

# **The City of Edmonton**

## **LITTER AUDIT**

### **2012**

PREPARED FOR

**City of Edmonton**  
**Community Services Department**

PREPARED BY

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Osoyoos, BC  
250-495-4592

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# Executive Summary

The City of Edmonton retained MGM Management, a British Columbia based environmental consulting firm to conduct a baseline litter audit throughout the city in 2007. This base-line litter audit was followed with repeat litter audits in 2009, 2010, 2011 and now in 2012.

MGM Management has conducted 21 litter audits for North American municipalities and provincial authorities since 2002, including this litter audit for Edmonton in 2012. MGM Management has accumulated a litter database of nearly 84,000 large litter observations from these litter audits.

The City of Edmonton conducted its fifth litter audit in July of 2012. Within this study litter is classified as “large” for those items over 25 sq. cm. (4 square inches) in size or as “small” litter for items less than 25 sq. cm. (4 sq. in.). Eighty-four sub-categories of large and sixteen sub-categories of small litter were examined.

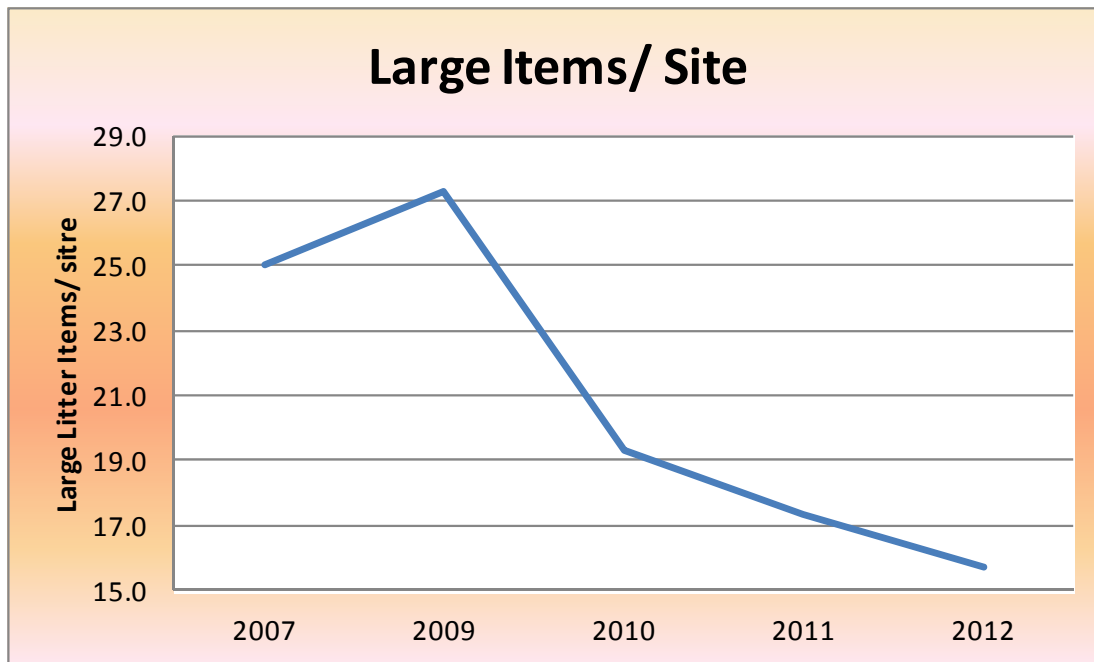
A total of 1,93 items of large litter were observed by auditors on Edmonton streets during the 2012 audit. The same one hundred and twenty three sites that were audited in 2009, 2010 and 2011 were re-examined during this audit, from July 2 – 9, 2012. The 2012 litter audit averaged 15.7 large litter items per site compared to 17.3 items per site in 2011, 19.3 items per site in 2010, 27 items per site in 2009 and 25 items of large litter items per site observed in 2007.

Auditors noted that in 2012 there were 12 sites where no large litter was observed, compared to 9 sites in 2011.

**Table ES 1 – 2012 Litter vs. Previous Audits**

Summary of Large Litter Results (2007 - 2012)					
	2012	2011	2010	2009	2007
Total Large Litter	1,933	2,134	2,378	3,361	2,650
Number of sites audited	123	123	123	123	106
Average large items / site	15.7	17.3	19.3	27.3	25.0
Reduction in Large Litter from 2011	9.4%				
Reduction in Large Litter from 2010	18.7%				
Reduction in Large Litter from 2009	42.5%				
Reduction in Large Litter from 2007	37.1%				

**Figure ES 1 – 2012 Litter vs. Previous Audits**



In 2012 MGM Management also conducted two mini-litter-audits in Edmonton. The first mini-audit, from this point on referred to as the “hotspot audit”, consisted of 10 sites, originally identified by the City of Edmonton in 2009.

