



CITY OF VANCOUVER
Street Litter Audit
2017 Results

November 7, 2017



City of Vancouver
507 West Broadway
Vancouver, BC
V5Z 1E6

Attention: Stephanie Chua
Solid Waste Program Management

Street Litter Audits – 2017 Report

Dear Stephanie:

Dillon Consulting Limited is pleased to present the City of Vancouver with the 2017 street litter audit results. This report summarizes the information collected during the street litter audits that took place September 18 -21, 2017. Through this report, we believe that we have efficiently collected information on the current accumulation and composition of litter at the reference sites with the City of Vancouver. These results have been compared to the baseline audits completed by the City of Vancouver in 2015.

Thank you for the opportunity to assist you 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".

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Executive Summary

The City of Vancouver retained Dillon Consulting Limited to conduct the City's second round of street litter audits at 108 pre-selected locations within Vancouver. The audits took place from September 18 – 21, 2017. 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 4 square inches; and small litter, which is any litter that is smaller than 4 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. It should be noted that the baseline audit, two sites were unable to be assessed because they were inaccessible. These sites were therefore not assessed in 2017. Two sites in 2017 were situated immediately adjacent to active construction. In the analysis, these two 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 8.1 pieces for sites with no construction and 8.6 if the sites with construction were included in the overall analysis.
- The most common categories for large litter observed were cups (20%), paper/fibre material (19%) and other miscellaneous (19%).
- The total large litter audited in 2017 was 925 pieces for both non-construction (862) and construction sites (63).

The key findings of the small litter assessment were:

- The average number of small litter items per site was 5.2 pieces for sites with no construction and 5.3 if the sites with construction were included in the overall analysis.
- The most common categories of small litter observed were cigarette butts/debris (37%) and chewing gum (25%).
- The total small litter audited in 2017 was 571 pieces for both non-construction (554) and construction sites (17).

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 193.9 pieces of small litter.
- The most common categories of small litter observed in the supersites were chewing gum (47%) and cigarette butts/debris (40%).
- The total small litter audited in the 2017 supersites was 3,685 pieces.

1.0

Introduction

The City of Vancouver (City) is home to over 603,000 residents across an area of 114 km. A bold initiative of Vancouver is to be recognized as the *Greenest City* in the world by the year 2020 and 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 including illegal dumping, and an increase in the diversion of these materials by implementing 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 18 – 21, 2017. This is the second round of audits completed for the City. 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. 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 the small subsections of the survey area;
- A detailed analysis of small litter items as supersites found within the survey area; and
- Analysis and reporting of results with a focus on a comparison to the 2015 baseline results and other municipalities.

Dillon staff were asked note if any sites had immediately adjacent construction occurring. There were two sites where this transpired (Sites 44 and 89). In the analysis, these two 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. 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 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 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 ahead to denote the starting point of the audit site. From this point the team measured 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 continuity 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 was 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 already selected by the City. Supersite 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 shows a site survey sheet with handwritten and printed information. The date is 18/09/2017, start time is 10:57 AM, and end time is 11:00 AM. Team ID is A, Surveyors Name is M.A., Site ID Number is 8, Site Name is 306 W 7th AVE, Site Description is hundred block, street, side street, etc., Hundred Block is 2300, Street Name is W 7th AVE, Side of Street (NSEW) is N/A, GPS Location of Centre of Site is N/A, Site type is Fixed (checked), Variable is not checked, Site length is Always 200 feet long, It's walkable is checked, Width 1 - Start is 18 ft (up to 18ft), Width 2 - Middle is 18 ft (up to 18ft), Width 3 - End is 18 ft (up to 18ft), Road type (check one) Major City Street is checked, Minor City Street is not checked, Laneway is not checked, Is roadway divided? Y is checked, Number of Lanes: 2 is checked, 4 is not checked, 6 is not checked, Other (explain) is blank. Area Attributes: Commercial is not checked, Residential is checked, Industrial is not checked, Parkland is not checked, Institutional is not checked. Grass Height (Check one): N/A is not checked, < 3 inches is not checked, 3'-6" is checked, over 6" is not checked. Fast food within sight: Y is checked, Name of Fast Food Facility is blank. Convenience store within sight: Y is checked. Bus Stop within sight: Y is checked. Bus stop within survey area? is not checked. Traffic Calming Device within survey area? (median bulge etc.) Yes then describe: is not checked. City street/park litter bin within 50 meter radius from site boundary: Y is not checked.

Figure 1: Site Survey Sheet



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

During the audits, Dillon staff collected information about the area and adjacent roads of the audit sites. As a part of the site survey, 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, 69% of sites were considered to be clean (and given a ranking of 1). An additional 24% were ranked as a 2, 6% were ranked as a 3 and only 1% was ranked as having a visual index of 4. The two sites where construction was observed were both given a litter index ranking of 2. Table 1 provides a breakdown by site type and the average visual rating observed.

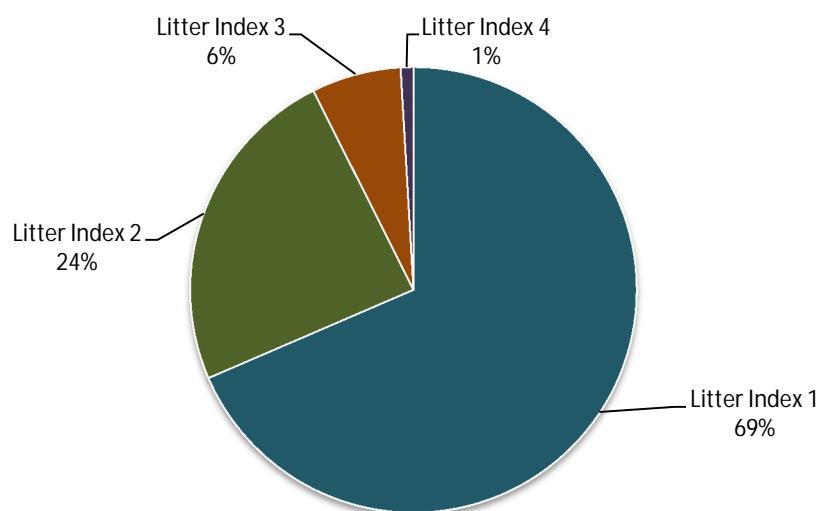


Figure 5: Visual Assessment Ranking of all Sites

Table 1: Average Visual Ranking by Site Type

Site Type	Average Visual Rating
Commercial	1.5
Industrial	1.3
Institutional	1.7
Multi-Family	1.7
Single- Family	1.2
Mixed Use	2.0

The remainder of the results (Subsections 3.2 to 3.4) are representative of the 106 sites that were not immediately adjacent to construction. The two 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. This section of the report provides results for large litter by material type, category and subcategory. In 2017, the average number of large litter items per site was 8.1 pieces. The most common sub-category of large litter observed was cup lids, pieces. This litter represented 10% of all litter surveyed. Table 2 illustrates the 20 most common large litter items observed (by sub-category) in the 2017 street litter audits. 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	Cup Lids, Pieces	90	10%	10%
2	Non-Brand Towels/Napkins	78	9%	19%
3	Tobacco other	60	7%	26%
4	Misc. Plastic	55	6%	33%
5	Receipts (business forms, bus tickets)	53	6%	39%
6	Snack Food Packaging	41	5%	44%
7	Paper Cups (hot)	36	4%	48%
8	Misc. Paper	32	4%	52%
9	Paper Food Wrap	29	3%	55%
10	Plastic Drink Cups	26	3%	58%
11	Printed Material	26	3%	61%
12	Plastic Wrap	24	3%	64%
13	Home Articles	23	3%	66%
14	Food	23	3%	69%
15	Branded Napkins / Serviettes	16	2%	71%
16	Paper Cups (cold)	15	2%	73%
17	Plastic Packaging Other	15	2%	74%
18	Zipper Bags/Sandwich Bags	12	1%	76%
19	Candy Bar Wrappers	12	1%	77%
20	Vehicle & Metal Road Debris	11	1%	79%
Total Top 20		677	79%	
Total All Litter		862	100%	

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 862 pieces of large litter observed in the 2017 street litter audits. The largest material type observed was paper (39%), followed by plastic (34%) and other (24%). Metal, composite and glass materials each represented 1% of the materials observed.

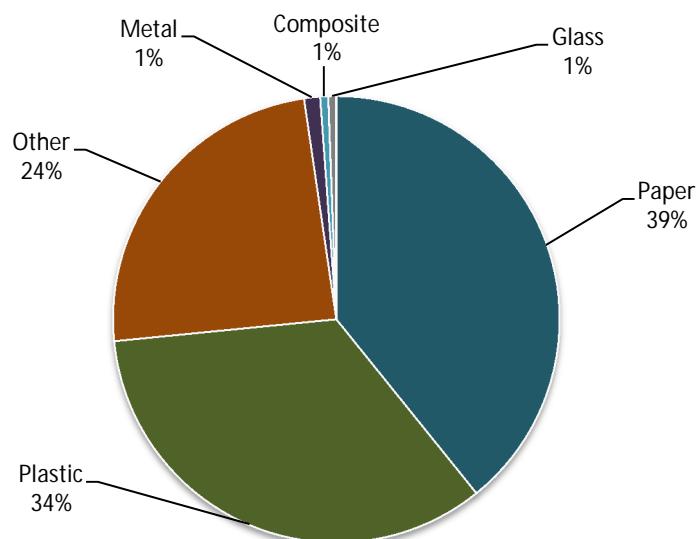


Figure 6: Large Litter by Material Type

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 2017, the most common category of litter observed was cups (20%), paper/fibre material (19%) and other miscellaneous (19%). Miscellaneous litter included items such as miscellaneous paper, plastic, as well as vehicle and road debris. Figure 7 illustrates these results.

Table 3: Large Litter Totals by Category

Category	Observed Number of Items	Percentage of Large Litter Observed
Beverage Containers	25	3%
Other Packaging	5	1%
Cups	172	20%
Bags	41	5%
Other Packaging (Boxes)	17	2%
Other Containers	12	1%
Food Wraps/ Containers	54	6%
Take Out Extras	32	4%
Trays	3	0%
Confectionary/Snack	65	8%
Cloth	18	2%
Other Miscellaneous Packaging	21	2%
Paper/Fibre Material	168	19%
Tobacco Products	62	7%
Other Miscellaneous	167	19%
Total	862	100%

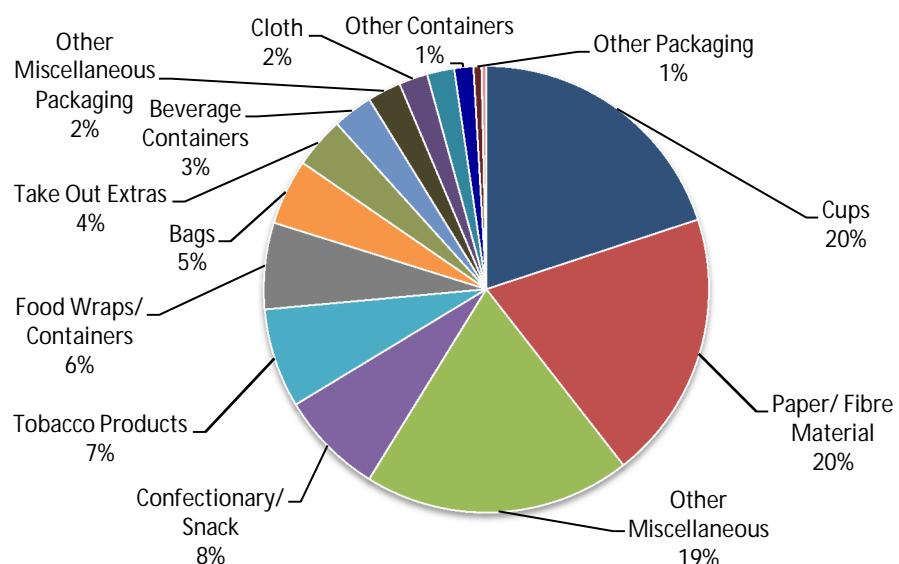


Figure 7: Large Litter Items by Category

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 3% of all large litter observed in the 2017 audits. The largest sub-category evaluated for beverage containers was beer cans (20%) and milk –milk type beverage (plastic) (20%), followed by water (plastic) (16%). Figure 8 illustrates the breakdown of the beverage container category. Figure 9 compares the highest three sub-categories from 2017 to the 2015 baseline litter audits.

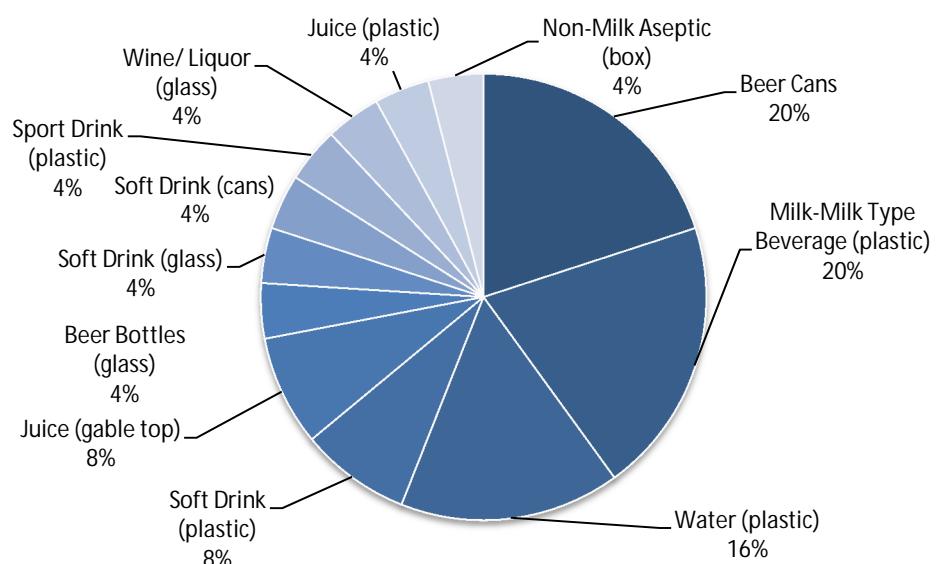


Figure 8: Beverage Container Composition 2017

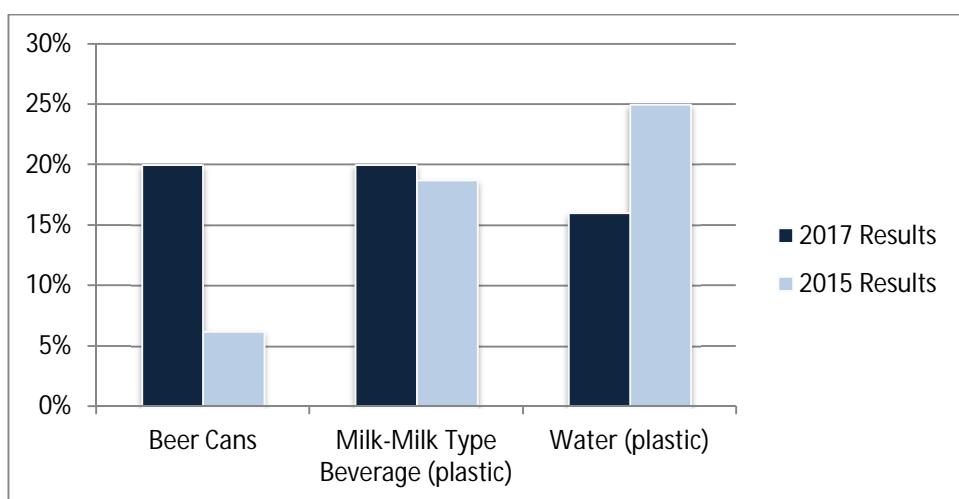


Figure 9: Beverage Containers 2017 vs. 2015 Comparison

Other Packaging:

Other packaging accounted for 1% of the overall large litter observed for the City's 2017 audits. Foil pouches (40%), broken container glass (40%) and foil containers (20%) comprise the other packaging category, entirely. Figure 10 illustrates the results of the other packaging category. Figure 11 compares the highest three sub-categories from 2017 to 2015.

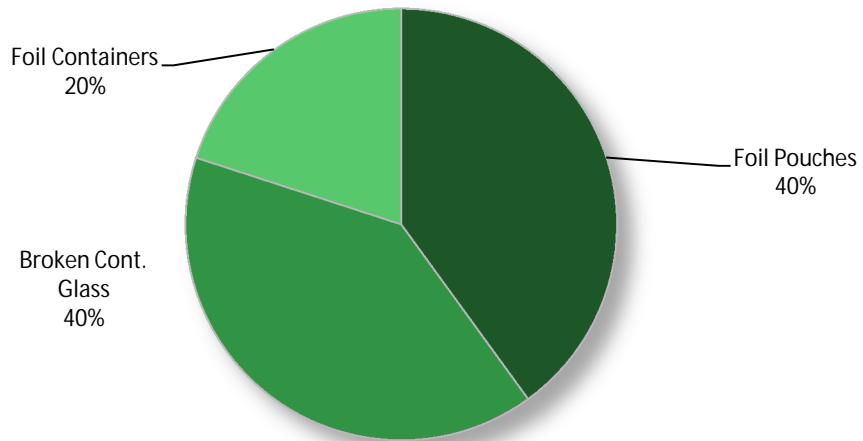


Figure 10: Other Packaging Composition 2017

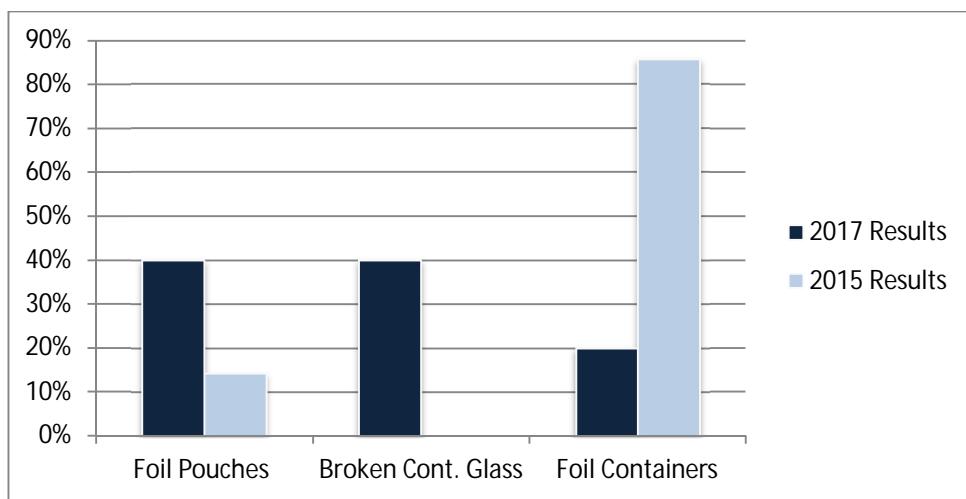


Figure 11: Other Packaging 2017 vs. 2015 Comparison

Cups:

Cups were the largest category observed in the 2017 street litter audits and represented 20% of all large litter observed. Cup lids, pieces were the largest subcategory (52%), followed by paper cups (hot) (21%). Figure 12 illustrates the breakdown of the cups category while Figure 13 compares the highest three sub-categories from the 2017 to 2015 audits.

