash and debris from clogging the face of the screens and to prevent standing debris from blowing away (Gordon and Zamist 2006). If cleaning can be incorporated into street sweeping programs, no additional maintenance costs will apply (RBF Consulting 2003).

Cost estimates for curb inlet screens are provided in Table 3.9. All cost data summarized was obtained from the Request for Proposals submitted by the manufacturer to the San Francisco Estuary Partnership (SFEP) in January 2010. All cost data for curb inlet screens presented in Table 3.9 were adjusted to 2016 dollars. The price for catch basin screens can range from $216 for a fixed inlet screen up to $670 for automated retractable types.

Table 3.9. Summary of collated costs for fixed and automated retractable curb inlet screens.

Manufacturer	Device Name	Cost[1] Per unit (installed)	Notes:
Ecology Control Industries	Surfgate	$437	Automated retractable screen (i.e., pop open inlet grate). Manufacture and installation price of one screen less than 5 feet in length.
G2 Construction, Inc.	CamLock Debris Gate	$421	Automated retractable screen (i.e., pop open inlet grate). Manufacture and installation price of one screen 3.5 feet in length.
G2 Construction, Inc.	FS 10 Fixed Screen	$216 $378	Fixed inlet screen. Manufacture and installation price of one screen 3.5 feet in length ($216) and one screen 5 feet in length ($378).
Gentile Family Industries	ARS- Automated Retractable Screen	$398	Automated retractable screen (i.e., pop open inlet grate). Manufacture and installation price of one screen less than 5 feet in length.
United Stormwater, Inc.	CleanScreen III-Automated Retractable Screen	$670	Automated retractable screen (i.e., pop open inlet grate). Manufacture and installation price of one screen.
Range of Cost Estimates		**$216 - $670**	

[1] Cost data collated from request for proposals were adjusted to 2016 dollars using http://www.usinflationcalculator.com.

4. CONCLUSIONS

Task 2 of the Tracking California's Trash (TCT) project, *Evaluating the Effectiveness and Costs of Trash Control Measures,* was conducted primarily to evaluate the trash reduction benefits of street sweeping programs as related to discharges from stormwater conveyance systems. Street sweeping programs were evaluated both with and without curb inlet screens to assess the added trash reduction benefit that the screens may provide.

The trash monitoring and assessment methodologies used during this component of the TCT project were the first of their kind. Based on the literature review conducted as part of the project (EOA and 5 Gyres 2014) and discussions with Technical Advisory Committee (TAC) members, this project was the first to yield data on the volumes and rates at which trash accumulates on streets and sidewalks, the rates at which trash is removed via street sweepers, and the rates and magnitude at which trash is transported to storm drain inlets from streets and sidewalks. Because the methodologies used to characterize both trash volumes and types are relatively novel, the results presented in section 3.0 and the conclusions drawn here should be considered preliminary at this time. The conclusions described in this section are organized by each monitoring question that were agreed upon by the project team and TAC members, and included in the Sampling and Analysis Plan (SAP) for the project.

- **What types of trash accumulate on streets, sidewalks and inlets?**

  Of the 535 gallons of trash and debris (e.g., vegetation, sand and sediment) collected and characterized from storm drain inlets, 26% was trash by volume. These percentages are somewhat greater than (but in the similar range as) the percentages observed during trash generation studies recently conducted in the San Francisco Bay Area (BASMAA 2014; ACCWP 2014; SCVURPPP 2016). Of all trash characterized from streets, sidewalks, and inlets, roughly 67% by volume was identified as plastic (e.g., single use plastic grocery bags, recyclable beverage containers, EPS foam food ware, and other miscellaneous plastic). The percentage of trash that was plastic during the TCT study are similar to those observed in recent studies of trash in storm drains and receiving water bodies in the San Francisco Bay Area, U.S. and worldwide (Lippner et al 2000; Lewis 2002; Marais et al. 2004; Ocean Conservancy 2013; BASMAA 2014; ACCWP 2014; SCVURPPP 2016). Compared to the composition of trash found on streets and sidewalks during the TCT study, higher percentages of plastic material were observed in storm drain inlets, suggesting that trash made of plastic is transported to storm drains more easily than trash made of materials (e.g., paper, glass or metal).

- **At what rate does trash accumulate on streets and sidewalks?**

  The three TCT quantitative study areas were selected because of the relatively high or very high levels of trash that are consistently observed on the sidewalks and/or streets at these sites. Therefore, trash accumulation rates presented for these sites should be considered high-end estimates for streets and sidewalks. Trash accumulated on sidewalks at the three sites at rates between 113 and 374 gallons/acre yr^{-1}, or daily rates between 0.3 and 1.0 gallons/acre day^{-1}. Trash generally accumulated on streets at a much higher rate than sidewalks, if the trash removed by street sweepers throughout the year was included in accumulation rates. Annual trash accumulation on streets ranged between 64 and 2,309 gallons per acre yr^{-1}, or daily rates between 0.18 and 6.3 gallons per acre day^{-1}. The amount of trash observed on sidewalks does not appear to be affected by the frequency of sweeping that occurs in the roadway(s) adjacent to the sidewalk. Trash present on sidewalks, however, likely provides a consistent supply of trash to streets. This suggests that reductions in the amounts of trash on sidewalks adjacent to streets will assist municipalities in reducing the amount trash that is ultimately discharged by stormwater conveyances.

- **What percentage of trash on streets and sidewalks is transported to storm drains under different street sweeping frequencies?**

  Reduction in the amount of trash that is discharged by stormwater conveyance systems to receiving water bodies is the ultimate goal of the stormwater regulations for trash. The amount of trash measured over time in storm drain inlets that are equipped with full capture systems serves as a surrogate for measuring trash in stormwater discharges. Based on the results of the TCT project, the amount of trash measured in inlets is significantly less than the amount that accumulates on streets and sidewalks. Approximately 15-20% of the trash that accumulates on streets & sidewalks reaches storm drain inlets that do not have curb inlet screens. For inlets with curb inlet screens, the percentage of trash reaching storm drain inlets is significantly less than for those without.

- **What percentage of trash on the street do street sweepers remove under different accumulation rates and street sweeping frequencies?**

  Based on the limited dataset collected during the TCT project, it appears that street sweepers do a very good job of removing trash from streets. On average, 75% of the trash present on streets in very high generating trash areas was removed during the study by sweeping at a frequency of 5x/week. For the sites that generated moderate to high levels of trash, sweeping 1-2x/month removed between 67% and 99% of the trash on streets. The high removal efficiencies were likely related to the low speed of the sweeper (<3 mph), good pavement quality, and the consistent lack of cars parked along the streets.

  In areas generating "very high" levels of trash, sweeping 5x per week without curb inlet screens appears to reduce trash to "high" levels (i.e., 10-50 gallons/acre yr^{-1}). In areas generating "high" levels of trash, sweeping 1-2x per month appears to reduce trash to "moderate" trash generating levels (i.e., 5-10 gallons/acre yr^{-1}). At two sites monitored without curb inlet screens, street sweeping programs alone did not achieve the desired trash load reduction goal (i.e., 0-5 gallons/acre yr^{-1}).

- **How quickly does trash accumulate again on streets and sidewalks after a street sweeping event?**

  For streets swept 1x to 2x per month, the levels of trash on streets, on average, reestablish themselves to pre-sweeping levels within 1-2 weeks (7-14 days) after a sweeping event. At that time, trash levels stabilize until after the next sweeping event has occurred. Street sweeping frequencies of 1x to 2x per month in very high or high trash generating areas, therefore, leaves peak levels of trash on the streets about half of the time. This trash is therefore available for transport to storm drains if conditions present themselves in dry or wet weather seasons (e.g., relatively large stormwater runoff events or high winds).

  The level of trash on sidewalks, in contrast, generally remain stable over time. Even if trash is blown into the street or removed from sidewalks via cleanups, new trash is quickly deposited in its place. This creates a consistent (steady state) level of trash on sidewalks, a portion of which is conceptually available for transport to storm drain inlets under the necessary transport conditions (e.g., high winds). These findings suggest that reductions in the amounts of trash on sidewalks will assist municipalities in reducing the amount of trash on streets, and ultimately discharged by stormwater conveyances.

- **To what extent does the amount of trash entering storm drain inlets change with curb inlet screens installed?**

  Curb inlet screens significantly reduce the amount of trash transported to storm drain inlets from streets and sidewalks. Curb inlet screens appear to block approximately 65-70% of the trash (by volume) that would have entered an inlet if the screens were not in place. Additionally, inlet screens installed in "high" trash generating areas (in combination with street sweeping 2x per month) appear to achieve the San Francisco Bay Area trash reduction goal (0-5 gallons per acre yr^{-1}), which is also currently viewed as equivalent to the performance of trash full capture systems. Curb inlet screens, therefore, appear to be effective in reducing the amount of trash that is discharged by stormwater conveyance systems during both dry and wet weather conditions due to their ability to block trash from entering inlets regardless of the mechanism by which it is transported (e.g., stormwater runoff or wind).

- **To what extent do street sweepers push trash into storm drain inlets, with and without curb inlet screens?**

  Street sweepers do not appear to be important trash transport mechanisms to storm drain inlets. Increases in the amount of trash observed in inlets after street sweeping events were not observed during the TCT study. Wind and direct dumping into storm drains are more likely important mechanisms, compared to sweepers, for transporting trash to storm drains during dry weather periods.

- **What are the costs of street sweeping programs and curb inlet screens?**

  The average costs of street sweepers range from $80,000 to $410,000, depending on the type, brand and condition of sweeper. The average life span of a sweeper is approximately 70,000 curb-miles swept. Lifecycle costs range between $21 and $81 per curb mile swept. The price of curb inlet screens ranges from $200 to $700 per screen. Costs typically include installation.

5. Recommendations

The following recommendations are provided based on the findings and lessons learned through the *Evaluating the Effectiveness and Costs of Trash Control Measures* portion of the TCT project:

- **Street Sweeping Programs as Trash Control Measures**

  Demonstration of trash reductions in stormwater discharges is a technically challenging and resource intensive endeavor. Data collected via the TCT project suggests that if street sweepers are able to consistently reach the curb (i.e., limited to no parked cars), operate at speeds < 3 mph, have relatively good pavement quality on streets; then sweep at a frequency of 5x/week in very high trash generating areas or 1x/month in high or moderate trash generating areas should reduce the volume of trash reaching storm drain inlets by one trash generation category (e.g., very high to high). Given these results, municipalities in California should consider developing a street sweeping performance standard specifically for trash.

  The standard would provide guidance on implementation and document the anticipated trash reduction benefits of street sweeping programs operated under different frequencies, environmental and operator conditions, and trash generation scenarios. If technically acceptable and defensible, State and Regional Water Board staff should consider the approval/allowance of such a performance standard, which could allow municipalities to demonstrate trash reductions through the documentation and reporting that the street sweeping program had been implemented and achieved the agreed upon performance standard. Implementation, documentation and reporting could potentially offset the need for On-land Visual Trash Assessments (OVTAs) in areas where the street sweeping program was effectively implemented. This type of performance standard is currently allowed under the Municipal Regional NPDES Permit for stormwater discharges in the San Francisco Bay Area.

- **Curb Inlet Screens as Trash Control Measures**

  Based on the limited study of curb inlet screens conducted via the TCT project and by the City of Los Angeles (2006), these partial capture devices appear to significantly reduce trash in stormwater discharges and therefore may be viable trash control measures for future consideration by municipalities. The limited dataset on the performance of these devices could benefit from additional study at more sites that generate different levels of trash (e.g., very high, high and moderate). Future study sites should always be paired with full capture systems to assist with performance evaluation monitoring. Study designs that incorporate both before and after (installation) evaluations and comparisons to established trash reductions goals (i.e., 0-5 gallons/acre yr^{-1}) should be considered.

  Based on future study(s) results, municipalities in California should consider developing a curb inlet screen performance standard specifically for trash. The standard would provide guidance on the implementation of these devices and document the anticipated trash reduction benefits of installing and maintaining inlet screens under different trash generation scenarios. If technically acceptable and defensible, State and Regional Water Board staff should consider the approval/allowance of such a performance standard, which would allow municipalities to document commensurate trash reductions via the implementation of these devices. This type of performance standard may offset or alleviate the need for OVTAs in certain areas and is currently allowed under the Municipal Regional NPDES Permit for stormwater discharges in the San Francisco Bay Area. Additionally, if the results of the study(s) determine that curb inlet screens can achieve low trash generation (possibly in concert with the implementation of the street sweeping performance standard) then these devices should be considered equivalent to full capture systems.

- **<u>Trash Accumulation Rates on Streets/Sidewalks as Indicators of Trash Levels in Stormwater Discharges</u>**

  In very high trash generating areas, trash annually accumulates on streets and sidewalks at a rate somewhere between 2,000-3,000 gallons/acre yr^{-1}. In high trash generating areas, accumulation rates range from 150-200 gallons/acre yr^{-1}. Streets and sidewalks in moderate trash generating areas annually accumulate trash at a rate less than high areas. Although many factors can impact the transport of trash from street and sidewalks to storm drain inlets, first-order estimates suggest that roughly 15-20% of trash that accumulates on streets/sidewalks enters storm drain inlets. Given a stormwater trash reduction goal of 0-5 gallons/acre yr^{-1}, these findings suggest that an annual on-land trash accumulation rate of <25 gallons /acre yr^{-1} should achieve the trash reduction goal for stormwater under a street sweeping regime of 1x/month.

  Based on these preliminary calculations, municipalities and/or water quality regulators should consider collecting additional data that may support the establishment an "on-land trash accumulation goal." If the data collected further establish the relationship between the accumulation of trash on-land and trash in storm drain inlets, the amount of trash on-land could be used as a metric to evaluate progress towards stormwater trash reduction goals. If technically acceptable and defensible, State and Regional Water Board staff may choose to support the "on-land trash accumulation goal" as another method by which cities/counties can use to demonstrate the attainment of a stormwater goal or equivalency to trash full capture systems.

- **<u>Trash Characterization Methods</u>** – Although trash and debris sorting and characterization methods utilized in during the TCT project resulted in a generally acceptable level of data quality, methods could be improved in the following ways to increase precision in results:

  - Reduce the number of trash types sorted and characterized to reduce small volumes of trash in each category, which tend to have the least precision. Determine if it is necessary to sort certain plastic and paper trash types into separate sub-categories. If not, sort the minimum number of trash types necessary to meet project goals and objectives.
  - Use highly-trained and experienced personnel to conduct sorting and characterization. Since replication of results is difficult, use skilled personnel who have considerable experience in measuring volumes of trash with significant interstitial space.
  - Reduce the tendency to compact trash and debris in sorting/characterization containers. Compacting trash changes volume measurements and creates unnecessary variability in results.
  - Perform re-characterizations immediately after original characterizations have occurred. Trash and debris will likely have similar moisture content and composition if intercomparisons are performed on the same day.
  - Update the characterization protocol to insist that the smallest measurement container possible should be used when performing sorting and characterization. The consistent use of small containers will greatly improve the precision of volume measurements.
  - For future projects, review MQOs to assess their appropriateness for usage for new data collection and assessment efforts.

6. TERMINOLOGY

Curb Inlet Screen: Perforated stainless steel screens that are designed to fit outside or immediately within the storm drain curb opening. Screens are either fixed or retractable manually or hydraulically open when storm flow is detected. Water passes through the screen, while debris, trash and litter are prevented from entering.

Full Capture Equivalency: The trash load that would be reduced if full capture systems were installed, operated, and maintained for all storm drains that capture runoff from the relevant areas of land. Full capture system equivalency is the trash load reduction target that a NPDES stormwater Permittee quantifies by using an approach that is based on technically acceptable and defensible assumptions and methods subject to the approval by the State or Regional Water Boards. Both a "low" trash generation (stormwater loading) rate of 0-5 gallons/acre yr^{-1} and a consistent OVTA score of "A" in a trash management area currently meet the full capture equivalency definition as described in the Regional Stormwater NPDES Permit in the San Francisco Bay Area.

On-land Visual Trash Assessment: A qualitative assessment protocol that categorically scores (A, B, C, D) the levels of trash on streets and sidewalks. The "OVTA" is used in the San Francisco Bay Area to establish both baseline trash levels and evaluate changes in trash levels over time. OVTA scores are used in the Bay Area as surrogates for trash in stormwater discharges.

Partial Capture Device: Stormwater treatment devices that have not been certified/approved as full capture systems by the Los Angeles or San Francisco Bay Regional Water Boards or the State Board, but have some level of trash reduction benefit. Curb inlet screens are one example of a partial capture device.

Storm Drain Inlet: Component of the municipal separate storm sewer system (MS4) stormwater drainage system where surface runoff enters the underground conveyance system. Includes side inlets located adjacent to curbs, grate inlets located on the surface of a street or parking lot, and designs with both curb inlets and grates.

Stormwater Conveyance System: Drainage facilities and features that collect, contain, and provide for the flow of surface and stormwater from the highest points on the land down to a receiving water body. Conveyance systems are made up of natural elements and of constructed facilities.

Trash: Trash includes litter as defined by the California Government Code, but excludes sediments, sand, vegetation, oil and grease, and exotic species that cannot pass through a 5 mm mesh screen. As defined by California Government Code Section 68055.1(g), litter means all improperly discarded waste material, including, but not limited to, convenience food, beverage, and other product packages or containers constructed of steel, aluminum, glass, paper, plastic, and other natural and synthetic materials, thrown or deposited on the lands and waters of the state, but not including the properly discarded waste of the primary processing of agriculture, mining, logging, sawmilling or manufacturing.

Trash Accumulation (Rate): The amount of rate at which trash accumulates on the surface of the watershed and is potentially available for transport to stormwater conveyances and/or receiving water bodies. Trash accumulation includes trash removed via institutional controls (e.g., street sweeping) and stormwater treatment measures (e.g., full capture systems), and trash generated and transported by stormwater conveyance systems to receiving water bodies.

Trash Full Capture System: A single or series of proprietary devices or landscape-based stormwater treatment features that can trap all particles retained by a 5 mm mesh screen, and has a treatment capacity that exceeds the peak flow rate resulting from a one-year, one-hour storm in the drainage area treated by the device. Based on the NOAA precipitation frequency analysis, the one-year, one-hour storm depths in Fremont, Oakland and San Jose are 0.36 inches, 0.44 inches and 0.33 inches, respectively.

Trash Generation (Rate): The amount or rate at which trash is discharged from stormwater conveyance systems. Generation rates are expressed as trash volume per acre over a specified time period (e.g., annual or daily). Annual trash generation rates were established via the *BASMAA Baseline Trash Generation Rates for the San Francisco Bay* project - Very High (50-150 gal/acre/yr); High (10-50 gal/acre/yr); Moderate (5-10 gal/acre/yr); Low (0-5 gal/acre/yr). Synonymous with trash loading from stormwater conveyances.

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Appendix A

Data Quality Assurance Evaluation

Summary

The TCT project is the first project of its kind to attempt to quantify trash accumulation rates and the effectiveness of trash control measures via the particular sampling and analysis methods employed. Therefore, the control limits described in the project's Quality Assurance Project Plan (QAPP) and used for the various Measurement Quality Objectives (MQOs) specified were uncertain at best. The control limits were in large part obtained from those in use for biological laboratory analysis used for the State of California's Surface Water Ambient Monitoring Program (SWAMP), which may be too restrictive compared to the uncertainty related to trash identification and quantification process. Per the QAPP, various metrics were employed to obtain a general assessment of accuracy (exclusion sensitivity, error rates) and precision (laboratory duplicates, laboratory intercomparisons) of data generated. These metrics are discussed is this appendix to provide a general sense of quality of data collected and analyzed as part of the TCT project. In general, data collection and analysis techniques employed supported project objectives.

Exclusion Sensitivity

Exclusion sensitivity measurements were made to ensure that all trash had been sorted from debris in samples collected as part of the TCT project. A second team member examined samples for trash items that had mistakenly been excluded from a specific trash category. Consistent with the QAPP, exclusion sensitivity measurements were made on a mass basis. The frequency goal for exclusion analysis outlined in the QAPPP was 5% of total project sample count. The MQO was >90% of each waste category reported correctly.

An exclusion sensitivity analysis was conducted on 12 of the 215 samples (5.6%). A team member who did not perform the original trash sort of a sample carefully picked through the remaining debris to determine if there were any excluded pieces of trash > 5mm remaining in the debris. Table A-1 includes the results of the exclusion analysis. Overall, the second trash sorter found only 0.05 lbs of trash out of the 12.61 total lbs that had already been sorted in those 12 samples (0.4%). All of the samples met the exclusion sensitivity MQO. There were two trash categories in two separate samples that did not meet the MQO, but this was because of the very small weights of trash already found in that category.

Table A-1: Percent of all trash (by category and total) included in initial trash sort. The difference between 100% and the percent listed is the amount that was considered *excluded* for the secondary sort as part of the exclusion sensitivity analysis.

BASMAA Sample ID	Sample Date	Plastic CRV (lbs)	Glass CRV (lbs)	Plastic Bag (lbs)	EPS (lbs)	Plastic Foodware (lbs)	Mylar (lbs)	Plastic Other (lbs)	Paper Foodware (lbs)	Bulk Paper (lbs)	Cigs (lbs)	Glass Other (lbs)	Metal (lbs)	Misc (lbs)	Total Trash (lbs)
OK01-INLET 1.1-B	2/22/2016	N/A	N/A	N/A	N/A	N/A	N/A	93%	N/A	N/A	**80%**	N/A	N/A	100%	90%
OK01-INLET 1.2-B	1/25/2016	N/A	N/A	N/A	N/A	100%	N/A	100%	100%	100%	100%	100%	100%	100%	100%
OK01-INLET 1.2-B	4/18/2016	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	100%	100%	N/A	100%	100%	100%
OK01-INLET 2-B	2/22/2016	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	100%	100%	N/A	N/A	100%	100%
OK01-INLET 2-B	4/4/2016	N/A	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	100%	100%	N/A	100%	100%
OK01-INLET 2-B	4/18/2016	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	N/A	100%	100%
OK01-STREET 1-B	4/4/2016	N/A	N/A	N/A	100%	100%	100%	98%	100%	100%	100%	100%	100%	100%	100%
OK01-STREET 1-B	4/18/2016	N/A	N/A	N/A	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
OK01-STREET 2-A	1/25/2016	N/A	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	100%	N/A	100%	100%	100%
OK01-STREET 2-A	4/4/2016	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	100%	100%	N/A	100%	100%	100%
OK01-STREET 2-A	4/18/2016	N/A	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	100%	N/A	100%	100%	100%
SJ01-INLET 2-B	12/9/2015	N/A	N/A	N/A	N/A	N/A	N/A	100%	N/A	N/A	100%	N/A	**50%**	100%	96%

Laboratory Intercomparison

As part of the TCT project, two different teams sorted and characterized trash and debris. Cascadia Consulting Group sorted and characterized material collected as part of the Street Sweeping and Curb Inlet Screen Evaluation and On-land Visual Trash Assessment portion of the project. 5 Gyres sorted and characterized material collected as part of the receiving water monitoring component of the project. Both teams were trained in accordance with protocols described in the Sampling and Analysis Plan dated December 2014 (Geosyntec et al. 2014).

The laboratory duplicate and intercomparison of sample results was included as part of the characterization process to assess the precision between the characterization efforts of each team. Consistent with the project QAPP, a minimum of five percent (5%) of all samples characterized by the first team were forwarded under standard chain-of-custody procedures to the second team for recharacterization. Each team performed sorting and characterization on different dates.

Precision is used to measure the extent of agreement between measurements of the same collected sample under prescribed similar conditions. For this project, overall precision was defined as the degree of agreement in the volumes of materials and trash types in samples characterized by both teams. Precision is expressed as the relative percent difference (RPD):

RPD = ABS ([X1 - X2] / [(X1 + X2) / 2])

where:	*ABS*	=	*Absolute Value*
	X1	=	*Team #1 Result*
	X2	=	*Team #2 Result*

Seven samples collected as part of the Street Sweeping and Curb Inlet Screen Evaluation and On-land Visual Trash Assessment portion of the TCT project were separately characterized by two teams on December 3, 2015 (Cascadia) and December 4, 2015 (5 Gyres). The RPD results are presented in Table A-2.

Table A-2: Relative Percent Differences (RPDs) of trash and debris samples collected as part of the Street Sweeping and Curb Inlet Screen Evaluation and On-land Visual Trash Assessment portion of the TCT project and characterized by two separate teams.