At that time, the City had 106 randomly selected sites from the 2007 audit, but wanted the consultant to sample certain areas it felt needed greater examination. The consultant then proceeded to randomly select the 10 additional sites from these general areas. Seven further sites that were randomly generated by the computer were also added by the auditor as a “top up”. Thus the 2009 litter audit contained a total of 123 sites. This sample size was repeated in 2010, and 2011 at 123. For 2012 the City of Edmonton requested that the 10 “hotspot” sites of 2009 remain as part of the main audit, but also be examined separately as mini re-audit.

A separate mini-audit was also done in 2012 with site along the Yellowhead Corridor, between 107 Street and the Beverly Bridge (across the North Saskatchewan River) on Highway 16 east. Twenty litter sites from this area were originally audited in 2010. For 2012, the City requested that these 20 litter sites on the Yellowhead Corridor be audited again and reported separately from the main litter audit. The total number of sites audited in 2012, including the Yellowhead Corridor sites was 143 sites.

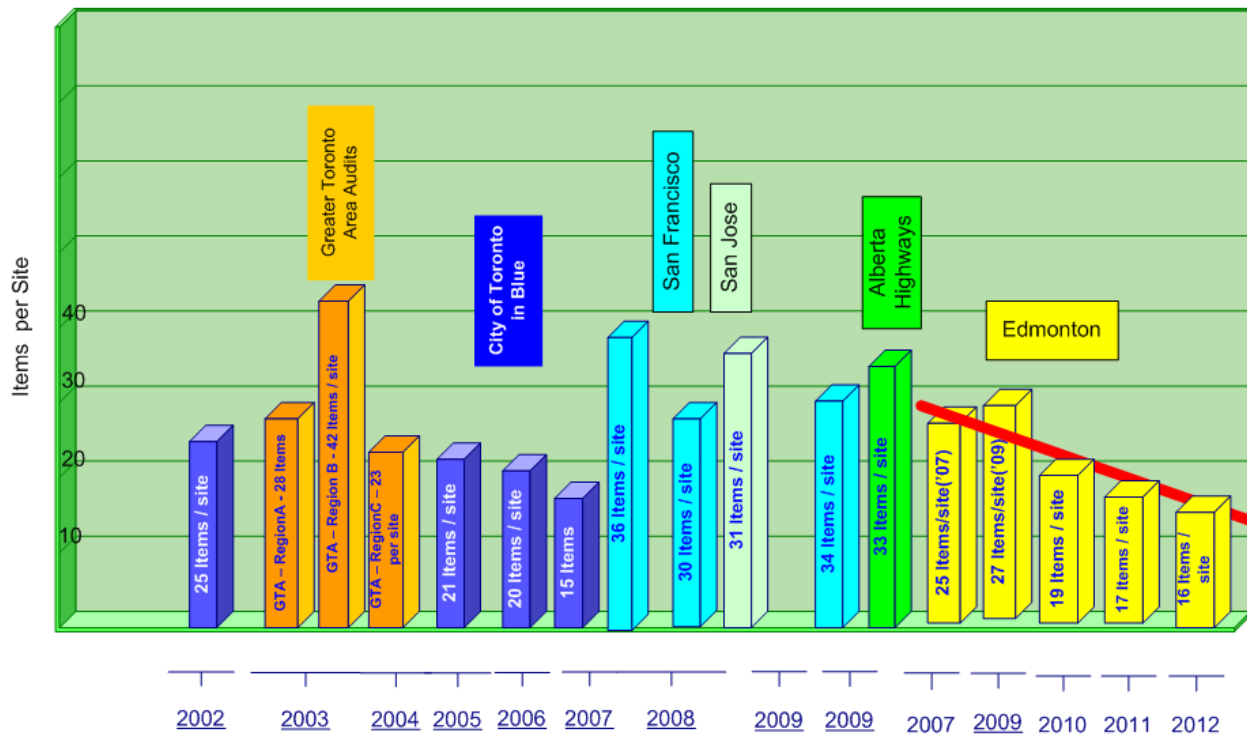
**Table ES 2 - Litter Sites Audited**

**Litter Sites - 2007 to 2012**

	Computer Generated Random Sites	Additional Sites Requested COE	Additional Sites done - from 2007 random list not previously audited	Yellowhead Hwy Corridor Sites	Total Sites Audited
<b>2007</b>	106	0	0	0	106
<b>2009</b>	106	10	7	0	123
<b>2010</b>	106	10	7	20	143
<b>2011</b>	106	10	7	0	123
<b>2012</b>	<b>106</b>	<b>10</b>	<b>7 *</b>	<b>20</b>	<b>143</b>

**Figure ES2 – Edmonton vs. Other Litter Audit Results**

**Large Litter – Edmonton 2012 vs.  
Other Litter Audits**



Tobacco packaging continues to be the largest identifiable sub-category of large litter observed at 183 items or 9% of total large litter, compared to 10.8% in 2011 and 10.4% of total large litter in 2010.

