



**CITY OF VANCOUVER**  
**Street Litter Audit**

**2018 Results**



October 12, 2018



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***Street Litter Audits – 2018 Report***

Dear Stephanie:

Dillon Consulting Limited is pleased to present the City of Vancouver with the 2018 street litter audit results. This report summarizes the information collected during the street litter audits that took place September 17-20, 2018. Through this report, we believe that we have efficiently provided an overview of the current accumulation and composition of litter at City of Vancouver pre-selected locations. These results have been compared to the baseline audits completed at the same sites in 2015 and follow-up audits that occurred in 2017.

Thank you for the opportunity to assist you once again with this important assignment. We look forward to discussing this report with you and supporting your ongoing litter and waste management initiatives.

Sincerely,

**DILLON CONSULTING LIMITED**

A handwritten signature in blue ink, appearing to read "Klaryssa Lawrie".

Klaryssa Lawrie, B.Sc., EPt.  
Project Manager

Our file: 18-8281

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# Executive Summary

The City of Vancouver (City) retained Dillon Consulting Limited to conduct the City's third round of street litter audits at 108 pre-selected locations within Vancouver. Sites audited were identical to those audited in the baseline and 2017 audits. The audits took place from September 17 – 20, 2018. These 108 sites were audited with the purpose of assessing the composition of the accumulated litter present on the streets of Vancouver. Two types of litter were assessed: large litter, which is any litter that is equal to or larger than four square inches; and small litter, which is any litter that is smaller than four square inches.

Within each site, a site survey and assessments on large litter and small litter were completed. An additional assessment, referred to as a 'supersite' evaluation, was completed at 19 of the pre-selected sites. A supersite evaluation refers to a more thorough assessment of small litter within the site. It should be noted that during the baseline audit, two sites were unable to be assessed because they were inaccessible. These sites were therefore not assessed in the follow-up audits that occurred in 2017 or in the 2018 street litter audits. Five sites in 2018 were situated immediately adjacent to active construction. In the analysis, these five sites were removed and analyzed separately.

The key findings of the large litter assessment were:

- The average number of large litter items per site was 9.7 pieces for sites with no construction and 10.5 if the sites with construction were included in the overall analysis.
- The most common categories for large litter observed were 'other miscellaneous' (25%), paper/fibre materials (18%) and cups (13%).
- The total large litter audited in 2018 was 1,138 pieces for both non-construction (998) and construction sites (140).

The key findings of the small litter assessment were:

- The average number of small litter items per site was 8.1 pieces for sites with no construction and 8.4 if the sites with construction were included in the overall analysis.
- The most common categories of small litter observed were cigarette butts/debris (34%) and chewing gum (19%).
- The total small litter audited in 2018 was 910 pieces for both non-construction (836) and construction sites (74).

Supersite audits were completed within 19 sites. The key findings of the supersite assessments were:

- The average number of small litter items per site was 37.1 pieces of small litter.
- The most common categories of small litter observed in the supersites were chewing gum (42%) and cigarette butts/debris (38%).
- The total small litter audited in the 2018 supersites was 7,070 pieces.

## 1.0

## Introduction

The City of Vancouver (City) is home to over 603,000 residents across an area of 114 km<sup>2</sup>. A bold initiative of Vancouver is to be recognized as the *Greenest City* in the world by the year 2020; effective management of waste is an integral part of achieving this initiative.

The City's *Greenest City Action Plan* 2015-2020 (GCAP) was approved by City Council in 2011 along with high priority actions to work towards achieving the 10 goals and targets outlined in the GCAP. Of relevance to the street litter audit, *Goal 4: Zero Waste* of the GCAP aims to reduce solid waste going to landfill and incinerator by 50% from 2008 levels. More specifically, the litter audit is an important step towards achieving Action 4.3 of the GCAP which targets the reduction of street litter and abandoned garbage in public spaces. This includes illegal dumping, and increased diversion of these materials through implementation of a comprehensive litter management strategy. While the overall tonnage of street litter across the City is fairly small, reducing street litter can have a great impact on individual behaviour and public perception as street litter is such a visible component of a waste management system.

The City retained Dillon Consulting Limited (Dillon) to conduct street litter audits at 108 pre-selected locations within the public realm across the City. The audits took place from September 17-20, 2018. This is the third round of audits completed for the City at the same pre-selected sites. A baseline assessment was completed in the fall of 2015. These 108 sites were audited with the purpose of assessing the composition of the accumulated litter present on the streets of Vancouver. The types of litter were classified into two categories: large litter (equal to or larger than 4 square inches) and small litter (smaller than 4 square inches). Within each site, a site survey, large litter assessment and small litter assessment were completed. Within 19 of the pre-selected sites a supersite audit was also completed. It should be noted that in 2015 two sites were unable to be assessed due to lack of access (Site 29 and Site 99). These sites were therefore not included in the 2017 audits or the 2018 audits. The site distribution map is provided in **Appendix A**.

The main objectives of the street litter audits included:

- A detailed analysis of large litter items within the survey area;
- A detailed analysis of small litter items that fell within three small subsections of each survey area;
- A detailed analysis of small litter items in 'supersites' found within 19 of the survey areas;
- Analysis and reporting of results with a focus on a comparison to the 2015 baseline results and other municipalities, and
- Analysis and reporting of results with a focus on a comparison to the follow-up results from 2017.

Dillon staff were asked to note if any sites had construction occurring immediately adjacent the pre-selected site. There were five sites where this transpired (Sites 15, 48, 82, 89 and 103). In the analysis, these five sites were removed and analyzed separately.

## 2.0 Methodology

Dillon staff completed litter assessments on the same 108 sites that were selected for the baseline street litter audits in 2015, and audited again in 2017. This section of the report provides a brief overview of the street litter audit methodology; a detailed methodology is provided in **Appendix B**.

### 2.1 Conducting the Litter Audit

Dillon staff followed the same standard litter audit methodology used in the 2015 and 2017 audits. Areas were measured to be 200 feet x 18 feet, whenever possible. When an audit area was full sized (i.e., 200 feet x 18 feet), it was termed a “fixed site”. The site width may have been less than 18 feet in certain cases. This included scenarios such as when residential property lines exist or when a commercial storefront was less than the prescribed distance. In these cases, each site was 200 feet in length by the available width. These sites are termed “variable sites”.

From the beginning of the pre-selected site, the team used a measuring device to measure 50 feet ahead of the start of the site. Using a temporary marking method (e.g., pylons), a mark was made on the pavement to denote the starting point of the pre-selected audit site. From this point the team used a measuring device to measure 100 feet, marking the roadway with another temporary identifier to show the mid-point of the site. A final measurement of an additional 100 feet denoted the end of the audit site.

The width measurements were taken at the start, midpoint and end of the site. The width of the site was measured 1.5 feet from inside the curb or the start of the pavement, towards the outer edge of the site. The maximum width was 18 feet and marked to indicate the boundary.

#### 2.1.1 Site Survey

Before any litter audits were initiated, a site survey was completed. During the site survey Dillon staff recorded relevant information about the litter site and the surrounding vicinity. Information collected on these forms included:

- Date and time;
- Audit team;
- Site identification;
- Audit area size;
- Characteristics and type of adjacent road;
- General attributes of the area; and
- Visual rating of the site.

This detailed information is provided in **Appendix C**.

## 2.1.2 Classification of Large Litter

To maintain consistency with the previous litter audits, large litter was defined as any litter that was greater than or equal to 4 square inches in size. In order to assist the team completing the audit, a template was created to illustrate what 4 square inches equated to in multiple shapes. Large litter audits took place throughout the entire site. A first and second pass was completed on the site and litter observed was recorded on a large litter data form (**Appendix D**). An average number of litter items for the first and second passes were used as the value for the amount of large litter observed on a site.

## 2.1.3 Classification of Small Litter

Small litter was defined as observed litter that was less than 4 square inches in size. The small litter audit involved examining three sections within the audit site. Dillon staff constructed a small litter frame using PVC plastic tubing measuring one foot wide and six feet long to serve as the template. Up to three consecutive “flips” of the template frame were completed to cross the 18 foot boundary of the site. The litter auditor observed and counted all of the small litter contained within the template at three locations within each site: at the start, midpoint and end of the site. All data was recorded on the small litter form provided in **Appendix D**.

## 2.1.4 Supersite

The supersite audits entailed having Dillon staff record ***all*** the small litter observed within the fixed or variable site for a more thorough assessment of small litter. This was accomplished by having one team member record data while the other is counting small litter within the site. Supersite audits were completed at the 19 pre-determined sites as selected by the City. Supersite evaluation forms are also provided in **Appendix D**.

## 2.1.5 Photographic Record of the Site

During the site survey, the litter audit team took photographs of the site from three points. The first photograph was taken from the beginning of the site looking towards the end of the site. The second photograph was taken from the mid-point of the site looking into the site (towards the boundary) and the final photograph was taken from the end of the site looking towards the start. **Figure 1 to Figure 4** provides an example of the photographs taken at each site.

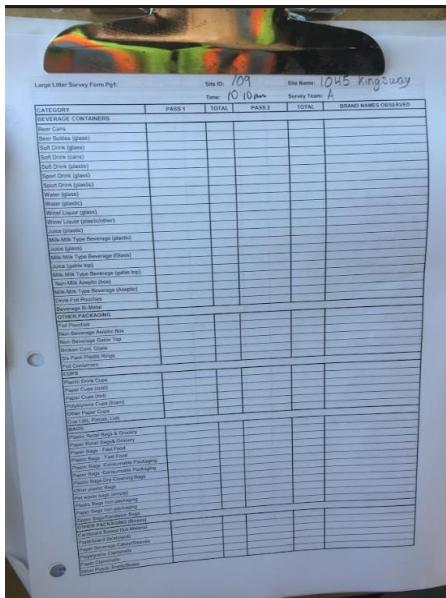


Figure 1: Site ID Photo



Figure 2: Start of Site



Figure 3: Middle of Site

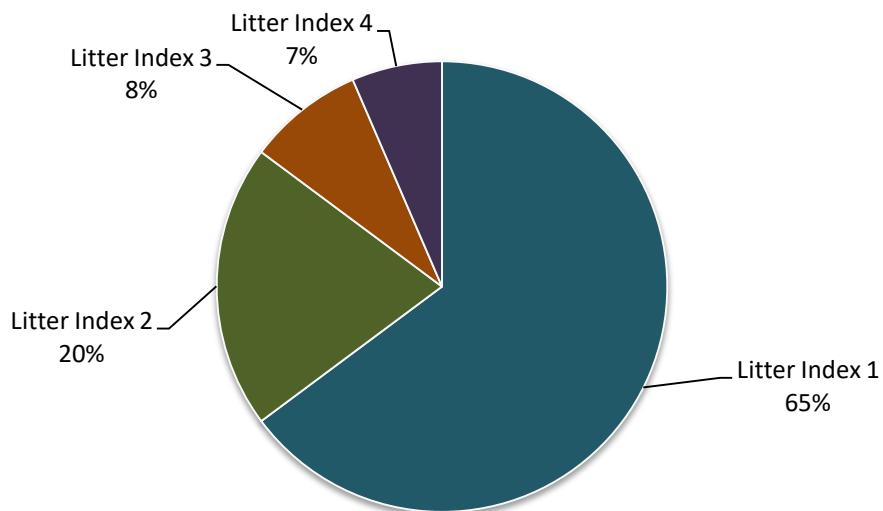


Figure 4: End of Site

## 3.0 Summary of Litter Results

### 3.1 Visual Assessments of Litter Sites

As a part of the site survey, Dillon staff collected information about the area and adjacent roads of the audit sites. Dillon staff would visually assess the site and rank it on a scale from 1 to 4. This was termed the visual litter index. In this index, 1 represented sites that were clean (less than five pieces of large litter visible) and 4 represented sites that were considered dirty (more than 20 pieces of large litter visible). **Figure 5** illustrates the results of this visual index for all 108 litter sites. Overall, 65% of sites were considered to be clean (and given a ranking of 1). An additional 20% were ranked as a 2, 8% were ranked as a 3 and 7% was ranked as having a visual index of 4. **Table 1** provides a breakdown by site type and the average visual rating observed. The sites where construction was observed were given a ranking of 2 (sites 48 and 103) and 4 (sites 15, 82 and 89).



**Figure 5:** Visual Assessment Ranking of all Sites

**Table 1: Average Visual Ranking by Site Type**

Site Type	Average Visual Rating
Commercial	1.7
Industrial	1.3
Institutional	2.0
Multi-Family	1.4
Single-Family	1.5
Mixed Use	2.2

The remainder of the results (**Subsections 3.2 to 3.4**) are representative of the 103 sites that were not immediately adjacent to construction. The five sites that did have construction activities are analyzed in **Subsection 3.5**.

### 3.2 Large Litter Results

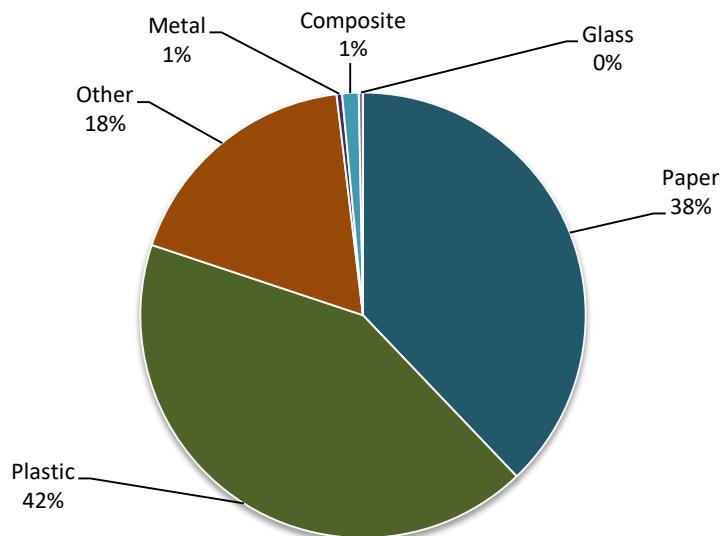
Large litter is any piece litter that is equal or greater than 4 square inches in size. This section of the report provides results for large litter by material type, category and subcategory. In 2018, the average number of large litter items per site was 9.7 pieces. The most common sub-category of large litter observed was Miscellaneous Paper. This litter represented 9% of all litter surveyed. **Table 2** illustrates the 20 most common large litter items observed (by sub-category) in the 2018 street litter audits. These 20 item types account for 76% of the total large litter items observed. The complete list of items is provided in **Appendix E**.

**Table 2: Top 20 Large Litter Items**

Number	Large Litter Item	Number Observed	% of Total Large Litter Items Observed	Cumulative Total (%)
1	Misc. Paper	86	9%	9%
2	Misc. Plastic	80	8%	17%
3	Cup Lids, Pieces	63	6%	23%
4	Non-Brand Towels/Napkins	58	6%	29%
5	Printed Material	58	6%	35%
6	Receipts (business forms, bus tickets)	52	5%	40%
7	Snack Food Packaging	42	4%	44%
8	Utensils	41	4%	48%
9	Cigarette / Cigar Debris	36.5	4%	52%
10	Plastic Packaging Other	32.5	3%	55%
11	Home Articles	28	3%	58%
12	Paper Cups (hot)	27	3%	61%
13	Paper Cups (cold)	24	2%	63%
14	Candy Bar Wrappers	22	2%	65%
15	Condiment Packaging	20	2%	67%
16	Tobacco other	20	2%	69%
17	Other Construction/ Demolition Debris	18	2%	71%
18	Cardboard Boxes/ Box Material	17	2%	73%
19	Paper Food Wrap	17	2%	74%
20	Plastic Drink Cups	15	2%	76%
<b>Total Top 20</b>		<b>757</b>	<b>76%</b>	
<b>Total All Litter</b>		<b>998</b>	<b>100%</b>	

**3.2.1****Large Litter by Material Type**

Items within the large litter categories were composed of different material types (paper, plastic, glass, metal, composite and other). These items were classified based on their known composition. **Figure 6** illustrates the breakdown by material type of all 998 pieces of large litter observed in the 2018 street litter audits. The largest material type observed was plastic (42%), followed by paper (38%) and ‘other’ (18%). Metal and composite materials each represented 1% of the materials observed, and glass was less than 1% of all litter observed.



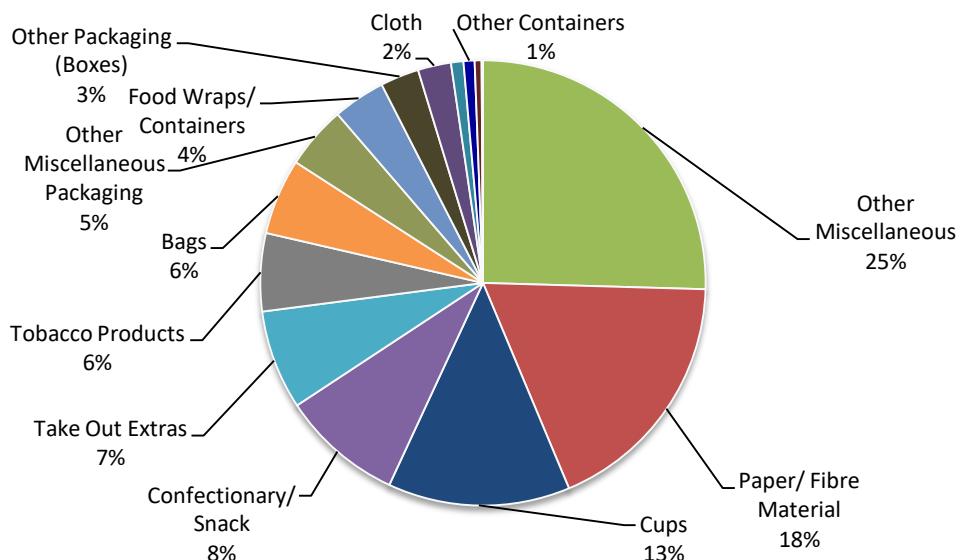
**Figure 6: Large Litter by Material Type**

**3.2.2****Large Litter by Category**

Each of the large litter items were classified into 15 categories and 120 sub-categories. **Table 3** provides a summary of the total amount of large litter observed for each of the 15 categories. In 2018, the most common category of litter observed was ‘other miscellaneous’ (25%). Miscellaneous litter included items such as miscellaneous paper, plastic, as well as household items. Paper/fibre material (18%) and cups (13%) were the next most common categories of litter recorded. **Figure 7** illustrates these results.

**Table 3: Large Litter Totals by Category**

Category	Observed Number of Items	Percentage of Large Litter Observed
Beverage Containers	9	1%
Other Packaging	5	1%
Cups	132	13%
Bags	55	6%
Other Packaging (Boxes)	28	3%
Other Containers	8	1%
Food Wraps/ Containers	38	4%
Take Out Extras	72	7%
Trays	1	0%
Confectionary/Snack	88	9%
Cloth	24	2%
Other Miscellaneous Packaging	45.5	5%
Paper/Fibre Material	182	18%
Tobacco Products	56.5	6%
Other Miscellaneous	254	25%
<b>Total</b>	<b>998</b>	<b>100%</b>

**Figure 7: Large Litter Items by Category**

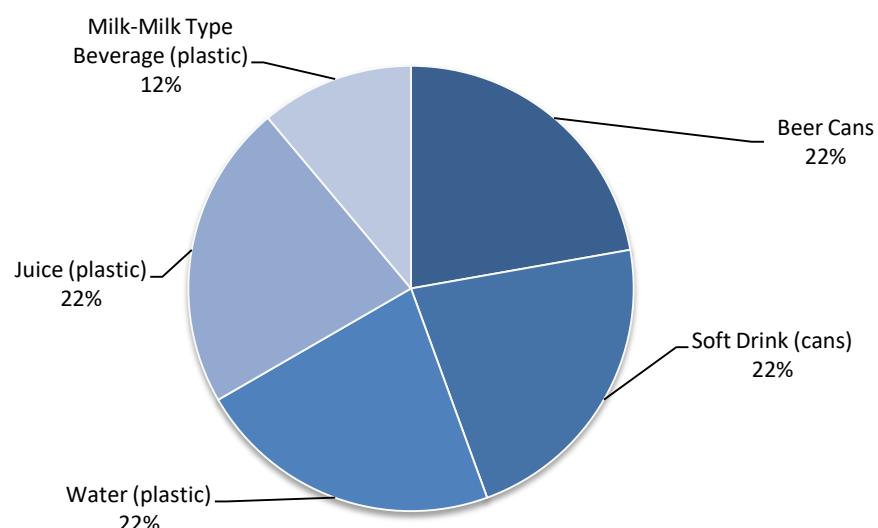
## 3.2.3

**Large Litter by Sub-Category**

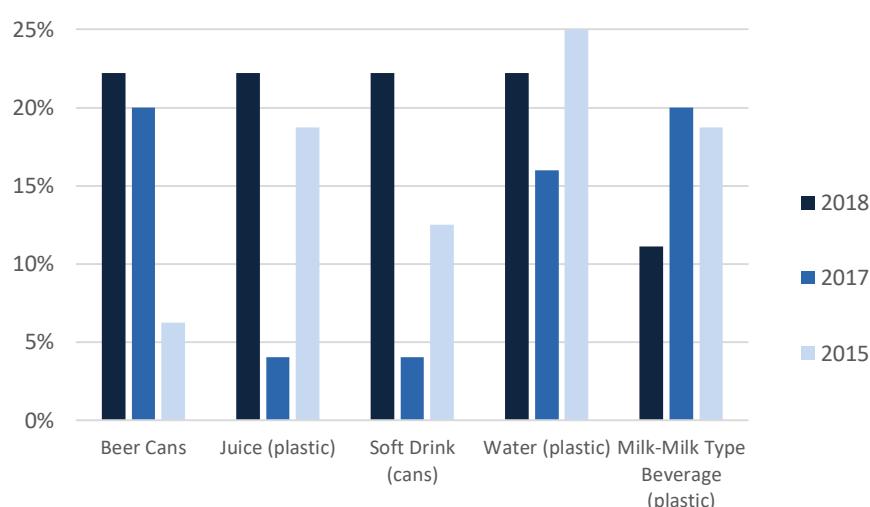
Each of the 15 large litter categories has several subcategories within them. The breakdown of litter by sub-categories is provided below.

**Beverage Containers:**

Beverage containers accounted for 1% of all large litter observed in the 2018 audits. The largest sub-category evaluated for beverage containers were beer cans, soft drink (cans), water (plastic) and juice (plastic), which each represented 22% of the beverage containers, respectively. **Figure 8** illustrates the breakdown of the beverage container category. **Figure 9** compares the highest five sub-categories from 2018 to the 2015 baseline and 2017 litter audits.



**Figure 8: Beverage Containers Composition 2018**

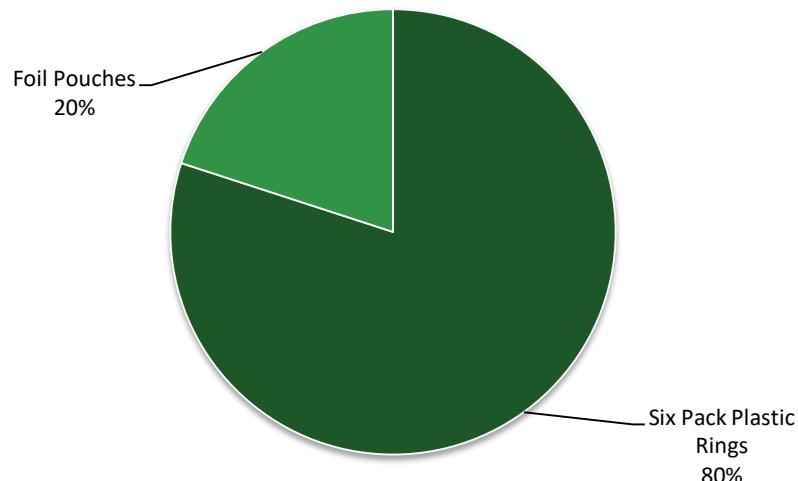


**Figure 9: Beverage Containers 2018, 2017 and 2015 Comparison**

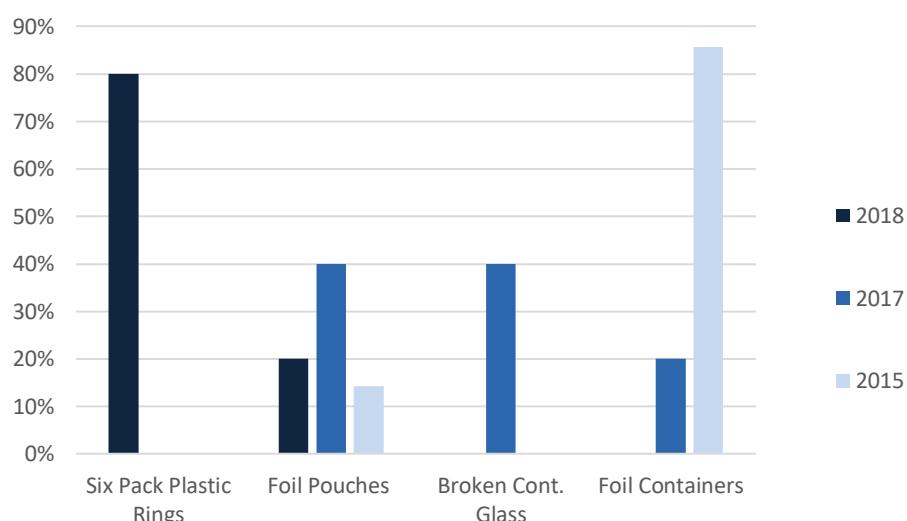
**Other Packaging:**

'Other packaging' accounted for 1% of the overall large litter observed for the City's 2018 audits. Six pack plastic rings (80%) and foil pouches (20%) comprised the 'other packaging' category, entirely.

