

# **Solid Waste Study Report**

*Prepared for*  
**School District 38 (Richmond)**

*Prepared by*  
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# SD38 (Richmond) Solid Waste Study – May 2008

## Introduction

In May 2008, a solid waste study was conducted to examine the composition of the solid waste disposed and the solid waste and recycling collection systems of four sample schools in SD38 (Richmond). Two secondary and two elementary schools were studied.

The purpose of the waste study was to identify the successes and challenges of the solid waste and recycling system within SD38. This report briefly outlines Urban Impact's findings and presents recommendations to improve the SD38 solid waste and recycling systems.

The study examined one sample of solid waste and recyclables at each facility. The solid waste and recycling collection systems were also inspected to identify where system improvements might be possible.

Waste material categories were identified based on the materials collected for recycling. The material categories are defined in Appendix A.

## Findings

This report provides a baseline for waste diversion in SD 38 (Richmond). Waste diversion data, waste per capita and findings from the waste study summarize the present state of the SD38 solid waste and recycling systems.

The waste study findings are presented for each sample school. The information is presented as the representative percentage of each material found in the solid waste disposed. The data was then extrapolated based on 2007/08 disposal data, to identify by material stream, the estimated amount of material being disposed to landfill.

## Waste Diversion Rate

The waste diversion rate for each facility is presented, as well as an overall waste diversion rate for SD38. The waste diversion rate is calculated by adding together the quantity of waste disposed to landfill and the quantity of material diverted to recycling; this determines "waste generated". The amount of material recycled is then divided by the waste generated to determine the waste diversion rate.

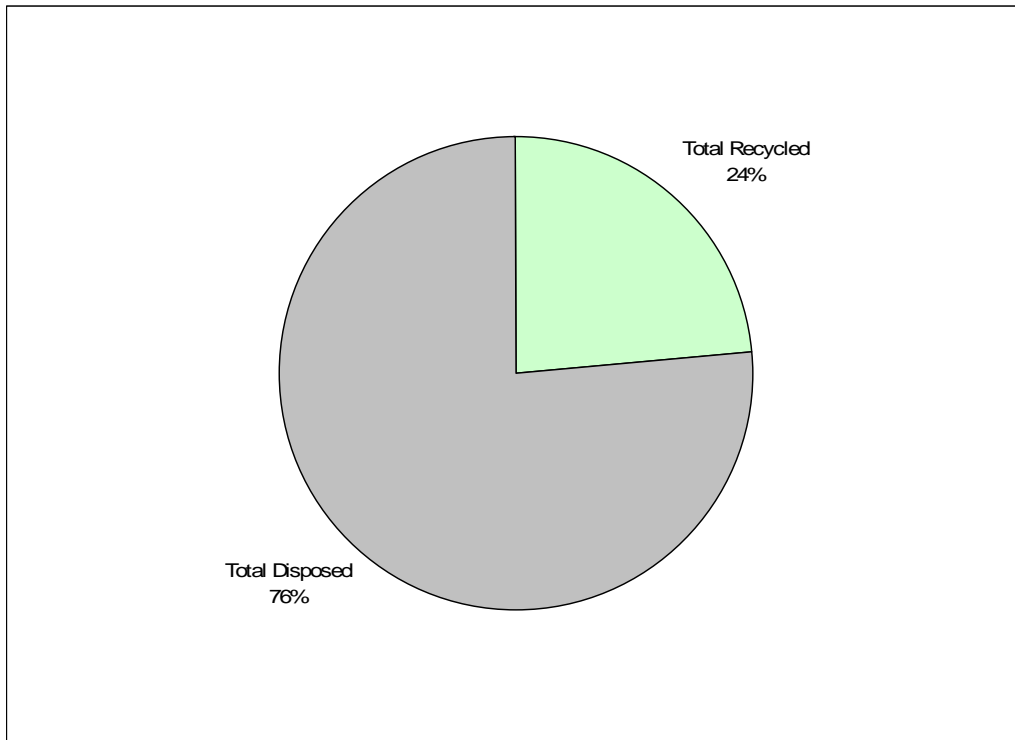
$$\text{Recycled} / (\text{Disposed} + \text{Recycled}) \times 100\% = \text{Diversion Rate}$$