Miscellaneous paper also continues to be a significant contributor to large litter in Edmonton at 8.4% of total large litter as compared to 9.3% in 2011, 7.6% in 2011, and 12.7% in 2010.

Paper napkins that were not associated with any particular brand accounted for 156 items, or 8.1% of total large litter in the 2012 audit, which is a slight increase from the 2011 result of 7.6% of total large litter, but lower than 9.7% in 2010 (11.6% in 2009, and 8.2% in 2007).

Miscellaneous plastic litter which was observed at 149 litter items, or 7.7% of total large litter, showed an increase from the 6.6% of total litter for this sub-category in 2011. These results compare with 6.9% in 2010, 9.7% in 2009, and 14.1% in 2007, revealing that miscellaneous plastic continues to be a significant sub-category of large litter on Edmonton streets.

These four sub-categories combined, provide a similar result in 2012, to previous audits, in which these sub-categories contribute over 1/3 (33.7%) of all large litter observed in Edmonton during the audit.

**Table ES 3 – Top 20 Subcategories of Litter**

Top 20 Litter Categories Equal 81% of Litter in 2012						
2012 Top 20 Large Litter		2012 Results	2011 Results	2010 Results	2009 Results	2007 Baseline
		Total Items	Total Items	Total Items	Total Items	Total Items
1	Tobacco packaging	183.5	229.5	248.5	310	197
2	Misc. Paper	163	166	137.5	337.5	296
3	No Brand Name Towels / Napkins	156	162.5	232.5	389.5	217
4	Printed material (newspapers etc.)	150	128.5	171.5	220	137.5
5	Misc. Plastic	149	140	164.5	326	374
6	Plastic packaging other	80.5	79.5	69.5	125	53.5
7	Home Articles	78.5	97	105	135	91.5
8	Receipts (forms, bus tickets etc.)	66	54.5	55.5	60.5	84
9	Misc. Paperboard	62.5	34	42	88.5	63.5
10	Candy bar wraps	58.5	110	161	160	106
11	Plastic bags - not retail	55.5	Not Top 20	Not Top 20	Not Top 20	Not Top 20
12	Cup Lids, Pieces lids	54	81	60.5	86.5	97.5
13	Sweet packaging	50.5	Not Top 20	Not Top 20	Not Top 20	Not Top 20
14	Vehicle & Metal Road Debris	48	76	61.5	Not Top 20	Not Top 20
15	Construction debris	43	81.5	82	69	111.5
16	Paper Cups (Hot)	43	67	73.5	79.5	59.5
17	Misc. Cardboard	41.5	36	73.5	76	50
18	Paper cups (cold)	32.5	54	Not Top 20	51	Not Top 20
19	Plastic drink Cups	30	Not Top 20	Not Top 20	Not Top 20	Not Top 20
20	Condiment packaging	29.5	43.5	46	66	47.5
	Paper packaging other		30.5	Not Top 20	Not Top 20	Not Top 20
	Gum Wrappers		42	38	76	44
	Paper food wrap		31.5	Not Top 20	Not Top 20	Not Top 20
Items in Top 20 Sub-categories		1,575	1,745	1,823	2,656	2,030
% of Total Large Litter (Top 20)		81%	82%	77%	79%	84%

### **Large Litter**

Fibre and plastic material litter together, accounted for 84% of the large litter observed.