**Figure 10** illustrates the results of the other packaging category for 2018 and **Figure 11** compares the highest four sub-categories from all litter audits.



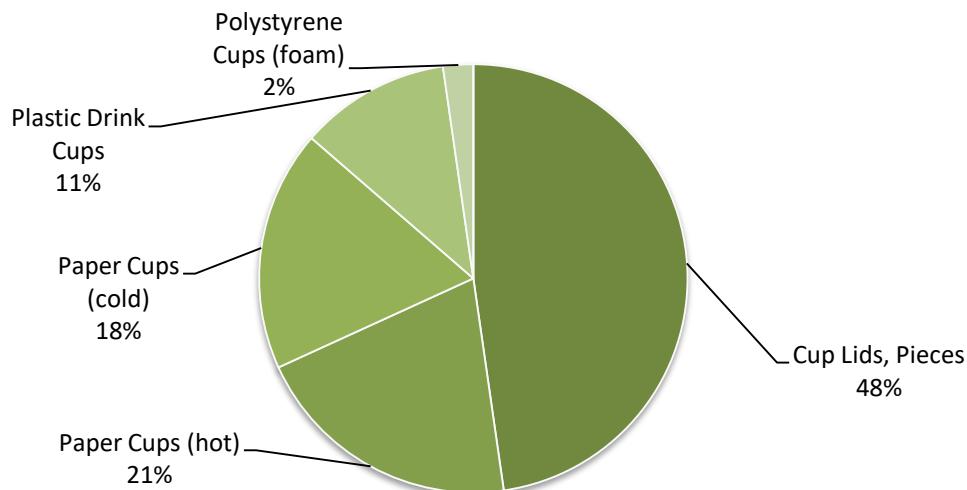
**Figure 10: Other Packaging Composition 2018**



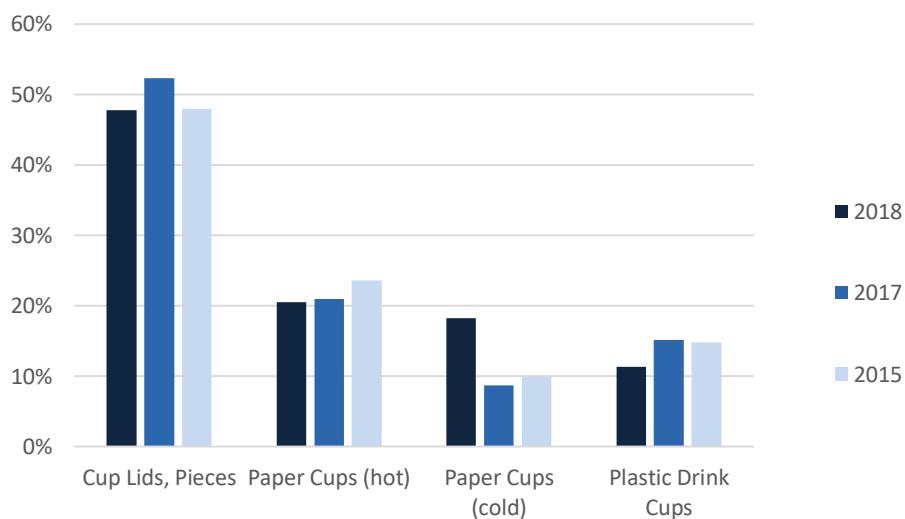
**Figure 11: Other Packaging 2018, 2017 and 2015 Comparison**

### Cups:

Cups were the third largest category observed in the 2018 street litter audits and represented 13% of all large litter observed. Cup lids and/or pieces were the largest subcategory (48%), followed by paper cups (hot) (21%), and paper cups (cold) (18%). **Figure 12** illustrates the breakdown of the cups category while **Figure 13** compares the highest three sub-categories from the three completed litter audits.



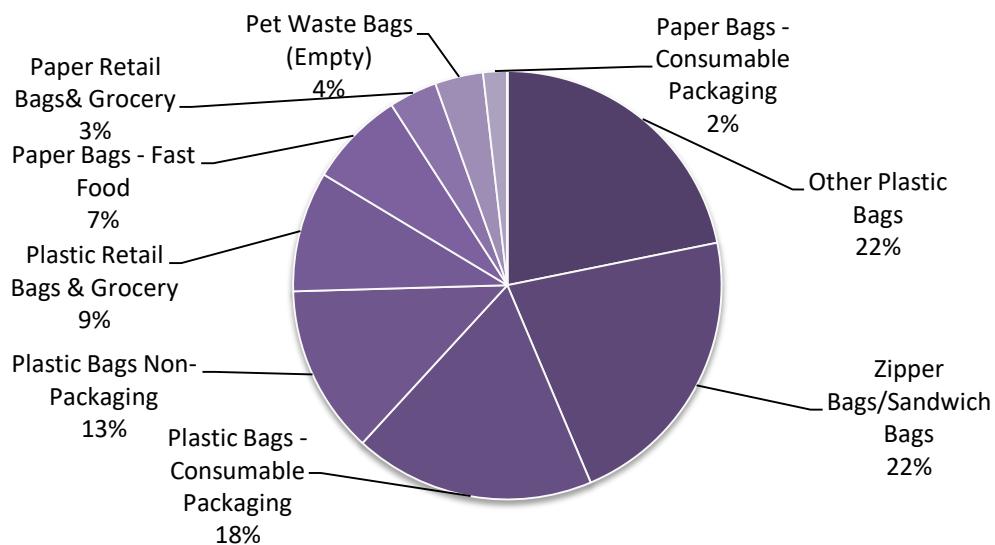
**Figure 12: Cups Composition 2018**



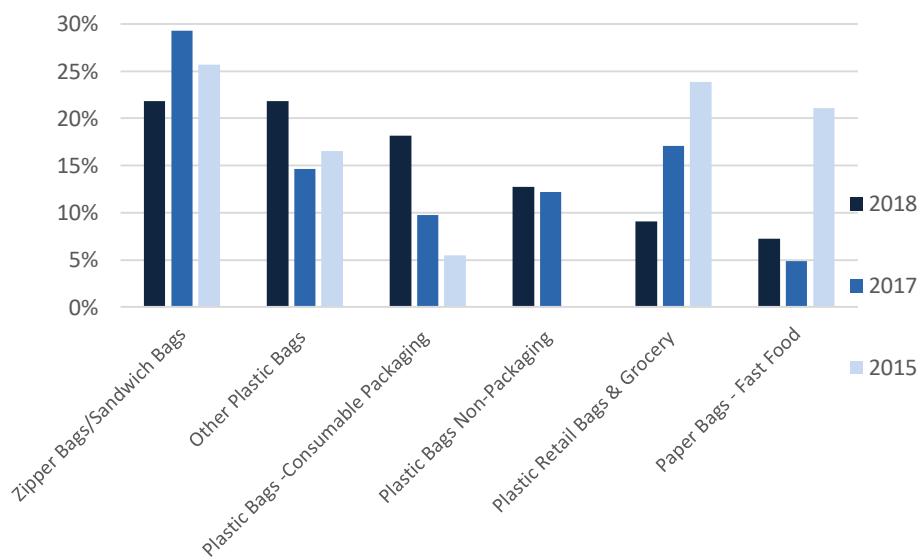
**Figure 13: Cups 2018, 2017 and 2015 Comparison**

### Bags:

Bags represented 6% of all large litter observed. This category was comprised primarily of other plastic bags (non-fast food or retail) (22%) and zipper bags/sandwich bags (22%). **Figure 14** illustrates the 2018 composition of the bags category; **Figure 15** compares the highest six sub-categories from 2018 to 2017 and 2015 results.



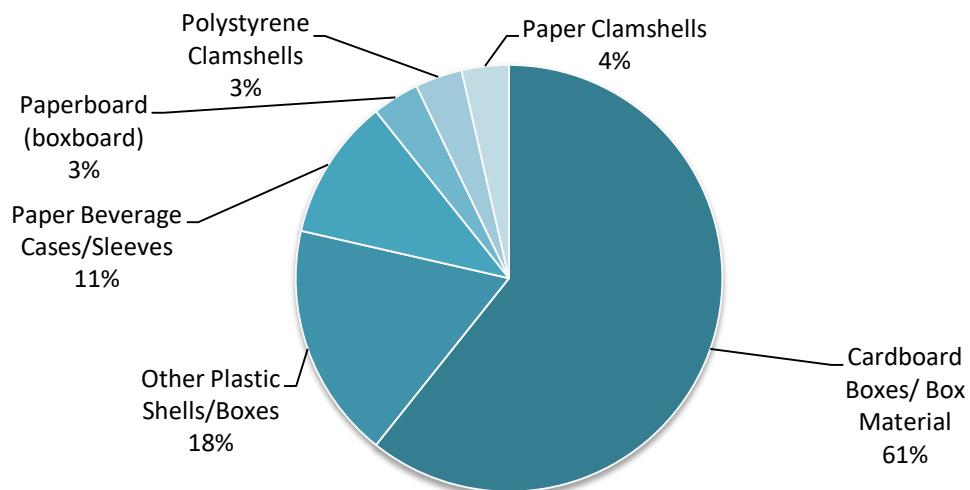
**Figure 14: Bags Composition 2018**



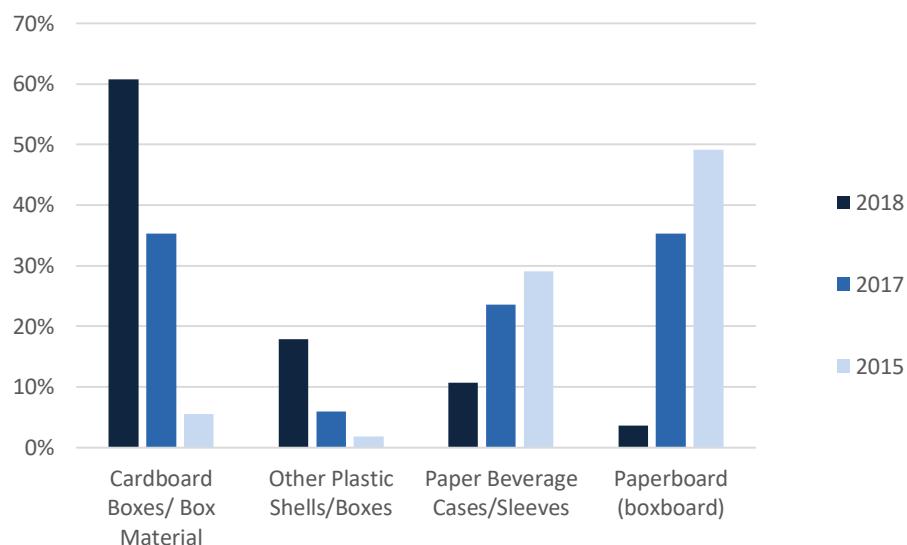
**Figure 15: Bags 2018, 2017 and 2015 Comparison**

### Other Packaging (Boxes):

Within the 2018 audits other packaging (boxes) represented 3% of the accumulated large litter. This category consisted mostly of cardboard boxes/box material (61%), as illustrated in **Figure 16**. **Figure 17** compares the highest four sub-categories from the 2018 audits to the 2017 and 2015 results.



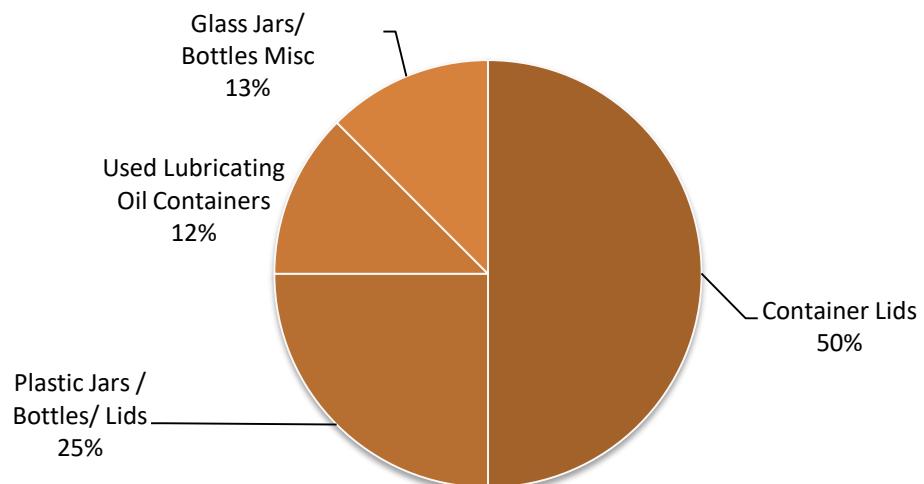
**Figure 16: Other Packaging (Boxes) Composition 2018**



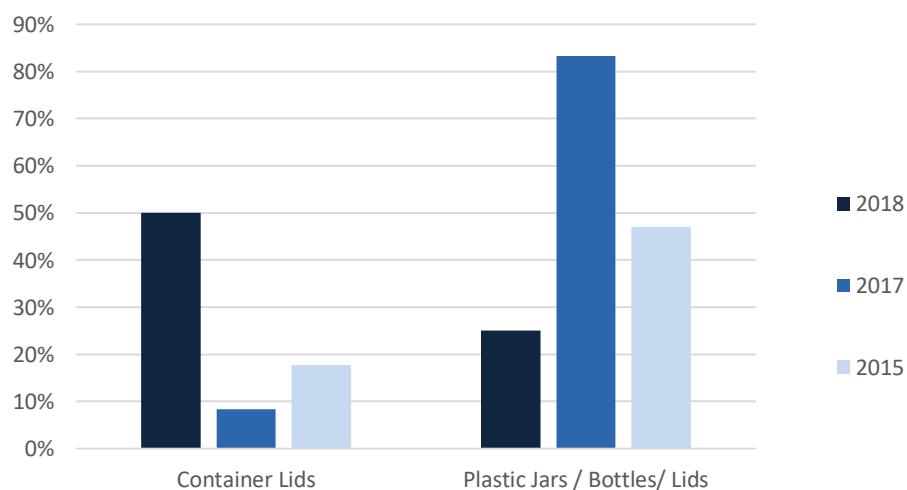
**Figure 17: Other Packaging (Boxes) 2018, 2017 and 2015 Comparison**

### Other Containers:

Other containers represented 1% of all large litter observed in 2018. The breakdown of this category was largely container lids (50%) followed by plastic jars/bottles/lids (25%). This composition is illustrated in **Figure 18** while a comparison of the highest two sub-categories from 2018 to 2017 and 2015 results is illustrated in **Figure 19**.



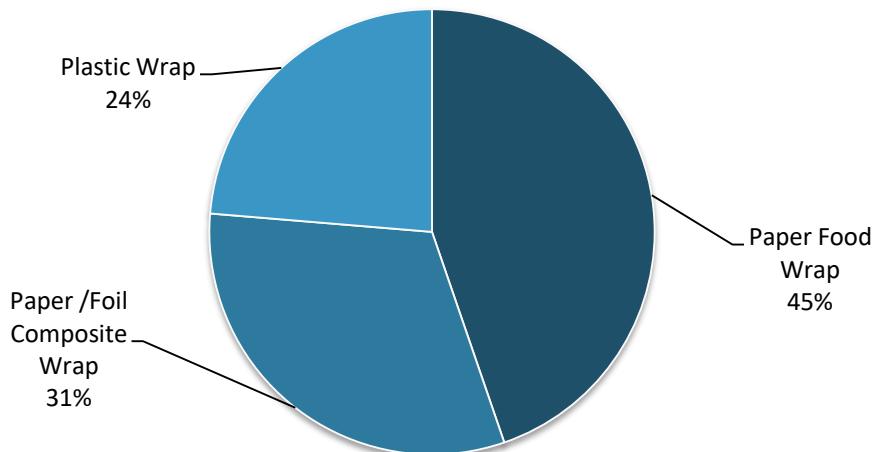
**Figure 18: Other Containers Composition 2018**



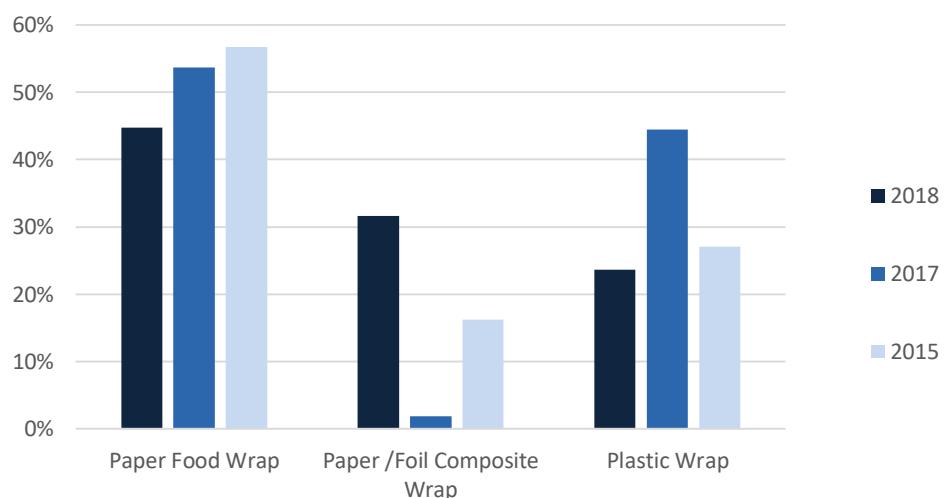
**Figure 19: Other Containers 2018, 2017 and 2015 Comparison**

### Food Wraps/Containers:

Food wraps/containers represented 4% of the litter observed in this audit. **Figure 20** illustrates the breakdown of this category. The sub-categories that comprised food wraps/containers included: paper food wrap (45%), paper/foil composite wrap (31%) and plastic wrap (24%). **Figure 21** compares all three sub-categories from 2018 to the 2017 and 2015 results.



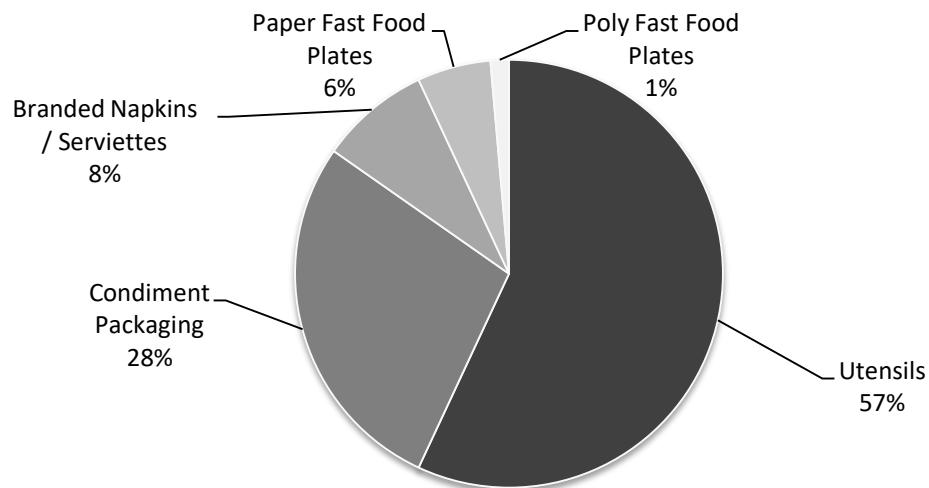
**Figure 20: Food Wraps/Containers Composition 2018**



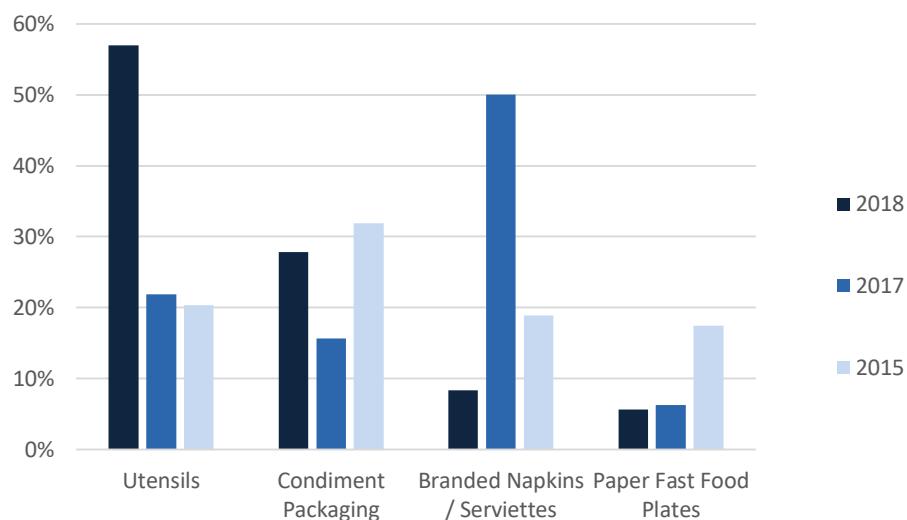
**Figure 21: Food Wraps/Containers 2018, 2017 and 2015 Comparison**

### Take out Extras:

Take out extras accounted for 7% of the large litter observed. This category was comprised largely of utensils (57%) and condiment packaging (28%). **Figure 22** illustrates the breakdown of this category while **Figure 23** compares the highest four sub-categories from 2018 to the 2017 and 2015 results.