**Table 1. SD38 Waste Diversion Rate**

<b>2007/08</b>	<b>Kilograms</b>
Recycled	204,750
Disposed	631,395
Waste Generated	836,145
<b>Waste Diversion Rate</b>	<b>24%</b>

Waste Diversion Rate

Figure 1 SD38 Waste Diversion Rate



Waste Disposed and Waste Recycled Per Student

As part of the baseline exercise, the waste disposed and recycled per student was calculated. Summary data are presented in Table 2. Details are in Appendix B – Waste Diversion Summary.

Table 2. SD38 Disposal and Recycling Per Student (2007/08)

Location	Total Disposed	Total Recycled	Disposed per Student*	Recycled per Student*	Waste Diversion Rate
Secondary	330,278	78,827	32	8	19%
Elementary	279,675	112,280	24	9	29%
Administration	21,443	13,643	0	0	39%
<b>Totals</b>	<b>631,395</b>	<b>204,750</b>	<b>28</b>	<b>9</b>	<b>24%</b>

\* The per capita calculations are averages, not totals.

**Secondary School “A” – Waste Audit Findings**

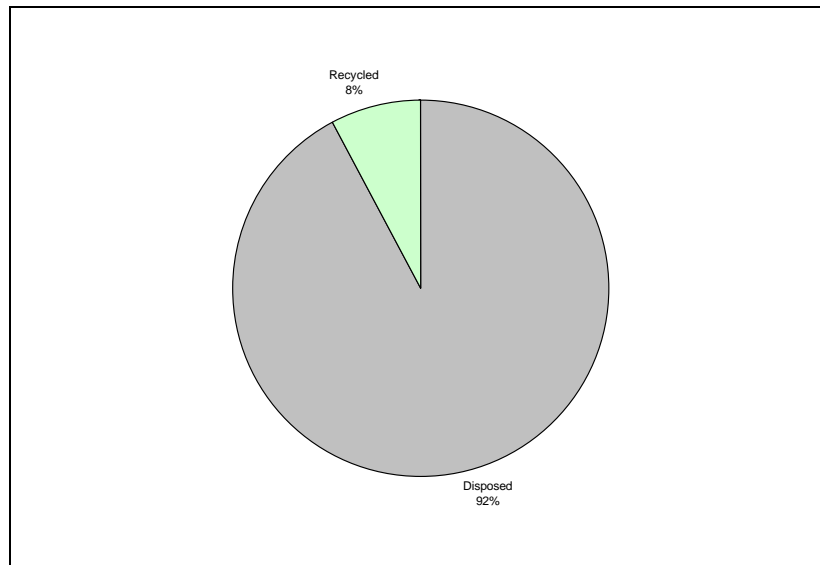
Secondary School “A” has two bins for solid waste (one 4cyd and one 6cyd). The contents were examined to determine the waste composition. Waste sample photos are presented on page 8.

Compostable food waste (20%) and compostable paper products (15%) are the largest component of the waste stream (35%). The second largest component consisted of recyclable paper products and cardboard (25%); refundable beverage containers (10%) and rigid food containers (5%) made up the third largest component of the waste stream at 15%.

**Table 3. Secondary School “A” Waste Audit Findings**

<b>Material Category</b>	<b>Waste Stream Composition</b>	<b>Estimated Annual Disposal</b>
Mixed Office Paper	25%	13,640
Compostable Food Waste	20%	10,912
Compostable Paper Products	15%	8,184
Beverage Containers	10%	5,456
Cardboard	5%	2,728
Rigid Food Containers	5%	2,728
Yard and Garden Waste	5%	2,728
Household Waste	5%	2,728
Residuals	10%	5,456
<b>Totals</b>	<b>100%</b>	<b>54,558</b>