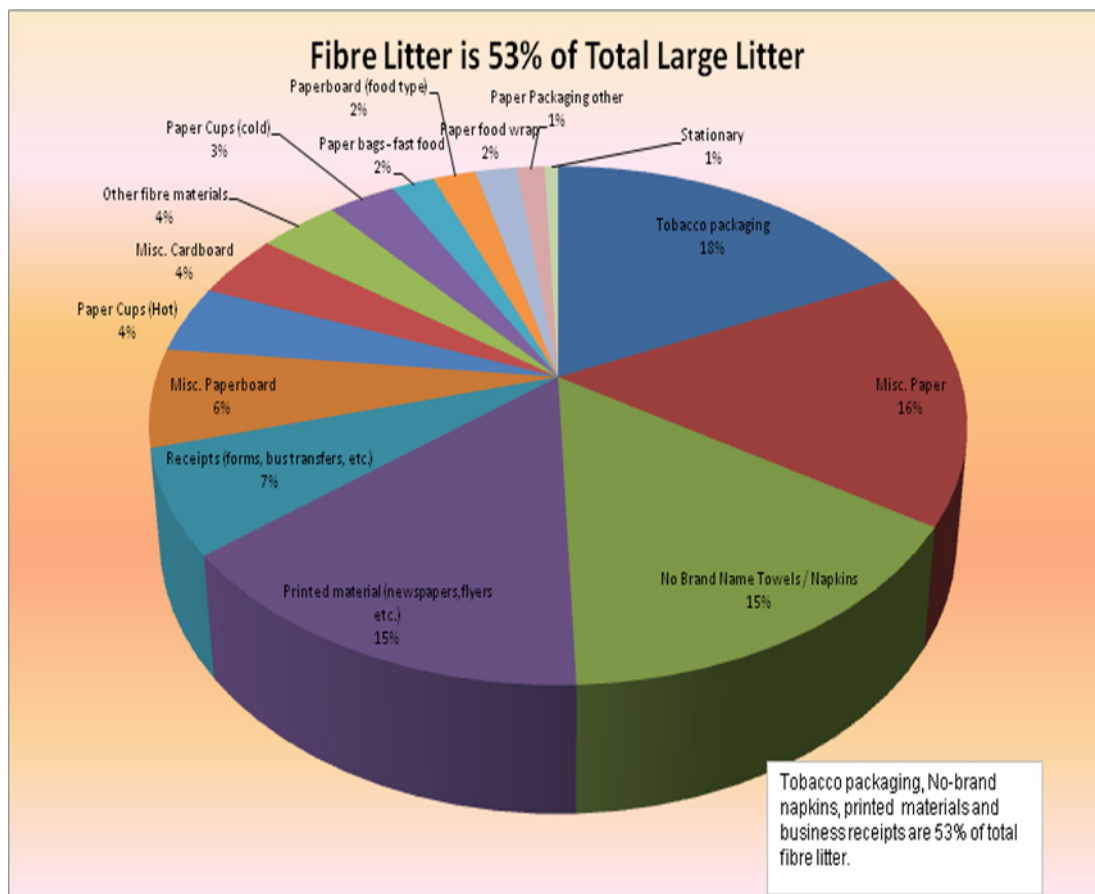
### ***Fibre litter***

Fibre litter is comprised of miscellaneous paper, paper packaging, printed paper, paperboard, cardboard, newspapers and advertisement flyers which all combine to make fibre litter a significant contributor to the litter on Edmonton streets. Twenty-four sub-categories of fibre litter account for 53% of the total large litter observed in 2012. As seen in Table ES-4 and Figure ES-3 below, the proportion of total litter composed of fibre materials has remained consistent from past audits to the 2012 survey at between 53% - 55% of total large litter.

**Table ES 4 - Composition of Fibre Litter**

<b>2012 Composition of Fibre Litter</b>									
	<b>2012</b>	<b>2012</b>	2011	2011	2010	2010	2009	2009	
	Items	% of Fibre Litter	Items	% of Fibre Litter					
Tobacco packaging	183.5	18.0%	229.5	19.7%	248.5	19.9%	310	16.7%	
Misc. Paper	163	16.0%	166	14.3%	137.5	11.0%	337.5	18.2%	
No Brand Name Towels / Napkins	156	15.3%	162.5	14.0%	232.5	18.6%	389.5	21.0%	
Printed material (newspapers, flyers etc.)	150	14.7%	128.5	11.0%	171.5	13.7%	220	11.9%	
Receipts (forms, bus transfers, etc.)	66	6.5%	54.5	4.7%	55.5	4.4%	60.5	3.3%	
Misc. Paperboard	62.5	6.1%	34	2.9%	42	3.4%	88.5	4.8%	
Paper Cups (Hot)	43	4.2%	67	5.8%	73.5	5.9%	79.5	4.3%	
Misc. Cardboard	41.5	4.1%	36	3.1%	73.5	5.9%	76	4.1%	
Other fibre materials	38	3.7%	118	10.1%	53.5	4.3%	118.5	6.4%	
Paper Cups (cold)	32.5	3.2%	54	4.6%	32.5	2.6%	51	2.8%	
Paper bags - fast food	20.5	2.0%	21	1.8%	23.5	1.9%	30.5	1.6%	
Paperboard (food type)	20.5	2.0%	20	1.7%	42	3.4%	40	2.2%	
Paper food wrap	20	2.0%	31.5	2.7%	35	2.8%	27	1.5%	
Paper Packaging other	13.5	1.3%	30.5	2.6%	24.0	1.9%	15.5	0.8%	
Stationary	6.5	0.6%	11.5	1.0%	6	0.5%	8	0.4%	
Total Fibre large litter	1,017	100.0%	1,165	100%	1,251	100%	1,852	100%	
% of total large litter	53%		55%		53%		55%		
<b>Other fibre materials</b>									
Cardboard boxes	13								
Paper foil comp wrap	11								
Paper retail bags	3.5								
Paper fast food plates	3.5								
Paper bags - not retail	2								
Milk / Juice (gable)	2								
Aseptic box	2								
Lottery debris	1								
	38								

**Figure ES 3 - Composition of Fibre Litter**



As illustrated in Figure ES 3 above, the most significant contributors to fibre litter are tobacco packaging, no-brand name napkins, printed materials (newspaper, advertisements & flyers) and business receipts.