Sample ID	Sample Date	Debris			Trash		
		Cascadia (gal)	5 Gyres (gal)	RPD	Cascadia (gal)	5 Gyres (gal)	RPD
FR01-INLET 1-B	11/14/2015	0.72	0.61	16.7%	0.25	0.18	33.0%
FR01-SIDE 2-A	11/14/2015	0.19	0.24	21.1%	3.06	1.56	65.0%
FR01-INLET 2.2-B	11/14/2015	2.86	1.28	76.4%	0.13	0.14	7.8%
OK01-INLET 2-B	8/10/2015	3.48	3.04	13.7%	3.98	3.75	5.8%
FR01-SIDE 1-B	7/11/2015	0.19	0.21	9.4%	1.02	1.08	5.6%
FR01-SIDE 1-B	9/12/2015	10.45	8.04	26.1%	2.28	2.01	12.6%
FR01-STREET 1-B	9/12/2015	16.96	13.57	22.2%	2.15	3.04	34.2%

A total of seven samples collected during the Street Sweeping and Curb Inlet Screen Evaluation and On-land Visual Trash Assessment portion of the TCT project were re-characterized by a second characterization team. Results of the RPD analysis indicated that the debris portion had relatively low (<25%) RPDs for five of the seven samples. One sample had a RPD of >50% for debris. Re-characterization of the trash portion of the samples yielded similar RPDs to the debris portion. Four of seven trash samples had RPDs <25%, while only one sample had an RPD >50%.

Differences in characterization results between teams may be attributed to:

- Characterization of trash types can be subjective at times. Certain plastic and paper trash types can be difficult to identify and may not be placed into correct sub-categories.
- Due to the inherent challenges in measuring trash, replication of results is often difficult. Trash comes in all shapes and sizes, resulting in differences in interstitial spaces in measurement containers, which can create variability in measurements.
- Samples can deteriorate, losing moisture content and composition over time. Moisture losses are typically seen in samples with large debris volumes that are wet when first characterized and then drier when re-characterization occurs.
- The use of different sizes of sorting and characterization containers can change results. The use of the smallest possible containers increases the accuracy of the results.

Waste Identification and Systemic Error Rates

Waste identification and systematic error rates measure the rate at which trash was sorted into the correct category during characterization events, consistent with characterization protocols. To assess these rates, the field project manager assessed whether trash items were misidentified in at least 5% of the samples collected. The MQO for this quality control measure was >90% agreement in the mass of trash initially characterized in each trash category, and the trash reanalyzed by the field project manager.

A total of 12 of the 215 (5.6%) samples collected were assessed to determine if trash was sorted into incorrect trash categories during the initial sort. Table A-3 presents the results of the waste identification and systematic error rate analysis. Overall, this check found that 0.11 pounds, or 0.9% of the trash had been categorized incorrectly. All of the samples reanalyzed met the MQO for waste identification and systemic error rates. Two individual trash categories in one sample, and one in another sample did not meet the MQO, although each sample had a very small amount of trash in each category.

Table A-3: Percent of trash included in initial trash sort. The difference between 100% and the percent listed is the amount that was considered *excluded* for the secondary sort as part of the exclusion sensitivity analysis.

BASMAA Sample ID	Sample Date	Plastic CRV (lbs)	Glass CRV (lbs)	Plastic Bag (lbs)	EPS (lbs)	Plastic Foodware (lbs)	Mylar (lbs)	Plastic Other (lbs)	Paper Foodware (lbs)	Bulk Paper (lbs)	Cigs (lbs)	Glass Other (lbs)	Metal (lbs)	Misc (lbs)	Total Trash (lbs)
OK01-INLET 1.1-B	2/22/2016	N/A	N/A	N/A	N/A	N/A	N/A	100%	N/A	N/A	100%	N/A	N/A	100%	100%
OK01-INLET 1.2-B	1/25/2016	N/A	N/A	N/A	N/A	100%	N/A	100%	100%	100%	100%	100%	100%	100%	100%
OK01-INLET 1.2-B	4/18/2016	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	100%	100%	N/A	100%	100%	100%
OK01-INLET 2-B	2/22/2016	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	100%	100%	N/A	N/A	100%	100%
OK01-INLET 2-B	4/4/2016	N/A	N/A	N/A	N/A	N/A	N/A	100%	**50%**	**81%**	100%	100%	N/A	100%	94%
OK01-INLET 2-B	4/18/2016	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	N/A	100%	100%
OK01-STREET 1-B	4/4/2016	N/A	N/A	N/A	100%	100%	100%	100%	92%	92%	100%	100%	100%	100%	99%
OK01-STREET 1-B	4/18/2016	N/A	N/A	N/A	100%	100%	100%	97%	100%	100%	100%	100%	100%	94%	99%
OK01-STREET 2-A	1/25/2016	N/A	N/A	N/A	N/A	N/A	N/A	100%	**67%**	92%	100%	N/A	100%	100%	95%
OK01-STREET 2-A	4/4/2016	N/A	N/A	N/A	N/A	N/A	100%	95%	92%	100%	100%	N/A	100%	100%	99%
OK01-STREET 2-A	4/18/2016	N/A	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	100%	N/A	100%	100%	100%
SJ01-INLET 2-B	12/9/2015	N/A	N/A	N/A	N/A	N/A	N/A	100%	N/A	N/A	100%	N/A	100%	100%	100%

Laboratory Duplicates

A total of 20 samples out of 215 (9.3%), were measured a second time to better understand measurement errors between field crew members (Table A-4). This quality check involved the sorting and measuring of all debris and trash categories into containers of the most appropriate size for the debris or trash fraction. After the first field crew member measured the volume of trash/debris in each bucket, a second field crew member would independently measure the volumes in each container. The measurement duplicates for trash were very similar, with the largest difference between total sample volumes being a 13% RPD.

Table A-4: Relative Percent Differences (RPDs) of initial and repeat volume measurements of trash and debris samples and collected as part of the Street Sweeping and Curb Inlet Screen Evaluation and On-land Visual Trash Assessment portion of the TCT project.

Sample ID	Sample Date	Debris			Trash		
		Sample Vol	Dup Vol	RPD	Sample Vol	Dup Vol	RPD
FR01-INLET 1-B	5/9/2015	6.70	6.79	1%	0.91	0.92	1%
FR01-INLET 1-B	10/10/2015	3.93	4.02	2%	0.53	0.57	7%
FR01-SIDE 1-B	3/14/2015	0.11	0.05	79%	4.04	3.82	5%
FR01-SIDE 2-A	3/14/2015	2.86	2.86	0%	4.66	4.45	5%
FR01-STREET 1-B	4/11/2015	12.77	12.68	1%	2.11	2.10	1%
OK01-INLET 1.1-B	10/19/2015	2.50	2.68	7%	3.92	3.82	3%
OK01-INLET 1.2-B	8/10/2015	2.86	3.04	6%	1.31	1.30	1%
OK01-INLET 2-B	5/4/2015	2.14	2.14	0%	2.35	2.41	2%
OK01-SIDE 1-B	3/23/2015	0.53	0.53	0%	13.91	14.17	2%
OK01-SIDE 1-B	1/25/2016	0.11	0.10	6%	12.12	12.13	0%
OK01-SIDE 2-A	5/4/2015	0.00	0.00	N/A	3.35	3.26	3%
OK01-SIDE 2-A	8/10/2015	0.00	0.00	N/A	2.52	2.53	0%
OK01-SIDE 2-A	8/31/2015	0.00	0.00	N/A	1.83	1.87	2%
SJ01-INLET 2-B	7/22/2015	1.44	1.44	0%	0.37	0.38	3%
SJ01-SIDE 1-B	5/27/2015	2.05	1.79	14%	1.67	1.63	2%
SJ01-SIDE 1-B	12/9/2015	1.70	1.70	0%	0.92	0.89	3%
SJ01-SIDE 1-B	1/27/2016	2.59	2.59	0%	0.12	0.12	3%
SJ01-STREET 1-B	3/25/2015	4.38	4.38	0%	1.18	1.33	13%
SJ01-STREET 2-A	5/27/2015	0.02	0.02	7%	0.13	0.14	3%
SJ01-STREET 2-A	9/23/2015	0.29	0.26	9%	0.36	0.35	4%

Completeness

Completeness is a measurement of whether the planned number and type of sampling events was achieved. The QAPP for the project set a MQO of 90% completeness for the project. The TCT Sampling and Analysis Plan outlined the following sampling/assessment goals for the project:

- 32 quantitative monitoring events;
- 32 paired on-land visual assessments before and after quantitative monitoring events;
- 58 paired on-land visual assessments before and after other street sweeping events;
- 132 on-land visual assessments between street sweeping events; and
- 26 paired on-land visual assessments before and after rain events.

Table XX presents the level of completeness achieved during the Street Sweeping and Curb Inlet Screen Evaluation and On-land Visual Trash Assessment portion of the TCT project. All (32 of 32) of the planned quantitative monitoring events were completed. A total of 107 of the 116 planned (92.2%) paired on-land visual assessments (either before and after other street sweeping events or before and after rain events) were completed. Of the 132 on-land visual assessments planned to be conducted between street sweeping events, 114 assessment were completed (86%).

Table A-5. Percentage of planned quantitative and qualitative monitoring events that were conducted in each TCT study area as part of the Street Sweeping and Curb Inlet Screen Evaluation and On-land Visual Trash Assessment portion of the project.

Study Area	# of Paired Quantitative/ Qualitative Monitoring Events	# Additional Qualitative Monitoring Events			Total
		# Paired Events Directly Before & After Sweeping Events	# Events Between Street Sweeping Events	# Paired Events Directly Before & After Rain Events	
FR-01	100%	50%	111%	100%	**97%**
SJ-01	100%	67%	117%	100%	**100%**
OK-01	100%	117%	50%	50%	**88%**
OK-02	NA	100%	92%	100%	**95%**
OK-03	NA	100%	92%	100%	**95%**
SJ-02	NA	110%	75%	100%	**87%**
SJ-03	NA	60%	63%	100%	**66%**

Visual Assessment Field Intercomparisons

To evaluate the variability in assessments scores between assessors conducting On-land Visual Trash Assessments (OVTAs), two assessors independently performed OVTAs on streets, sidewalks, and overall study areas during the Sweeping and Curb Inlet Screen Evaluation and On-land Visual Trash Assessment (OVTA) portion of the TCT project. Assessment scoring was done independently by the two assessors during 341 OVTAs conducted in seven study areas, each with two segments.

The results of the field intercomparison for OVTAs is included in Table A-6. The results of the analysis show a relatively similar rate of disagreement across the different sites and zones being assessed. Overall, 19% of the time the assessors assigned different scores. When disagreements occurred, the two assessors never disagreed by more than one trash generation category. Differences in scores were most often attributable to assessment areas (segments) bordering two trash generation categories rather than a lack of calibration between the two assessors. Study area SJ-03 by far had the largest percentage of scoring differences at 52%. This site was unique in that the street, sidewalk, and overall often bordered between a C and D (high and very high) score.

Table A-6. Percentage of OVTAs with two assessors assigning different scores.

Segment	# of Assessments with Two Assessors	Percent of Assessments with Different Scores			
		Street	Sidewalk	Overall	All
FR-01-1	8	0%	38%	0%	**13%**
FR-01-2	16	13%	0%	6%	**6%**
OK-01-1	26	4%	23%	4%	**10%**
OK-01-2	49	10%	12%	16%	**13%**
OK-02-1	40	13%	30%	13%	**18%**
OK-02-2	40	23%	28%	28%	**26%**
OK-03-1	40	25%	20%	15%	**20%**
OK-03-2	40	28%	18%	10%	**18%**
SJ-01-1	13	8%	8%	23%	**13%**
SJ-01-2	21	29%	14%	29%	**24%**
SJ-02-1	17	18%	24%	35%	**25%**
SJ-02-2	17	35%	18%	18%	**24%**
SJ-03-1	7	29%	29%	29%	**29%**
SJ-03-2	7	71%	57%	29%	**52%**
All Segments	**341**	**19%**	**21%**	**17%**	**19%**

Appendix B

Trash Characterization Data for Quantitative Monitoring Events

Tracking California's Trash Characterization Data: Counts and Volumes

Study Area	Segment	Location ID	Sample Date	Street Sweeping Timing	Debris (gal)	Plastic Bottles (#)	Glass Bottles (#)	Plastic Bags (#)	EPS (#)	Plastic CRV (gal)	Glass CRV (gal)	Plastic Bag (gal)	EPS (gal)	Plastic Food-ware (gal)	Mylar (gal)	Plastic Other (gal)	Paper Food-ware (gal)	Bulk Paper (gal)	Cigs (gal)	Glass Other (gal)	Metal (gal)	Misc (gal)	Total (gal)
FR-01	1	INLET 1-B	3/14/2015	Before	21.7					0.00	0.00	0.00	0.00	0.00	0.11	0.67	0.11	0.20	0.04	0.00	0.05	0.01	1.19
FR-01	1	SIDE 1-B	3/14/2015	Before	0.1				1	0.00	0.00	0.00	0.01	0.00	0.03	0.48	0.34	2.86	0.07	0.20	0.01	0.05	4.04
FR-01	1	STREET 1-B	3/14/2015	Before	6.7					0.00	0.00	0.00	0.00	0.00	0.07	0.44	0.34	0.28	0.16	0.00	0.02	0.05	1.35
FR-01	2	INLET 2.1-B	3/14/2015	Before	23.0					0.00	0.00	0.00	0.00	0.00	0.18	1.44	0.13	0.26	0.08	0.00	0.00	0.09	2.19
FR-01	2	INLET 2.2-B	3/14/2015	Before	2.9					0.00	0.00	0.00	0.00	0.00	0.03	0.26	0.00	0.01	0.01	0.00	0.00	0.00	0.31
FR-01	2	SIDE 2-A	3/14/2015	After	2.9	1		1	1	0.13	0.00	0.09	0.00	0.00	0.41	1.05	0.61	2.05	0.06	0.04	0.12	0.08	4.66
FR-01	2	STREET 2-A	3/14/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
FR-01	1	INLET 1-B	4/11/2015	Before	10.8					0.00	0.00	0.00	0.00	0.00	0.02	0.36	0.07	0.13	0.03	0.00	0.00	0.00	0.61
FR-01	1	SIDE 1-B	4/11/2015	Before	0.1					0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.17	0.22	0.04	0.00	0.01	0.00	0.70
FR-01	1	STREET 1-B	4/11/2015	Before	12.8					0.00	0.00	0.00	0.00	0.00	0.02	0.83	0.24	0.89	0.09	0.00	0.01	0.03	2.11
FR-01	2	INLET 2.1-B	4/11/2015	Before	7.8				1	0.00	0.00	0.00	0.05	0.00	0.05	0.53	0.24	0.13	0.05	0.00	0.19	0.01	1.24
FR-01	2	INLET 2.2-B	4/11/2015	Before	9.6				1	0.00	0.00	0.00	0.01	0.00	0.16	0.61	0.21	0.26	0.04	0.00	0.00	0.04	1.34
FR-01	2	SIDE 2-A	4/11/2015	After	0.1					0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.34	0.89	0.04	0.03	0.04	0.01	1.83
FR-01	2	STREET 2-A	4/11/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
FR-01	1	INLET 1-B	5/9/2015	Before	6.7	2				0.26	0.00	0.00	0.00	0.08	0.01	0.38	0.00	0.16	0.01	0.00	0.00	0.02	0.91
FR-01	1	SIDE 1-B	5/9/2015	Before	0.1				1	0.00	0.00	0.00	0.01	0.00	0.01	0.31	0.14	0.36	0.05	0.01	0.05	0.09	1.03
FR-01	1	STREET 1-B	5/9/2015	Before	11.6					0.00	0.00	0.00	0.00	0.29	0.02	0.78	0.48	0.31	0.12	0.00	0.00	0.18	2.18
FR-01	2	INLET 2.1-B	5/9/2015	Before	7.2	1				0.16	0.00	0.00	0.00	0.22	0.05	0.34	0.00	0.02	0.01	0.00	0.00	0.00	0.79
FR-01	2	INLET 2.2-B	5/9/2015	Before	12.3			1		0.00	0.00	0.09	0.00	0.00	0.14	0.48	0.13	0.05	0.02	0.00	0.00	0.05	0.96
FR-01	2	SIDE 2-A	5/9/2015	After	0.2				1	0.00	0.00	0.00	0.01	0.00	0.22	0.48	0.72	0.26	0.01	0.03	0.17	0.09	2.00
FR-01	2	STREET 2-A	5/9/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.11
FR-01	1	INLET 1-B	7/11/2015	Before	3.9					0.00	0.00	0.00	0.00	0.00	0.03	0.83	0.56	0.50	0.03	0.00	0.00	0.18	2.13
FR-01	1	SIDE 1-B	7/11/2015	Before	0.2					0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.61	0.17	0.06	0.00	0.00	0.04	1.02
FR-01	1	STREET 1-B	7/11/2015	Before	18.9	1				0.13	0.00	0.00	0.00	0.00	0.00	0.67	0.77	1.22	0.38	0.00	0.12	0.21	3.50
FR-01	2	INLET 2.1-B	7/11/2015	Before	13.3			1	2	0.00	0.00	0.09	0.05	0.00	0.24	1.11	0.61	0.94	0.01	0.00	0.04	0.18	3.28
FR-01	2	INLET 2.2-B	7/11/2015	Before	7.4	1		1	1	0.13	0.00	0.09	0.03	0.16	0.05	0.61	0.13	0.78	0.03	0.00	0.00	0.01	2.02
FR-01	2	SIDE 2-A	7/11/2015	After	0.3				1	0.00	0.00	0.00	0.04	0.00	0.02	1.55	0.94	1.44	0.05	0.24	0.02	0.89	5.20
FR-01	1	INLET 1-B	9/12/2015	Before	10.4					0.00	0.00	0.00	0.00	0.00	0.08	0.38	1.00	0.78	0.03	0.00	0.00	0.01	2.28
FR-01	1	SIDE 1-B	9/12/2015	Before	0.2				1	0.00	0.00	0.00	0.05	0.00	0.04	0.38	0.21	0.29	0.05	0.00	0.05	0.02	1.09
FR-01	1	STREET 1-B	9/12/2015	Before	17.0					0.00	0.00	0.00	0.00	0.00	0.21	0.44	0.21	0.83	0.24	0.00	0.01	0.21	2.15
FR-01	2	INLET 2.1-B	9/12/2015	Before	6.8					0.00	0.00	0.00	0.00	0.16	0.05	0.38	0.43	0.29	0.02	0.00	0.00	0.07	1.41
FR-01	2	INLET 2.2-B	9/12/2015	Before	21.3					0.00	0.00	0.00	0.01	0.11	0.67	1.39	0.89	1.55	0.03	0.00	0.00	0.04	4.68
FR-01	2	INLET 2.1-A	9/12/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
FR-01	2	SIDE 2-A	9/12/2015	After	0.2	2			1	0.31	0.00	0.00	0.03	0.00	0.09	1.22	0.56	0.44	0.05	0.05	0.00	1.55	4.30
FR-01	2	STREET 2-A	9/12/2015	After	0.1					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FR-01	1	INLET 1-B	10/10/2015	Before	3.9					0.00	0.00	0.00	0.00	0.00	0.12	0.18	0.14	0.07	0.00	0.00	0.00	0.02	0.53
FR-01	1	SIDE 1-B	10/10/2015	Before	0.1					0.00	0.00	0.00	0.00	0.00	0.01	0.34	0.00	0.67	0.05	0.00	0.00	0.04	1.10
FR-01	1	STREET 1-B	10/10/2015	Before	3.5					0.00	0.00	0.00	0.04	0.00	0.01	0.56	0.08	1.17	0.08	0.00	0.00	0.15	2.07
FR-01	2	INLET 2.1-B	10/10/2015	Before	4.2					0.00	0.00	0.00	0.00	0.00	0.04	0.38	0.00	0.02	0.01	0.00	0.00	0.11	0.56
FR-01	2	INLET 2.2-B	10/10/2015	Before	14.3				1	0.00	0.00	0.00	0.01	0.00	0.07	1.00	0.83	0.67	0.02	0.00	0.00	0.08	2.67
FR-01	2	SIDE 2-A	10/10/2015	After	0.1					0.00	0.00	0.00	0.00	0.00	0.02	0.67	0.29	0.17	0.02	0.00	0.00	0.05	1.22
FR-01	2	STREET 2-A	10/10/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FR-01	1	INLET 1-B	11/14/2015	Before	0.7					0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.09	0.11	0.00	0.00	0.00	0.00	0.25
FR-01	1	SIDE 1-B	11/14/2015	Before	0.1					0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.02	0.02	0.05	0.00	0.00	0.08	0.30
FR-01	1	STREET 1-B	11/14/2015	Before	4.5	1				0.13	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.38	0.03	0.00	0.01	0.31	1.08
FR-01	2	INLET 2.1-B	11/14/2015	Before	0.4					0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.03
FR-01	2	INLET 2.2-B	11/14/2015	Before	2.9					0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03	0.08	0.01	0.00	0.00	0.00	0.13
FR-01	2	SIDE 2-A	11/14/2015	After	0.2	1		1		0.13	0.00	0.09	0.00	0.07	0.06	2.14	0.29	0.29	0.05	0.00	0.00	0.03	3.15
FR-01	2	STREET 2-A	11/14/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
FR-01	1	INLET 1-B	2/6/2016	Before	12.4					0.00	0.00	0.00	0.00	0.13	0.09	0.53	0.05	0.01	0.01	0.00	0.04	0.00	0.86
FR-01	1	SIDE 1-B	2/6/2016	Before	0.3	1				0.06	0.00	0.00	0.00	0.00	0.02	0.41	0.34	0.34	0.03	0.00	0.00	0.08	1.27
FR-01	1	STREET 1-B	2/6/2016	Before	7.6					0.00	0.00	0.00	0.00	0.09	0.01	2.14	0.34	0.03	0.05	0.00	0.05	0.16	2.86
FR-01	2	INLET 2.1-B	2/6/2016	Before	14.9					0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.16	0.01	0.00	0.00	0.00	0.37
FR-01	2	INLET 2.2-B	2/6/2016	Before	25.4					0.00	0.00	0.00	0.00	0.00	0.01	0.22	0.00	0.09	0.01	0.08	0.00	0.05	0.47
FR-01	2	SIDE 2-A	2/6/2016	After	0.3		2			0.00	0.18	0.00	0.00	0.21	0.01	0.43	0.34	0.58	0.03	0.00	0.02	0.11	1.90
OK-01	1	INLET 1.1-B	3/23/2015	Before	2.8				2	0.00	0.00	0.00	0.07	0.00	0.07	0.83	0.00	0.00	0.05	0.02	0.05	0.05	1.13
OK-01	1	INLET 1.2-B	3/23/2015	Before	0.4			1	1	0.00	0.00	0.09	0.13	0.00	0.17	2.32	0.67	0.33	0.05	0.20	0.08	0.00	4.05
OK-01	1	SIDE 1-B	3/23/2015	Before	0.5		3	1	3	0.00	0.36	0.09	0.15	0.00	0.50	1.96	1.52	8.75	0.26	0.05	0.16	0.11	13.91
OK-01	1	STREET 1-B	3/23/2015	Before	0.3			1	1	0.00	0.00	0.09	0.04	0.09	0.09	0.67	0.56	2.32	0.07	0.00	0.02	0.00	3.95
OK-01	2	INLET 2-B	3/23/2015	Before	0.4			3	1	0.00	0.00	0.28	0.02	0.00	0.39	2.86	0.21	0.56	0.00	0.00	0.00	0.00	4.32
OK-01	2	SIDE 2-A	3/23/2015	After	0.6			1	1	0.00	0.00	0.09	0.05	0.00	0.01	0.39	0.20	0.44	0.00	0.05	0.01	0.01	1.27