**Figure 2 Waste Diversion Rate – Secondary School “A”**



**Secondary School “B” – Waste Audit Findings**

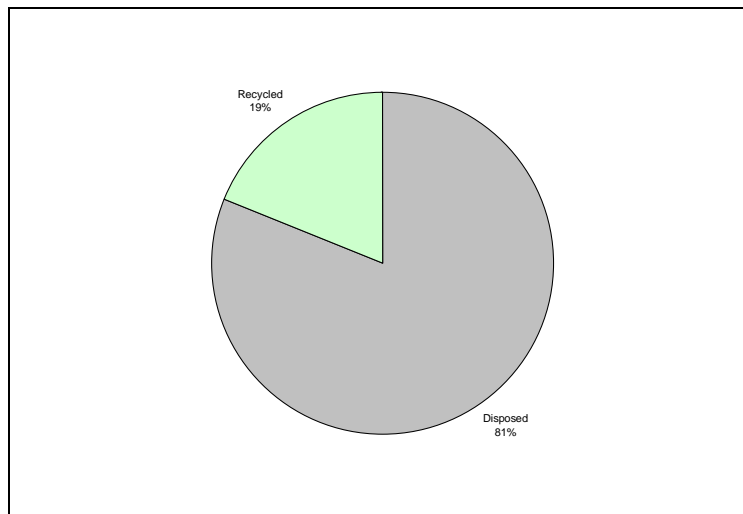
Secondary School “B” has two bins for solid waste (one 4cyd and one 8cyd). The contents were examined to determine the waste composition; photos are presented on page 9.

Compostable food waste (25%) and compostable paper products (30%) are the largest component of the waste stream (55%). The second largest component consisted of recyclable paper products (25%); refundable beverage containers (5%) and rigid food containers (5%) made up the third largest component of the waste stream at 10%.

**Table 4. Secondary School “B” Waste Audit Findings**

Material Category	Waste Stream Percentage	Estimated Annual Disposal
Compostable Paper Products	30%	11,691
Compostable Food Waste	25%	9,743
Mixed Office Paper	20%	7,794
Cardboard	5%	1,949
Beverage Containers	5%	1,949
Rigid Food Containers	5%	1,949
Yard and Garden Waste	0%	-
Household Waste	0%	-
Residuals	10%	3,897
<b>Totals</b>	<b>100%</b>	<b>38,970</b>

**Figure 3. Waste Diversion Rate – Secondary School “B”**



# SD38 (Richmond) Solid Waste Study – May 2008

## Elementary School "A" – Waste Audit Findings

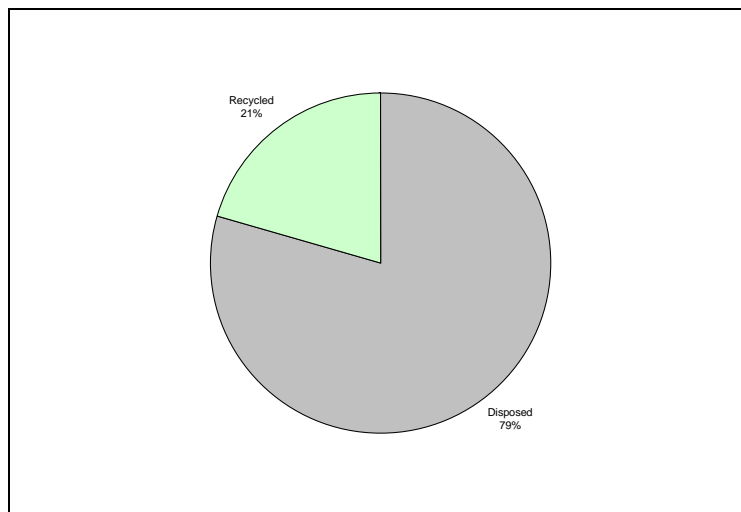
Elementary School "A" has one 4cyd bin for solid waste. The contents were examined to determine the facility's waste composition; photos are presented on page 8.