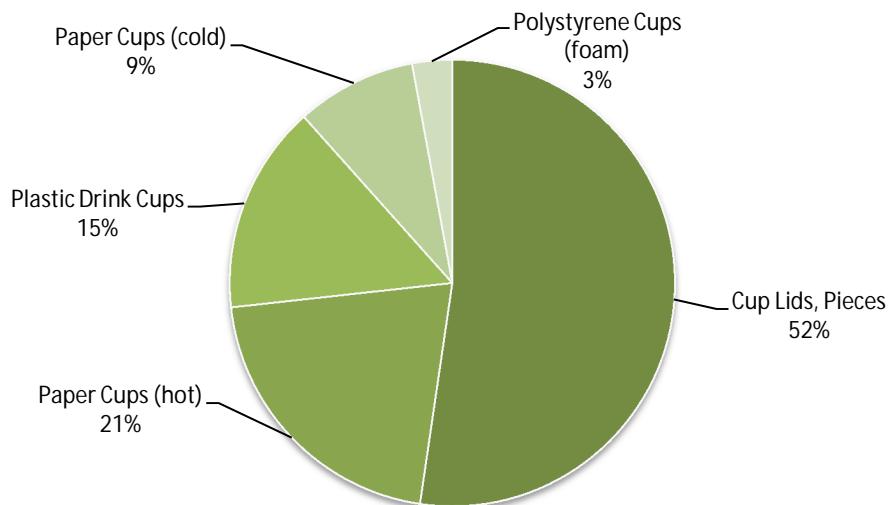


Figure 12: Cups Composition 2017

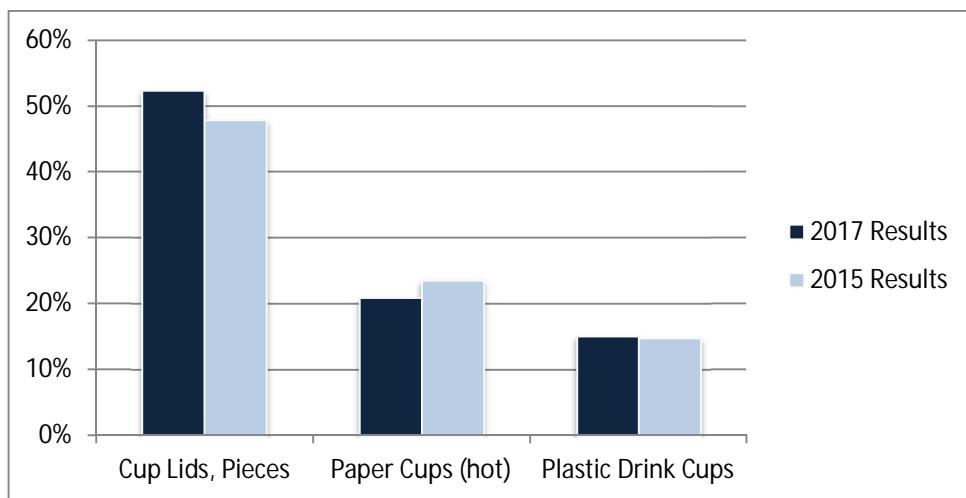


Figure 13: Cups 2017 vs. 2015 Comparison

Bags:

Bags represented 5% of all large litter observed. This category comprised primarily of zipper bags/sandwich bags (29%) and plastic retail bags and grocery (15%). Figure 14 illustrates the 2017 composition of the bags category; Figure 15 compares the highest three sub-categories from 2017 to 2015.

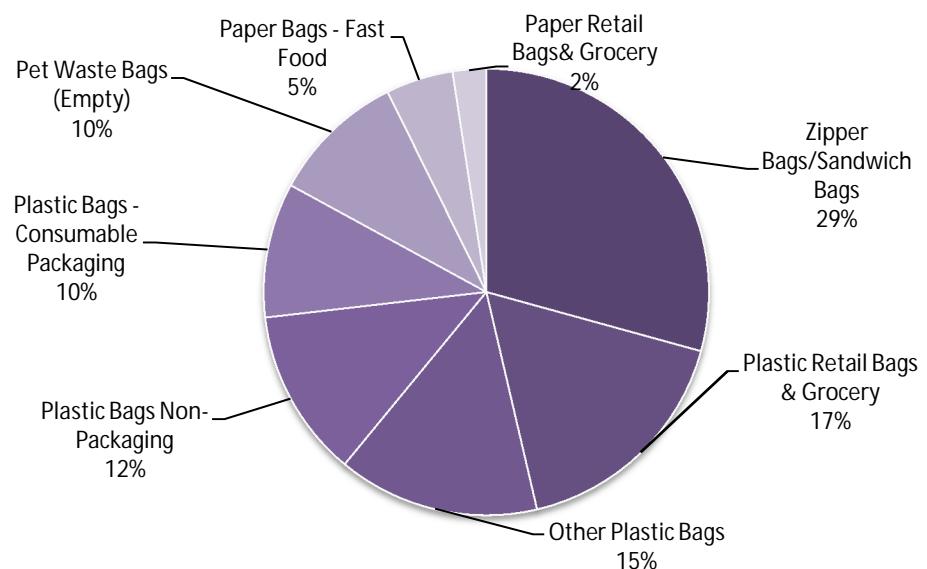


Figure 14: Bags Composition 2017

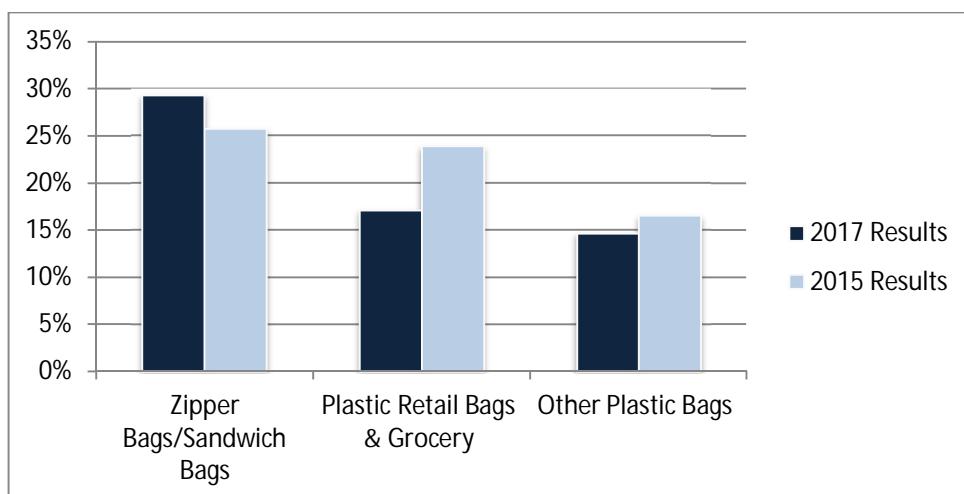


Figure 15: Bags 2017 vs. 2015 Comparison

Other Packaging (Boxes):

Within the 2017 audits other packaging (boxes) represented 2% of the accumulated large litter. This category consisted of cardboard boxes/box material (35%), paperboard (35%), paper beverage cases/sleeves (24%) and other plastic shells/boxes (6%), as illustrated in Figure 16. Figure 17 compares the highest three sub-categories from 2017 to 2015.

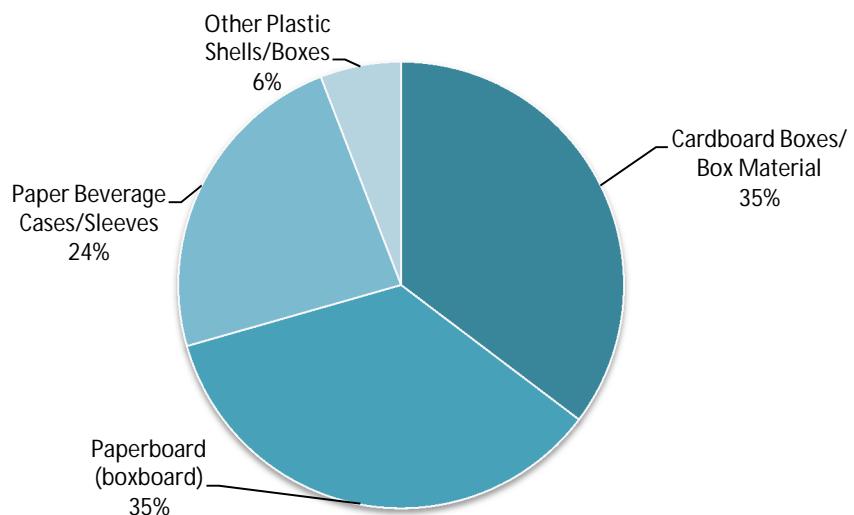


Figure 16: Other Packaging (Boxes) Composition 2017

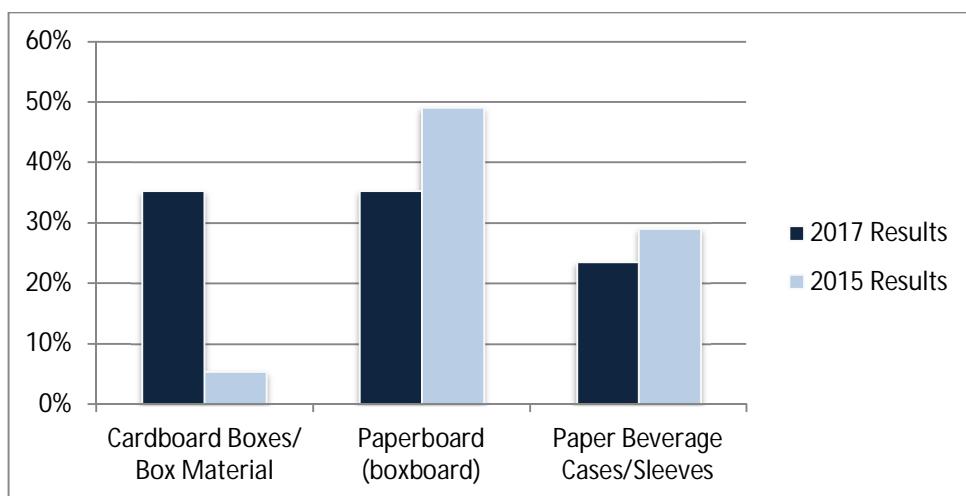


Figure 17: Other Packaging (Boxes) 2015 vs. 2017 Comparison

Other Containers:

Other containers represented 1% of all large litter observed in 2017. The breakdown of this category was plastic jars/bottles/lids (83%), cans-aluminum (9%) and containers lids (8%). This composition is illustrated in Figure 18 while a comparison of the highest three sub-categories from 2017 to 2015 is illustrated in Figure 19.

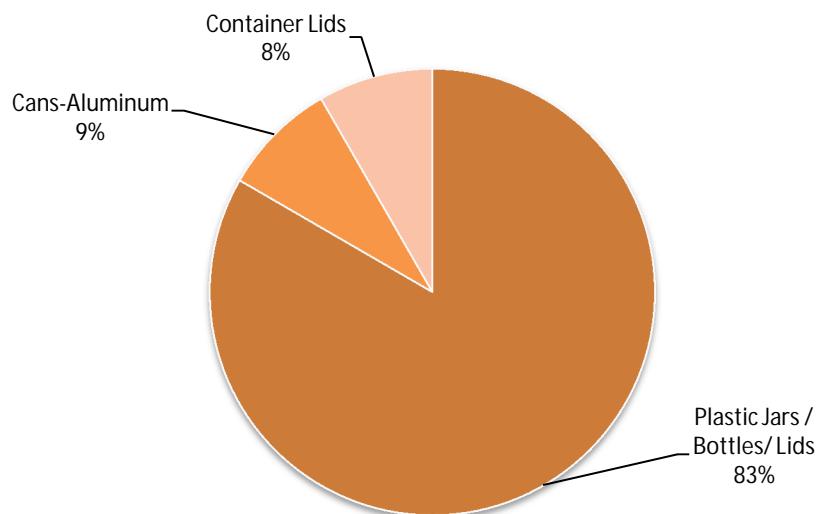


Figure 18: Other Containers Composition 2017

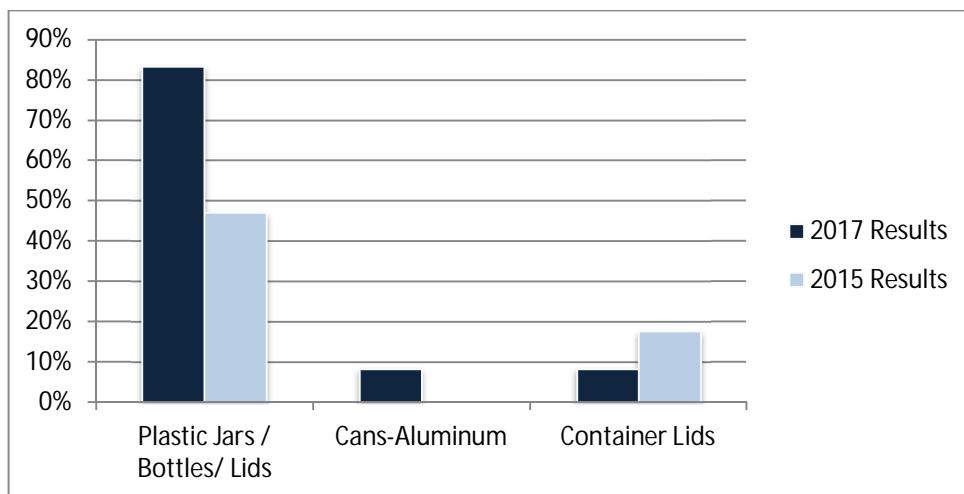


Figure 19: Other Containers 2017 vs. 2015 Comparison

Food Wraps/Containers:

Food wraps/containers represented 6% 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 (54%), plastic wrap (44%) and paper/foil composite wrap (2%). Figure 21 compares the three sub-categories from 2017 to 2015.

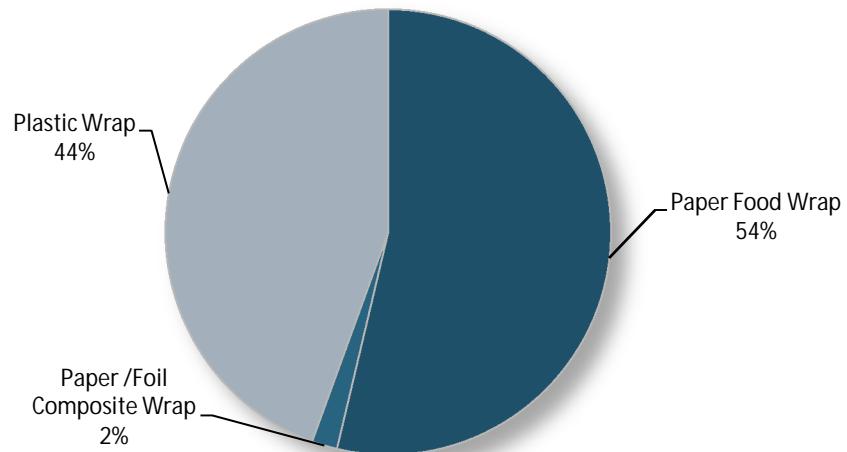


Figure 20: Food Wraps/Containers Composition 2017

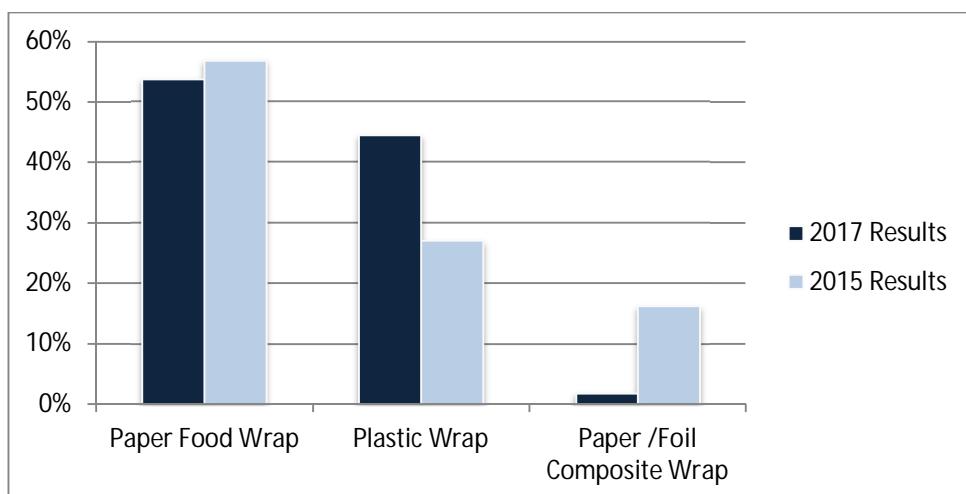


Figure 21: Food Wraps/Containers 2017 vs. 2015 Comparison

Take out Extras:

Take out extras accounted for 4% of the large litter observed. Half of the litter in this category was comprised of branded napkins/serviettes. Figure 22 illustrates the breakdown of this category while Figure 23 compares the highest three sub-categories from 2017 to 2015.