### ***Plastic Litter***

Plastic litter is the second most significant material type of large litter observed in Edmonton. These materials include, candy bar wrappers, other plastic packaging, condiment packaging, plastic cups and plastic bags, contributing 31% of total large litter observed during the audit.

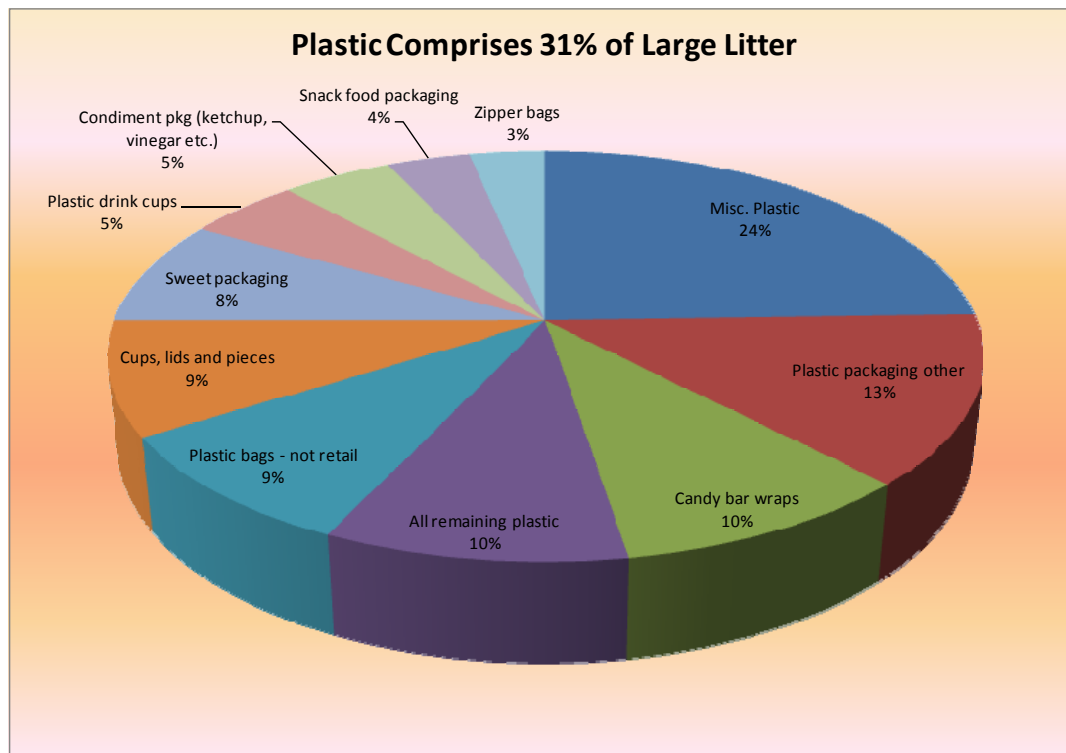
As illustrated by Table ES 5 and Figure ES 4 below, we see that the contribution to total litter attributed to plastic litter has also remained consistent when compared to previous litter audits in Edmonton (see next page).



**Table ES 5 - Composition of Plastic Litter**

<b>2012</b>										
<b>Composition of Plastic Litter</b>										
	2012	2012	2011	2011	2010	2010	2009	2009	2007	2007
	Items	% of Plastic Litter	Items	% of Plastic Litter						
Misc. Plastic	149	24.5%	140	22%	164.5	21%	326	35%	374	42%
Candy bar wraps	58.5	9.6%	110	17%	161.0	21%	160	17%	106	12%
Cups, lids and pieces	54	8.9%	81	13%	60.5	8%	86.5	9%	97.5	11%
Plastic packaging other	80.5	13.3%	79.5	12%	69.5	9%	75	8%	53.5	6%
All remaining plastic	58	9.5%	77	7%	114.5	15%	66	7%	97	11%
Condiment pkg (ketchup, vinegar etc.)	29.5	4.9%	43.5	7%	46.0	6%	62.5	7%	47.5	5%
Plastic drink cups	30	4.9%	29	4%	35.0	5%	53.6	6%	27	3%
Plastic bags - not retail	55.5	9.1%	28.5	4%	42.5	5%	0	0%	26	3%
Plastic retail bags	In Other		23.5	4%	12.5	2%	30.5	3%	9.5	1%
Sweet packaging	50.5	8.3%	22.5	3%	28.5	4%	11.5	1%	34	4%
Plastic Jars / Bottles/ Lids	In Other		22.5	3%	24.0	3%	0	0%	8	1%
Zipper bags	20	3.3%	19.5	3%	16.5	2%	61	7%	18	2%
Snack food packaging	22	3.6%								
Total plastic large litter	607.5	100%	676.5	100%	775.0	100%	932.6	100%	898	100%
% of total large litter	31%		32%		33%		28%		34%	
<b>All remaining plastic litter</b>										
Utensils	8.5									
Plastic retail bags	5.5									
Polystyrene cups	10									
Candy pouches	5.5									
Container lids	5.5									
Polystyrene fast food plates	5									
Waer (plastic)	3.5									
Polystyrene trays	3									
Plastic jars/ bottles	2.5									
Wine/ Liquor (Plastic)	2.5									
Milk/ Juice (Plastic)	2									
Six pack rings	1.5									
Soft drink (plastic)	1									
Sport drink (plastic)	1									
Polystyrene clamshells	1									
	58									