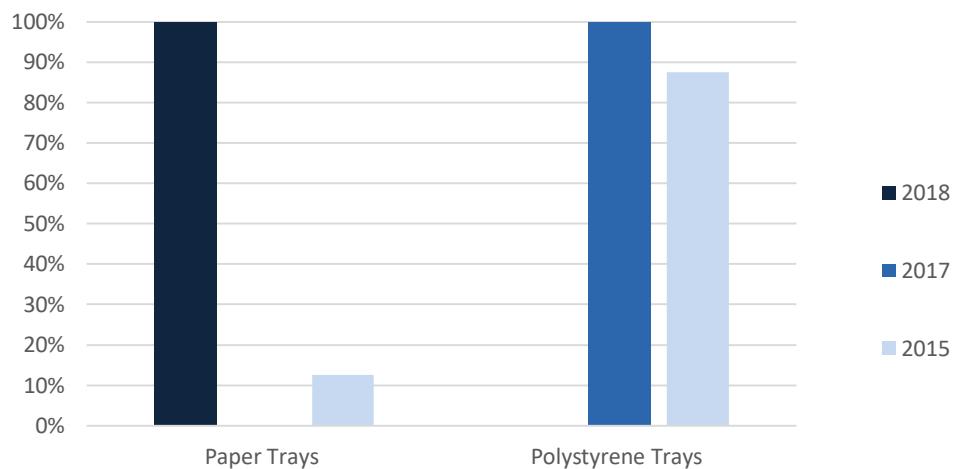
**Figure 22: Take Out Extras Composition 2018**



**Figure 23: Take Out Extras 2018, 2017 and 2015 Comparison**

**Trays:**

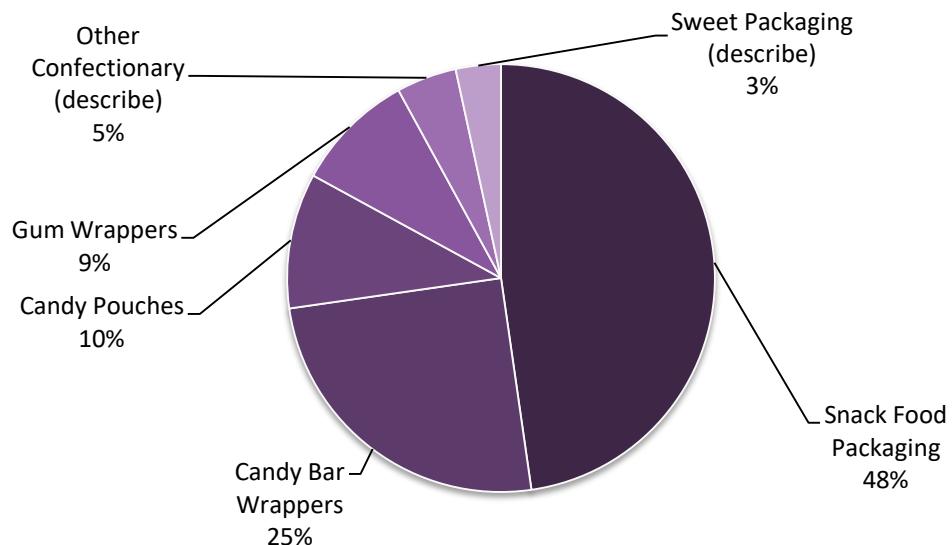
Trays represented less than 1% of all litter observed and was 100% paper trays. **Figure 24** compares sub-categories from the 2018 audits to the 2017 and 2015 audits.



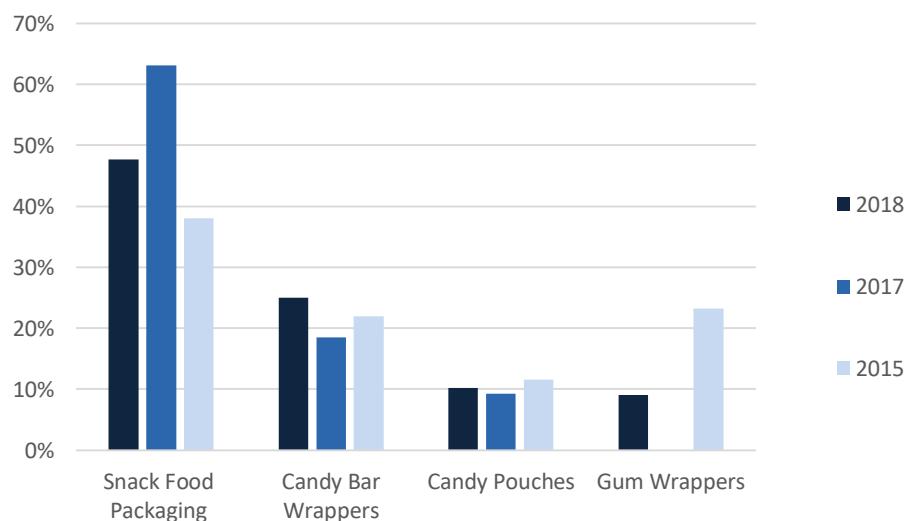
**Figure 24: Trays 2018, 2017 and 2015 Comparison**

### Confectionary/Snacks:

This category represented 9% of all large litter observed in 2018. The most frequently observed sub-categories for large litter were snack food packaging (48%) and candy bar wrappers (25%). **Figure 25** illustrates the results of the confectionary/snacks category breakdown. **Figure 26** compares the highest four sub-categories from 2018 to the previous litter audits.



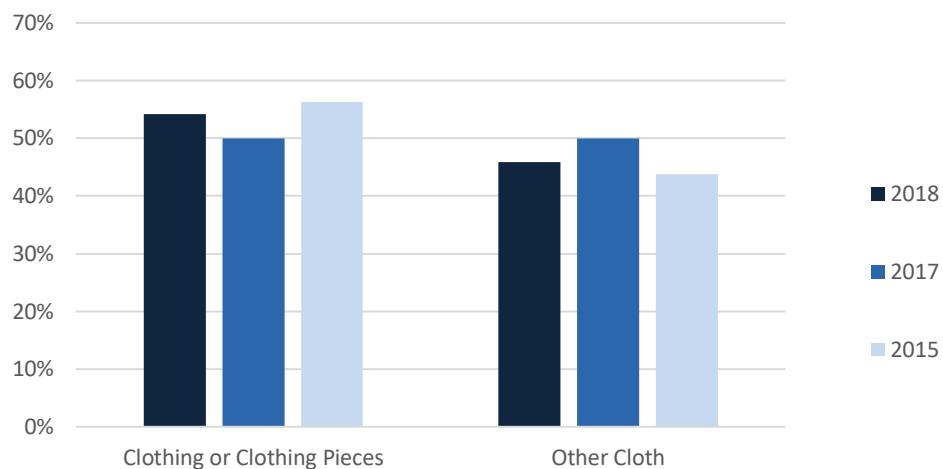
**Figure 25: Confectionary/Snacks Composition 2018**



**Figure 26: Confectionary/Snack 2018, 2017 and 2015 Comparison**

**Cloth:**

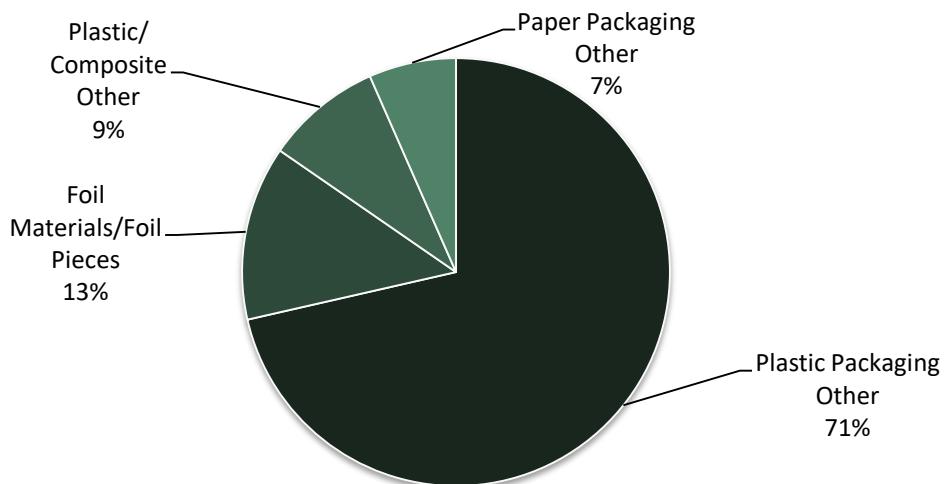
The cloth category was split 54% for clothing or clothing pieces and 46% for other cloth. Cloth represented 2% of all large litter observed in 2018. **Figure 27** compares the sub-categories observed in the most recent audit to the 2017 and 2015 audits.



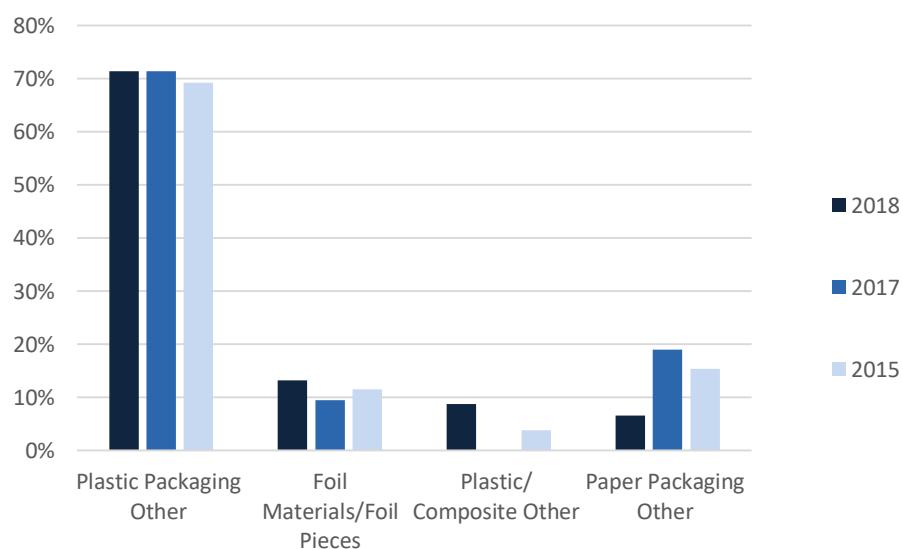
**Figure 27: Cloth 2018, 2017 and 2015 Comparison**

### Other Miscellaneous Packaging:

Other miscellaneous packaging represented 5% of the large litter observed in 2018. The majority of other miscellaneous packaging was plastic packaging other (71%). **Figure 28** illustrates the breakdown of this category and **Figure 29** compares all four sub-categories observed in 2018 in comparison to the 2017 and 2015 results.



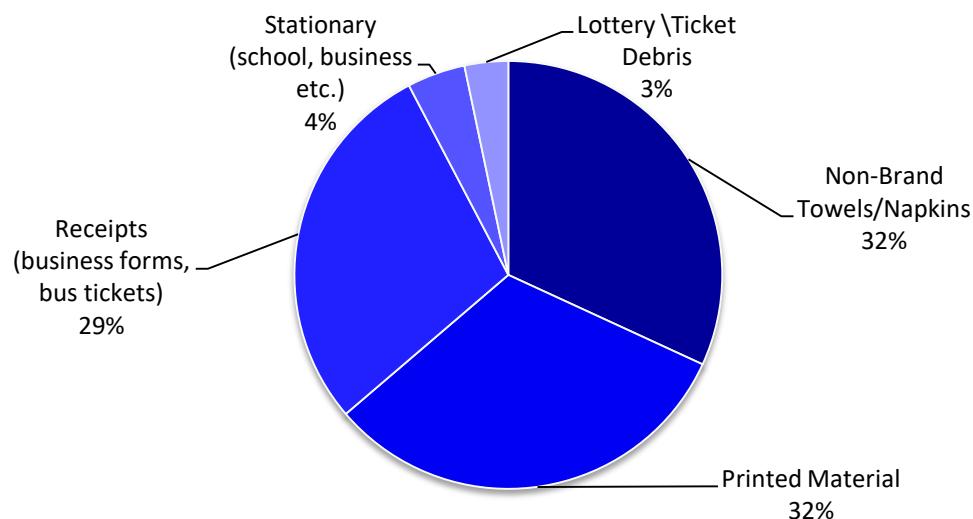
**Figure 28: Other Miscellaneous Packaging Composition 2018**



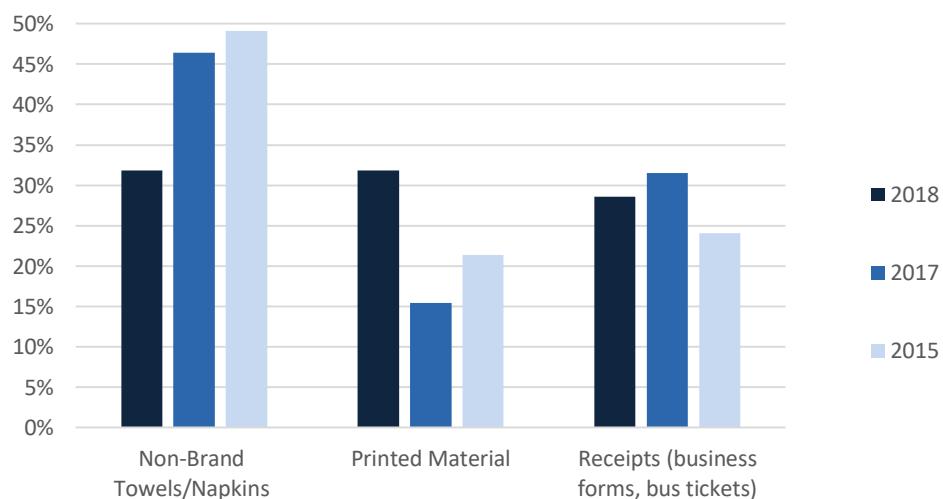
**Figure 29: Other Miscellaneous Packaging 2018, 2017 and 2015 Comparison**

### Paper/Fibre Materials:

This category represented 18% of all large litter observed in 2018. The majority of the paper/fibre materials category was non-brand name towels/napkins (32%), printed material (32%) and receipts (29%). **Figure 30** provides the detailed breakdown of this category. **Figure 31** compares the highest three sub-categories from 2018 to 2017 and 2015.



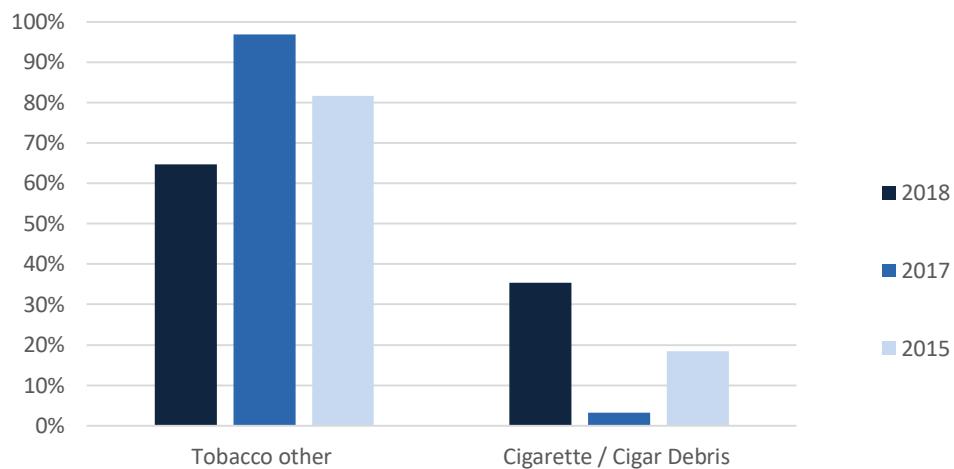
**Figure 30: Paper/Fibre Composition 2018**



**Figure 31: Paper/Fibre Material 2018, 2017 and 2015 Comparison**

**Tobacco Products:**

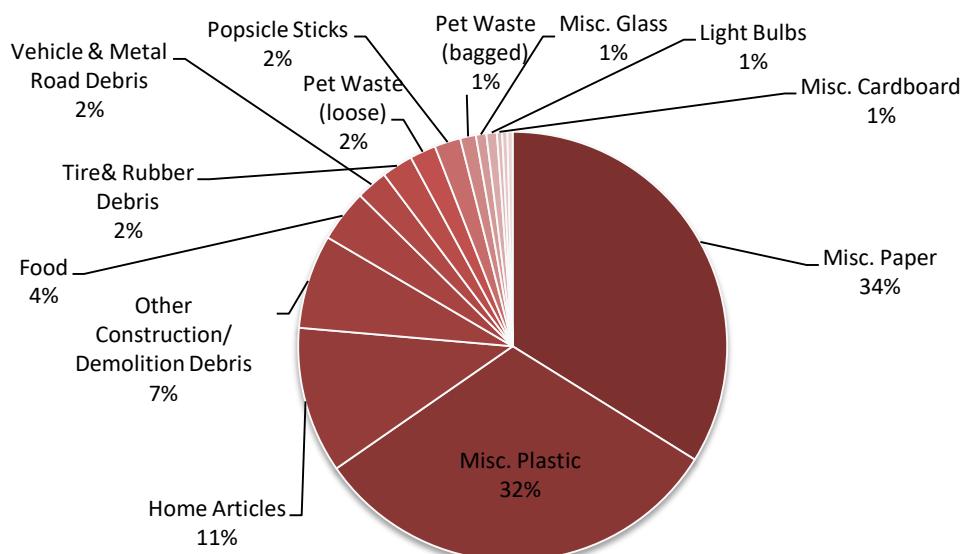
Tobacco products were 6% of the large litter items surveyed in 2018. Within this category, 65% was 'tobacco other' and 35% cigarette/cigar debris. **Figure 32** compares the two sub-categories from the 2018 study to the 2017 and 2015 studies.



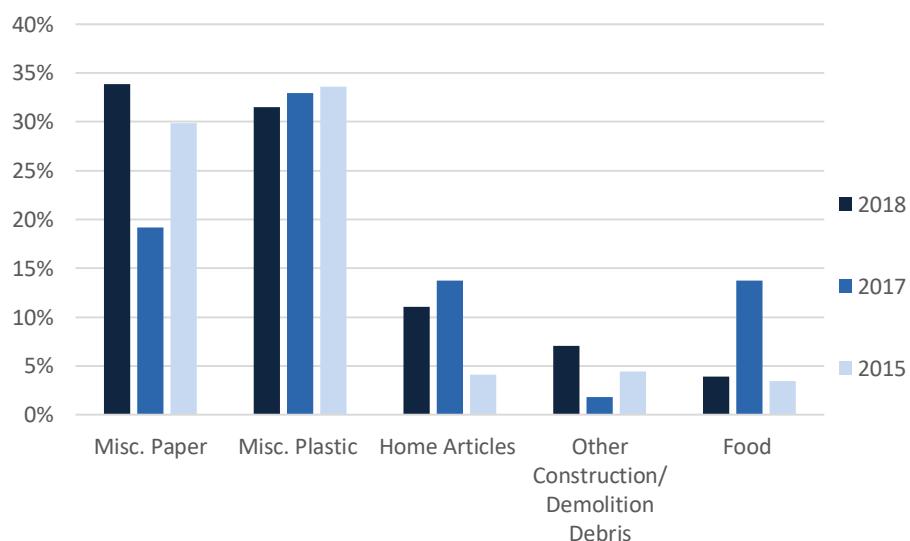
**Figure 32: Tobacco Products 2018, 2017 and 2015 Comparison**

### Other Miscellaneous:

'Other miscellaneous' was the largest category observed in 2018 and represented 25% of all large litter. The primary sub-categories assessed in 2018 included: miscellaneous paper (34%) and miscellaneous plastic (32%). It should be noted that these items are made of paper or plastic that did not fit into any other category or could not be identified as such. Household items were items observed that did not fit into other categories such as composite strapping, trinkets and photo albums. **Figure 33** illustrates the breakdown of this category while **Figure 34** compares the highest five sub-categories observed in the 2018 audits to the 2017 and 2015 studies.



**Figure 33: Other Miscellaneous Composition 2018**



**Figure 34: Other Miscellaneous 2018, 2017 and 2015 Comparison**

## 3.2.4

**Large Litter by Sites**

The ten litter sites having the highest number of large litter pieces are listed below in **Table 4**. The site with the most accumulated large litter in 2018 was Site 55 with 45 pieces of litter observed. This site was zoned multi-family residential. About 40% of sites in the “top 10” were residential (sites 55, 92, 17, and 107). An additional 30% were mixed use sites (sites 97, 76 and 96), while the remaining sites were commercial (sites 31 and 1) or industrial (site 52). A full ranking of sites is provided in **Appendix F**. Of note, Sites 107, 17 and 52 were also litter sites with the highest number of large litter pieces in the 2017 audits.

**Table 4: Large Litter Site Rankings**

<b>Site Number</b>	<b>Number of Pieces of Large Litter</b>	<b>Hundred Block</b>	<b>Street Name</b>
55	45	3400	Vanness
92	38	2200	E. Pender
97	36	800	Commercial
17	34	2100	Renfrew
107	30	600	Powell
52	29	600	Evans
76	28	700	E. 30 <sup>th</sup>
31	25	2700	E. Hastings
96	24	1700	E. Pender
1	23	700	Terminal Ave

## 3.2.5

**Large Litter Results Compared to 2015 Baseline and 2017 Follow-Up Studies**

Results from the 2015 audit were established as the baseline against which future litter audit results (e.g., 2017 and 2018) can be compared. Visual ratings for the litter index were completed for each site in 2015 and in the follow-up audit that took place in 2017. **Table 5** compares the results of the 2018 study to the baseline 2015 visual litter index ratings as well as the follow-up audit completed in 2017.

**Table 5: Visual Litter Index Ranking 2018 vs. 2017 vs. 2015**

<b>Visual Litter Index Rating</b>	<b>Percentage of Sites Ranked (%) 2018</b>	<b>Percentage of Sites Ranked (%) 2017</b>	<b>Percentage of Sites Ranked (%) 2015</b>
1	65%	69%	74%
2	20%	24%	18%
3	8%	6%	7%
4	6%	1%	1%

Of note, 2018 had the highest percentage of sites ranked a 4 (6%) of the three years of litter audits. The composition and accumulation from the 2015 baseline to the 2018 results by category are compared in **Table 6**. Overall, there was a 23% decrease in the amount of large litter observed in 2018. It should be

noted that these values do not include the five sites that were immediately adjacent to construction activity. All categories with the exception of bags, food wrap/containers, take out extras, confectionary/snack and tobacco products decreased in 2018 when compared to the 2015 baseline results. Take out extras had the largest increase 109% (35.5 pieces in the baseline to 72 in 2018) followed by other miscellaneous packaging with an increase of 75% (26 pieces in 2015 to 45.5 in 2018).

**Table 6: 2018 vs. 2015 Large Litter Comparison**

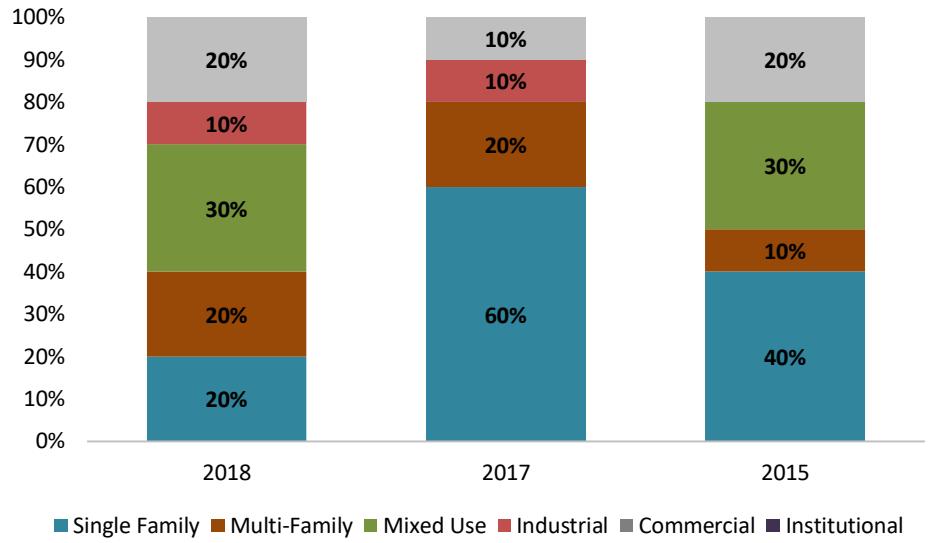
Category	2018 Results (103 Sites)		2015 Baseline Results (108 Sites)		% Change
	# Litter Items	% of Total	# Litter Items	% of Total	
Beverage Containers	9	1%	16	1%	-44%
Other Packaging	5	1%	7	1%	-29%
Cups	132	13%	284	22%	-54%
Bags	55	6%	54.5	4%	1%
Other Packaging (Boxes)	28	3%	55	4%	-49%
Other Containers	8	1%	17	1%	-53%
Food Wraps/ Containers	38	4%	37	3%	3%
Take Out Extras	72	7%	34.5	3%	109%
Trays	1	0%	8	1%	-88%
Confectionary/Snack	88	9%	77.5	6%	14%
Cloth	24	2%	32	2%	-25%
Other Miscellaneous Packaging	45.5	5%	26	2%	75%
Paper/ Fibre Material	182	18%	311.5	24%	-42%
Tobacco Products	56.5	6%	49	4%	15%
Other Miscellaneous	254	25%	291.5	22%	-13%
<b>Total</b>	<b>998</b>	<b>100%</b>	<b>1,300.5</b>	<b>100%</b>	<b>-23%</b>

The composition and accumulation from the 2017 follow-up audit to the 2018 results by category are compared in **Table 7**. There was a 16% increase in the amount of large litter observed in 2018 from 2017. It should be noted that these values do not include the five sites that were immediately adjacent to construction activity in 2018 or the two sites in 2017. Categories where an increase was observed includes bags, other packaging (boxes), take out extras, confectionary/snack, cloth, other miscellaneous packaging, paper fibre/material and other miscellaneous. The largest increase was seen in the take out extras category at 125%.