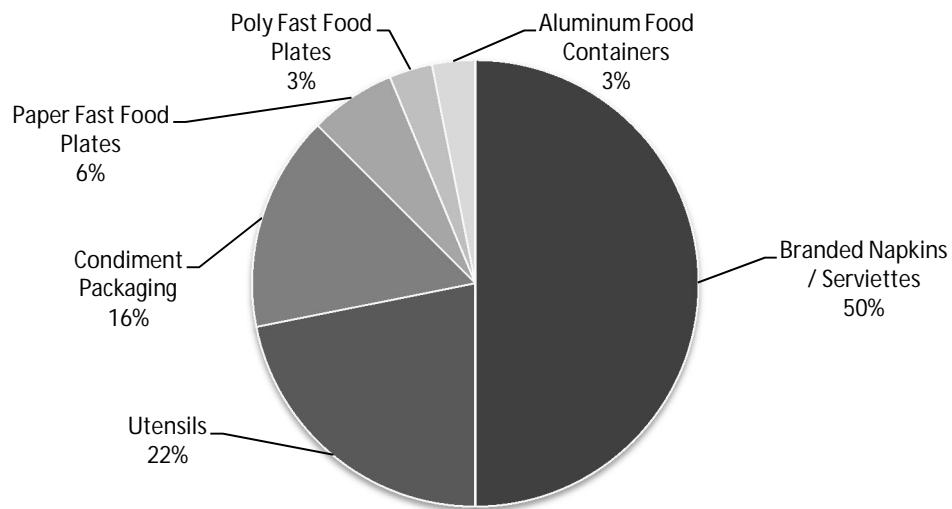


Figure 22: Take Out Extras Composition 2017

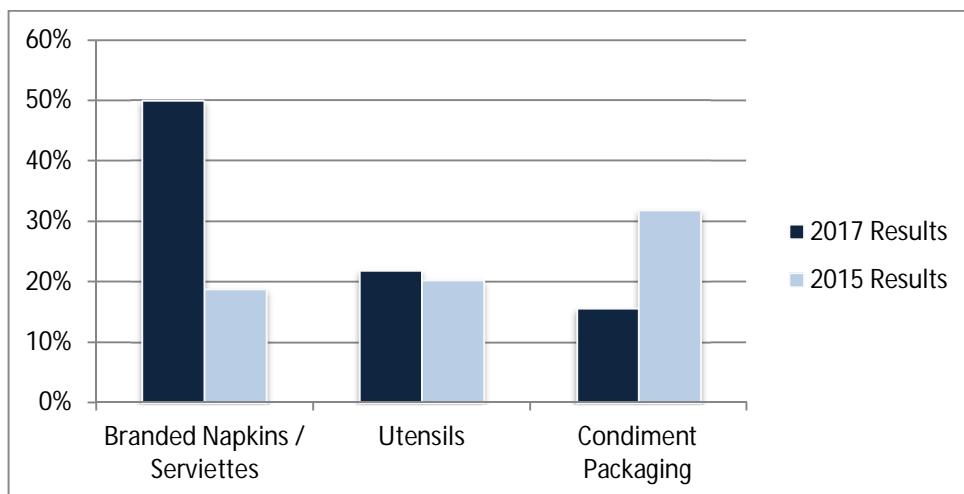


Figure 23: Take Out Extras 2017 vs. 2015 Comparison

Trays:

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

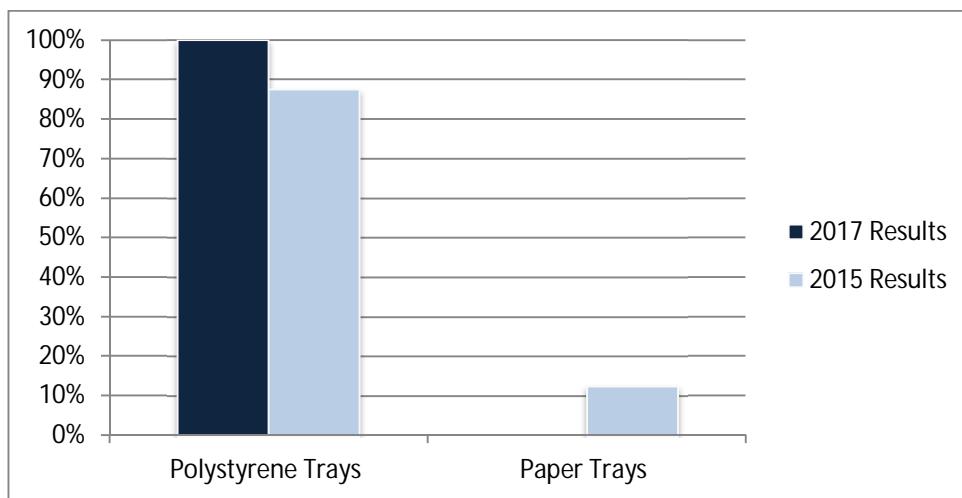


Figure 24: Trays 2017 vs. 2015 Comparison

Confectionary/Snacks:

This category represented 8% of all large litter observed in 2017. The most frequent observed sub-categories for large litter were snack food packaging (63%) and candy bar wrappers (18%). Figure 25 illustrates the results of the confectionary/snacks category breakdown. Figure 26 compares the highest three sub-categories from 2017 to 2015.

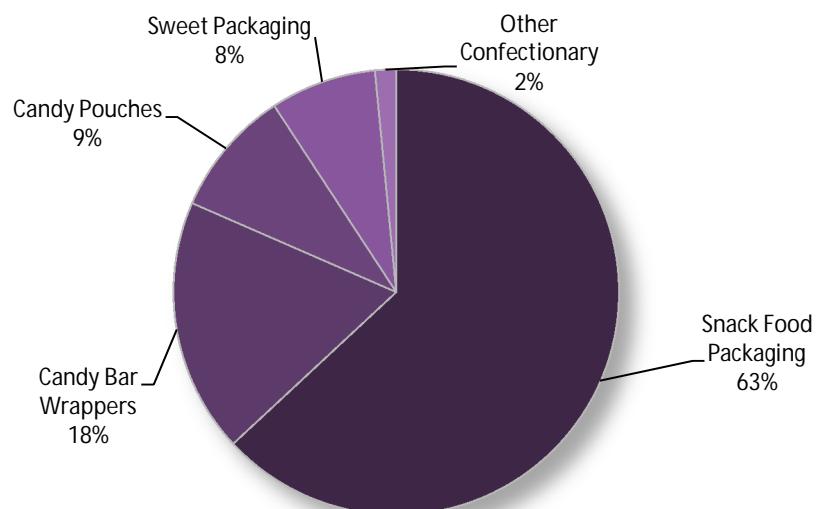


Figure 25: Confectionary/Snacks Composition 2017

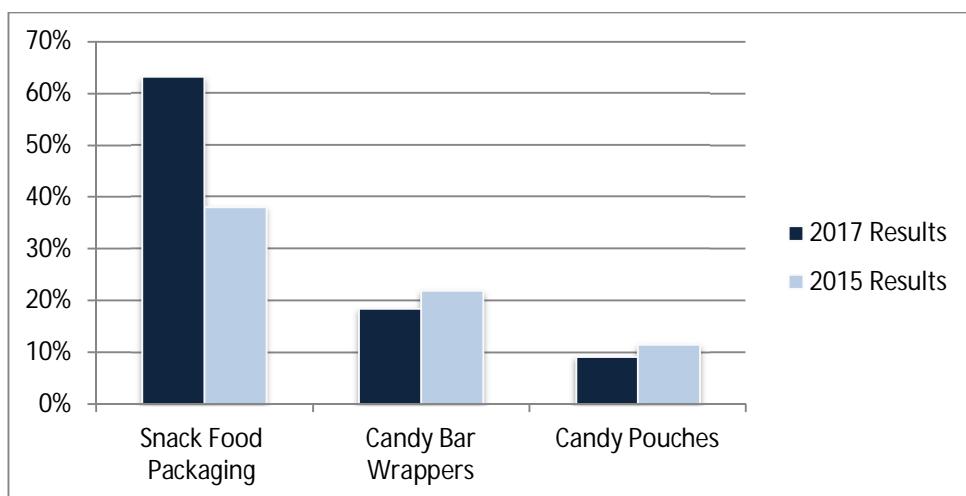


Figure 26: Confectionary/Snack 2017 vs. 2015 Comparison

Cloth:

Cloth was split 50/50 between other cloth and clothing or clothing pieces. Cloth represented 2% of all large litter observed in 2017. Figure 27 compares the sub-categories observed in the 2017 and 2015 audits.

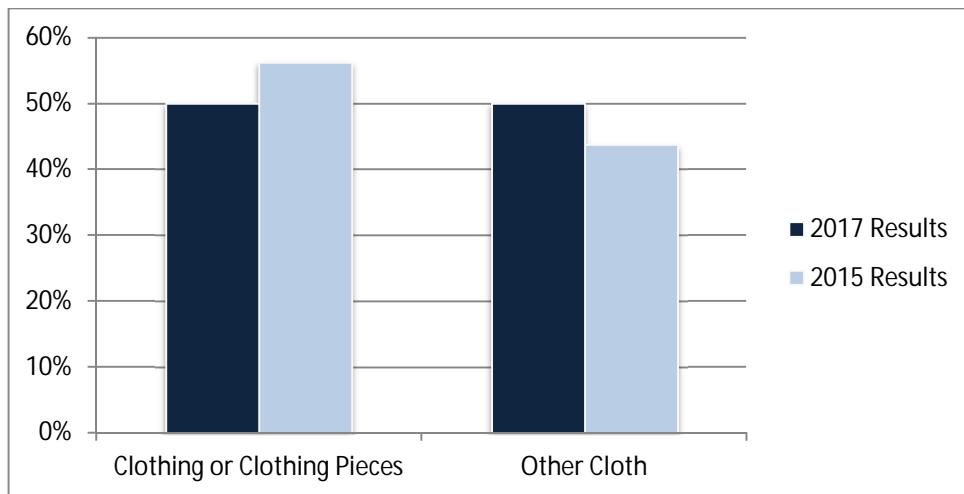


Figure 27: Cloth 2017 vs. 2015 Comparison

Other Miscellaneous Packaging:

Other miscellaneous packaging represented 2% of the large litter. The majority of other miscellaneous packaging was plastic packaging other (71%). Figure 28 illustrates the breakdown of this category and Figure 29 compares the highest three sub-categories from 2017 to 2015.

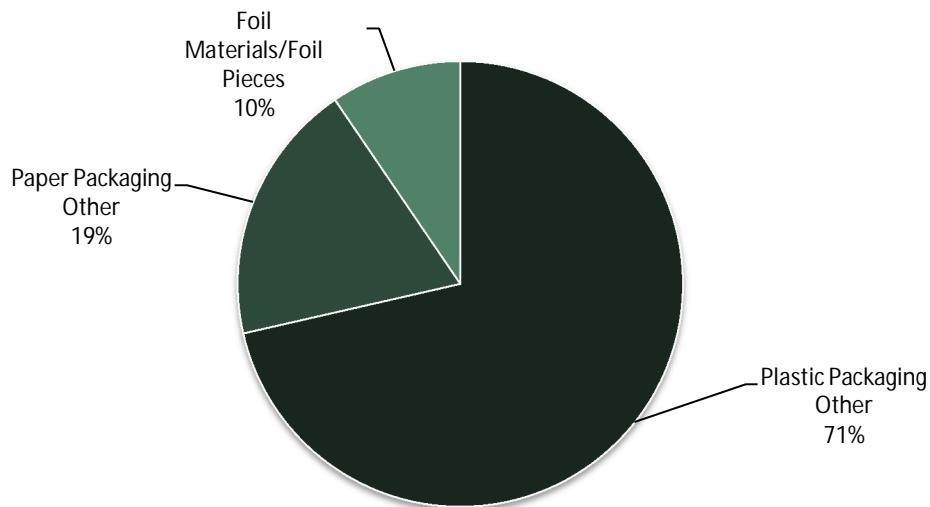


Figure 28: Other Miscellaneous Packaging Composition 2017

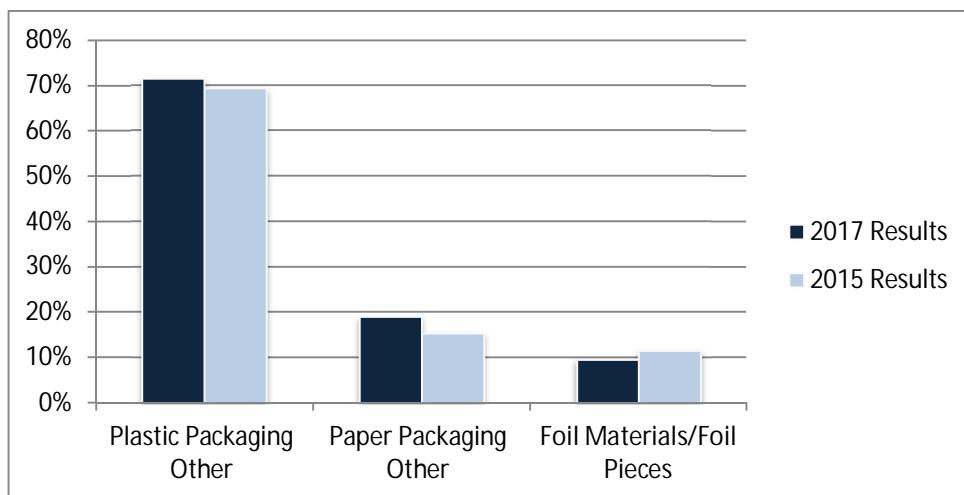


Figure 29: Other Miscellaneous Packaging 2017 vs. 2015 Comparison

Paper/Fibre Materials:

This category represented 19% of all large litter observed in 2017. The majority of the paper/fibre materials category was non-brand name towels/napkins (46%) and receipts (32%). Figure 30 provides the detailed breakdown of this category. Figure 31 compares the highest three sub-categories from 2017 to 2015.

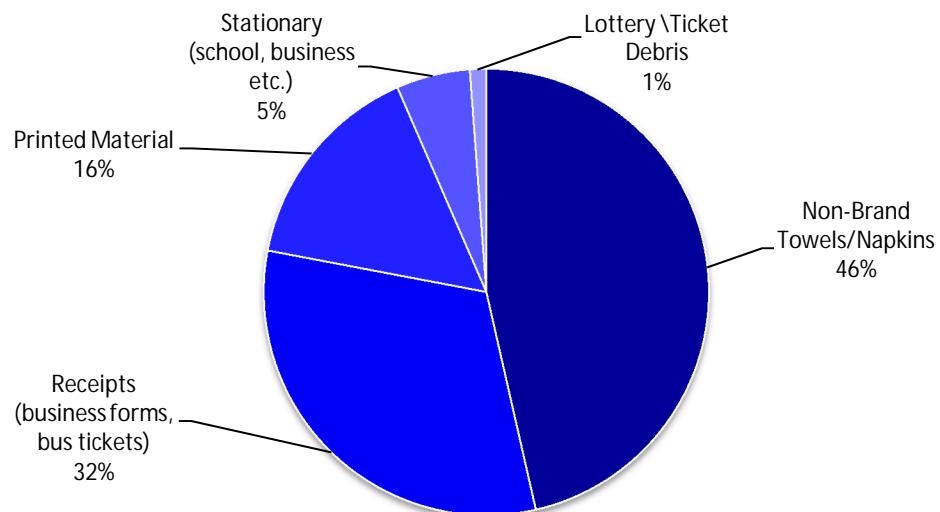


Figure 30: Paper/Fibre Composition 2017

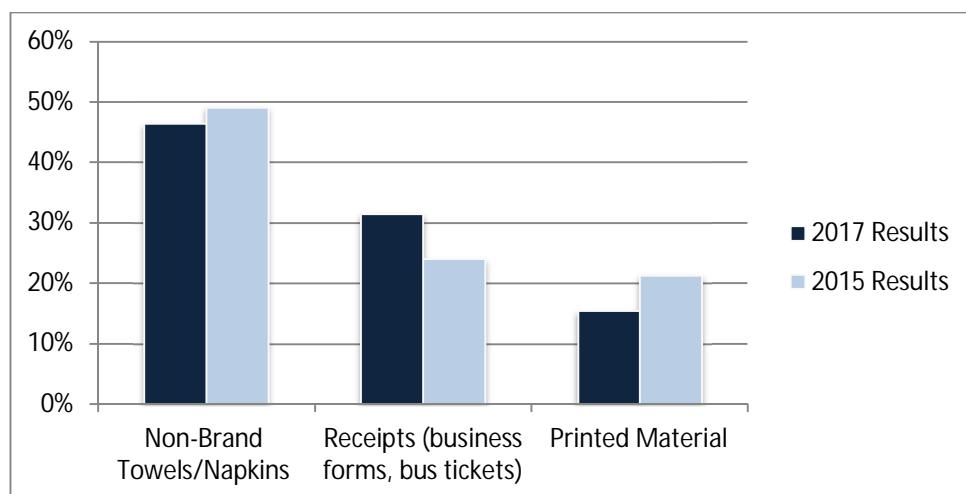


Figure 31: Paper/Fibre Material 2017 vs. 2015 Comparison

Tobacco Products:

Tobacco products were 7% of the large litter items surveyed in 2017. Within this category, 97% was tobacco other and 3% cigarette/cigar debris. Figure 32 compares the two sub-categories from 2017 to 2015.

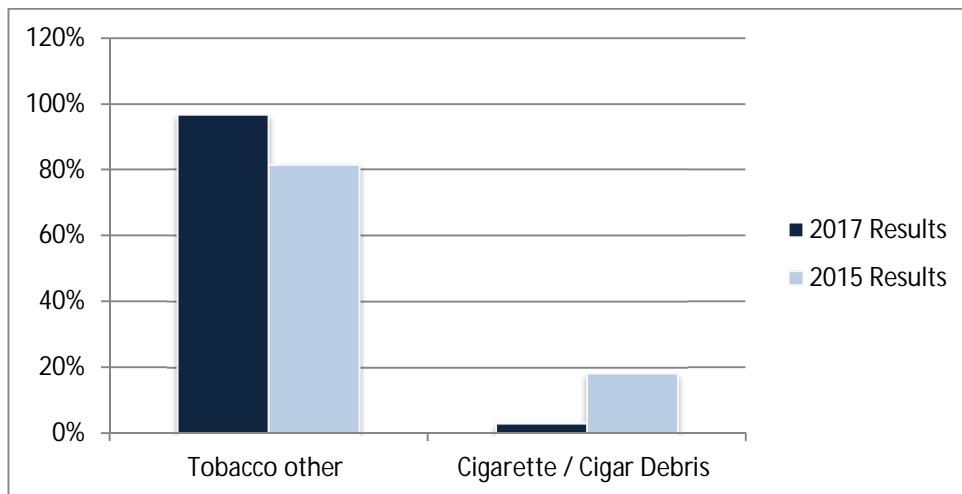


Figure 32: Tobacco Products 2017 vs. 2015 Comparison

Other Miscellaneous:

This category represented 19% of all large litter observed in 2017. The primary sub-categories assessed in 2017 included: miscellaneous plastic (33%), miscellaneous paper (19%), home articles (14%) and food (14%). Figure 33 illustrates the breakdown of this category while Figure 34 compares the highest three sub-categories from 2017 to 2015.