Compostable food waste (20%) and compostable paper products (30%) are the largest component of the waste stream (50%). The second largest component consisted of recyclable paper products (20%); refundable beverage containers (5%) and rigid food containers (5%) made up the third largest component of the waste stream at 10%.

**Table 5. Elementary School "A" Waste Audit Findings**

Material Category	Waste Stream Composition	Estimated Annual Disposal
Compostable Paper Products	30%	3,507
Mixed Office Paper	20%	2,338
Compostable Food Waste	20%	2,338
Beverage Containers	5%	585
Rigid Food Containers	5%	585
Yard and Garden Waste	0%	-
Cardboard	0%	-
Household Waste	0%	-
Residuals	20%	2,338
<b>Totals</b>	<b>100%</b>	<b>11,691</b>

**Figure 4 Waste Diversion Rate – Elementary School "A"**



**Elementary School “B” – Waste Audit Findings**

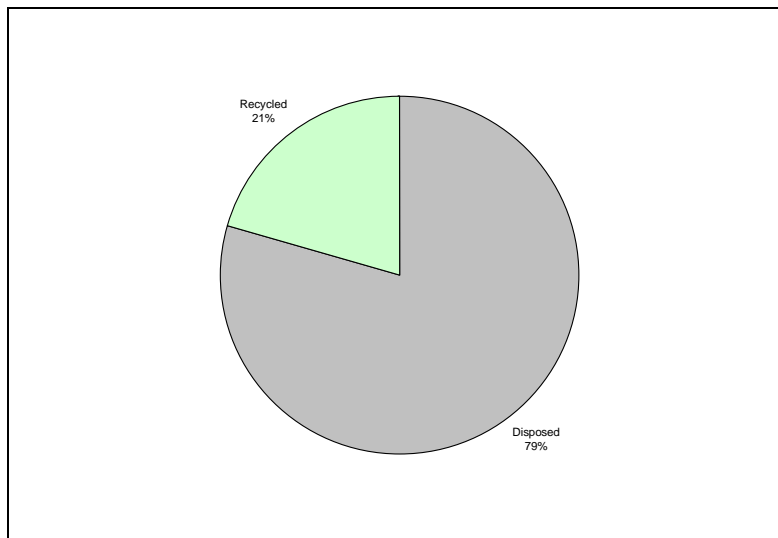
Elementary School “B” has one 4cyd bin for solid waste. The contents were examined to determine the waste composition; photos are presented on page 8.

Recyclable paper products and cardboard are the largest component of the waste stream (30%). The second largest component consisted of compostable food waste (15%) and compostable paper products (15%); refundable beverage containers (10%) and rigid food containers (5%) made up the third largest component of the waste stream at 15%.

**Table 6. Elementary School “B” Waste Audit Findings**

<b>Material Category</b>	<b>Waste Stream Percentage</b>	<b>Estimated Annual Disposal</b>
Mixed Office Paper	25%	2,923
Compostable Food Waste	15%	1,754
Compostable Paper Products	15%	1,754
Beverage Containers	10%	1,169
Rigid Food Containers	5%	585
Cardboard	5%	585
Yard and Garden Waste	0%	-
Household Waste	0%	-
Residuals	25%	2,923
<b>Totals</b>	<b>100%</b>	<b>11,691</b>

**Figure 5 Waste Diversion Rate – Elementary School “B”**



### Observations

This section summarizes the observations from the “walk-throughs” of each school. Recommendations follow on page 8.

#### 1. Recycling Programs

During the facility site visits, it was identified that the paper and beverage container recycling programs are doing well. The materials observed were generally clean and free of contaminants. However, the waste audit identified that a significant quantity of waste paper and beverage containers continue to be disposed as garbage. A program addressing office/notepaper would assist in maximizing SD38's diversion from landfill.

#### 2. Signage / Written Communication Materials

The site visits also identified a lack of written communications materials and formal signage to support the recycling programs.

#### 3. Recycling Collection Containers

In most of the facilities the interior recycling collection containers were observed to be worn-out and unsightly.