**Table 7: 2018 vs. 2017 Large Litter Comparison**

Category	2018 Results (103 Sites)		2017 Follow-Up (106 Sites)		% Change
	# Litter Items	% of Total	# Litter Items	% of Total	
Beverage Containers	9	1%	25	3%	-64%
Other Packaging	5	1%	5	1%	0%
Cups	132	13%	172	20%	-23%
Bags	55	6%	41	5%	34%
Other Packaging (Boxes)	28	3%	17	2%	65%
Other Containers	8	1%	12	1%	-33%
Food Wraps/ Containers	38	4%	54	6%	-30%
Take Out Extras	72	7%	32	4%	125%
Trays	1	0%	3	0%	-67%
Confectionary/Snack	88	9%	65	8%	35%
Cloth	24	2%	18	2%	33%
Other Miscellaneous Packaging	45.5	5%	21	2%	117%
Paper/ Fibre Material	182	18%	168	19%	8%
Tobacco Products	56.5	6%	62	7%	-9%
Other Miscellaneous	254	25%	167	19%	52%
<b>Total</b>	<b>998</b>	<b>100%</b>	<b>862</b>	<b>100%</b>	<b>16%</b>

The top ten large litter sites were analyzed for each litter audit. During this analysis zoning and land use were recorded. In 2018 and 2015 the majority of sites were classified as mixed use and single family; 2017 the majority of sites were single family. **Figure 35** illustrates these results.



**Figure 35: 2018, 2017 and 2015 top 10 Large Litter Sites Zoning and Land Use**

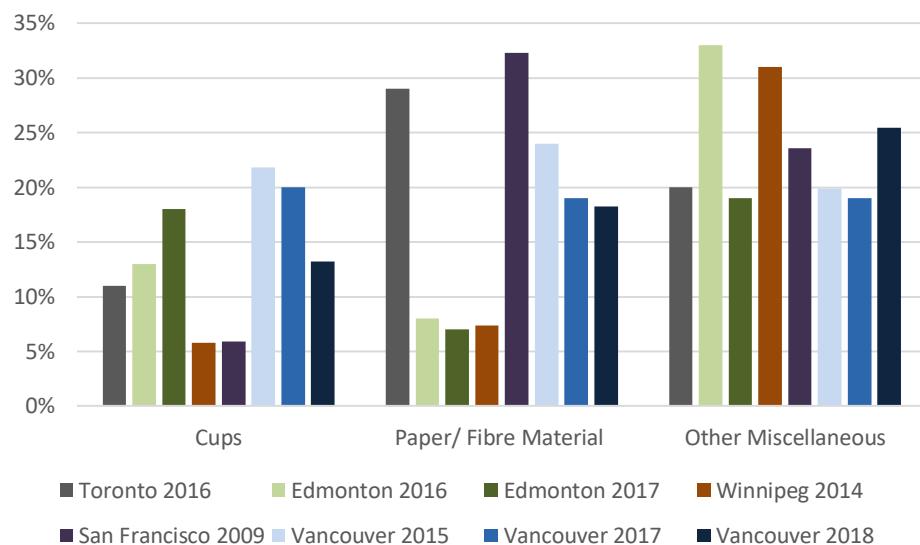
### 3.2.6

#### Large Litter Results Compared to Other North American Municipalities

Large litter audits are completed in several North American Municipalities. These assessments audit large litter in similar categories using the same methodology as this study. **Table 8** illustrates the percentage breakdown per large litter item category for each municipality. **Figure 36** illustrates the top three large litter categories observed in the 2018 Vancouver street litter audits to the results for each municipality (as well as Vancouver in previous years). **Table 9** illustrates the average number of items counted per site based on category. **Figure 37** illustrates these results graphically.

**Table 8: Vancouver Large Litter Audit Results Compared with Audit Results of Other Cities (by Percent Breakdown)**

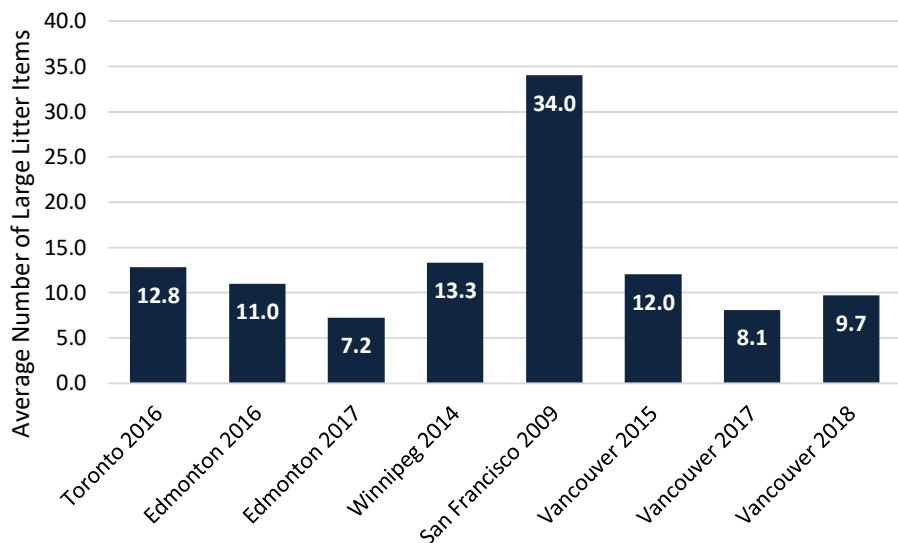
Category	Toronto 2016	Edmonton 2016	Edmonton 2017	Winnipeg 2014	San Francisco 2009	Vancouver 2015	Vancouver 2017	Vancouver 2018
Beverage Containers	6%	2%	1%	10%	3%	1%	3%	1%
Other Packaging	1%	0%	0%	5%	3%	1%	1%	1%
Cups	11%	13%	18%	6%	6%	22%	20%	13%
Bags	4%	2%	3%	6%	6%	4%	5%	6%
Other Packaging (Boxes)	9%	3%	4%	2%	3%	4%	2%	3%
Other Containers	1%	5%	8%	1%	2%	1%	1%	1%
Food Wraps/Containers	3%	4%	4%	1%	4%	3%	6%	4%
Take Out Extras	2%	8%	9%	13%	4%	3%	4%	7%
Trays	0%	0%		N/A	0%	1%	0%	0%
Confectionary/Snack	5%	4%	6%	6%	8%	6%	8%	9%
Cloth	2%	0%		1%	1%	3%	2%	2%
Other Miscellaneous Packaging	0%	0%	0%	0%	0%	2%	2%	5%
Paper/ Fibre Material	29%	8%	7%	7%	32%	24%	19%	18%
Tobacco Products	6%	3%	5%	8%	4%	4%	7%	6%
Other Miscellaneous	20%	33%	19%	31%	24%	20%	19%	25%
Additional Categories	0%	1%	1%	0%	0%	3%	0%	0%
Household Articles	0%	16%	15%	0%	0%	0%	0%	0%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>



**Figure 36: Comparison of Top Large Litter Categories by Municipality**

**Table 9: Vancouver Large Litter Audit Results Compared with Audit Results of Other Cities (Average Number of Items per Site)**

Category	Toronto 2016	Edmonton 2016	Edmonton 2017	Winnipeg 2014	San Francisco 2009	Vancouver 2015	Vancouver 2017	Vancouver 2018
Beverage Containers	0.7	0.2	0.1	1.5	1.3	0.2	0.2	0.1
Other Packaging	1.2	0	0	0.8	1.9	0.1	0.0	0.0
Cups	1.4	1.4	1.3	1.0	3.0	2.6	1.6	1.3
Bags	0.6	0.2	0.2	0.8	1.4	0.5	0.4	0.5
Other Packaging (Boxes)	0.1	0.3	0.3	0.3	0.7	0.5	0.2	0.3
Other Containers	0.1	0.6	0.6	0.1	0.7	0.2	0.1	0.1
Food Wraps/ Containers	0.4	0.4	0.3	1.8	1.2	0.3	0.5	0.4
Take Out Extras	0.3	0.8	0.6	0.0	1.4	0.3	0.3	0.7
Trays	0.1	0	0	0	0.2	0.1	0.0	0.0
Confectionary/Snack	0.7	0.5	0.4	0.9	3.2	0.7	0.6	0.9
Cloth	0.2	0	0	0.2	0.4	0.3	0.2	0.2
Other Miscellaneous Packaging	0	0	0	0	0	0.2	0.2	0.4
Paper/ Fibre Material	3.7	0.9	0.5	1.0	7.8	2.9	1.6	1.8
Tobacco Products	0.7	0.3	0.4	1.1	1.4	0.5	0.6	0.5
Other Miscellaneous	2.6	3.6	1.4	4.1	9.5	2.4	1.6	2.5
Additional Categories	0	0.1	0.1	0	0	0.3	0	0
Household Articles	0	1.7	1.1	0	0	0	0	0
<b>Total</b>	<b>12.8</b>	<b>11.1</b>	<b>7.2</b>	<b>13.3</b>	<b>34</b>	<b>12</b>	<b>8.1</b>	<b>9.7</b>



**Figure 37: Average Large Litter Items per Site**

### 3.2.7

#### Large Litter Statistical Analysis

The average number of large litter items per site in the 2018 audits was 9.7 pieces. There were five sites that had no large litter accumulation. Of the 103 sites surveyed, eight sites had an average of 10 pieces of large litter within the site, 60 sites had fewer than 10 pieces and 35 sites had more than 10 pieces of large litter.

## 3.3

## Small Litter Results

Small litter is any piece of litter that is less than 4 square inches. Small litter is divided into 26 categories. This section reviews small litter by category, site and compared to the baseline 2015 results and follow-up 2017 results. In 2018, the average number of small litter items per site with no construction was 8.1 pieces. The most common categories of small litter observed were cigarette butts/debris (34%) chewing gum and paper (both 19%). **Table 10** provides these results.

**Table 10: Small Litter Data 2018**

Category	Total Number of Items	% of Total
Cigarette Butts/Debris	286	34%
Other Tobacco	0	0%
Bottle Caps	0	0%
Straws	1	0%
Candy Packaging and Wrappers	28	3%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	0	0%
Other Polystyrene Debris (i.e., Poly Foam Pieces)	8	1%
Glass	26	3%
Paper	155	19%
Cup Sleeves	0	0%
Plastic Film	56	7%
Hard Plastic	28	3%
Aluminum/Foil Debris	42	5%
Rubber	3	0%
Metal (not aluminum)	12	1%
Chewing Gum (stuck on pavement)	155	19%
Food and Food Scraps	9	1%
Pet Waste (bagged)	3	0%
Pet Waste (loose)	2	0%
Needles/Syringes	0	0%
Medications	0	0%
Cell Phones	0	0%
Audio-Visual Devices	0	0%
Batteries	0	0%
Other Electronic Waste	0	0%
Other Material	22	3%
<b>Total Site Small Litter</b>	<b>836</b>	<b>100%</b>

## 3.3.1

**Small Litter by Sites**

The ten small litter sites with the most observed small litter are listed below in **Table 11**. The site with the most accumulated small litter in 2018 was Site 56 with 38 pieces of small litter observed. This site was zoned multi-family residential. The majority of sites in the “top 10” were zoned commercial. A full ranking of sites is provided in **Appendix F**.

**Table 11: Small Litter Site Rankings**

<b>Site Number</b>	<b>Number of Pieces of Small Litter</b>	<b>Hundred Block</b>	<b>Street Name</b>
56	38	2900	Horley
62	38	2400	Kingsway
107	32	600	Powell
19	30	700	Granville
102	28	5600	Cambie
108	27	2400	Main
106	25	1000	Burrard
110	24	400	Main
31	23	2700	East Hastings
41	22	300	Terminal

## 3.3.2

**Small Litter Results Compared to 2015 Baseline and 2017 Follow-Up Studies**

Results from the 2015 audit were established as the baseline against which future litter audit results (e.g., 2017 and 2018) can be compared. **Table 12** compares the composition and accumulation from the 2015 baseline to the 2018 results while **Table 13** compares the composition of accumulated small litter from the 2017 follow-up audit. Overall, there was a 6% increase in the small litter observed in 2018 from the baseline audit and a 51% increase from the follow-up audit in 2017. It should be noted that these values do not include the five sites that were immediately adjacent to construction in 2018 or the two in 2017.

Of note, compared to the 2015 baseline, small litter increases were predominantly seen in the other polystyrene debris (700%), other materials (450%), plastic film (211%) and glass (100%) categories. Compared to the 2017 results, small litter increases of more than 100% were found in seven categories, with the highest increases seen in the rubber (200%), candy packaging and wrappers (180%) and other materials (144%) categories.

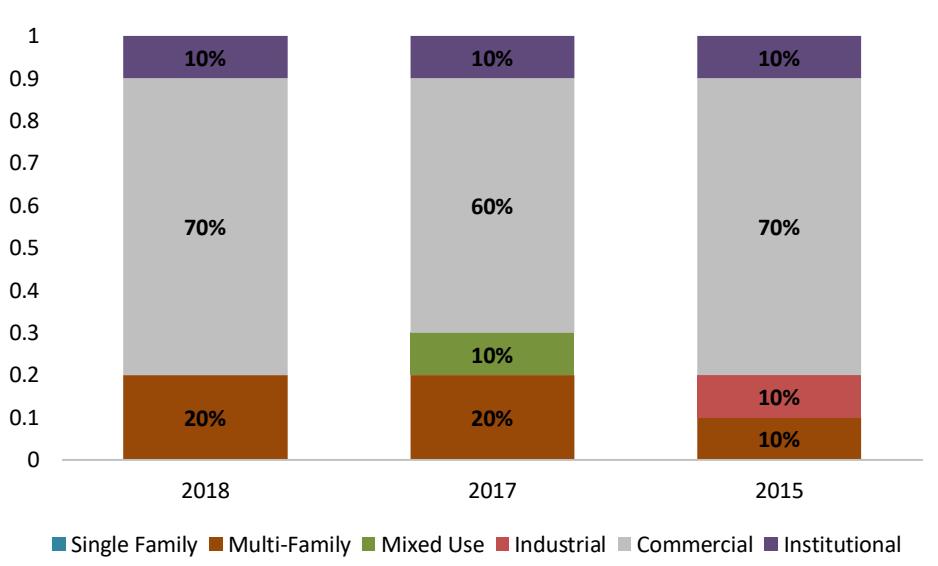
**Table 12: 2018 vs 2015 Small Litter Comparison**

Category	2018 Results (103 Sites)		2015 Baseline Results (108 Sites)		% Change
	# Small Litter Items	% of Total	# Small Litter Items	% of Total	
Cigarette Butts/Debris	286	34%	243	31%	18%
Other Tobacco	0	0%	1	0%	-100%
Bottle Caps	0	0%	0	0%	-
Straws	1	0%	0	0%	-
Candy Packaging and Wrappers	28	3%	20	3%	40%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	0	0%	42	5%	-100%
Other Polystyrene Debris (i.e., Poly Foam Pieces)	8	1%	1	0%	700%
Glass	26	3%	13	2%	100%
Paper	155	19%	121	15%	28%
Cup Sleeves	0	0%	2	0%	-100%
Plastic Film	56	7%	18	2%	211%
Hard Plastic	28	3%	39	5%	-28%
Aluminum/Foil Debris	42	5%	24	3%	75%
Rubber	3	0%	4	1%	-25%
Metal (not aluminum)	12	1%	8	1%	50%
Chewing Gum (stuck on pavement)	155	19%	231	29%	-33%
Food and Food Scraps	9	1%	10	1%	-10%
Pet Waste (bagged)	3	0%	0	0%	-
Pet Waste (loose)	2	0%	4	1%	-50%
Needles/Syringes	0	0%	0	0%	-
Medications	0	0%	0	0%	-
Cell Phones	0	0%	0	0%	-
Audio-Visual Devices	0	0%	0	0%	-
Batteries	0	0%	2	0%	-100%
Other Electronic Waste	0	0%	0	0%	-
Other Materials	22	3%	4	1%	450%
<b>Total Site Small Litter</b>	<b>836</b>	<b>100%</b>	<b>787</b>	<b>100%</b>	<b>6%</b>

**Table 13: 2018 vs. 2017 Small Litter Comparison**

Category	2018 Results (103 Sites)		2017 Baseline Results (106 Sites)		% Change
	# Small Litter Items	% of Total	# Small Litter Items	% of Total	
Cigarette Butts/Debris	286	34%	207	37%	38%
Other Tobacco	0	0%	1	0%	-100%
Bottle Caps	0	0%	3	1%	-100%
Straws	1	0%	5	1%	-80%
Candy Packaging and Wrappers	28	3%	10	2%	180%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	0	0%	0	0%	-
Other Polystyrene Debris (i.e., Poly Foam Pieces)	8	1%	7	1%	14%
Glass	26	3%	12	2%	117%
Paper	155	19%	65	12%	138%
Cup Sleeves	0	0%	0	0%	-
Plastic Film	56	7%	26	5%	115%
Hard Plastic	28	3%	36	6%	-22%
Aluminum/Foil Debris	42	5%	21	4%	100%
Rubber	3	0%	1	0%	200%
Metal (not aluminum)	12	1%	7	1%	71%
Chewing Gum (stuck on pavement)	155	19%	140	25%	11%
Food and Food Scraps	9	1%	0	0%	-
Pet Waste (bagged)	3	0%	0	0%	-
Pet Waste (loose)	2	0%	3	1%	-33%
Needles/Syringes	0	0%	0	0%	-
Medications	0	0%	0	0%	-
Cell Phones	0	0%	0	0%	-
Audio-Visual Devices	0	0%	0	0%	-
Batteries	0	0%	1	0%	-100%
Other Electronic Waste	0	0%	0	0%	-
Other Materials	22	3%	9	2%	144%
<b>Total Site Small Litter</b>	<b>836</b>	<b>100%</b>	<b>554</b>	<b>100%</b>	<b>51%</b>

The top small large litter sites were analyzed for each litter audit. During this analysis zoning and land use were recorded. In each year of the audit commercial sites comprised the majority of the top 10 small litter sites. These results are provided in **Figure 38**.



**Figure 38: 2018, 2017 and 2015 top 10 Small Litter Sites by Zoning and Land Use**

### 3.3.3

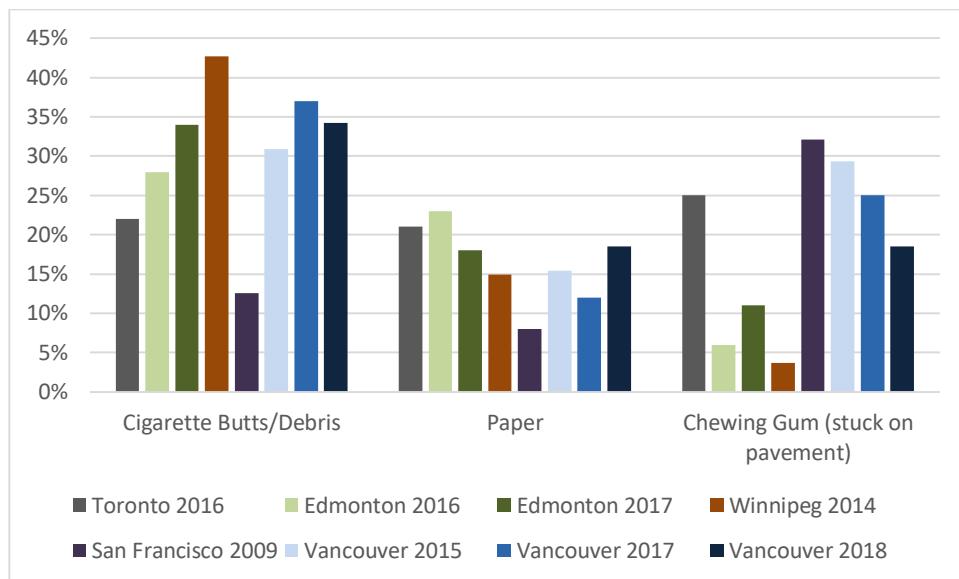
#### Small Litter Results Compared to Other North American Municipalities

Small litter audits are completed in several North American Municipalities. These audits record small litter in similar categories using the same methodology. **Table 14** illustrates the percentage breakdown per small litter item category for each municipality (as well as Vancouver in previous years). **Figure 39** illustrates the top three small litter categories observed in the 2018 Vancouver street litter audits to the results for each municipality.

**Table 15** illustrates the average number of items counted per site based on category. **Figure 40** illustrates these results graphically.

**Table 14: Vancouver Small Litter Audit Results Compared to Other Cities**

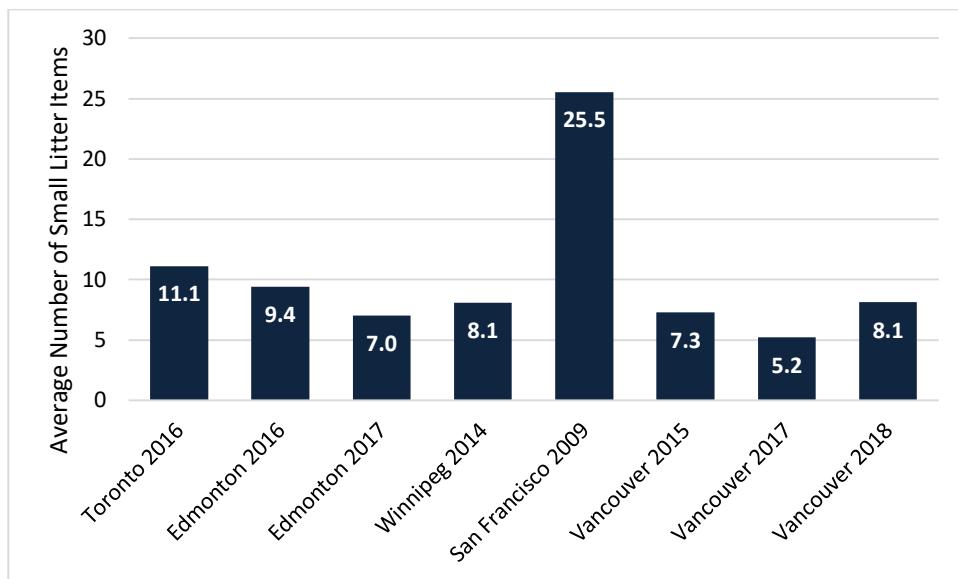
<b>Category</b>	<b>Toronto 2016</b>	<b>Edmonton 2016</b>	<b>Edmonton 2017</b>	<b>Winnipeg 2014</b>	<b>San Francisco 2009</b>	<b>Vancouver 2015</b>	<b>Vancouver 2017</b>	<b>Vancouver 2018</b>
Cigarette Butts/Debris	22%	28%	34%	43%	13%	31%	37%	34%
Other Tobacco	1%	0%	0%	1%	2%	0%	0%	0%
Bottle Caps	1%	0%	1%	1%	0%	0%	1%	0%
Straws	0%	0%	1%	1%	0%	0%	1%	0%
Candy Packaging and Wrappers	3%	3%	6%	0%	2%	3%	2%	3%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	1%	1%	2%	0%	2%	5%	0%	0%
Other Polystyrene Debris (i.e., Poly Foam Pieces)	1%	7%	6%	3%	1%	0%	1%	1%
Glass	7%	12%	6%	8%	23%	2%	2%	3%
Paper	21%	23%	18%	15%	8%	15%	12%	19%
Cup Sleeves				n/a	n/a	0%	0%	0%
Plastic Film	3%	5%	3%	8%	3%	2%	5%	7%
Hard Plastic	7%	7%	9%	11%	6%	5%	6%	3%
Aluminum/Foil Debris	2%	3%	1%	4%	1%	3%	4%	5%
Rubber	0%	1%	1%	1%	1%	1%	0%	0%
Metal (not aluminum)	2%	0%	0%	1%	2%	1%	1%	1%
Chewing Gum (stuck on pavement)	25%	6%	11%	4%	32%	29%	25%	19%
Food and Food Scraps	1%	1%	0%	0%	0%	1%	0%	1%
Pet Waste (bagged)	0%	0%	0%	0%	0%	0%	0%	0%
Pet Waste (loose)	0%	0%	0%	0%	0%	1%	1%	0%
Needles/Syringes	0%	0%	0%	0%	0%	0%	0%	0%
Medications	0%	0%	0%	0%	0%	0%	0%	0%
Cell Phones	0%	0%	0%	0%	0%	0%	0%	0%
Audio-Visual Devices	0%	0%	0%	0%	0%	0%	0%	0%
Batteries	0%	0%	0%	0%	0%	0%	0%	0%
Other Electronic Waste	0%	0%	0%	0%	0%	0%	0%	0%
Other Material	5%	2%	1%	1%	5%	1%	2%	3%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>



**Figure 39: Comparison of Top Small Litter Categories by Municipality**

**Table 15: Vancouver Small Litter Results Compared to Other Cities (Average Number of Items per Site)**

<b>Category</b>	<b>Toronto 2016</b>	<b>Edmonton 2016</b>	<b>Edmonton 2017</b>	<b>Winnipeg 2014</b>	<b>San Francisco 2009</b>	<b>Vancouver 2015</b>	<b>Vancouver 2017</b>	<b>Vancouver 2018</b>
Cigarette Butts/Debris	2.6	2.6	2.4	3.5	3.2	2.3	2.0	2.8
Other Tobacco	0.1	0.0	0.0	0.0	0.5	0.0	0.0	0.0
Bottle Caps	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0
Straws	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Candy Packaging and Wrappers	0.3	0.3	0.4	0.0	0.4	0.2	0.1	0.3
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	0.1	0.1	0.1	0.2	0.2	0.4	0.0	0.0
Other Polystyrene Debris (i.e., Poly Foam Pieces)	0.1	0.7	0.4	0.0	0.4	0.0	0.1	0.1
Glass	0.8	1.2	0.4	0.6	6.0	0.1	0.1	0.3
Paper	2.4	2.2	1.3	1.2	2.1	1.1	0.6	1.5
Cup Sleeves			0.0	n/a	n/a	0.0	0.0	0.0
Plastic Film	0.4	0.4	0.2	0.6	0.6	0.2	0.2	0.5
Hard Plastic	0.8	0.6	0.7	0.9	1.5	0.4	0.3	0.3
Aluminum/Foil Debris	0.2	0.3	0.0	0.3	0.3	0.2	0.2	0.4
Rubber	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Metal (not aluminum)	0.2	0.0	0.0	0.1	0.6	0.1	0.1	0.1
Chewing Gum (stuck on pavement)	3.0	0.6	0.8	0.3	8.2	2.1	1.3	1.5
Food and Food Scraps	0.2	0.1	0.1	0.0	0.0	0.1	0.0	0.1
Pet Waste (bagged)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pet Waste (loose)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Needles/Syringes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Medications	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cell Phones	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Audio-Visual Devices	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Batteries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Electronic Waste	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Material	0.0	0.2	0.1	0.1	1.2	0.0	0.1	0.2
<b>Total</b>	<b>11.1</b>	<b>9.4</b>	<b>7.0</b>	<b>8.1</b>	<b>25.5</b>	<b>7.3</b>	<b>5.2</b>	<b>8.1</b>



**Figure 40: Average Small Litter Items per Site**

### 3.3.4

#### Small Litter Statistical

The average number of small litter items per site in the 2018 audits was observed at 8.1 pieces with no construction adjacent. There were 17 sites that had no small litter accumulation. Of the 103 sites surveyed, five sites had an average of eight pieces of small litter within the site, 63 sites had fewer than eight pieces and 35 sites had more than eight pieces of small litter.