Tracking California's Trash Characterization Data: Counts and Volumes

Study Area	Segment	Location ID	Sample Date	Street Sweeping Timing	Debris (gal)	Plastic Bottles (#)	Glass Bottles (#)	Plastic Bags (#)	EPS (#)	Plastic CRV (gal)	Glass CRV (gal)	Plastic Bag (gal)	EPS (gal)	Plastic Food-ware (gal)	Mylar (gal)	Plastic Other (gal)	Paper Food-ware (gal)	Bulk Paper (gal)	Cigs (gal)	Glass Other (gal)	Metal (gal)	Misc (gal)	Total (gal)
OK-01	2	STREET 2-A	3/23/2015	After	0.1					0.00	0.00	0.00	0.00	0.00	0.13	0.17	0.00	0.20	0.01	0.00	0.00	0.00	0.51
OK-01	1	INLET 1.1-B	4/13/2015	Before	1.7			1	4	0.00	0.00	0.09	0.21	0.00	0.21	0.89	0.24	0.00	0.11	0.00	0.16	0.01	1.92
OK-01	1	INLET 1.2-B	4/13/2015	Before	1.0					0.00	0.00	0.00	0.00	0.00	0.11	0.20	0.10	0.13	0.03	0.00	0.01	0.00	0.59
OK-01	1	SIDE 1-B	4/13/2015	Before	1.4	1			3	0.13	0.00	0.00	0.11	0.00	0.20	1.43	1.96	0.39	0.14	0.89	0.06	4.11	9.41
OK-01	1	STREET 1-B	4/13/2015	Before	0.3					0.00	0.00	0.00	0.00	0.00	0.16	0.44	0.39	0.45	0.09	0.01	0.12	0.05	1.70
OK-01	2	INLET 2-B	4/13/2015	Before	1.1					0.00	0.00	0.00	0.00	0.00	0.11	0.56	0.26	0.40	0.01	0.00	0.00	0.00	1.33
OK-01	2	SIDE 2-A	4/13/2015	After	0.0		1			0.00	0.11	0.00	0.00	0.00	0.00	0.28	0.16	0.28	0.04	0.01	0.02	0.00	0.89
OK-01	2	STREET 2-A	4/13/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.07
OK-01	1	INLET 1.1-B	5/4/2015	Before	1.3			1		0.00	0.00	0.09	0.00	0.00	0.16	0.53	0.00	0.06	0.05	0.01	0.00	0.02	0.92
OK-01	1	INLET 1.2-B	5/4/2015	Before	1.1			1	1	0.00	0.00	0.09	0.05	0.05	0.03	0.29	0.10	0.22	0.02	0.00	0.00	0.00	0.84
OK-01	1	SIDE 1-B	5/4/2015	Before	0.3		4	2	1	0.00	0.30	0.19	0.03	1.55	0.36	1.50	1.72	7.50	0.16	1.00	0.18	1.17	15.65
OK-01	1	STREET 1-B	5/4/2015	Before	3.5	1			1	0.16	0.00	0.00	0.03	0.19	0.11	1.22	1.17	1.33	0.13	0.03	0.19	0.02	4.58
OK-01	2	INLET 2-B	5/4/2015	Before	2.1			1		0.00	0.00	0.09	0.00	0.00	0.67	1.05	0.14	0.39	0.01	0.00	0.00	0.00	2.35
OK-01	2	SIDE 2-A	5/4/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.08	0.89	0.55	1.50	0.04	0.01	0.20	0.08	3.35
OK-01	2	STREET 2-A	5/4/2015	After	0.0	1				0.12	0.00	0.00	0.00	0.14	0.01	0.17	0.44	0.89	0.01	0.00	0.00	1.11	2.89
OK-01	1	INLET 1.1-B	6/15/2015	Before	1.9			4	1	0.00	0.00	0.38	0.07	0.36	1.44	1.39	0.46	0.03	0.07	0.10	0.01	0.44	4.73
OK-01	1	INLET 1.2-B	6/15/2015	Before	3.2	1	1	1	2	0.13	0.05	0.09	0.29	0.38	1.05	1.67	0.78	0.24	0.04	0.01	0.05	0.07	4.86
OK-01	1	SIDE 1-B	6/15/2015	Before	0.4	7	1	2	1	0.49	0.16	0.19	0.03	0.00	0.20	0.78	0.72	4.11	0.13	0.67	0.06	0.13	7.66
OK-01	1	STREET 1-B	6/15/2015	Before	8.5		1		4	0.00	0.09	0.00	0.56	0.34	0.78	1.61	3.57	6.07	0.14	0.04	0.13	0.44	13.76
OK-01	2	INLET 2-B	6/15/2015	Before	6.4	1		2	5	0.13	0.00	0.19	0.83	0.14	1.89	4.63	0.22	0.94	0.01	0.00	0.00	0.56	9.53
OK-01	2	SIDE 2-A	6/15/2015	After	0.1			1	5	0.00	0.00	0.09	0.16	0.00	0.05	0.14	0.56	1.35	0.09	0.11	0.02	0.02	2.58
OK-01	2	STREET 2-A	6/15/2015	After	0.1				1	0.00	0.00	0.00	0.03	0.18	0.00	0.18	0.67	0.13	0.01	0.43	0.01	0.00	1.63
OK-01	1	INLET 1.1-B	7/20/2015	Before	2.7	1		1		0.13	0.00	0.09	0.00	0.00	0.43	0.89	0.20	0.08	0.02	0.00	0.00	0.00	1.84
OK-01	1	INLET 1.2-B	7/20/2015	Before	11.4	1	2	1	8	0.13	0.18	0.09	1.22	0.00	0.43	1.39	1.17	0.89	0.03	0.01	0.02	0.22	5.78
OK-01	1	SIDE 1-B	7/20/2015	Before	1.9			1		0.00	0.00	0.09	0.00	1.22	0.10	0.67	3.75	1.87	0.20	0.38	0.00	0.17	8.46
OK-01	1	STREET 1-B	7/20/2015	Before	2.0				2	0.00	0.00	0.00	0.50	1.22	0.29	1.67	1.72	1.11	0.13	0.01	0.02	0.21	6.87
OK-01	2	INLET 2-B	7/20/2015	Before	10.3	2		2	2	0.20	0.00	0.19	0.24	0.07	1.22	3.57	0.41	0.31	0.01	0.02	0.00	0.14	6.37
OK-01	2	SIDE 2-A	7/20/2015	After	0.1					0.00	0.00	0.00	0.00	0.00	0.01	0.38	0.22	0.34	0.07	0.02	0.08	0.05	1.16
OK-01	2	STREET 2-A	7/20/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
OK-01	1	INLET 1.1-B	7/27/2015	Before	1.5			1		0.00	0.00	0.09	0.00	0.00	0.02	0.43	0.34	0.26	0.02	0.00	0.00	0.00	1.17
OK-01	1	INLET 1.2-B	7/27/2015	Before	4.3			2		0.00	0.00	0.19	0.00	0.00	0.01	0.83	0.61	0.00	0.02	0.00	0.00	0.05	1.71
OK-01	1	SIDE 1-B	7/27/2015	Before	0.3				7	0.00	0.00	0.00	1.55	0.00	0.29	2.94	1.17	1.28	0.07	0.03	0.02	0.14	7.47
OK-01	1	STREET 1-B	7/27/2015	Before	3.8				5	0.00	0.00	0.00	1.00	0.00	0.05	0.94	0.48	1.44	0.11	0.20	0.03	0.05	4.32
OK-01	2	INLET 2-B	7/27/2015	Before	3.8			1		0.00	0.00	0.09	0.00	0.00	0.31	0.58	0.54	0.43	0.00	0.00	0.00	0.00	1.96
OK-01	2	SIDE 2-A	7/27/2015	After	0.0			1		0.00	0.00	0.09	0.00	0.00	0.03	0.51	0.17	0.00	0.03	0.00	0.01	0.04	0.89
OK-01	2	STREET 2-A	7/27/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.07	0.53	0.10	0.21	0.01	0.01	0.00	0.00	0.92
OK-01	1	INLET 1.1-B	8/10/2015	Before	0.8				1	0.00	0.00	0.00	0.04	0.28	0.09	0.89	0.00	0.26	0.02	0.00	0.03	0.00	1.61
OK-01	1	INLET 1.2-B	8/10/2015	Before	2.9					0.00	0.00	0.00	0.00	0.00	0.09	0.89	0.08	0.17	0.02	0.02	0.00	0.05	1.31
OK-01	1	SIDE 1-B	8/10/2015	Before	0.1				3	0.00	0.00	0.00	0.11	1.34	0.21	1.05	0.83	2.68	0.06	0.18	0.01	0.38	6.86
OK-01	1	STREET 1-B	8/10/2015	Before	3.2			1		0.00	0.00	0.09	0.13	0.24	0.21	2.32	0.53	1.96	0.16	0.08	0.05	0.05	5.82
OK-01	2	INLET 2-B	8/10/2015	Before	3.5			7	1	0.00	0.00	0.66	0.04	0.00	0.83	2.86	0.01	0.21	0.01	0.00	0.01	0.01	4.63
OK-01	2	SIDE 2-A	8/10/2015	After	0.0			1		0.00	0.00	0.09	0.00	0.13	0.02	0.29	0.67	1.11	0.03	0.10	0.00	0.08	2.52
OK-01	2	STREET 2-A	8/10/2015	After	0.1				1	0.00	0.00	0.00	0.03	0.18	0.00	1.11	0.38	1.50	0.00	0.00	0.00	0.01	3.22
OK-01	1	INLET 1.1-B	8/31/2015	Before	0.9					0.00	0.00	0.00	0.01	0.00	0.05	0.46	0.00	0.00	0.01	0.00	0.00	0.00	0.52
OK-01	1	INLET 1.2-B	8/31/2015	Before	3.5					0.00	0.00	0.00	0.06	0.03	0.07	0.78	0.72	0.29	0.04	0.00	0.01	0.05	2.05
OK-01	1	SIDE 1-B	8/31/2015	Before	0.3		1		1	0.00	0.09	0.00	0.19	0.00	0.11	0.24	1.22	1.33	0.24	0.05	0.08	0.04	3.59
OK-01	1	STREET 1-B	8/31/2015	Before	7.1					0.00	0.00	0.00	0.83	1.19	0.00	0.89	1.33	1.50	0.18	0.18	0.21	0.09	6.41
OK-01	2	INLET 2-B	8/31/2015	Before	3.8			2		0.00	0.00	0.19	0.00	0.00	0.15	3.93	0.18	1.17	0.00	0.00	0.00	0.03	5.64
OK-01	2	SIDE 2-A	8/31/2015	After	0.0	1			1	0.11	0.00	0.00	0.13	0.00	0.00	0.67	0.43	0.41	0.04	0.02	0.00	0.02	1.83
OK-01	2	STREET 2-A	8/31/2015	After	0.0					0.00	0.00	0.00	0.00	0.11	0.00	0.29	1.00	0.55	0.01	0.00	0.00	0.01	1.96
OK-01	1	INLET 1.1-B	10/19/2015	Before	2.5	1			3	0.09	0.00	0.00	0.28	0.00	0.04	1.39	0.00	2.05	0.01	0.00	0.03	0.02	3.92
OK-01	1	INLET 1.2-B	10/19/2015	Before	3.8			1	1	0.00	0.00	0.09	0.03	0.35	0.22	1.55	0.29	0.61	0.07	0.01	0.18	0.07	3.48
OK-01	1	SIDE 1-B	10/19/2015	Before	0.4			2		0.00	0.00	0.19	0.16	0.00	0.89	4.28	3.21	4.28	0.13	0.07	0.00	0.24	13.45
OK-01	1	STREET 1-B	10/19/2015	Before	16.2				2	0.00	0.00	0.00	0.09	0.16	0.16	3.12	1.22	1.55	0.12	0.15	0.00	0.09	6.66
OK-01	2	INLET 2-B	10/19/2015	Before	7.1			7	2	0.00	0.00	0.66	0.16	0.00	0.34	3.84	1.05	1.94	0.00	0.00	0.00	0.14	8.13
OK-01	2	SIDE 2-A	10/19/2015	After	0.2					0.00	0.00	0.00	0.00	0.01	0.01	0.21	0.56	0.67	0.11	0.09	0.11	0.16	1.91
OK-01	2	STREET 2-A	10/19/2015	After	0.0			1		0.00	0.00	0.09	0.00	0.00	0.00	0.38	0.56	0.29	0.00	0.00	0.03	0.05	1.41
OK-01	1	INLET 1.1-B	11/16/2015	Before	3.6			2		0.00	0.00	0.19	0.08	0.00	0.00	0.61	0.12	0.00	0.08	0.00	0.00	0.25	1.33
OK-01	1	INLET 1.2-B	11/16/2015	Before	1.1					0.00	0.00	0.00	0.00	0.00	0.07	0.11	0.03	0.09	0.01	0.05	0.02	0.03	0.42
OK-01	1	SIDE 1-B	11/16/2015	Before	0.4	1	2	1	1	0.08	0.19	0.09	0.04	0.00	0.29	1.11	1.50	1.05	0.11	0.24	0.14	0.08	4.91
OK-01	1	STREET 1-B	11/16/2015	Before	13.4	1		3		0.13	0.00	0.28	0.55	0.07	0.21	1.61	0.29	1.78	0.13	0.34	0.33	1.33	7.05

Tracking California's Trash Characterization Data: Counts and Volumes

Study Area	Segment	Location ID	Sample Date	Street Sweeping Timing	Debris (gal)	Plastic Bottles (#)	Glass Bottles (#)	Plastic Bags (#)	EPS (#)	Plastic CRV (gal)	Glass CRV (gal)	Plastic Bag (gal)	EPS (gal)	Plastic Food-ware (gal)	Mylar (gal)	Plastic Other (gal)	Paper Food-ware (gal)	Bulk Paper (gal)	Cigs (gal)	Glass Other (gal)	Metal (gal)	Misc (gal)	Total (gal)
OK-01	2	INLET 2-B	11/16/2015	Before	1.6			1		0.00	0.00	0.09	0.00	0.00	0.01	0.48	0.07	0.00	0.01	0.00	0.00	0.11	0.77
OK-01	2	SIDE 2-A	11/16/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.00	0.46	1.72	0.38	0.03	0.02	0.02	0.09	2.72
OK-01	2	STREET 2-A	11/16/2015	After	1.4					0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.10	0.36	0.03	0.00	0.00	0.00	0.58
OK-01	1	INLET 1.1-B	11/30/2015	Before	1.4				1	0.00	0.00	0.00	0.04	0.00	0.00	0.09	0.02	0.00	0.02	0.00	0.00	0.01	0.17
OK-01	1	INLET 1.2-B	11/30/2015	Before	1.3				1	0.00	0.00	0.00	0.01	0.00	0.01	0.22	0.05	0.18	0.03	0.01	0.01	0.01	0.52
OK-01	1	SIDE 1-B	11/30/2015	Before	0.2	1				0.13	0.00	0.00	0.07	0.11	0.26	3.75	1.89	0.67	0.03	0.78	0.00	0.08	7.75
OK-01	1	STREET 1-B	11/30/2015	Before	23.4	1		1	5	0.16	0.00	0.09	0.76	0.77	0.16	4.55	8.03	4.82	0.15	0.56	0.14	1.89	22.08
OK-01	2	INLET 2-B	11/30/2015	Before	0.8					0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.38
OK-01	2	SIDE 2-A	11/30/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.18	0.89	0.02	0.05	0.07	0.00	1.23
OK-01	2	STREET 2-A	11/30/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.01	0.00	0.00	0.00	0.03
OK-01	1	INLET 1.1-B	1/25/2016	Before	1.6				1	0.00	0.00	0.00	0.01	0.02	0.04	0.55	0.09	0.00	0.03	0.00	0.08	0.05	0.86
OK-01	1	INLET 1.2-B	1/25/2016	Before	0.6					0.00	0.00	0.00	0.00	0.08	0.00	0.25	0.11	0.12	0.00	0.00	0.03	0.11	0.70
OK-01	1	SIDE 1-B	1/25/2016	Before	0.1		2	2	6	0.00	0.28	0.19	1.11	1.12	0.89	3.12	2.86	1.70	0.04	0.46	0.17	0.19	12.12
OK-01	1	STREET 1-B	1/25/2016	Before	0.1	1		1		0.13	0.00	0.09	0.05	0.08	0.20	0.94	0.38	0.78	0.08	0.01	0.11	0.12	2.98
OK-01	2	INLET 2-B	1/25/2016	Before	0.3				1	0.00	0.00	0.00	0.05	0.00	0.08	0.67	0.02	0.00	0.00	0.02	0.07	0.05	0.95
OK-01	2	SIDE 2-A	1/25/2016	After	0.0				3	0.00	0.00	0.00	0.18	0.00	0.00	0.36	0.13	2.23	0.08	0.08	0.00	0.16	3.23
OK-01	2	STREET 2-A	1/25/2016	After	0.0				1	0.00	0.00	0.00	0.07	0.00	0.05	0.09	0.08	0.31	0.01	0.00	0.01	0.03	0.65
OK-01	1	INLET 1.1-B	2/22/2016	Before	0.2					0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.01	0.00	0.00	0.01	0.27
OK-01	1	INLET 1.2-B	2/22/2016	Before	0.7				1	0.00	0.00	0.00	0.00	0.00	0.01	0.21	0.00	0.01	0.04	0.03	0.05	0.11	0.46
OK-01	1	SIDE 1-B	2/22/2016	Before	0.1		2		5	0.00	0.20	0.00	2.22	0.21	0.01	1.17	0.61	0.78	0.15	0.78	0.07	0.26	6.45
OK-01	1	STREET 1-B	2/22/2016	Before	0.2	1		2		0.06	0.00	0.19	0.11	0.24	0.04	0.48	0.29	0.31	0.08	0.29	0.11	0.25	2.44
OK-01	2	INLET 2-B	2/22/2016	Before	0.5					0.00	0.00	0.00	0.00	0.00	0.11	1.33	0.05	0.07	0.01	0.00	0.00	0.03	1.59
OK-01	2	SIDE 2-A	2/22/2016	After	0.0	1				0.16	0.00	0.00	0.00	0.00	0.05	0.26	0.36	0.38	0.04	0.43	0.10	0.10	1.89
OK-01	2	STREET 2-A	2/22/2016	After	0.1				1	0.00	0.00	0.00	0.05	0.00	0.08	0.43	0.78	1.11	0.02	0.01	0.03	0.04	2.54
OK-01	1	INLET 1.1-B	3/21/2016	Before	3.9	1		2	3	0.12	0.00	0.19	0.21	0.56	0.21	1.78	0.09	0.11	0.02	0.01	0.01	0.16	3.45
OK-01	1	INLET 1.2-B	3/21/2016	Before	1.1				1	0.00	0.00	0.00	0.08	0.00	0.00	0.29	0.00	0.00	0.01	0.00	0.00	0.05	0.42
OK-01	1	SIDE 1-B	3/21/2016	Before	0.4		3	1	2	0.00	0.00	0.09	0.26	1.05	0.26	2.68	0.78	2.68	0.09	1.05	0.17	0.29	9.41
OK-01	1	STREET 1-B	3/21/2016	Before	1.9	2			11	0.25	0.00	0.00	1.32	1.61	0.24	5.47	1.05	2.00	0.04	0.89	0.21	1.00	14.08
OK-01	2	INLET 2-B	3/21/2016	Before	1.8					0.00	0.00	0.00	0.00	0.00	0.01	0.20	0.00	0.02	0.01	0.00	0.01	0.08	0.32
OK-01	2	SIDE 2-A	3/21/2016	After	0.1		2		1	0.00	0.18	0.00	0.01	0.00	0.01	0.53	0.26	1.00	0.08	0.17	0.05	0.18	2.48
OK-01	2	STREET 2-A	3/21/2016	After	0.1				1	0.00	0.00	0.00	0.04	0.00	0.00	0.26	0.05	0.09	0.01	0.00	0.00	0.11	0.57
OK-01	1	INLET 1.1-B	4/4/2016	Before	1.1					0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.06	0.21	0.03	0.03	0.01	0.00	0.54
OK-01	1	INLET 1.2-B	4/4/2016	Before	1.9			2	1	0.00	0.00	0.19	0.08	0.00	0.26	1.55	0.43	1.22	0.00	0.01	0.05	0.04	3.84
OK-01	1	SIDE 1-B	4/4/2016	Before	0.2			1	4	0.00	0.00	0.09	0.38	0.00	0.21	1.44	1.61	4.19	0.21	0.89	0.07	0.25	9.36
OK-01	1	STREET 1-B	4/4/2016	Before	0.6			3	2	0.00	0.00	0.28	1.46	0.17	0.21	1.87	3.21	4.28	0.11	0.56	0.26	0.38	12.82
OK-01	2	INLET 2-B	4/4/2016	Before	1.3				1	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.12	0.21	0.03	0.01	0.00	0.04	0.57
OK-01	2	SIDE 2-A	4/4/2016	After	0.1			1		0.00	0.00	0.09	0.00	0.13	0.03	0.50	1.11	2.50	0.11	0.09	0.09	0.26	4.90
OK-01	2	STREET 2-A	4/4/2016	After	0.1				1	0.00	0.00	0.00	0.01	0.00	0.05	0.44	0.25	1.22	0.05	0.00	0.04	0.24	2.30
OK-01	1	INLET 1.1-B	4/18/2016	Before	1.1					0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.02	0.08	0.05	0.00	0.00	0.02	0.30
OK-01	1	INLET 1.2-B	4/18/2016	Before	1.1					0.00	0.00	0.00	0.00	0.00	0.05	0.26	0.07	0.41	0.01	0.00	0.08	0.05	0.94
OK-01	1	SIDE 1-B	4/18/2016	Before	0.3	1			1	0.13	0.00	0.00	0.07	0.12	0.16	0.94	1.72	1.11	0.11	1.22	0.00	1.00	6.58
OK-01	1	STREET 1-B	4/18/2016	Before	0.0				2	0.00	0.00	0.00	0.21	0.37	0.11	1.44	1.22	1.50	0.13	0.03	0.01	0.26	5.29
OK-01	2	INLET 2-B	4/18/2016	Before	0.3					0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.07	0.02	0.00	0.00	0.07	0.16
OK-01	2	SIDE 2-A	4/18/2016	After		5	5	2		0.54	0.54	0.19	0.26	0.26	0.08	0.26	0.48	0.44	0.06	0.00	0.04	0.05	3.22
OK-01	2	STREET 2-A	4/18/2016	After	0.1					0.00	0.00	0.00	0.01	0.00	0.00	0.24	0.51	1.61	0.09	0.00	0.01	0.08	2.54
SJ-01	1	INLET 1-B	2/25/2015	Before	11.7					0.00	0.00	0.00	0.00	0.00	0.12	0.67	0.00	0.06	0.03	0.00	0.01	0.06	0.94
SJ-01	1	SIDE 1-B	2/25/2015	Before	5.0				1	0.00	0.00	0.00	0.00	0.14	0.00	0.19	0.24	0.17	0.07	0.05	0.08	0.05	1.00
SJ-01	1	STREET 1-B	2/25/2015	Before	16.5				1	0.00	0.00	0.00	0.03	0.00	0.01	0.36	0.34	0.12	0.09	0.03	0.08	0.09	1.14
SJ-01	2	INLET 2-B	2/25/2015	Before	7.1				2	0.00	0.00	0.00	0.04	0.00	0.06	0.34	0.03	0.00	0.05	0.02	0.01	0.01	0.56
SJ-01	2	SIDE 2-A	2/25/2015	After	1.8					0.00	0.00	0.00	0.00	0.00	0.08	0.29	0.21	0.50	0.04	0.07	0.16	0.19	1.54
SJ-01	2	STREET 2-A	2/25/2015	After	1.0					0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.02	0.01	0.01	0.00	0.07
SJ-01	1	INLET 1-B	3/25/2015	Before	0.4					0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.03	0.01	0.00	0.00	0.00	0.12
SJ-01	1	SIDE 1-B	3/25/2015	Before	0.4					0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.16	2.86	0.02	0.09	0.02	0.00	3.33
SJ-01	1	STREET 1-B	3/25/2015	Before	4.4					0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.28	0.05	0.05	0.01	0.01	1.18
SJ-01	2	INLET 2-B	3/25/2015	Before	0.8					0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.02	0.02	0.04	0.00	0.01	0.00	0.14
SJ-01	2	SIDE 2-A	3/25/2015	After	0.2					0.00	0.00	0.00	0.00	0.40	0.01	0.13	0.17	0.09	0.07	0.01	0.01	0.01	0.91
SJ-01	2	STREET 2-A	3/25/2015	After	0.2					0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.07	0.00	0.02	0.01	0.03	0.01	0.19
SJ-01	1	INLET 1-B	4/22/2015	Before	0.4					0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.06	0.01	0.00	0.00	0.01	0.13
SJ-01	1	SIDE 1-B	4/22/2015	Before	0.1					0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.07	0.18	0.03	0.00	0.01	0.01	0.63
SJ-01	1	STREET 1-B	4/22/2015	Before	1.6					0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.11	0.08	0.07	0.00	0.03	0.01	0.47
SJ-01	2	INLET 2-B	4/22/2015	Before	0.7					0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.05	0.00	0.02	0.00	0.01	0.00	0.22