#### 4. Bin Twinning

While the facilities appeared to have a sufficient quantity of recycling bins, their positions, especially in the hallways could be revised. In very few places were bins “twinning” – bin twinning entails siting a recycling bin beside a garbage bin, in all situations. Bin twinning encourages the correct choice (recycle or garbage) – when bins aren't twinned, recyclables tend to end up in the garbage and garbage tends to end up in the recycling.

#### 5. Beverage Container Recycling Data Tracking

As identified, each facility has a beverage container recycling program. The management of the programs varies from school to school. The most significant finding was that data collection and reporting are inconsistent or non-existent. The lack of data tracking is affecting the overall waste diversion rate. Centralized tracking/reporting of the data would immediately improve the waste diversion rate.

### Recommendations

#### 1. Waste Diversion Goal

Identify and communicate a district wide waste diversion goal. Metro Vancouver has recently adopted a Zero Waste goal. SD38 should investigate Zero Waste and consider adopting a Zero Waste goal.

#### 2. Waste Diversion Communications Program

Consider developing a re-vitalized communications program for staff, students and parents. The communications program should support the Zero Waste goal and include new signage and awareness materials.

Conduct class tours of Urban Impact's recycling facility, to revitalize interest in recycling and expand recycling/waste reduction awareness.

#### 3. Bin Twinning

"Bin twinning" throughout the SD38 system is strongly recommended. Wherever there is a garbage bin, there should be a recycling bin and vice versa. Twinned bins promote a convenient system; convenience is the primary driver for effective participation in recycling/waste diversion programs.

#### 4. New Collection Containers

Consider purchasing new interior recycling collection containers for classrooms and offices.

#### 5. Beverage Container Recycling Data

Beverage container recycling is conducted in most schools; however the collection systems and data collection reporting are inconsistent or non-existent. The lack of available data is affecting the waste diversion rate. At present there is no system to quantify the materials recovered for recycling. Centralized collection of the data would assist to in improving the waste diversion rate.

#### 6. Custodial Recycling Re-fresher

Develop a "recycling procedures" workshop to be delivered to custodial staff to remind staff of the solid waste and recycling goals of SD38.

SD38 (Richmond) Solid Waste Study – Photos

Paper Products  
Secondary School A



Paper and Beverage Containers  
(Secondary School B)



Compostable Paper Towels  
(Secondary School B)



Beverage Containers  
(Elementary School A)

## Appendix A – Solid Waste Definitions

### **RECYCLABLE PAPER PRODUCTS**

1. Cardboard – Shipping boxes, kraft linerboard and containerboard cartons & brown paper bags.
2. Mixed Office Paper – Printing, writing, and computer paper, books, boxboard, coloured paper, magazines, and newspaper.

### **RIGID FOOD CONTAINERS**

3. All recyclable food containers including glass, metal and plastic that could be clearly identified as a food container or cleaning product. Excludes polystyrene products.

### **BEVERAGE CONTAINERS**

4. All “ready-to-drink” beverage containers made from glass, plastic, metal and aseptic packaging. Includes bottled water, sport drinks, juice and pop; excludes dairy products.

### **COMPOSTABLES**

5. Compostable Paper Products – Tissue paper, paper towels and other paper not included in the recyclable paper product categories.
6. Food Waste – Putrescible materials derived from the preparation and consumption of food and paper contaminated with food.
7. Yard and Garden Waste – Putrescible materials derived from yard and gardens.

### **RESIDUAL MATERIALS**

8. Household Waste – bagged garbage derived from residential households.
9. Miscellaneous materials – rock, dirt, asphalt, cement, drywall, rubber and tires. Includes materials that could not otherwise be classified.