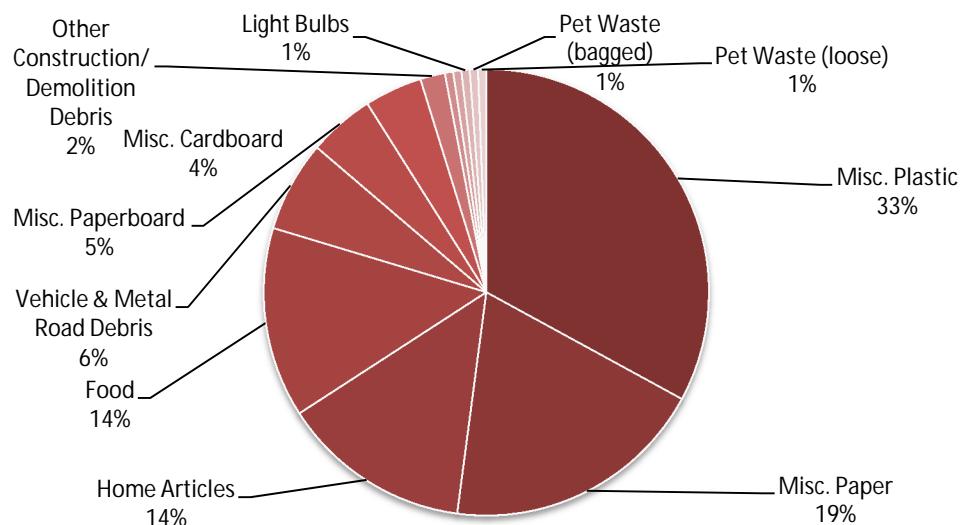


Figure 33: Other Miscellaneous Composition 2017

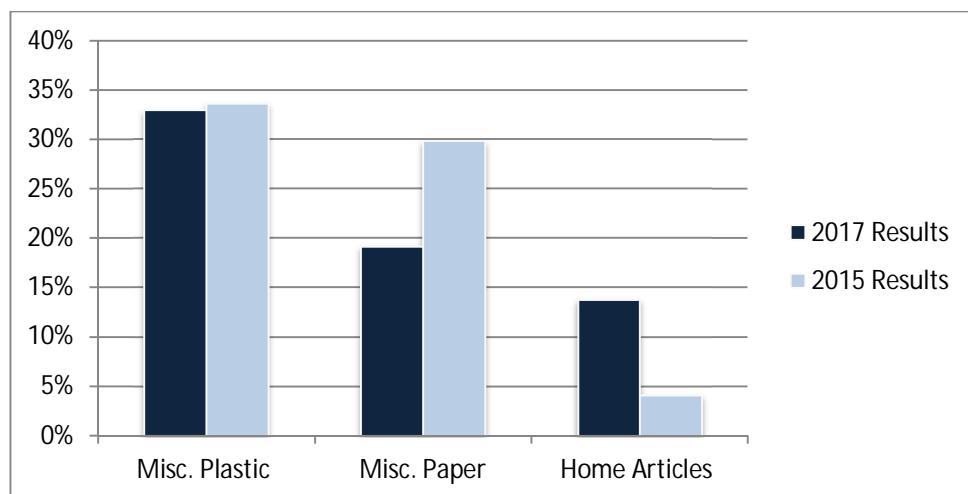


Figure 34: Other Miscellaneous 2017 vs. 2015 Comparison

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 2017 was Site 107 with 43 pieces of litter observed. This site was multi-family residential. The majority of sites in the “top 10” were residential with the exception of Site 41 (commercial) and Site 52 (industrial). A full ranking of sites is provided in Appendix F. Site 41 was also one of the sites with the highest number of large litter pieces in the 2015 baseline street litter audits.

Table 4: Large Litter Site Rankings

Site Number	Number of Pieces of Large Litter	Hundred Block	Street Name
107	43	600	Powell Street
41	35	300	Terminal Avenue
17	31	2100	Renfrew Street
52	27	600	Evans Street
77	25	5500	Main Street
60	24	7200	Dumfries Street
67	22	2100	Yew Street
10	21	3400	Wellington Street
11	21	3400	East 29 Avenue
58	20	5700	Berkeley Street

3.2.5

Large 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) can be compared. Visual ratings for the litter index were completed for each site in 2015. Table 5 compares the results of the 2017 results to the baseline 2015 visual litter index ratings.

Table 5: Visual Litter Index Ranking 2017 vs. 2015

Visual Litter Index Rating	Percentage of Sites Ranked (%) 2017	Percentage of Sites Ranked (%) 2015
1	69%	74%
2	24%	18%
3	6%	7%
4	1%	1%

The composition and accumulation from the 2015 baseline to the 2017 results by category are compared in Table 6. Overall, there was a 34% decrease in the amount of large litter observed in 2017. It should be noted that these values do not include the two sites that were immediately adjacent to construction activity. All categories with the exception of beverage containers, food wraps/containers and tobacco products were lower for 2017 when compared to the 2015 baseline results.

Table 6: 2017 vs. 2015 Large Litter Comparison

Category	2017 Results (106 Sites)		2015 Baseline Results (108 Sites)		% Change
	# Litter Items	% of Total	# Litter Items	% of Total	
Beverage Containers	25	3%	16	1%	56%
Other Packaging	5	1%	7	1%	-29%
Cups	172	20%	284	22%	-39%
Bags	41	5%	54.5	4%	-25%
Other Packaging (Boxes)	17	2%	55	4%	-69%
Other Containers	12	1%	17	1%	-29%
Food Wraps/ Containers	54	6%	37	3%	46%
Take Out Extras	32	4%	34.5	3%	-7%
Trays	3	0%	8	1%	-63%
Confectionary/Snack	65	8%	77.5	6%	-16%
Cloth	18	2%	32	2%	-44%
Other Miscellaneous Packaging	21	2%	26	2%	-19%
Paper/ Fibre Material	168	19%	311.5	24%	-46%
Tobacco Products	62	7%	49	4%	27%
Other Miscellaneous	167	19%	291.5	22%	-43%
Total	862	100%	1,300.5	100%	-34%

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. Table 7 illustrates the percentage breakdown per large litter item category for each municipality. Figure 35 illustrates the top five large litter categories observed in the 2017 Vancouver street litter audits to the results for each municipality. Table 8 illustrates the average number of items counted per site based on category. Figure 36 illustrates these results graphically.

Table 7: Vancouver Large Litter Audit Results Compared with Audit Results of Other Cities (by Percent Breakdown)

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

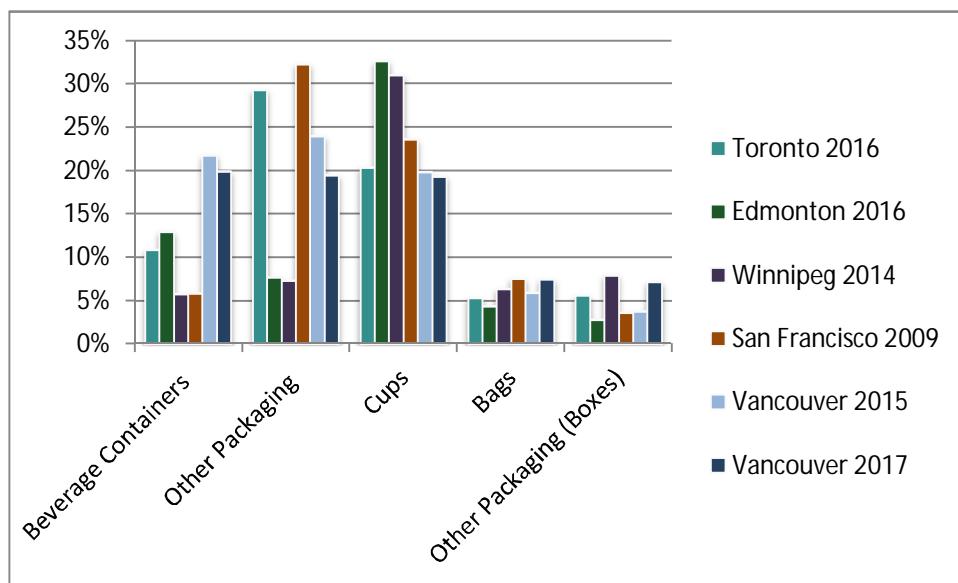


Figure 35: Comparison of Top Large Litter Categories by Municipality

Table 8: Vancouver Large Litter Audit Results Compared with Audit Results of Other Cities (Average Number of Items per Site)

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

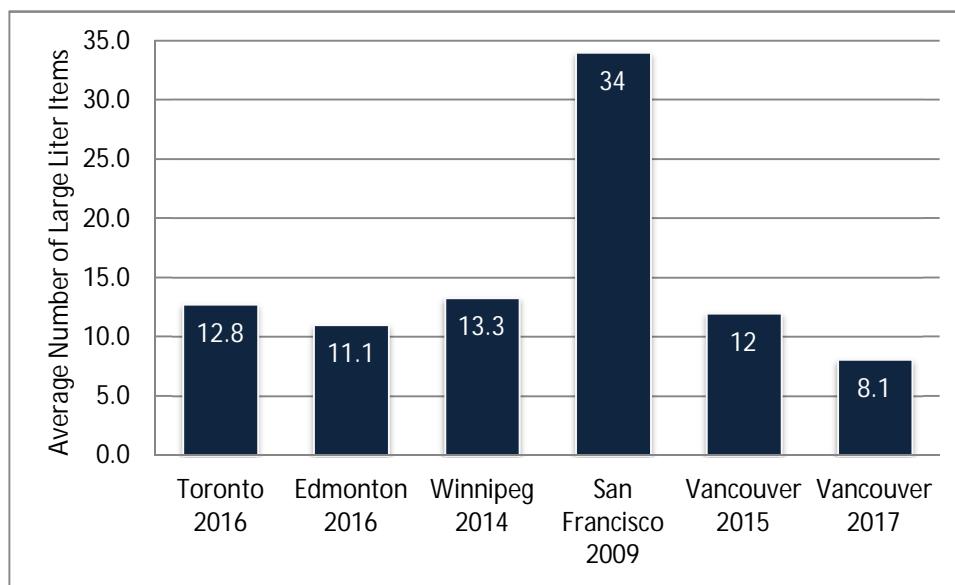


Figure 36: Average Large Litter Items per Site

3.2.7

Large Litter Statistical Analysis

The average number of large litter items per site in the 2017 audits was 8.1 pieces. There were three sites that had no large litter accumulation. Of the 106 sites surveyed, five sites had an average of eight pieces of large litter within the site, 65 sites had fewer than eight pieces and 36 sites had more than eight 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. In 2017, the average number of small litter items per site was 5.2 pieces with no construction. The most common categories of small litter observed were cigarette butts/debris (37%) and chewing gum (25%). Table 9 provides these results.

Table 9: Small Litter Data 2017

Category	Total Number of Items	% of Total
Cigarette Butts/Debris	207	37%
Other Tobacco	1	0%
Bottle Caps	3	1%
Straws	5	1%
Candy Packaging and Wrappers	10	2%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	0	0%
Other Polystyrene Debris (i.e., Poly Foam Pieces)	7	1%
Glass	12	2%
Paper	65	12%
Cup Sleeves	0	0%
Plastic Film	26	5%
Hard Plastic	36	6%
Aluminum/Foil Debris	21	4%
Rubber	1	0%
Metal (not aluminum)	7	1%
Chewing Gum (stuck on pavement)	140	25%
Food & Food Scraps	0	0%
Pet Waste (bagged)	0	0%
Pet Waste (loose)	3	1%
Needles/Syringes	0	0%
Medications	0	0%
Cell Phones	0	0%
Audio-Visual Devices	0	0%
Batteries	1	0%
Other Electronic Waste	0	0%
Other Material	9	2%
Total Site Small Litter	554	100%

3.3.1

Small Litter by Sites

The ten small litter sites with the most observed small litter are listed below in Table 10. The site with the most accumulated small litter in 2017 was Site 107 with 33 pieces of small litter observed. This site was multi-family residential. The majority of sites in the “top 10” were commercial. A full ranking of sites is provided in Appendix F. Sites 41, 75, 106, 107 and 110 were all sites with the highest observed small litter in the 2015 baseline audit as well.

Table 10: Small Litter Site Rankings

Site Number	Number of Pieces of Small Litter	Hundred Block	Street Name
107	33	600	Powell Street
108	32	2400	Main Street
15	20	600	East Broadway
75	19	400	Homer Street
13	18	3500	Euclid Avenue
104	17	1100	Denman Street
106	16	1000	Burrard Street
110	15	400	Main Street
41	14	300	Terminal Avenue
109	14	1100	Kingsway

3.3.2

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) can be compared. Table 11 compares the composition and accumulation from the 2015 baseline to the 2017 results. Overall, there was a 30% decrease in the small litter observed in 2017. It should be noted that these values do not include the two sites that were immediately adjacent to construction. All categories with the exception of other polystyrene debris, plastic film and other materials were lower than the 2015 baseline results.

Table 11: 2017 vs 2015 Small Litter Comparison

Category	2017 Results (106 Sites)		2015 Baseline Results (108 Sites)		% Change
	# Small Litter Items	% of Total	# Small Litter Items	% of Total	
Cigarette Butts/Debris	207	37%	243	31%	-15%
Other Tobacco	1	0%	1	0%	0%
Bottle Caps	3	1%	0	0%	-
Straws	5	1%	0	0%	-
Candy Packaging and Wrappers	10	2%	20	3%	-50%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	0	0%	42	5%	-100%
Other Polystyrene Debris (i.e., Poly Foam Pieces)	7	1%	1	0%	600%
Glass	12	2%	13	2%	-8%
Paper	65	12%	121	15%	-46%
Cup Sleeves	0	0%	2	0%	-100%
Plastic Film	26	5%	18	2%	44%
Hard Plastic	36	6%	39	5%	-8%
Aluminum/Foil Debris	21	4%	24	3%	-13%
Rubber	1	0%	4	1%	-75%
Metal (not aluminum)	7	1%	8	1%	-13%
Chewing Gum (stuck on pavement)	140	25%	231	29%	-39%
Food & Food Scraps	0	0%	10	1%	-100%
Pet Waste (bagged)	0	0%	0	0%	-
Pet Waste (loose)	3	1%	4	1%	-25%
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	1	0%	2	0%	-50%
Other Electronic Waste	0	0%	0	0%	-
Other Materials	9	2%	4	1%	125%
Total Site Small Litter	554	100%	787	100%	-30%

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 12 illustrates the percentage breakdown per small litter item category for each municipality. Figure 37 illustrates the top five small litter categories observed in the 2017 Vancouver street litter audits to the results for each municipality.

Table 13 illustrates the average number of items counted per site based on category. Figure 38 illustrates these results graphically.

Table 12: Vancouver Small Litter Audit Results Compared to Other Cities

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

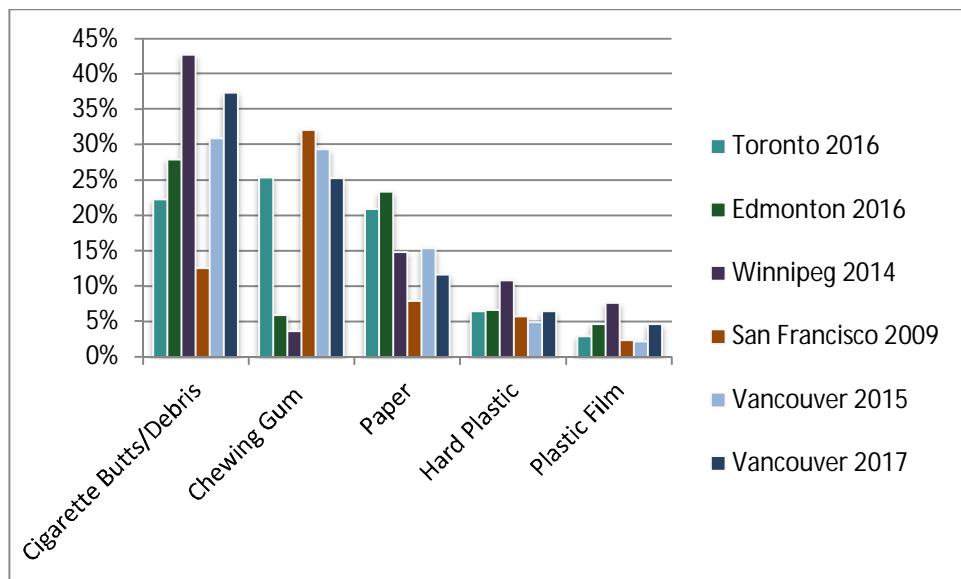


Figure 37: Comparison of Top Small Litter Categories by Municipality

Table 13: Vancouver Small Litter Results Compared to Other Cities (Average Number of Items per Site)

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

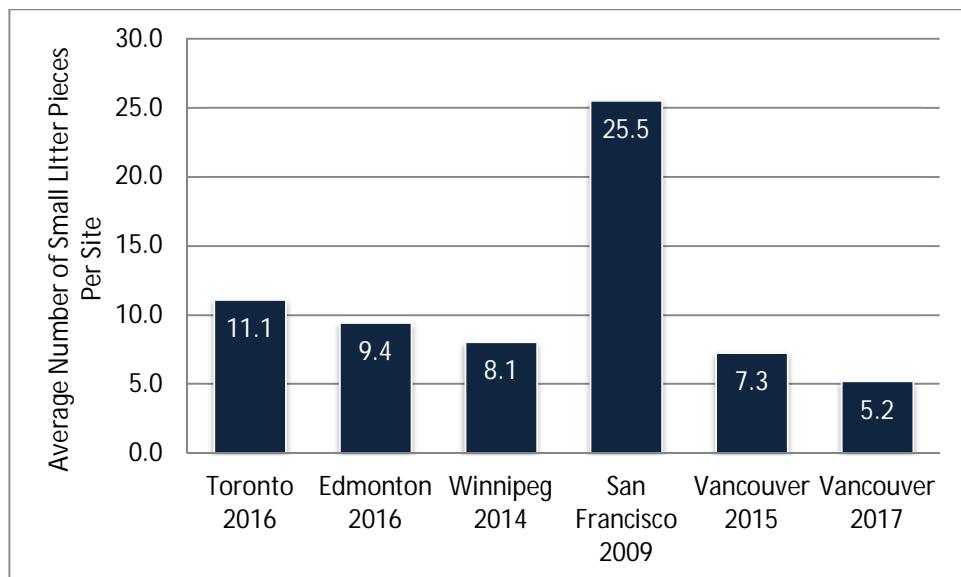


Figure 38: Average Small Litter Items per Site

3.3.4

Small Litter Statistical

The average number of small litter items per site in the 2017 audits was observed at 5.2 pieces with no construction adjacent. There were eight sites that had no small litter accumulation. Of the 106 sites surveyed, five sites had an average of five pieces of small litter within the site, 66 sites had fewer than five pieces and 35 sites had more than five pieces of small litter.