## 3.4

## Small Litter Supersites Result

A supersite is when *all* small litter within the site is observed and counted, not only three portions of the site (beginning, end and mid-point). This assessment was completed at 19 pre-determined sites. In 2018, the average number of small litter items per supersite was 372.1 pieces. The most common categories of small litter observed were chewing gum (42%) and cigarette butts/debris (38%). **Table 16** provides these results.

**Table 16: Supersite Litter Data 2018**

Category	Total Number of Items	% of Total
Cigarette Butts/Debris	2,681	38%
Other Tobacco	0	0%
Bottle Caps	5	0%
Straws	9	0%
Candy Packaging and Wrappers	117	2%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	0	0%
Other Polystyrene Debris (i.e., Poly Foam Pieces)	18	0%
Glass	104	1%
Paper	499	7%
Cup Sleeves	0	0%
Plastic Film	132	2%
Hard Plastic	240	3%
Aluminum/Foil Debris	112	2%
Rubber	10	0%
Metal (not aluminum)	39	1%
<b>Chewing Gum (stuck on pavement)</b>	<b>2,974</b>	<b>42%</b>
Food and Food Scraps	32	0%
Pet Waste (bagged)	3	0%
Pet Waste (loose)	3	0%
Needles/Syringes	1	0%
Medications	1	0%
Cell Phones	0	0%
Audio-Visual Devices	0	0%
Batteries	1	0%
Other Electronic Waste	0	0%
Other Material	89	1%
<b>Total Supersite Small Litter</b>	<b>7,070</b>	<b>100%</b>

## 3.4.1

**Small Litter by Supersites**

All 19 supersites are ranked in **Table 17**. The site with the most accumulated litter in 2018 was Site 106 with 779 pieces of small litter observed.

**Table 17: Supersite Rankings 2018**

<b>Site Number</b>	<b>Number of Pieces of Small Litter</b>	<b>Hundred Block</b>	<b>Street Name</b>
106	779	1000	Burrard Street
41	764	300	Terminal Avenue
54	661	1100	Clark Drive
108	636	2400	Main Street
38	622	1000	West Georgia Street
104	581	1100	Denman Street
31	485	2700	East Hastings Street
109	476	1045	Kingsway
97	409	800	Commercial Drive
18	384	800	Hornby Street
101	283	1700	West Broadway
77	210	5500	Main Street
26	206	2300	Wall Street
52	170	600	Evans Street.
32	159	1800	Yew Street
42	114	1700	West 3 Avenue
56	61	2900	Horley Street
82	52	900	East 24 Avenue
21	18	300	East 39 Avenue

## 3.4.2

**Supersite Small Litter Results Compared to 2015 Baseline**

Results from the 2015 audit were established as the baseline against which future litter audit results (e.g., 2017 and 2018) can be compared. **Table 18** provides the comparison in composition and accumulation from the 2015 baseline to the 2018 results for supersite small litter; Table 19 compares the small litter accumulation from the 2018 supersite audits to the 2017 follow-up audits. Overall, there was a 38% increase in the litter accumulated at the supersites in 2018 from the baseline and a 92% increase from the 2017 audits. **Table 20** compares the 2018, 2017 and 2015 results based on site.

Of note, the 2018 audit showed a 1700% increase in the amount of other polystyrene debris at the supersites. Compared to the 2017 audits, the largest increases were seen in food and food scraps (540 %), glass (447 %) and other materials (456%).

**Table 18: 2018 vs. 2015 Supersite Litter Comparison**

<b>Category</b>	<b>2018 Results</b>		<b>2015 Results</b>		<b>% Change</b>
	<b># Small Litter Items</b>	<b>%</b>	<b># Small Litter Items</b>	<b>%</b>	
Cigarette Butts/Debris	2,681	38%	1,923	38%	39%
Other Tobacco	0	0%	5	0%	-100%
Bottle Caps	5	0%	14	0%	-64%
Straws	9	0%	-	0%	-
Candy Packaging and Wrappers	117	2%	49	1%	139%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	0	0%	3	0%	-100%
Other Polystyrene Debris (i.e., Poly Foam Pieces)	18	0%	1	0%	1700%
Glass	104	1%	35	1%	197%
Paper	499	7%	312	6%	60%
Cup Sleeves	0	0%	-	-	-
Plastic Film	132	2%	38	1%	247%
Hard Plastic	240	3%	84	2%	186%
Aluminum/Foil Debris	112	2%	69	1%	62%
Rubber	10	0%	16	0%	-38%
Metal (not aluminum)	39	1%	9	0%	333%
Chewing Gum (stuck on pavement)	2,974	42%	2,475	48%	20%
Food and Food Scraps	32	0%	27	1%	19%
Pet Waste (bagged)	3	0%	1	0%	200%
Pet Waste (loose)	3	0%	1	0%	200%
Needles/Syringes	1	0%	0	0%	-
Medications	1	0%	0	0%	-
Cell Phones	0	0%	0	0%	-
Audio-Visual Devices	0	0%	0	0%	-
Batteries	1	0%	2	0%	-50%
Other Electronic Waste	0	0%	1	0%	-100%
Other Materials	89	1%	57	1%	56%
<b>Total Site Small Litter</b>	<b>7,070</b>	<b>100%</b>	<b>5,122</b>	<b>100%</b>	<b>38%</b>

**Table 19: 2018 vs. 2017 Supersite Litter Comparison**

<b>Category</b>	<b>2018 Results</b>		<b>2017 Results</b>		<b>% Change</b>
	<b># Small Litter Items</b>	<b>%</b>	<b># Small Litter Items</b>	<b>%</b>	
Cigarette Butts/Debris	2,681	38%	1,469	40%	83%
Other Tobacco	0	0%	0	0%	-
Bottle Caps	5	0%	21	1%	-76%
Straws	9	0%	10	0%	-10%
Candy Packaging and Wrappers	117	2%	29	1%	303%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	0	0%	0	0%	-
Other Polystyrene Debris (i.e., Poly Foam Pieces)	18	0%	4	0%	350%
Glass	104	1%	19	1%	447%
Paper	499	7%	175	5%	185%
Cup Sleeves	0	0%	2	0%	-100%
Plastic Film	132	2%	44	1%	200%
Hard Plastic	240	3%	96	3%	150%
Aluminum/Foil Debris	112	2%	62	2%	81%
Rubber	10	0%	6	0%	67%
Metal (not aluminum)	39	1%	10	0%	290%
Chewing Gum (stuck on pavement)	2,974	42%	1,716	47%	73%
Food and Food Scraps	32	0%	5	0%	540%
Pet Waste (bagged)	3	0%	0	0%	-
Pet Waste (loose)	3	0%	0	0%	-
Needles/Syringes	1	0%	0	0%	-
Medications	1	0%	0	0%	-
Cell Phones	0	0%	0	0%	-
Audio-Visual Devices	0	0%	0	0%	-
Batteries	1	0%	0	0%	-
Other Electronic Waste	0	0%	1	0%	-100%
Other Materials	89	1%	16	0%	456%
<b>Total Site Small Litter</b>	<b>7,070</b>	<b>100%</b>	<b>3,685</b>	<b>100%</b>	<b>92%</b>

**Table 20: Supersite 2017 vs. 2015 Percent Change by Site Comparison**

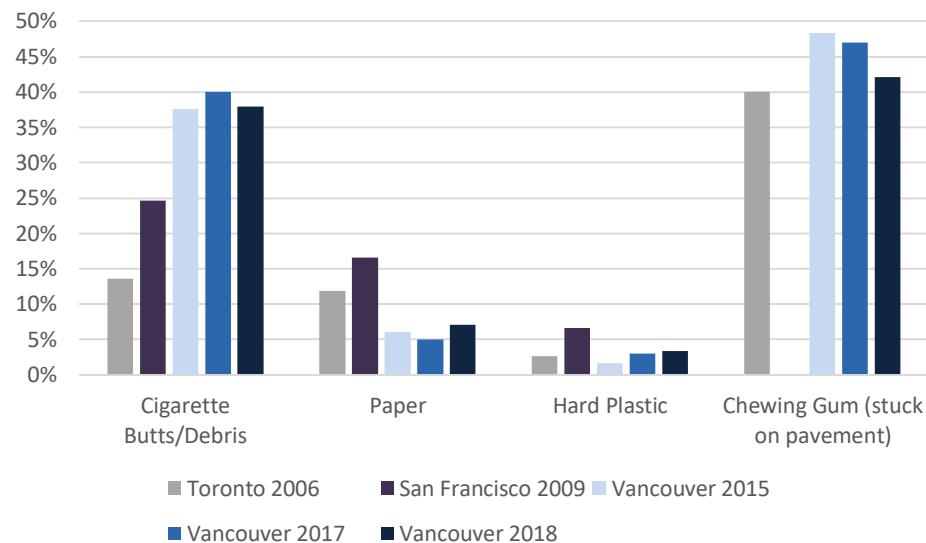
<b>Site Number</b>	<b>2018 Number of Pieces of Small Litter</b>	<b>2017 Number of Pieces of Small Litter</b>	<b>2015 Number of Pieces of Small Litter</b>
106	779	385	368
41	764	418	533
54	661	210	248
108	636	492	470
38	622	478	561
104	581	293	196
31	485	109	461
109	476	299	369
97	409	126	282
18	384	153	344
101	283	116	502
77	210	92	211
26	206	84	69
52	170	141	71
32	159	67	160
42	114	49	126
56	61	134	77
82	52	26	37
21	18	13	37
<b>Total Small Litter</b>	<b>7,070</b>	<b>3,685</b>	<b>5,122</b>

**3.4.3****Supersite Results Compared to Other North American Municipalities**

Supersite assessments are completed in a few North American Municipalities. These assessments audit small litter in similar categories using the same methodology. **Table 21** illustrates the percentage breakdown per small litter item category for each municipality. **Figure 41** compares the top four supersite categories in the 2018 Vancouver street litter audits to other municipalities. **Table 22** illustrates the average number of items counted per site based on category. **Figure 42** illustrates these results graphically.

**Table 21: Vancouver Supersite Small Litter Comparison to Other Cities**

<b>Category</b>	<b>Toronto 2006</b>	<b>San Francisco 2009</b>	<b>Vancouver 2015</b>	<b>Vancouver 2017</b>	<b>Vancouver 2018</b>
Cigarette Butts/Debris	14%	25%	38%	40%	38%
Other Tobacco	1%	0%	0%	0%	0%
Bottle Caps	1%	1%	0%	1%	0%
Straws	0%	1%	0%	0%	0%
Candy Packaging and Wrappers	1%	4%	1%	1%	2%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	1%	1%	0%	0%	0%
Other Polystyrene Debris (i.e., Poly Foam Pieces)	3%	0%	0%	0%	0%
Glass	17%	38%	1%	1%	1%
Paper	12%	17%	6%	5%	7%
Cup Sleeves	n/a	n/a	0%	0%	0%
Plastic Film	3%	3%	1%	1%	2%
Hard Plastic	3%	7%	2%	3%	3%
Aluminum/Foil Debris	2%	2%	1%	2%	2%
Rubber	0%	1%	0%	0%	0%
Metal (not aluminum)	1%	2%	0%	0%	1%
Chewing Gum (stuck on pavement)	40%	not included	48%	47%	42%
Food and Food Scraps	0%	0%	1%	0%	0%
Pet Waste (bagged)	0%	0%	0%	0%	0%
Pet Waste (loose)	0%	0%	0%	0%	0%
Needles/Syringes	0%	0%	0%	0%	0%
Medications	0%	0%	0%	0%	0%
Cell Phones	0%	0%	0%	0%	0%
Audio-Visual Devices	0%	0%	0%	0%	0%
Batteries	0%	0%	0%	0%	0%
Other Electronic Waste	0%	0%	0%	0%	0%
Other Material	1%	1%	1%	0%	1%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>



**Figure 41: Comparison of Top Supersite Litter Categories by Municipality**

**Table 22: Vancouver Supersite Small Litter Comparison to Other Cities (Average Number of Items per Site)**

<b>Category</b>	<b>Toronto 2006</b>	<b>San Francisco 2009</b>	<b>Vancouver 2015</b>	<b>Vancouver 2017</b>	<b>Vancouver 2018</b>
Cigarette Butts/Debris	176.6	83.8	101.2	77.3	141.1
Other Tobacco	14.6	0.0	0.3	0.0	0.0
Bottle Caps	8.6	2.0	0.7	1.1	0.3
Straws	4.7	1.7	0.0	0.5	0.5
Candy Packaging and Wrappers	16.9	12.2	2.6	1.5	6.2
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	39.2	3.3	0.2	0.0	0.0
Other Polystyrene Debris, (i.e., Poly Foam Pieces)	14.5	0.5	0.1	0.2	0.9
Glass	218.7	128.1	1.8	1.0	5.5
Paper	154.3	56.8	16.4	9.2	26.3
Cup Sleeves	n/a	n/a	0.0	0.1	0.0
Plastic Film	35.7	10.3	2.0	2.3	6.9
Hard Plastic	34.1	22.5	4.4	5.1	12.6
Aluminum/Foil Debris	24.9	6.2	3.6	3.3	5.9
Rubber	5.4	1.8	0.8	0.3	0.5
Metal (not aluminum)	15.3	8.2	0.5	0.5	2.1
Chewing Gum (stuck on pavement)	518.5	0.0	130.3	90.3	156.5
Food and Food Scraps	0.0	0.0	1.4	0.3	1.7
Pet Waste (bagged)	0.0	0.0	0.1	0.0	0.2
Pet Waste (loose)	0.0	0.0	0.1	0.0	0.2
Needles/Syringes	0.0	0.0	0.0	0.0	0.1
Medications	0.0	0.0	0.0	0.0	0.1
Cell Phones	0.0	0.0	0.0	0.0	0.0
Audio-Visual Devices	0.0	0.0	0.0	0.0	0.0
Batteries	0.0	0.0	0.1	0.0	0.1
Other Electronic Waste	0.0	0.0	0.1	0.1	0.0
Other Material	13.0	4.0	3.0	0.8	4.7
<b>Total</b>	<b>1,294.8</b>	<b>341.5</b>	<b>269.6</b>	<b>193.9</b>	<b>372.1</b>



**Figure 42: Average Supersite Small Litter Items per Site**

#### 3.4.4

#### Supersite Small Litter Statistical

The average number of small litter items per supersite in the 2018 audits was 372.1 pieces. All sites observed had some amount of small litter accumulated. Of the 19 sites surveyed, nine sites had less than 372 pieces of small litter and ten sites had more than 372 pieces of small litter.

#### 3.4.5

#### Overall Litter Accumulation on Supersites

When a site is observed as a supersite every piece of litter is recorded. **Table 23** illustrates the combined results of small and large litter for each site. Of all the supersites, Site 106 had the most accumulated litter with 787 pieces of litter counted. Site 41 was close behind with 784 pieces of litter counted.

**Table 23: Overall Combined Small and Large Litter for Supersites**

<b>Site Number</b>	<b>Number of Pieces of Small Litter</b>	<b>Number of Pieces of Large Litter</b>	<b>Total Litter</b>
106	779	8	787
41	764	20	784
54	661	17	678
108	636	12	648
38	622	13	635
104	581	4	585
31	485	25	510
109	476	0	476
97	409	36	445
18	384	0	384
101	283	11	294
77	210	19	229
26	206	13	219
52	170	29	199
32	159	5	164
42	114	10	124
82	52	19	71
56	61	2	63
21	18	3	21

**3.5****Sites Immediately Adjacent to Construction**

Dillon staff were asked to note if any sites had construction occurring immediately adjacent to the site being studied. There were five sites where this occurred in 2018 (Sites 15,48,82,89 and 103). These five sites were analyzed separately because the construction activities were expected to increase accumulation of litter.

**3.5.1****Large Litter Results**

Within the five sites that were immediately adjacent to construction, the average number of large litter items per site was 28 pieces of litter. This was, on average 288% more litter than the sites that did not have construction directly adjacent. The breakdown by material did not differ dramatically from these sites. Overall, 42% of material was plastic, 38% plastic and 18% other.

The general composition of material did differ between the sites that had construction and the sites that did not. **Figure 43** illustrates the composition of litter found within the construction sites. **Table 24** provides a comparison of large litter observed on sites with and without construction based on category.

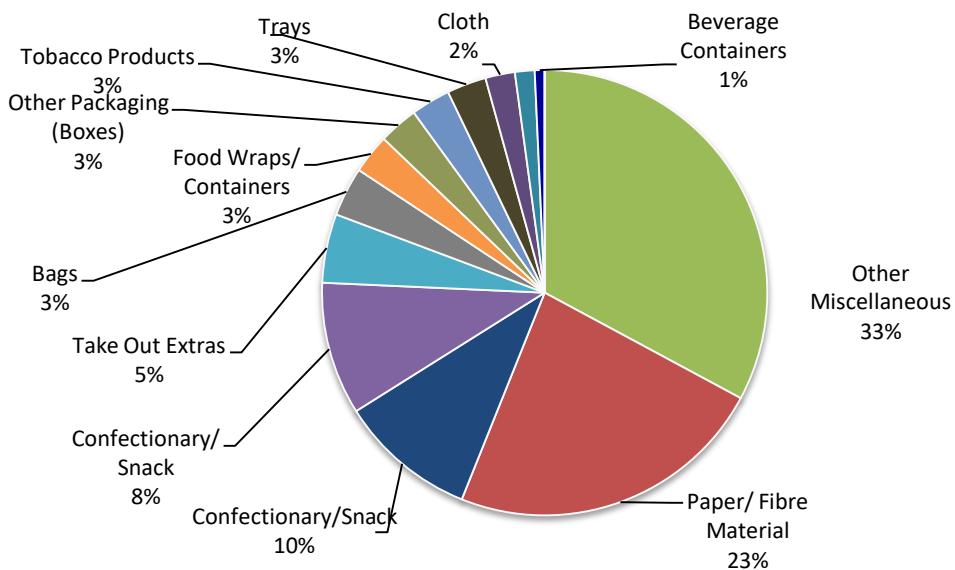


Figure 43: Litter Sites with Immediately Adjacent Construction Large Litter by Category

Table 24: Large Litter Categories Comparison for Sites with and without Construction

Category	Sites with Construction	Sites without Construction
Other Miscellaneous	33%	25%
Paper/ Fibre Material	23%	18%
Confectionary/Snack	10%	9%
Cups	10%	13%
Take Out Extras	5%	7%
Bags	4%	6%
Food Wraps/ Containers	3%	4%
Other Packaging (Boxes)	3%	3%
Tobacco Products	3%	6%
Trays	3%	0%
Cloth	2%	2%
Other Miscellaneous Packaging	1%	5%
Beverage Containers	1%	1%
Other Containers	0%	1%
Other Packaging	0%	1%
<b>Total</b>	<b>100%</b>	<b>100%</b>

### 3.5.2

### Small Litter Results

Within the five sites that were immediately adjacent to construction, the average number of small litter items per site was 14.8 pieces of litter. This was, on average, 183% more small litter than the sites that did not have construction (at 9.7 pieces).

The general composition of material did differ slightly between the sites that had construction and the sites that did not. **Table 25** provides a comparison of small litter observed on sites with and without construction based on category. Overall, the comparison is quite similar from one category to the next. The most significant change is the increase in paper (31% with construction, 19% without construction).

**Table 25: Small Litter Comparison for Sites with and without Construction**

Category	Sites with Construction	Sites without Construction
Cigarette Butts/Debris	27%	34%
Other Tobacco	0%	0%
Bottle Caps	0%	0%
Straws	0%	0%
Candy Packaging and Wrappers	3%	3%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	0%	0%
Other Polystyrene Debris (i.e., Poly Foam Pieces)	3%	1%
Glass	3%	3%
Paper	31%	19%
Cup Sleeves	0%	0%
Plastic Film	0%	7%
Hard Plastic	3%	3%
Aluminum/Foil Debris	0%	5%
Rubber	0%	0%
Metal (not aluminum)	3%	1%
Chewing Gum (stuck on pavement)	19%	19%
Food and Food Scraps	0%	1%
Pet Waste (bagged)	0%	0%
Pet Waste (loose)	0%	0%
Needles/Syringes	0%	0%
Medications	0%	0%
Cell Phones	0%	0%
Audio-Visual Devices	0%	0%
Batteries	0%	0%
Other Electronic Waste	0%	0%
Other Material	9%	3%
<b>Total Site Small Litter</b>	<b>100%</b>	<b>100%</b>

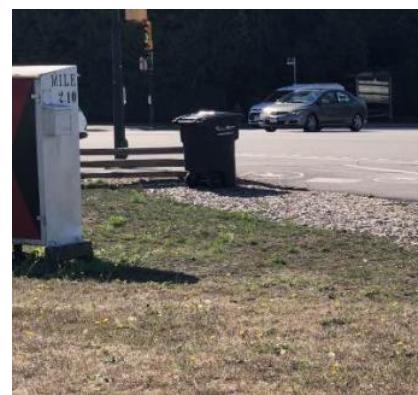
## 4.0

## Additional Observations

Within the City of Vancouver there are a few public spaces programs and pilots being run. These programs promote waste diversion in the public realm and support the GCAP and are a part of the ongoing zero waste initiatives that aim to promote diversion and reduce litter. During the litter audits, Dillon staff would note if there were any City waste receptacles within 50m of the site. There were several types of receptacles that were noticed within and around the litter sites as illustrated in **Figure 44** to **Figure 47**. The Emily Carr receptacles are three stream (garbage, paper and containers) receptacles that are being tested in the West End. Another program is the downtown on-street recycling project which started in summer 2017 with 15 new three stream waste receptacles being installed in the downtown core. In 2018 there were 28 more receptacles installed, 10 in the summer and 18 in the winter. To date, there has not been any analysis to determine if the installation of these receptacles has assisted in reducing curbside littering.



