

FANSHAWE

Facilities Operations
and Sustainability

Waste Audit Report

Prepared for:

Fanshawe College
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April 28, 2020

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Executive Summary

Ontario regulation 102/94 stipulates that all educational institutions with more than 350 persons enrolled must conduct an annual waste audit and waste reduction work plan. Waste audits are an analysis of a facility's waste stream that can classify what types of waste are produced, how much of each category is recovered through reuse or recycling, and can assist in identifying potential cost savings associated with waste disposal.

The College has made many changes over the last few years, with the intention of increased its diversion rate and reducing the amount of waste produced. One change, made in the spring of 2018, was switching the main contracted hauler to Miller Waste Systems. Doing this allowed the College to start sending organics to a biogas facility, which permits more paper take out products to be diverted from landfill.

In 2019, Fanshawe sent 468.5 tonnes of waste to landfills and reused or recycled 662.1 tonnes. Based on this data and appropriate assumptions, Fanshawe's 2019 diversion rate is 58.6%, a decrease of 8% from 2018, however an increase of 17.7% from 2014. The College has also reduced the amount of waste produced on site by 12.7%, and the amount sent to landfill by 26% since 2014.

Facility Operations and Sustainability staff conducted the landfill waste audit internally. Waste was collected over a 24 hour period on March 5, 2020 by custodial staff, from a sample of buildings at the London Campus. On March 6, 2020, approximately 335kg of waste from buildings B, D, H, and LDB Downtown was sorted. Also included in this audit were all outside landfill bins. Results showed that 28% of the waste was true landfill waste and 72% could have been diverted through already available channels (Figure 1).

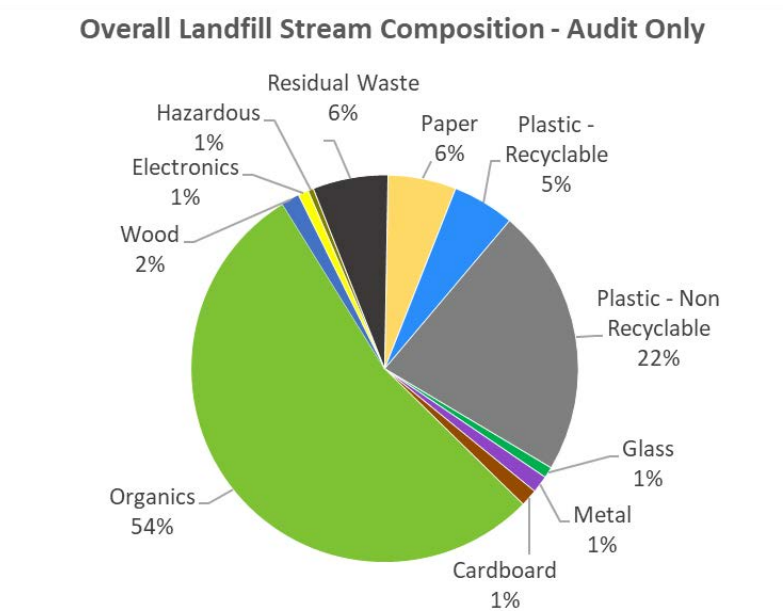


Figure 1. Overall landfill stream composition from all buildings audited at the London Campus.

Organics continue to comprise the majority of waste currently being sent to landfill. Most of the organics stream is composed of food waste (35%), with the remaining made up of compostable paper/tissue (9%), paper cups (6%), and take out containers (4%) (Figure 2).

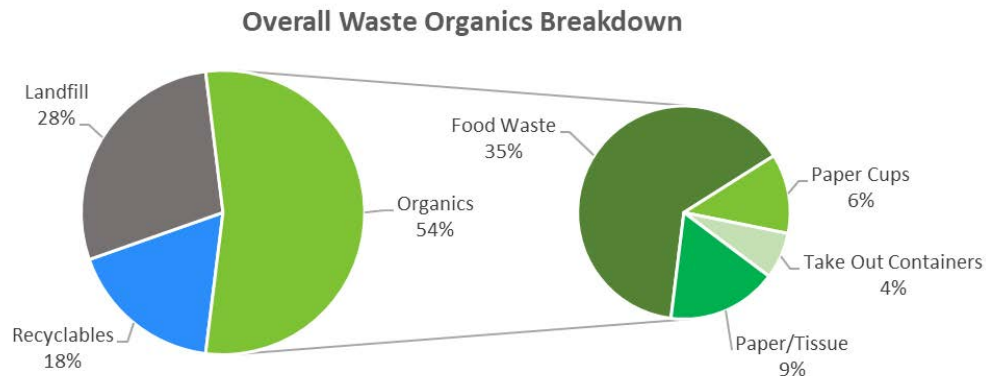


Figure 2. Overall landfill stream organics breakdown from all buildings audited at the London Campus. Percentages noted in organics breakdown are the portion of the whole that the category accounts for.

Overall, the initiatives that are currently in place allow for a wide variety of diversion options. Awareness needs to be improved to strengthen student and employee engagement and use of the current systems. This could be accomplished in many ways, including a sustainability column in the Interrobang, staff meeting presentations, and a greater presence at orientation events. Educational materials should be produced and supplied to faculty to allow them to add the items they would like into class orientations.

It is recommended that diversion and awareness efforts over the next year focus on ways to improve utilization of the organics stream. If half of the organics currently going to landfill could be captured, the College could increase their diversion rate up to 20%, and save up to 130 tonnes of GHG emissions annually. LDB culinary programs currently account for a large portion of organics waste in landfills; it is imperative that students in the programs receive education and continued guidance to help the College reduce the amount of food waste making it into the landfill stream.

Mini office waste audits of all 4 streams should be performed to determine how each office is doing and areas of improvement. The results could be posted in the office and help tailor education toward items commonly put in the wrong bin. Creation and implementation a green office challenge and reward system would help bring sustainability to the forefront of people's daily lives at work, and create some friendly competition between offices.

Acknowledgements

Fanshawe Sustainability would like to extend a heartfelt thank you to the volunteers who helped complete the landfill waste audit. Their help was invaluable and allowed us to complete the audit in a single day – the fastest audit we have completed so far! Thank you to:

Fanshawe College Corporate Communications students:

- Katrina Carr Marcelo
- Olajumoke Atere

Western University Masters of Environment and Sustainability students:

- Jessica Cordes
- Taylor Ball
- Heather Jensen
- Rachel Tiessen
- Kate Smith
- Nathalie Palka
- Isabel Johnson
- Claire Kartner

Thank you, also, to Fanshawe College and C&W Service employees for their help with organization, transportation, and collection of waste.

1.0 Introduction

Fanshawe College is a comprehensive college in the greater London region that offers more than 200 degree, diploma, certificate and apprenticeship programs to 43,000 students each year. The campus has classes year-round, however the majority of activity is during the fall (Sept-Dec) and winter (Jan-Apr) semesters. The London Campus includes 29 buildings and 2,465,168 square feet of building space (Figure 1.1).



Figure 1.1. Fanshawe College London Campus.

Fanshawe is committed to sustainability through education and corporate practices. The College's sustainability practices are guided by the values and principles of compliance, ethical behaviour, stakeholder interest, transparency, and accountability.

As part of its commitment to sustainability, Fanshawe conducts an annual waste audit. Waste audits are an analysis of a facility's waste stream that can identify what types of waste are produced and how much of each category is recovered through reuse or recycling. The data collected can be used to implement and improve upon existing waste diversion measures and to find potential for cost savings.

1.1 Legislative Requirements

Under Ontario Regulation 102/94: Waste Audits and Waste Reduction Work Plans (hereafter "the Regulation") operators of educational institutions with more than 350 persons enrolled must conduct an annual waste audit and waste reduction work plan. The Regulation states that a waste audit must address the amount, nature and composition of waste, how waste is produced, and how it is managed. All buildings owned by the institution need to be audited every 5 years, allowing for more manageable audits each year. Waste reduction work plans require that plans to reduce, reuse, and recycle waste are in place and who is responsible for implementation of the plans. Reducing the amount of waste produced is the first priority of the waste reduction work plan.

Waste audit and waste reduction work plans must describe opportunities for waste reduction and diversion at the institution and the extent to which materials or products sold consist of recycled or reused materials. Finally, the audit report must be posted where employees and/or tenants will have access to it. If a summary is posted, any employee who requests to look at the full plan can be allowed to do so.

2.0 Waste Management at Fanshawe

Waste is collected throughout the College by contracted custodial staff and brought to a central compound where waste is then discarded in appropriate bins (Table 2.1). Fanshawe’s primary waste contractor is Miller Waste Systems.

Table 2.1: Frequency of waste collection by external contractors.

Waste Material	Equipment Size and Type	Collection Schedule	Contractor
Landfill	40 yard compactor	As needed via sensor	Miller Waste Systems
Containers Recycling	40 yard bin	2x/week	Miller Waste Systems
Paper Recycling	0.45 yard recycling totes	2x/week	Miller Waste Systems
Shredded Paper	Confidential bins in offices	2x/month	Iron Mountain
Cardboard	40 yard compactor	As needed via sensor	Miller Waste Systems
Organics	0.45 yard organics totes	1x/week	Davidson Environmental
Kitchen Oil	Specialty collection tanks	1x/month	Rothsay/Davidson Environmental
Wood	8 yard bin	As needed	Try Recycling
Metal	14 yard bin	As needed	John Zubick Ltd.
E-Waste	Crates in receiving area	As needed	OEM Corporation

Throughout all hallways, three stream recycling is provided with paper, containers, and landfill bins. In most locations on the first floor, compost is included with these bins. On upper floors, compost bins are available, but not as commonly. Office kitchens include all 4 streams. There should be no solitary bins on campus, ensuring the opportunity for diversion every time someone needs to dispose of waste. Figure 2.1 shows the four stream recycling bins with posters above.



Figure 2.1 Four stream hallway recycling station at Fanshawe College.

In cafeterias, there are large, central units with three streams (Figure 2.2). Mini audits of these large stations concluded little to no paper waste was generated in cafeterias, and everything thrown in the paper bin was actually compostable. Therefore paper was removed from these stations



Figure 2.2. Central diversion stations in D-, B-, and H-building cafeterias.

2.1 Reduce, Reuse, Recycle

A waste management strategy is most effective when the 3R's are followed, in order: reduce, reuse, and recycle. The goal is to reduce the amount of waste produced as much as possible in all streams, reuse as much as can be, which includes donations, and finally, recycle when reduction and reuse are not appropriate or possible.

Fanshawe encourages all service providers to adhere to the 3R's principle. All food services currently provide either compostable or recyclable take-out food containers and promote trayless dining. Reduction efforts include water bottle fill stations in numerous locations across campus to reduce bottled water waste and paperless processes in offices across campus. Construction contractors are required to use recycled materials in parts of construction projects and all events held on campus go through a screening process, whereby if food is going to be served, organics bins must be made available.

Reuse programs at the College include asset surplus sales, where used but functional electronics, computers, office equipment, and furniture are available for purchase to the public. Some assets are also sold on the auction website GovDeals.net, where anyone can access the listings and bid on them. The Campus Bookstore and Fanshawe Student Union both have book buy-back programs for used textbooks, and the College works with Textbooks for Change to donate unwanted and unsold used textbooks. At the end of each winter term, during residence move out, Fanshawe partners with Goodwill to provide donation bins in each residence, reducing the amount of waste that goes to landfill each spring.

In compliance with Regulation 103/94, source separation programs provided by Fanshawe College include:

- Fine paper and newsprint
- Cardboard
- Containers (aluminum food or beverage cans, plastics #1-7, glass bottles and jars, beverage cartons)
- Organics

- Scrap metal
- Wood
- Hazardous waste
- Electronic waste
- Construction and demolition waste

Many items are accepted into Fanshawe's organics stream (Appendix A). All food waste and paper/tissue are fairly straight forward items one considers when they think of organics. Other accepted items that are more out of the ordinary include all paper beverage cups, plus fountain pop cups, waxed paper, and all paper take out containers from Harvey's, Smoke's Poutine, and other non-branded vendors on campus.

Construction and demolition waste from the College's building technology and arts programs are collected and recycled at a local facility. Scrap metal is also collected and recycled locally. Pre-consumer food waste from food services on campus are collected separately and disposed of in organics bins.

The College also has many specialty recycling efforts in place. Photocopier toner cartridges, all e-waste, and batteries are collected and recycled with OEM Corporation. Through Terracycle, Fanshawe collects coffee pods in office kitchens, recycles used writing utensils, and also recovers cigarette butt waste. At the Campus Bookstore, students and staff can drop off empty toner and ink cartridges, electronic waste, writing utensils, textbooks and batteries. For a more detailed breakdown of source-separation programs, see Appendix A.

2.2 Overview of Waste Generation in 2019

The period covered by this report is January 1, 2019 to December 31, 2019. Table 2.2 shows annual waste generation from contractor records, as well as in house programs run by the College. Landfill waste generation increased by 33%. Waste reduction efforts can be seen in the reduction of the amount of office paper and cardboard recycling. Total waste produced overall increased by 7.5%. Based on this data, Fanshawe's waste diversion rate is 58.6%, a decrease of 8% over 2018, however an increase of 17.7% from 2014. The College has also reduced the amount of waste produced on site by 12.7%, and the amount sent to landfill by 26% since 2014.