Tracking California's Trash Characterization Data: Counts and Volumes

Study Area	Segment	Location ID	Sample Date	Street Sweeping Timing	Debris (gal)	Plastic Bottles (#)	Glass Bottles (#)	Plastic Bags (#)	EPS (#)	Plastic CRV (gal)	Glass CRV (gal)	Plastic Bag (gal)	EPS (gal)	Plastic Food-ware (gal)	Mylar (gal)	Plastic Other (gal)	Paper Food-ware (gal)	Bulk Paper (gal)	Cigs (gal)	Glass Other (gal)	Metal (gal)	Misc (gal)	Total (gal)
SJ-01	2	SIDE 2-A	4/22/2015	After	0.4				1	0.00	0.00	0.00	0.00	0.00	0.02	0.26	0.13	0.17	0.07	0.01	0.04	0.21	0.91
SJ-01	2	STREET 2-A	4/22/2015	After	0.1					0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.13	0.05	0.00	0.03	0.03	0.44
SJ-01	1	INLET 1-B	5/27/2015	Before	0.3					0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.08	0.00	0.00	0.00	0.03	0.22
SJ-01	1	SIDE 1-B	5/27/2015	Before	2.1					0.00	0.00	0.00	0.00	0.00	0.01	0.36	0.34	0.83	0.04	0.00	0.03	0.06	1.67
SJ-01	1	STREET 1-B	5/27/2015	Before	2.9					0.00	0.00	0.00	0.00	0.00	0.02	0.38	0.46	0.21	0.12	0.12	0.02	0.13	1.46
SJ-01	2	INLET 2-B	5/27/2015	Before	1.3					0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.07
SJ-01	2	SIDE 2-A	5/27/2015	After	0.1					0.00	0.00	0.00	0.00	0.00	0.03	0.15	0.48	0.36	0.04	0.13	0.03	0.03	1.23
SJ-01	2	STREET 2-A	5/27/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.00	0.00	0.02	0.00	0.00	0.02	0.13
SJ-01	1	INLET 1-B	7/22/2015	Before	2.0					0.00	0.00	0.00	0.00	0.00	0.01	0.24	0.00	0.00	0.02	0.00	0.00	0.02	0.28
SJ-01	1	SIDE 1-B	7/22/2015	Before	3.0					0.00	0.00	0.00	0.00	0.00	0.01	0.26	0.03	0.16	0.04	0.01	0.01	0.07	0.59
SJ-01	1	STREET 1-B	7/22/2015	Before	7.9					0.00	0.00	0.00	0.00	0.07	0.00	0.31	0.05	0.36	0.11	0.05	0.07	0.17	1.19
SJ-01	2	INLET 2-B	7/22/2015	Before	1.4					0.00	0.00	0.00	0.00	0.00	0.10	0.22	0.00	0.03	0.03	0.00	0.00	0.00	0.37
SJ-01	2	SIDE 2-A	7/22/2015	After	0.8		1			0.00	0.19	0.00	0.00	0.00	0.03	0.22	0.07	0.78	0.01	0.06	0.03	0.05	1.43
SJ-01	2	STREET 2-A	7/22/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.01	0.00	0.02	0.01	0.06
SJ-01	1	INLET 1-B	9/23/2015	Before	2.2					0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.04	0.11	0.01	0.00	0.00	0.00	0.42
SJ-01	1	SIDE 1-B	9/23/2015	Before	5.4				1	0.00	0.00	0.00	0.03	0.00	0.00	0.51	0.43	1.33	0.07	0.00	0.01	0.10	2.48
SJ-01	1	STREET 1-B	9/23/2015	Before	15.9					0.00	0.00	0.00	0.00	0.12	0.00	0.39	0.46	0.61	0.12	0.00	0.02	0.26	1.98
SJ-01	2	INLET 2-B	9/23/2015	Before	1.8					0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.07	0.00	0.01	0.03	0.56
SJ-01	2	SIDE 2-A	9/23/2015	After	0.7					0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.34	0.05	0.00	0.08	0.14	1.71
SJ-01	2	STREET 2-A	9/23/2015	After	0.3					0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.21	0.03	0.00	0.04	0.00	0.36
SJ-01	1	INLET 1-B	12/9/2015	Before	0.6					0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.07	0.00	0.00	0.00	0.00	0.05	0.13
SJ-01	1	SIDE 1-B	12/9/2015	Before	1.7				1	0.00	0.00	0.00	0.01	0.16	0.04	0.38	0.08	0.12	0.03	0.01	0.02	0.07	0.92
SJ-01	1	STREET 1-B	12/9/2015	Before	8.8					0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.11	0.05	0.00	0.02	0.02	0.46
SJ-01	2	INLET 2-B	12/9/2015	Before	1.1					0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.03	0.00	0.00	0.01	0.15
SJ-01	2	SIDE 2-A	12/9/2015	After		1				0.13	0.00	0.00	0.00	0.00	0.13	0.18	0.16	0.67	0.03	0.04	0.04	0.07	1.45
SJ-01	2	STREET 2-A	12/9/2015	After	0.0					0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.00	0.00	0.00	0.01	0.01	0.06
SJ-01	1	INLET 1-B	1/27/2016	Before	0.7					0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.04
SJ-01	1	SIDE 1-B	1/27/2016	Before	2.6					0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.01	0.00	0.01	0.00	0.00	0.01	0.12
SJ-01	1	STREET 1-B	1/27/2016	Before	2.9					0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.01	0.00	0.01	0.16	0.34
SJ-01	2	INLET 2-B	1/27/2016	Before	2.9					0.00	0.00	0.00	0.00	0.07	0.00	0.21	0.00	0.00	0.01	0.00	0.01	0.05	0.35
SJ-01	2	SIDE 2-A	1/27/2016	After	0.2					0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.06	0.03	0.00	0.05	0.08	0.38
SJ-01	2	STREET 2-A	1/27/2016	After	0.1					0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.20	0.16	0.04	0.01	0.02	0.03	0.72

Tracking California's Trash Characterization Data: Weights

Study Area	Segment	Location ID	Sample Date	Street Sweeping Timing	Debris (lbs)	Plastic CRV (lbs)	Glass CRV (lbs)	Plastic Bag (lbs)	EPS (lbs)	Plastic Food-ware (lbs)	Mylar (lbs)	Plastic Other (lbs)	Paper Food-ware (lbs)	Bulk Paper (lbs)	Cigs (lbs)	Glass Other (lbs)	Metal (lbs)	Misc (lbs)	Total (lbs)
FR-01	1	INLET 1-B	3/14/2015	Before	117.18				0.00	0.00	0.15	0.94	0.10	0.45	0.13	0.00	0.09	0.06	1.91
FR-01	1	SIDE 1-B	3/14/2015	Before	0.14				0.01	0.00	0.00	0.04	0.07	0.27	0.03	1.64	0.01	0.03	2.11
FR-01	1	STREET 1-B	3/14/2015	Before	18.74				0.00	0.00	0.01	0.31	0.13	0.33	0.12	0.00	0.17	0.07	1.13
FR-01	2	INLET 2.1-B	3/14/2015	Before	126.02				0.00	0.00	0.28	1.59	0.15	0.37	0.24	0.00	0.00	0.29	2.91
FR-01	2	INLET 2.2-B	3/14/2015	Before	15.15				0.00	0.00	0.02	0.23	0.00	0.01	0.01	0.00	0.00	0.00	0.27
FR-01	2	SIDE 2-A	3/14/2015	After	0.77	0.02		0.02	0.00	0.00	0.02	0.35	0.07	0.50	0.04	0.18	0.14	0.08	1.42
FR-01	2	STREET 2-A	3/14/2015	After	0.00				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.11
FR-01	1	INLET 1-B	4/11/2015	Before	40.05				0.00	0.00	0.01	0.21	0.11	0.28	0.12	0.00	0.00	0.00	0.73
FR-01	1	SIDE 1-B	4/11/2015	Before	0.05				0.00	0.00	0.00	0.08	0.03	0.08	0.03	0.00	0.01	0.00	0.22
FR-01	1	STREET 1-B	4/11/2015	Before	23.69				0.00	0.00	0.00	0.28	0.12	0.57	0.06	0.00	0.07	0.02	1.11
FR-01	2	INLET 2.1-B	4/11/2015	Before	18.72				0.01	0.00	0.02	0.15	0.10	0.14	0.08	0.00	0.14	0.01	0.64
FR-01	2	INLET 2.2-B	4/11/2015	Before	25.78				0.00	0.00	0.04	0.27	0.24	0.42	0.07	0.00	0.00	0.06	1.08
FR-01	2	SIDE 2-A	4/11/2015	After	0.13				0.00	0.00	0.00	0.08	0.09	0.13	0.02	0.10	0.17	0.00	0.59
FR-01	2	STREET 2-A	4/11/2015	After	0.00				0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
FR-01	1	INLET 1-B	5/9/2015	Before	21.74	0.12		0.12	0.00	0.02	0.01	0.08	0.00	0.09	0.01	0.00	0.00	0.01	0.47
FR-01	1	SIDE 1-B	5/9/2015	Before	0.06				0.02	0.00	0.00	0.09	0.06	0.12	0.04	0.10	0.45	0.06	0.94
FR-01	1	STREET 1-B	5/9/2015	Before	16.15				0.00	0.06	0.00	0.69	0.21	0.07	0.06	0.00	0.00	0.17	1.27
FR-01	2	INLET 2.1-B	5/9/2015	Before	21.80	0.06		0.06	0.00	0.07	0.02	0.15	0.00	0.01	0.01	0.00	0.00	0.00	0.38
FR-01	2	INLET 2.2-B	5/9/2015	Before	27.08				0.00	0.00	0.02	0.15	0.20	0.03	0.02	0.00	0.00	0.03	0.45
FR-01	2	SIDE 2-A	5/9/2015	After	0.13				0.01	0.00	0.01	0.14	0.13	0.01	0.01	0.08	2.13	0.02	2.54
FR-01	2	STREET 2-A	5/9/2015	After	0.00				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.42	0.01	2.43
FR-01	1	INLET 1-B	7/11/2015	Before	4.06				0.00	0.00	0.01	0.12	0.10	0.10	0.02	0.00	0.00	0.47	0.81
FR-01	1	SIDE 1-B	7/11/2015	Before	0.07				0.00	0.00	0.01	0.03	0.19	0.05	0.04	0.00	0.00	0.05	0.37
FR-01	1	STREET 1-B	7/11/2015	Before	21.72	0.03		0.03	0.00	0.00	0.00	0.37	0.20	0.63	0.26	0.00	0.08	0.65	2.23
FR-01	2	INLET 2.1-B	7/11/2015	Before	16.99				0.00	0.00	0.04	0.37	0.37	0.52	0.00	0.00	0.01	0.07	1.38
FR-01	2	INLET 2.2-B	7/11/2015	Before	7.46	0.02		0.02	0.00	0.04	0.00	0.12	0.03	0.19	0.02	0.00	0.00	0.00	0.42
FR-01	2	SIDE 2-A	7/11/2015	After	0.21				0.01	0.00	0.00	0.34	0.27	1.14	0.03	1.04	0.23	1.65	4.71
FR-01	1	INLET 1-B	9/12/2015	Before	13.48				0.00	0.00	0.01	0.02	0.02	0.13	0.03	0.00	0.00	0.00	0.20
FR-01	1	SIDE 1-B	9/12/2015	Before	0.11				0.02	0.00	0.01	0.08	0.09	0.09	0.05	0.00	0.76	0.03	1.13
FR-01	1	STREET 1-B	9/12/2015	Before	17.38				0.00	0.00	0.09	0.15	0.13	0.46	0.15	0.00	0.03	0.17	1.16
FR-01	2	INLET 2.1-B	9/12/2015	Before	9.35				0.00	0.08	0.01	0.07	0.20	0.15	0.01	0.00	0.00	0.06	0.58
FR-01	2	INLET 2.2-B	9/12/2015	Before	12.76				0.01	0.05	0.05	0.23	0.09	0.30	0.02	0.00	0.00	0.03	0.77
FR-01	2	INLET 2.1-A	9/12/2015	After	0.00				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.13
FR-01	2	SIDE 2-A	9/12/2015	After	0.09	0.16		0.16	0.01	0.00	0.01	0.31	0.09	0.11	0.67	0.37	0.00	0.66	2.53
FR-01	2	STREET 2-A	9/12/2015	After	0.22				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FR-01	1	INLET 1-B	10/10/2015	Before	3.38				0.00	0.00	0.01	0.03	0.05	0.01	0.00	0.00	0.00	0.00	0.09
FR-01	1	SIDE 1-B	10/10/2015	Before	0.14				0.00	0.00	0.01	0.07	0.00	0.10	0.03	0.00	0.01	0.10	0.32
FR-01	1	STREET 1-B	10/10/2015	Before	7.45				0.01	0.00	0.01	0.31	0.05	1.56	0.13	0.00	0.00	0.30	2.37
FR-01	2	INLET 2.1-B	10/10/2015	Before	6.46				0.00	0.00	0.01	0.03	0.00	0.01	0.00	0.00	0.00	0.05	0.09
FR-01	2	INLET 2.2-B	10/10/2015	Before	12.38				0.00	0.00	0.01	0.10	0.10	0.18	0.01	0.00	0.00	0.01	0.41
FR-01	2	SIDE 2-A	10/10/2015	After	0.07				0.00	0.00	0.00	0.05	0.02	0.07	0.01	0.00	0.00	0.08	0.22
FR-01	2	STREET 2-A	10/10/2015	After	0.00				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FR-01	1	INLET 1-B	11/14/2015	Before	1.75				0.00	0.00	0.01	0.00	0.08	0.06	0.00	0.00	0.00	0.00	0.15
FR-01	1	SIDE 1-B	11/14/2015	Before	0.29				0.00	0.00	0.00	0.03	0.01	0.01	0.04	0.00	0.01	0.21	0.31
FR-01	1	STREET 1-B	11/14/2015	Before	16.42	0.02		0.02	0.00	0.00	0.00	0.05	0.00	0.33	0.06	0.01	0.07	1.87	2.43
FR-01	2	INLET 2.1-B	11/14/2015	Before	1.12				0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.02	0.05
FR-01	2	INLET 2.2-B	11/14/2015	Before	1.13				0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.03
FR-01	2	SIDE 2-A	11/14/2015	After	0.11	0.03		0.03	0.00	0.03	0.00	0.09	0.09	0.14	0.05	0.00	0.01	0.04	0.51
FR-01	2	STREET 2-A	11/14/2015	After	0.00				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02
FR-01	1	INLET 1-B	2/6/2016	Before	58.25				0.00	0.05	0.06	0.37	0.09	0.01	0.03	0.00	0.00	0.00	0.61
FR-01	1	SIDE 1-B	2/6/2016	Before	0.08	0.09		0.09	0.00	0.00	0.01	0.09	0.06	0.08	0.03	0.00	0.00	0.03	0.47
FR-01	1	STREET 1-B	2/6/2016	Before	18.83				0.00	0.06	0.01	0.42	0.30	0.01	0.05	0.00	0.03	0.06	0.94
FR-01	2	INLET 2.1-B	2/6/2016	Before	52.79				0.00	0.00	0.00	0.09	0.00	0.22	0.01	0.00	0.00	0.01	0.34
FR-01	2	INLET 2.2-B	2/6/2016	Before	104.31				0.00	0.00	0.01	0.23	0.00	0.14	0.04	0.00	0.02	0.06	0.50
FR-01	2	SIDE 2-A	2/6/2016	After	0.11		0.91		0.00	0.04	0.01	0.05	0.11	0.16	0.02	0.00	0.02	0.11	1.43
OK-01	1	INLET 1.1-B	3/23/2015	Before	31.02				0.03	0.00	0.08	1.07	0.00	0.00	0.22	0.09	0.15	0.19	1.83
OK-01	1	INLET 1.2-B	3/23/2015	Before	2.47				0.03	0.00	0.05	0.40	0.27	0.12	0.03	1.50	0.05	0.00	2.45
OK-01	1	SIDE 1-B	3/23/2015	Before	1.18		1.54		0.02	0.00	0.11	0.44	0.63	3.90	0.29	0.43	0.36	0.45	8.18
OK-01	1	STREET 1-B	3/23/2015	Before	0.52				0.01	0.04	0.08	0.27	0.59	2.41	0.10	0.01	0.04	0.00	3.55
OK-01	2	INLET 2-B	3/23/2015	Before	1.80				0.01	0.00	0.10	1.15	0.56	2.04	0.02	0.01	0.00	0.00	3.89
OK-01	2	SIDE 2-A	3/23/2015	After	3.17				0.00	0.00	0.00	0.16	0.14	0.85	0.00	0.38	0.02	0.03	1.59

Tracking California's Trash Characterization Data: Weights

Study Area	Segment	Location ID	Sample Date	Street Sweeping Timing	Debris (lbs)	Plastic CRV (lbs)	Glass CRV (lbs)	Plastic Bag (lbs)	EPS (lbs)	Plastic Food-ware (lbs)	Mylar (lbs)	Plastic Other (lbs)	Paper Food-ware (lbs)	Bulk Paper (lbs)	Cigs (lbs)	Glass Other (lbs)	Metal (lbs)	Misc (lbs)	Total (lbs)
OK-01	2	STREET 2-A	3/23/2015	After	0.20				0.00	0.00	0.01	0.11	0.00	0.23	0.03	0.00	0.00	0.00	0.38
OK-01	1	INLET 1.1-B	4/13/2015	Before	8.46				0.00	0.00	0.05	0.47	0.39	0.00	0.38	0.00	0.11	0.02	1.43
OK-01	1	INLET 1.2-B	4/13/2015	Before	4.86				0.00	0.00	0.11	0.48	0.13	0.26	0.08	0.02	0.03	0.00	1.10
OK-01	1	SIDE 1-B	4/13/2015	Before	1.59	0.02		0.02	0.00	0.00	0.06	0.97	0.59	0.27	0.17	6.20	0.19	6.25	14.75
OK-01	1	STREET 1-B	4/13/2015	Before	0.69				0.00	0.00	0.04	0.39	0.21	0.35	0.07	0.03	0.18	0.12	1.40
OK-01	2	INLET 2-B	4/13/2015	Before	2.74				0.00	0.00	0.00	0.36	0.26	0.59	0.01	0.00	0.00	0.00	1.21
OK-01	2	SIDE 2-A	4/13/2015	After	0.04		0.50		0.00	0.00	0.00	0.07	0.07	0.06	0.02	0.03	0.09	0.00	0.84
OK-01	2	STREET 2-A	4/13/2015	After	0.00				0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.02
OK-01	1	INLET 1.1-B	5/4/2015	Before	6.79				0.00	0.00	0.09	0.56	0.00	0.15	0.20	0.03	0.00	0.03	1.06
OK-01	1	INLET 1.2-B	5/4/2015	Before	1.98				0.00	0.01	0.01	0.09	0.05	0.07	0.01	0.00	0.01	0.00	0.26
OK-01	1	SIDE 1-B	5/4/2015	Before	0.25		1.64		0.01	0.35	0.06	0.68	0.56	3.12	0.14	4.84	0.13	2.05	13.60
OK-01	1	STREET 1-B	5/4/2015	Before	2.32	0.04		0.04	0.39	0.04	0.06	0.27	0.34	0.72	0.11	0.28	0.18	0.05	2.53
OK-01	2	INLET 2-B	5/4/2015	Before	2.98				0.00	0.00	0.08	0.37	0.08	0.41	0.02	0.00	0.00	0.00	0.97
OK-01	2	SIDE 2-A	5/4/2015	After	0.00				0.00	0.00	0.04	0.16	0.15	0.73	0.03	0.04	0.24	0.05	1.45
OK-01	2	STREET 2-A	5/4/2015	After	0.00	0.09		0.09	0.00	0.04	0.01	0.03	0.25	0.42	0.01	0.00	0.00	1.84	2.80
OK-01	1	INLET 1.1-B	6/15/2015	Before	10.20				0.02	0.05	0.11	1.03	1.22	0.06	0.22	0.43	0.01	0.16	3.30
OK-01	1	INLET 1.2-B	6/15/2015	Before	7.25	0.04	0.35	0.04	0.07	0.10	0.21	0.86	0.73	0.53	0.12	0.09	0.04	0.08	3.26
OK-01	1	SIDE 1-B	6/15/2015	Before	0.15	0.23	0.69	0.23	0.01	0.00	0.07	0.17	0.14	1.79	0.10	2.36	0.43	0.16	6.37
OK-01	1	STREET 1-B	6/15/2015	Before	4.69		0.40		0.05	0.05	0.10	0.46	0.70	2.24	0.12	0.32	0.12	0.72	5.27
OK-01	2	INLET 2-B	6/15/2015	Before	12.77	0.04		0.04	0.09	0.03	0.29	1.71	0.11	2.02	0.01	0.01	0.01	0.12	4.47
OK-01	2	SIDE 2-A	6/15/2015	After	0.10				0.02	0.00	0.04	0.08	0.13	0.79	0.09	0.94	0.04	0.01	2.13
OK-01	2	STREET 2-A	6/15/2015	After	0.03				0.01	0.06	0.00	0.03	0.14	0.04	0.01	1.85	0.01	0.00	2.15
OK-01	1	INLET 1.1-B	7/20/2015	Before	10.40	0.02		0.02	0.00	0.00	0.33	1.05	0.43	0.32	0.08	0.00	0.00	0.00	2.26
OK-01	1	INLET 1.2-B	7/20/2015	Before	12.62	0.08	0.86	0.08	0.15	0.00	0.09	0.89	0.44	0.33	0.04	0.10	0.02	0.12	3.21
OK-01	1	SIDE 1-B	7/20/2015	Before	6.32				0.00	0.24	0.03	0.22	0.97	0.44	0.13	1.91	0.19	0.18	4.33
OK-01	1	STREET 1-B	7/20/2015	Before	1.89				0.09	0.28	0.06	0.40	0.51	0.36	0.10	0.09	0.06	0.09	2.06
OK-01	2	INLET 2-B	7/20/2015	Before	18.96	0.06		0.06	0.03	0.03	0.38	2.92	1.34	0.60	0.02	0.14	0.00	0.14	5.72
OK-01	2	SIDE 2-A	7/20/2015	After	0.39				0.00	0.00	0.02	0.07	0.09	0.48	0.05	0.13	0.06	0.06	0.96
OK-01	2	STREET 2-A	7/20/2015	After	0.00				0.00	0.00	0.01	0.05	0.00	0.01	0.00	0.01	0.00	0.00	0.08
OK-01	1	INLET 1.1-B	7/27/2015	Before	1.42				0.00	0.00	0.00	0.08	0.03	0.06	0.02	0.00	0.02	0.00	0.21
OK-01	1	INLET 1.2-B	7/27/2015	Before	2.54				0.00	0.00	0.01	0.05	0.06	0.04	0.01	0.01	0.00	0.00	0.18
OK-01	1	SIDE 1-B	7/27/2015	Before	0.22				0.15	0.00	0.12	0.55	0.22	0.62	0.05	0.23	0.02	0.12	2.08
OK-01	1	STREET 1-B	7/27/2015	Before	7.85				0.08	0.00	0.01	0.22	0.15	0.93	0.08	1.99	0.03	0.06	3.55
OK-01	2	INLET 2-B	7/27/2015	Before	5.12				0.00	0.00	0.02	0.14	0.22	0.16	0.00	0.00	0.00	0.00	0.54
OK-01	2	SIDE 2-A	7/27/2015	After	-0.12				0.00	0.00	0.03	0.13	0.03	0.18	0.02	0.02	0.03	0.00	0.45
OK-01	2	STREET 2-A	7/27/2015	After	0.08				0.00	0.00	0.02	0.10	0.03	0.05	0.01	0.03	0.00	0.00	0.23
OK-01	1	INLET 1.1-B	8/10/2015	Before	0.99				0.00	0.06	0.01	0.22	0.00	0.09	0.02	0.00	0.03	0.00	0.43
OK-01	1	INLET 1.2-B	8/10/2015	Before	1.94				0.00	0.00	0.01	0.14	0.02	0.02	0.01	0.09	0.00	0.01	0.29
OK-01	1	SIDE 1-B	8/10/2015	Before	0.11				0.01	0.31	0.05	0.27	0.14	0.86	0.05	1.10	0.02	0.16	2.95
OK-01	1	STREET 1-B	8/10/2015	Before	2.11				0.04	0.07	0.07	0.50	0.20	0.68	0.12	0.56	0.03	0.08	2.33
OK-01	2	INLET 2-B	8/10/2015	Before	5.32				0.01	0.00	0.14	0.56	0.01	0.13	0.02	0.00	0.01	0.00	0.87
OK-01	2	SIDE 2-A	8/10/2015	After	0.00				0.00	0.06	0.01	0.14	0.17	0.42	0.05	0.66	0.00	0.05	1.55
OK-01	2	STREET 2-A	8/10/2015	After	0.10				0.01	0.07	0.00	0.33	0.11	0.74	0.00	0.00	0.00	0.01	1.26
OK-01	1	INLET 1.1-B	8/31/2015	Before	3.21				0.01	0.00	0.02	0.73	0.00	0.00	0.01	0.00	0.00	0.00	0.77
OK-01	1	INLET 1.2-B	8/31/2015	Before	2.28				0.01	0.00	0.00	0.16	0.15	0.07	0.04	0.00	0.12	0.03	0.58
OK-01	1	SIDE 1-B	8/31/2015	Before	0.67		0.36		0.05	0.00	0.01	0.07	0.24	0.36	0.21	0.22	0.13	0.04	1.69
OK-01	1	STREET 1-B	8/31/2015	Before	2.66				0.12	0.23	0.00	0.33	0.51	0.53	0.16	1.12	0.09	0.06	3.14
OK-01	2	INLET 2-B	8/31/2015	Before	4.22				0.00	0.00	0.03	1.05	0.09	1.37	0.00	0.00	0.00	0.01	2.54
OK-01	2	SIDE 2-A	8/31/2015	After	0.00	0.07		0.07	0.02	0.00	0.00	0.10	0.17	0.13	0.07	0.16	0.00	0.03	0.81
OK-01	2	STREET 2-A	8/31/2015	After	0.00				0.00	0.05	0.00	0.05	0.20	0.11	0.01	0.00	0.00	0.00	0.41
OK-01	1	INLET 1.1-B	10/19/2015	Before	5.09	0.07		0.07	0.10	0.00	0.05	1.67	0.00	7.88	0.06	0.00	0.15	0.09	10.13
OK-01	1	INLET 1.2-B	10/19/2015	Before	4.53				0.01	0.11	0.07	1.21	0.14	0.47	0.05	0.05	0.09	0.39	2.58
OK-01	1	SIDE 1-B	10/19/2015	Before	0.28				0.03	0.06	0.11	0.55	0.91	1.24	0.11	0.31	0.31	0.16	3.79
OK-01	1	STREET 1-B	10/19/2015	Before	4.49				0.03	0.16	0.04	0.77	0.54	1.24	0.09	0.60	0.00	0.04	3.51
OK-01	2	INLET 2-B	10/19/2015	Before	9.26				0.03	0.00	0.08	1.68	0.21	1.21	0.01	0.00	0.00	0.12	3.33
OK-01	2	SIDE 2-A	10/19/2015	After	1.06				0.00	0.01	0.00	0.10	0.14	0.16	0.08	0.46	0.08	0.19	1.22
OK-01	2	STREET 2-A	10/19/2015	After	0.00				0.00	0.00	0.00	0.10	0.25	0.09	0.00	0.00	0.04	0.05	0.52
OK-01	1	INLET 1.1-B	11/16/2015	Before	10.18				0.01	0.00	0.01	0.46	0.42	0.00	0.26	0.00	0.01	0.93	2.10
OK-01	1	INLET 1.2-B	11/16/2015	Before	3.60				0.00	0.00	0.02	0.07	0.06	0.07	0.07	0.26	0.03	0.08	0.66
OK-01	1	SIDE 1-B	11/16/2015	Before	0.18	0.06	0.83	0.06	0.00	0.00	0.04	0.23	0.35	0.38	0.08	0.91	0.21	0.22	3.36
OK-01	1	STREET 1-B	11/16/2015	Before	11.21	0.02		0.02	0.12	0.01	0.04	0.65	0.15	1.48	0.17	1.53	0.33	2.89	7.40