3.4

Small Litter Supersites Result

A supersite is when all observed small litter is observed within a site. This assessment was completed at 19 pre-determined sites. In 2017, the average number of small litter items per supersite was 193.9 pieces. The most common categories of small litter observed were chewing gum (47%) and cigarette butts/debris (40%). Table 14 provides these results.

Table 14: Supersite Litter Data 2017

Category	Total Number of Items	% of Total
Cigarette Butts/Debris	1,469	40%
Other Tobacco	0	0%
Bottle Caps	21	1%
Straws	10	0%
Candy Packaging and Wrappers	29	1%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	0	0%
Other Polystyrene Debris (i.e., Poly Foam Pieces)	4	0%
Glass	19	1%
Paper	175	5%
Cup Sleeves	2	0%
Plastic Film	44	1%
Hard Plastic	96	3%
Aluminum/Foil Debris	62	2%
Rubber	6	0%
Metal (not aluminum)	10	0%
Chewing Gum (stuck on pavement)	1,716	47%
Food & Food Scraps	5	0%
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	1	0%
Other Material	16	0%
Total Supersite Small Litter	3,685	100%

3.4.1

Small Litter by Supersites

All 19 supersites are ranked in Table 15. The site with the most accumulated litter in 2017 was Site 108 with 492 pieces of small litter observed.

Table 15: Supersite Rankings

Site Number	Number of Pieces of Small Litter	Hundred Block	Street Name
108	492	2400	Main Street
38	478	1000	West Georgia Street
41	418	300	Terminal Avenue
106	385	1000	Burrard Street
109	299	1045	Kingsway
104	293	1100	Denman Street
54	210	1100	Clark Drive
18	153	800	Hornby Street
52	141	600	Evans Street.
56	134	2900	Horley Street
97	126	800	Commercial Drive
101	116	1700	West Broadway
31	109	2700	East Hastings Street
77	92	5500	Main Street
26	84	2300	Wall Street
32	67	1800	Yew Street
42	49	1700	West 3 Avenue
82	26	900	East 24 Avenue
21	13	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) can be compared. Table 16 provides the comparison in composition and accumulation from the 2015 baseline to the 2017 results for supersite small litter. Overall, there was a 28% decrease in the litter accumulated at the supersites in 2017. Table 17 compares the 2017 and 2015 results based on site.

Table 16: 2017 vs. 2015 Supersite Litter Comparison

Category	2017 Results		2015 Results		% Change
	# Small Litter Items	%	# Small Litter Items	%	
Cigarette Butts/Debris	1,469	40%	1,923	38%	-24%
Other Tobacco	0	0%	5	0%	-100%
Bottle Caps	21	1%	14	0%	50%
Straws	10	0%	-	0%	-
Candy Packaging and Wrappers	29	1%	49	1%	-41%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	0	0%	3	0%	-100%
Other Polystyrene Debris (i.e., Poly Foam Pieces)	4	0%	1	0%	300%
Glass	19	1%	35	1%	-46%
Paper	175	5%	312	6%	-44%
Cup Sleeves	2	0%	-	-	-
Plastic Film	44	1%	38	1%	16%
Hard Plastic	96	3%	84	2%	14%
Aluminum/Foil Debris	62	2%	69	1%	-10%
Rubber	6	0%	16	0%	-63%
Metal (not aluminum)	10	0%	9	0%	11%
Chewing Gum (stuck on pavement)	1,716	47%	2,475	48%	-31%
Food & Food Scraps	5	0%	27	1%	-81%
Pet Waste (bagged)	0	0%	1	0%	-100%
Pet Waste (loose)	0	0%	1	0%	-100%
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	1	0%	1	0%	0%
Other Materials	16	0%	57	1%	-72%
Total Site Small Litter	3,685	100%	5,122	100%	-28%

Table 17: Supersite 2017 vs. 2015 Percent Change by Site Comparison

Site Number	2017 Number of Pieces of Small Litter	2015 Number of Pieces of Small Litter	% Change
108	492	470	5%
38	478	561	-15%
41	418	533	-22%
106	385	368	5%
109	299	369	-19%
104	293	196	49%
54	210	248	-15%
18	153	344	-56%
52	141	71	99%
56	134	77	74%
97	126	282	-55%
101	116	502	-77%
31	109	461	-76%
77	92	211	-56%
26	84	69	22%
32	67	160	-58%
42	49	126	-61%
82	26	37	-30%
21	13	37	-65%
Total Small Litter	3,685	5,122	-28%

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 18 illustrates the percentage breakdown per small litter item category for each municipality. Figure 39 compares the top five supersite categories in the 2017 Vancouver street litter audits to other municipalities. Table 19 illustrates the average number of items counted per site based on category. Figure 40 illustrates these results graphically.

Table 18: Vancouver Supersite Small Litter Comparison to Other Cities

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

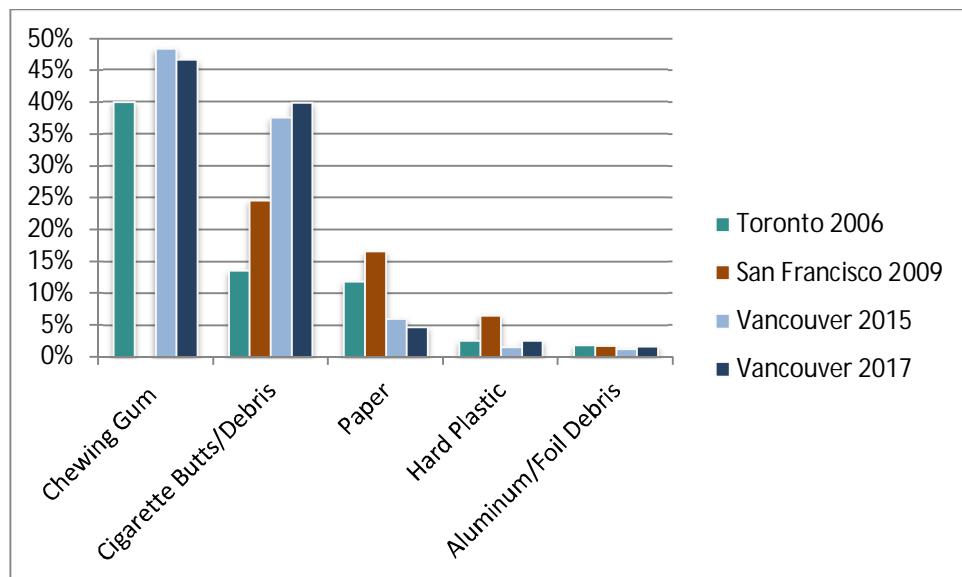


Figure 39: Comparison of Top Supersite Litter Categories by Municipality

Table 19: Vancouver Supersite Small Litter Comparison to Other Cities (Average Number of Items per Site)

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

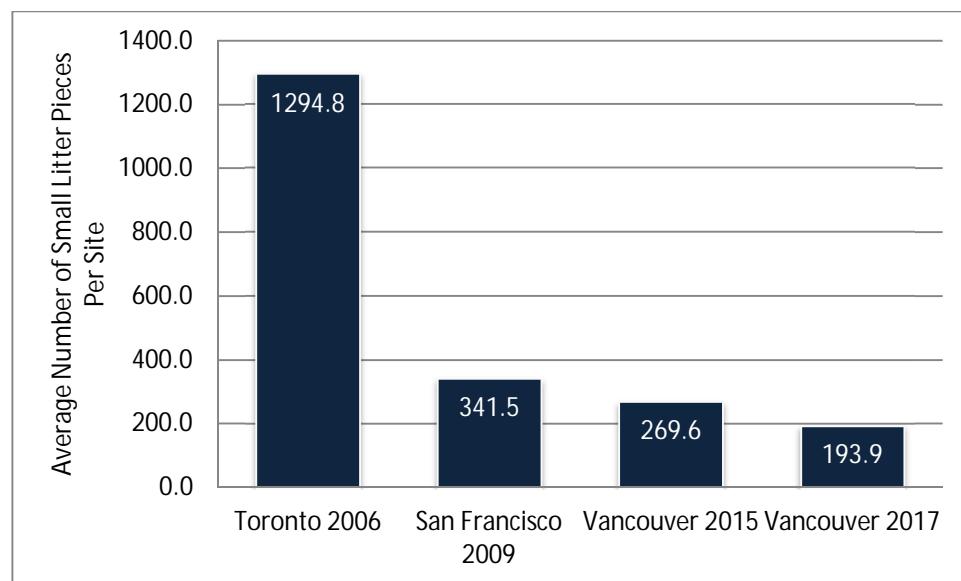


Figure 40: Average Supersite Small Litter Items per Site

3.4.4

Supersite Small Litter Statistical

The average number of small litter items per site in the 2017 audits was 193.9 pieces. All sites observed had small litter accumulated. Of the 19 sites surveyed, 12 sites had less than 194 pieces of small litter and seven sites had more than 194 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 20 illustrates the combined results of small and large litter for each site. Of all the supersites, Site 108 has the most accumulated litter with 495 pieces of litter counted.

Table 20: Overall Combined Small and Large Litter for Supersites

Site Number	Number of Pieces of Small Litter	Number of Pieces of Large Litter	Total Litter
108	492	3	495
38	478	2	480
41	418	35	453
106	385	15	400
109	299	4	303
104	293	6	299
54	210	15	225
52	141	27	168
18	153	5	158
56	134	17	151
97	126	3	129
101	116	6	122
77	92	25	117
31	109	3	112
26	84	8	92
32	67	11	78
42	49	3	52
82	26	8	34
21	13	4	17

3.5

Sites Immediately Adjacent to Construction

Dillon staff were asked note if any sites had immediately adjacent construction occurring. There were two sites where this occurred in 2017 (Sites 44 and 89). These two sites were analyzed separately because the construction activities were expected to increase accumulation of litter.

3.5.1

Large Litter Results

Within the two sites that were immediately adjacent to construction, the average number of large litter items per site was 31.5 pieces of litter. This was, on average 289% more litter than the sites that did not have construction. The breakdown by material did not differ dramatically from these sites. Overall, 46% of material was paper, 30% other and 24% plastic.

The general composition of material did differ between the sites that had construction and the sites that did not. Figure 41 illustrates the composition of litter found within the construction sites. Table 21 provides a comparison of large litter observed on sites with and without construction based on category. Overall, the largest increase was in the cloth category which represented 21% of large litter for sites with construction and 2% of large litter for sites without.

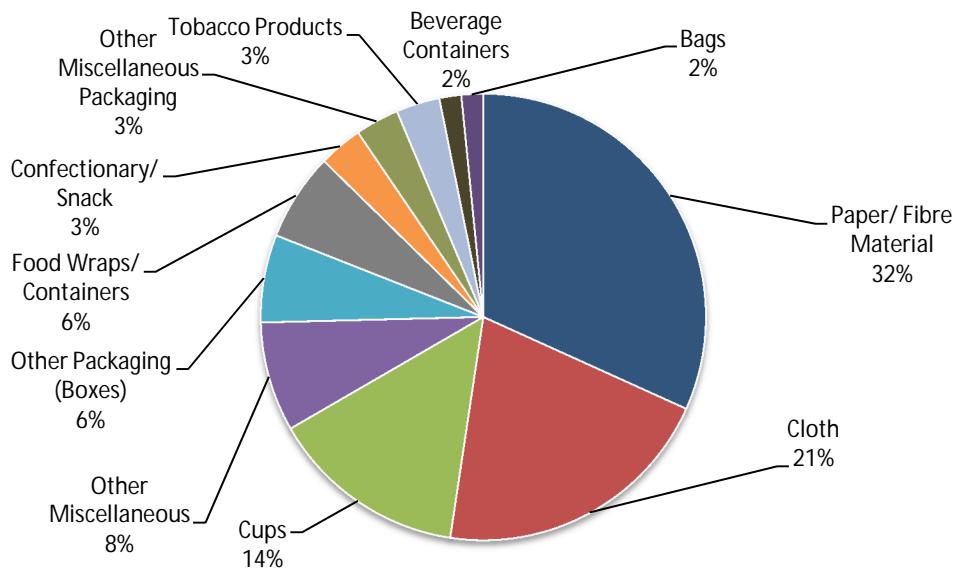


Figure 41: Litter Sites with Immediately Adjacent Construction Large Litter by Category

Table 21: Large Litter Categories Comparison for Sites with and without Construction

Category	Sites with Construction	Sites without Construction
Paper/ Fibre Material	32%	19%
Cloth	21%	2%
Cups	14%	20%
Other Miscellaneous	8%	19%
Other Packaging (Boxes)	6%	2%
Food Wraps/ Containers	6%	6%
Confectionary/Snack	3%	8%
Other Miscellaneous Packaging	3%	2%
Tobacco Products	3%	7%
Beverage Containers	2%	3%
Bags	2%	5%
Other Packaging	0%	1%
Other Containers	0%	1%
Take Out Extras	0%	4%
Trays	0%	0%
Total	100%	100%

3.5.2

Small Litter Results

Within the two sites that were immediately adjacent to construction, the average number of small litter items per site was 8.5 pieces of litter. This was, on average, 63% more small litter than the sites that did not have construction.

The general composition of material did differ slightly between the sites that had construction and the sites that did not. Table 22 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 chewing gum (53% with construction, 25% without).

Table 22: Small Litter Comparison for Sites with and without Construction

Category	Sites with Construction	Sites without Construction
Cigarette Butts/Debris	47%	37%
Other Tobacco	0%	0%
Bottle Caps	0%	1%
Straws	0%	1%
Candy Packaging and Wrappers	0%	2%
Expanded Polystyrene Packing Materials (i.e., Foam Peanuts)	0%	0%
Other Polystyrene Debris (i.e., Poly Foam Pieces)	0%	1%
Glass	0%	2%
Paper	0%	12%
Cup Sleeves	0%	0%
Plastic Film	0%	5%
Hard Plastic	0%	6%
Aluminum/Foil Debris	0%	4%
Rubber	0%	0%
Metal (not aluminum)	0%	1%
Chewing Gum (stuck on pavement)	53%	25%
Food & Food Scraps	0%	0%
Pet Waste (bagged)	0%	0%
Pet Waste (loose)	0%	1%
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	0%	2%
Total Site Small Litter	100%	100%

4.0

Additional Observations

Currently the City is running multiple public spaces waste receptacle pilots. The Emily Carr receptacles are three stream (garbage, paper and containers) receptacles that are being tested in the West End and promote waste diversion in the public realm. 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. These receptacles support the GCAP and are a part of the ongoing zero waste initiatives that aim to promote diversion and reduce litter. 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 illustrate in Figure 42 to Figure 44.



Figure 42: City Receptacles in the Downtown Core



Figure 43: Emily Carr Receptacles



Figure 44: City Single Stream Receptacles

There were 90 sites (83%) where City litter bins were not within 50 m of the site and 18 sites (17%) where there were City litter receptacles within 50 m. Sites with waste receptacles had on average 11.9 pieces of large litter while sites without had an average of 7.9 pieces of large litter. Small litter was, on average higher where there were waste receptacles (11.3 pieces) versus when there were no waste receptacles (4.1 pieces). These results are illustrated in Figure 45.

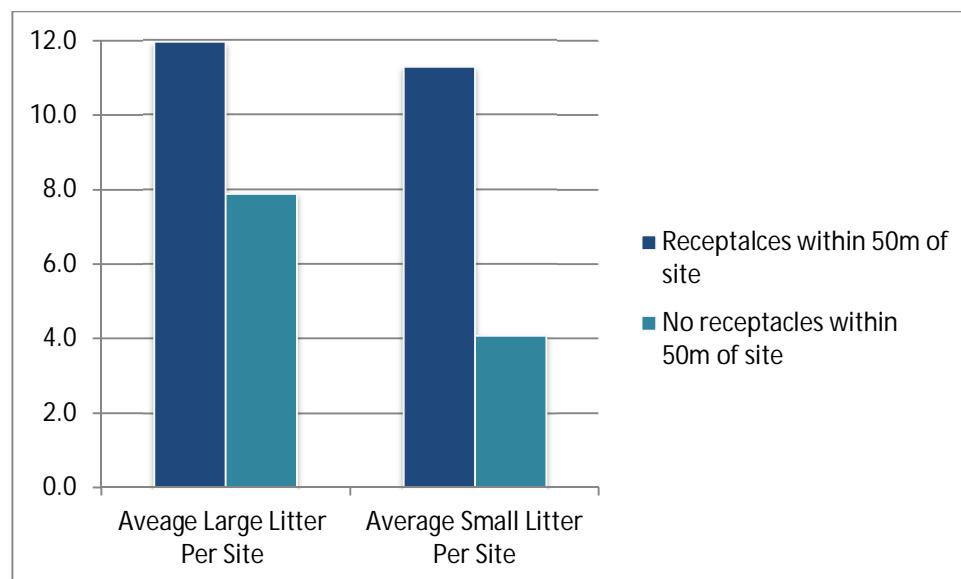


Figure 45: Average Large and Small Litter Pieces per Site based on the Presence of Waste Receptacle

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 23 provides the 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 23. Of these sites, 70% do not have fast food within sight, 80% do not have a convenience store within sight, 90% do not have a bus stop within the survey area and 60% do not have a City litter receptacle within 50 m of the site.