Table 2.2: Overall waste generation in tonnes, diversion rates, and percent change in 2018 and 2019.

Waste Material	2018	2019	% change
Landfill	351.6	468.5	33.3
Recyclables			
Office Paper	132.3	101.4	-23.3
Cardboard	76.2	55.6	-27.1
Shredded Paper	58.5	31.3	-46.6
Comingled Recycling	70.6	71.2	0.9
Compost	136.5	144.0	5.5
Scrap Wood	31.1	39.1	25.5
Batteries	1.2	1.2	0.0
Books	3.2	5.8	82.5
Cooking Oil and Grease	6.6	9.1	38.6
E-Waste	4.9	4.9	-0.6
Light Bulbs	1.6	1.4	-13.8
Hazardous Waste	11.0	9.8	-10.3
LCBO Bottles Return	8.5	7.1	-16.5
Leaf and Yard Waste	62.0	64.8	4.5
Scrap Metal	31.7	33.3	5.2
Construction/Demolition	46.6	53.8	15.4
Asset Surplus	16.1	12.4	-23.0
Specialty*	0.02	0.03	57.5
Donated Items	1.6	16.0	929.4
Subtotal (Recyclables)	700.1	662.1	-5.4
Total Waste	1051.7	1130.6	7.5
Diversion Rate (%)	66.6	58.6	-8.0

*specialty items include coffee pods, markers, and cigarette butts.

3.0 Methodology

A sample of buildings from Fanshawe’s London Campus were selected to ensure an accurate estimate of daily waste generated by the facility as a whole. Within each building, landfill waste from food areas, hallways, classrooms and offices were collected. The buildings used for this audit were B-building, D-building, H-building, M-building, LDB downtown, and all outside bins. Each building is described in section 4.0 Building Information. It is important to note that culinary labs in LDB were categorized as “food areas” for this audit. Doing so enabled us to look at the labs separate from other classroom waste. This sample represents 30% of total space at London Campus, three of which are the busiest buildings.

The waste composition study involved sorting landfill-directed waste only. Contracted custodial staff collected all landfill bags over a 24-hour period, starting at 7:00am Thursday March 5, 2019. The bags were labelled and identified as seen in Table 3.1.

Table 3.1: Colours of tape used to label landfill waste bags and what area each colour corresponds to.

Area	Tape Colour
Food Area	White
Hallway	Red
Classroom	Green
Office	Blue
Outside	Black

Throughout the collection period, labeled bags were brought to 2 Cuddy Crt, a storage facility owned by Fanshawe College, for staging in areas delineated by building and sorted by tag colour (Figure 2.3).



Figure 2.3 Collection bags colour coded and sorted by building at 2 Cuddy Crt.

Sorting began at 9:00 am on March 6, 2020 and was completed by 3:30pm that same day. Two staff members and ten students were present to complete the sorting and weighing of all collected waste (Figure 2.4).

The following equipment was used:

- Sorting tables
- 33 blue boxes
- Garbage bags
- Data inventory forms
- Cut resistant gloves
- Masks
- Disposable coveralls
- Weigh scale
- Coloured tape
- Clear and black garbage bags

The contents of the landfill bags were separated into 33 sorting categories (Appendix A) and weighed to determine the types and proportions of material represented in each area. Data was collected in kilograms and entered into a spreadsheet for analysis.

Once weighed, materials were landfilled, recycled or composted as appropriate.



Figure 2.4 Staff and students sorting waste at 2 Cuddy Crt.

4.0 Building Information

For the purposes of this study, a subset of buildings were chosen as a representative sample. Of Fanshawe's 29 buildings and 2,465,168 square feet of building space at the London Campus, 5 buildings and 727,314 square feet were audited, or 30%.

4.1 B-Building

B-building has 2 floors, 199386 square feet and has a large cafeteria and atrium and houses one of the food services preparatory kitchens. Because of this, there is a lot of pre- and post-consumer organic waste produced in this building. One large office, classrooms, and computer and technology labs also occupy this space.

4.2 D-Building

D-building has 3 floors, 239305 square feet and has two large cafeterias and a variety store. Because of this, there is a lot of post-consumer organic waste produced in this building. There are also several offices, classrooms, and labs that occupy this space.

4.3 H-Building

H-building has 3 floors, 77,135 square feet and has one cafeteria. There are also several offices, classrooms, and labs that occupy this space. Many of the labs are dedicated to visual arts, which tend to produce a fair amount of paper waste.

4.4 M-Building

M-building has 3 floors covering 91,503 square feet. This building has one office, many classrooms, as well as broadcast radio and television studios. No food services are offered in this building.

4.5 LDB Downtown

LDB is Fanshawe's second building in downtown London, with 6 floors covering 119,990 square feet. It houses the Tourism and Hospitality department, as well as many IT programs. Culinary labs make up the majority of the space, with a restaurant, The Chef's Table and Café, which is student-operated. There is one large and one small office, as well as a small retail store on the main level. This building has all of the same waste-management practices as the main campus.

4.6 Outside Bins

There are 78 sets of outside bins placed around main campus, outside buildings, throughout parking lots, and at bus stops. The majority of bins are either landfill or containers. Few paper and compost bins can be found outside.

5.0 Waste Audit Results

5.1 Overall Waste

Approximately 335kg of waste from the landfill stream was audited from London Campus. Of this, 28% was landfill waste and 72% could have been diverted through the various channels available (Figure 5.1).

Overall Landfill Stream Composition - Audit Only

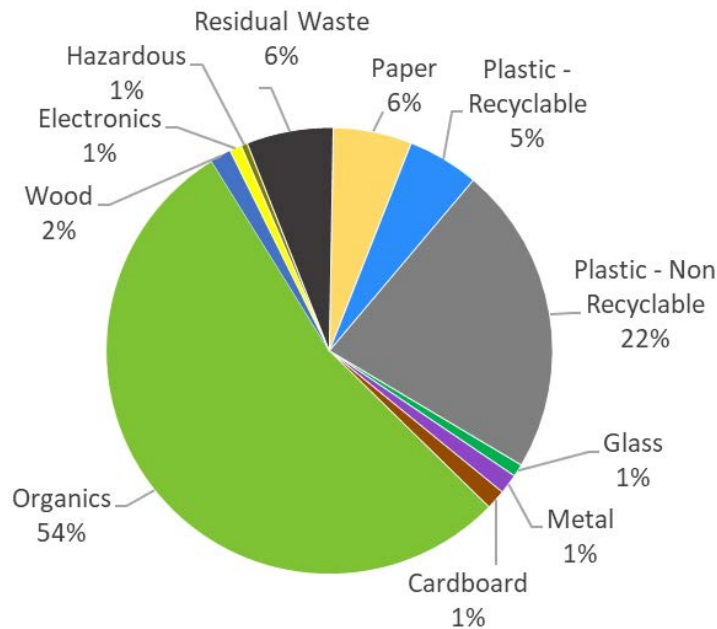


Figure 5.1. Overall landfill stream composition from all buildings audited at the London Campus.

Organics composed the largest portion (54%; Figure 5.2) of landfill waste generated, consisting mostly of food waste (34%) and compostable paper/tissue (9%). Paper cups (6%) made up the next largest portion of the organics category. The remaining compost waste was take-out containers/trays (4%).

Overall Waste Organics Breakdown

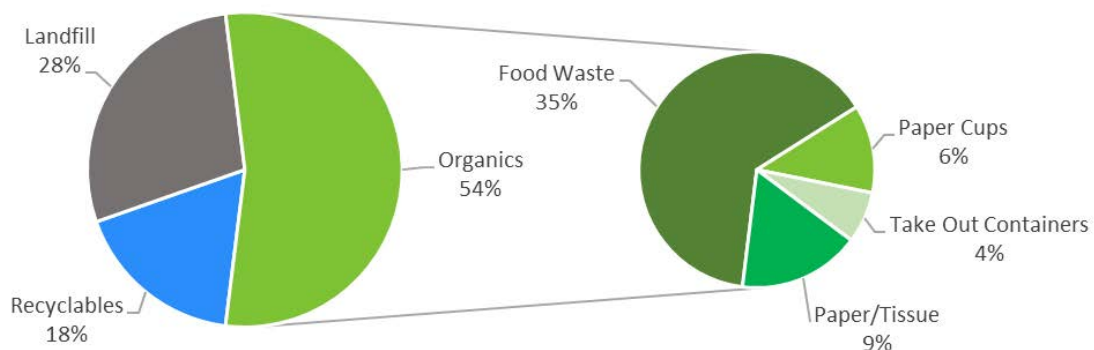


Figure 5.2. Overall landfill stream organics breakdown from all buildings audited at the London Campus. Percentages noted in organics breakdown are the portion of the whole that the category accounts for.

The recyclable plastics category represented 5% of overall waste. Plastics consisted mostly of #5 Tubs (49%), #1 PET & #2 HDPE plastics (36%). Polycoat/aseptic containers (14%) made up the remainder of the recyclable plastic stream, with #3, 4 & 7 plastics (<2%) contributing a negligible amount. The paper category represented 6% of overall waste. Newspaper and mixed paper (79%) contributed to the majority of the paper category and office paper made up the remainder.

Hazardous waste represented 1% of overall waste. Other hazardous waste accounted for 94%, with a small amount of batteries (6%). Metal (1%) consisted mostly of other metal such as tin foil with a small amount of food & beverage cans. Glass, cardboard, and electronics each accounted for 1% of waste.

Non-recyclable plastic made up 22% of overall waste. Unclassified waste (90%) made up the majority of the residual waste category, which represented 6% of overall waste.

5.2 Results by Area

5.2.1 Food Areas

The food area landfill stream accounted for 32% of all waste collected. This waste consisted of 65% organics, 4% recyclable plastics, with most being #5 tubs and #1 PET & #2 HDPE (Figure 5.3). The paper category (2%) consisted largely of newspaper and mixed paper, but still had a significant amount of office paper as well. All metal waste (2%) came from LDB and consisted mostly of other metal, which was almost entirely aluminum foil.

Non-recyclable plastic and residual waste composed 22% and 5% of the waste, respectively. Unclassified waste and textiles made up all of the residual waste.

Food Area Landfill Stream Composition - Audit Only

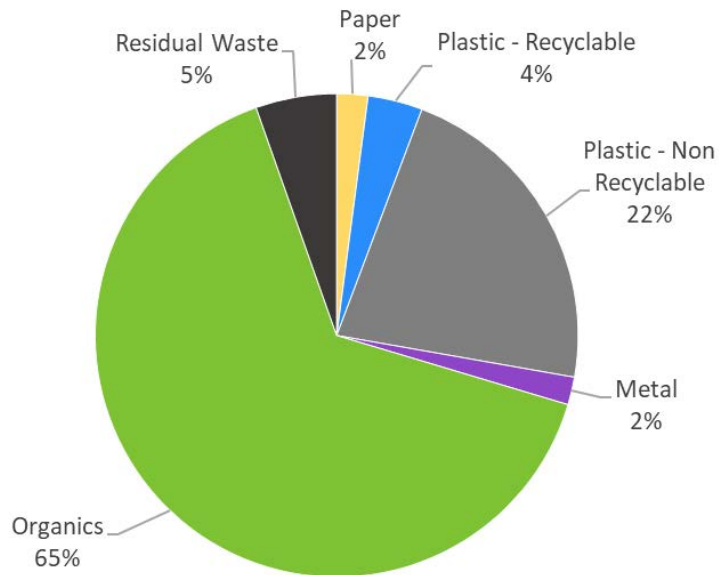


Figure 5.3. Landfill stream composition from all building food areas audited at the London Campus.

Organics found in food area landfill bins consisted mostly of food waste (43%) and paper/tissue (15%). Paper cups and take out containers both accounted for 3% of the total organics weight (Figure 5.4).

Food Area Waste Organics Breakdown

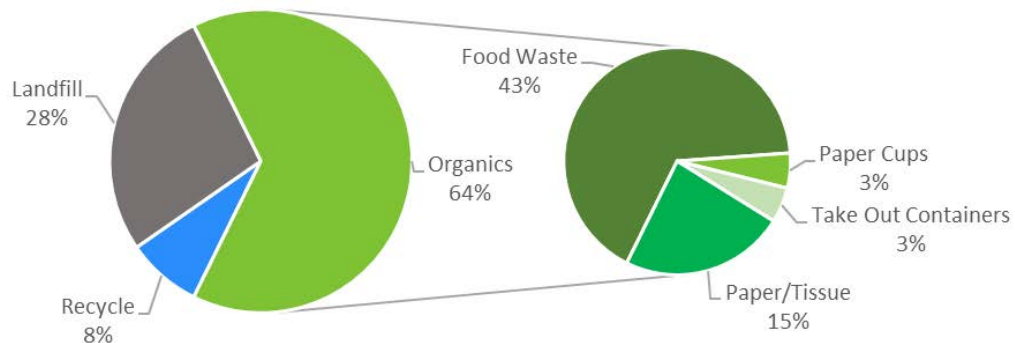


Figure 5.4. Landfill organics stream breakdown from all building food areas audited at the London Campus.

5.2.2 Hallways

Landfill stream composition in hallways at the College consisted of 63% organics and 6% recyclable plastics, consisting mostly of #5 tubs with #1 PET & #2 HDPE coming second (Figure 5.5). There were very little polycoat/asceptic containers in the recyclable plastics category.