Tracking California's Trash Characterization Data: Weights

Study Area	Segment	Location ID	Sample Date	Street Sweeping Timing	Debris (lbs)	Plastic CRV (lbs)	Glass CRV (lbs)	Plastic Bag (lbs)	EPS (lbs)	Plastic Food-ware (lbs)	Mylar (lbs)	Plastic Other (lbs)	Paper Food-ware (lbs)	Bulk Paper (lbs)	Cigs (lbs)	Glass Other (lbs)	Metal (lbs)	Misc (lbs)	Total (lbs)
OK-01	2	INLET 2-B	11/16/2015	Before	2.94				0.00	0.00	0.01	0.38	0.19	0.00	0.01	0.00	0.00	0.20	0.78
OK-01	2	SIDE 2-A	11/16/2015	After	0.00				0.00	0.00	0.00	0.12	0.53	0.26	0.04	0.13	0.04	0.08	1.19
OK-01	2	STREET 2-A	11/16/2015	After	0.89				0.00	0.00	0.00	0.02	0.12	0.36	0.06	0.00	0.01	0.00	0.57
OK-01	1	INLET 1.1-B	11/30/2015	Before	3.22				0.02	0.00	0.00	0.05	0.03	0.00	0.05	0.00	0.00	0.03	0.18
OK-01	1	INLET 1.2-B	11/30/2015	Before	2.90				0.00	0.00	0.00	0.07	0.02	0.11	0.02	0.07	0.13	0.00	0.42
OK-01	1	SIDE 1-B	11/30/2015	Before	0.06	0.21		0.21	0.01	0.05	0.05	0.83	0.72	0.30	0.03	3.50	0.00	0.09	5.99
OK-01	1	STREET 1-B	11/30/2015	Before	22.70	0.06		0.06	0.13	0.18	0.13	0.59	2.58	1.86	0.12	1.81	0.22	1.38	9.11
OK-01	2	INLET 2-B	11/30/2015	Before	1.33				0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.20
OK-01	2	SIDE 2-A	11/30/2015	After	0.00				0.00	0.00	0.00	0.04	0.06	0.12	0.01	0.24	0.15	0.00	0.62
OK-01	2	STREET 2-A	11/30/2015	After	0.00				0.00	0.00	0.00	0.01	0.00	0.03	0.00	0.00	0.00	0.00	0.04
OK-01	1	INLET 1.1-B	1/25/2016	Before	6.66				0.01	0.02	0.02	0.16	0.26	0.00	0.12	0.00	0.11	0.13	0.82
OK-01	1	INLET 1.2-B	1/25/2016	Before	5.10				0.00	0.01	0.00	0.17	0.04	0.34	0.01	0.02	0.08	0.44	1.12
OK-01	1	SIDE 1-B	1/25/2016	Before	0.18		1.32		0.19	0.13	0.08	0.49	0.88	0.82	0.05	2.20	0.09	0.27	6.53
OK-01	1	STREET 1-B	1/25/2016	Before	0.12	0.03		0.03	0.01	0.02	0.01	0.80	0.37	1.18	0.10	0.08	0.07	0.11	2.82
OK-01	2	INLET 2-B	1/25/2016	Before	1.82				0.04	0.00	0.02	0.19	0.07	0.00	0.01	0.15	0.29	0.08	0.86
OK-01	2	SIDE 2-A	1/25/2016	After	-0.11				0.02	0.00	0.00	0.07	0.07	0.83	0.05	0.39	0.01	0.04	1.49
OK-01	2	STREET 2-A	1/25/2016	After	0.06				0.00	0.00	0.00	0.03	0.02	0.11	0.01	0.00	0.01	0.01	0.19
OK-01	1	INLET 1.1-B	2/22/2016	Before	0.94				0.00	0.00	0.00	0.12	0.00	0.00	0.04	0.00	0.00	0.01	0.17
OK-01	1	INLET 1.2-B	2/22/2016	Before	3.58				0.00	0.00	0.00	0.11	0.00	0.01	0.10	0.21	0.03	0.07	0.53
OK-01	1	SIDE 1-B	2/22/2016	Before	0.11		0.93		0.20	0.04	0.01	0.31	0.25	0.44	0.12	1.93	0.13	0.27	4.64
OK-01	1	STREET 1-B	2/22/2016	Before	1.32	0.02		0.02	0.00	0.03	0.01	0.22	0.17	0.19	0.12	1.54	0.14	0.22	2.68
OK-01	2	INLET 2-B	2/22/2016	Before	1.41				0.00	0.00	0.03	0.20	0.13	0.15	0.03	0.00	0.00	0.04	0.58
OK-01	2	SIDE 2-A	2/22/2016	After	0.03	0.08		0.08	0.00	0.00	0.00	0.11	0.32	0.25	0.04	1.99	0.08	0.02	2.97
OK-01	2	STREET 2-A	2/22/2016	After	0.04				0.01	0.00	0.03	0.14	0.24	0.31	0.01	0.02	0.03	0.01	0.80
OK-01	1	INLET 1.1-B	3/21/2016	Before	21.16	0.05		0.05	0.05	0.24	0.08	0.49	0.31	0.30	0.08	0.06	0.02	0.09	1.84
OK-01	1	INLET 1.2-B	3/21/2016	Before	3.62				0.02	0.00	0.00	0.21	0.00	0.00	0.01	0.03	0.00	0.14	0.41
OK-01	1	SIDE 1-B	3/21/2016	Before	0.73		1.28		0.05	0.22	0.05	0.80	1.01	3.90	0.20	5.10	0.39	0.29	13.30
OK-01	1	STREET 1-B	3/21/2016	Before	8.80	0.23		0.23	0.30	0.37	0.08	1.62	2.07	4.38	0.12	5.18	0.30	0.44	15.33
OK-01	2	INLET 2-B	3/21/2016	Before	10.66				0.00	0.00	0.01	0.18	0.00	0.05	0.04	0.02	0.02	0.32	0.64
OK-01	2	SIDE 2-A	3/21/2016	After	0.16		1.46		0.01	0.01	0.00	0.21	0.46	1.92	0.19	0.83	0.20	0.22	5.52
OK-01	2	STREET 2-A	3/21/2016	After	0.19				0.02	0.00	0.01	0.20	0.18	0.33	0.04	0.00	0.02	0.13	0.93
OK-01	1	INLET 1.1-B	4/4/2016	Before	2.32				0.00	0.00	0.01	0.03	0.01	0.04	0.04	0.19	0.00	0.00	0.32
OK-01	1	INLET 1.2-B	4/4/2016	Before	2.61				0.00	0.00	0.04	1.30	0.20	0.74	0.01	0.04	0.04	0.05	2.43
OK-01	1	SIDE 1-B	4/4/2016	Before	0.20				0.04	0.00	0.01	0.26	0.41	0.77	0.15	4.55	0.05	0.39	6.65
OK-01	1	STREET 1-B	4/4/2016	Before	1.57				0.25	0.06	0.01	0.45	0.79	0.79	0.08	2.69	0.14	0.45	5.72
OK-01	2	INLET 2-B	4/4/2016	Before	1.58				0.00	0.00	0.00	0.02	0.01	0.04	0.02	0.06	0.00	0.02	0.17
OK-01	2	SIDE 2-A	4/4/2016	After	0.07				0.00	0.03	0.01	0.10	0.20	0.52	0.06	0.34	0.09	0.11	1.47
OK-01	2	STREET 2-A	4/4/2016	After	0.04				0.00	0.00	0.01	0.19	0.11	0.42	0.04	0.00	0.03	0.05	0.85
OK-01	1	INLET 1.1-B	4/18/2016	Before	3.23				0.00	0.00	0.00	0.03	0.05	0.04	0.10	0.02	0.01	0.01	0.25
OK-01	1	INLET 1.2-B	4/18/2016	Before	2.00				0.00	0.00	0.01	0.06	0.20	0.31	0.01	0.00	0.03	0.02	0.64
OK-01	1	SIDE 1-B	4/18/2016	Before	0.22	0.02		0.02	0.00	0.01	0.01	0.46	0.39	0.28	0.07	5.12	0.02	0.00	6.41
OK-01	1	STREET 1-B	4/18/2016	Before	0.00				0.01	0.00	0.01	0.34	0.27	0.55	0.09	0.27	0.04	0.16	1.75
OK-01	2	INLET 2-B	4/18/2016	Before	0.89				0.00	0.00	0.00	0.00	0.00	0.15	0.05	0.01	0.00	0.17	0.38
OK-01	2	SIDE 2-A	4/18/2016	After	0.18		3.13		0.04	0.06	0.01	0.08	0.24	0.37	0.07	0.00	0.06	0.11	4.18
OK-01	2	STREET 2-A	4/18/2016	After	0.14				0.00	0.00	0.00	0.10	0.10	0.41	0.05	0.00	0.03	0.08	0.78
SJ-01	1	INLET 1-B	2/25/2015	Before	55.80				0.00	0.00	0.13	1.02	0.00	0.13	0.08	0.01	0.03	0.22	1.62
SJ-01	1	SIDE 1-B	2/25/2015	Before	8.97				0.00	0.04	0.01	0.13	0.06	0.08	0.07	0.50	2.11	0.08	3.07
SJ-01	1	STREET 1-B	2/25/2015	Before	47.18				0.00	0.00	0.00	0.41	0.19	0.01	0.07	0.29	1.45	0.07	2.49
SJ-01	2	INLET 2-B	2/25/2015	Before	52.39				0.04	0.00	0.11	0.70	0.08	0.00	0.21	0.13	0.11	0.00	1.38
SJ-01	2	SIDE 2-A	2/25/2015	After	1.04				0.00	0.00	0.04	0.26	0.04	0.10	0.05	0.31	0.87	0.12	1.78
SJ-01	2	STREET 2-A	2/25/2015	After	12.94				0.00	0.00	0.00	0.03	0.01	0.00	0.01	0.07	0.20	0.01	0.34
SJ-01	1	INLET 1-B	3/25/2015	Before	0.73				0.00	0.00	0.00	0.01	0.01	0.01	0.02	0.00	0.02	0.00	0.07
SJ-01	1	SIDE 1-B	3/25/2015	Before	0.29				0.00	0.00	0.02	0.09	0.05	1.72	0.00	0.56	0.11	0.00	2.56
SJ-01	1	STREET 1-B	3/25/2015	Before	23.15				0.00	0.00	0.01	0.44	0.04	0.25	0.07	0.53	0.21	0.09	1.64
SJ-01	2	INLET 2-B	3/25/2015	Before	5.47				0.00	0.00	0.01	0.04	0.03	0.08	0.18	0.01	0.02	0.01	0.38
SJ-01	2	SIDE 2-A	3/25/2015	After	0.08				0.00	0.08	0.01	0.11	0.04	0.06	0.04	0.12	0.07	0.01	0.53
SJ-01	2	STREET 2-A	3/25/2015	After	3.03				0.00	0.00	0.00	0.10	0.07	0.00	0.02	0.05	0.36	0.03	0.64
SJ-01	1	INLET 1-B	4/22/2015	Before	0.40				0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.02
SJ-01	1	SIDE 1-B	4/22/2015	Before	0.06				0.00	0.00	0.00	0.10	0.03	0.06	0.02	0.01	0.02	0.00	0.23
SJ-01	1	STREET 1-B	4/22/2015	Before	4.91				0.00	0.00	0.00	0.12	0.04	0.01	0.05	0.02	0.39	0.01	0.62
SJ-01	2	INLET 2-B	4/22/2015	Before	4.79				0.00	0.00	0.00	0.10	0.11	0.00	0.09	0.01	0.04	0.00	0.34

Tracking California's Trash Characterization Data: Weights

Study Area	Segment	Location ID	Sample Date	Street Sweeping Timing	Debris (lbs)	Plastic CRV (lbs)	Glass CRV (lbs)	Plastic Bag (lbs)	EPS (lbs)	Plastic Food-ware (lbs)	Mylar (lbs)	Plastic Other (lbs)	Paper Food-ware (lbs)	Bulk Paper (lbs)	Cigs (lbs)	Glass Other (lbs)	Metal (lbs)	Misc (lbs)	Total (lbs)
SJ-01	2	SIDE 2-A	4/22/2015	After	0.51				0.00	0.00	0.00	0.13	0.03	0.07	0.04	0.03	0.09	0.15	0.52
SJ-01	2	STREET 2-A	4/22/2015	After	0.13				0.00	0.00	0.00	0.17	0.00	0.09	0.03	0.01	0.26	0.04	0.59
SJ-01	1	INLET 1-B	5/27/2015	Before	0.29				0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.07	0.09
SJ-01	1	SIDE 1-B	5/27/2015	Before	1.65				0.00	0.00	0.01	0.09	0.05	0.08	0.02	0.01	0.02	0.03	0.31
SJ-01	1	STREET 1-B	5/27/2015	Before	15.25				0.00	0.00	0.00	0.14	0.18	0.06	0.08	1.28	0.13	0.11	1.97
SJ-01	2	INLET 2-B	5/27/2015	Before	6.05				0.00	0.00	0.03	0.04	0.00	0.00	0.01	0.00	0.00	0.00	0.09
SJ-01	2	SIDE 2-A	5/27/2015	After	0.44				0.00	0.00	0.00	0.11	0.14	0.10	0.02	0.82	0.02	0.01	1.22
SJ-01	2	STREET 2-A	5/27/2015	After	0.07				0.00	0.00	0.01	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.05
SJ-01	1	INLET 1-B	7/22/2015	Before	1.50				0.00	0.00	0.01	0.07	0.00	0.02	0.01	0.00	0.00	0.02	0.13
SJ-01	1	SIDE 1-B	7/22/2015	Before	3.44				0.00	0.00	0.01	0.10	0.00	0.04	0.01	0.08	0.04	0.02	0.31
SJ-01	1	STREET 1-B	7/22/2015	Before	10.67				0.00	0.07	0.00	0.33	0.04	0.10	0.07	0.17	0.33	0.14	1.23
SJ-01	2	INLET 2-B	7/22/2015	Before	6.02				0.00	0.00	0.03	0.05	0.00	0.00	0.03	0.00	0.02	0.01	0.14
SJ-01	2	SIDE 2-A	7/22/2015	After	3.85		0.83		0.00	0.00	0.01	0.11	0.02	0.32	0.01	0.43	0.36	0.04	2.14
SJ-01	2	STREET 2-A	7/22/2015	After	0.00				0.00	0.00	0.00	0.04	0.00	0.00	0.01	0.00	0.27	0.04	0.37
SJ-01	1	INLET 1-B	9/23/2015	Before	1.42				0.00	0.00	0.00	0.04	0.00	0.02	0.01	0.00	0.00	0.00	0.07
SJ-01	1	SIDE 1-B	9/23/2015	Before	2.69				0.01	0.00	0.00	0.09	0.16	0.37	0.04	0.00	0.03	0.07	0.76
SJ-01	1	STREET 1-B	9/23/2015	Before	12.69				0.00	0.03	0.00	0.29	0.19	0.19	0.07	0.00	0.23	0.23	1.22
SJ-01	2	INLET 2-B	9/23/2015	Before	8.09				0.00	0.00	0.00	0.27	0.00	0.00	0.05	0.00	0.04	0.05	0.41
SJ-01	2	SIDE 2-A	9/23/2015	After	1.63				0.00	0.00	0.00	0.29	0.03	0.08	0.03	0.00	0.14	0.20	0.76
SJ-01	2	STREET 2-A	9/23/2015	After	0.18				0.00	0.00	0.00	0.05	0.00	0.26	0.02	0.00	0.12	0.02	0.47
SJ-01	1	INLET 1-B	12/9/2015	Before	0.66				0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.00	0.02	0.05
SJ-01	1	SIDE 1-B	12/9/2015	Before	0.29				0.01	0.03	0.02	0.06	0.01	0.03	0.02	0.07	0.07	0.04	0.36
SJ-01	1	STREET 1-B	12/9/2015	Before	6.61				0.00	0.00	0.00	0.18	0.00	0.02	0.01	0.03	0.08	0.03	0.35
SJ-01	2	INLET 2-B	12/9/2015	Before	8.95				0.00	0.00	0.00	0.14	0.00	0.00	0.09	0.00	0.01	0.02	0.26
SJ-01	2	SIDE 2-A	12/9/2015	After	0.19	0.02		0.02	0.00	0.00	0.01	0.14	0.06	0.18	0.02	0.23	0.23	0.02	0.93
SJ-01	2	STREET 2-A	12/9/2015	After	0.00				0.00	0.00	0.00	0.02	0.03	0.00	0.00	0.00	0.03	0.03	0.11
SJ-01	1	INLET 1-B	1/27/2016	Before	0.47				0.00	0.00	0.01	0.04	0.02	0.00	0.00	0.00	0.00	0.01	0.08
SJ-01	1	SIDE 1-B	1/27/2016	Before	1.69				0.00	0.00	0.01	0.04	0.01	0.00	0.01	0.01	0.00	0.01	0.09
SJ-01	1	STREET 1-B	1/27/2016	Before	6.41				0.00	0.00	0.00	0.09	0.00	0.00	0.01	0.00	0.05	0.04	0.20
SJ-01	2	INLET 2-B	1/27/2016	Before	16.01				0.00	0.02	0.00	0.18	0.00	0.00	0.02	0.00	0.04	0.08	0.34
SJ-01	2	SIDE 2-A	1/27/2016	After	0.23				0.00	0.00	0.00	0.07	0.00	0.04	0.01	0.00	0.05	0.03	0.20
SJ-01	2	STREET 2-A	1/27/2016	After	0.16				0.00	0.00	0.00	0.14	0.07	0.03	0.02	0.08	0.10	0.08	0.52

Appendix C

Results for On-land Visual Trash Assessments (OVTAs)