**Figure 44:** City Receptacles in the Downtown Core



**Figure 45:** City Park Litter Bin

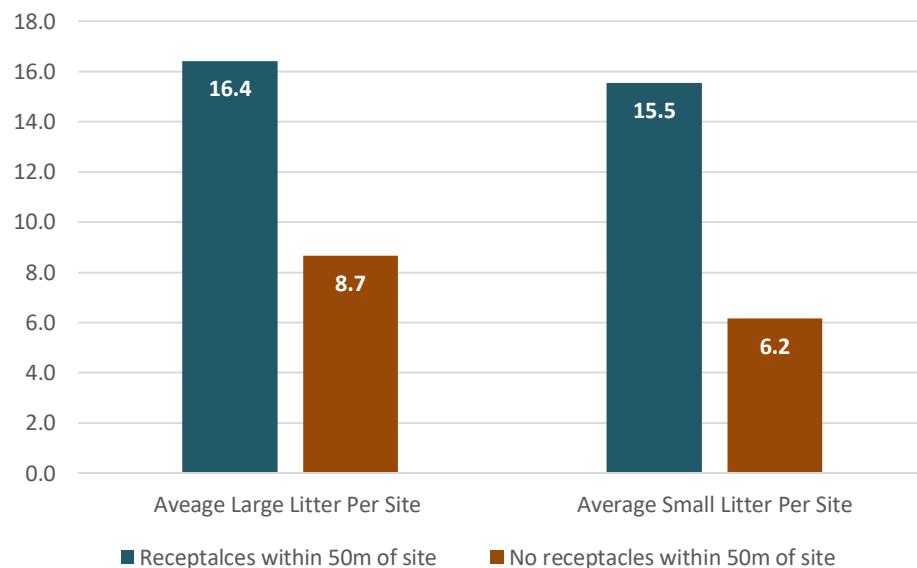


**Figure 46:** Emily Carr Receptacle



**Figure 47:** City Single Stream Receptacle

There were 82 sites (76%) where City litter bins were not within 50 m of the site and 26 sites (24%) where there were City litter receptacles within 50 m. Sites *with* waste receptacles had on average 16.4 pieces of large litter while sites *without* had an average of 8.7 pieces of large litter. Small litter was, on average higher where there were waste receptacles (15.5 pieces) versus when there were no waste receptacles (6.2 pieces). These results are illustrated in **Figure 48**.



**Figure 48: Average Large and Small Litter Pieces per Site based on the Presence of Waste Receptacle**

5.0

## Site Ranking and Attributes

Dillon staff ranked each of the 108 audited sites in three different ways, as follows:

1. Total number of large litter items audited within each site;
2. Total number of small litter items audited within each site; and
3. Total number of combined large and small litter items within each site.

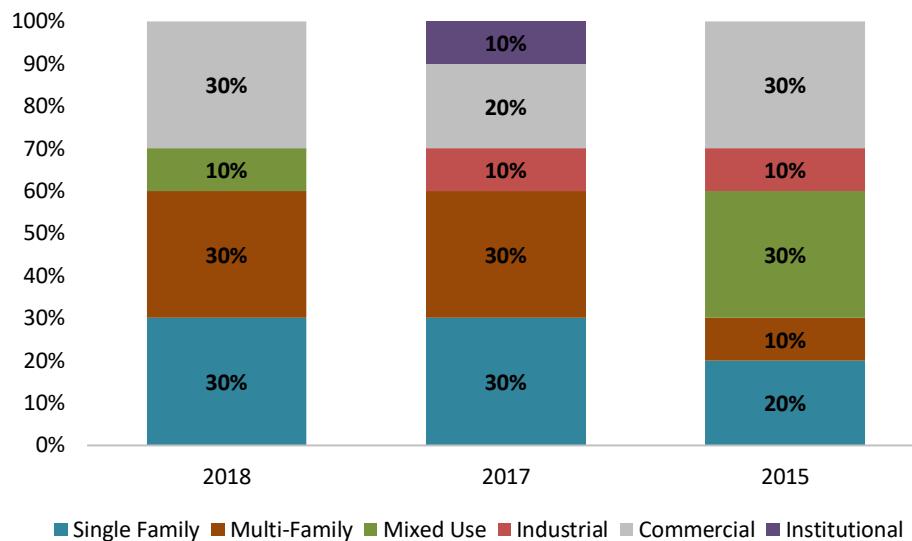
**Table 26** indicates the top ten sites, having the most accumulated large and small litter combined. A full list of all sites is provided in **Appendix F**.

In an effort to examine the audit results further, various attributes which may contribute to litter levels were examined. Attributes associated with the ten sites having the highest amount of combined litter sites are proved in **Table 26**. Of these sites, none (100%) had a fast food restaurant within sight, a convenience store within sight, a bus stop within the survey area or a City litter receptacle within 50 m of the site.

**Table 26: Combined Ranking for Large and Small Litter**

Site #	All Litter	Hundred Block	Street Name	Fast Food	Conv. Store	Bus Stop	Litter Bin
89	109	6500	Main	N	N	N	N
55	66	3400	Vanness	N	N	N	N
107	62	600	Powell	N	N	N	N
97	56	800	Commercial	N	N	N	N
62	50	2400	Kingsway	N	N	N	N
17	48	2100	Renfrew	N	N	N	N
31	48	2700	E. Hastings	N	N	N	N
102	43	5600	Cambie	N	N	N	N
92	42	2200	E. Pender	N	N	N	N
60	41	7200	Dumfries	N	N	N	N

The combined small and large litter sites were analyzed for each litter audit. During this analysis zoning and land use were recorded (**Figure 49**). Combined litter had the most variation in land use from the baseline audit in 2015 (30% mixed use and 30% commercial) while 2017 and 2018 had more similar results (30% single family and 30% multi-family).



**Figure 49: 2018, 2017 and 2015 top 10 Combined Litter Sites by Zoning and Land Use**

## 6.0 Conclusions

It is important to note that the information contained within this report outlining the litter audit results is a “snapshot” in time. These results only reflect the conditions of the period of time in which they were collected. Seasonal variability, among other factors, can affect the amount of litter within an area. The litter audit results for the assessments that took place September 17 to September 20, 2018 are those reflected in this report.

### 6.1 Key Findings of the Large Litter Audits

Large litter was observed at all 108 sites. Five of these audits are analyzed separately as they were immediately adjacent to construction sites. The key findings of the large litter audits were:

- The average number of large litter items per site was 9.7 pieces for sites with no adjacent construction and 10.5 if the sites with construction were included in the overall analysis. This number (of pieces of litter accumulated) was less than the baseline audit in 2015 (12 pieces per site) but more than the 2017 follow-up audit (8.1).
- Total large litter observed in 2018 was 998 pieces for sites without construction (9.7 per site).
- The total large litter observed in 2018 was 140 pieces for sites immediately adjacent to construction (28 per site).
- In 2018, the most common categories for large litter observed were other miscellaneous (25%), paper/fibre materials (18%) and cups (13%).

### 6.2 Key Findings of the Small Litter Audits

Small litter was observed at all 108 sites. Five of these assessments are analyzed separately as they were immediately adjacent to construction. The key findings of the small litter audits were:

- The average number of small litter items per site was 8.1 pieces for sites with no construction and 8.4 if the sites with construction were included in the overall analysis. This was more than both the baseline audit (7.3 pieces) and the follow-up audit (5.2 pieces).
- The total small litter audited in 2018 was 836 pieces for sites without construction (8.1 per site).
- The total small litter audited in 2018 was 74 pieces for sites immediately adjacent to construction (14.8 per site).
- The most common categories of small litter observed were cigarette butts/debris (34%) and chewing gum (19%).

### 6.3 Key Findings of the Supersite Audits

Supersite audits were completed within 19 sites. The key findings of the supersite assessments were:

- The average number of small litter items per site was 37.1 pieces of small litter. This was more than the 2015 baseline audits (269.6 pieces/site) and the 2017 follow-up audits (193.9 pieces/site).
- The total small litter audited in the 2018 supersites was 7,070 pieces.

- The most common categories of small litter observed in the supersites were chewing gum (42%) and cigarette butts/debris (38%).

**7.0**

## **Recommendations**

Success in combating litter is not an easy task. Reviews completed on jurisdictional litter abatement practices and policies for litter management show that the best practices for reducing litter and illegal waste dumping include litter campaigns and education. It is recommended that follow-up litter audits are completed to assess the success of litter abatement practices and City-wide litter programs.

**7.1**

### **Campaigns and Education**

The City has several programs and initiatives in place to reduce litter. Currently, the City is working on a Single Use-Item Reduction Strategy. This strategy is designed to explore the ways in which residents can reduce single-use items from going to landfill. During the 2017 street litter audits it was determined that 20% of large litter observed was cups. This reduced to 13% of the large litter observed in 2018.

Continuing to campaign using materials that target key litter groups, such as single-use items could positively impact litter abatement within the City and promote the Single-Use Reduction Strategy.

Should the City create more of a targeted approach to litter abatement it is recommended that the campaigns focus on these small litter categories:

- Chewing gum; and
- Cigarette butts/debris;

Targeted litter approaches on large litter items are also recommended that focus on:

- Printed paper products;
- Cups; and
- Take out extras.

Focusing campaigns and educational outreach on areas with high litter accumulation could impact litter management within these areas. It is also recommended that these campaigns be targeted on the specific items noted above.

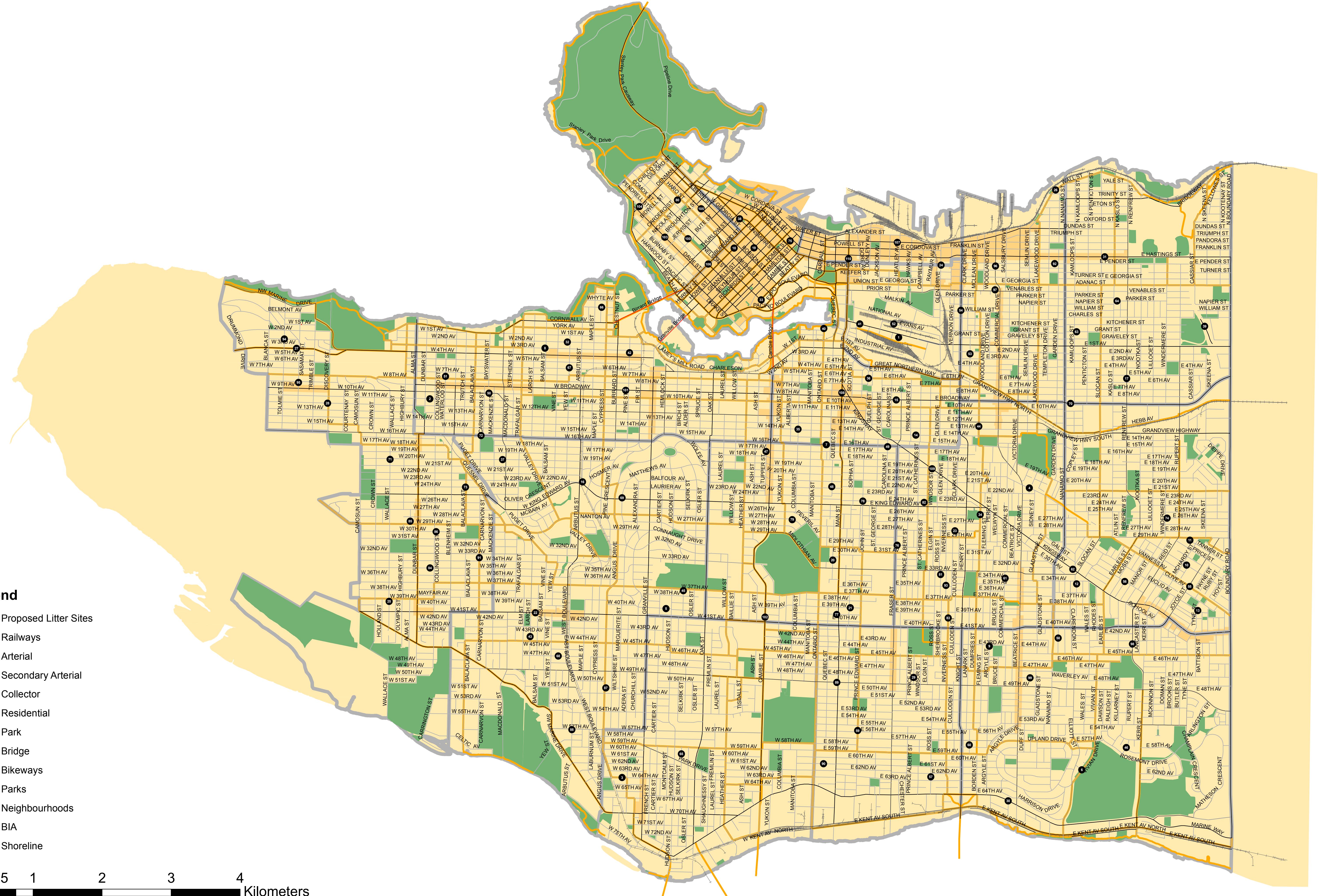
## Appendix A

### *Site Distribution Map and Litter Hot Spots*



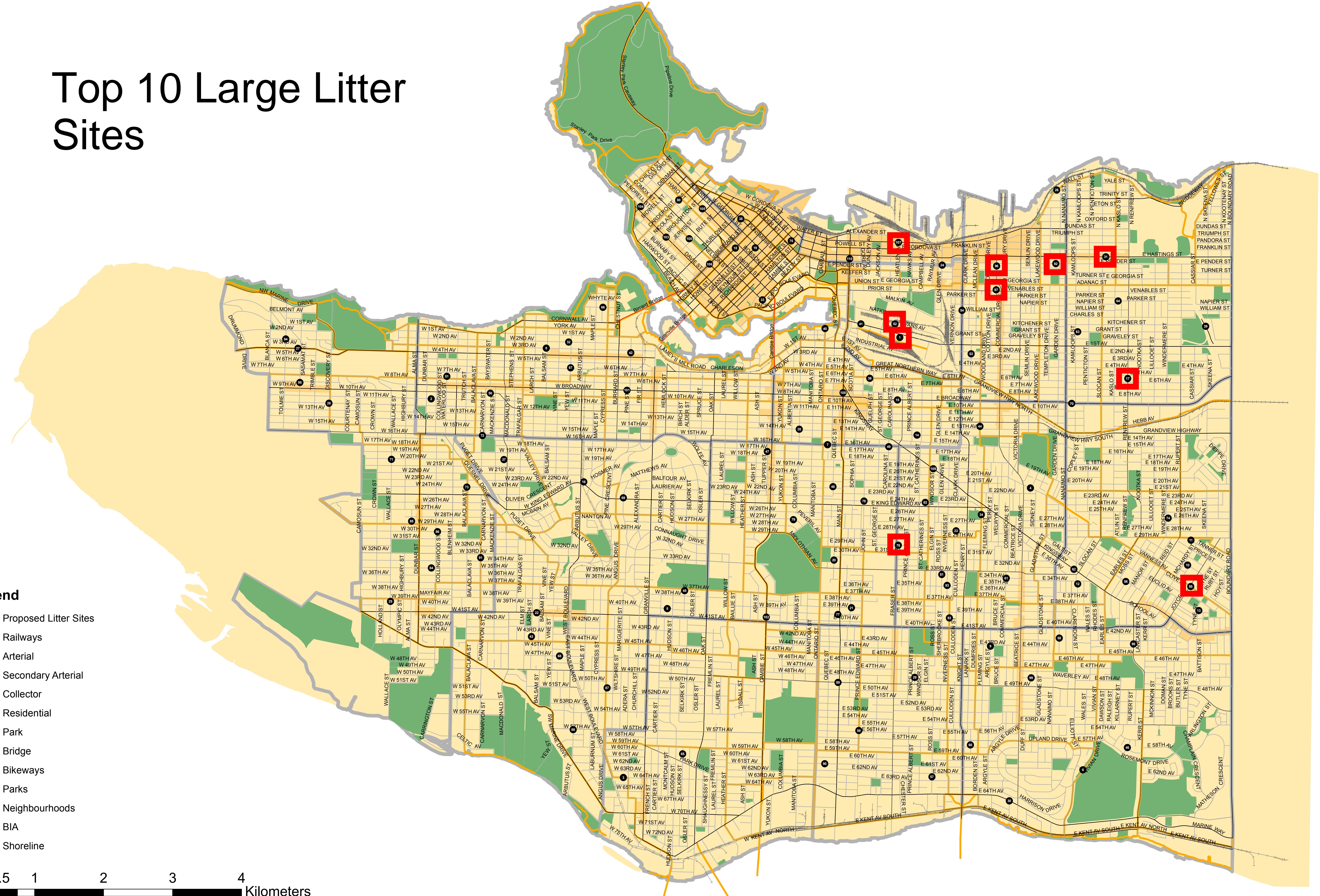
## Legend

- Proposed Litter Sites
  - Railways
  - Arterial
  - Secondary Arterial
  - Collector
  - Residential
  - Park
  - Bridge
  - Bikeways
  - Parks
  - Neighbourhoods
  - BIA
  - Shoreline



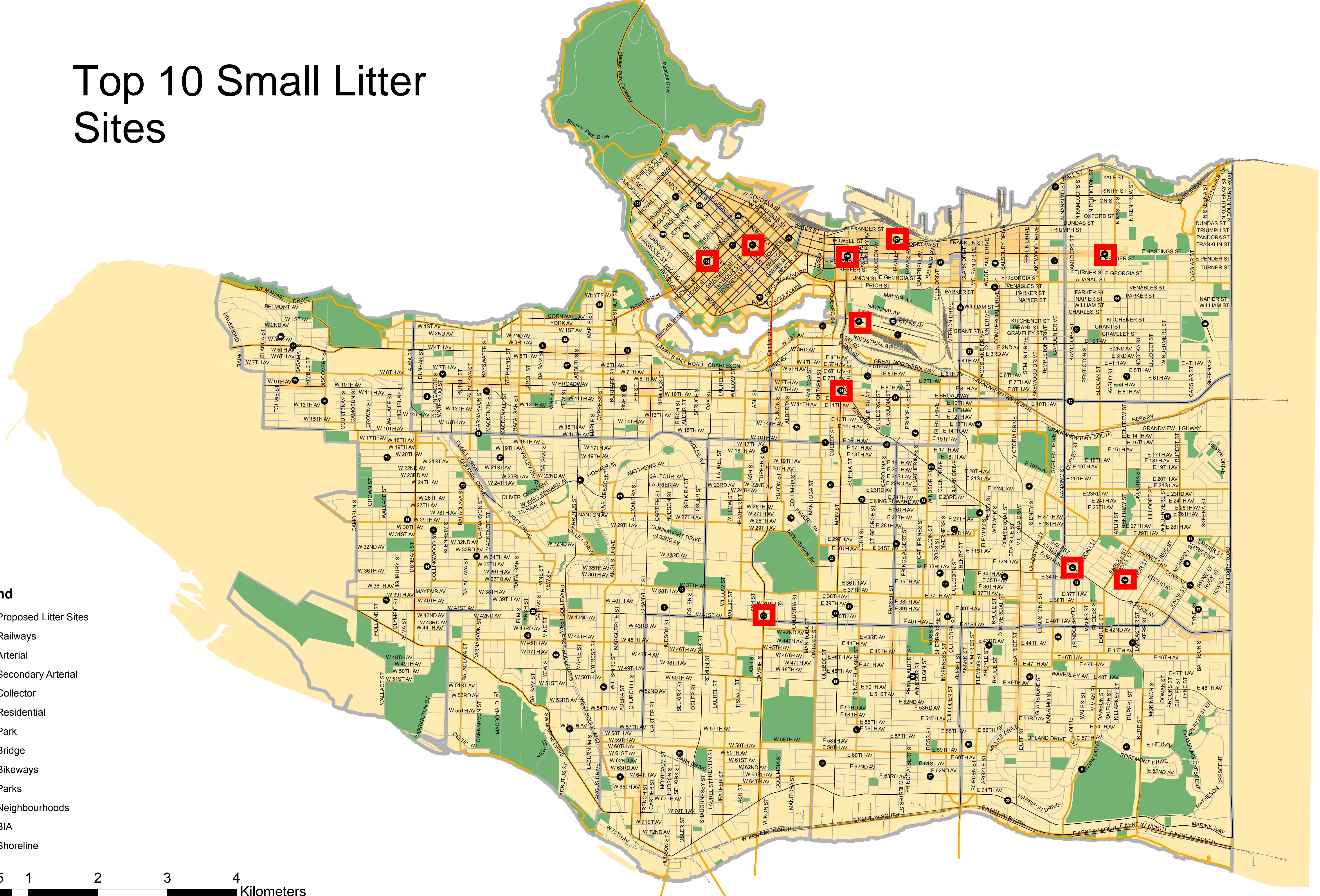


# Top 10 Large Litter Sites



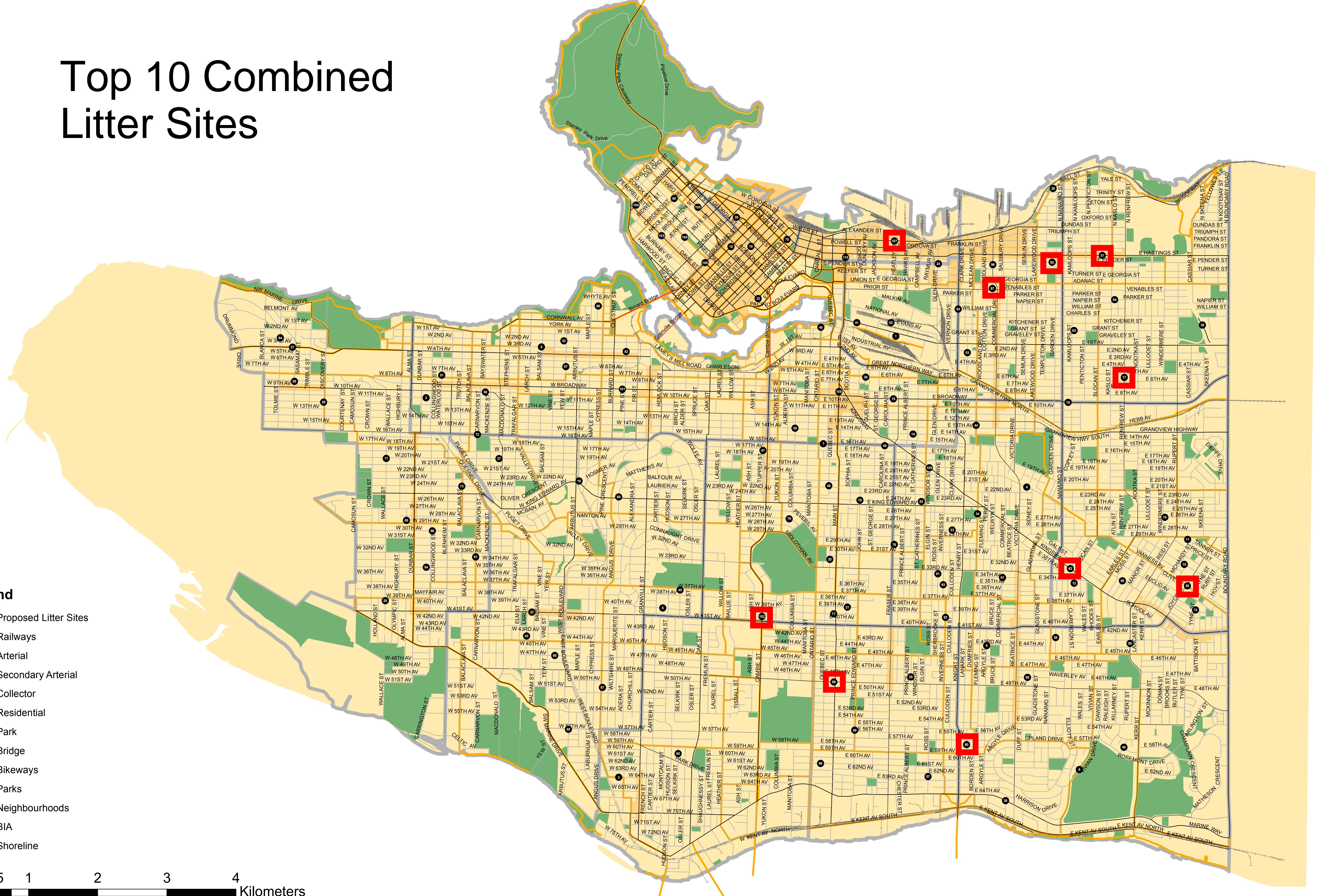


# Top 10 Small Litter Sites





# Top 10 Combined Litter Sites



## Appendix B

### *Methodology*

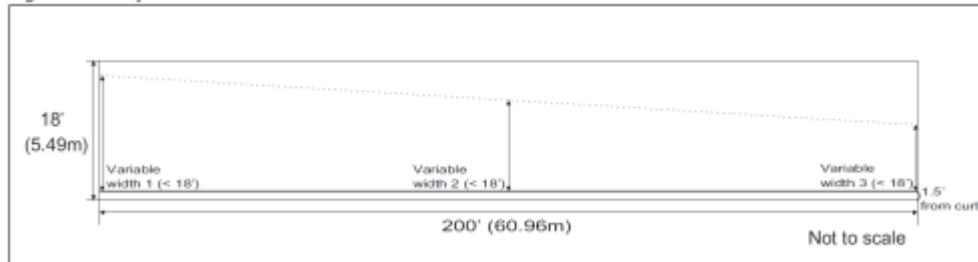
### **Conducting the Litter Audit**

Audit area at the sites should be the same size. Audit Areas are to be 200 feet x 18 feet. These full sized audit areas are termed “fixed” sites. The site width may be less than 18 feet in some cases, such as when in commercial areas the storefront is set back less than the prescribed distance. In these cases, each site should be 200 feet in length by the width available (<18 feet), which will be recorded. These sites are termed “variable” sites.