**Figure ES 4 - Composition of Plastic Litter**



**Table ES 6: Edmonton Large Litter vs. 21 Litter Audits**

Edmonton Litter Audits vs. Other Jurisdictions (2002 - 2012) <sup>1.</sup>							
	Observations - 2002 to 2012 (21 litter audits)	% of Total Litter 2002 to 2012 (21 litter audits)	Edmonton July 2012	Edmonton July 2011	Edmonton June 2010	Edmonton June 2009	Edmonton June 2007
		% of total large litter	% of total large litter	% of total large litter	% of total large litter	% of total large litter	% of total large litter
		Average all Audits					
Other Miscellaneous	28,201	33.8%	30.5%	29.7%	28.4%	33.1%	39.9%
Printed & Fiber Mat'l	15,770	18.9%	16.9%	16.8%	19.6%	20.3%	17.4%
Cups	6,556	7.9%	8.8%	11.6%	9.0%	8.4%	9.8%
Confectionary	7,338	8.8%	8.4%	8.6%	10.2%	9.1%	8.0%
Other Packaging	4,873	5.8%	5.1%	6.2%	6.4%	6.7%	4.6%
Bags	2,761	3.3%	5.5%	4.6%	4.4%	3.5%	2.7%
Tobacco Products	4,830	5.8%	9.5%	10.8%	10.4%	9.2%	7.4%
Take-Out Extras	2,065	2.5%	5.2%	2.5%	2.3%	2.4%	2.4%
Beverage Containers	4,993	6.0%	2.7%	3.7%	2.5%	1.8%	3.8%
Wraps	1,834	2.2%	1.4%	1.9%	1.9%	1.3%	1.3%
Other Containers	1,979	2.4%	1.7%	1.4%	1.3%	1.3%	0.7%
Boxes	1,034	1.2%	1.8%	1.0%	1.9%	1.4%	1.0%
Textiles	1,117	1.3%	2.0%	1.2%	1.4%	1.3%	0.8%
Trays	161	0.2%	0.5%	0.0%	0.1%	0.0%	0.1%
	83,512	100%	100%	100%	100%	100%	100%
<p>1. Aggregated litter data, Litter audits by MGM Management including:  City of Toronto, Canada (2002, 2003, 2004 (2 audits), 2005, 2006  Regional Municipality of Peel, Canada (2003)  Regional Municipality of York, Canada (2003)  Regional Municipality of Durham, Canada (2003) and  Recycling Council of Alberta (2007)  San Francisco (2007, 2008, 2009)  San Jose (2008)  Alberta Transportation (2009)  City of Winnipeg &amp; City of Brandon (2010)  Edmonton (2007, 2009, 2010, 2011, 2012)</p> <p>2. Other miscellaneous sub-category includes: Miscellaneous paper, Miscellaneous plastic,  Construction debris, Home articles, Vehicle &amp; Metal Road debris,  Miscellaneous Paperboard, Miscellaneous cardboard, Miscellaneous Glass and Tire &amp; Rubber debris.</p>							

As Table ES 6 above shows, for the most part the litter composition in Edmonton is similar to that observed in 21 other litter audits in various jurisdictions in North America.

Whereas the overall litter rate in Edmonton has decreased steadily since the 2009 audit, there are interesting exceptions for some categories of large litter:

- Printed and fibre materials continue to be a major contributor to large litter observed on Edmonton streets. The City might consider targeting these specific sub-categories of fibre litter in its abatements efforts, as it works towards lowering total large litter on Edmonton streets.
- Once again in 2012, we note that tobacco products continue to be nearly 10% of total large litter on streets. This proportion of total large litter, provided from tobacco products is higher than the aggregate percentage noted in 21 litter audits (9.5% in Edmonton in 2012 vs. 5.9% of total large litter aggregated from 21 litter audits). This category of litter may continue to warrant special attention in the City's efforts to reduce large litter in the future.