Site ID	Segment ID	Date	Time	Event Timing	Observer #1	O#1 Street Score	O #1 Sidewalk Score	O#1 Overall Score	Observer #2	O#2 Street Score	O#2 Sidewalk Score	O#2 Overall Score
FR-01	Segment 1	3/14/2015	5:00	Before SS	Nick Zigler	C	C	C	Lori Baumgartner	C	C	C
FR-01	Segment 1	3/14/2015	7:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
FR-01	Segment 1	4/11/2015	5:00	Before SS	Nick Zigler	C	C	C	Andrea Trese	C	B	C
FR-01	Segment 1	4/11/2015	7:00	After SS and Cleanup	Nick Zigler	A	A	A	Andrea Trese	A	A	A
FR-01	Segment 1	5/9/2015	5:00	Before SS	Nick Zigler	C	B	C	Lori Baumgartner	C	B	C
FR-01	Segment 1	5/9/2015	7:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
FR-01	Segment 1	7/11/2015	5:00	Before SS	Nick Zigler	C	B	C	Lori Baumgartner	C	B	C
FR-01	Segment 1	7/11/2015	7:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
FR-01	Segment 1	7/24/2015	9:25	Between SS	Nick Zigler	C	B	C				
FR-01	Segment 1	7/29/2015	19:40	Between SS	Nick Zigler	C	B	C				
FR-01	Segment 1	8/5/2015	21:15	Before SS	Nick Zigler	C	B	C				
FR-01	Segment 1	8/6/2015	8:00	After SS	Nick Zigler	A	B	B				
FR-01	Segment 1	8/10/2015	8:20	Between SS	Nick Zigler	C	C	C				
FR-01	Segment 1	8/14/2015	9:15	Between SS	Nick Zigler	C	C	C				
FR-01	Segment 1	8/29/2015	13:20	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 1	9/12/2015	5:00	Before SS	Nick Zigler	C	B	C	Lori Baumgartner	C	B	C
FR-01	Segment 1	9/12/2015	7:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
FR-01	Segment 1	9/16/2015	9:40	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 1	9/25/2015	9:40	Between SS	Nick Zigler	C	B	C				
FR-01	Segment 1	10/2/2015	8:45	Between SS	Nick Zigler	C	B	C				
FR-01	Segment 1	10/10/2015	5:00	Before SS	Nick Zigler	B	B	B	Lori Baumgartner	B	A	B
FR-01	Segment 1	10/10/2015	7:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
FR-01	Segment 1	10/13/2015	9:30	Between SS	Nick Zigler	A	B	B				
FR-01	Segment 1	10/19/2015	9:55	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 1	10/27/2015	9:30	Before Rain Event	Nick Zigler	C	B	C				
FR-01	Segment 1	11/2/2015	9:05	After Rain Event	Nick Zigler	B	B	B				
FR-01	Segment 1	11/7/2015	13:55	Before Rain Event	Nick Zigler	B	B	B				
FR-01	Segment 1	11/9/2015	15:55	After Rain Event	Nick Zigler	B	B	B				
FR-01	Segment 1	11/14/2015	5:00	Before SS	Nick Zigler	B	B	B	Lori Baumgartner	B	B	B
FR-01	Segment 1	11/14/2015	7:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
FR-01	Segment 1	11/17/2015	9:30	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 1	11/24/2015	9:30	Before Rain Event	Nick Zigler	B	B	B				
FR-01	Segment 1	11/25/2015	9:05	After Rain Event	Nick Zigler	B	B	B				
FR-01	Segment 1	12/2/2015	15:12	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 1	12/8/2015	10:05	Before Rain Event	Nick Zigler	B	B	B				
FR-01	Segment 1	12/11/2015	10:00	After Rain Event	Nick Zigler	B	B	B				
FR-01	Segment 1	12/15/2015	19:35	Before SS	Nick Zigler	B	B	B				
FR-01	Segment 1	12/16/2015	8:53	After SS	Nick Zigler	A	B	B				
FR-01	Segment 1	12/22/2015	8:40	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 1	1/2/2016	14:30	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 1	1/12/2016	8:18	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 1	1/22/2016	9:15	Between SS	Nick Zigler	A	B	B				
FR-01	Segment 1	2/1/2016	9:05	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 1	2/6/2016	5:00	Before SS	Nick Zigler	C	B	C	Lori Baumgartner	C	C	C
FR-01	Segment 1	2/6/2016	7:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
FR-01	Segment 1	2/9/2016	9:20	Between SS	Nick Zigler	A	B	B				
FR-01	Segment 1	2/12/2016	9:35	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 1	2/22/2016	9:20	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 1	2/29/2016	20:50	Before SS	Nick Zigler	C	B	C				
FR-01	Segment 1	3/2/2016	9:35	After SS	Nick Zigler	A	B	B				
FR-01	Segment 2	3/14/2015	5:00	Before SS	Nick Zigler	C	C	C	Lori Baumgartner	C	C	C
FR-01	Segment 2	3/14/2015	7:00	After SS	Nick Zigler	A	C	C	Lori Baumgartner	A	C	C
FR-01	Segment 2	4/11/2015	5:00	Before SS	Nick Zigler	B	B	B	Andrea Trese	B	B	B
FR-01	Segment 2	4/11/2015	7:00	After SS	Nick Zigler	A	B	B	Andrea Trese	B	B	B
FR-01	Segment 2	5/9/2015	5:00	Before SS	Nick Zigler	C	B	C	Lori Baumgartner	B	B	B
FR-01	Segment 2	5/9/2015	7:00	After SS	Nick Zigler	A	B	B	Lori Baumgartner	A	B	B
FR-01	Segment 2	7/11/2015	5:00	Before SS	Nick Zigler	B	B	B	Lori Baumgartner	B	B	B
FR-01	Segment 2	7/11/2015	7:00	After SS	Nick Zigler	A	B	B	Lori Baumgartner	A	B	B
FR-01	Segment 2	7/24/2015	9:25	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 2	7/29/2015	19:40	Between SS	Nick Zigler	B	B	C				
FR-01	Segment 2	8/5/2015	21:15	Before SS	Nick Zigler	B	B	B				
FR-01	Segment 2	8/6/2015	8:00	After SS	Nick Zigler	A	B	B				
FR-01	Segment 2	8/10/2015	8:20	Between SS	Nick Zigler	B	C	C				
FR-01	Segment 2	8/14/2015	9:15	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 2	8/29/2015	13:20	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 2	9/12/2015	5:00	Before SS	Nick Zigler	B	B	B	Lori Baumgartner	B	B	B
FR-01	Segment 2	9/12/2015	7:00	After SS	Nick Zigler	A	B	B	Lori Baumgartner	A	B	B
FR-01	Segment 2	9/16/2015	9:40	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 2	9/25/2015	9:40	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 2	10/2/2015	8:45	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 2	10/10/2015	5:00	Before SS	Nick Zigler	B	A	B	Lori Baumgartner	B	A	B
FR-01	Segment 2	10/10/2015	7:00	After SS	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
FR-01	Segment 2	10/13/2015	9:30	Between SS	Nick Zigler	B	A	B				
FR-01	Segment 2	10/19/2015	9:55	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 2	10/27/2015	9:30	Before Rain Event	Nick Zigler	B	B	B				
FR-01	Segment 2	11/2/2015	9:05	After Rain Event	Nick Zigler	B	B	B				
FR-01	Segment 2	11/7/2015	13:55	Before Rain Event	Nick Zigler	B	B	B				
FR-01	Segment 2	11/9/2015	15:55	After Rain Event	Nick Zigler	B	B	B				
FR-01	Segment 2	11/14/2015	5:00	Before SS	Nick Zigler	B	B	B	Lori Baumgartner	B	B	B
FR-01	Segment 2	11/14/2015	7:00	After SS	Nick Zigler	A	B	B	Lori Baumgartner	A	B	B
FR-01	Segment 2	11/17/2015	9:30	Between SS	Nick Zigler	A	A	B				
FR-01	Segment 2	11/24/2015	9:30	Before Rain Event	Nick Zigler	B	B	B				
FR-01	Segment 2	11/25/2015	9:05	After Rain Event	Nick Zigler	A	B	B				
FR-01	Segment 2	12/2/2015	15:12	Between SS	Nick Zigler	A	B	B				
FR-01	Segment 2	12/8/2015	10:05	Before Rain Event	Nick Zigler	B	B	B				
FR-01	Segment 2	12/11/2015	10:00	After Rain Event	Nick Zigler	A	B	B				
FR-01	Segment 2	12/15/2015	19:35	Before SS	Nick Zigler	B	B	B				
FR-01	Segment 2	12/16/2015	8:53	After SS	Nick Zigler	A	B	B				
FR-01	Segment 2	12/22/2015	8:40	Between SS	Nick Zigler	A	B	B				
FR-01	Segment 2	1/2/2016	14:30	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 2	1/12/2016	8:18	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 2	1/22/2016	9:15	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 2	2/1/2016	9:05	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 2	2/6/2016	5:00	Before SS	Nick Zigler	B	B	B	Lori Baumgartner	B	B	B
FR-01	Segment 2	2/6/2016	7:00	After SS	Nick Zigler	A	B	B	Lori Baumgartner	A	B	B
FR-01	Segment 2	2/9/2016	9:20	Between SS	Nick Zigler	A	A	A				
FR-01	Segment 2	2/12/2016	9:35	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 2	2/22/2016	9:20	Between SS	Nick Zigler	B	B	B				
FR-01	Segment 2	2/29/2016	20:50	Before SS	Nick Zigler	B	B	B				
FR-01	Segment 2	3/2/2016	9:35	After SS	Nick Zigler	A	B	B				
OK-01	Segment 1A	3/23/2015	0:30	Before SS	Stefan Grozev	C	C	C	Chris Sommers	C	C	C
OK-01	Segment 1B	3/23/2015	0:30	Before SS	Stefan Grozev	C	C	C	Chris Sommers	C	C	C
OK-01	Segment 1A	4/13/2015	0:30	Before SS	Paul Randall	C	C	C	Simon Olivieri	C	C	C
OK-01	Segment 1B	4/13/2015	0:30	Before SS	Paul Randall	C	C	C	Simon Olivieri	C	C	C
OK-01	Segment 1A	5/4/2015	0:30	Before SS	Paul Randall	D	C	C	Simon Olivieri	D	C	C
OK-01	Segment 1B	5/4/2015	0:30	Before SS	Paul Randall	C	C	C	Simon Olivieri	C	C	C
OK-01	Segment 1A	6/15/2015	0:30	Before SS	Paul Randall	C	B	C	Simon Olivieri	C	B	C
OK-01	Segment 1B	6/15/2015	0:30	Before SS	Paul Randall	C	C	C	Simon Olivieri	C	C	C

Site ID	Segment ID	Date	Time	Event Timing	Observer #1	O#1 Street Score	O #1 Sidewalk Score	O#1 Overall Score	Observer #2	O#2 Street Score	O#2 Sidewalk Score	O#2 Overall Score
OK-01	Segment 1A	7/20/2015	0:30	Before SS	Simon Olivieri	C	B	C	Stefan Grozev	C	B	C
OK-01	Segment 1B	7/20/2015	0:30	Before SS	Simon Olivieri	C	B	C	Stefan Grozev	C	B	C
OK-01	Segment 1A	7/27/2015	0:30	Before SS	Simon Olivieri	B	B	B	Stefan Grozev	B	B	B
OK-01	Segment 1B	7/27/2015	0:30	Before SS	Simon Olivieri	C	C	C	Stefan Grozev	C	C	C
OK-01	Segment 1A	8/10/2015	0:30	Before SS	Simon Olivieri	C	B	C	Stefan Grozev	C	B	C
OK-01	Segment 1B	8/10/2015	0:30	Before SS	Simon Olivieri	C	D	C	Stefan Grozev	C	C	C
OK-01	Segment 1A	8/31/2015	0:30	Before SS	Simon Olivieri	D	C	D	Stefan Grozev	D	C	D
OK-01	Segment 1B	8/31/2015	0:30	Before SS	Simon Olivieri	C	B	C	Stefan Grozev	C	C	C
OK-01	Segment 1	10/19/2015	0:30	Before SS	Simon Olivieri	D	C	D	Stefan Grozev	D	D	D
OK-01	Segment 1	11/16/2015	0:30	Before SS	Simon Olivieri	C	C	C	Stefan Grozev	C	C	C
OK-01	Segment 1	11/30/2015	0:30	Before SS	Simon Olivieri	D	D	D	Stefan Grozev	D	D	D
OK-01	Segment 1	1/25/2016	0:30	Before SS	Simon Olivieri	C	D	C	Stefan Grozev	D	C	D
OK-01	Segment 1	1/25/2016	2:00	After SS and Cleanup	Simon Olivieri	A	A	A	Stefan Grozev	A	A	A
OK-01	Segment 1	2/17/2016	16:35	Before Rain Event	Nick Zigler	C	C	D				
OK-01	Segment 1	2/18/2016	9:00	After Rain Event	Nick Zigler	B	C	C				
OK-01	Segment 1	2/22/2016	0:30	Before SS	Paul Randall	C	C	C	Stefan Grozev	C	B	C
OK-01	Segment 1	2/22/2016	2:00	After SS and Cleanup	Paul Randall	A	A	A	Stefan Grozev	A	A	A
OK-01	Segment 1	2/22/2016	10:26	Between SS	Nick Zigler	B	B	B				
OK-01	Segment 1	2/22/2016	16:55	Before SS	Nick Zigler	B	B	B	Andrea Trese	B	B	B
OK-01	Segment 1	2/23/2016	10:00	After SS	Nick Zigler	B	B	B				
OK-01	Segment 1	2/23/2016	16:10	Before SS	Nick Zigler	C	B	C	Andrea Trese	C	C	C
OK-01	Segment 1	2/24/2016	7:30	After SS	Nick Zigler	B	B	B				
OK-01	Segment 1	2/24/2016	16:50	Before SS	Nick Zigler	C	B	C				
OK-01	Segment 1	2/25/2016	8:12	After SS	Nick Zigler	B	B	B				
OK-01	Segment 1	2/25/2016	15:40	Between SS	Nick Zigler	C	B	C				
OK-01	Segment 1	3/4/2016	14:04	Before Rain Event	Stefan Grozev	C	C	C				
OK-01	Segment 1	3/7/2016	8:05	After Rain Event	Stefan Grozev	B	B	B				
OK-01	Segment 1	3/21/2016	0:30	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-01	Segment 1	3/21/2016	2:00	After SS and Cleanup	Nick Zigler	A	A	A	Stefan Grozev	A	A	A
OK-01	Segment 1	3/21/2016	11:15	Between SS	Nick Zigler	B	A	B				
OK-01	Segment 1	3/21/2016	18:45	Before SS	Nick Zigler	B	B	B				
OK-01	Segment 1	3/22/2016	7:35	After SS	Nick Zigler	B	B	B				
OK-01	Segment 1	3/22/2016	17:40	Before SS	Nick Zigler	C	B	C				
OK-01	Segment 1	3/23/2016	7:50	After SS	Nick Zigler	B	B	B				
OK-01	Segment 1	3/23/2016	15:08	Before SS	Nick Zigler	B	B	C				
OK-01	Segment 1	3/24/2016	7:48	After SS	Nick Zigler	B	B	B				
OK-01	Segment 1	3/24/2016	18:20	Before SS	Nick Zigler	C	B	C				
OK-01	Segment 1	3/25/2016	8:20	After SS	Nick Zigler	B	B	B				
OK-01	Segment 1	4/4/2016	0:30	Before SS	Paul Randall	C	C	C	Stefan Grozev	C	C	C
OK-01	Segment 1	4/4/2016	2:00	After SS and Cleanup	Paul Randall	A	A	A	Stefan Grozev	A	A	A
OK-01	Segment 1	4/18/2016	0:30	Before SS	Nick Zigler	C	B	C	Stefan Grozev	C	B	C
OK-01	Segment 1	4/18/2016	2:00	After SS and Cleanup	Nick Zigler	A	A	A	Stefan Grozev	A	A	A
OK-01	Segment 2A	3/23/2015	0:30	Before SS	Stefan Grozev	C	C	C	Chris Sommers	C	C	C
OK-01	Segment 2B	3/23/2015	0:30	Before SS	Stefan Grozev	D	B	C	Chris Sommers	D	B	C
OK-01	Segment 2A	3/23/2015	2:00	After SS	Stefan Grozev	B	C	C	Chris Sommers	B	C	C
OK-01	Segment 2B	3/23/2015	2:00	After SS	Stefan Grozev	A	B	B	Chris Sommers	A	B	B
OK-01	Segment 2A	4/13/2015	0:30	Before SS	Paul Randall	B	C	C	Simon Olivieri	B	C	C
OK-01	Segment 2B	4/13/2015	0:30	Before SS	Paul Randall	A	B	B	Simon Olivieri	A	B	B
OK-01	Segment 2A	4/13/2015	2:00	After SS	Paul Randall	A	C	C	Simon Olivieri	A	C	C
OK-01	Segment 2B	4/13/2015	2:00	After SS	Paul Randall	A	B	B	Simon Olivieri	A	B	B
OK-01	Segment 2A	5/4/2015	0:30	Before SS	Paul Randall	C	B	C	Simon Olivieri	C	B	C
OK-01	Segment 2B	5/4/2015	0:30	Before SS	Paul Randall	D	B	C	Simon Olivieri	D	B	C
OK-01	Segment 2A	5/4/2015	2:00	After SS	Paul Randall	A	B	A	Simon Olivieri	A	B	A
OK-01	Segment 2B	5/4/2015	2:00	After SS	Paul Randall	A	B	B	Simon Olivieri	A	B	B
OK-01	Segment 2A	6/15/2015	0:30	Before SS	Paul Randall	C	B	C	Simon Olivieri	C	B	C
OK-01	Segment 2B	6/15/2015	0:30	Before SS	Paul Randall	C	B	C	Simon Olivieri	C	B	C
OK-01	Segment 2A	6/15/2015	2:00	After SS	Paul Randall	B	B	B	Simon Olivieri	B	B	B
OK-01	Segment 2B	6/15/2015	2:00	After SS	Paul Randall	B	B	B	Simon Olivieri	B	B	B
OK-01	Segment 2A	7/20/2015	0:30	Before SS	Simon Olivieri	B	B	B	Stefan Grozev	C	B	C
OK-01	Segment 2B	7/20/2015	0:30	Before SS	Simon Olivieri	B	A	B	Stefan Grozev	B	A	B
OK-01	Segment 2A	7/20/2015	2:00	After SS	Simon Olivieri	A	B	A	Stefan Grozev	A	B	A
OK-01	Segment 2B	7/20/2015	2:00	After SS	Simon Olivieri	A	A	A	Stefan Grozev	A	A	A
OK-01	Segment 2A	7/27/2015	0:30	Before SS	Simon Olivieri	C	B	C	Stefan Grozev	C	B	C
OK-01	Segment 2B	7/27/2015	0:30	Before SS	Simon Olivieri	C	B	C	Stefan Grozev	D	B	C
OK-01	Segment 2A	7/27/2015	2:00	After SS	Simon Olivieri	B	B	B	Stefan Grozev	B	B	B
OK-01	Segment 2B	7/27/2015	2:00	After SS	Simon Olivieri	B	B	B	Stefan Grozev	B	B	B
OK-01	Segment 2A	8/10/2015	0:30	Before SS	Simon Olivieri	C	B	C	Stefan Grozev	C	B	C
OK-01	Segment 2B	8/10/2015	0:30	Before SS	Simon Olivieri	D	B	C	Stefan Grozev	D	B	D
OK-01	Segment 2A	8/10/2015	2:00	After SS	Simon Olivieri	C	B	C	Stefan Grozev	C	B	C
OK-01	Segment 2B	8/10/2015	2:00	After SS	Simon Olivieri	B	B	B	Stefan Grozev	B	B	B
OK-01	Segment 2A	8/31/2015	0:30	Before SS	Simon Olivieri	C	B	C	Stefan Grozev	C	B	C
OK-01	Segment 2B	8/31/2015	0:30	Before SS	Simon Olivieri	D	B	C	Stefan Grozev	D	B	D
OK-01	Segment 2A	8/31/2015	2:00	After SS	Simon Olivieri	C	B	C	Stefan Grozev	C	B	C
OK-01	Segment 2B	8/31/2015	2:00	After SS	Simon Olivieri	B	B	B	Stefan Grozev	B	B	B
OK-01	Segment 2	10/19/2015	0:30	Before SS	Simon Olivieri	D	B	C	Stefan Grozev	D	C	D
OK-01	Segment 2	10/19/2015	2:00	After SS	Simon Olivieri	B	B	B	Stefan Grozev	B	B	B
OK-01	Segment 2	11/16/2015	0:30	Before SS	Simon Olivieri	B	B	B	Stefan Grozev	B	B	B
OK-01	Segment 2	11/16/2015	2:00	After SS	Simon Olivieri	B	B	B	Stefan Grozev	B	B	B
OK-01	Segment 2	11/30/2015	0:30	Before SS	Simon Olivieri	B	A	B	Stefan Grozev	B	B	B
OK-01	Segment 2	11/30/2015	2:00	After SS	Simon Olivieri	A	A	B	Stefan Grozev	A	B	B
OK-01	Segment 2	1/25/2016	0:30	Before SS	Simon Olivieri	C	C	C	Stefan Grozev	C	B	C
OK-01	Segment 2	1/25/2016	2:00	After SS	Simon Olivieri	C	B	C	Stefan Grozev	C	B	C
OK-01	Segment 2	2/17/2016	16:35	Before Rain Event	Nick Zigler	D	C	D				
OK-01	Segment 2	2/18/2016	9:00	After Rain Event	Nick Zigler	B	B	B				
OK-01	Segment 2	2/22/2016	0:30	Before SS	Paul Randall	C	B	C	Stefan Grozev	C	B	C
OK-01	Segment 2	2/22/2016	2:00	After SS	Paul Randall	B	B	B	Stefan Grozev	C	B	C
OK-01	Segment 2	2/22/2016	10:26	Between SS	Nick Zigler	B	A	B				
OK-01	Segment 2	2/22/2016	16:55	Before SS	Nick Zigler	C	B	C	Andrea Trese	C	B	C
OK-01	Segment 2	2/23/2016	10:00	After SS	Nick Zigler	B	B	B				
OK-01	Segment 2	2/23/2016	16:10	Before SS	Nick Zigler	B	B	B	Andrea Trese	B	B	C
OK-01	Segment 2	2/24/2016	7:30	After SS	Nick Zigler	B	B	B				
OK-01	Segment 2	2/24/2016	16:50	Before SS	Nick Zigler	C	B	C				
OK-01	Segment 2	2/25/2016	8:12	After SS	Nick Zigler	B	B	B				
OK-01	Segment 2	2/25/2016	15:40	Between SS	Nick Zigler	B	B	C				
OK-01	Segment 2	3/4/2016	14:04	Before Rain Event	Stefan Grozev	B	C	C				
OK-01	Segment 2	3/7/2016	8:05	After Rain Event	Stefan Grozev	B	B	B				
OK-01	Segment 2	3/21/2016	0:30	Before SS	Nick Zigler	D	C	D	Stefan Grozev	C	B	C
OK-01	Segment 2	3/21/2016	2:00	After SS	Nick Zigler	B	C	C	Stefan Grozev	B	B	B
OK-01	Segment 2	3/21/2016	11:15	Between SS	Nick Zigler	B	A	B				
OK-01	Segment 2	3/21/2016	18:45	Before SS	Nick Zigler	C	A	C				
OK-01	Segment 2	3/22/2016	7:35	After SS	Nick Zigler	B	A	B				
OK-01	Segment 2	3/22/2016	17:40	Before SS	Nick Zigler	C	B	C				
OK-01	Segment 2	3/23/2016	7:50	After SS	Nick Zigler	B	B	B				
OK-01	Segment 2	3/23/2016	15:08	Before SS	Nick Zigler	B	B	B				
OK-01	Segment 2	3/24/2016	7:48	After SS	Nick Zigler	B	B	B				
OK-01	Segment 2	3/24/2016	18:20	Before SS	Nick Zigler	B	B	C				
OK-01	Segment 2	3/25/2016	8:20	After SS	Nick Zigler	B	B	B				
OK-01	Segment 2	4/4/2016	0:30	Before SS	Paul Randall	C	B	C	Stefan Grozev	D	B	C