The paper category (4%) consisted largely of newspaper and mixed paper, with a small amount of office paper. Metal, glass, and cardboard comprised a small amount of hallway landfill waste, at 1% each. The metal category was fairly even between food & beverage cans and other metal.

Non-recyclable plastic composed 24% of the waste collected.

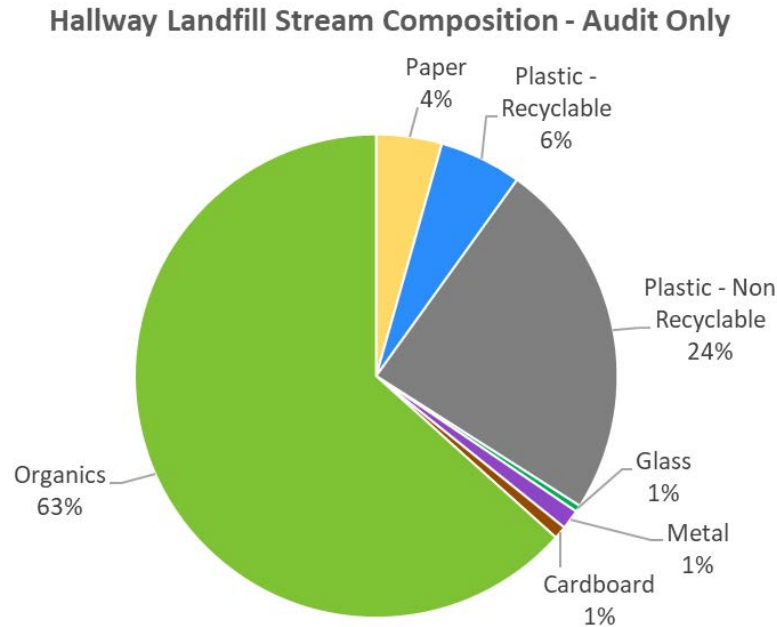


Figure 5.5. Landfill stream composition from all building hallways audited at the London Campus.

Organics found in hallway landfill bins consisted mostly of food waste (41%) and paper cups (10%). The remainder of the organics category was take out containers/trays and paper/tissue, each representing 6% of the total hallway waste (Figure 5.6).

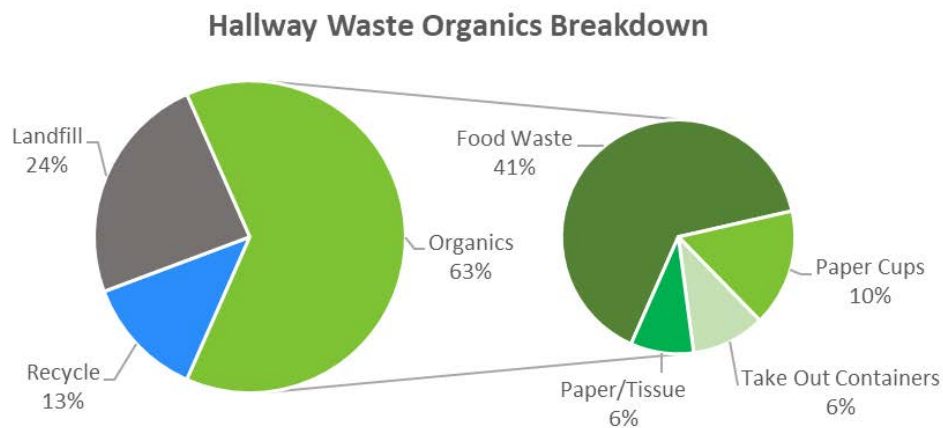


Figure 5.6. Landfill organics stream breakdown from all building hallways audited at the London Campus.

5.2.3 Classrooms

Landfill stream composition in classrooms at the College consisted of 47% organics and 6% recyclable plastics, which consisted mostly of #5 tubs, with #1 PET & #2 HDPE coming second, (Figure 5.7).

The paper category (10%) consisted largely of newspaper and mixed paper, with a very small amount of office paper. Wood contributed 4% of classroom waste and 2%. Both were mostly from art labs. Metal, electronics, hazardous, and cardboard categories each represented 1%.

Residual waste and non-recyclable plastic composed 3% and 24% of the waste, respectively. Unclassified made up the majority of residual waste, with other glass contributing a small amount.

Classroom Landfill Stream Composition - Audit Only

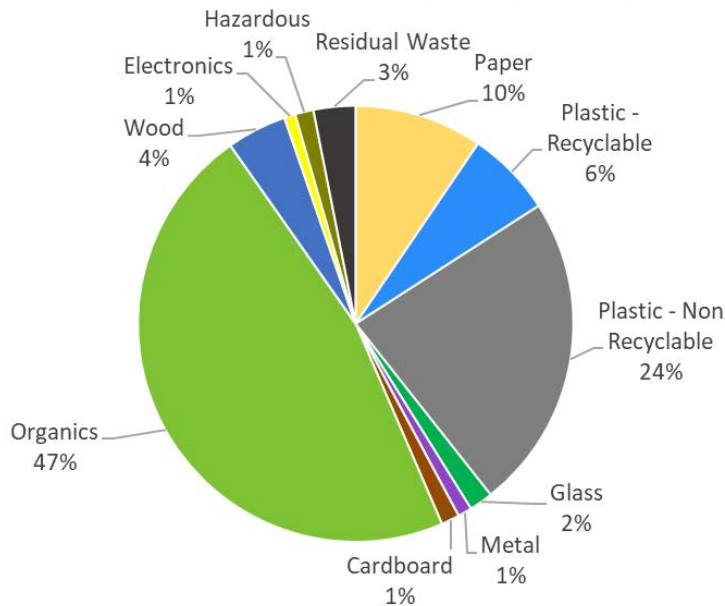


Figure 5.7. Landfill stream composition from all building classrooms audited at the London Campus.

Organics found in classroom landfill bins consisted mostly of food waste (29%) and paper cups (8%). The remainder of the organics category was paper/tissue (7%) and take out containers/trays (3%) (Figure 5.8).

Classroom Waste Organics Breakdown

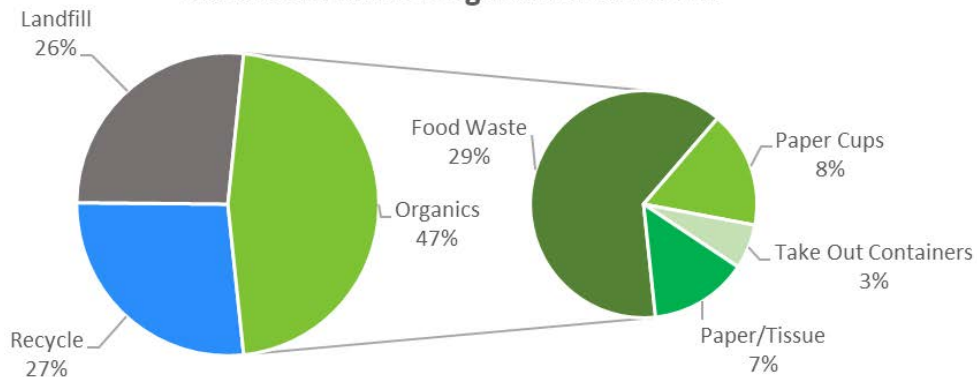


Figure 5.8. Landfill organics stream breakdown from all building classrooms audited at the London Campus.

5.2.4 Offices

Landfill stream composition in offices at the College contained 35% organics and 2% recyclable plastics, consisting mostly of #1 PET and #2 HDPE, with a small amount of #5 tubs (Figure 5.9). The paper category (4%) consisted of more office paper than newspaper and mixed paper, but not a significant difference.

Glass represented 3% of office waste and miscellaneous waste contributed 1%. All of the miscellaneous waste was disposable coffee pods.

Residual waste and non-recyclable plastic composed 42% and 13% of the waste, respectively. Residual waste consisted mostly of unclassified waste, with a negligible amount of textiles.

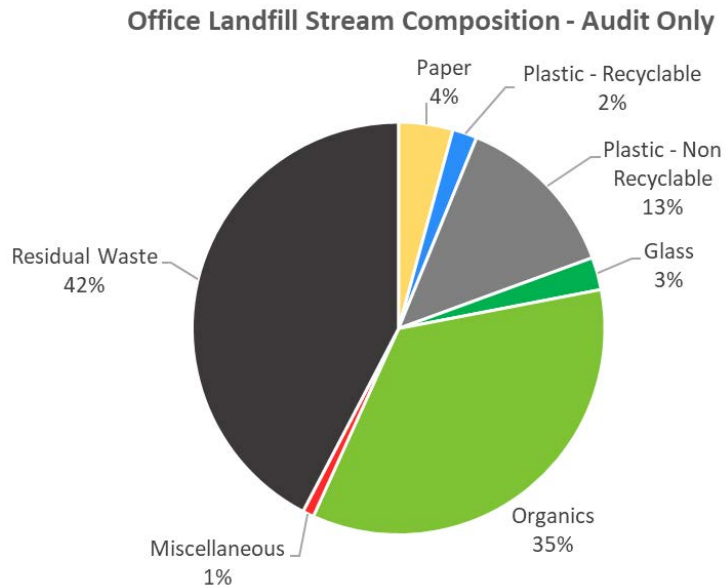


Figure 5.9. Landfill stream composition from all building offices audited at the London Campus.

Organics found in office landfill bins consisted mostly of food waste (17%) and paper/tissue waste (11%). The remainder of the organics category was made up of paper cups (7%) and take out containers/trays (3%) (Figure 5.10).

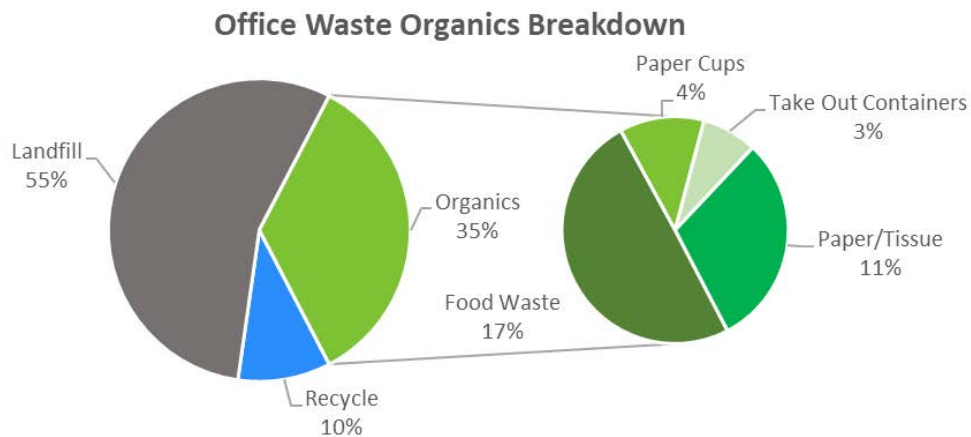


Figure 5.10. Landfill organics stream breakdown from all building offices audited at the London Campus.

5.3 Results by Building

5.3.1 B-Building

B-Building food area landfill composition consisted of more than half organics (64%) and 24% true landfill waste, made up of non-recyclable plastic (Figure 5.11). Recyclable plastics, paper, and cardboard accounted for 6%, 3%, and 3%, respectively. Recyclable plastics were evenly distributed between #5 tubs and #1 PET and #2 HDP with some polycoat/aseptic containers.

B Building - Food Area Landfill Composition

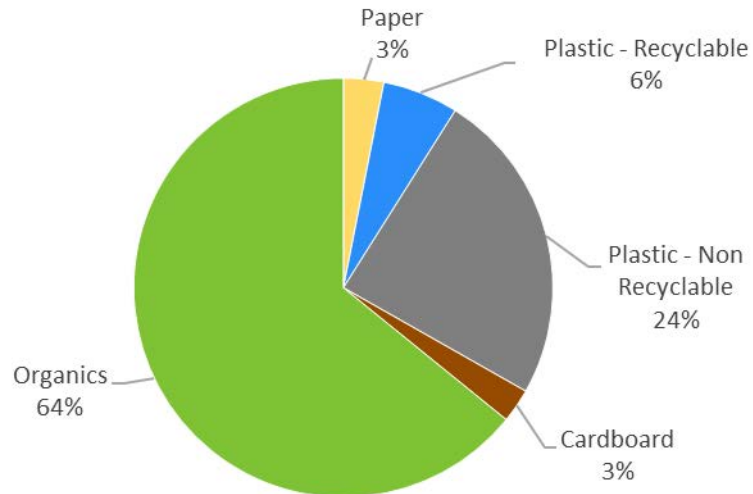


Figure 5.11. Landfill stream composition from B-Building food areas audited at the London Campus.

Organics found in B-Building food area landfill bins consisted of mostly food waste (38%) and take out containers (13%) (Figure 5.12). The remainder of the organics category was paper/tissue (7%) and paper cups (6%).