## Small Litter Observations

Observations of small litter made during the Edmonton audit continue to reveal a relatively low occurrence of small litter on city streets, but it is noted that small litter items per site did rise from 11 items / site in 2012 to 15 items per site in 2012.

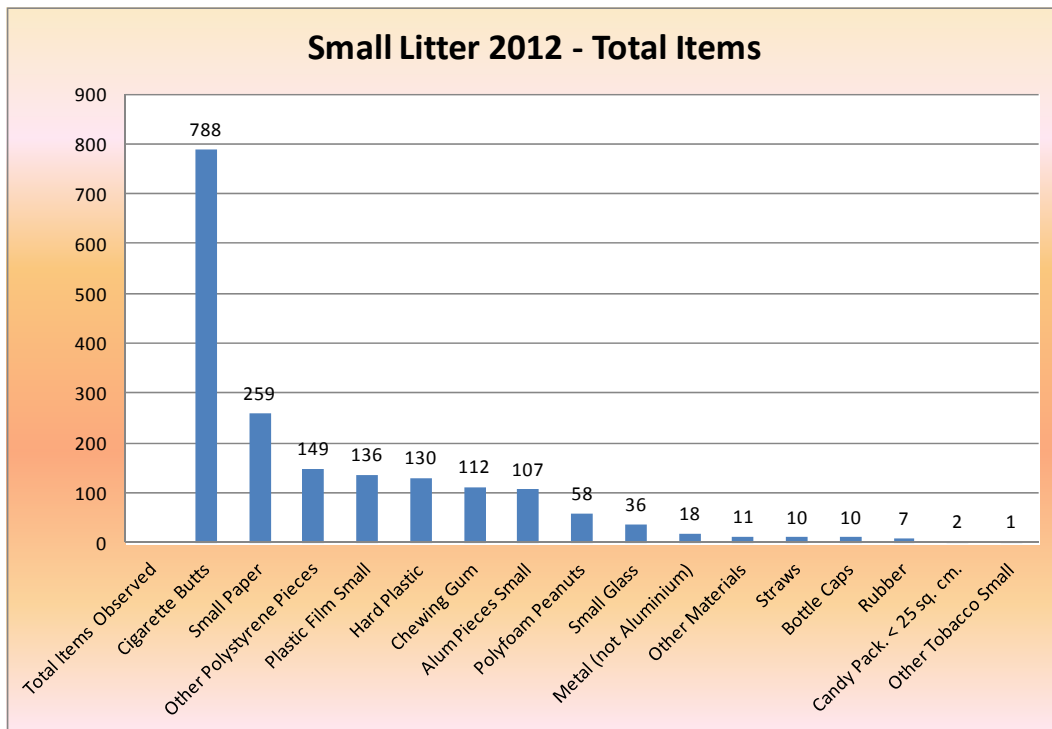
When contrasted against the 21 small litter items / site observed for the City of Toronto, in 2006, or the 23 items per site reported in San Francisco in 2007; the small litter occurrence in Edmonton continues to be relatively low.

The small litter results for the Edmonton audit sites are reported in the table and charts below (Table ES 7, Figures 5, 6, & 7).