Beginning at the front of the parked car or the start of the site, the team shall use a measuring device to measure 50 feet ahead of the start of the site. Using street marking paint (water based to dissolve) or some other temporary marking method (e.g., chalk, pylons), a mark should be made on the pavement ahead to denote the starting point of the audit site. From this point the team will measure 100 feet, marking the roadway with another identifier to show the mid-point of the site. A final measurement of an additional 100 feet denotes the end of the audit site. As mentioned above, each site is to be 200 feet in length.

The width measurement shall be taken at the start, midpoint and end of the site. The width of the site should be measured 1.5 feet from inside the curb or the start of the pavement, towards the outer edge of the site, up to a maximum width of 18 feet and marked to indicate the boundary. This rule is set to include 1.5 feet into the street since curbs are normal catchment structures, for which the City is responsible for litter clean up. Refer to **Figure 1** below depicting the audit site setup.

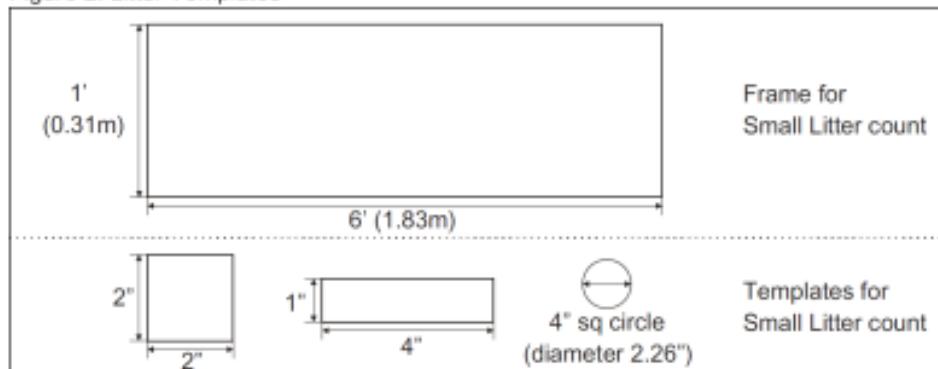
Figure 1: Survey Site



### **Classification of Large Litter**

For purposes of classifying litter, and in accordance with the methods used in previous litter surveys, large litter is defined as being greater than 4 square inches in size. To assist the field teams with determining the litter sizes, each audit team will be provided with three templates of 4 square inches in rectangle, square and round shape form. Refer to **Figure 2** depicting diagrams of the litter templates. At each site location this litter audit will observe and document large litter in 15 categories and 120 sub-categories.

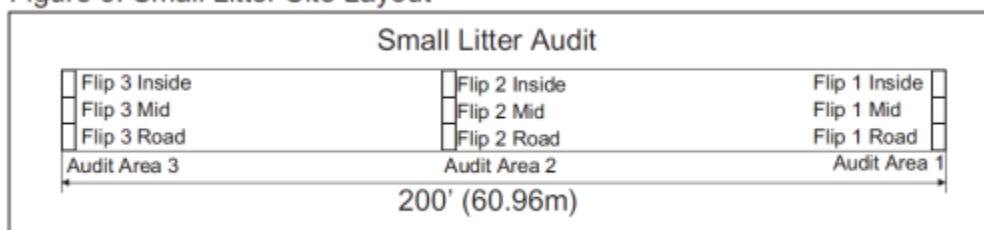
Figure 2: Litter Templates



### **Classification of Small Litter and Supersites**

Small litter is defined as those pieces of debris that are less than 4 square inches in size. It is classified under 26 categories. The small litter audit involves examining three segments, or slices taken through the audit site. A frame shall be constructed for each audit team, using  $\frac{1}{2}$  inch PVC plastic tubing (or a similar material) to act as the template. This frame shall measure 1 foot wide and 6 feet long. Three successive “flips” of the frame will complete crossing the site to the 18 foot boundary of the site. The litter auditor will observe and count all the small litter contained within the frames at three locations within each site: at the start, mid-point and end of the site. At each segment three flips of the frame will be analyzed, thus surveying a total of 18 square feet segment for a total of 54 square feet of the entire site. See **Figure 3** for a depiction of the site setup for the small litter survey. The Site Surveyor Form – Small Litter Count Sheet will be used to record the findings for each site. All small litter within supersites is to be observed, counted and classified as per the small litter categories outlined.

Figure 3: Small Litter Site Layout



## Appendix C

### *Site Location Details*

Site #	Hundred Block	Date (mm/dd/yyyy)	Start Time	End Time	Team	Fixed	Width 1	Width 2	Width 3	Street Type	Lanes	Divided	Area	Grass Ht. (inches)	Fast Food	Name of Fast Food	Conv. Store	Stop	Bus Stop within Sight	Bus Stop Within Survey Area	Traffic Calming	Litter Bin	Details on Litter Bin	Catch Points	Litter Visual Index	Clean Up	Details on Cleanup	Comments
1	700	09/19/2018	7:58	8:20	B	N	14	14.5	13.5	Major	6	Y	Commercial	<3	Y	Starbucks	N	Y	Y	N	N	N		Hedge, curb, tree line, storm drain	1	N		
2	3400	09/17/2018	9:40	9:52	A	N	14	14	15	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N	Headed east from starting location	
3	1600	09/18/2018	8:30	8:45	A	N	14	14	14	Minor	2	N	Residential	<3	N	N/A	N	N	Y	N	Y	N		Curb, grass line, tree line	1	N		
4	2000	09/20/2018	7:52	8:13	B	N	12.5	13	12.5	Minor	2	N	Residential	Over 6	N	N/A	N	Y	N	N	Y	N		Fence, hedge, curb, grass line, tree line	1	N	beside skytrain, garbage day	
5	5400	09/18/2018	10:20	10:33	A	N	9	9	10	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	Y	N		Fence, curb, tree line	2	N	Construction across the street	
6	7600	09/20/2018	11:55	12:05	A	N	10	7	11	Minor	2	N	Residential, parkland	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	3	N	Includes alleyway	
7	3100	09/18/2018	12:40	12:55	A	N	6	6	5	Minor	2	N	Residential, parkland	<3	N	N/A	N	Y	N	N	N	Y		Single stream garbage bin	3	N		
8	2300	09/17/2018	10:55	11:05	A	N	7.5	8	8	Minor	2	N	Residential	N/A	N	N/A	N	Y	N	N	N	N		Curb	1	N		
9	5916	09/20/2018	12:46	12:57	B	N	18	18	16.5	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Fence, curb, grass line, tree line	1	N		
10	3400	09/20/2018	8:43	8:58	B	N	14.5	14.5	14.5	Minor	2	N	Residential	3-6	N	N/A	N	Y	Y	N	N	N		Fence, curb, grass line, tree line	1	N		
11	3400	09/19/2018	16:13	16:27	B	Y	18	18	18	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grassline, tree line	1	N		
12	5000	09/20/2018	11:48	11:58	B	Y	18	18	18	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N		
13	3500	09/20/2018	9:35	9:52	B	N	15.5	17	15.5	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	N	N		Fence, curb, grass line, tree line	1	N	lots of leaves in parking area of street	
14	800	09/19/2018	9:00	9:22	A	N	13	16	13.5	Minor	2	N	Residential	<3	N	N/A	N	N	N	N	Y	N		Curb, grass line, tree line, flower beds	1	N		
15	600	09/19/2018	8:30	8:55	A	N	10	8	12	Major	6	Y	Commercial	N/A	Y	Subway	Y	Y	Y	N	N	Y		at bus stop across from site	Fence, curb, scaffolding	4	N	Site was under construction
16	3800	09/17/2018	13:50	14:00	A	N	6.5	12	7	Minor	2	N	Residential	<3	N	N/A	N	Y	Y	N	N	N		Curb, grass line	1	N		
17	2100	09/19/2018	15:19	15:41	B	N	11.5	11.5	11.5	Major	6	N	Residential	3-6	N	N/A	N	Y	Y	N	N	Y		recycling bin	1	N		
18	800	09/18/2018	10:16	10:45	B	N	13.5	13.5	13.5	Minor	2	N	Commercial	N/A	Y	Starbucks	N	Y	N	N	N	N		Curb, building	1	Y	Door man	
19	700	09/18/2018	11:10	11:32	B	Y	18	18	18	Major	2	N	Commercial	N/A	Y	Burger King	Y	Y	Y	Y	N	Y		Curb, grass line, tree line	2	N		
20	4800	09/20/2018	8:55	9:05	A	N	16.5	16.5	16.5	Minor	2	Y	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N		
21	300	09/19/2018	14:10	14:22	A	N	16.5	16	15.5	Minor	2	Y	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line, lamp post	1	N		
22	2400	09/17/2018	14:25	14:36	A	N	18	10	10	Major	4	N	Commercial	N/A	N	N/A	N	Y	Y	N	N	N		Curb, tree line	1	N		
23	1200	09/19/2018	11:45	11:58	A	N	16	14	13	Minor	2	Y	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	2	N	went west	
24	500	09/18/2018	14:05	14:27	B	N	9	8	7	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	N	N		Fence, curb, grass line, tree line	1	N		
25	5500	09/17/2018	7:27	7:45	B	N	17	15	16	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N		
26	2300	09/19/2018	11:46	12:08	B	Y	18	18	18	Minor	2	N	Residential	Over 6	N	N/A	N	Y	N	N	N	N		Hedge, grassline	1	N	construction beside site	

Site #	Hundred Block	Date (mm/dd/yyyy)	Start Time	End Time	Team	Fixed	Width 1	Width 2	Width 3	Street Type	Lanes	Divided	Area	Grass Ht. (inches)	Fast Food	Name of Fast Food	Conv. Store	Stop	Bus Stop within Sight	Bus Stop Within Survey Area	Traffic Calming	Litter Bin	Details on Litter Bin	Catch Points	Litter Visual Index	Clean Up	Details on Cleanup	Comments
27	4500	09/17/2018	11:56	12:10	B	N	18	8	9	Major	2	N	Residential	Over 6	N	N/A	N	N	Y	Y	N	N		Fence, hedge, curb, grass line, power poles	1	N		
28	4300	09/17/2018	11:11	11:24	B	N	18	17	15	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	Y	N		Hedge, curb, grass line, tree line, steps	1	N	bike route within 50m	
30	8300	09/20/2018	11:37	11:48	A	N	4.5	3	4	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	Y	N	N		grass line	1	N	no curb - difficult to figure out property line	
31	2700	09/19/2018	13:20	13:52	B	N	13.5	14.5	12.5	Major	6	N	Commercial	N/A	N	N/A	Y	Y	Y	Y	N	Y	recycling bin	Curb, grass line, tree line, buildings	1	N		
32	1900	09/17/2018	11:10	11:36	A	N	16	16	14	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N		
33	900	09/17/2018	16:15	16:33	B	N	18	10.5	16	Major	2	N	Residential	3-6	Y	711	Y	Y	N	N	N	N		Fence, curb, tree line	1	N		
34	4100	09/19/2018	11:30	11:37	A	N	17	12	12	Major	2	N	Residential, parkland	<3	N	N/A	N	Y	Y	N	Y	Y		Curb, grass line, tree line	2	N		
35	2900	09/18/2018	12:20	12:32	A	N	14	14	14	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Fence, hedge, curb, grass line, tree line	2	N		
36	2200	09/18/2018	14:25	14:40	A	N	8.5	8.5	8.5	Minor	2	N	Residential, parkland	<3	N	N/A	N	Y	N	N	N	Y	in park garbage and yard waste bins	Grass line, power polls	3	N		
37	2800	09/17/2018	9:05	9:22	A	N	17	17	17	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N		
38	1000	09/18/2018	9:22	10:05	B	Y	18	18	18	Major	6	N	Commercial	N/A	Y	McDonalds	N	Y	Y	Y	N	Y	Single stream garbage bin	Curb, building	1	N		
39	1400	09/19/2018	14:53	15:08	B	N	14	12.5	13	Minor	2	N	Commercial, Industrial, Institutional	3-6	N	N/A	N	N	N	N	N	N		Hedge, curb, grass line, tree line	1	N		
40	43	09/18/2018	14:46	15:18	B	N	15	12	13	Minor	2	Y	Residential	<3	Y	Subway Craft Market	N	Y	N	N	Y	N		Fence, curb, tree line	1	N		
41	300	09/18/2018	15:31	14:03	B	N	15.5	18	11.5	Major	6	Y	Commercial, Industrial, Institutional	Over 6	Y	Tim Hortons, A&W	Y	Y	Y	N	N	N		Fence, hedge, curb, grass line, tree line	1	N	near skytrain	
42	1800	09/17/2018	12:00	12:00	A	Y	18	18	18	Minor	2	N	Commercial, Industrial	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N		
43	44	09/17/2018	14:14	14:50	A	N	17	17	17	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	Y	N		Curb, grass line, tree line	1	N		
44	2800	09/19/2018	9:30	9:45	A	N	9	9	10	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	Y	N		Curb, grass line, tree line, flower bed	3	N		
45	45	09/18/2018	10:45	10:55	A	N	11	11	11	Minor	2	N	Residential	<3	N	N/A	N	N	Y	N	N	N		Curb, grass line, tree line	2	N		
46	3000	09/20/2018	12:10	12:18	A	N	11	11	11	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line, lamp post	1	N	Includes alleyway	
47	500	09/18/2018	12:00	12:12	A	N	17	17	17	Minor	2	N	Residential, Commercial, Industrial	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	2	N		
48	3700	09/18/2018	13:00	13:20	A	N	16	16	16	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	N	N		Fence, curb, grass line, tree line	2	N	Construction at 3789 Quebec St and across the street at Quebec. Measure includes alleyway.	
49	3200	09/19/2018	8:05	8:22	A	N	13	13	14	Minor	2	N	Residential, Commercial, Industrial	3-6	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	3	N	Construction across the street (2 houses)	
50	2900	09/17/2018	10:24	10:37	A	Y	18	18	18	Minor	2	N	Commercial		N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line, telephone post, lamp post	2	N	2941 does not exist - started at 2945 and went west	
51	3300	09/17/2018	10:00	10:15	A	N	10	8	8	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line	2	N		

Site #	Hundred Block	Date (mm/dd/yyyy)	Start Time	End Time	Team	Fixed	Width 1	Width 2	Width 3	Street Type	Lanes	Divided	Area	Grass Ht. (inches)	Fast Food	Name of Fast Food	Conv. Store	Stop	Bus Stop within Sight	Bus Stop Within Survey Area	Traffic Calming	Litter Bin	Details on Litter Bin	Catch Points	Litter Visual Index	Clean Up	Details on Cleanup	Comments
52	600	09/19/2018	8:30	9:00	B	N	13.5	12.5	12.5	Minor	2	N	Industrial	<3	N	N/A	N	Y	N	N	N	N		Hedge, curb, grass line, tree line	1	N		
53	1800	09/19/2018	9:55	10:10	B	N	10.5	11.5	11	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	Y	N		Curb, grass line, tree line	1	N	construction one block away	
54	1100	09/19/2018	9:15	9:42	B	N	10.5	10.5	10.5	Major	6	N	Commercial, industrial	N/A	N	N/A	N	Y	Y	Y	N	Y	recycling bin	Hedge, curb	2	N		
55	3400	09/20/2018	9:04	9:28	B	N	18	18	15.5	Major	2	N	Residential, Commercial, Industrial	3-6	N	N/A	N	Y	Y	N	N	Y	skytain bins	Fence, curb, grass line, tree line	1	N		
56	2900	09/20/2018	9:59	10:14	B	Y	18	18	18	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Fence, curb, grass line, tree line	1	N		
57	7800	09/20/2018	11:00	11:10	A	N	14	14	14.5	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N	Includes alleyway	
58	5700	09/20/2018	11:28	11:41	B	Y	18	18	18	Minor	2	Y	Residential	3-6	N	N/A	N	Y	N	N	N	N		Fence, curb, grass line, tree line	1	N	start at 5790 Berkeley	
59	300	09/20/2018	10:26	10:36	A	N	16.5	16	16	Minor	2	Y	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	2	N		
60	7200	09/20/2018	11:18	11:30	A	N	14	14.5	14.5	Minor	2	Y	Commercial, residential	<3	Y	McDonalds	Y	Y	N	N	N	N		Curb, grass line, tree line	4	N	Includes alleyway	
61	5000	09/20/2018	12:28	12:39	B	Y	18	18	18	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	N	N		Fence, curb, grass line, tree line	1	N		
62	2400	09/20/2018	12:04	12:12	B	Y	18	18	18	Major	6	N	Commercial, residential	3-6	Y	Churches Chicken	N	Y	N	N	Y	N		Curb, grass line	1	N		
63	1500	09/19/2018	14:19	14:31	B	N	14	14.5	14	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	Y	N	N		Curb, grass line, tree line	1	N		
64	2800	09/19/2018	14:01	14:11	B	N	15.5	15.5	15.5	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	N	N		Hedge, curb, grass line, tree line	1	N		
65	7500	09/18/2018	8:55	9:05	A	Y	18	18	18	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N	started at 7598 and went south	
66	1300	09/17/2018	11:40	11:55	A	N	16	15	15	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N		
67	2100	09/17/2018	12:50	13:00	A	N	14	12	13	Minor	2	N	Commercial, residential	<3	N	N/A	N	Y	N	N	Y	N		Curb, grass line, tree line, power polls	1	N		
68	2100	09/18/2018	9:50	10:05	A	N	17	17	17	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	2	N	construction to the east	
69	3900	09/17/2018	14:05	14:15	A	Y	18	18	18	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	Y		Curb, grass line, tree line	1	N		
70	2400	09/19/2018	15:45	15:59	B	N	12	8.5	14.5	Major	6	Y	Residential	3-6	N	N/A	N	Y	Y	Y	Y	N		Hedge, curb, grass line, tree line	1	N		
71	3900	09/17/2018	10:44	11:05	B	Y	18	18	18	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Fence, curb, tree line	1	N		
72	3000	09/17/2018	9:25	9:36	A	N	16	16	16	Minor	2	Y	Residential	<3	N	N/A	N	N	N	N	Y	Y		Curb, grass line, tree line, lamp post	2	N		
73	3200	09/17/2018	10:20	10:37	B	N	18	17	18	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	N	N		Hedge, curb, grass line, tree line, gardens	1	N	lots of leaf cover	
74	3200	09/20/2018	8:25	8:34	B	Y	18	18	18	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N	construction beside site	
75	400	09/19/2018	11:47	11:57	B	N	15	14	15	Major	2	N	Commercial, residential	N/A	N	N/A	N	Y	Y	Y	N	Y	Single stream garbage bin	Curb, building	2	N		
76	700	09/19/2018	12:55	13:10	A	N	8	9	8	Minor	2	N	Commercial, residential	<3	Y	Starbucks	Y	Y	N	N	N	N	Y	Single stream garbage bin	Curb, grass line	4	N	Construction east of site beside 744 E30th ave
77	5500	09/19/2018	14:35	15:05	A	N	8	7	15	Major	4	Y	Commercial, residential	N/A	Y	Subway	Y	Y	Y	Y	N	N		Hedge, curb	4	N		
78	3900	09/20/2018	9:26	9:36	A	N	14.5	14.5	14.5	Minor	2	N	Residential, institutional	<3	N	N/A	N	Y	N	N	Y	N		Curb, grass line,	1	N		

Site #	Hundred Block	Date (mm/dd/yyyy)	Start Time	End Time	Team	Fixed	Width 1	Width 2	Width 3	Street Type	Lanes	Divided	Area	Grass Ht. (inches)	Fast Food	Name of Fast Food	Conv. Store	Stop	Bus Stop within Sight	Bus Stop Within Survey Area	Traffic Calming	Litter Bin	Details on Litter Bin	Catch Points	Litter Visual Index	Clean Up	Details on Cleanup	Comments
79	200	09/20/2018	9:10	9:20	A	N	14.5	14.5	14.5	Minor	2	Y	Residential	<3	N	N/A	N	N	N	N	N	N		Curb, grass line, tree line	2	N		
80	1600	09/17/2018	14:18	14:37	B	N	17.5	17.5	14	Minor	2	N	Residential	Over 6	N	N/A	N	N	N	N	N	N		Hedge, curb, grass line, tree line, rocks, newspaper box	1	N	road block bike lane	
81	4900	09/19/2018	13:35	13:45	A	N	8	8	8	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	2	N	section 2 had car glass over a 1 m area	
82	900	09/19/2018	10:50	11:20	A	N	13.5	14.5	15.5	Minor	2	Y	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	4	N	Construction between 937 and 949 in site	
83	5500	09/19/2018	13:50	14:05	A	N	15.5	16.5	14	Minor	2	N	Residential	<3	N	N/A	N	N	N	N	N	N		curb, grass line, tree line, bench, rock flower bed	2	N	Road work at round about at E 37th	
84	3500	09/17/2018	9:02	9:22	B	N	18	17	17	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grassw line, tree line, power poles	1	N		
85	3700	09/17/2018	9:47	10:10	B	Y	18	18	18	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	Y	N		Fence, curb, grass line, tree line	1	N		
86	3400	09/17/2018	9:07	9:42	B	N	18	18	16	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Hedge, curb, grass line, tree line, garden box	1	N		
87	66	09/18/2018	9:30	9:43	A	Y	18	18	18	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line, light poles	1	N		
88	2100	09/18/2018	9:15	9:25	A	N	10	6	6	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N	went west, road work in front of 2108 W57th	
89	6500	09/20/2018	9:45	10:15	A	N	9	10.5	10	Major	4	Y	Commercial, residential	N/A	N	N/A	Y	Y	Y	Y	N	Y		garbage with bottle/can recycling attached (near bus stop)	4	N	construction at 6507, over 70 pieces of large litter	
90	100	09/20/2018	10:43	10:52	A	N	16.5	16.5	16.5	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	2	N		
91	2900	09/17/2018	8:15	8:45	B	N	17	16	18	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N	Construction near SW side of street	
92	2200	09/19/2018	12:47	13:13	B	Y	18	18	18	Minor	2	N	Residential	Over 6	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N		
93	1200	09/19/2018	13:20	13:32	A	N	12	7.5	7.5	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Fence, curb, grass line	3	N		
94	1800	09/17/2018	12:13	12:25	B	N	18	14	14	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	N	N		Fence, curb, grass line, tree line, power box	1	N		
95	4400	09/17/2018	11:28	11:51	B	N	18	16	17	Minor	2	N	Residential	<3	N	N/A	N	Y	N	N	N	N		Fence, hedge, curb, grass line, tree line	1	N		
96	1700	09/19/2018	11:17	11:35	B	N	18	16.5	18	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	N	N		Curb, grass line, tree line	1	N	landscaping beside site and construction	
97	800	09/19/2018	10:25	11:07	B	N	10.5	15	15	Minor	2	N	Commercial, residential	3-6	Y	Café	N	Y	N	N	N	N		Fence, hedge, curb, grass line, tree line, building	1	N		
98	2900	09/20/2018	10:58	11:20	B	Y	18	18	18	Minor	2	Y	Residential	3-6	N	N/A	N	Y	N	N	Y		recycling bin	1	N			
100	1200	09/17/2018	15:38	15:57	B	N	18	14.5	12.5	Minor	2	N	Residential	3-6	N	N/A	N	Y	N	N	N	Y		dog park garbage can	1	N	bike lane	