B Building Food Area Waste Organics Breakdown

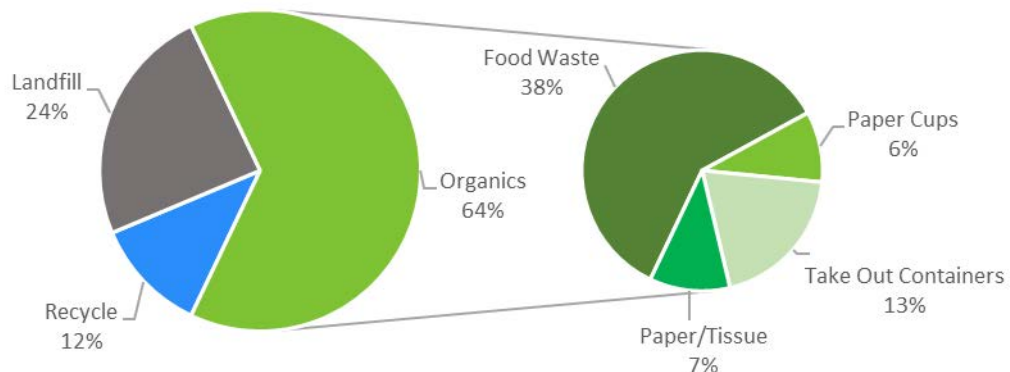


Figure 5.12. Landfill organics stream breakdown from B-Building food areas audited at the London Campus.

B-Building hallway landfill consisted of over half organics (57%) and 26% true landfill waste, which was all non-recyclable plastic (Figure 5.13). Paper accounted for 9%, recyclable plastics for 4%, and metal for 4%, which was mostly other metal. Paper consisted entirely of newspaper and mixed paper. Plastics found in the landfill stream included #5 tubs, #1 PET and #2 HDPE and polycoat/aseptic containers.

B Building - Hallway Landfill Composition

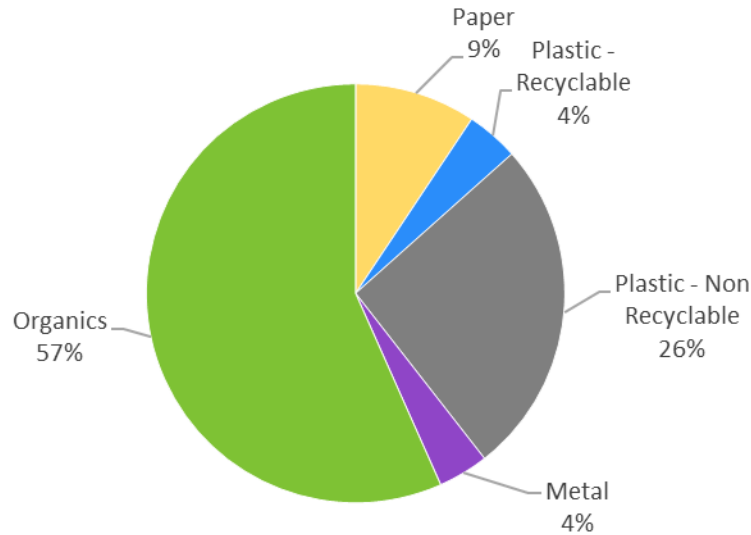


Figure 5.13. Landfill stream composition from B-Building hallways audited at the London Campus.

Organics found in B-Building hallway landfill bins consisted of mostly food waste (41%) and paper cups (8%) (Figure 5.14). The remainder of the organics category was paper/tissue and take out containers, which each representing 4% of the landfill waste.

B Building Hallway Waste Organics Breakdown

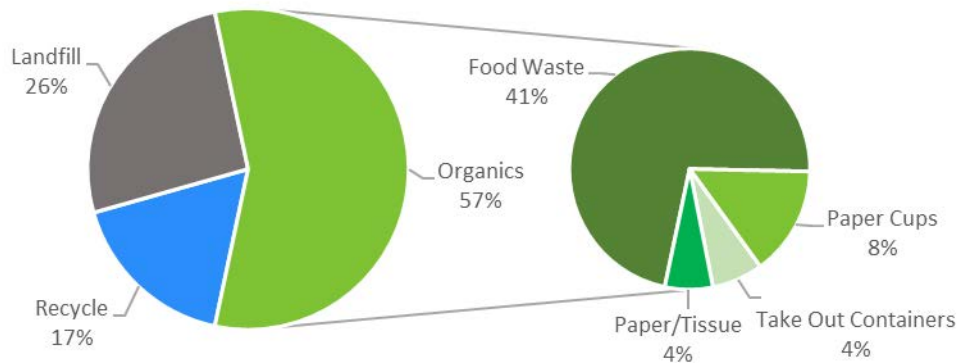


Figure 5.14. Landfill organics stream breakdown from B-Building hallways audited at the London Campus.

B-Building classroom landfill consisted of over half organics (54%) and 34% true landfill waste, made up of 28% non-recyclable plastic and 6% residual waste (Figure 5.15). Recyclable plastics and paper accounted for 5% each, and metal and electronics for 1% each. Plastics found in the landfill stream included #5 tubs, #1 PET and #2 HDPE and polycoat/aseptic containers. Paper was fairly evenly distributed between office paper and newspaper and mixed paper.

B Building - Classroom Landfill Composition

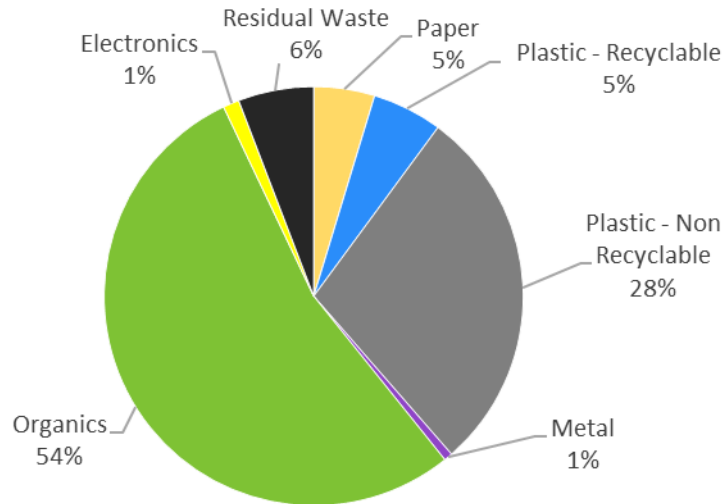


Figure 5.15. Landfill stream composition from B-Building classrooms audited at the London Campus.

Organics found in B-Building classroom landfill bins consisted of mostly food waste (28%) and paper cups (16%) (Figure 5.16). The remainder of the organics category was paper/tissue (7%) and take out containers (3%).

B Building Classroom Waste Organics Breakdown

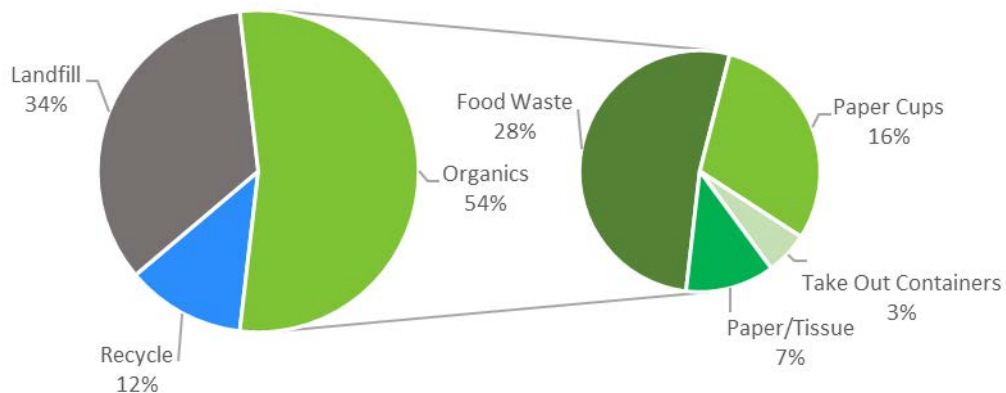


Figure 5.16. Landfill organics stream breakdown from B-Building classrooms audited at the London Campus.

B-Building office landfill composition consisted of 76% true waste, 68% of which was residual waste (Figure 5.17). Recyclable plastics, paper, and miscellaneous accounted for 1% each. The only recyclable plastics found in the landfill stream were #5 tubs. Coffee pods made up the entire miscellaneous category.

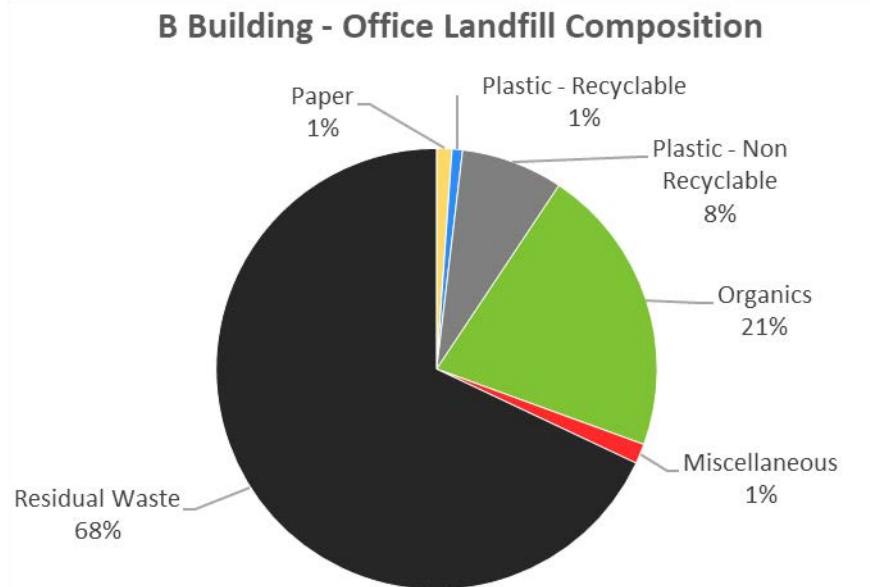


Figure 5.17. Landfill stream composition from B-Building offices audited at the London Campus.

Organics found in B-Building office landfill bins consisted of mostly food waste (10%), and paper/tissue (6%) (Figure 5.18). The remainder of the organics category was paper cups (3%) and take out containers (2%).

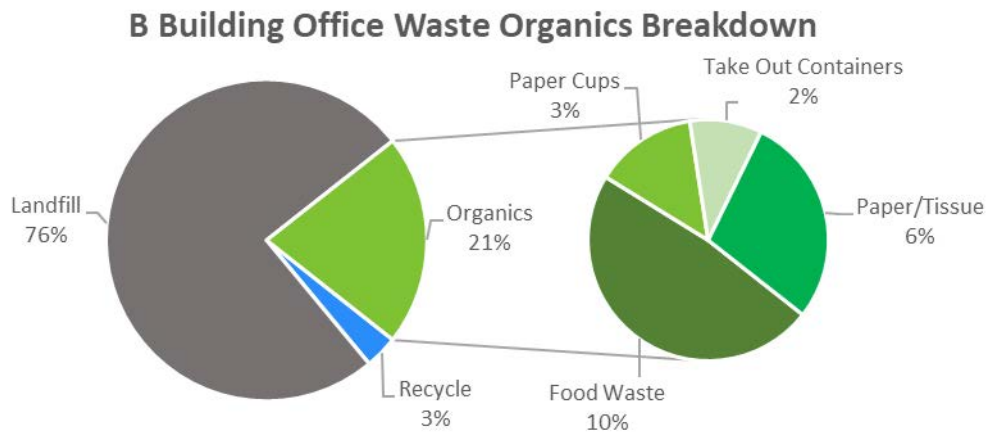


Figure 5.18. Landfill organics stream breakdown from B-Building offices audited at the London Campus.

5.3.2 D-Building

D-Building food area landfill composition consisted of 78% organics and 17% true landfill waste, made up of 14% non-recyclable plastic and 3% residual waste (Figure 5.19). Recyclable plastics accounted for 3%, and paper for 2%. Plastics found in the landfill stream included #1 PET and #2 HDPE and #5 tubs. The majority of paper was newspaper and mixed paper.

D Building - Food Area Landfill Composition

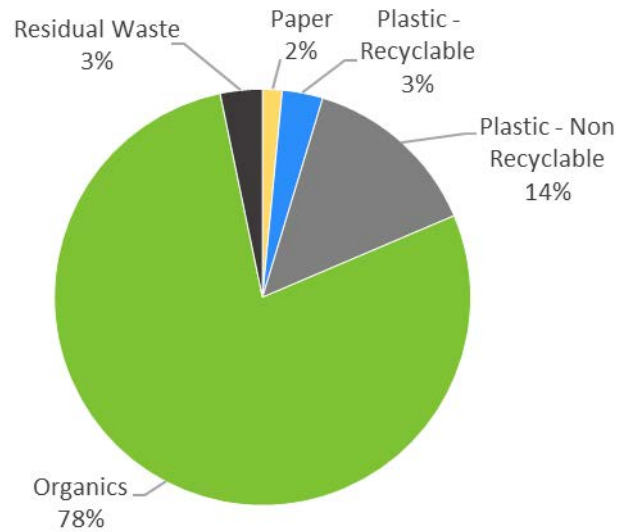


Figure 5.19. Landfill stream composition from D-Building food areas audited at the London Campus.

Organics found in D-Building food area landfill bins consisted of mostly food waste (49%), and take out containers (13%) (Figure 5.20). The remainder of the organics category was paper/tissue (9%) and paper cups (7%).