Table 23: Combined Ranking for Large and Small Litter

Site #	All Litter	Hundred Block	Street Name	Fast Food	Conv. Store	Bus Stop	Litter Bin
107	76	600	Powell Street	N	N	Y	Y
44	52	2800	Woodland Drive	N	N	N	N
41	49	300	Terminal Avenue	Y	N	N	N
17	36	2100	Renfrew Street	N	N	N	Y
60	35	7200	Dumfries Street	Y	Y	N	N
108	35	2400	Main Street	Y	N	N	Y
52	34	600	Evans Street	N	N	N	N
67	32	2100	Yew Street	N	N	N	N
13	31	3500	Euclid Avenue	N	N	N	N
106	31	1000	Burrard Street	N	Y	N	Y

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 18 to September 21, 2017 are reflected in this report.

6.1 Key Findings of the Large Litter Audits

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

- The average number of large litter items per site was 8.1 pieces for sites with no construction and 8.6 if the sites with construction were included in the overall analysis. This litter accumulation is less than the baseline audits in 2015 (12 pieces/site) and less than other North American Municipalities which range from 11.1 – 34 pieces of large litter per site.
- The total large litter observed in 2017 was 862 pieces for sites without construction.
- The total large litter observed in 2017 was 63 pieces for sites immediately adjacent to construction.
- In 2017, the most common category of litter observed was cups (20%), paper/fibre material (19%) and other miscellaneous (19%).
- The most commonly found items in the 2017 were cup lids, pieces (10%) and non-brand name napkins and towels (9%).

6.2 Key Findings of the Small Litter Audits

Small litter was observed at all 108 sites. Two 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 5.2 pieces for sites with no construction and 5.3 if the sites with construction were included in the overall analysis. This litter accumulation is less than the baseline audits in 2015 (7.3 pieces/site) and less than other North American Municipalities which range from 8.1 – 25.5 pieces of small litter per site.
- The total small litter audited in 2017 was 554 pieces for sites without construction.
- The total small litter audited in 2017 was 17 pieces for sites immediately adjacent to construction.
- In 2017, the most common category of small litter observed was cigarette butts/debris (37%) and chewing gum (25%).

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 193.9 pieces of small litter. This litter accumulation is less than the baseline audits in 2015 (269.6 pieces/site) and less than other North American Municipalities which range from 341.5 – 1,294.8 pieces of small litter per site.
- The total small litter audited in the 2017 supersites was 3,685 pieces.
- In 2017, the most common category of small litter observed in the supersites was chewing gum (47%) and cigarette butts/debris (40%).

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 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 were cups. These are all single-use items. A campaign that targets key litter groups, such as single-use items could positively impact litter abatement within the City and promote the Single-Use Reduction Strategy.

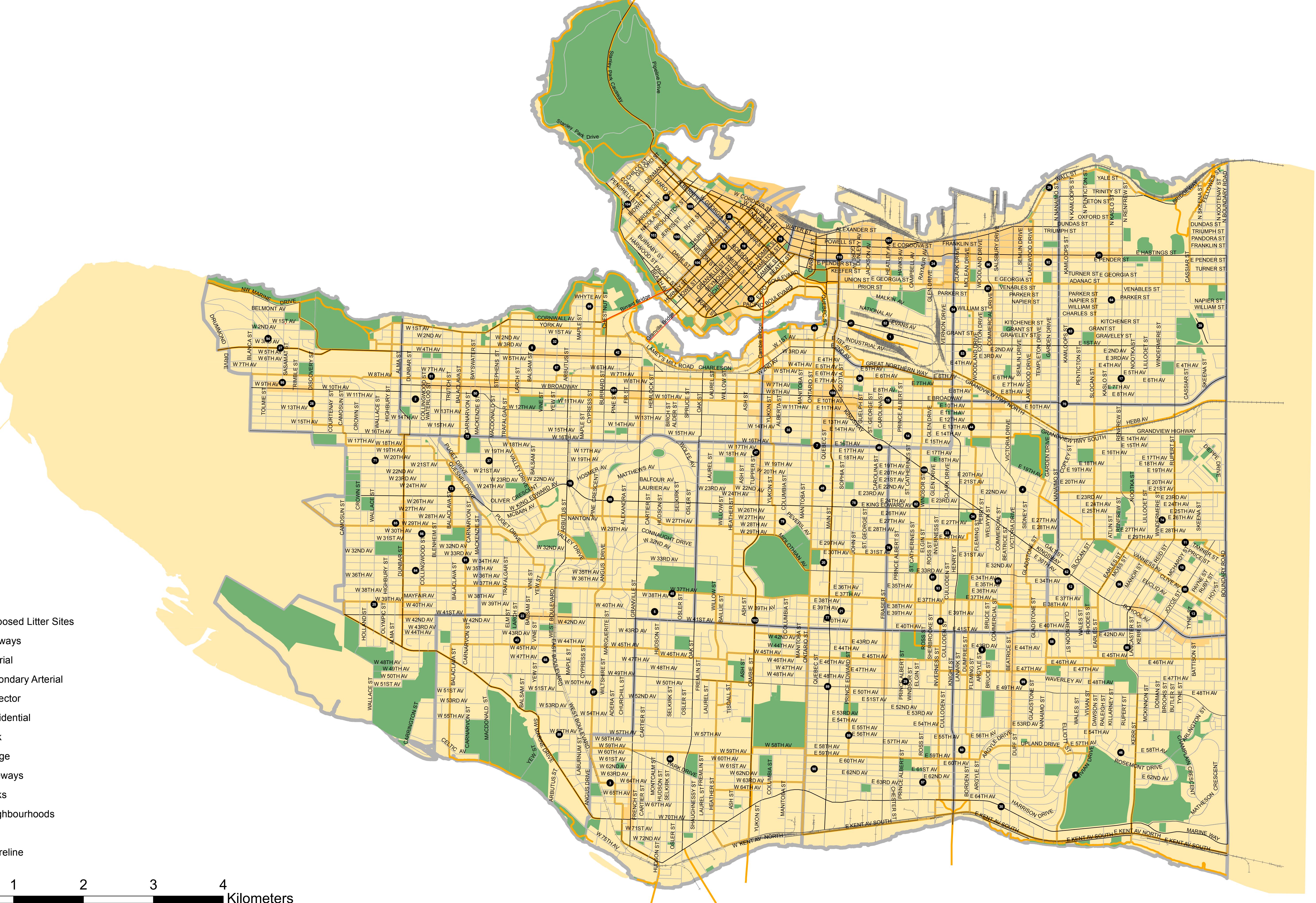
Should the City create more of a targeted approach to litter abatement it is recommended that the campaigns focus on:

- Cups;
- Chewing gum;
- Cigarette butts/debris;
- Napkins; and
- Printed material such as receipts and transit stubs.

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 specific items.

Appendix A

Site Distribution Map and Litter Hot Spots



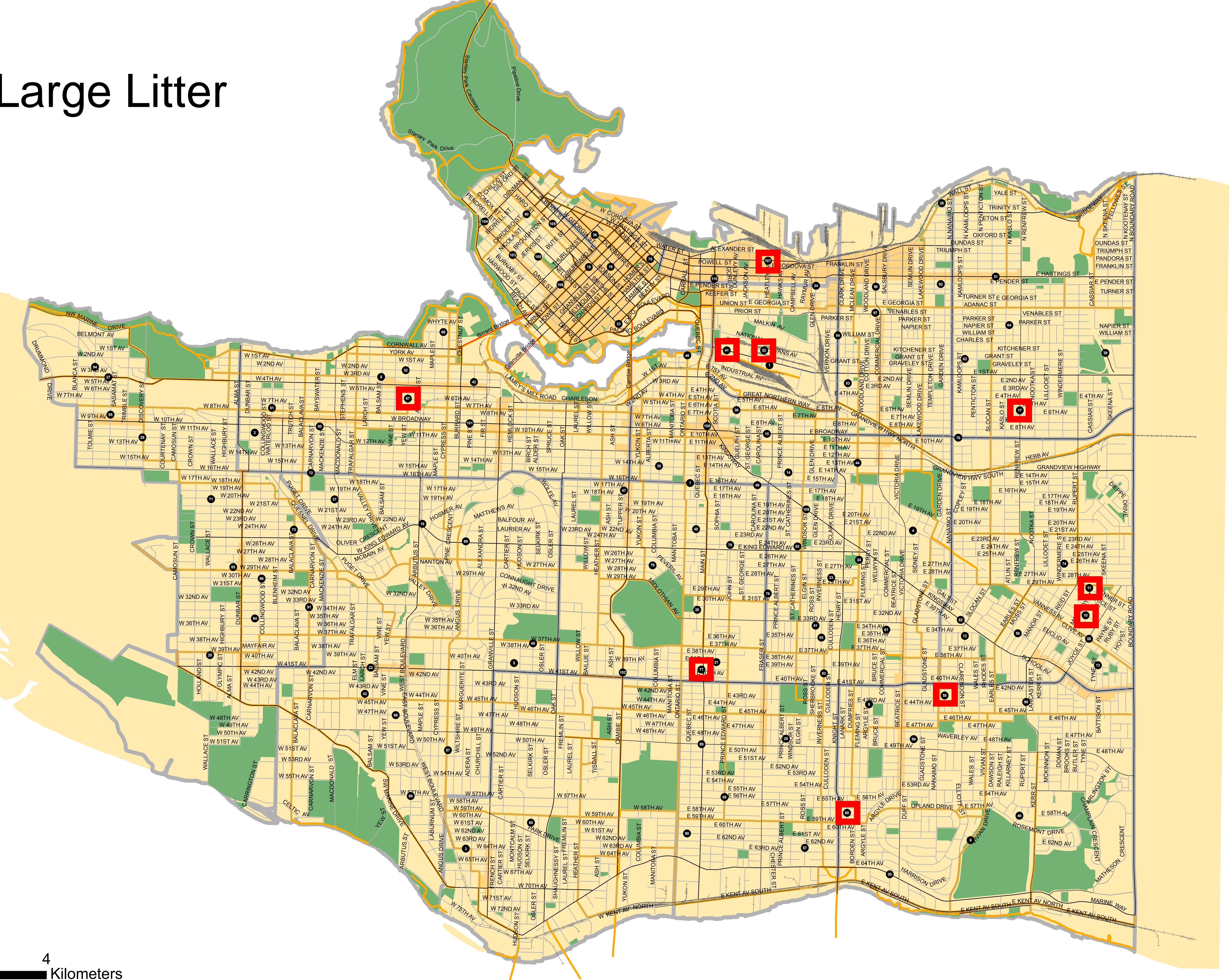
Legend

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

0 0.5 1 2 3 4 Kilometers

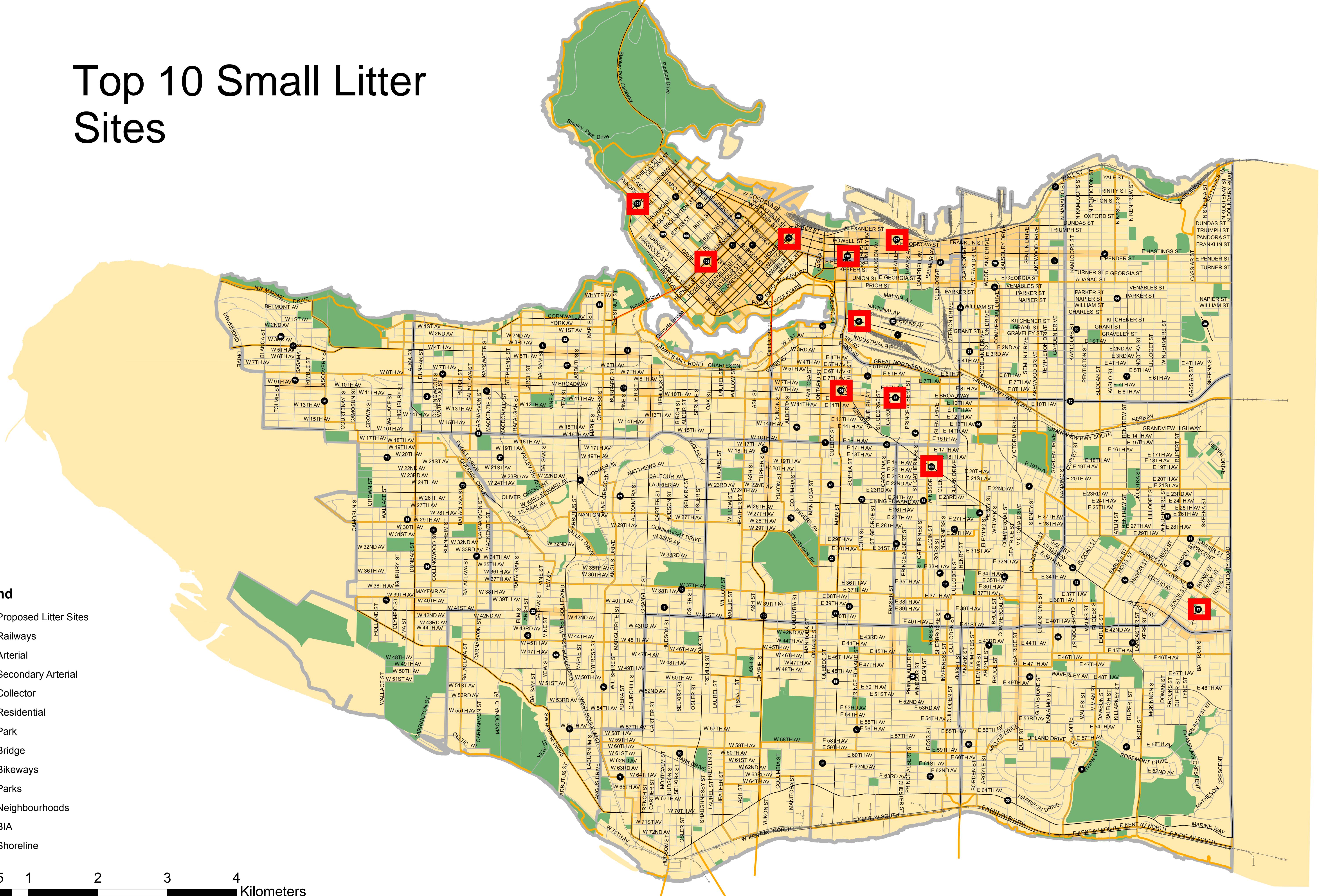


Top 10 Large Litter Sites



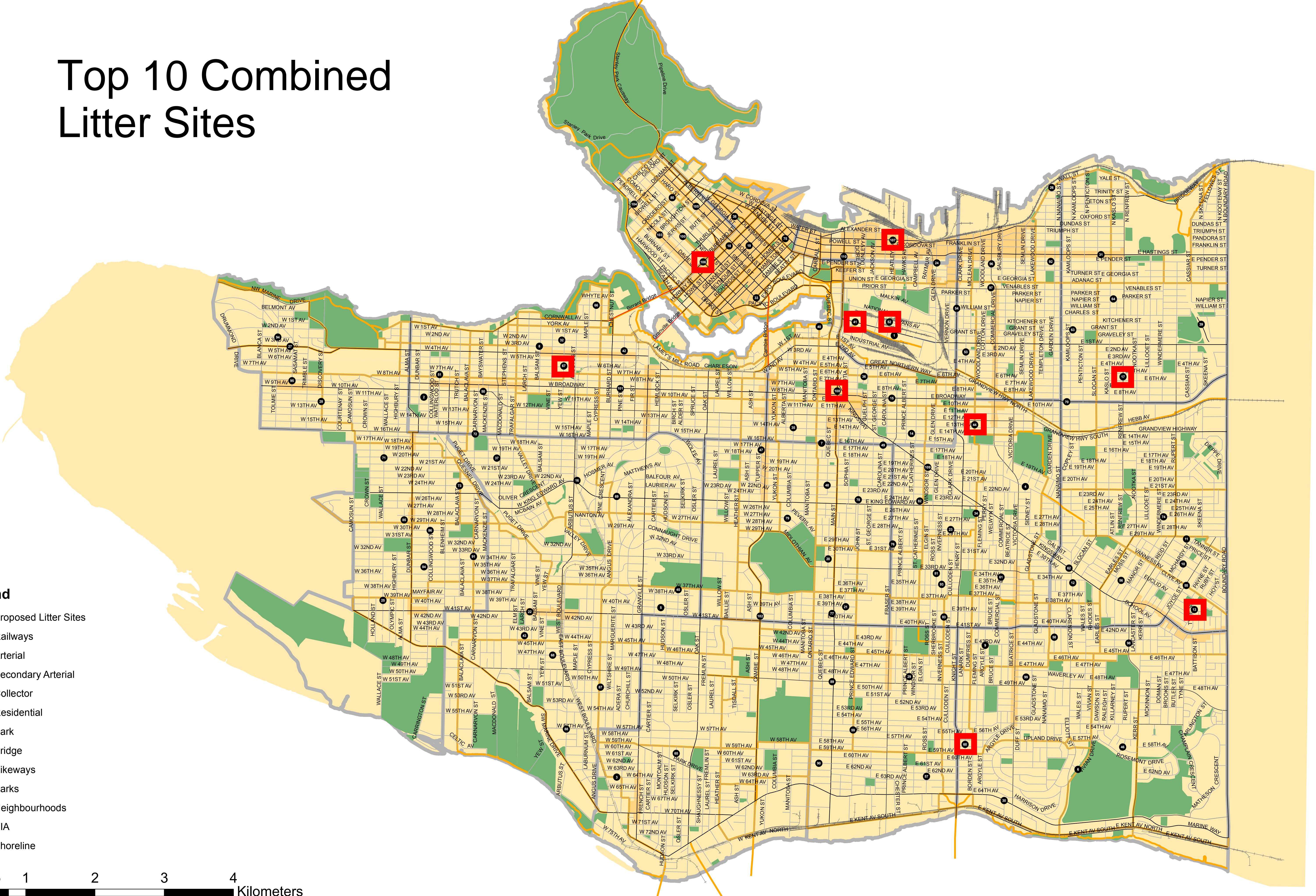


Top 10 Small Litter Sites





Top 10 Combined Litter Sites



Appendix B

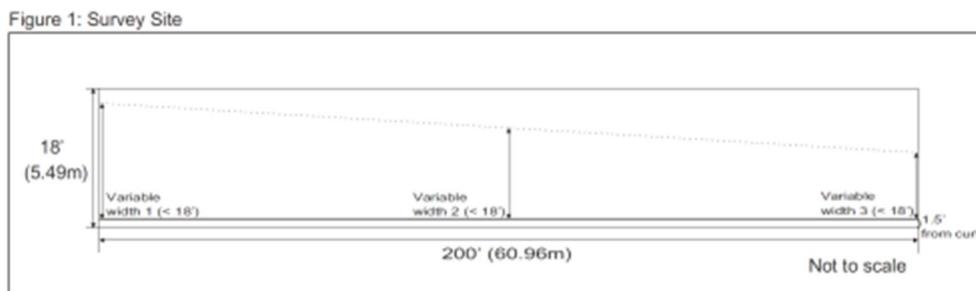
Methodology

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.

