STOPPING TRASH WHERE IT STARTS - SITE DESCRIPTION

1. Date _____Site ID_____ Name(s) of Surveyor(s) _____
2. Starts at: Lat_____Long_____ Ends at: Lat_____Long_____
3. Today: Temperature (°C/°F) _____ Rain (mm/inch) _____
4. Past 24 h: Avg Temp (°C/°F) _____ Rain (mm/inch) _____
5. Past 48 h: Avg Temp (°C/°F) _____ Rain (mm/inch) _____
6. Wind speed today (miles/h or km/h) _____
7. Survey start time _____ Survey end time_____

Assessment parameter	Least disturbed	Sub optimal urban	Marginal urban	Most disturbed	Average
Trash level first glance	Little or no trash detected (small pieces) which could be easily cleaned up in a short timeframe by one person.	Low levels of trash (few pieces) that could be easily cleaned up by two people in a relatively short time.	Medium quantity of trash evenly distributed or small piles of trash are visible. Site clearly shows MODERATE usage by people (e.g. cigarette butts, food and beverage containers, clothing)	Substantial quantity of trash throughout with large piles of trash . Site clearly shows HEAVY usage by people (e.g. cigarette butts, food and beverage containers, clothing)	
Surveyor 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
Surveyor 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
Access to the waterbody from the site	No access or difficult access due to any sort of barrier (vegetation or gate). Not used by people. Private or restricted area.	Limited access and no evidence of usage by people.	Public access is fair to good but no evidence of frequent use by people.	Optimal access (even dedicated trails) to the waterbody. Evident usage by people (e.g. food and/or drink items, cigarette butts).	
Surveyor 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
Surveyor 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
Floatability of litter found	Little (<25 items) or no floatable litter (transportable) litter (e.g. plastics, Styrofoam, cigarette butts)	Low to moderate (26-75 items) presence of buoyant (transportable) litter (e.g. plastics, Styrofoam, cigarette butts)	Moderate (76-200 items) presence of buoyant (transportable) litter (e.g. plastics, Styrofoam, cigarette butts)	Consistent (>200 items) presence of buoyant (transportable) litter (e.g. plastics, Styrofoam, cigarette butts)	
Surveyor 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
Surveyor 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
Large & or household items	No sign of illegal trash disposal. Trash is accidental or carried by surface runoff.	Some evidence of illegal dumping coupled with limited access.	One to two items (e.g. furniture, shopping carts, green waste) illegally dumped coupled with an almost facilitated vehicular access.	More than two items (e.g. furniture, shopping carts, green waste) illegally dumped coupled with an easy vehicular access.	
Surveyor 1	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
Surveyor 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0	
FINAL SCORE OUT OF A TOTAL OF 80 POSSIBLE POINTS					