D Building Food Area Waste Organics Breakdown

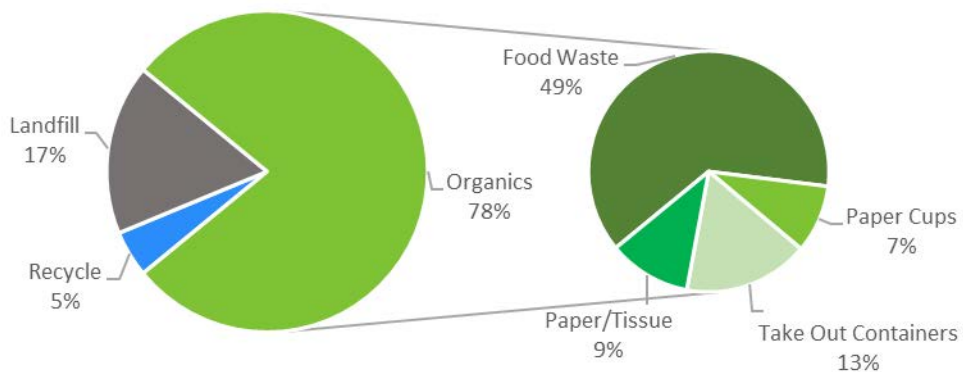


Figure 5.20. Landfill organics stream breakdown from D-Building food areas audited at the London Campus.

D-Building hallway landfill composition consisted of 62% organics and 28% true landfill waste, made up entirely of non-recyclable plastic (Figure 5.21). Recyclable plastics accounted for 7%, and paper for 3%. Plastics found in the landfill stream included #5 tubs, #1 PET and #2 HDPE and polycoat/aseptic containers. Newspaper and mixed paper accounted for all of the paper waste found in landfill.

D Building - Hallway Landfill Composition

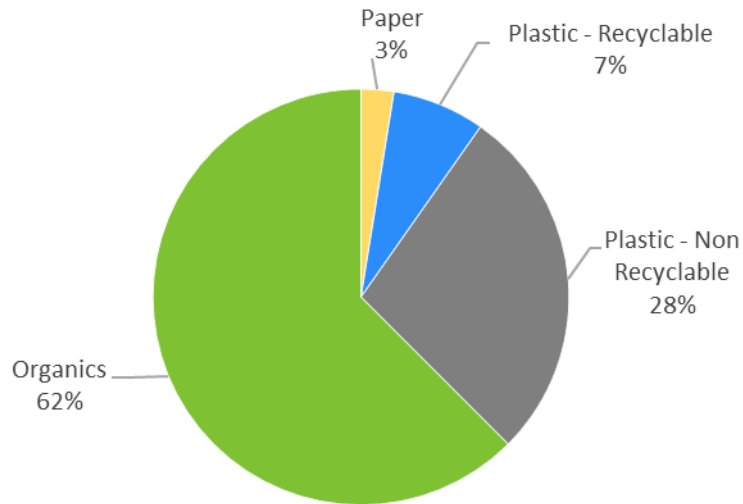


Figure 5.21. Landfill stream composition from D-Building hallways audited at the London Campus.

Organics found in D-Building hallway landfill bins consisted of mostly food waste (34%), and paper cups (15%) (Figure 5.22). The remainder of the organics category was paper/tissue (7%) and take out containers (6%).

D Building Hallway Waste Organics Breakdown

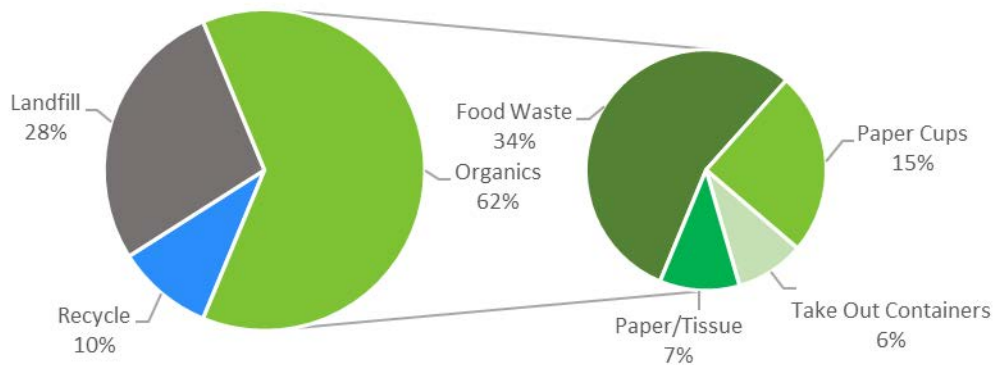


Figure 5.22. Landfill organics stream breakdown from D-Building hallways audited at the London Campus.

D-Building classroom landfill composition consisted of 40% organics and 23% true landfill waste, made up of 19% non-recyclable plastic and 4% residual waste (Figure 5.23). Paper accounted for 14% of waste, which was mostly newspaper and mixed paper. Wood accounted for 10%, recyclable plastics for 5%, hazardous for 3%, cardboard for 2%, and glass, metal, and electronics for 1% each. Plastics found in the landfill stream included #5 tubs, #1 PET and #2 HDPE, polycoat/aseptic containers and #3, 4 & 7. Other hazardous waste made up all of the hazardous category, which was mostly wet paint in tubs.

D Building - Classroom Landfill Composition

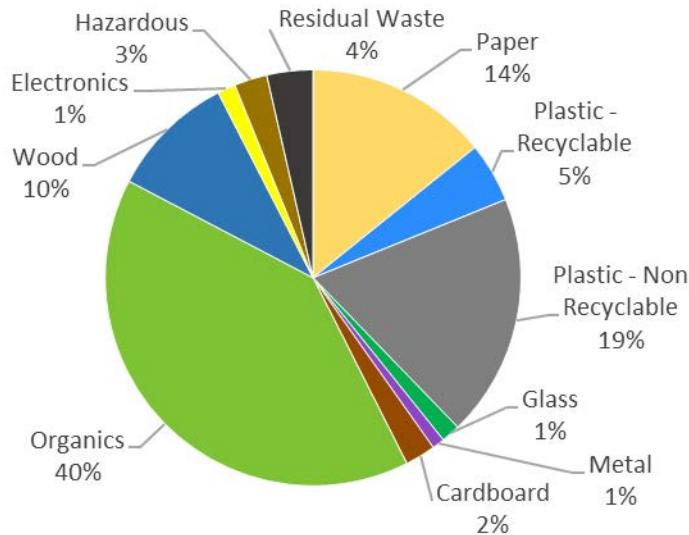


Figure 5.23. Landfill stream composition from D-Building classrooms audited at the London Campus.

Organics found in D-Building classroom landfill bins consisted of mostly food waste (27%), and paper/tissue (7%) (Figure 5.24). The remainder of the organics category was take out containers and paper cups, both representing 3% each.

D Building Classroom Waste Organics Breakdown

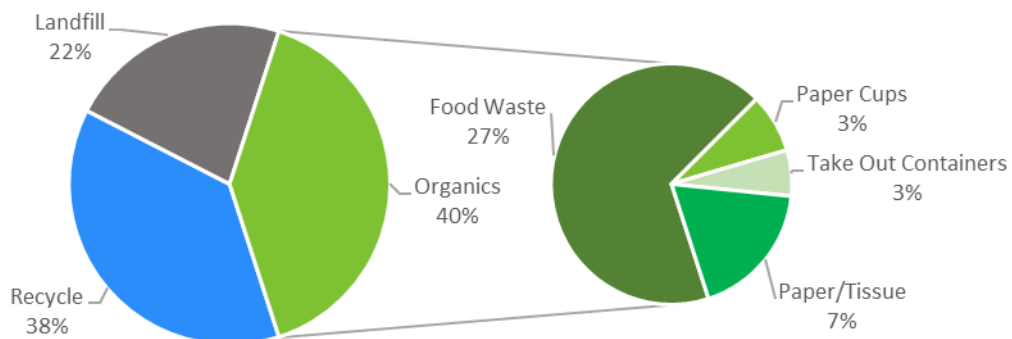


Figure 5.24. Landfill organics stream breakdown from D-Building classrooms audited at the London Campus.

D-Building office landfill composition consisted of 56% organics and 31% true landfill waste, consisting of 25% non-recyclable plastic and 6% residual waste (Figure 5.25). Paper accounted for 10%, which was all office paper. Recyclable plastics represented 3% of office landfill waste, which was all #1 PET and #2 HDPE.

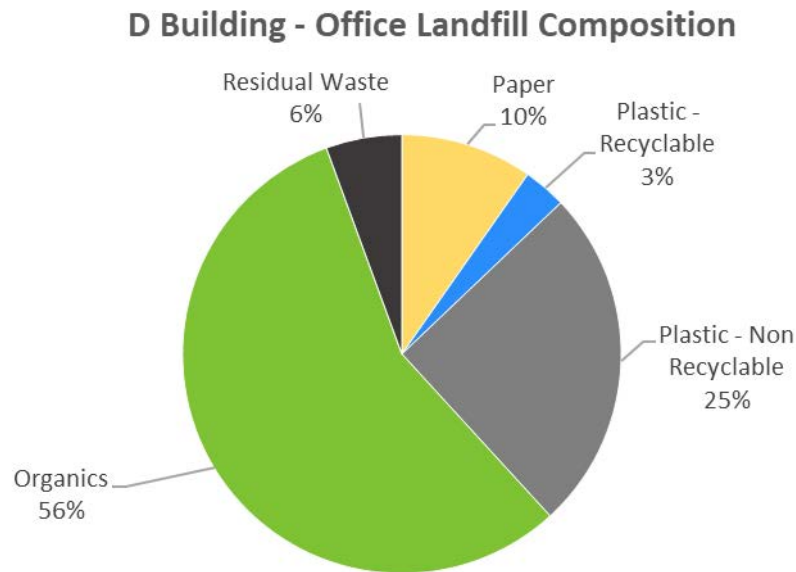


Figure 5.25. Landfill stream composition from D-Building offices audited at the London Campus.

Organics found in D-Building office landfill bins consisted of mostly food waste (33%) and paper/tissue (11%) (Figure 5.26). The remainder of the organics category was take out containers and paper cups, both representing 6% each.

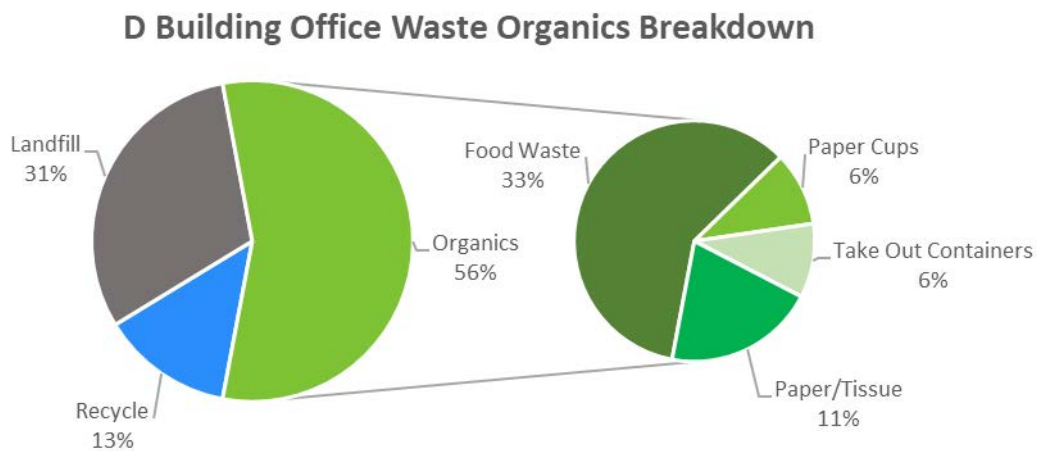


Figure 5.26. Landfill organics stream breakdown from D-Building offices audited at the London Campus.

5.3.3 H-Building

H-Building food area landfill composition consisted of 60% organics and 27% true landfill waste, which was entirely non-recyclable plastic (Figure 5.27). Recyclable plastics accounted for 10%, which consisted of #5 tubs, #1 PET and #2 HDPE, and polycoat/aseptic containers. Paper in food area landfill represented 3%, and was all newspaper and mixed paper.

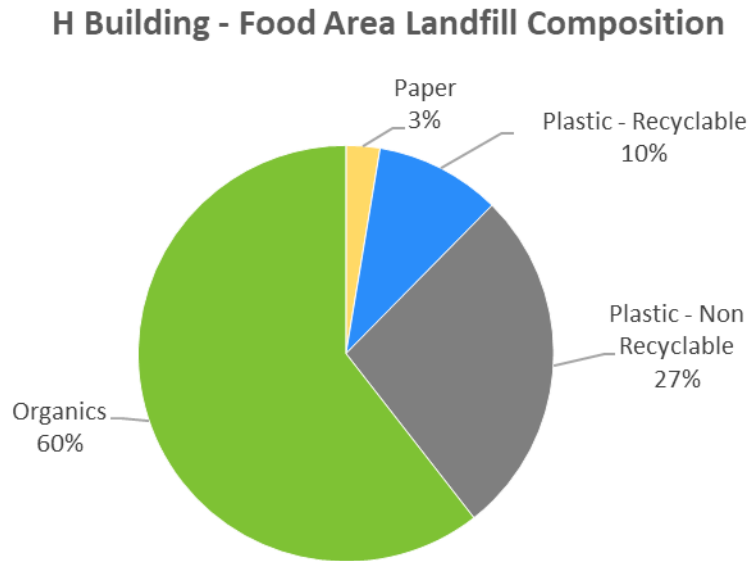


Figure 5.27. Landfill stream composition from H-Building food areas audited at the London Campus.