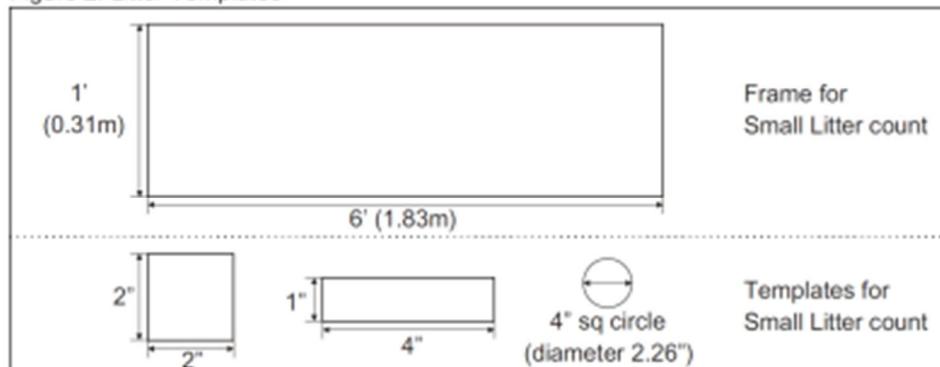
Beginning at the front of the parked car or the start of the site, the team shall use a measuring device to measure 50 feet ahead of the start of the site. Using street marking paint (water based to dissolve) or some other temporary marking method (e.g., chalk, pylons), a mark should be made on the pavement 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.



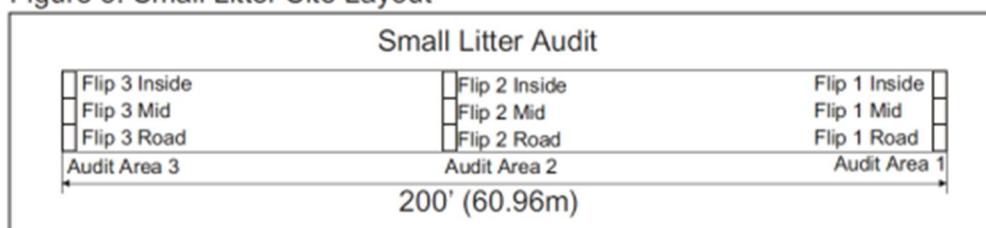
Classification of Large Litter

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 Survey Area	Traffic Calming	Litter Bin	Details on Litter Bin	Catch Points	Litter Visual Index	Clean Up	Details on Cleanup	Comments
1	730	9/20/2017	9:32	9:38	B	N	11	10	10	Major	6	Y	Residential, industrial	<3"	Y	Starbucks	N	Y	N	N	N	N	N/A	Curb	1	N		
2	3400	9/18/2017	1:32	1:42	A	N	15	15	15	Minor	2	N	Residential	3"-6"	N	N/A	N	Y	N	N	N	N	N/A	Fence, curb, grass line, tree line	1	N	N/A	House # 3550 being renovated (fencing around house)
3	1600	9/19/2017	9:39	9:44	A	N	14	14	14	Minor	2	N	Residential	<3"	N	N/A	N	N	Y	N	N	N	N/A	Curb, grass line, tree line	1	N	N/A	
4	2055	9/20/2017	1:43	1:53	B	N	13	12	12	Minor	2	N	Residential	Over 6"	N	N/A	N	N	N	N	Y	N	N/A	Hedge, curb, grass line	2	N	N/A	Started in front of vacant lot and went east
5	5400	9/19/2017	10:21	10:27	A	N	8	8	8	Minor	2	N	Residential	N/A	N	N/A	N	Y	N	N	N	N	N/A	Fence, curb, tree line	1	N	N/A	Address is Vancouver College (under construction at time of study). Headed towards 40 Ave.
6	7600	9/21/2017	9:48	9:54	A	N	13	6	13	Minor	2	Y	Residential, parkland	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb	1	N	N/A	Width 1: up to fire hydrant/Width 2: up to light post.
7	3100	9/19/2017	1:26	1:39	A	Y				Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, grass line, tree line	2	N	N/A	
8	2300	9/18/2017	10:57	11:10	A	Y				Minor	2	N	Residential	3"-6"	N	N/A	N	Y	N	N	N	N	N/A	Curb, grass line, tree line	2	N	N/A	
9	5916	9/21/2017	10:24	12:34	B	Y				Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb	1	N	N/A	
10	3400	9/18/2017	12:52	1:00	B	N	11	11	11	Minor	2	N	Residential	<3"	N	N/A	N	Y	Y	N	N	N	N/A	Curb, tree line	1	N	N/A	
11	3400	9/21/2017	8:23	8:31	B	Y				Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb	2	N	N/A	
12	5000	9/21/2017	9:22	9:29	B	N	16.5	16.5	16.5	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb	1	N	N/A	
13	3500	9/18/2017	1:12	1:22	B	N	13	18	13	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb	1	N	N/A	
14	800	9/19/2017	2:52	3:01	A	N	14	16	16	Minor	2	N	Residential	<3"	N	N/A	N	N	N	N	N	N	N/A	Curb, grass line, tree line	1	N	N/A	Started at 846 and went downhill
15	600	9/19/2017	2:31	2:45	A	N	11	11	11	Major	6	Y	Commercial	N/A	Y	711, Subway	Y	Y	Y	N	N	N	N/A	Curb	3	N	N/A	Started at 638, towards Fraser
16	3800	9/18/2017	1:49	2:00	A	N	18	14	10	Minor	2	N	Residential	3"-6"	N	N/A	N	Y	Y	N	N	N	N/A	Curb, grass line, tree line, wall on properties	1	N	N/A	
17	2100	9/20/2017	1:10	1:20	B	N	10	14	12	Major	4	N	Residential	<3"	N	N/A	N	Y	Y	N	N	Y	Single stream bin	Curb	3	N	N/A	
18	800	9/19/2017	11:02	11:17	B	N	13	14	18	Minor	2	N	Commercial	N/A	Y	Starbucks	N	Y	N	N	N	N	N/A	Curb	1	N	N/A	Started at 845 Hornby and headed south
19	700	9/19/2017	11:45	11:53	B	Y				Major	2	N	Commercial	N/A	Y	The Crepe Café	N	Y	Y	N	Y	Single stream bin	Curb	2	N	N/A		
20	4800	9/20/2017	11:57	12:12	A	N	17	18	18	Minor	2	Y	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Fence, curb, grass line	1	N	N/A	
21	300	9/20/2017	1:40	1:50	A	N	18	18	15	Minor	2	Y	Residential	<3'	N	N/A	N	Y	N	N	N	N	N/A	Curb, grass line, flower gardens	1	N	N/A	
22	2400	9/19/2017	8:38	9:44	A	N	18	18	10	Major	4	N	Commercial	N/A	N	N/A	N	Y	Y	N	Y	N	N/A	Curb	1	N	N/A	
23	1200	9/20/2017	10:43	10:55	A	N	16	16	16	Minor	2	Y	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Fence, curb, grass line	1	N	N/A	Headed east
24	500	9/19/2017	2:09	2:17	B	N	10	10	10	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, tree line	3	N	N/A	
25	5500	9/18/2017	12:11	12:19	B	N	16	16	16	Minor	2	N	Residential	<3'	N	N/A	N	Y	N	N	N	N	N/A	Curb, tree line	1	N	N/A	
26	2300	9/20/2017	10:57	11:14	B	Y				Minor	2	N	Residential	3"-6"	N	N/A	N	N	N	N	N	N	N/A	Hedge	1	N	N/A	Started at 2357 and headed east
27	4500	9/18/2017	9:35	9:43	B	N	17	9	11	Major	2	N	Residential	<3"	N	N/A	N	Y	Y	N	N	N	N/A	Curb, grass line, tree line	1	N	N/A	
28	4300	9/18/2017	10:09	10:17	B	N	17	18	18	Minor	2	N	Residential	<3"	N	N/A	N	N	N	N	Y	N	N/A	Curb, grass line, tree line	1	N	N/A	
30	8300	9/21/2017	9:30	9:37	A	Y	4	4	18	Minor	2	Y	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, grass line	1	N	N/A	Garbage day in Neighbourhood
31	2700	9/20/2017	11:44	11:56	B	N	15	13	13	Major	6	N	Commercial	N/A	Y	Laughing Bean Coffee	N	Y	Y	N	N	N	N/A	Curb	2	N	N/A	
32	1900	9/18/2017	10:34	10:54	A	N	18	12	14	Minor	2	N	Residential	3"-6"	N	N/A	N	Y	Y	N	N	Y	Single stream bin	Curb, tree line	1	N	N/A	
33	900	9/19/2017	12:56	1:05	B	N	10	13	13	Major	2	N	Residential	N/A	N	N/A	Y	Y	N	N	N	Y	Single Stream at bus stop	Fence, curb, grass line	2	N	N/A	
34	4100	9/20/2017	10:17	10:32	A	N	10	10	10	Major	7	N	Residential, parkland	<3"	N	N/A	N	Y	Y	N	Y	Y	Single Stream at bus stop	Fence, curb, grass line	1	N	N/A	
35	2900	9/19/2017	1:49	1:55	A	N	15	15	15	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	Y	360L Garbage Bin	Curb, grass line	2	N	N/A	
36	2200	9/19/2017	12:15	12:22	A	Y				Minor	2	N	Residential, parkland, institutional	<3"	N	N/A	N	Y	N	N	N	Y	360L Garbage Bin	Curb, grass line	2	N	N/A	

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
37	2800	9/18/2017	11:17	11:34	A	N	16	16	16	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, grass line, tree line	1	N	N/A	
38	1000	9/19/2017	10:25	10:39	B	Y				Major	6	N	Commercial	N/A	Y	Starbucks, McDonalds, Tim Hortons	N	Y	Y	Y	N	Y	Single stream bin	Curb	1	Y	Business hired to clean in front of stores	
39	1400	9/20/2017	12:20	12:27	B	N	15	15	15	Minor	2	N	Industrial	<3"	N	N/A	N	N	N	N	N	N	N/A	Hedge, curb	1	N	N/A	
40	43	9/20/2017	8:12	8:21	B	N	15	13	13	Minor	2	Y	Residential	N/A	Y	Subway, Craft Market	N	Y	N	N	N	N	N/A	Curb, shrubs	1	N	N/A	
41	300	9/20/2017	8:35	8:56	B	N	10	11	10	Major	6	Y	Commercial, industrial	<3"	Y	Tim Hortons, Subway	N	Y	N	N	N	N	N/A	Fence, Curb	3	N	N/A	
42	1800	9/18/2017	9:16	9:43	A	Y				Minor	2	N	Commercial	3"-6"	N	N/A	N	Y	N	N	N	N	N/A	Curb, grass line, tree line	1	N	N/A	
43	44	9/19/2017	8:46	8:54	A	N	16	16	16	Minor	2	N	Residential	<3"	N	N/A	N	N	N	N	Y	N	N/A	Hedge, curb, grass line	1	N	N/A	
44	2800	9/20/2017	8:51	9:07	A	N	9	9	9	Minor	2	N	Residential	<3'	N	N/A	N	Y	N	N	Y	N	N/A	Fence, curb, grass line	2	N	N/A	Construction within survey area
45	45	9/19/2017	10:32	10:47	A	N	13.5	13.5	13.5	Minor	2	N	Residential	<3"	N	N/A	N	N	N	N	N	N	N/A	Hedge, curb	1	N	N/A	
46	3000	9/21/2017	9:59	10:10	A	N	11	17	17	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Fence, curb, grass line	1	N	N/A	
47	500	0/19/2017	2:02	2:10	A	Y				Major	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, grass line, tree line	1	N	N/A	
48	3700	9/19/2017	1:10	1:21	A	Y				Minor	2	N	Residential	<3'	N	N/A	N	Y	N	N	N	N	N/A	Curb, grass line, tree line	1	N	N/A	
49	3200	9/20/2017	8:16	8:31	A	Y				Minor, Laneway	2	N	Residential	<3'	N	N/A	N	Y	N	N	N	N	N/A	Fence, curb, grass line	1	N	N/A	
50	2900	9/18/2017	11:57	12:05	A	Y	17	17	17	Minor	2	N	Commercial	3"-6"	N	N/A	N	Y	N	N	Y	N	N/A	Hedge, curb, grass line, tree line	2	N	N/A	
51	3300	9/18/2017	1:16	1:26	A	N	9.5	9.5	9.5	Minor	2	N	Residential	Over 6"	N	N/A	N	Y	N	N	N	N	N/A	Hedge, curb, grass line	2	N	N/A	
52	600	9/20/2017	9:11	9:24	B	N	11	10	10	Minor	2	N	Industrial	<3"	N	N/A	N	N	N	N	N	N	N/A	Curb, tee line	1	N	N/A	
53	1800	9/20/2017	9:45	9:52	B	Y				Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb	1	N	N/A	
54	1100	9/20/2017	10:00	10:16	B	N	10	10	13	Major	6	N	Commercial, industrial	N/A	N	N/A	N	Y	Y	Y	N	Y	Single stream bin	Hedge, curb	2	N	N/A	
55	3400	9/21/2017	8:40	9:48	B	N	13	13	13	Minor	2	N	Residential	<3"	N	N/A	N	Y	Y	N	N	N	N/A	Curb, tree line	2	N	N/A	
56	2900	9/21/2017	9:01	9:18	B	N	15	15	15	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb	2	N	N/A	
57	7800	9/21/2017	9:00	9:06	A	N	13	18	13	Minor	2	Y	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Fence, curb, grass line	1	N	N/A	
58	5700	9/21/2017	10:25	10:30	A	Y				Minor	2	Y	Residential	<3"	N	N/A	N	N	N	N	N	N	N/A	Curb, grass line	2	N	N/A	Headed north
59	300	9/21/2017	8:32	8:40	A	N	18	15	15	Minor	2	Y	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, grass line	2	N	N/A	
60	7200	9/21/2017	9:15	9:25	A	N	18	18	13	Minor	2	Y	Commercial, residential	<3"	Y	Subway, 711	Y	Y	N	N	N	N	N/A	Fence, curb, grass line	2	N	N/A	Garbage day in Neighbourhood
61	5000	9/21/2017	10:10	10:19	B	N	18	13	16.5	Minor	2	N	Residential	<3"	N	N/A	N	N	N	N	N	N	N/A	Curb	1	N	N/A	
62	2400	9/21/2017	9:41	9:50	B	N	11	18	18	Major	6	N	Commercial, residential	<3"	Y	Churches Chicken	Y	Y	N	N	N	N	N/A	Curb	2	N	N/A	Large number of cigarette butts in the area
63	1500	9/20/2017	12:56	1:03	B	N	14	14	18	Minor	2	N	Essential	<3'	N	N/A	N	N	N	Y	N	N	N/A	Curb	1	N	N/A	
64	2800	9/20/2017	12:42	12:47	B	N	10	10	10	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Hedge, curb	1	N	N/A	
65	7500	9/19/2017	10:02	10:07	A	Y				Minor	2	N	Residential	<3"	N	N/A	N	N	N	N	N	N	N/A	Fence, hedge, curb, grass line	1	N	N/A	
66	1300	9/18/2017	8:30	8:53	A	N	14	14	14	Minor	2	N	Residential	<3"	N	N/A	N	N	N	N	N	N/A	Curb, grass line, tree line	1	N	N/A		
67	2100	9/18/2017	10:16	10:32	A	N	13.5	13.5	13.5	Minor	2	N	Commercial, residential	3"-6"	N	N/A	N	N	N	N	Y	N	N/A	Curb, grass line, tree line	2	N	N/A	
68	2100	9/19/2017	9:00	9:07	A	Y				Major	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, grass line, tree line	1	N	N/A	
69	3900	9/18/2017	2:07	2:17	A	N	18	18	15	Minor, Laneway	2	N	Residential	3"-6"	N	N/A	N	Y	Y	N	N	Y	Bus stop bin with recycling tray	curb, grass line, tree line	1	N	N/A	
70	2400	9/20/2017	1:27	1:37	B	N	12	8.5	10	Major	6	Y	Residential	<3"	Y	Kaura Coffee	N	Y	Y	N	N	N	N/A	Hedge, curb	1	N	N/A	
71	3900	9/18/2017	10:26	10:32	B	N	16	16	16	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, tree line	1	N	N/A	
72	3000	9/18/2017	11:47	11:54	A	N	16	16	16	Minor	2	Y	Residential	3"-6"	N	N/A	N	Y	N	N	N	Y	Vancouver parks totes	Curb, grass line, tree line	1	Y	Employees in Park	