8. Ground cover (%): Paved____ Grass_____ Shrubs/Bushes ____ Wooded _____Sand/Soil _____
9. Number of landscaped areas (e.g. flowers, mowed areas) _____ Specify _____
10. Number of people that walk by you:
    1st 10-min period _____2nd 10-min period _____3rd 10-min period _____
11. Number of vehicles that pass by you:
    1st 10-min period _____2nd 10-min period _____3rd 10-min period _____
12. Number of food-related business activities within the block (If 0 skip to question 15):
    a) Number of Grocery stores (e.g. Shop Rite, Walmart, Trader Joe's) _____
    b) Number of Convenience stores (e.g. 7-eleven, Dollar Tree)_____
    c) Number of Restaurants/Diners (e.g. Olive Garden, IHOP) _____
    d) Number of Coffee shops (e.g. Starbucks, Dunkin Donut) _____
    e) Number of Fast-foods (e.g. Mc Donald's, Burger King) _____
    f) Number of Food carts (e.g. hot dog, halal, bagels) _____
    g) Number of Food trucks (e.g. Ice cream truck) _____
    h) Number of Other _____Describe_____
13. Number of open bed vehicles (e.g. construction trucks, road maintenance) _____
14. Number of Public areas within the block_____ near-by_____ Distance _____
15. Number of Construction sites within the block_____ near-by _____Distance _____
16. Number of Loading docks within the block _____ near-by _____Distance _____
17. Number of Public buildings within the block _____near-by _____Distance _____
18. Number of trash cans on the block _____ (If 0 skip to question 21)
    a) Number of Trashcan with plastic bag liner _____ Without _____
    b) 100% full_____ 75% full_____ 50% full_____ 25% full_____ 0% full_____
    c) Number of trashcan with trash on the ground around the trashcan _____
    d) Among the trashcans with trash on the ground next to them, how many are:
       100% full_____ 75% full_____ 50% full_____ 25% full_____ 0% full_____
19. Number of recycling bins on the block _____ (If 0 skip to question 22)
    a) 100% full_____ 75% full_____ 50% full_____ 25% full_____ 0% full_____
    b) Number of recycling bins with litter on the ground around the bin _____
    c) Among the recycling bins with litter on the ground next to them, how many are:
       100% full_____ 75% full_____ 50% full_____ 25% full_____ 0% full_____
20. Number of manhole covers _____
21. Have you seen anyone collecting plastic bottles/cans? Yes _____ No _____
22. Number of storm drains _____
23. Number of storm drains clogged with litter or debris:
    100% clogged__ 75% clogged__ 50% clogged__ 25% clogged__ 0% clogged__?
24. Is there a particular spot in which you see the most litter (next to trash bins, on storm drains, on sidewalk, on the road, in tree pits, etc.)_____
25. Pictures taken (Y/N) _____

Notable/Unusual weather conditions (or NOTES in general)

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Measurements of the collected trash:

- **Volume determination of the bin:**

a) Bin sides (cm): *height*_____ (cm) *width*_____ (cm) *length*_____ (cm)

b) Volume of the bin: *height* x *width* x *length* = _____ (cm^3)

- **Volume determination of the trash collected:**

Trash volume (full bin): Same volume of the bin at b): _____ cm^3

Trash volume (not-full bin): _____ cm^3

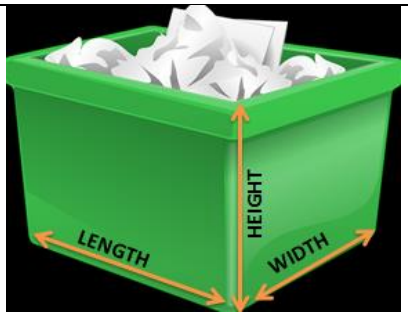
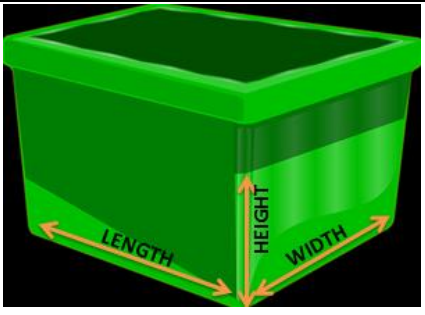
- Measure the *new height* of the trash inside the bin
- As for the *length* and *width* use the bin's measures from a).
- Compute the volume applying the multiplication at b).

- **Weight determination of the trash:**

  Put either the trash bag(s) or the bin with the garbage content on a digital scale.
  If using the bin, weight the bin first or put the bin on the scale first and reset the scale to 0.
  Then weight the content, either loose or inside a trash bag.

Trash weight: _____ kg (one decimal point is fine).

NOTE: If measures are taken in pounds or inches or feet, this MUST be specified.