Organics found in H-Building food area landfill bins consisted of mostly food waste (51%) (Figure 5.28). Paper cups and paper/tissue represented the remainder of the organics category, at 5% each.

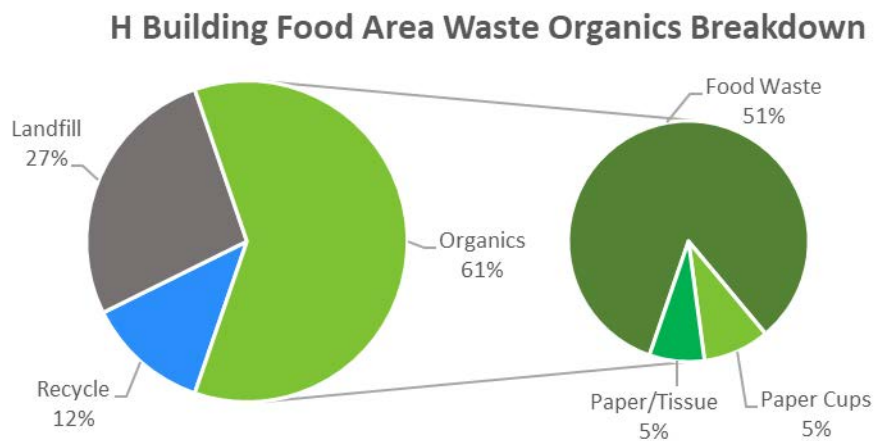


Figure 5.28. Landfill organics stream breakdown from H-Building food areas audited at the London Campus.

H-Building hallway landfill composition consisted of 62% organics and 27% true landfill waste, made up entirely of non-recyclable plastic (Figure 5.29). Recyclable plastics accounted for 8%, which consisted of #5 tubs, #1 PET and #2 HDPE, and polycoat/aseptic containers. Paper in hallway landfill represented 2% of waste, and was all newspaper and mixed paper. Food and beverage cans made up the entire metal category, which accounted for 1% of hallway landfill waste.

H Building - Hallway Landfill Composition

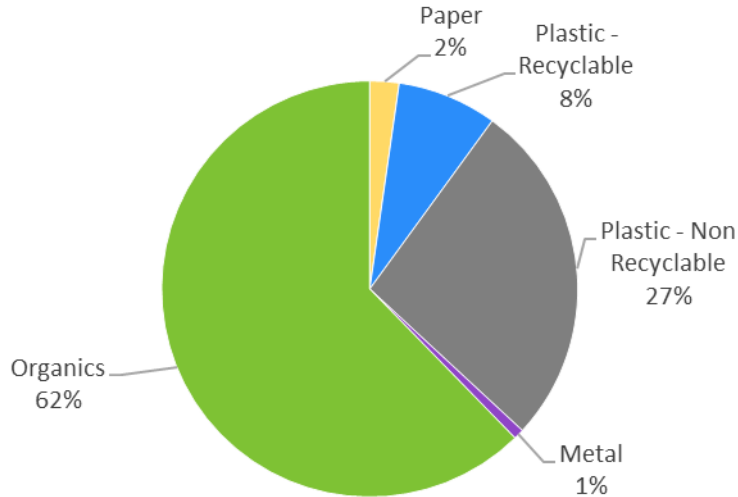


Figure 5.29. Landfill stream composition from H-Building hallways audited at the London Campus.

Organics found in H-Building hallway landfill bins consisted of mostly food waste (43%) and paper cups (10%) (Figure 5.30). Paper/tissue and take out containers represented the remainder of the organics category, at 6% and 3%, respectively.

H Building Hallway Waste Organics Breakdown

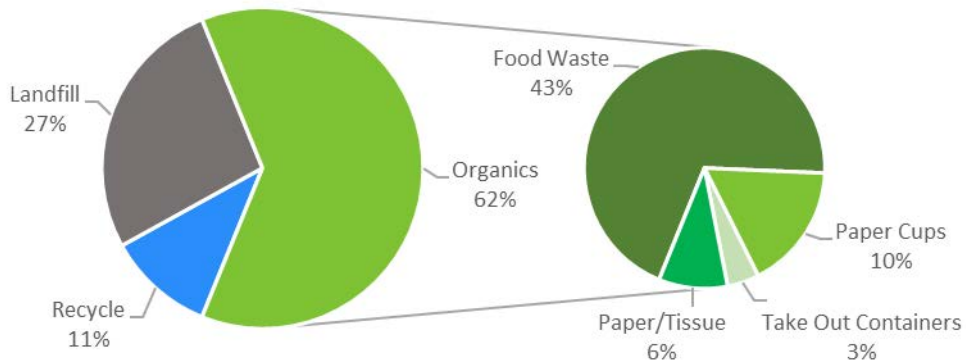


Figure 5.30. Landfill organics stream breakdown from H-Building hallways audited at the London Campus.

H-Building classroom landfill composition consisted of 53% organics and 27% true landfill waste, made up of 25% non-recyclable plastic and 2% residual waste (Figure 5.31). Recyclable plastics accounted for 9%, which consisted of #5 tubs, polycoat/aseptic containers, and #1 PET and #2 HDPE. Paper in classroom landfill represented 8%, which was mostly newspaper and mixed paper with some office paper. The metal category represented 1% of waste, and was fairly evenly distributed between food and beverage cans and other metal. Cardboard and glass each accounted for 1% of classroom landfill waste.

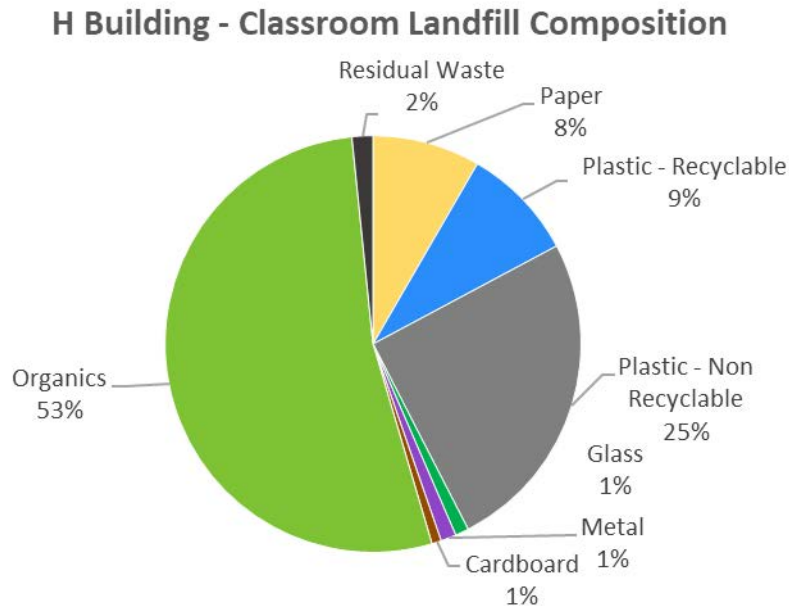


Figure 5.31. Landfill stream composition from H-Building classrooms audited at the London Campus.

Organics found in H-Building classroom landfill bins consisted of mostly food waste (33%) and paper cups (10%) (Figure 5.32). Paper/tissue and take out containers represented the remainder of the organics category, at 6% and 3%, respectively.

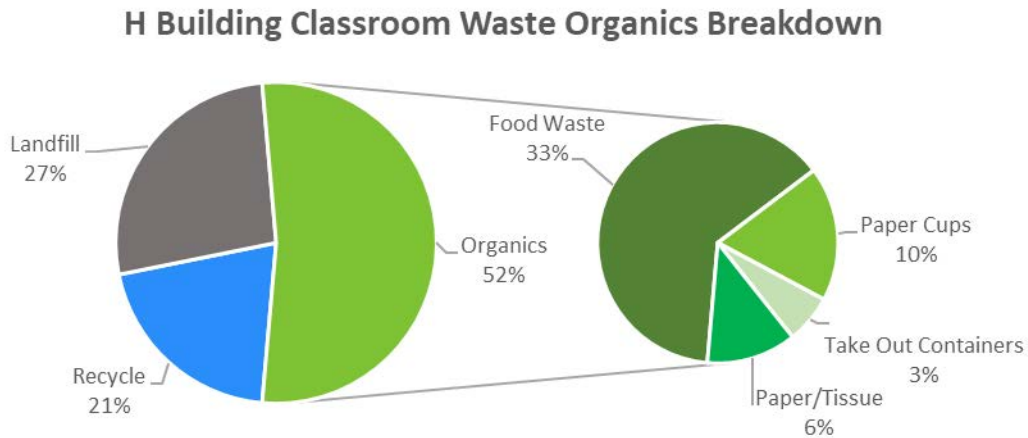


Figure 5.32. Landfill organics stream breakdown from H-Building classrooms audited at the London Campus.

5.3.4 M-Building

M-Building hallway landfill composition consisted of 64% organics and 26% true landfill waste, made up entirely of non-recyclable plastic (Figure 5.33). Recyclable plastics made up 6%, which consisted of #5 tubs and #1 PET and #2 HDPE. Newspaper and mixed paper made up the entire paper category, which accounted for 2% of hallway landfill waste. Metal, which was all food and beverage cans, and miscellaneous, which wall all coffee pods, represented 1% each.

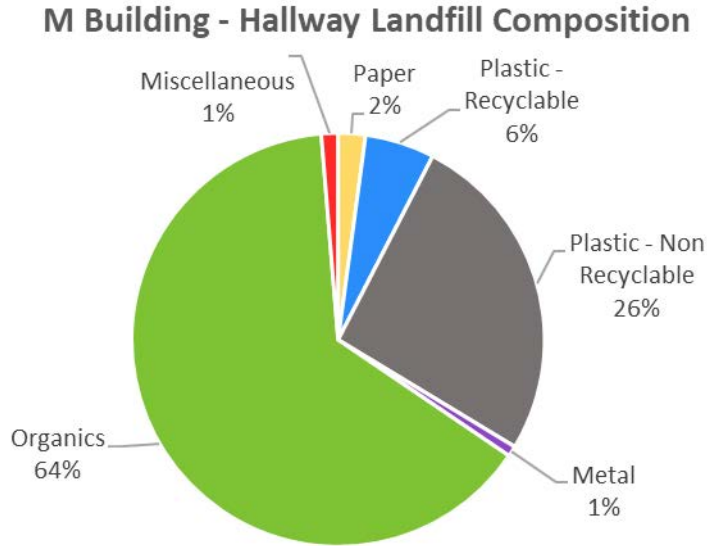


Figure 5.33. Landfill stream composition from M-Building hallways audited at the London Campus.

Organics found in M-Building hallway landfill bins consisted of mostly food waste (41%) and paper cups (11%) (Figure 5.34). Paper/tissue and take out containers represented the remainder of the organics category, at 9% and 3%, respectively.

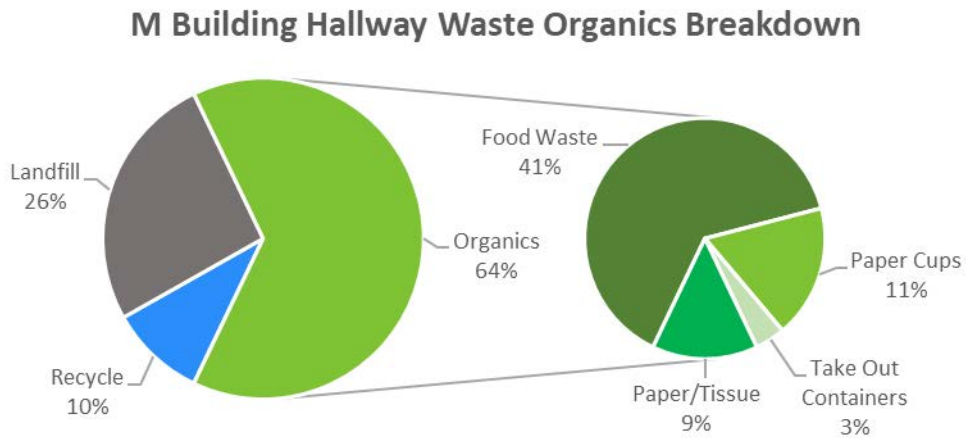


Figure 5.34. Landfill organics stream breakdown from M-Building hallways audited at the London Campus.

M-Building classroom landfill composition consisted of 49% organics and 30% true landfill waste, made up of 28% non-recyclable plastic and 2% residual waste (Figure 5.35). Recyclable plastics made up 8%, which consisted of #1 PET and #2 HDPE, polycoat/aseptic containers, #5 tubs and a very small amount of #3, 4 & 7 plastics. Glass accounted for 7%, and paper, which consisted of office paper and newspaper and mixed paper, for 3%. Hazardous waste included other hazardous and batteries, which represented 2% of classroom landfill waste, while metal accounted for 1%, consisting of food and beverage cans and other metal.