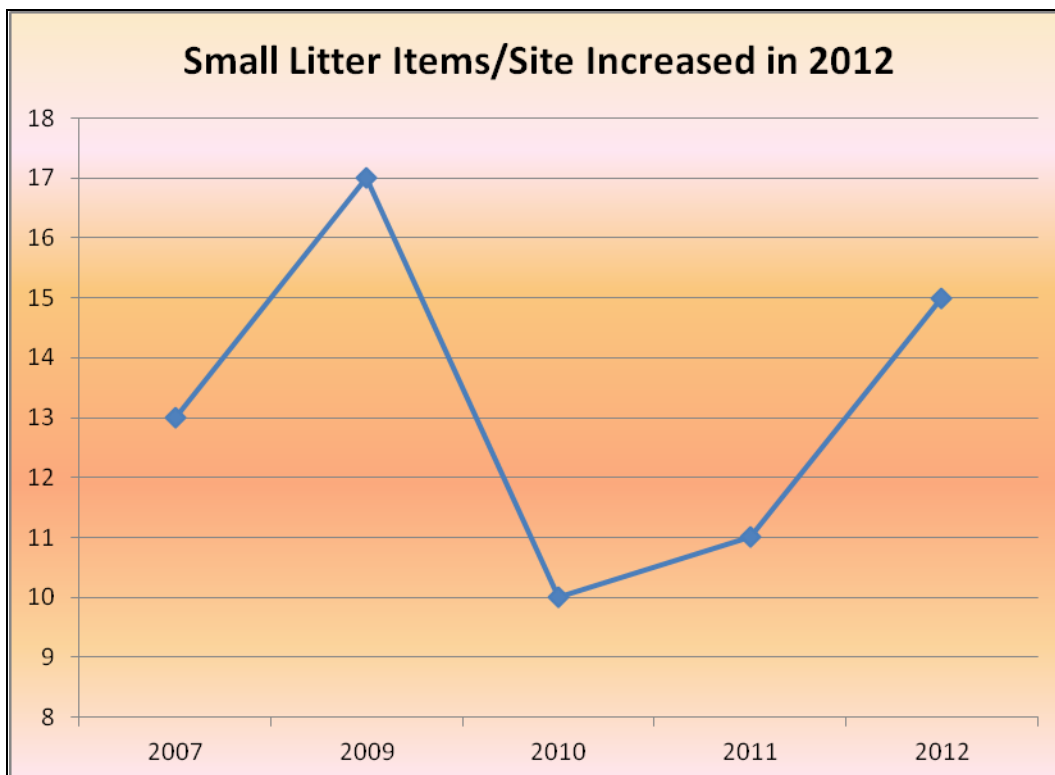
**Table ES 7 - Small Litter Summary**

2012 Edmonton Small Litter Summary					
Description of Sub-Category	2012 Edmonton Small Items Observed	2011 Edmonton Small Items Observed	2010 Edmonton Small Items Observed	2009 Edmonton Small Items Observed	2007 Edmonton Small Items Observed
Cigarette Butts	788	613	572	961	479
Small Paper	259	190	164	383	279
Other Polystyrene Pieces	149	57	49	113	108
Plastic Film Small	136	93	67	108	107
Hard Plastic	130	183	104	232	103
Chewing Gum	112	48	76	40	61
Alum Pieces Small	107	74	47	72	17
Polyfoam Peanuts	58	0	13	7	2
Small Glass	36	40	16	90	101
Metal (not Aluminium)	18	9	13	7	8
Other Materials	11	0	19	33	24
Straws	10	15	11	16	11
Bottle Caps	10	9	12	9	4
Rubber	7	5	5	10	7
Candy Pack. < 25 sq. cm.	2	36	42	31	6
Other Tobacco Small	1	4	10	2	24
Small litter items observed	1,834	1,376	1,220	2,114	1,341
Average small litter per site	15	11	10	17	13
Sites audited	123	123	123	123	106

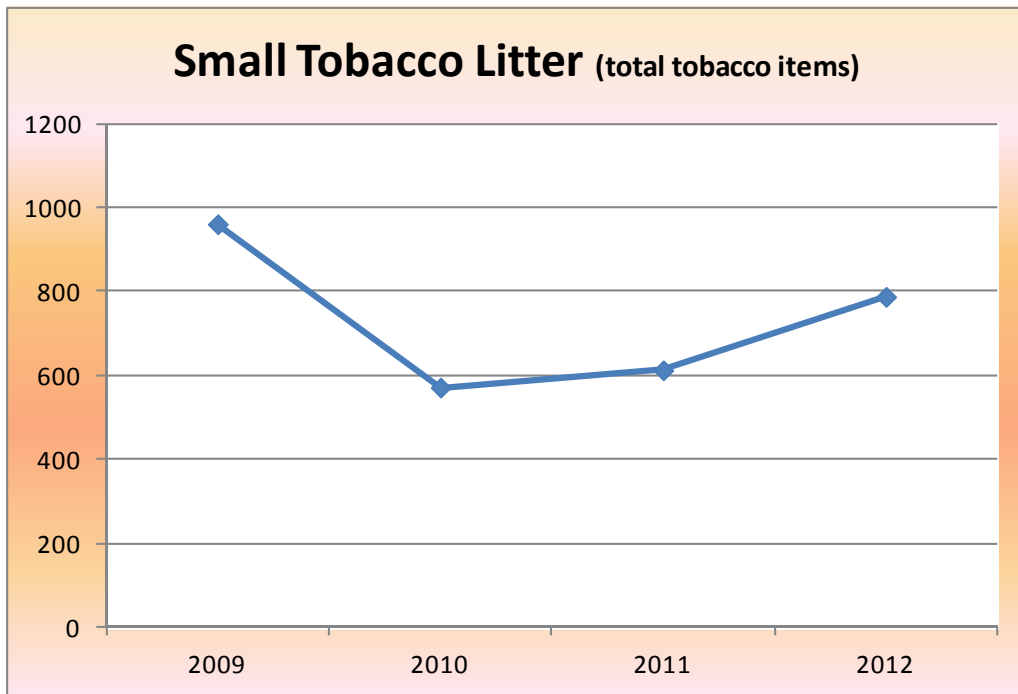
**Figure ES 5 - Small Litter Summary**



**Figure ES6 - Small Litter Items per Site in 2012**



**Figure ES7 - Small Tobacco Litter**



Small tobacco litter continues to be an issue, with cigarette butts counted increasing to 788 in 2012 compared to 613 in 2011.