Visual On-land Trash Assessment Protocol for Stormwater

Version 1.3

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Visual On-land Trash Assessment Methodology

INTRODUCTION

This *On-land Visual Trash Assessment Protocol* is designed to provide qualitative estimates of the amount of trash generated on specific street segments, sidewalks and adjacent land areas that may be transported to a municipal stormwater conveyances system. Trash generation is a term used to describe the level of trash deposited onto land areas and available for transport to the conveyance system prior to removal via street sweeping or other significant management actions that intercept trash before entering the stormwater conveyance system. The protocol serves the following two purposes:

1) **Confirmation of Trash Generation** - to provide a line of evidence to confirm or redesignate trash generation rate categories[1] assigned to specific land areas via trash generation modeling, and;

2) **Assessing Changes in On-land Trash Conditions** - to provide a qualitative tool to assist in evaluating changes in the level of on-land trash that could be transported to a stormwater conveyance system.

In this methodology, the definition of trash or litter is generally consistent with the definition included in the California Code Section 68055.1(g)[2], but excludes sediments, sand, vegetation, oil and grease, exotic species, food waste (e.g., apple cores and banana peels), landscaping material that has been improperly disposed on the public right-of-way, and pet wastes. For the purposes of this protocol, mattresses, shopping carts, furniture, appliances, contained bags of trash, and all other illegally dumped large items not capable of fitting in a storm drain inlet opening are also excluded from the definition of trash.

PERSONNEL

This methodology requires at least two personnel, both for objectivity and safety. An additional person in the office should be designated as a point-of-contact with cell phone numbers of both field personnel and their planned schedule (i.e., location and time).

EQUIPMENT

The following equipment is needed to properly apply the protocol:

- Clipboard
- Pencils and red marker/Sharpie
- Digital camera (preferably with GPS capabilities)
- One copy of the field form for each assessment area

Bright clothing or safety vests are also recommended.

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[1] Trash generation rate categories have been calculated and mapped for much of the San Francisco Bay Area so that agencies can determine where to prioritize their resources for the Long Term Trash Load Reduction Plan. Trash generation rates depicted on the maps range from Low (0 – 5 gallons/acre/year) to Very High (> 50 gallons/acre/year).
[2] Defined as 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.

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ASSESSMENT AREA

When using the protocol to assess changes in on-land trash conditions, the length of the assessment should be approximately 1,000 curb feet and will be delineated on the assessment form. The width of the assessment area extends from the center line of the road (or middle of the median) to back of the sidewalk, and includes all portions of the public right-of-way that could reach the stormwater drainage system, including but not limited to the median, street, gutter, curb, sidewalk, back of sidewalk, and vegetated areas (e.g., grass, bushes, and tree wells). The assessment should also include any trash in visible areas that could theoretically reach the stormwater drainage system. If there are obstructions such as a building or fence that would prevent trash from moving to the stormwater drainage system, the area should *not* be included.

TIMING OF ASSESSMENT

When using the protocol to assess changes in on-land trash conditions, the timing of the assessment should be selected carefully in accordance with the following directions. In order to represent average trash conditions, assessments should be conducted at a time which is approximately half-way between control measure implementation events (e.g. street-sweeping events). Ideally, the assessment should be performed as close as possible to the day that is half-way between sweeping events. Certain conditions (such as holidays, weekends, sites wrapping around street corners and thus incorporating two different sweeping schedules) may merrit moving assessment dates (e.g. if a site is swept on the 1st Monday of each month, the 3rd Monday is ideal, but the 2nd Friday, 3rd Tuesday, or 3rd Wednesday are also fine. For a site swept each Tuesday, the site should be assessed on a Friday).

In order to reduce influence of recent rainfall, which may have washed street trash into storm drains, therefore lowering levels visible on-land, assessments should not be conducted after a significant rainfall event. A significant rainfall event is defined for this protocol as at least 0.5 inches of rain in a 24 hour period occurring withing a 48 hour period before the assessment.

Check recent rainfall by visiting: http://cdec.water.ca.gov/precip_maps/sf_24HRprecip.html or http://www.wrh.noaa.gov/mtr/versprod.php?pil=RR5&sid=RSA. If more than a half-inch of rain has fallen within a 24 hour period, reschedule the assessment for a later date.

Check forecasted rain levels by visiting: http://www.weather.gov/forecastmaps. Type in the zipcode and navigate to the hourly weather graph at the bottom right of the page.

TRASH CONDITION CATEGORIES

This assessment protocol is based on visual observations of the level of trash in a defined assessment area. Identify the condition category for the assessment area consistent with the definitions provided in the table. There are four primary condition categories (A, B, C and D) that an assessment area may be assigned based on the visual assessment.

Trash Condition Category	Definition
A Not Littered	• Effectively no trash is observed in the assessment area. • Approximately less than one piece per two car lengths on average • There may be some small pieces in the area, but they are not obvious at first glance • One individual could easily clean up all trash observed in a very short timeframe.
B Slightly Littered	• Predominantly free of trash except for a few littered areas. • On average, one piece per two car lengths • The trash could be collected by one or two individuals in a short period of time.
C Littered	• Predominantly littered except for a few clean areas. • Trash is widely/evenly distributed and/or small accumulations are visible on the street, sidewalks, or inlets. • At least two or three pieces per car length on average • It would take a more organized effort to remove all trash from the area.
D Very Littered	• Trash is continuously seen throughout the assessment area, • Large piles and a strong impression of lack of concern for litter in the area. • There is often significant litter along gutters. • It would take a large number of people during an organized effort to remove all trash from the area.