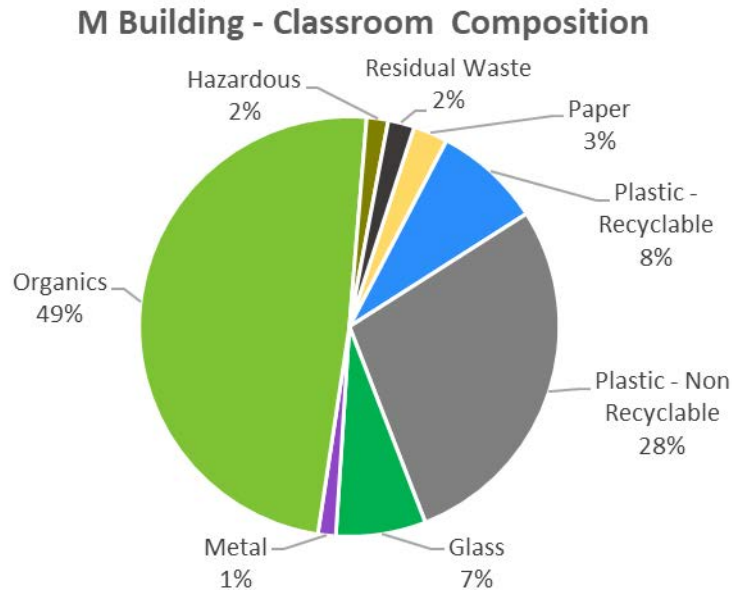


Figure 5.35. Landfill stream composition from M-Building classrooms audited at the London Campus.

Organics found in M-Building classroom landfill bins consisted of mostly food waste (31%) and paper cups (11%) (Figure 5.36). Paper/tissue and take out containers represented the remainder of the organics category, at 5% and 2%, respectively.

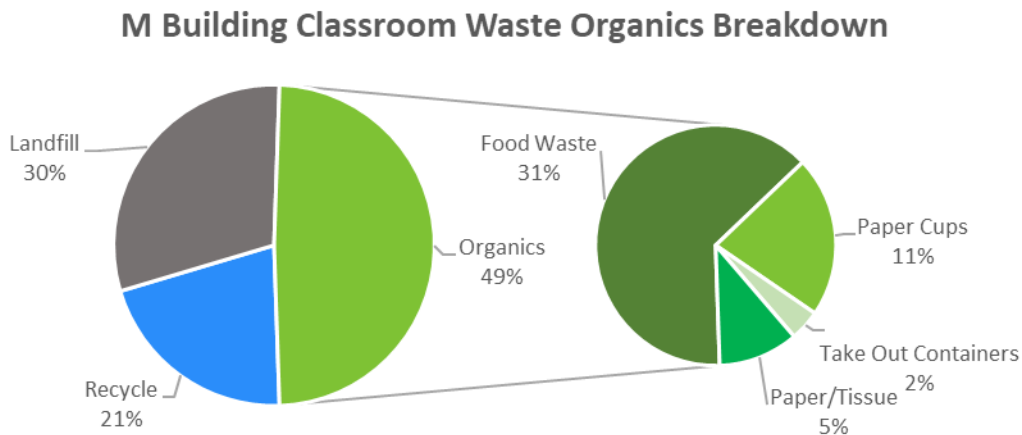


Figure 5.36. Landfill organics stream breakdown from M-Building classrooms audited at the London Campus.

M-Building office landfill composition consisted of 71% organics and 21% true landfill waste, made up entirely of non-recyclable plastic (Figure 5.37). Paper accounted for 8%, which was distributed evenly between office paper and newspaper.

M Building - Office Landfill Composition

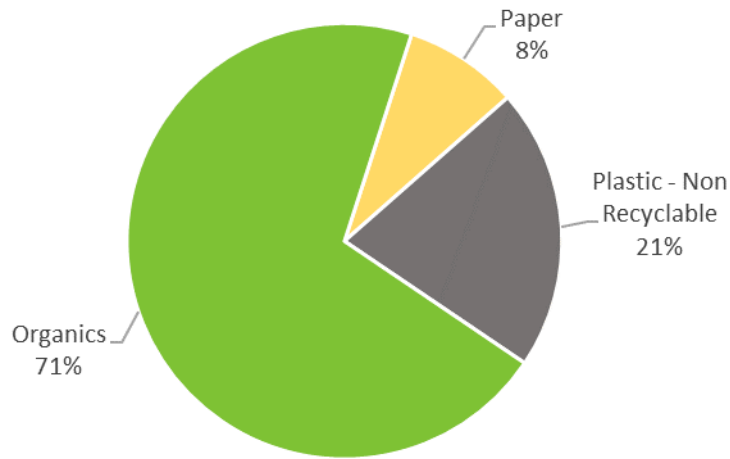


Figure 5.37. Landfill stream composition from M-Building offices audited at the London Campus.

Organics found in M-Building office landfill bins consisted of mostly food waste (37%) (Figure 5.38). Paper/tissue and paper cups represented the remainder of the organics category, at 26% and 8%, respectively.

M Building Office Waste Organics Breakdown

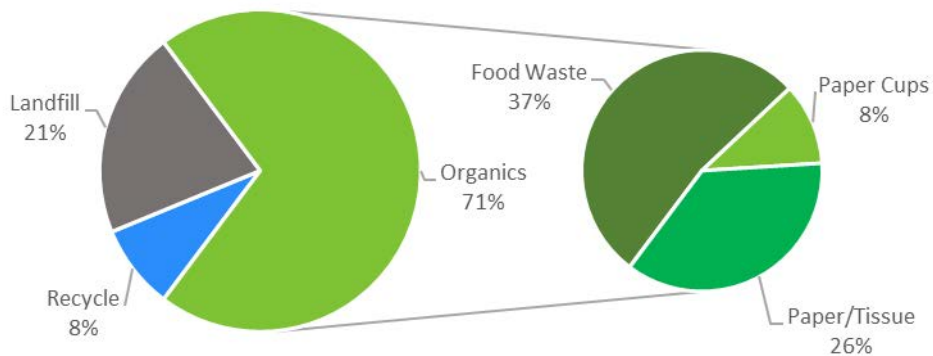


Figure 5.38. Landfill organics stream breakdown from M-Building offices audited at the London Campus.

5.3.5 LDB Downtown

LDB food area landfill consisted of 45% organics and 16% true landfill waste, made up entirely of non-recyclable plastic (Figure 5.39). Recyclable plastics accounted for 20%, which consisted of #5 tubs, #1 PET and #2 HDPE, and polycoat/aseptic containers. Newspaper and mixed paper and office paper made up the paper category, which represented 6% of food area landfill waste. Glass represented 5% of waste and cardboard 3%. Metal made up 2% of waste, the majority of which was other metal and food and beverage cans.

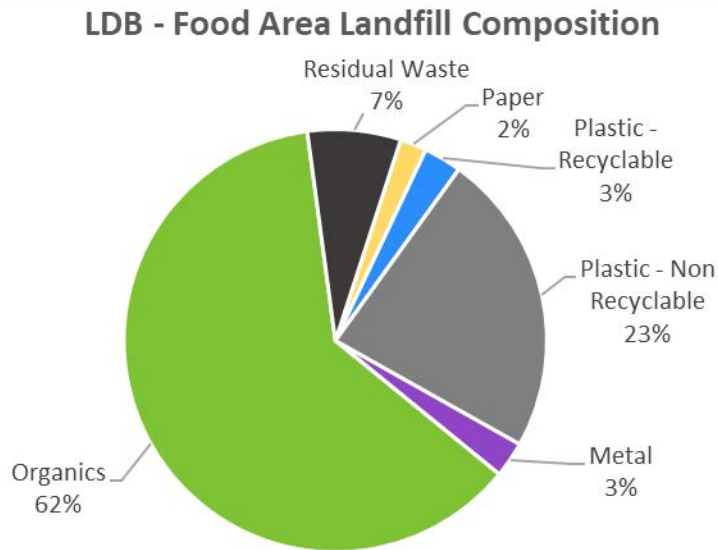


Figure 5.39. Landfill stream composition from LDB food areas audited at the London Campus.

Organics found in LDB food area landfill bins consisted of mostly food waste (41%) (Figure 5.40). Paper/tissue and paper cups represented the remainder of the organics category, at 19% and 2%, respectively. It is worth noting that the organics waste from this building accounted for 65% of organics in all food area waste across all building audited.

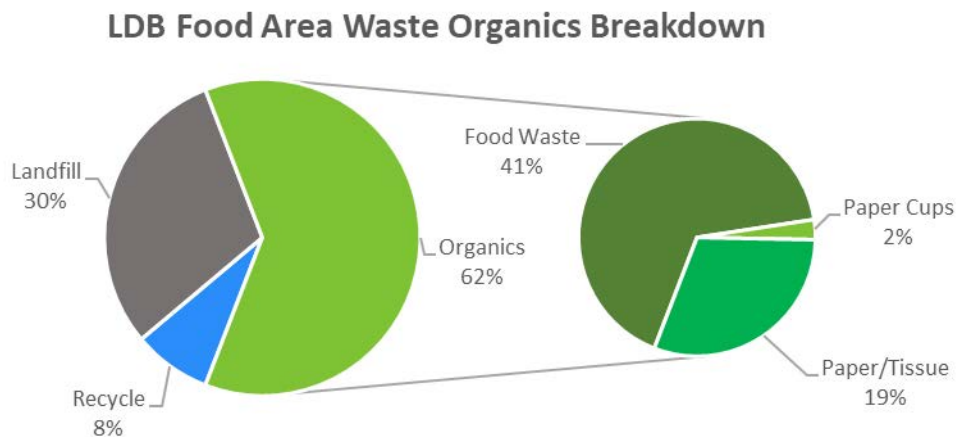


Figure 5.40. Landfill organics stream breakdown from LDB food areas audited at the London Campus.

LDB hallway landfill consisted of 68% organics and 19% true landfill waste, made up entirely of non-recyclable plastic (Figure 5.41). Recyclable plastics accounted for 4%, which consisted of #5 tubs, #1 PET and #2 HDPE, and polycoat/aseptic containers. Office paper and newspaper and mixed paper made up the paper category, which represented 4% of hallway area landfill waste. Cardboard represented 3% of waste, and glass and metal 1% each. The metal category was mostly food and beverage cans, with a small amount of other metal.

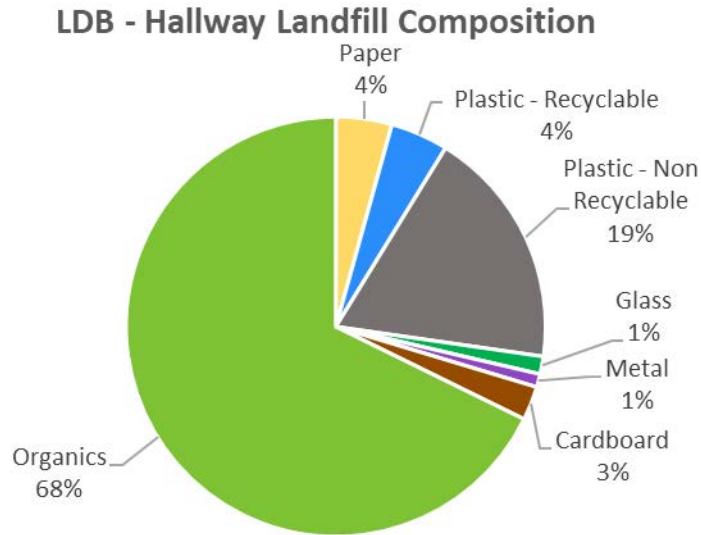


Figure 5.41. Landfill stream composition from LDB hallways audited at the London Campus.

Organics found in LDB hallway landfill bins consisted of mostly food waste (45%) and take out containers (11%) (Figure 5.42). Paper cups and paper/tissue represented the remainder of the organics category, at 7% and 4%, respectively.

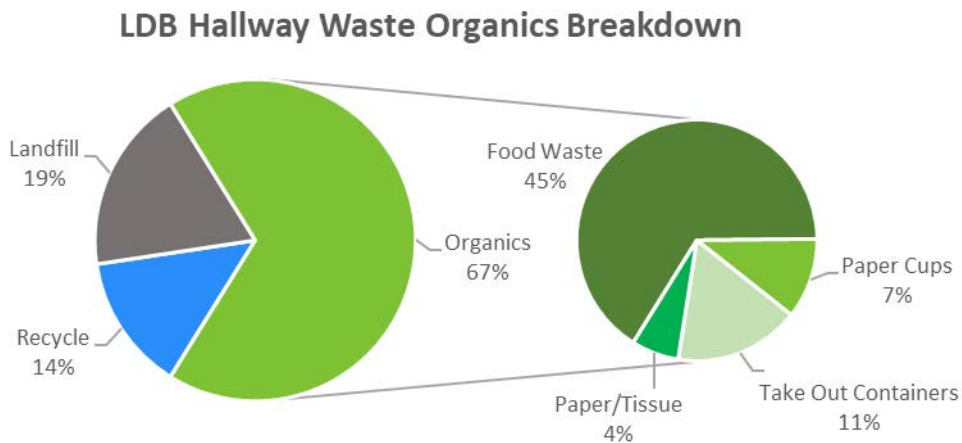


Figure 5.42. Landfill organics stream breakdown from LDB hallways audited at the London Campus.