Bin with trash – example of **FULL** bin	Bin with trash – example of a **NOT-FULL** bin
	

STOPPING TRASH WHERE IT STARTS - TALLY FORM

Category	Subcategory	Material	Tally	Brand/Notes
DRINKS CONTAINERS AND PARTS	Liquor Bottles	Glass		
	Non-Liquor Bottles	Plastic		
		Glass		
		Metal		
	Juice boxes	Composite		
	Cups	Styrofoam		
		Plastic		
		Paper		
		Glass/Ceramics		
	Caps	Plastic		
		Metal		
	Lid	Plastic		
		Metal		
	Straw	Plastic		
	Coffee stirrer	Plastic		
	Cup sleeves	paper		
	Four or Six pack rings for cans	Plastic		
	Bottle neck ring	Plastic		
	Liquor Cans	Metal		
	Non-Liq. Cans	Metal		
	Drink carrier/tray	Paper		
	Pull tabs	Metal		
FOOD WRAPPING & PACKAGING	Gum/Snacks/ candies Wrappers	Plastic		
		Aluminum		
		Paper		
	Utensils	Plastic		
	Ziplock bag	Plastic		
	Lollipop stick	Paper		
		Plastic		
	Popsicle stick	Plastic		
		Wood		
	Food Wrappers/Packaging	Plastic		
		Styrofoam		
		Metal		
		Paper		

		Composite		
	Food Containers	Plastic		
		Styrofoam		
		Metal		
		Paper		
		Composite		
	Subcategory	**Material**	**Tally**	**Brand/Notes**
	Plates	Styrofoam		
		Paper		
		Glass/Ceramics		
		Metal		
		Plastic		
MEDICAL RELATED	Drug vials	Plastic		
	Drug vials with content	Composite		
	Condoms	Plastic		
	Bandages	Plastic		
	Wound wrapping	Textile		
	Syringe	Composite		
	Pipette tips	Plastic		
ORGANIC WASTE	Human waste	Organic		
	Loose Pet waste	Organic		
	Wrapped Pet waste	Composite		
	Food waste	Organic		
	Yard waste	Organic		
	Leaves	Organic		
LARGER AND OR HOUSEHOLD ITEMS	Furniture	Composite		
	Mattresses	Composite		
	Bags with trash	Composite		
	Tires	Plastic		
	Appliances	Metal		
	Shopping carts	Metal		
	Vehicle batteries	Composite		
	Bike	Composite		
	Bike wheel	Composite		
	Vehicle wheel	Composite		
	Vehicle (specify)	Composite		
	Vehicle parts	Plastic		
		Metal		

TOBACCO PRODUCTS	Lighters	Composite		
	Cigarette/cigars butts	Composite		
	Tobacco wrap (cellophane)	Plastic		
		Cellophane/Foil		
	Tobacco box	Paper		
	Cigarette holder	Plastic		
	Matches	Composite		
Category	**Subcategory**	**Material**	**Tally**	**Brand/Notes**
CONSTRUCTION MATERIALS/TOOLS	Concrete waste	Rock		
	Bricks	Rock		
	Wood boards	Organic		
	Wood chips	Organic		
	Rebar	Metal		
	Tiles	Rock		
	Tarp	Plastic		
	Tools	Composite		
	Gloves	Textile		
MISCELLANEOUS	Balls (type)	Plastic		
	Toys	Plastic		
	Toys	Textile		
	Non-vehicle batteries	Composite		
	Pen/pencil	Plastic		
		Metal		
		Wood		
	Chemical containers	Composite		
	Personal care bottle	Plastic		
	Home care bottle	Plastic		
	Make up item	Plastic		
		Composite		
	Greasy layer on water (either oil or surfactant)	Composite		
	Spray paint cans (or bottles)	Composite		
	Hose/Pipe parts	Plastic		
		Metal		
	Wire/cable/rope	Plastic/Synthetic		
		Metal		

		Electric		
		Composite		
	Tarp	Plastic		
	Foam materials	Styrofoam		
	Dryer sheets	Textile		
	Non-food Wrappers/Packaging	Plastic		
		Metal		
		Styrofoam		
	Human diapers/pads	Composite		
	Wipes	Textile		
	Tampon applicators	Plastic		
	Grocery/Shopping bags	Plastic		
		Textile		
		Paper		
	Non-food containers	Plastic		
		Metal		
		Styrofoam		
MISCELLANEOUS	Product tag/label	Paper		
		Plastic		
		Textile		
		Metal		
	Newspaper	Paper		
	Magazine	Paper		
	Office paper	Paper		
	Cardboard	Paper		
	Tissue/Napkin	Paper		
	Flyer	Paper		
	Shoe/Boot	Composite		
	Clothes	Fabric		
	Bedding	Fabric		
	Cleaning bottles/spray	Plastic		
		Metal		
	Dead animals	Organic		
FRAGMENTS	Fragments/ Pieces	Glass		
		Plastic		
		Textile		
		Paper		
		Metal		
		Styrofoam		