**Appendix B - Waste Diversion Summary (2007/ 08)**

	<i>kilograms</i>				
<b>SECONDARY SCHOOLS</b>	<b>Total Disposed</b>	<b>Total Recycled</b>	<b>Disposed per Student</b>	<b>Recycled per Student</b>	<b>Waste Diversion Rate</b>
BOYD	17,537	9,093	21	11	34%
MACNEILL	23,382	9,093	27	10	28%
STEVES/STONELAND	27,279	9,093	20	7	25%
MCROBERTS	29,228	9,093	27	8	24%
MCNAIR	34,106	9,093	35	9	21%
RICHMOND	38,970	9,093	33	8	19%
CAMBIE	40,919	9,093	42	9	18%
MCMATH	27,279	6,062	23	5	18%
PALMER	37,022	4,557	48	6	11%
BURNETT	54,558	4,557	45	4	8%
<b>TOTAL SECONDARY</b>	<b>330,278</b>	<b>78,827</b>	<b>32</b>	<b>8</b>	<b>19%</b>

	<i>kilograms</i>				
<b>ELEMENTARY SCHOOLS</b>	<b>Total Disposed</b>	<b>Total Recycled</b>	<b>Disposed per Student</b>	<b>Recycled per Student</b>	<b>Waste Diversion Rate</b>
TAIT	5,846	4,557	18	14	44%
BYNG	7,794	6,062	22	17	44%
TALMEY	3,906	3,038	19	15	44%
WOWK	3,906	3,038	17	13	44%
ANDERSON	7,794	4,557	17	10	37%
GEN.CURRIE	7,794	4,557	16	9	37%
BLAIR	5,846	3,038	21	11	34%
DIEFENBAKER	5,846	3,038	21	11	34%
DIXON	5,846	3,038	17	9	34%
SPULUKWUKS	5,846	3,038	15	8	34%
STEVES	5,846	3,038	17	9	34%
FERRIS	11,691	6,062	21	11	34%
ST.STRECH	2,930	1,512	4	2	34%
BRIDGE	7,794	3,038	21	8	28%
BRIGHOUSE	11,691	4,557	29	11	28%
COOK	7,794	3,038	15	6	28%

**Appendix B - Waste Diversion Summary (2007/ 08)**

	<i>kilograms</i>				
<b>SECONDARY SCHOOLS</b>	<b>Total Disposed</b>	<b>Total Recycled</b>	<b>Disposed per Student</b>	<b>Recycled per Student</b>	<b>Waste Diversion Rate</b>
GARDEN CITY	7,794	3,038	25	10	28%
HAMILTON	7,794	3,038	18	7	28%
KINGSWOOD	7,794	3,038	29	11	28%
LEE	7,794	3,038	27	10	28%
MITCHELL	7,794	3,038	19	7	28%
WESTWIND	7,794	3,038	17	7	28%
WHITESIDE	7,794	3,038	16	6	28%
WOODWARD	7,794	3,038	38	15	28%
MAPLE LANE	3,906	1,512	19	7	28%
QUILCHENA	3,906	1,512	22	8	28%
SEA ISLAND	3,906	1512	106	41	28%
GILMORE	11,691	3,038	27	7	21%
MCNEELY	11,691	3,038	26	7	21%
T. HOMMA	11,691	3,038	22	6	21%
DEBECK	5,846	1,512	19	5	21%
ERRINGTON	5,846	1,512	23	6	21%
GRAUER	5,846	1,512	23	6	21%
KIDD	5,846	1,512	30	8	21%
MCKAY	5,846	1,512	28	7	21%
MCKINNEY	5,846	1,512	19	5	21%
TOMSETT	5,846	1,512	33	8	21%
RIDEAU	5,859	1512	7	2	21%
BLUNDELL	7,794	1,512	36	7	16%
THOMPSON	7,794	1,512	34	7	16%
<b>TOTAL ELEMENTARY</b>	<b>279,675</b>	<b>112,280</b>	<b>24</b>	<b>9</b>	<b>29%</b>

TECH CENTER	3,906	3,038	5	4	44%
WORKS YARD	11,691	9,093	0	0	44%
ADMIN BLDG	5,846	1,512	0	0	21%
<b>TOTAL ADMIN</b>	<b>21,443</b>	<b>13,643</b>	<b>0</b>	<b>0</b>	<b>39%</b>