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	
73	3200	9/18/2017	10:40	10:48	B	Y				Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, tree line	1	N	N/A		
74	3200	9/21/2017	8:08	8:17	B	N	16.5	16.5	16.5	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb	1	N	N/A		
75	400	9/19/2017	12:35	12:45	B	N	18	16	16	Minor	4	N	Commercial	N/A	N	N/A	N	Y	Y	N	Y	N/A	Curb	2	N	N/A			
76	700	9/20/2017	11:12	11:22	A	N	18	13	8	Minor	2	N	Commercial, residential	N/A	N	N/A	Y	Y	N	N	N	N	N/A	Curb, grass line	2	N	N/A		
77	5500	9/20/2017	1:55	2:09	A	N	7	7	15	Major	4	Y	Commercial, residential	N/A	Y	Subway	Y	Y	Y	Y	N	Y	Single stream at bus stop and bin attached to the bus stop sign	Hedge, curb	2	N	N/A		
78	3900	9/20/2017	11:28	11:35	A	N	13	13	17	Minor	2	Y	Residential, institutional	<3"	N	N/A	N	Y	N	N	N	N	N/A	Fence, curb, grass line	1	N	N/A		
79	200	9/20/2017	11:41	11:51	A	N				Minor	2	Y	Residential	<3"	N	N/A	N	N	N	N	N	N	N/A	Curb, grass line	1	N	N/A	Headed east	
80	1600	9/19/2017	8:40	8:49	B	N	16.5	16	12	Minor	2	N	Residential	<3"	N	N/A	N	N	N	N	N	N	N/A	Curb	2	N	N/A		
81	4900	9/20/2017	12:17	12:25	A	N	8			Minor	2	Y	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, grass line, tree line, garden bed	1	N	N/A		
82	900	9/20/2017	9:49	10:06	A	N	13	15	15	Minor	2	Y	Residential	<3"	N	N/A	N	N	N	N	N	N	N/A	Curb, grass line	1	N	N/A		
83	5500	9/20/2017	1:28	1:35	A	N	14	18	18	Minor	2	Y	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, tree line	1	N	N/A		
84	3500	9/18/2017	11:58	12:05	B	Y				Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, tree line	1	N	N/A		
85	3700	9/18/2017	10:56	11:03	B	N	18	16	16	Major	2	N	Residential	<3"	N	N/A	N	Y	N	N	Y	N	N/A	Curb, tree line	1	N	N/A		
86	3400	9/18/2017	11:11	11:19	B	Y				Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, tree line	1	N	N/A		
87	66	9/19/2017	9:13	9:21	A	Y				Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	Y	N	N/A	Curb, grass line, tree line	1	N	N/A		
88	2100	9/19/2017	9:27	9:31	A	N	2	2	2	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Hedge, curb, grass line	1	N	N/A		
89	6500	9/21/2017	8:17	8:26	A	N	9	9	12	Major	4	Y	Commercial	<3"	N	N/A	N	Y	Y	Y	N	Y	Single stream next to bus stop	Fence, curb	2	N	N/A	Construction within survey area	
90	100	9/21/2017	8:45	8:51	A	Y				Minor	2	Y	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Hedge, curb, grass line	1	N	N/A		
91	2900	9/18/2017	11:45	1:53	B	Y				Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, tree line	1	N	N/A		
92	2200	9/20/2017	11:21	11:30	B	Y				Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	Y	N	N/A	Curb	3	N	N/A	Started at 2255 East Pender and moved west	
93	1200	9/20/2017	12:28	12:33	A	Y	14	12	12	Minor	2	Y	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Fence, curb, grass line	1	N	N/A	Includes laneway	
94	1800	9/18/2017	9:15	9:30	B	N	16	16	16	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, grass line, tree line	1	N	N/A		
95	4400	9/18/2017	9:48	9:58	B	N	17	16	17	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Grass line, tree line	1	N	N/A		
96	1700	9/19/2017	2:27	2:39	B	N	15	13	13	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb	2	N	N/A		
97	800	9/20/2017	10:33	10:43	B	N	12.5	18	18	Minor	2	N	Commercial	<3"	Y	Uprising breads bakery	N	Y	N	N	N	N	N/A	Curb	2	N	N/A		
98	2900	9/21/2017	10:13	10:19	A	Y				Minor	2	Y	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb, grass line	1	N	N/A		
100	1200	9/19/2017	9:29	9:37	B	N	16	15	18	Minor	2	N	Residential	<3"	N	N/A	N	Y	N	N	N	N	N/A	Curb	1	N	N/A		
101	2500	9/18/2017	9:46	10:09	A	N	18	18	12	Major	6	N	Commercial	N/A	Y	Starbucks	N	Y	N	N	N	N	N/A	Curb, tree line	1	N	N/A		
102	5600	9/20/2017	2:17	2:29	A	N	18	18	16	Major	8	Y	Commercial	N/A	N	N/A	N	Y	Y	Y	N	N	N/A	Hedge, curb	1	N	N/A	A lot of cigarette butts clustered around street sign	
103	1100	9/19/2017	9:13	9:20	B	N	13	13	13	Minor	2	N	Residential	<3"	N	N/A	Starbucks, La Catrina Mexican Tacos, Falafel & Friends	N	Y	N	N	N	N	N/A	Curb	1	N	N/A	
104	1100	9/19/2017	8:11	8:29	B	N	12.5	13	13	Major	4	N	Commercial	N/A	Y	Miko Sushi, Vietnamese Cuisine, Starbucks, Tim Hortons	N	Y	Y	Y	Y	Y	Emily Carr bins		1	N	N/A		
105	1300	9/19/2017	8:57	9:05	B	N	18	18	12	Major	4	N	Commercial	N/A	Y		N	Y	N	N	Y	Single Stream	Curb	1	N	N/A			
106	1000	9/19/2017	9:51	10:09	B	Y				Major	6	N	Commercial	N/A	N	N/A	Y	Y	Y	N	N	Y	Single Stream	Curb, tree line	3	N	N/A		
107	600	9/19/2017	1:43	1:54	B	N	13	13	13	Major	4	N	Commercial, residential	<3"	N	N/A	N	Y	Y	N	Y	Y	Single Stream	Curb, grass line	4	N	N/A		
108	2400	9/19/2017	12:44	12:55	A	N	13.5	13.5	13.5	Major	6	N	Commercial	N/A	Y	Tim Hortons	N	Y	N	N	N	Y	Recycling Bins	Curb	1	N	N/A		
109	1100	9/20/2017	9:20	9:41	A	N	16	16	18	Major	6	Y	Commercial	N/A	N	N/A	Y	Y	N	N	N	N	N/A	Curb, store front	1	N	N/A	Headed towards Windsor Street	
110	400	9/19/2017	1:19	1:30	B	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: _____

Large Litter Survey Form Pg1:

Site ID:

Site Name:

Time:

Survey Team:

CATEGORY	PASS 1	TOTAL	PASS 2	TOTAL	BRAND NAMES OBSERVED
BEVERAGE CONTAINERS					
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					
OTHER PACKAGING					
Foil Pouches					
Non-Beverage Aseptic Box					
Non-Beverage Gable Top					
Broken Cont. Glass					
Six Pack Plastic Rings					
Foil Containers					
CUPS					
Plastic Drink Cups					
Paper Cups (cold)					
Paper Cups (hot)					
Polystyrene Cups (foam)					
Other Paper Cups					
Cup Lids, Pieces, Lids					
BAGS					
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					
OTHER PACKAGING (Boxes)					
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
OTHER CONTAINERS					
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					
FOOD WRAPS/CONTAINERS					
Paper Food Wrap					
Paper /Foil Composite Wrap					
Plastic Wrap					
TAKE OUT EXTRAS					
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					
TRAYS					
Polystyrene Trays					
Paper Trays					
Other Material Trays					
CONFECTIONARY/ SNACK					
Gum Wrappers					
Candy Bar Wrappers					
Candy Pouches					
Sweet Packaging (describe)					
Other Confectionary (describe)					
Snack Food Packaging					
CLOTH					
Clothing or Clothing Pieces					
Other Cloth					
OTHER MISCELLANEOUS PACKAGING					
Plastic Packaging Other					
Paper Packaging Other					
Plastic/ Composite Other					
Foil Materials/Foil Pieces					
PAPER/ FIBRE MATERIAL					
Non-Brand Towels/Napkins					
Lottery \Ticket Debris					
Printed Material					
Stationary (school, business etc.)					
Receipts (business forms, bus tickets)					
TOBACCO PRODUCTS					
Cigarette / Cigar Debris					
Tobacco other					

CATEGORY	PASS 1	TOTAL	PASS 2	TOTAL	BRAND NAMES OBSERVED
Large Litter Survey Form Pg 2: SiteID:					
OTHER MISCELLANEOUS					
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
Small Litter Categories		
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
Cup Lids, Pieces	94	10%
Non-Brand Towels/Napkins	83	9%
Tobacco other	62	7%
Receipts (business forms, bus tickets)	59	6%
Misc. Plastic	58	6%
Snack Food Packaging	42	5%
Paper Cups (hot)	37	4%
Misc. Paper	33	4%
Paper Food Wrap	30	3%
Printed Material	29	3%
Plastic Wrap	27	3%
Plastic Drink Cups	26	3%
Home Articles	23	2%
Food	23	2%
Clothing or Clothing Pieces	21	2%
Paper Cups (cold)	16	2%
Branded Napkins / Serviettes	16	2%
Plastic Packaging Other	15	2%
Zipper Bags/Sandwich Bags	12	1%
Candy Bar Wrappers	12	1%
Vehicle & Metal Road Debris	11	1%
Plastic Jars / Bottles/ Lids	10	1%
Other Cloth	10	1%
Stationary (school, business etc.)	9	1%
Polystyrene Cups (foam)	8	1%
Cardboard Boxes/ Box Material	8	1%
Lottery \Ticket Debris	8	1%
Misc. Paperboard	8	1%
Misc. Cardboard	8	1%
Plastic Retail Bags & Grocery	7	1%
Paperboard (boxboard)	7	1%
Utensils	7	1%
Other Plastic Bags	6	1%
Candy Pouches	6	1%
Beer Cans	5	1%
Milk-Milk Type Beverage (plastic)	5	1%
Plastic Bags Non-Packaging	5	1%
Condiment Packaging	5	1%
Sweet Packaging (describe)	5	1%
Water (plastic)	4	0%
Plastic Bags -Consumable Packaging	4	0%
Pet Waste Bags (Empty)	4	0%
Paper Beverage Cases/Sleeves	4	0%
Paper Packaging Other	4	0%
Soft Drink (plastic)	3	0%

Large Litter Item	Total	Percent
Polystyrene Trays	3	0%
Other Construction/ Demolition Debris	3	0%
Juice (gable top)	2	0%
Foil Pouches	2	0%
Broken Cont. Glass	2	0%
Paper Bags - Fast Food	2	0%
Other Plastic Shells/Boxes	2	0%
Paper Fast Food Plates	2	0%
Plastic/ Composite Other	2	0%
Foil Materials/Foil Pieces	2	0%
Cigarette / Cigar Debris	2	0%
Beer Bottles (glass)	1	0%
Soft Drink (glass)	1	0%
Soft Drink (cans)	1	0%
Sport Drink (plastic)	1	0%
Wine/ Liquor (glass)	1	0%
Juice (plastic)	1	0%
Non-Milk Aseptic (box)	1	0%
Foil Containers	1	0%
Paper Retail Bags& Grocery	1	0%
Paper Bags Non-Packaging	1	0%
Cans-Aluminum	1	0%
Container Lids	1	0%
Paper /Foil Composite Wrap	1	0%
Poly Fast Food Plates	1	0%
Aluminum Food Containers	1	0%
Gum Wrappers	1	0%
Other Confectionary (describe)	1	0%
Tire& Rubber Debris	1	0%
Batteries	1	0%
Light Bulbs	1	0%
Pet Waste (bagged)	1	0%
Pet Waste (loose)	1	0%
Sport Drink (glass)	0	0%
Water (glass)	0	0%
Wine/ Liquor (plastic/other)	0	0%
Juice (glass)	0	0%
Milk-Milk Type Beverage (Glass)	0	0%
Milk-Milk Type Beverage (gable top)	0	0%
Milk-Milk Type Beverage (Aseptic)	0	0%
Drink Foil Pouches	0	0%
Beverage Bi-Metal	0	0%
Non-Beverage Aseptic Box	0	0%
Non-Beverage Gable Top	0	0%
Six Pack Plastic Rings	0	0%

Large Litter Item	Total	Percent
Other Paper Cups	0	0%
Plastic Bags - Fast Food	0	0%
Paper Bags -Consumable Packaging	0	0%
Plastic Bags-Dry-Cleaning Bags	0	0%
Polystyrene Clamshells	0	0%
Paper Clamshells	0	0%
Paint Containers/Cans	0	0%
Pesticide Containers	0	0%
Used Lubricating Oil Containers	0	0%
Solvent Containers	0	0%
Gasoline Containers	0	0%
Glass Jars/ Bottles Misc	0	0%
Cans/Containers-Steel	0	0%
Spiral Wound Containers	0	0%
Other Aerosol Containers	0	0%
Other Plastic Fast Food Plates	0	0%
Plates-Other Materials	0	0%
Paper Trays	0	0%
Other Material Trays	0	0%
Misc. Glass	0	0%
Gypsum/ Drywall	0	0%
Rigid Asphalt Products	0	0%
Carpet	0	0%
Cell Phones	0	0%
Audio-Visual Devices	0	0%
Electronic Toys	0	0%
Small Appliances, Power Tools	0	0%
Alarms	0	0%
Medications	0	0%
Popsicle Sticks	0	0%

Small Litter Items	Items	Percent
Cigarette Butts/Debris	215	38%
Other Tobacco	1	0%
Bottle Caps	3	1%
Straws	5	1%
Candy Packaging and Wrappers	10	2%
Expanded Polystyrene Packing Materials, ie. Foam Peanuts	0	0%
Other Polystyrene Debris, ie. Poly Foam Pieces	7	1%
Glass	12	2%
Paper	65	11%
Cup Sleeves	0	0%
Plastic Film	26	5%
Hard Plastic	36	6%
Aluminum/Foil Debris	21	4%
Rubber	1	0%
Metal (not aluminum)	7	1%
Chewing Gum (stuck on pavement)	149	26%
Food & Food Scraps	0	0%
Pet Waste (bagged)	0	0%
Pet Waste (loose)	3	1%
Needles/Syringes	0	0%
Medications	0	0%
Cell Phones	0	0%
Audio-Visual devices	0	0%
Batteries	1	0%
Other Electronic Waste	0	0%
Other Material	9	2%
Total Site Small Litter	571	100%

Super Site Items	Items	Percent
Cigarette Butts/Debris	1469	40%
Other Tobacco	0	0%
Bottle Caps	21	1%
Straws	10	0%
Candy Packaging and Wrappers	29	1%
Expanded Polystyrene Packing Materials, ie. Foam Peanuts	0	0%
Other Polystyrene Debris, ie. Poly Foam Pieces	4	0%
Glass	19	1%
Paper	175	5%
Cup Sleeves	2	0%
Plastic Film	44	1%
Hard Plastic	96	3%
Aluminum/Foil Debris	62	2%
Rubber	6	0%
Metal (not aluminum)	10	0%
Chewing Gum (stuck on pavement)	1716	47%
Food & Food Scraps	5	0%
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	1	0%
Other Material	16	0%
Total Site Small Litter	3685	100%

Appendix F

Ranking of Sites

Large Litter Results

Site Number	Large Litter
44	47
107	43
41	35
17	31
52	27
77	25
60	24
67	22
10	21
11	21
58	20
9	17
56	17
59	17
4	16
89	16
98	16
54	15
106	15
13	13
24	13
96	13
7	12
49	12
81	12
110	12
25	11
32	11
61	11
15	10
75	10
76	10
92	10
6	9
34	9
50	9
85	9
100	9
26	8
30	8
68	8
82	8
95	8
19	7
39	7

Small Litter Results

Site Number	Small Litter
107	33
108	32
15	20
75	19
13	18
104	17
106	16
110	15
41	14
109	14
19	13
89	12
102	12
60	11
61	10
62	10
67	10
70	9
105	9
11	8
38	8
55	8
76	8
80	8
96	8
100	8
32	7
33	7
52	7
7	6
40	6
47	6
49	6
56	6
92	6
95	6
17	5
26	5
35	5
42	5
44	5
54	5
4	4
9	4
18	4

Combined Litter Results

Site Number	Total
107	76
44	52
41	49
17	36
60	35
108	35
52	34
67	32
13	31
106	31
15	30
11	29
75	29
77	29
89	28
110	27
10	24
56	23
58	23
104	23
9	21
61	21
96	21
4	20
19	20
54	20
59	20
98	19
7	18
32	18
49	18
76	18
109	18
100	17
92	16
102	16
24	15
80	15
25	14
55	14
95	14
26	13
34	13
50	13
62	13

Large Litter Results

Site Number	Large Litter
51	7
72	7
80	7
27	6
35	6
36	6
37	6
55	6
101	6
103	6
104	6
12	5
18	5
33	5
45	5
66	5
73	5
90	5
1	4
21	4
40	4
43	4
47	4
53	4
57	4
88	4
93	4
102	4
109	4
3	3
14	3
20	3
23	3
31	3
42	3
46	3
48	3
62	3
64	3
70	3
71	3
74	3
83	3
91	3
97	3

Small Litter Results

Site Number	Small Litter
34	4
45	4
48	4
50	4
64	4
77	4
97	4
5	3
10	3
12	3
22	3
25	3
51	3
53	3
58	3
59	3
74	3
78	3
83	3
98	3
101	3
103	3
2	2
3	2
8	2
23	2
24	2
30	2
36	2
57	2
79	2
86	2
1	1
20	1
21	1
27	1
28	1
31	1
43	1
63	1
66	1
68	1
69	1
71	1
72	1

Combined Litter Results

Site Number	Total
33	12
70	12
81	12
35	11
105	11
30	10
38	10
40	10
47	10
51	10
85	10
6	9
18	9
45	9
68	9
82	9
101	9
103	9
12	8
36	8
42	8
72	8
27	7
39	7
48	7
53	7
64	7
97	7
37	6
57	6
66	6
73	6
74	6
83	6
90	6
1	5
3	5
21	5
22	5
23	5
43	5
88	5
93	5
2	4
5	4

Large Litter Results

Site Number	Large Litter
108	3
2	2
16	2
22	2
38	2
79	2
84	2
86	2
105	2
5	1
28	1
65	1
69	1
78	1
87	1
8	0
63	0
94	0

Small Litter Results

Site Number	Small Litter
73	1
82	1
84	1
85	1
87	1
88	1
90	1
91	1
93	1
94	1
6	0
14	0
16	0
37	0
39	0
46	0
65	0
81	0

Combined Litter Results

Site Number	Total
20	4
31	4
71	4
78	4
79	4
86	4
91	4
14	3
46	3
84	3
8	2
16	2
28	2
69	2
87	2
63	1
65	1
94	1