		Composite		
		Other		
OTHERS (SPECIFY)				

STOPPING TRASH WHERE IT STARTS – SURVEY PROTOCOL

Survey dates:

The survey will take place on pre-scheduled dates which will depend on the absence of major rain events as well as the absence of street sweeping in the previous 48 hours.

Data forms and data insertion:

Both the SURVEY FORM and the TALLY FORM will be converted into a fillable pdf file once the final versions will be official. The fillable pdf files will be uploaded into iPads and surveyors will insert the information collected on site in these fillable forms. The forms will be saved using the following labeling code: DATE_SITEID. (DATE should be in the format *ddmmyy*).

The Site ID of each location will be provided to the surveyors in a list of sites complete of street names delimiting the area to be surveyed and indicative coordinates (longitude and latitude). This list will be completed at the end of the sites selection and scouting evaluation.

The SURVEY FORM is the first one that has to be completed. After completion of this document, the surveyor can move to the TALLY FORM, qualifying and quantifying the trash items found.

Meteorological information:

Air temperature (T) and rain during survey, average diurnal air T and cumulative rain in the previous 24 h, average diurnal air T and cumulative rain in the previous 48 h, and wind speed during the survey, should be noted from reliable sites on the same day, before heading to the site (e.g. NOAA, Newark International Airport).

Survey start time and survey end time:

They should be written in military format (24 hour-method). Example: instead of 2 pm it should be noted as 14:00. In this way, AM and PM specifications are not needed.

Names of the surveyors:

Complete first and last names of the surveyors are needed. Moreover, the initials of each surveyor should be reported in parentheses next to the full name.

Assessment parameter table:

This table is meant to provide an initial general visual assessment of the visited site. Since this information is mostly subjective to the surveyor's opinion, both surveyors at each site should select the value that better describes (from least disturbed to most disturbed) each of the

four parameters provided in the assessment parameter table. Two lines are provided in the table (one per each surveyor). No need to indicate who is surveyor 1 or 2. The values assigned to each parameter under evaluation will be averaged and each averaged value will be summed up to a final score reported out of the total of 80 possible points. This final score will help us to classify each site based upon an initial visual evaluation. For each parameter, four situations are described, and for each situation 5 values are available.

1. Trash level first glance: the surveyors should express in a value from 0 to 20, what is the level of trash presence in a first glance (pictures with examples will be provided).
2. Access to the waterbody from the site: each of the 35 sites was selected at a maximum distance of 300 m from the waterbody (either Passaic River or its tributaries). This means that they are located fairly close to the waterbody. Despite their vicinity, some of them might not have direct access to the waterbody (e.g. there is a private passage and/or a gate is present; it is densely vegetated and no pathways are cutting through the vegetation). On the other hand, direct access could be present that would easily let people do some activities next to the water and leave traces (trash) along the shoreline or on the way to the waterbody.
3. Floatability of litter found: the amount of trash found at the site might be significant but only a part of it is light enough to be easily transported by the wind or surface runoff to the waterbody. Here we want to estimate the approximate quantity of items that potentially could reach the water because of light-weighted items (e.g. plastic, Styrofoam, paper, cardboard).
4. Large or household items: in addition to the light trash that potentially could be transported to the waterbody we will evaluate the eventual presence of large and/or heavy items or any household object dumped on the street illegally that would negatively affect aesthetics.

Ground cover (%):

Here the surveyor is required to estimate the percent coverage at the ground level of the following ground cover categories: 1) Paved 2) Grass 3) Shrubs/Bushes 4) Wooded 5) Sand/Soil. For instance: Paved 80% Grass 0% Shrubs/Bushes 5% Wooded 5% Sand/Soil 10%
Depending on the representativeness of each category here, they could imply a higher or lower possibility of trapping or retaining the trash. Moreover, a lower paved area might represent a lower surface runoff effect.