Important Note: Because the visual assessment protocol is intended to assess the level of trash observed on-land that can reasonably be transported to the stormwater conveyance system, only trash that appears to be mobile should be included in the assessment. Large items such as furniture, tires, and appliances should not be included in this assessment. Additionally, graffiti on roads, buildings, or landscaping in disrepair should not affect the assessment grading.

ASSESSMENT PROTOCOL

The following on-land visual assessment protocol should be used to assess **changes in trash generation** of a specific assessment area over time. The protocol should take no more than 10-15 minutes per assessment area, including discussions among team members and completion of the field form.

The protocol consists of the following steps that should be conducted in sequential order:

1. **Assemble equipment** needed to conduct the assessment including the field form delineating the assessment area.

2. **Review the assessment area provided**. Assessment areas are delineated on the field sheet by a yellow line. The line spans approximately 1,000 curb feet on one side of the street.

3. **Review trash condition category definitions** presented in Table 1 and examples in Appendix A.

4. After arriving at the assessment area, **safely walk at a normal pace on the sidewalk** from one end of the yellow line to the other. Team members should discuss their observations as they walk.

5. **Carefully look for trash deposited in the assessment area**. The width of the assessment area extends from the center line of the road (or middle of the median) to back of the sidewalk, and includes all portions of the public right-of-way that could reach the stormwater drainage system, including but not limited to the median, street, gutter, curb, sidewalk, back of sidewalk, and vegetated areas (e.g., grass, bushes, and tree wells). Also include any trash in parcels that could theoretically reach the stormwater drainage system, if there are no obstructions such as a building or fence that would prevent trash from moving to the stormwater drainage system.

6. **Note sources of trash on the field form**. If the source of the observed trash is evident and would require the attention of municipal staff, circle the number next to that source. Locate its location on the map and write the corresponding number at the location in red marker.

7. **Record the number of single-use plastic bags observed** during the assessment on the field form.

8. **Record an estimate of percentage of food and beverage waste observed** on the field form.

9. **Take at least one photograph per assessment area** to document that the site was visited. The photograph should represent the level of trash identified in assessment area. Photographs of trash sources or other items of interest are optional but encouraged.

10. **Note the street sweeping schedule on the field form** if it is posted.

11. If, based on the observations made during the assessment, there is **substantial variability** in the level of trash in the assessment area, **circle the letter "Y" for yes on the field form and segment the line** on the field form into multiple sub-segments. Define the new sub-segments on the map with their corresponding condition category using a red marker.

12. Team members may individually choose a trash condition category initially, but must **collectively agree on the appropriate trash condition category** to assign the area.

13. If the team assigns an assessment area the trash condition category "A", safely look in and/or around the storm drain inlet(s) draining the assessment areas to confirm that no or very little trash is in or around the storm drain inlet. **If there is substantial trash in the inlet, draw an asterisk on the map** at the location of the storm drain and circle the words "substatial inlet trash" on the form.

APPENDIX A

EXAMPLES OF TRASH CONDITION CATEGORIES

CONDITION A - LOW TRASH LEVEL

Description of a Grade A: 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.
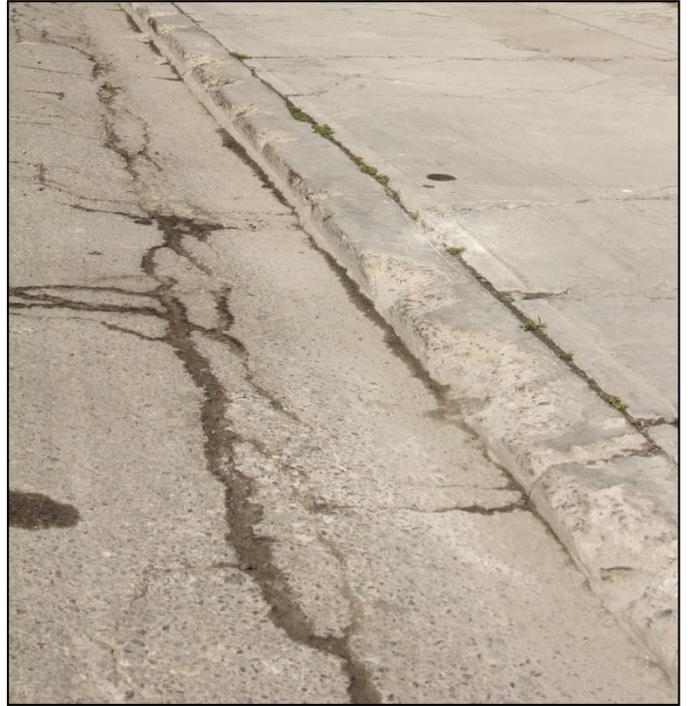
CONDITION B – MODERATE TRASH LEVEL