Site #	Hundred Block	Date (mm/dd/yyyy)	Start Time	End Time	Team	Fixed	Width 1	Width 2	Width 3	Street Type	Lanes	Divided	Area	Grass Ht. (inches)	Fast Food	Name of Fast Food	Conv. Store	Stop	Bus Stop Within Survey Area	Traffic Calming	Litter Bin	Details on Litter Bin	Catch Points	Litter Visual Index	Clean Up	Details on Cleanup	Comments
101	2500	09/17/2018	13:15	13:40	A	N	18	18	12	Major	6	N	Commercial, residential	N/A	Y	Starbucks	N	Y	Y	Y	N	Y	bus stop garbage and bottle recycling	Curb, tree line	2	N	
102	5600	09/20/2018	8:15	8:40	A	N	18	18	16	Major	6	Y	Commercial, residential	N/A	N	N/A	N	Y	Y	Y	N	Y	bus stop garbage and bottle recycling	Hedge, curb, bus structure, lamp posts, road light, radar	4	N	by oakridge mall
103	1100	09/17/2018	15:08	15:33	B	N	11	11	13	Minor	2	N	Residential	Over 6	N	N/A	N	Y	N	N	N	Y	Single stream garbage bin	Fence, curb, grass line, tree line, construction shed walkway	2	N	small litter count missed a lot of debris near construction
104	1100	09/17/2018	13:20	14:10	B	N	13	11.5	12.5	Major	4	N	Commercial	N/A	Y	Starbucks, La Catrina Mexican Tacos, Falafel & Friends	Y	Y	Y	Y	N	Y	mixed containers, paper and garbage	Curb, buildings	1	N	
105	1300	09/17/2018	14:46	14:58	B	Y	18	18	18	Major	2	N	Commercial	N/A	Y	Starbucks	Y	Y	Y	N	N	Y	Single stream garbage bin	Curb, buildings	1	N	
106	1000	09/18/2018	8:15	9:04	B	N	18	18	16.5	Major	4	N	Commercial, residential, institutional	N/A	N	N/A	Y	Y	Y	N	N	N		Fence, curb, grass line, tree line, building	3	N	
107	600	09/18/2018	13:32	13:56	B	N	12	13	13	Major	2	N	Commercial	Over 6	N	N/A	N	Y	Y	N	N	Y	Single stream garbage bin	Curb, grass line, tree line, buildings	3	N	
108	2400	09/18/2018	13:30	14:20	A	N	12	13	12	Major	6	Y	Commercial, residential	N/A	Y	Tim Hortons	N	Y	Y	N	N	Y		Curb, tree line	3	N	started at corner and went south
109	1100	09/19/2018	10:10	10:40	A	N	14.5	15	14.5	Major	6	N	Commercial, residential	N/A	Y	N/A	N	Y	Y	N	N	Y	Single stream garbage bin	Curb, tree line	2	N	
110	400	09/18/2018	12:57	13:21	B	Y	18	18	18	Major	6	N	Commercial, residential, institutional	N/A	N	N/A	N	Y	Y	N	N	Y	N/A	Curb, building	1	N	

## Appendix D

### *Field Forms*

## Site Surveyor Form

Date: \_\_\_\_\_ (DD/MM/YYYY) Start Time: \_\_\_\_\_ (AM/PM) End Time: \_\_\_\_\_ (AM/PM)

Team ID \_\_\_\_\_ Surveyors Names: \_\_\_\_\_

Site ID Number: \_\_\_\_\_ Site Name: \_\_\_\_\_

Site Description (hundred block, street, side street, etc)

Hundred Block: \_\_\_\_\_ Street Name: \_\_\_\_\_ Side of Street (NSEW) \_\_\_\_\_

Site type: Fixed  Variable  Site length: **Always 200 feet long**

**If variable:**

Width 1 - Start: \_\_\_\_\_ ft. (up to 18ft.)

Width 2 - Middle: \_\_\_\_\_ ft. (up to 18ft.)

Width 3 - End: \_\_\_\_\_ ft. (up to 18ft.)

Road type (check one): Major City Street  Minor City Street  Laneway

Is roadway divided: Y / N

Number of Lanes: 2  4  6  Other  (explain): \_\_\_\_\_

**Area Attributes:**

Commercial  Residential  Industrial  Parkland  Institutional

Grass Height (Check one): N/A  < 3 inches  3" – 6"  over 6"

Fast food within sight: Y / N Name of Fast Food Facility: \_\_\_\_\_

Convenience store within sight: Y / N Traffic light or stop sign within sight? Y / N

Bus Stop within sight? Y/N Bus stop within survey area? Y/N

Traffic Calming Device within survey area? (median bulge etc. Y/N If yes then describe?)

City street/park litter bin within 50 meter radius from site boundary: Y / N

City street/park litter bin details: \_\_\_\_\_

Evidence of litter cleanup? Y / N

Cleanup details: \_\_\_\_\_

Catch point: fence  hedge  curb  grass line  tree line  other  \_\_\_\_\_

Details:

---

# Photos Taken: \_\_\_\_\_

Visual rating of site (1 = cleanest, ie. <5 large pieces of litter; 4 = dirtiest, ie. >20 large pieces of litter) \_\_\_\_\_

Additional Comments: \_\_\_\_\_

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Large Litter Survey Form Pg1:

Site ID:

Site Name:

Time:

Survey Team:

CATEGORY	PASS 1	TOTAL	PASS 2	TOTAL	BRAND NAMES OBSERVED
<b>BEVERAGE CONTAINERS</b>					
Beer Cans					
Beer Bottles (glass)					
Soft Drink (glass)					
Soft Drink (cans)					
Soft Drink (plastic)					
Sport Drink (glass)					
Sport Drink (plastic)					
Water (glass)					
Water (plastic)					
Wine/ Liquor (glass)					
Wine/ Liquor (plastic/other)					
Juice (plastic)					
Milk-Milk Type Beverage (plastic)					
Juice (glass)					
Milk-Milk Type Beverage (Glass)					
Juice (gable top)					
Milk-Milk Type Beverage (gable top)					
Non-Milk Aseptic (box)					
Milk-Milk Type Beverage (Aseptic)					
Drink Foil Pouches					
Beverage Bi-Metal					
<b>OTHER PACKAGING</b>					
Foil Pouches					
Non-Beverage Aseptic Box					
Non-Beverage Gable Top					
Broken Cont. Glass					
Six Pack Plastic Rings					
Foil Containers					
<b>CUPS</b>					
Plastic Drink Cups					
Paper Cups (cold)					
Paper Cups (hot)					
Polystyrene Cups (foam)					
Other Paper Cups					
Cup Lids, Pieces, Lids					
<b>BAGS</b>					
Plastic Retail Bags & Grocery					
Paper Retail Bags& Grocery					
Paper Bags - Fast Food					
Plastic Bags - Fast Food					
Plastic Bags -Consumable Packaging					
Paper Bags -Consumable Packaging					
Plastic Bags-Dry-Cleaning Bags					
Other plastic Bags					
Pet waste bags (empty)					
Plastic Bags non-packaging					
Paper Bags non-packaging					
Zipper Bags/Sandwich Bags					
<b>OTHER PACKAGING (Boxes)</b>					
Cardboard Boxes/ Box Material					
Paperboard (boxboard)					
Paper Beverage Cases/Sleeves					
Polystyrene Clamshells					
Paper Clamshells					
Other Plastic Shells/Boxes					

CATEGORY	PASS 1	TOTAL	PASS 2	TOTAL	BRAND NAMES OBSERVED
<b>OTHER CONTAINERS</b>					
Plastic Jars / Bottles/ Lids					
Paint Containers/Cans					
Pesticide Containers					
Used Lubricating oil containers					
Solvent Containers					
Gasoline Containers					
Glass Jars/ Bottles Misc					
Cans/Containers-steel					
Cans-Aluminum					
Spiral Wound Containers					
Container Lids					
Other Aerosol Containers					
<b>FOOD WRAPS/CONTAINERS</b>					
Paper Food Wrap					
Paper /Foil Composite Wrap					
Plastic Wrap					
<b>TAKE OUT EXTRAS</b>					
Condiment Packaging					
Utensils					
Branded Napkins / Serviettes					
Paper Fast Food Plates					
Poly Fast Food Plates					
Aluminum Food Containers					
Other Plastic Fast Food Plates					
Plates-Other Materials					
<b>TRAYS</b>					
Polystyrene Trays					
Paper Trays					
Other Material Trays					
<b>CONFECTIONARY/ SNACK</b>					
Gum Wrappers					
Candy Bar Wrappers					
Candy Pouches					
Sweet Packaging (describe)					
Other Confectionary (describe)					
Snack Food Packaging					
<b>CLOTH</b>					
Clothing or Clothing Pieces					
Other Cloth					
<b>OTHER MISCELLANEOUS PACKAGING</b>					
Plastic Packaging Other					
Paper Packaging Other					
Plastic/ Composite Other					
Foil Materials/Foil Pieces					
<b>PAPER/ FIBRE MATERIAL</b>					
Non-Brand Towels/Napkins					
Lottery \Ticket Debris					
Printed Material					
Stationary (school, business etc.)					
Receipts (business forms, bus tickets)					
<b>TOBACCO PRODUCTS</b>					
Cigarette / Cigar Debris					
Tobacco other					

CATEGORY	PASS 1	TOTAL	PASS 2	TOTAL	BRAND NAMES OBSERVED
<b>Large Litter Survey Form Pg 2: SiteID:</b>					
<b>OTHER MISCELLANEOUS</b>					
Misc. Paper					
Misc. Plastic					
Misc. Paperboard					
Misc. Cardboard					
Misc. Glass					
Vehicle & Metal Road Debris					
Gypsum/ Drywall					
Rigid Asphalt Products					
Carpet					
Other Construction/Demolition Debris					
Tire & Rubber Debris					
Cell Phones					
Batteries					
Audio Visual Devices					
Electronic Toys					
Small Appliances, power tools					
Alarms					
Light Bulbs					
Home Articles					
Medications					
Food					
Pet Waste (bagged)					
Pet Waste (loose)					
Popsicle Sticks					

**Site Surveyor Form - Small Litter (<4") Count Sheet**

Date (DD/MM/YY): \_\_\_\_\_

Start Time: \_\_\_\_\_ End Time: \_\_\_\_\_

Team ID: \_\_\_\_\_ Surveyors Names: \_\_\_\_\_

Site ID Number: \_\_\_\_\_

Site Name: \_\_\_\_\_

SMALL LITTER CATEGORY	Item	Section #1*				Section #2				Section #3				Grand Total
		Flip 1	Flip 2	Flip 3	Total	Flip 1	Flip 2	Flip 3	Total	Flip 1	Flip 2	Flip 3	Total	
Cigarette butts/debris	1													
Other tobacco	2													
Bottle caps	3													
Straws	4													
Candy packaging and wrappers	5													
Expanded Polystyrene packing materials, ie. foam peanuts	6													
Other polystyrene debris, ie. poly foam pieces	7													
Glass	8													
Paper	9													
Cup Sleeves	10													
Plastic film	11													
Hard plastic	12													
Aluminum/foil debris	13													
Rubber	14													
Metal (not aluminum)	15													
Chewing gum (stuck on pavement)	16													
Food & Food Scraps	17													
Pet Waste (bagged)	18													
Pet Waste (loose)	19													
Needles/Syringes	20													
Medications	21													
Cell Phones	22													
Audio-Visual devices	23													
Batteries	24													
Other Electronic Waste	25													
Other Material	26													

\*closest to vehicle/starting point

Date:

Time:

Survey Team:

CATEGORY	PASS 1	TOTAL
<b>Small Litter Categories</b>		
Cigarette butts/debris		
Other tobacco		
Bottle caps		
Straws		
Candy packaging and wrappers		
Expanded Polystyrene packing materials, i.e.. foam peanuts		
Other polystyrene debris, i.e.. poly foam pieces		
Glass		
Paper		
Cup Sleeves		
Plastic film		
Hard plastic		
Aluminum/foil debris		
Rubber		
Metal (not aluminum)		
Chewing gum (stuck on pavement)		
Food & Food Scraps		
Pet Waste Loose		
Pet Waste (bagged)		
Needles/Syringes		
Medications		
Cell Phones		
Audio-Visual devices		
Batteries		
Other Electronic Waste		
Other Material		

## Appendix E

### *Litter Data*

Large Litter Item	Total	Percent
Misc. Plastic	98.5	9%
Misc. Paper	98	9%
Printed Material	75.5	7%
Cup Lids, Pieces	69	6%
Receipts (business forms, bus tickets)	62	5%
Non-Brand Towels/Napkins	61	5%
Snack Food Packaging	47	4%
Utensils	42	4%
Cigarette / Cigar Debris	36.5	3%
Plastic Packaging Other	34.5	3%
Home Articles	33	3%
Paper Cups (hot)	28	2%
Paper Cups (cold)	26	2%
Candy Bar Wrappers	25	2%
Tobacco other	24	2%
Condiment Packaging	23	2%
Other Construction/ Demolition Debris	23	2%
Plastic Drink Cups	18	2%
Cardboard Boxes/ Box Material	18	2%
Paper Food Wrap	17	1%
Paper /Foil Composite Wrap	16	1%
Other Plastic Bags	14	1%
Other Cloth	14	1%
Zipper Bags/Sandwich Bags	13	1%
Clothing or Clothing Pieces	13	1%
Gum Wrappers	12	1%
Food	10.5	1%
Plastic Bags -Consumable Packaging	10	1%
Stationary (school, business etc.)	10	1%
Plastic Wrap	9	1%
Branded Napkins / Serviettes	9	1%
Candy Pouches	9	1%
Plastic Bags Non-Packaging	7	1%
Vehicle & Metal Road Debris	7	1%
Plastic Retail Bags & Grocery	6	1%
Other Confectionary (describe)	6	1%
Foil Materials/Foil Pieces	6	1%
Lottery \Ticket Debris	6	1%
Tire& Rubber Debris	6	1%
Paper Bags - Fast Food	5	0%
Other Plastic Shells/Boxes	5	0%
Medications	5	0%
Pet Waste (loose)	5	0%
Popsicle Sticks	5	0%
Six Pack Plastic Rings	4	0%

Large Litter Item	Total	Percent
Paper Beverage Cases/Sleeves	4	0%
Container Lids	4	0%
Paper Fast Food Plates	4	0%
Polystyrene Trays	4	0%
Plastic/ Composite Other	4	0%
Polystyrene Cups (foam)	3.5	0%
Soft Drink (cans)	3	0%
Sweet Packaging (describe)	3	0%
Paper Packaging Other	3	0%
Pet Waste (bagged)	3	0%
Beer Cans	2	0%
Water (plastic)	2	0%
Juice (plastic)	2	0%
Paper Retail Bags& Grocery	2	0%
Pet Waste Bags (Empty)	2	0%
Paperboard (boxboard)	2	0%
Paper Clamshells	2	0%
Plastic Jars / Bottles/ Lids	2	0%
Misc. Glass	2	0%
Light Bulbs	2	0%
Milk-Milk Type Beverage (plastic)	1	0%
Foil Pouches	1	0%
Other Paper Cups	1	0%
Paper Bags -Consumable Packaging	1	0%
Polystyrene Clamshells	1	0%
Used Lubricating Oil Containers	1	0%
Glass Jars/ Bottles Misc	1	0%
Poly Fast Food Plates	1	0%
Paper Trays	1	0%
Misc. Cardboard	1	0%
Gypsum/ Drywall	1	0%
Beer Bottles (glass)	0	0%
Soft Drink (glass)	0	0%
Soft Drink (plastic)	0	0%
Sport Drink (glass)	0	0%
Sport Drink (plastic)	0	0%
Water (glass)	0	0%
Wine/ Liquor (glass)	0	0%
Wine/ Liquor (plastic/other)	0	0%
Juice (glass)	0	0%
Milk-Milk Type Beverage (Glass)	0	0%
Juice (gable top)	0	0%
Milk-Milk Type Beverage (gable top)	0	0%
Non-Milk Aseptic (box)	0	0%
Milk-Milk Type Beverage (Aseptic)	0	0%

Large Litter Item	Total	Percent
Drink Foil Pouches	0	0%
Beverage Bi-Metal	0	0%
Non-Beverage Aseptic Box	0	0%
Non-Beverage Gable Top	0	0%
Broken Cont. Glass	0	0%
Foil Containers	0	0%
Plastic Bags - Fast Food	0	0%
Plastic Bags-Dry-Cleaning Bags	0	0%
Paper Bags Non-Packaging	0	0%
Paint Containers/Cans	0	0%
Pesticide Containers	0	0%
Solvent Containers	0	0%
Gasoline Containers	0	0%
Cans/Containers-Steel	0	0%
Cans-Aluminum	0	0%
Spiral Wound Containers	0	0%
Other Aerosol Containers	0	0%
Aluminum Food Containers	0	0%
Other Plastic Fast Food Plates	0	0%
Plates-Other Materials	0	0%
Other Material Trays	0	0%
Misc. Paperboard	0	0%
Rigid Asphalt Products	0	0%
Carpet	0	0%
Cell Phones	0	0%
Batteries	0	0%
Audio-Visual Devices	0	0%
Electronic Toys	0	0%
Small Appliances, Power Tools	0	0%
Alarms	0	0%

Small Litter Items	Items	Percent
Cigarette Butts/Debris	306	34%
Other Tobacco	0	0%
Bottle Caps	0	0%
Straws	1	0%
Candy Packaging and Wrappers	30	3%
Expanded Polystyrene Packing Materials, ie. Foam Peanuts	0	0%
Other Polystyrene Debris, ie. Poly Foam Pieces	10	1%
Glass	28	3%
Paper	178	20%
Cup Sleeves	0	0%
Plastic Film	56	6%
Hard Plastic	30	3%
Aluminum/Foil Debris	42	5%
Rubber	3	0%
Metal (not aluminum)	14	2%
Chewing Gum (stuck on pavement)	169	19%
Food & Food Scraps	9	1%
Pet Waste (bagged)	3	0%
Pet Waste (loose)	2	0%
Needles/Syringes	0	0%
Medications	0	0%
Cell Phones	0	0%
Audio-Visual devices	0	0%
Batteries	0	0%
Other Electronic Waste	0	0%
Other Material	29	3%
Total Site Small Litter	910	100%

Super Site Items	Items	Percent
Cigarette Butts/Debris	2681	38%
Other Tobacco	0	0%
Bottle Caps	5	0%
Straws	9	0%
Candy Packaging and Wrappers	117	2%
Expanded Polystyrene Packing Materials, ie. Foam Peanuts	0	0%
Other Polystyrene Debris, ie. Poly Foam Pieces	18	0%
Glass	104	1%
Paper	499	7%
Cup Sleeves	0	0%
Plastic Film	132	2%
Hard Plastic	240	3%
Aluminum/Foil Debris	112	2%
Rubber	10	0%
Metal (not aluminum)	39	1%
Chewing Gum (stuck on pavement)	2974	42%
Food & Food Scraps	32	0%
Pet Waste (bagged)	3	0%
Pet Waste (loose)	3	0%
Needles/Syringes	1	0%
Medications	1	0%
Cell Phones	0	0%
Audio-Visual devices	0	0%
Batteries	1	0%
Other Electronic Waste	0	0%
Other Material	89	1%
Total Site Small Litter	7070	100%

## Appendix F

### *Ranking of Sites*

### Large Litter Results

Site Number	Large Litter
89	71
55	45
92	38
97	36
17	34
107	30
52	29
76	28
31	25
96	24
103	24
1	23
60	22
11	21
15	20
77	19
82	19
54	17
44	16
58	15.5
50	15
75	15
102	15
49	14
9	13.5
4	13
24	13
26	13
33	13
38	13
6	12
39	12
62	12
95	12
108	12
13	11
51	11
61	11
101	11
41	10
42	10
59	10
66	10
70	10

### Small Litter Results

Site Number	Small Litter
56	38
62	38
89	38
107	32
19	30
102	28
108	27
106	25
110	24
31	23
41	22
33	21
55	21
97	20
60	19
13	17
24	17
50	17
75	17
104	16
30	15
103	15
17	14
105	14
15	13
101	13
54	12
7	11
40	11
57	11
76	11
38	10
42	10
51	10
67	10
93	10
44	9
69	9
20	8
32	8
35	8
49	8
96	8
1	7

### Combined Litter Results

Site Number	Total
89	109
55	66
107	62
97	56
62	50
17	48
31	48
102	43
92	42
60	41
56	40
76	39
103	39
108	39
19	36
33	34
15	33
106	33
41	32
50	32
75	32
96	32
110	32
1	30
24	30
52	30
54	29
13	28
11	26
44	25
77	25
82	24
101	24
38	23
49	22
51	21
26	20
42	20
93	20
104	20
30	19
39	19
4	18
7	18

Site Number	Large Litter
85	10
93	10
100	10
79	9
81	9
90	9
98	9
10	8
23	8
80	8
106	8
110	8
7	7
34	7
36	7
67	7
83	7
19	6
40	6
47	6
48	6
53	6
72	6
91	6
32	5
35	5
37	5
43	5
57	5
71	5
84	5
14	4
16	4
20	4
22	4
30	4
45	4
64	4
68	4
73	4
104	4
5	3
21	3
27	3

Site Number	Small Litter
14	7
18	7
26	7
39	7
98	7
100	7
109	7
22	6
77	6
80	6
2	5
4	5
11	5
70	5
82	5
83	5
61	4
90	4
92	4
12	3
28	3
43	3
45	3
47	3
48	3
53	3
59	3
64	3
81	3
95	3
21	2
34	2
36	2
58	2
71	2
91	2
10	1
16	1
23	1
25	1
37	1
52	1
65	1
66	1

Site Number	Total
58	17.5
40	17
67	17
100	17
57	16
98	16
61	15
70	15
95	15
80	14
105	14
9	13.5
32	13
35	13
59	13
90	13
6	12
20	12
69	12
81	12
83	12
14	11
66	11
22	10
79	10
85	10
10	9
23	9
34	9
36	9
47	9
48	9
53	9
43	8
91	8
18	7
45	7
64	7
71	7
72	7
109	7
2	6
37	6
12	5

Site Number	Large Litter
69	3
8	2
12	2
46	2
56	2
74	2
78	2
2	1
3	1
28	1
63	1
65	1
86	1
87	1
94	1
18	0
25	0
88	0
105	0
109	0

Site Number	Small Litter
72	1
79	1
87	1
3	0
5	0
6	0
8	0
9	0
27	0
46	0
63	0
68	0
73	0
74	0
78	0
84	0
85	0
86	0
88	0
94	0

Site Number	Total
16	5
21	5
84	5
28	4
68	4
73	4
5	3
27	3
8	2
46	2
65	2
74	2
78	2
87	2
3	1
25	1
63	1
86	1
94	1
88	0