Landscaped areas:

Usually, signs of beautification like, presence of flowers, mowed areas, trimmed bushes, are a sign of people taking care of the neighborhood and interested in keeping the area clean and in

order. There might be a linkage between the amount of trash found and the frequency of these signs of beautification.

People and vehicles that pass by you:

This information will give us an idea of how busy the site is and the relative frequentation of vehicles versus pedestrians. While two surveyors are collecting and tallying the trash found along the surveyed segment, a third person will be in charge of counting people and vehicles passing by in the street segment designated for the survey. This person will do it for 10 consecutive minutes using tally counters (like the ones used in a laboratory of biology). One tally counter will be used for counting the vehicles and one for counting the persons. Ideally, the 10-minute intervals should be repeated two more times any time during the permanence of the surveyors on the site that date.

This will allow a consistent comparison of foot and wheel traffic between sites. We suggest that the surveyor choose a spot in the block and maintain it, approximately, for the entire duration of the count. Although double counts are expected and will be considered as possible bias in this count, deciding not to change position is intended to minimize count bias.

Food related business activities within the block:

We distinguished the different types of food related businesses with the purpose of later finding the sources of litter, especially when the wraps and containers found are showing a brand. The different types are grocery and convenience stores, restaurants are grouped with diners, coffee shops, fast-foods. These are the stores that are always present, but there also could be food-carrying vehicles like ice cream trucks and carts. Some examples are provided in parentheses for each category. Also, an extra line for any other food business not listed is provided.

Open bed vehicles:

Vehicles that do not cover or secure their loads may allow for the release of items into the environment while operating or when parked and this may represent a noticeable contribution of trash to local waterways and also to Municipal Separate Storm Sewer System (MS4s). New Jersey regulates this issue through section 39:4-77 and any violator may be fined. For this reason, surveyors should write notes (e.g. plate number, construction business name) of any open-bed truck vehicle, within the surveyed segment site, which load is not secured. **Public areas, constructions sites, loading docks, public buildings:**

These areas are potential sources or carriers of trash. Public areas include playgrounds and parks and may be a source of food and drink-related containers and packages. Construction sites and loading docks may be sources of big plastic wraps, debris and cardboard. Public

buildings like hospitals, libraries, and post offices might represent highly-frequented meeting areas that may result in litter generation. These trash sources might be within the delineated surveyed area (within the 400m pre-determined segment(s)) and/or near-by. In this last case, the surveyors have to estimate the approximate distance (in m) from the limits of the surveyed block.

Trash cans and recycling bins:

The presence of trash cans and recycling bins is extremely important in the intent to keep the environment in which we live clean. The higher the number of these containers and the better they are maintained (replaced if broken and emptied when almost full) the easier is to keep the street clean. In addition, the presence or absence of plastic bag liners is important especially when liquids are disposed and when trash is in small pieces. The presence of a liner would prevent liquids and small parts to be spread out on the ground and also leach into draining systems when rain dilutes and washes them.

Manhole covers:

A manhole cover is a small opening in the street and covered by a lid, in order to allow staff in charge of maintenance to have access underneath it. This opening usually leads to a sewer. Depending on how the cover is made and what condition it is in, there could be passage of trash eventually present on the street into the opening.

Collectors of recyclables:

Often we can see people (mostly homeless) sorting plastic bottles and aluminum cans from the trash bins and from the street and collecting them in big plastic bags in order to sell them later to recycle points. If we see one of these individuals, it is important to mention it because they might be usually removing these items in that area. In fact, these people usually do not possess any vehicle so they can just cover a small area, the surveyed one included, and there could be bias in the tallying.

Storm drains:

Storm drains in between the curb and the street usually have large opening for allowing a good drainage of the stormwater flowing along the street. Unfortunately, when trash is present on the street, it can be transported along with the same stormwater (through water runoff) and it ends very often in these storm drains. Items smaller than the openings can be drained together with the water but larger items can remain stuck against the storm drain structure. This can prevent the rest of the water from draining properly and increase the amount of water running over the surface and eventually reaching the nearest waterbody together with the light trash that moves with it. In this case, both large and small trash items

represent a big problem. This is why we have to identify any storm drains and their condition (if clogged and at what percentage).