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.
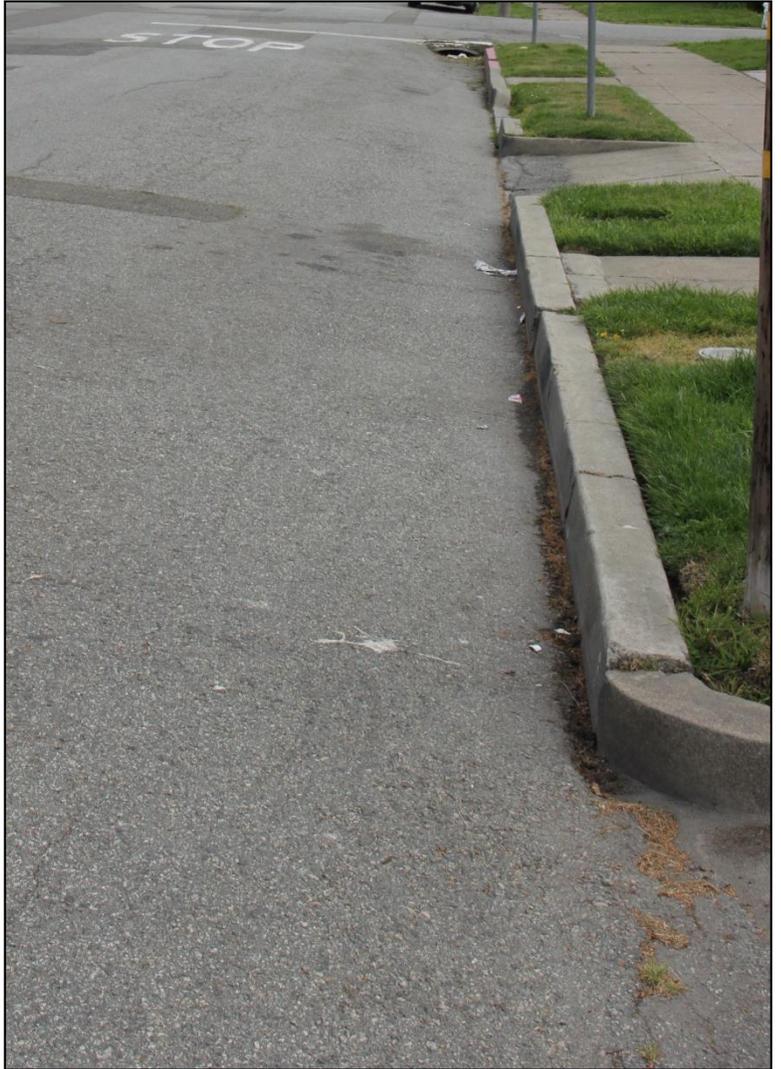
CONDITION C: HIGH TRASH LEVEL

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.
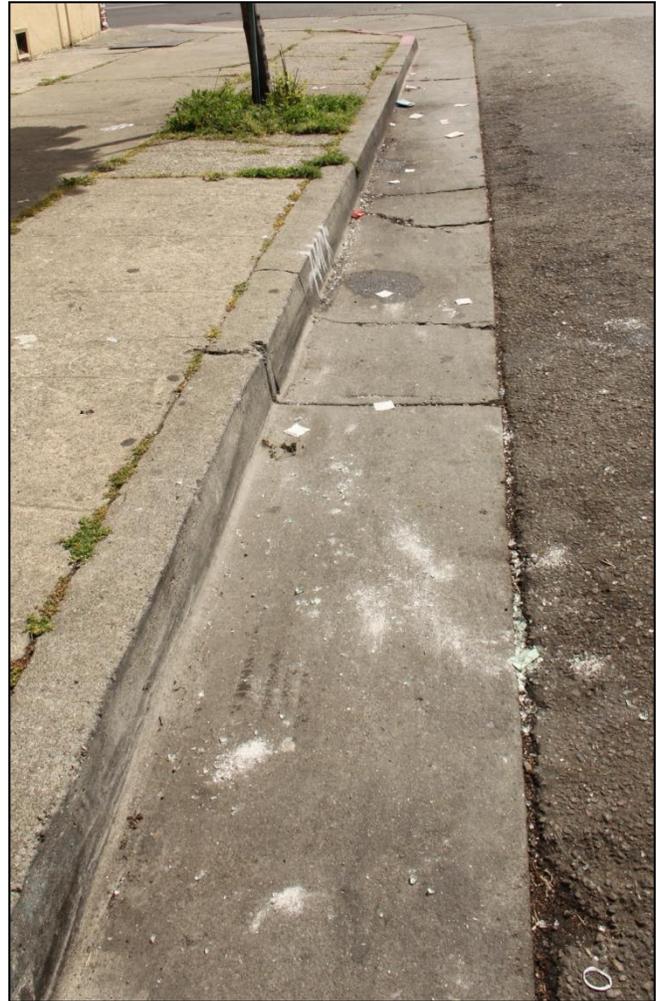
CONDITION D: VERY HIGH TRASH LEVEL

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.