Site ID	Segment ID	Date	Time	Event Timing	Observer #1	O#1 Street Score	O #1 Sidewalk Score	O#1 Overall Score	Observer #2	O#2 Street Score	O#2 Sidewalk Score	O#2 Overall Score
OK-01	Segment 2	4/4/2016	2:00	After SS	Paul Randall	B	B	B	Stefan Grozev	B	B	B
OK-01	Segment 2	4/18/2016	0:30	Before SS	Nick Zigler	C	B	C	Stefan Grozev	C	B	C
OK-01	Segment 2	4/18/2016	2:00	After SS	Nick Zigler	B	B	B	Stefan Grozev	B	B	B
OK-02	Segment 1	4/1/2015	11:40	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 1	4/1/2015	15:25	After SS	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-02	Segment 1	4/3/2015	16:25	Between SS	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-02	Segment 1	4/7/2015	9:40	After Rain Event	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-02	Segment 1	7/15/2015	11:30	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	D	D
OK-02	Segment 1	7/15/2015	14:58	After SS	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-02	Segment 1	7/20/2015	12:10	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	D	D
OK-02	Segment 1	7/24/2015	15:10	Between SS	Nick Zigler	D	C	D				
OK-02	Segment 1	7/30/2015	13:50	Between SS	Stefan Grozev	D	C	D	Andrea Trese	C	C	C
OK-02	Segment 1	8/5/2015	11:46	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 1	8/5/2015	15:19	After SS	Nick Zigler	D	C	D	Stefan Grozev	C	C	C
OK-02	Segment 1	8/10/2015	14:36	Between SS	Nick Zigler	D	D	D	Stefan Grozev	D	D	D
OK-02	Segment 1	8/14/2015	15:10	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 1	8/17/2015	11:36	Between SS	Nick Zigler	D	D	D	Stefan Grozev	D	D	D
OK-02	Segment 1	8/19/2015	11:31	Before SS	Andrea Trese	D	C	D	Stefan Grozev	D	D	D
OK-02	Segment 1	8/19/2015	15:29	After SS	Nick Zigler	D	D	D	Stefan Grozev	C	D	D
OK-02	Segment 1	8/21/2015	13:50	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 1	8/25/2015	11:08	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 1	8/28/2015	11:26	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 1	9/2/2015	11:46	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 1	9/2/2015	14:52	After SS	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-02	Segment 1	11/4/2015	11:20	Between SS	Nick Zigler	D	D	D	Stefan Grozev	D	C	D
OK-02	Segment 1	11/6/2015	15:31	Before Rain Event	Nick Zigler	D	D	D	Stefan Grozev	D	D	D
OK-02	Segment 1	11/9/2015	12:08	After Rain Event	Nick Zigler	D	C	D	Stefan Grozev	D	D	D
OK-02	Segment 1	11/13/2015	15:58	Before Rain Event	Nick Zigler	D	C	D				
OK-02	Segment 1	11/16/2015	9:20	After Rain Event	Nick Zigler	D	C	D				
OK-02	Segment 1	11/18/2015	15:35	Between SS	Nick Zigler	C	C	C				
OK-02	Segment 1	11/21/2015	11:15	Between SS	Nick Zigler	C	C	C				
OK-02	Segment 1	11/24/2015	10:35	Between SS	Nick Zigler	C	C	D				
OK-02	Segment 1	11/30/2015	11:18	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 1	12/2/2015	11:55	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 1	12/2/2015	15:00	After SS	Stefan Grozev	B	C	C	Andrea Trese	B	B	B
OK-02	Segment 1	12/3/2015	15:17	Between SS	Nick Zigler	B	C	C	Stefan Grozev	B	B	C
OK-02	Segment 1	12/9/2015	15:00	Before Rain Event	Nick Zigler	C	C	C	Stefan Grozev	D	C	D
OK-02	Segment 1	12/11/2015	12:02	After Rain Event	Nick Zigler	D	C	D	Stefan Grozev	D	D	D
OK-02	Segment 1	12/14/2015	9:40	Between SS	Stefan Grozev	C	C	D	Andrea Trese	C	C	C
OK-02	Segment 1	12/16/2015	11:18	Before SS	Nick Zigler	D	D	D	Stefan Grozev	D	C	D
OK-02	Segment 1	12/16/2015	15:11	After SS	Nick Zigler	C	D	D	Stefan Grozev	C	C	D
OK-02	Segment 1	1/20/2016	11:20	Before SS	Andrea Trese	D	B	D	Stefan Grozev	C	C	D
OK-02	Segment 1	1/20/2016	15:45	After SS	Andrea Trese	C	B	C	Stefan Grozev	C	C	C
OK-02	Segment 1	1/22/2016	15:52	Between SS	Nick Zigler	C	B	C	Stefan Grozev	C	B	C
OK-02	Segment 1	1/29/2016	10:46	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 1	2/3/2016	10:30	Before SS	Nick Zigler	D	D	D	Stefan Grozev	D	D	D
OK-02	Segment 1	2/3/2016	15:45	After SS	Nick Zigler	B	D	D	Stefan Grozev	B	D	D
OK-02	Segment 1	2/5/2016	14:35	Between SS	Nick Zigler	C	D	D	Stefan Grozev	C	D	D
OK-02	Segment 1	2/8/2016	13:46	Between SS	Nick Zigler	D	D	D	Stefan Grozev	D	D	D
OK-02	Segment 1	2/12/2016	10:55	Between SS	Nick Zigler	D	C	D				
OK-02	Segment 1	2/17/2016	11:32	Before SS	Nick Zigler	D	C	D				
OK-02	Segment 1	2/17/2016	15:28	After SS	Nick Zigler	C	C	C				
OK-02	Segment 1	3/4/2016	14:51	Before Rain Event	Stefan Grozev	D	C	D				
OK-02	Segment 1	3/7/2016	7:50	After Rain Event	Stefan Grozev	C	C	C				
OK-02	Segment 2	4/1/2015	11:40	Before SS	Nick Zigler	C	C	C	Stefan Grozev	D	C	C
OK-02	Segment 2	4/1/2015	15:25	After SS	Nick Zigler	B	C	C	Stefan Grozev	B	C	C
OK-02	Segment 2	4/3/2015	16:25	Between SS	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-02	Segment 2	4/7/2015	9:40	After Rain Event	Nick Zigler	C	B	C	Stefan Grozev	C	C	C
OK-02	Segment 2	7/15/2015	11:30	Before SS	Nick Zigler	D	C	D	Stefan Grozev	C	B	C
OK-02	Segment 2	7/15/2015	14:58	After SS	Nick Zigler	C	C	C	Stefan Grozev	C	B	C
OK-02	Segment 2	7/20/2015	12:10	Between SS	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-02	Segment 2	7/24/2015	15:10	Between SS	Nick Zigler	C	B	C				
OK-02	Segment 2	7/30/2015	13:50	Between SS	Stefan Grozev	C	C	C	Andrea Trese	C	C	C
OK-02	Segment 2	8/5/2015	11:46	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 2	8/5/2015	15:19	After SS	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-02	Segment 2	8/10/2015	14:36	Between SS	Nick Zigler	C	C	D	Stefan Grozev	C	C	D
OK-02	Segment 2	8/14/2015	15:10	Between SS	Nick Zigler	D	C	D	Stefan Grozev	C	C	C
OK-02	Segment 2	8/17/2015	11:36	Between SS	Nick Zigler	D	C	D	Stefan Grozev	C	C	C
OK-02	Segment 2	8/19/2015	11:31	Before SS	Andrea Trese	C	C	D	Stefan Grozev	C	C	C
OK-02	Segment 2	8/19/2015	15:29	After SS	Nick Zigler	D	C	D	Stefan Grozev	C	C	C
OK-02	Segment 2	8/21/2015	13:50	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 2	8/25/2015	11:08	Between SS	Nick Zigler	D	C	D	Stefan Grozev	C	C	C
OK-02	Segment 2	8/28/2015	11:26	Between SS	Nick Zigler	D	B	D	Stefan Grozev	C	B	C
OK-02	Segment 2	9/2/2015	11:46	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 2	9/2/2015	14:52	After SS	Nick Zigler	B	C	C	Stefan Grozev	B	C	C
OK-02	Segment 2	11/4/2015	11:20	Between SS	Nick Zigler	C	B	C	Stefan Grozev	C	B	C
OK-02	Segment 2	11/6/2015	15:31	Before Rain Event	Nick Zigler	D	B	D	Stefan Grozev	D	C	D
OK-02	Segment 2	11/9/2015	12:08	After Rain Event	Nick Zigler	D	B	D	Stefan Grozev	D	B	D
OK-02	Segment 2	11/13/2015	15:58	Before Rain Event	Nick Zigler	D	C	D				
OK-02	Segment 2	11/16/2015	9:20	After Rain Event	Nick Zigler	D	D	D				
OK-02	Segment 2	11/18/2015	15:35	Between SS	Nick Zigler	B	C	C				
OK-02	Segment 2	11/21/2015	11:15	Between SS	Nick Zigler	C	C	C				
OK-02	Segment 2	11/24/2015	10:35	Between SS	Nick Zigler	C	C	C				
OK-02	Segment 2	11/30/2015	11:18	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	B	D
OK-02	Segment 2	12/2/2015	11:55	Before SS	Nick Zigler	D	B	D	Stefan Grozev	D	B	D
OK-02	Segment 2	12/2/2015	15:00	After SS	Stefan Grozev	B	B	B	Andrea Trese	B	B	C
OK-02	Segment 2	12/3/2015	15:17	Between SS	Nick Zigler	B	B	B	Stefan Grozev	B	A	B
OK-02	Segment 2	12/9/2015	15:00	Before Rain Event	Nick Zigler	D	B	D	Stefan Grozev	C	B	C
OK-02	Segment 2	12/11/2015	12:02	After Rain Event	Nick Zigler	B	B	B	Stefan Grozev	B	B	C
OK-02	Segment 2	12/14/2015	9:40	Between SS	Stefan Grozev	C	B	C	Andrea Trese	C	C	C
OK-02	Segment 2	12/16/2015	11:18	Before SS	Nick Zigler	D	B	D	Stefan Grozev	D	B	D
OK-02	Segment 2	12/16/2015	15:11	After SS	Nick Zigler	C	C	C	Stefan Grozev	C	B	C
OK-02	Segment 2	1/20/2016	11:20	Before SS	Andrea Trese	C	C	C	Stefan Grozev	C	B	C
OK-02	Segment 2	1/20/2016	15:45	After SS	Andrea Trese	C	C	C	Stefan Grozev	C	C	C
OK-02	Segment 2	1/22/2016	15:52	Between SS	Nick Zigler	C	B	C	Stefan Grozev	B	B	B
OK-02	Segment 2	1/29/2016	10:46	Between SS	Nick Zigler	D	B	D	Stefan Grozev	D	B	D
OK-02	Segment 2	2/3/2016	10:30	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 2	2/3/2016	15:45	After SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-02	Segment 2	2/5/2016	14:35	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	B	D
OK-02	Segment 2	2/8/2016	13:46	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	B	D
OK-02	Segment 2	2/12/2016	10:55	Between SS	Nick Zigler	D	C	D				
OK-02	Segment 2	2/17/2016	11:32	Before SS	Nick Zigler	D	B	D				
OK-02	Segment 2	2/17/2016	15:28	After SS	Nick Zigler	D	B	D				
OK-02	Segment 2	3/4/2016	14:51	Before Rain Event	Stefan Grozev	D	C	D				
OK-02	Segment 2	3/7/2016	7:50	After Rain Event	Stefan Grozev	C	B	C				
OK-03	Segment 1	4/1/2015	12:10	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-03	Segment 1	4/1/2015	13:15	After SS	Nick Zigler	B	C	C	Stefan Grozev	B	C	C
OK-03	Segment 1	4/3/2015	16:00	Between SS	Nick Zigler	C	C	C	Stefan Grozev	C	C	C

Site ID	Segment ID	Date	Time	Event Timing	Observer #1	O#1 Street Score	O #1 Sidewalk Score	O#1 Overall Score	Observer #2	O#2 Street Score	O#2 Sidewalk Score	O#2 Overall Score
OK-03	Segment 1	4/7/2015	10:20	After Rain Event	Nick Zigler	C	C	C	Stefan Grozev	C	B	C
OK-03	Segment 1	7/15/2015	11:07	Before SS	Nick Zigler	C	B	C	Stefan Grozev	C	B	C
OK-03	Segment 1	7/15/2015	14:32	After SS	Nick Zigler	B	B	B	Stefan Grozev	B	B	B
OK-03	Segment 1	7/20/2015	11:46	Between SS	Nick Zigler	D	C	D	Stefan Grozev	C	C	D
OK-03	Segment 1	7/24/2015	14:50	Between SS	Nick Zigler	C	B	C				
OK-03	Segment 1	7/30/2015	13:22	Between SS	Stefan Grozev	C	C	C	Andrea Trese	C	C	D
OK-03	Segment 1	8/5/2015	11:25	Before SS	Nick Zigler	C	B	C	Stefan Grozev	C	B	C
OK-03	Segment 1	8/5/2015	14:56	After SS	Nick Zigler	B	B	B	Stefan Grozev	C	B	C
OK-03	Segment 1	8/10/2015	14:12	Between SS	Nick Zigler	C	B	C	Stefan Grozev	C	B	C
OK-03	Segment 1	8/14/2015	14:57	Between SS	Nick Zigler	C	B	C	Stefan Grozev	C	B	C
OK-03	Segment 1	8/17/2015	11:14	Between SS	Nick Zigler	D	C	D	Stefan Grozev	C	C	D
OK-03	Segment 1	8/19/2015	11:14	Before SS	Andrea Trese	C	C	C	Stefan Grozev	C	C	D
OK-03	Segment 1	8/19/2015	13:48	After SS	Andrea Trese	B	C	C	Stefan Grozev	B	C	C
OK-03	Segment 1	8/21/2015	14:24	Between SS	Nick Zigler	C	B	C	Stefan Grozev	C	B	C
OK-03	Segment 1	8/25/2015	10:43	Between SS	Nick Zigler	D	C	D	Stefan Grozev	C	C	D
OK-03	Segment 1	8/28/2015	11:06	Between SS	Nick Zigler	D	C	D	Stefan Grozev	C	B	C
OK-03	Segment 1	9/2/2015	11:29	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-03	Segment 1	9/2/2015	14:32	After SS	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-03	Segment 1	11/4/2015	10:55	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-03	Segment 1	11/6/2015	15:17	Before Rain Event	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-03	Segment 1	11/9/2015	11:26	After Rain Event	Nick Zigler	D	B	D	Stefan Grozev	D	B	D
OK-03	Segment 1	11/13/2015	16:17	Before Rain Event	Nick Zigler	D	D	D				
OK-03	Segment 1	11/16/2015	9:00	After Rain Event	Nick Zigler	D	C	D				
OK-03	Segment 1	11/18/2015	15:10	Between SS	Nick Zigler	B	C	C				
OK-03	Segment 1	11/21/2015	10:55	Between SS	Nick Zigler	C	C	C				
OK-03	Segment 1	11/24/2015	10:20	Between SS	Nick Zigler	C	C	C				
OK-03	Segment 1	11/30/2015	10:55	Between SS	Nick Zigler	C	B	C	Stefan Grozev	C	C	C
OK-03	Segment 1	12/2/2015	11:40	Before SS	Nick Zigler	C	B	C	Stefan Grozev	D	C	D
OK-03	Segment 1	12/2/2015	14:45	After SS	Stefan Grozev	C	C	C	Andrea Trese	C	C	C
OK-03	Segment 1	12/3/2015	14:55	Between SS	Nick Zigler	B	B	B	Stefan Grozev	B	B	B
OK-03	Segment 1	12/9/2015	14:40	Before Rain Event	Nick Zigler	C	B	C	Stefan Grozev	C	B	C
OK-03	Segment 1	12/11/2015	11:45	After Rain Event	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-03	Segment 1	12/14/2015	9:22	Between SS	Stefan Grozev	C	C	D	Andrea Trese	C	C	D
OK-03	Segment 1	12/16/2015	11:02	Before SS	Nick Zigler	D	B	D	Stefan Grozev	D	C	D
OK-03	Segment 1	12/16/2015	14:47	After SS	Nick Zigler	B	B	B	Stefan Grozev	A	C	B
OK-03	Segment 1	1/20/2016	11:00	Before SS	Andrea Trese	C	C	D	Stefan Grozev	C	C	D
OK-03	Segment 1	1/20/2016	15:28	After SS	Andrea Trese	B	C	C	Stefan Grozev	B	C	C
OK-03	Segment 1	1/22/2016	15:27	Between SS	Nick Zigler	B	B	B	Stefan Grozev	B	B	B
OK-03	Segment 1	1/29/2016	10:19	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	B	D
OK-03	Segment 1	2/3/2016	10:05	Before SS	Nick Zigler	D	B	D	Stefan Grozev	D	B	D
OK-03	Segment 1	2/3/2016	15:20	After SS	Nick Zigler	D	C	D	Stefan Grozev	C	C	D
OK-03	Segment 1	2/5/2016	14:10	Between SS	Nick Zigler	D	B	D	Stefan Grozev	C	B	C
OK-03	Segment 1	2/8/2016	13:25	Between SS	Nick Zigler	D	C	D	Stefan Grozev	C	D	D
OK-03	Segment 1	2/12/2016	10:45	Between SS	Nick Zigler	D	D	D				
OK-03	Segment 1	2/17/2016	11:15	Before SS	Nick Zigler	C	C	C				
OK-03	Segment 1	2/17/2016	15:14	After SS	Nick Zigler	B	C	C				
OK-03	Segment 1	3/4/2016	14:21	Before Rain Event	Stefan Grozev	C	B	C				
OK-03	Segment 1	3/7/2016	7:10	After Rain Event	Stefan Grozev	B	B	B				
OK-03	Segment 2	4/1/2015	12:10	Before SS	Nick Zigler	D	D	D	Stefan Grozev	D	D	D
OK-03	Segment 2	4/1/2015	13:15	After SS	Nick Zigler	D	D	D	Stefan Grozev	D	D	D
OK-03	Segment 2	4/3/2015	16:00	Between SS	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-03	Segment 2	4/7/2015	10:20	After Rain Event	Nick Zigler	B	C	C	Stefan Grozev	C	C	C
OK-03	Segment 2	7/15/2015	11:07	Before SS	Nick Zigler	C	C	C	Stefan Grozev	D	C	C
OK-03	Segment 2	7/15/2015	14:32	After SS	Nick Zigler	B	C	C	Stefan Grozev	B	C	C
OK-03	Segment 2	7/20/2015	11:46	Between SS	Nick Zigler	C	C	C	Stefan Grozev	C	B	C
OK-03	Segment 2	7/24/2015	14:50	Between SS	Nick Zigler	C	C	C				
OK-03	Segment 2	7/30/2015	13:22	Between SS	Stefan Grozev	C	C	C	Andrea Trese	C	C	C
OK-03	Segment 2	8/5/2015	11:25	Before SS	Nick Zigler	D	C	D	Stefan Grozev	C	C	C
OK-03	Segment 2	8/5/2015	14:56	After SS	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-03	Segment 2	8/10/2015	14:12	Between SS	Nick Zigler	D	C	D	Stefan Grozev	C	C	C
OK-03	Segment 2	8/14/2015	14:57	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-03	Segment 2	8/17/2015	11:14	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-03	Segment 2	8/19/2015	11:14	Before SS	Andrea Trese	D	C	D	Stefan Grozev	D	C	D
OK-03	Segment 2	8/19/2015	13:48	After SS	Andrea Trese	C	C	D	Stefan Grozev	D	C	D
OK-03	Segment 2	8/21/2015	14:24	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	D	D
OK-03	Segment 2	8/25/2015	10:43	Between SS	Nick Zigler	D	D	D	Stefan Grozev	D	D	D
OK-03	Segment 2	8/28/2015	11:06	Between SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-03	Segment 2	9/2/2015	11:29	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-03	Segment 2	9/2/2015	14:32	After SS	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-03	Segment 2	11/4/2015	10:55	Between SS	Nick Zigler	D	D	D	Stefan Grozev	D	D	D
OK-03	Segment 2	11/6/2015	15:17	Before Rain Event	Nick Zigler	C	C	C	Stefan Grozev	C	B	C
OK-03	Segment 2	11/9/2015	11:26	After Rain Event	Nick Zigler	C	C	C	Stefan Grozev	C	C	C
OK-03	Segment 2	11/13/2015	16:17	Before Rain Event	Nick Zigler	D	C	D				
OK-03	Segment 2	11/16/2015	9:00	After Rain Event	Nick Zigler	D	C	D				
OK-03	Segment 2	11/18/2015	15:10	Between SS	Nick Zigler	D	C	D				
OK-03	Segment 2	11/21/2015	10:55	Between SS	Nick Zigler	D	C	D				
OK-03	Segment 2	11/24/2015	10:20	Between SS	Nick Zigler	D	C	D				
OK-03	Segment 2	11/30/2015	10:55	Between SS	Nick Zigler	D	C	D	Stefan Grozev	C	C	D
OK-03	Segment 2	12/2/2015	11:40	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-03	Segment 2	12/2/2015	14:45	After SS	Stefan Grozev	D	C	D	Andrea Trese	C	C	D
OK-03	Segment 2	12/3/2015	14:55	Between SS	Nick Zigler	C	C	C	Stefan Grozev	C	B	C
OK-03	Segment 2	12/9/2015	14:40	Before Rain Event	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-03	Segment 2	12/11/2015	11:45	After Rain Event	Nick Zigler	D	C	D	Stefan Grozev	C	C	C
OK-03	Segment 2	12/14/2015	9:22	Between SS	Stefan Grozev	D	C	D	Andrea Trese	D	C	D
OK-03	Segment 2	12/16/2015	11:02	Before SS	Nick Zigler	D	C	D	Stefan Grozev	D	C	D
OK-03	Segment 2	12/16/2015	14:47	After SS	Nick Zigler	B	C	C	Stefan Grozev	A	C	C
OK-03	Segment 2	1/20/2016	11:00	Before SS	Andrea Trese	D	C	D	Stefan Grozev	C	C	C
OK-03	Segment 2	1/20/2016	15:28	After SS	Andrea Trese	C	C	D	Stefan Grozev	C	C	D
OK-03	Segment 2	1/22/2016	15:27	Between SS	Nick Zigler	C	B	C	Stefan Grozev	C	C	C
OK-03	Segment 2	1/29/2016	10:19	Between SS	Nick Zigler	D	D	D	Stefan Grozev	D	C	D
OK-03	Segment 2	2/3/2016	10:05	Before SS	Nick Zigler	D	D	D	Stefan Grozev	D	D	D
OK-03	Segment 2	2/3/2016	15:20	After SS	Nick Zigler	C	D	D	Stefan Grozev	C	D	D
OK-03	Segment 2	2/5/2016	14:10	Between SS	Nick Zigler	C	D	D	Stefan Grozev	C	D	D
OK-03	Segment 2	2/8/2016	13:25	Between SS	Nick Zigler	C	D	D	Stefan Grozev	D	C	D
OK-03	Segment 2	2/12/2016	10:45	Between SS	Nick Zigler	D	D	D				
OK-03	Segment 2	2/17/2016	11:15	Before SS	Nick Zigler	D	D	D				
OK-03	Segment 2	2/17/2016	15:14	After SS	Nick Zigler	B	D	D				
OK-03	Segment 2	3/4/2016	14:21	Before Rain Event	Stefan Grozev	D	C	D				
OK-03	Segment 2	3/7/2016	7:10	After Rain Event	Stefan Grozev	C	D	D				
SJ-01	Segment 1	2/25/2015	0:30	Before SS	Nick Zigler	C	C	C	Lori Baumgartner	C	C	C
SJ-01	Segment 1	2/25/2015	2:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
SJ-01	Segment 1	3/25/2015	0:30	Before SS	Andrea Trese	C	B	C	Lori Baumgartner	C	B	C
SJ-01	Segment 1	3/25/2015	2:00	After SS and Cleanup	Andrea Trese	A	A	A	Lori Baumgartner	A	A	A
SJ-01	Segment 1	4/22/2015	0:30	Before SS	Nick Zigler	C	B	C	Lori Baumgartner	C	C	C
SJ-01	Segment 1	4/22/2015	2:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
SJ-01	Segment 1	5/27/2015	0:30	Before SS	Nick Zigler	C	C	C	Lori Baumgartner	C	C	C
SJ-01	Segment 1	5/27/2015	2:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
SJ-01	Segment 1	7/22/2015	0:30	Before SS	Nick Zigler	C	B	C	Lori Baumgartner	C	B	C