Particular spot with a lot of litter:

Surveyors should write down (and take a picture of it) if they see any particular spot in which the trash or debris seems to accumulate most. The location of accumulated debris could tell us a lot about the movement of material at that site or about particular activities or conditions which should receive the most attention.

Pictures:

We suggest taking pictures of significant areas/points/events/situations. Before doing this, the first picture to take should be of a white board showing site-specific information (date, Site ID, Initials of the surveyors) written with a dry erasable marker. In this way all the following pictures taken at the site will be consecutive to the board displaying the site-specific information. Pictures will be saved in the iPad and in the folder named PICTURES. Pictures and completed and saved forms will be sent through email to a project-specific email address. In this way the information and material collected will be maintained separate from other projects.

Notes in general:

Surveyors can write here anything that they think might need to be mentioned. For example if there is any unusual weather condition or activity.

Measurements of the collected trash:

- Volume determination of the bin (cm^3): the measurements of the bin should be taken and multiplied one another. This will provide the volume of the bin.

- Volume determination of the trash collected (cm^3): this value will be the same of the volume of the bin if the bin is filled with trash. If the bin is not full of trash, only the height of the bin will be different. The surveyor will have to measure the new height and multiply this new measurement by the same width and length. If both a full bin AND a portion of the bin are the case, both values need to be reported in the proper blank spaces.

- Weight determination of the trash (kg): the surveyor should put the trash on a field scale and written in the proper blank spaces (one decimal point). Put either the trash bag(s) or the bin with the garbage content on a digital scale. If using the bin, weight the bin first or put the bin on the scale first and reset the scale to 0. Then weight the content, either loose or inside a trash bag. NOTE: If measures are taken in pounds or inches or feet, this MUST be specified.

TALLY FORM

The first column lists the ten categories we grouped the item into: Drink containers and parts, Food wrapping and packaging, medical related, Organic waste, Larger and/or household items, Tobacco products, Construction material /tools, Miscellaneous, Fragments, Others.

The second column shows a long list of subcategories per each category, describing in details the several items that might be found as trash in an area. The subcategories indicate the individual items that will be tallied.

In the third column are listed all possible materials the individual items can be made of. The different materials listed are: metal, plastic, paper, glass, composite (when more than one material is present in the same item), Styrofoam, textile, fabric, organic (e.g.: food waste, material from pruning), and rock (e.g.: concrete, brick, tile).

The fourth column is for the tally. The person in charge tally lines (|) for each subcategory in the specific material it has been found. Tallies will be added up during the data analysis phase. A trash grabber or metal tongs and or latex/textile gloves should be used for picking up the trash.

The last column is intended for notes of any type. In particular, whenever it is possible and clear, the brand of the tallied item clearly coming from a particular store/discount/retailer should be specified. This will later help to trace back the sources of particular trash items and evaluate what could be done to reduce these sources.

Once trash has been tallied it has to be disposed in trash or recycle bags (except the large and/or heavy items) in plastic bags. These bags can be placed on a field scale in order to determine the weight of the entire collection from each site for each individual survey date. The weight value (in kg) should be reported on page 3 of the SURVEY FORM. Still on page 3 of the SURVEY FORM, the size (volume in cm^3) of the collected trash from the day should also be reported. Detailed instructions regarding how to determine the volume of the trash are provided in the same SURVEY FORM (still page 3). . The purpose of recording both volume and weight of the collected trash at the different locations is to provide results that can be compared with other projects even when the sites are in a totally different area. In some projects information about trash surveys is reported as count of items. In other researches, weight of the trash collected is provided. Finally, trash may be reported as a volume estimation. Having the opportunity to record both counts, weight and volume of the litter that we are going to collect will provided an exhaustive set of information which will allow different projects with different methodologies applied to be compared