Site ID	Segment ID	Date	Time	Event Timing	Observer #1	O#1 Street Score	O #1 Sidewalk Score	O#1 Overall Score	Observer #2	O#2 Street Score	O#2 Sidewalk Score	O#2 Overall Score
SJ-01	Segment 1	7/22/2015	2:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
SJ-01	Segment 1	9/23/2015	0:30	Before SS	Nick Zigler	C	C	C	Lori Baumgartner	C	C	C
SJ-01	Segment 1	9/23/2015	2:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
SJ-01	Segment 1	9/25/2015	11:15	Between SS	Andrea Trese	B	B	B	Lori Baumgartner	B	B	B
SJ-01	Segment 1	10/2/2015	12:10	Between SS	Andrea Trese	B	B	C	Lori Baumgartner	B	B	B
SJ-01	Segment 1	10/13/2015	17:08	Before SS	Lori Baumgartner	C	B	C				
SJ-01	Segment 1	10/14/2015	8:12	After SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 1	10/16/2015	15:33	Between SS	Lori Baumgartner	C	B	C				
SJ-01	Segment 1	10/20/2015	15:00	Between SS	Andrea Trese	C	B	C	Lori Baumgartner	C	B	B
SJ-01	Segment 1	11/2/2015	15:03	Between SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 1	11/7/2015	12:43	Before Rain Event	Lori Baumgartner	B	B	B				
SJ-01	Segment 1	11/9/2015	14:28	After Rain Event	Lori Baumgartner	B	B	B	Andrea Trese	B	B	B
SJ-01	Segment 1	11/10/2015	15:02	Before SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 1	11/11/2015	10:10	After SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 1	11/13/2015	15:03	Between SS	Lori Baumgartner	B	B	B	Andrea Trese	B	B	B
SJ-01	Segment 1	11/16/2015	6:49	Between SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 1	11/24/2015	8:12	Before Rain Event	Lori Baumgartner	C	B	C				
SJ-01	Segment 1	11/25/2015	8:40	After Rain Event	Lori Baumgartner	B	B	B				
SJ-01	Segment 1	12/2/2015	9:39	Between SS	Lori Baumgartner	C	B	B				
SJ-01	Segment 1	12/9/2015	0:30	Before SS	Nick Zigler	B	B	C	Lori Baumgartner	C	B	B
SJ-01	Segment 1	12/9/2015	2:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
SJ-01	Segment 1	12/11/2015	14:53	Between SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 1	12/15/2015	15:43	Between SS	Lori Baumgartner	C	B	C				
SJ-01	Segment 1	1/5/2016	15:41	Between SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 1	1/12/2016	15:16	Before SS	Lori Baumgartner	C	C	C				
SJ-01	Segment 1	1/13/2016	8:24	After SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 1	1/15/2016	15:43	Between SS	Lori Baumgartner	C	B	C				
SJ-01	Segment 1	1/19/2016	13:41	Between SS	Lori Baumgartner	C	C	C				
SJ-01	Segment 1	1/22/2016	15:00	Between SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 1	1/27/2016	0:30	Before SS	Nick Zigler	B	B	B	Lori Baumgartner	B	B	B
SJ-01	Segment 1	1/27/2016	2:00	After SS and Cleanup	Nick Zigler	A	A	A	Lori Baumgartner	A	A	A
SJ-01	Segment 1	2/9/2016	16:14	Before SS	Lori Baumgartner	C	C	C				
SJ-01	Segment 1	2/10/2016	6:53	After SS	Lori Baumgartner	A	C	B				
SJ-01	Segment 2	2/25/2015	0:30	Before SS	Nick Zigler	C	C	C	Lori Baumgartner	C	C	C
SJ-01	Segment 2	2/25/2015	2:00	After SS	Nick Zigler	B	C	C	Lori Baumgartner	B	C	C
SJ-01	Segment 2	3/25/2015	0:30	Before SS	Andrea Trese	C	B	C	Lori Baumgartner	C	B	C
SJ-01	Segment 2	3/25/2015	2:00	After SS	Andrea Trese	B	B	B	Lori Baumgartner	B	B	B
SJ-01	Segment 2	4/22/2015	0:30	Before SS	Nick Zigler	C	B	C	Lori Baumgartner	C	C	C
SJ-01	Segment 2	4/22/2015	2:00	After SS	Nick Zigler	B	B	B	Lori Baumgartner	B	C	C
SJ-01	Segment 2	5/27/2015	0:30	Before SS	Nick Zigler	C	B	C	Lori Baumgartner	B	B	B
SJ-01	Segment 2	5/27/2015	2:00	After SS	Nick Zigler	A	B	B	Lori Baumgartner	B	B	B
SJ-01	Segment 2	7/22/2015	0:30	Before SS	Nick Zigler	C	B	C	Lori Baumgartner	C	B	C
SJ-01	Segment 2	7/22/2015	2:00	After SS	Nick Zigler	A	B	B	Lori Baumgartner	A	B	B
SJ-01	Segment 2	9/23/2015	0:30	Before SS	Nick Zigler	B	B	B	Lori Baumgartner	C	B	C
SJ-01	Segment 2	9/23/2015	2:00	After SS	Nick Zigler	A	B	B	Lori Baumgartner	B	B	B
SJ-01	Segment 2	9/25/2015	11:15	Between SS	Andrea Trese	B	B	B	Lori Baumgartner	B	B	B
SJ-01	Segment 2	10/2/2015	12:10	Between SS	Andrea Trese	B	B	B	Lori Baumgartner	B	B	B
SJ-01	Segment 2	10/13/2015	17:08	Before SS	Lori Baumgartner	C	B	C				
SJ-01	Segment 2	10/14/2015	8:12	After SS	Lori Baumgartner	C	B	B				
SJ-01	Segment 2	10/16/2015	15:33	Between SS	Lori Baumgartner	C	B	C				
SJ-01	Segment 2	10/20/2015	15:00	Between SS	Andrea Trese	B	B	C	Lori Baumgartner	B	B	B
SJ-01	Segment 2	11/2/2015	15:03	Between SS	Lori Baumgartner	B	C	C				
SJ-01	Segment 2	11/7/2015	12:43	Before Rain Event	Lori Baumgartner	B	B	B				
SJ-01	Segment 2	11/9/2015	14:28	After Rain Event	Lori Baumgartner	B	B	B	Andrea Trese	B	B	B
SJ-01	Segment 2	11/10/2015	15:02	Before SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 2	11/11/2015	10:10	After SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 2	11/13/2015	15:03	Between SS	Lori Baumgartner	B	C	C	Andrea Trese	B	B	C
SJ-01	Segment 2	11/16/2015	6:49	Between SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 2	11/24/2015	8:12	Before Rain Event	Lori Baumgartner	B	B	B				
SJ-01	Segment 2	11/25/2015	8:40	After Rain Event	Lori Baumgartner	B	B	B				
SJ-01	Segment 2	12/2/2015	9:39	Between SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 2	12/9/2015	0:30	Before SS	Nick Zigler	B	B	B	Lori Baumgartner	B	B	B
SJ-01	Segment 2	12/9/2015	2:00	After SS	Nick Zigler	A	B	B	Lori Baumgartner	A	B	B
SJ-01	Segment 2	12/11/2015	14:53	Between SS	Lori Baumgartner	B	B	B				
SJ-01	Segment 2	12/15/2015	15:43	Between SS	Lori Baumgartner	C	B	C				
SJ-01	Segment 2	1/5/2016	15:41	Between SS	Lori Baumgartner	B	C	C				
SJ-01	Segment 2	1/12/2016	15:16	Before SS	Lori Baumgartner	C	C	C				
SJ-01	Segment 2	1/13/2016	8:24	After SS	Lori Baumgartner	B	C	B				
SJ-01	Segment 2	1/15/2016	15:43	Between SS	Lori Baumgartner	C	C	C				
SJ-01	Segment 2	1/19/2016	13:41	Between SS	Lori Baumgartner	C	C	C				
SJ-01	Segment 2	1/22/2016	15:00	Between SS	Lori Baumgartner	B	C	C				
SJ-01	Segment 2	1/27/2016	0:30	Before SS	Nick Zigler	B	B	B	Lori Baumgartner	C	B	C
SJ-01	Segment 2	1/27/2016	2:00	After SS	Nick Zigler	B	B	B	Lori Baumgartner	C	B	C
SJ-01	Segment 2	2/9/2016	16:14	Before SS	Lori Baumgartner	C	C	C				
SJ-01	Segment 2	2/10/2016	6:53	After SS	Lori Baumgartner	A	C	B				
SJ-02	Segment 1	9/25/2015	12:20	Between SS	Andrea Trese	C	C	C	Lori Baumgartner	C	C	C
SJ-02	Segment 1	10/2/2015	13:10	Between SS	Andrea Trese	D	C	D	Lori Baumgartner	C	C	C
SJ-02	Segment 1	10/6/2015	16:35	Before SS	Andrea Trese	D	C	D	Lori Baumgartner	D	C	C
SJ-02	Segment 1	10/7/2015	8:42	After SS	Lori Baumgartner	B	C	C				
SJ-02	Segment 1	10/9/2015	15:45	Between SS	Andrea Trese	C	B	C	Lori Baumgartner	C	C	C
SJ-02	Segment 1	10/13/2015	16:06	Between SS	Lori Baumgartner	C	D	C				
SJ-02	Segment 1	10/16/2015	14:47	Between SS	Lori Baumgartner	D	D	D				
SJ-02	Segment 1	10/20/2015	13:56	Before SS	Andrea Trese	C	C	C	Lori Baumgartner	C	C	D
SJ-02	Segment 1	10/21/2015	8:45	After SS	Andrea Trese	C	C	C				
SJ-02	Segment 1	10/27/2015	9:45	Before Rain Event	Lori Baumgartner	C	C	D				
SJ-02	Segment 1	11/2/2015	14:08	After Rain Event	Lori Baumgartner	C	C	C				
SJ-02	Segment 1	11/3/2015	15:07	Before SS	Lori Baumgartner	D	C	D				
SJ-02	Segment 1	11/4/2015	9:19	After SS	Lori Baumgartner	C	C	C				
SJ-02	Segment 1	11/6/2015	14:15	Between SS	Lori Baumgartner	C	C	C	Andrea Trese	C	C	C
SJ-02	Segment 1	11/7/2015	13:35	Before Rain Event	Lori Baumgartner	C	C	C				
SJ-02	Segment 1	11/9/2015	13:40	After Rain Event	Lori Baumgartner	C	C	C	Andrea Trese	C	C	C
SJ-02	Segment 1	11/13/2015	14:34	Between SS	Lori Baumgartner	C	C	C	Andrea Trese	C	C	C
SJ-02	Segment 1	11/16/2015	7:35	Before SS	Lori Baumgartner	C	C	D				
SJ-02	Segment 1	11/18/2015	8:34	After SS	Lori Baumgartner	D	C	D	Stefan Grozev	C	C	C
SJ-02	Segment 1	11/24/2015	9:23	Before Rain Event	Lori Baumgartner	C	C	C				
SJ-02	Segment 1	11/25/2015	9:36	After Rain Event	Lori Baumgartner	C	C	C				
SJ-02	Segment 1	12/1/2015	11:41	Before SS	Lori Baumgartner	C	B	C	Stefan Grozev	C	C	C
SJ-02	Segment 1	12/2/2015	10:39	After SS	Lori Baumgartner	B	D	C				
SJ-02	Segment 1	12/4/2015	9:37	Between SS	Lori Baumgartner	B	C	C				
SJ-02	Segment 1	12/9/2015	7:20	Before Rain Event	Andrea Trese	C	C	C				
SJ-02	Segment 1	12/11/2015	14:00	After Rain Event	Lori Baumgartner	C	D	C	Andrea Trese	C	C	C
SJ-02	Segment 1	12/15/2015	14:48	Before SS	Lori Baumgartner	C	D	C				
SJ-02	Segment 1	12/16/2015	7:20	After SS	Andrea Trese	C	C	C				
SJ-02	Segment 1	1/5/2016	14:00	Before SS	Lori Baumgartner	C	C	C				
SJ-02	Segment 1	1/6/2016	9:00	After SS	Lori Baumgartner	C	C	C				
SJ-02	Segment 1	1/13/2016	9:03	Between SS	Lori Baumgartner	C	D	D				
SJ-02	Segment 1	1/15/2016	15:06	Between SS	Lori Baumgartner	C	D	C				
SJ-02	Segment 1	1/19/2016	12:31	Before SS	Lori Baumgartner	D	C	D				

Site ID	Segment ID	Date	Time	Event Timing	Observer #1	O#1 Street Score	O #1 Sidewalk Score	O#1 Overall Score	Observer #2	O#2 Street Score	O#2 Sidewalk Score	O#2 Overall Score
SJ-02	Segment 1	1/20/2016	8:32	After SS	Lori Baumgartner	B	C	C				
SJ-02	Segment 1	1/22/2016	15:00	Between SS	Lori Baumgartner	C	D	C				
SJ-02	Segment 1	1/27/2016	17:03	Between SS	Lori Baumgartner	C	C	D				
SJ-02	Segment 1	2/2/2016	12:24	Before SS	Andrea Trese	C	C	C	Lori Baumgartner	D	C	C
SJ-02	Segment 1	2/3/2016	9:02	After SS	Lori Baumgartner	C	D	C				
SJ-02	Segment 1	2/5/2016	15:03	Between SS	Lori Baumgartner	D	C	D	Andrea Trese	D	C	D
SJ-02	Segment 1	2/10/2016	12:42	Between SS	Andrea Trese	C	C	D	Lori Baumgartner	C	C	D
SJ-02	Segment 1	2/12/2016	6:50	Between SS	Lori Baumgartner	C	D	D	Jonathan Hawkes	C	D	D
SJ-02	Segment 1	2/16/2016	14:18	Before SS	Lori Baumgartner	C	D	D				
SJ-02	Segment 1	2/17/2016	13:35	After SS	Lori Baumgartner	C	D	D	Jonathan Hawkes	C	C	C
SJ-02	Segment 1	2/19/2016	14:50	Between SS	Lori Baumgartner	C	D	C				
SJ-02	Segment 1	2/24/2016	15:40	Between SS	Lori Baumgartner	C	C	D	Andrea Trese	C	C	C
SJ-02	Segment 1	2/26/2016	15:41	Between SS	Lori Baumgartner	C	C	D				
SJ-02	Segment 1	3/1/2016	14:30	Before SS	Lori Baumgartner	C	C	D				
SJ-02	Segment 1	3/2/2016	10:59	After SS	Lori Baumgartner	C	D	D				
SJ-02	Segment 2	9/25/2015	12:20	Between SS	Andrea Trese	B	B	B	Lori Baumgartner	C	B	C
SJ-02	Segment 2	10/2/2015	13:10	Between SS	Andrea Trese	C	B	C	Lori Baumgartner	C	B	C
SJ-02	Segment 2	10/6/2015	16:35	Before SS	Andrea Trese	C	B	C	Lori Baumgartner	C	B	C
SJ-02	Segment 2	10/7/2015	8:42	After SS	Lori Baumgartner	B	B	B				
SJ-02	Segment 2	10/9/2015	15:45	Between SS	Andrea Trese	C	B	C	Lori Baumgartner	B	B	B
SJ-02	Segment 2	10/13/2015	16:06	Between SS	Lori Baumgartner	C	B	C				
SJ-02	Segment 2	10/16/2015	14:47	Between SS	Lori Baumgartner	C	B	C				
SJ-02	Segment 2	10/20/2015	13:56	Before SS	Andrea Trese	C	B	C	Lori Baumgartner	C	B	C
SJ-02	Segment 2	10/21/2015	8:45	After SS	Andrea Trese	C	B	C				
SJ-02	Segment 2	10/27/2015	9:45	Before Rain Event	Lori Baumgartner	C	B	C				
SJ-02	Segment 2	11/2/2015	14:08	After Rain Event	Lori Baumgartner	B	B	B				
SJ-02	Segment 2	11/3/2015	15:07	Before SS	Lori Baumgartner	C	B	C				
SJ-02	Segment 2	11/4/2015	9:19	After SS	Lori Baumgartner	B	B	B				
SJ-02	Segment 2	11/6/2015	14:15	Between SS	Lori Baumgartner	C	B	B	Andrea Trese	B	B	B
SJ-02	Segment 2	11/7/2015	13:35	Before Rain Event	Lori Baumgartner	C	B	C				
SJ-02	Segment 2	11/9/2015	13:40	After Rain Event	Lori Baumgartner	B	B	B	Andrea Trese	B	B	B
SJ-02	Segment 2	11/13/2015	14:34	Between SS	Lori Baumgartner	B	B	B	Andrea Trese	B	B	B
SJ-02	Segment 2	11/16/2015	7:35	Before SS	Lori Baumgartner	B	C	C				
SJ-02	Segment 2	11/18/2015	8:34	After SS	Lori Baumgartner	B	B	C	Stefan Grozev	C	B	C
SJ-02	Segment 2	11/24/2015	9:23	Before Rain Event	Lori Baumgartner	C	B	C				
SJ-02	Segment 2	11/25/2015	9:36	After Rain Event	Lori Baumgartner	B	B	B				
SJ-02	Segment 2	12/1/2015	11:41	Before SS	Lori Baumgartner	C	D	C	Stefan Grozev	C	C	C
SJ-02	Segment 2	12/2/2015	10:39	After SS	Lori Baumgartner	B	B	B				
SJ-02	Segment 2	12/4/2015	9:37	Between SS	Lori Baumgartner	A	B	B				
SJ-02	Segment 2	12/9/2015	7:20	Before Rain Event	Andrea Trese	C	C	C				
SJ-02	Segment 2	12/11/2015	14:00	After Rain Event	Lori Baumgartner	B	B	C	Andrea Trese	C	B	C
SJ-02	Segment 2	12/15/2015	14:48	Before SS	Lori Baumgartner	C	B	C				
SJ-02	Segment 2	12/16/2015	7:20	After SS	Andrea Trese	B	B	C				
SJ-02	Segment 2	1/5/2016	14:00	Before SS	Lori Baumgartner	B	C	C				
SJ-02	Segment 2	1/6/2016	9:00	After SS	Lori Baumgartner	B	C	C				
SJ-02	Segment 2	1/13/2016	9:03	Between SS	Lori Baumgartner	C	C	C				
SJ-02	Segment 2	1/15/2016	15:06	Between SS	Lori Baumgartner	C	B	C				
SJ-02	Segment 2	1/19/2016	12:31	Before SS	Lori Baumgartner	B	C	C				
SJ-02	Segment 2	1/20/2016	8:32	After SS	Lori Baumgartner	B	C	C				
SJ-02	Segment 2	1/22/2016	15:00	Between SS	Lori Baumgartner	C	B	C				
SJ-02	Segment 2	1/27/2016	17:03	Between SS	Lori Baumgartner	C	C	C				
SJ-02	Segment 2	2/2/2016	12:24	Before SS	Andrea Trese	C	B	C	Lori Baumgartner	C	C	C
SJ-02	Segment 2	2/3/2016	9:02	After SS	Lori Baumgartner	C	C	C				
SJ-02	Segment 2	2/5/2016	15:03	Between SS	Lori Baumgartner	C	C	C	Andrea Trese	C	C	C
SJ-02	Segment 2	2/10/2016	12:42	Between SS	Andrea Trese	C	C	C	Lori Baumgartner	C	C	C
SJ-02	Segment 2	2/12/2016	6:50	Between SS	Lori Baumgartner	C	C	C	Jonathan Hawkes	D	C	D
SJ-02	Segment 2	2/16/2016	14:18	Before SS	Lori Baumgartner	C	C	C				
SJ-02	Segment 2	2/17/2016	13:35	After SS	Lori Baumgartner	C	C	C	Jonathan Hawkes	C	B	C
SJ-02	Segment 2	2/19/2016	14:50	Between SS	Lori Baumgartner	B	B	B				
SJ-02	Segment 2	2/24/2016	15:40	Between SS	Lori Baumgartner	C	B	C	Andrea Trese	C	B	C
SJ-02	Segment 2	2/26/2016	15:41	Between SS	Lori Baumgartner	C	B	C				
SJ-02	Segment 2	3/1/2016	14:30	Before SS	Lori Baumgartner	C	C	C				
SJ-02	Segment 2	3/2/2016	10:59	After SS	Lori Baumgartner	C	C	C				
SJ-03	Segment 1	9/25/2015	11:45	Between SS	Andrea Trese	C	C	C	Lori Baumgartner	C	C	C
SJ-03	Segment 1	10/2/2015	12:36	Between SS	Andrea Trese	C	C	C	Lori Baumgartner	C	C	D
SJ-03	Segment 1	10/13/2015	16:36	Between SS	Lori Baumgartner	C	C	C				
SJ-03	Segment 1	10/20/2015	14:26	Before SS	Andrea Trese	C	C	C	Lori Baumgartner	D	C	D
SJ-03	Segment 1	10/21/2015	16:31	After SS	Andrea Trese	C	C	C				
SJ-03	Segment 1	10/27/2015	9:05	Before Rain Event	Lori Baumgartner	C	C	C				
SJ-03	Segment 1	11/2/2015	13:32	After Rain Event	Lori Baumgartner	C	C	C				
SJ-03	Segment 1	11/4/2015	8:34	Between SS	Lori Baumgartner	C	C	C				
SJ-03	Segment 1	11/7/2015	13:10	Before Rain Event	Lori Baumgartner	C	C	C				
SJ-03	Segment 1	11/9/2015	14:13	After Rain Event	Lori Baumgartner	C	B	C	Andrea Trese	C	C	C
SJ-03	Segment 1	11/16/2015	7:08	Before SS	Lori Baumgartner	C	C	C				
SJ-03	Segment 1	11/18/2015	16:09	After SS	Lori Baumgartner	B	C	C				
SJ-03	Segment 1	11/24/2015	15:44	Before Rain Event	Lori Baumgartner	D	D	D				
SJ-03	Segment 1	11/25/2015	9:04	After Rain Event	Lori Baumgartner	B	C	C				
SJ-03	Segment 1	12/2/2015	10:06	Between SS	Lori Baumgartner	C	C	C				
SJ-03	Segment 1	12/9/2015	8:00	Before Rain Event	Andrea Trese	C	C	C				
SJ-03	Segment 1	12/11/2015	14:27	After Rain Event	Lori Baumgartner	C	C	C	Andrea Trese	C	C	C
SJ-03	Segment 1	12/15/2015	15:14	Between SS	Lori Baumgartner	C	C	C				
SJ-03	Segment 1	12/16/2015	7:55	Before SS	Andrea Trese	C	C	C				
SJ-03	Segment 1	12/17/2015	7:50	After SS	Lori Baumgartner	B	C	C	Jonathan Hawkes	C	D	C
SJ-03	Segment 1	12/24/2015	12:05	Between SS	Nick Zigler	B	C	C				
SJ-03	Segment 1	1/5/2016	15:12	Between SS	Lori Baumgartner	C	C	D				
SJ-03	Segment 1	1/11/2016	15:53	Between SS	Lori Baumgartner	C	C	D				
SJ-03	Segment 1	1/19/2016	13:06	Before SS	Lori Baumgartner	D	C	D				
SJ-03	Segment 1	1/20/2016	14:33	After SS	Lori Baumgartner	C	C	C				
SJ-03	Segment 1	1/28/2016	14:50	Between SS	Lori Baumgartner	D	D	D				
SJ-03	Segment 1	2/3/2016	8:33	Between SS	Lori Baumgartner	C	C	C				
SJ-03	Segment 1	2/10/2016	14:44	Between SS	Andrea Trese	D	C	D	Lori Baumgartner	D	C	D
SJ-03	Segment 1	2/16/2016	15:00	Before SS	Lori Baumgartner	C	C	D				
SJ-03	Segment 1	2/17/2016	16:32	After SS	Lori Baumgartner	B	C	C				
SJ-03	Segment 1	2/26/2016	15:02	Between SS	Lori Baumgartner	C	C	C				
SJ-03	Segment 1	3/2/2016	10:33	Between SS	Lori Baumgartner	C	C	C				
SJ-03	Segment 1	3/9/2016	14:56	Between SS	Lori Baumgartner	C	D	C				
SJ-03	Segment 1	3/15/2016	17:03	Before SS	Lori Baumgartner	C	C	D				
SJ-03	Segment 1	3/16/2016	16:04	After SS	Lori Baumgartner	A	C	C				
SJ-03	Segment 2	9/25/2015	11:45	Between SS	Andrea Trese	C	D	D	Lori Baumgartner	C	C	C
SJ-03	Segment 2	10/2/2015	12:36	Between SS	Andrea Trese	C	C	D	Lori Baumgartner	D	D	D
SJ-03	Segment 2	10/13/2015	16:36	Between SS	Lori Baumgartner	C	D	C				
SJ-03	Segment 2	10/20/2015	14:26	Before SS	Andrea Trese	C	C	D	Lori Baumgartner	D	C	D
SJ-03	Segment 2	10/21/2015	16:31	After SS	Andrea Trese	C	C	C				
SJ-03	Segment 2	10/27/2015	9:05	Before Rain Event	Lori Baumgartner	C	D	D				
SJ-03	Segment 2	11/2/2015	13:32	After Rain Event	Lori Baumgartner	C	C	C				
SJ-03	Segment 2	11/4/2015	8:34	Between SS	Lori Baumgartner	C	C	C				
SJ-03	Segment 2	11/7/2015	13:10	Before Rain Event	Lori Baumgartner	C	C	C				
SJ-03	Segment 2	11/9/2015	14:13	After Rain Event	Lori Baumgartner	C	C	D	Andrea Trese	D	C	D

Site ID	Segment ID	Date	Time	Event Timing	Observer #1	O#1 Street Score	O #1 Sidewalk Score	O#1 Overall Score	Observer #2	O#2 Street Score	O#2 Sidewalk Score	O#2 Overall Score
SJ-03	Segment 2	11/16/2015	7:08	Before SS	Lori Baumgartner	C	C	D				
SJ-03	Segment 2	11/18/2015	16:09	After SS	Lori Baumgartner	B	C	C				
SJ-03	Segment 2	11/24/2015	15:44	Before Rain Event	Lori Baumgartner	D	D	D				
SJ-03	Segment 2	11/25/2015	9:04	After Rain Event	Lori Baumgartner	C	C	C				
SJ-03	Segment 2	12/2/2015	10:06	Between SS	Lori Baumgartner	C	D	D				
SJ-03	Segment 2	12/9/2015	8:00	Before Rain Event	Andrea Trese	D	C	D				
SJ-03	Segment 2	12/11/2015	14:27	After Rain Event	Lori Baumgartner	C	D	C	Andrea Trese	D	C	D
SJ-03	Segment 2	12/15/2015	15:14	Between SS	Lori Baumgartner	D	D	D				
SJ-03	Segment 2	12/16/2015	7:55	Before SS	Andrea Trese	C	D	D				
SJ-03	Segment 2	12/17/2015	7:50	After SS	Lori Baumgartner	C	C	C	Jonathan Hawkes	B	C	C
SJ-03	Segment 2	12/24/2015	12:05	Between SS	Nick Zigler	C	C	C				
SJ-03	Segment 2	1/5/2016	15:12	Between SS	Lori Baumgartner	D	D	D				
SJ-03	Segment 2	1/11/2016	15:53	Between SS	Lori Baumgartner	D	D	D				
SJ-03	Segment 2	1/19/2016	13:06	Before SS	Lori Baumgartner	D	C	D				
SJ-03	Segment 2	1/20/2016	14:33	After SS	Lori Baumgartner	B	C	C				
SJ-03	Segment 2	1/28/2016	14:50	Between SS	Lori Baumgartner	D	D	D				
SJ-03	Segment 2	2/3/2016	8:33	Between SS	Lori Baumgartner	D	D	D				
SJ-03	Segment 2	2/10/2016	14:44	Between SS	Andrea Trese	D	C	D	Lori Baumgartner	D	D	D
SJ-03	Segment 2	2/16/2016	15:00	Before SS	Lori Baumgartner	D	D	D				
SJ-03	Segment 2	2/17/2016	16:32	After SS	Lori Baumgartner	B	D	C				
SJ-03	Segment 2	2/26/2016	15:02	Between SS	Lori Baumgartner	C	C	D				
SJ-03	Segment 2	3/2/2016	10:33	Between SS	Lori Baumgartner	C	D	D				
SJ-03	Segment 2	3/9/2016	14:56	Between SS	Lori Baumgartner	C	D	C				
SJ-03	Segment 2	3/15/2016	17:03	Before SS	Lori Baumgartner	C	C	D				
SJ-03	Segment 2	3/16/2016	16:04	After SS	Lori Baumgartner	C	C	C				