LDB classroom landfill consisted of 53% organics and 31% true landfill waste, made up entirely of non-recyclable plastic (Figure 5.43). Recyclable plastics accounted for 10%, which consisted of #5 tubs, polycoat/aseptic containers, and #1 PET and #2 HDPE. Cardboard, metal, and paper represented 2% each. Food and beverage cans made up the metal category and newspaper and mixed paper made up the paper category.

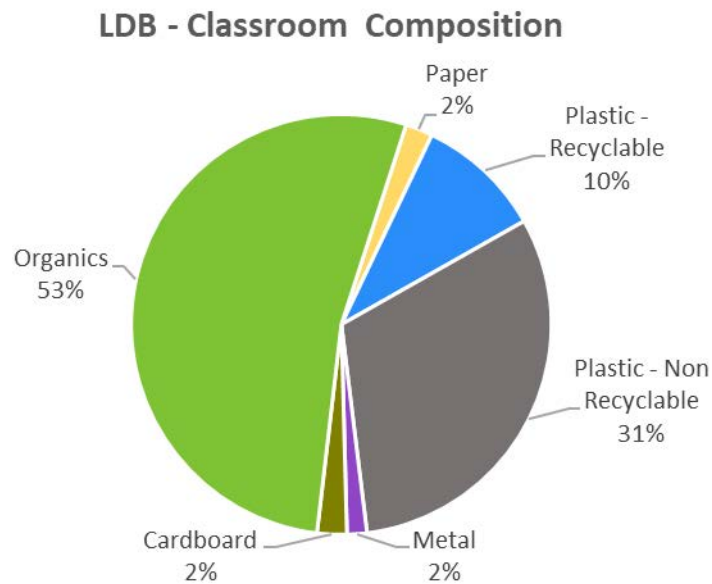


Figure 5.43. Landfill stream composition from LDB classrooms audited at the London Campus.

Organics found in LDB classroom landfill bins consisted of mostly food waste (33%) and paper cups (11%) (Figure 5.44). Take out containers and paper/tissue represented the remainder of the organics category, at 8% and 3%, respectively.

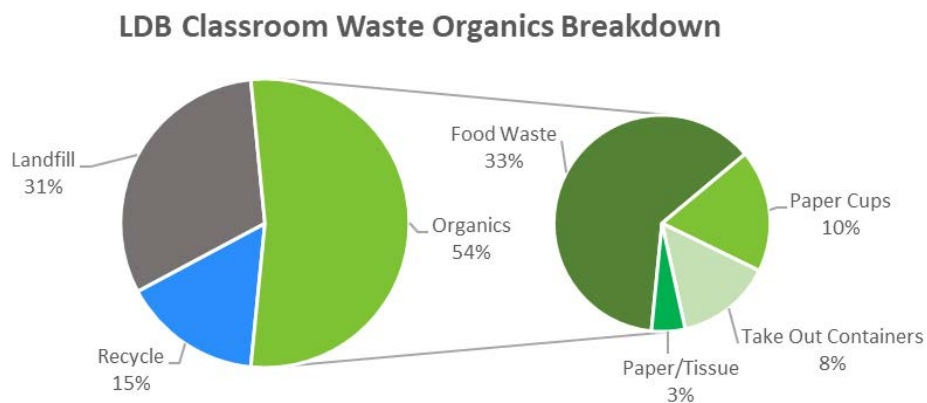


Figure 5.44. Landfill organics stream breakdown from LDB classrooms audited at the London Campus.

LDB office landfill consisted of 45% organics and 16% true landfill waste, made up entirely of non-recyclable plastic (Figure 5.45). Glass made up 22% of waste and paper represented 8% of waste, made up of newspaper and mixed paper. Recyclable plastics accounted for 7%, which consisted of only #1 PET and #2 HDPE. Other metal made up the metal category, which accounted for 2% of office landfill waste.

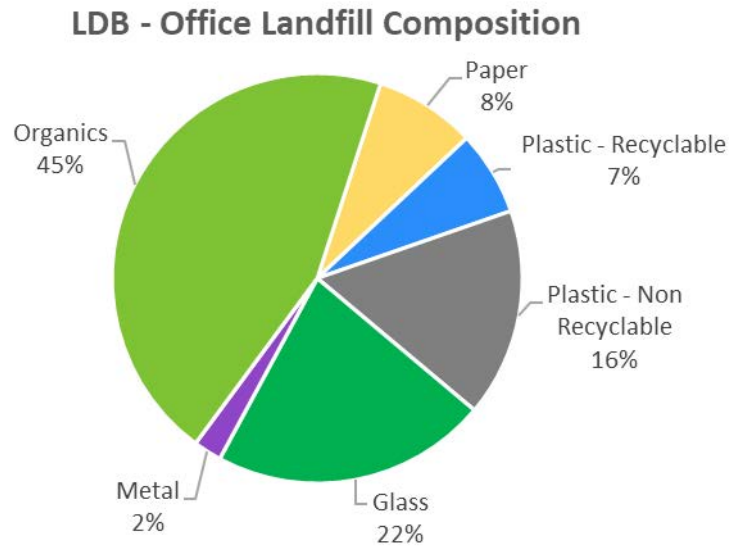


Figure 5.45. Landfill stream composition from LDB offices audited at the London Campus.

Organics found in LDB office landfill bins consisted of mostly paper/tissue (24%) and food waste (12%) (Figure 5.46). Paper cups and take out containers represented the remainder of the organics category, at 6% and 3%, respectively.

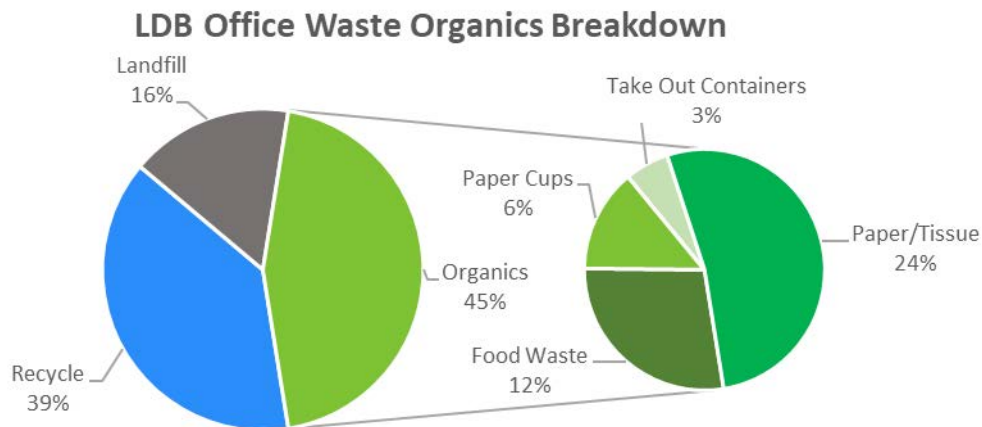


Figure 5.46. Landfill organics stream breakdown from LDB offices audited at the London Campus.

5.3.6 Outside

Outside landfill consisted of 35% organics and 33% true landfill waste, made up of 22% non-recyclable plastic and 11% residual waste (Figure 5.47). Paper, consisting of newspaper and mixed paper and office paper, and cardboard accounted for 8% each. Recyclable plastic represented 7% of outside landfill waste, which consisted of #1 PET and #2 HDPE, #5 tubs, polycoat/aseptic containers, and #3, 4 & 7 plastics. Electronics accounted for 6%, and metal for 3%. The metal category consisted mostly of food and beverage cans, with some other metal.

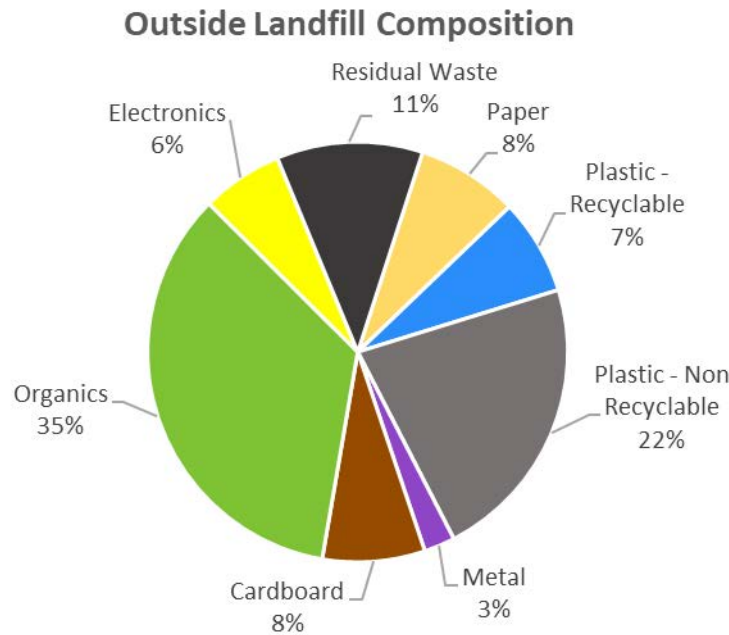


Figure 5.47. Landfill stream composition from Outside bins audited at the London Campus.

Organics found in outside landfill bins consisted of mostly food waste (21%) paper cups (7%) (Figure 5.48). Take out containers and paper/tissue represented the remainder of the organics category, at 4% and 3%, respectively.



Figure 5.48. Landfill organics stream breakdown from Outside bins audited at the London Campus

5.4 Breakdown of Multi-Component Material Categories

5.4.1 Paper

Paper accounted for 6% of overall audited waste (Figure 5.1). Below, Figure 5.49 demonstrates that the majority (79%) of the paper category consisted of newspaper and mixed paper, with the remainder office paper (21%).

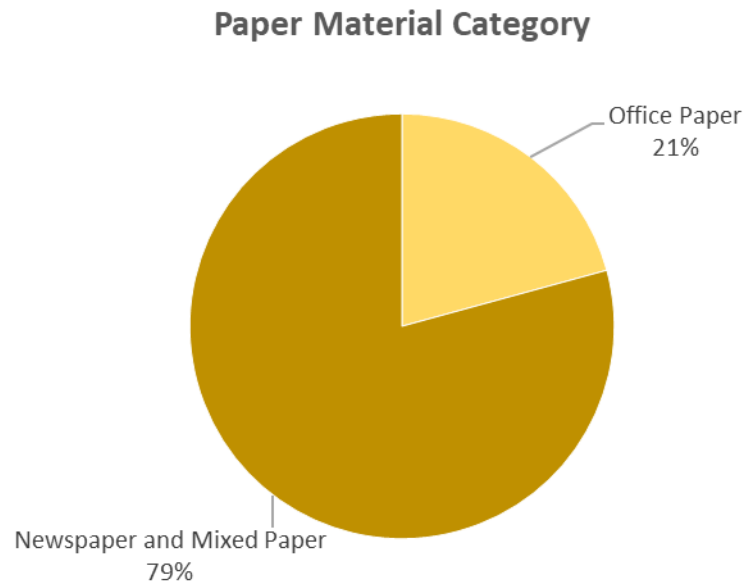


Figure 5.49. Paper material category in overall landfill stream audited at London Campus.

5.4.2 Recyclable Plastics

Recyclable Plastics accounted for 5% of overall audited waste (Figure 5.1). Below, Figure 5.50 demonstrates that #5 tubs (49%) and #1 PET & #2 HDPE (36%) comprised the highest percentages. Polycoat/aseptic containers accounted for 14% and #3, 4 & 7 plastics 1%.

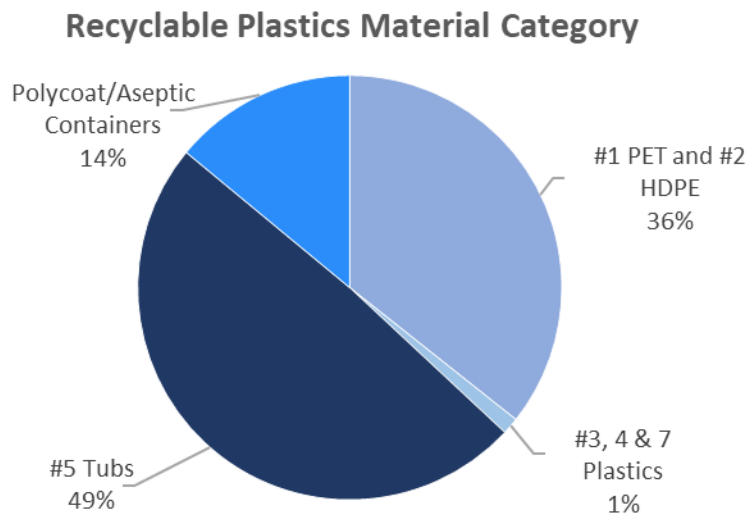


Figure 5.50. Recyclable plastics material category in overall landfill stream audited at London Campus.

5.4.3 Metal

Metal accounted for 1% of overall audited waste (Figure 5.1). Below, Figure 5.51 demonstrates that the category distributed fairly evenly between other metal (54%) and food & beverage cans (46%). The majority of other metal was foil from LDB food areas.

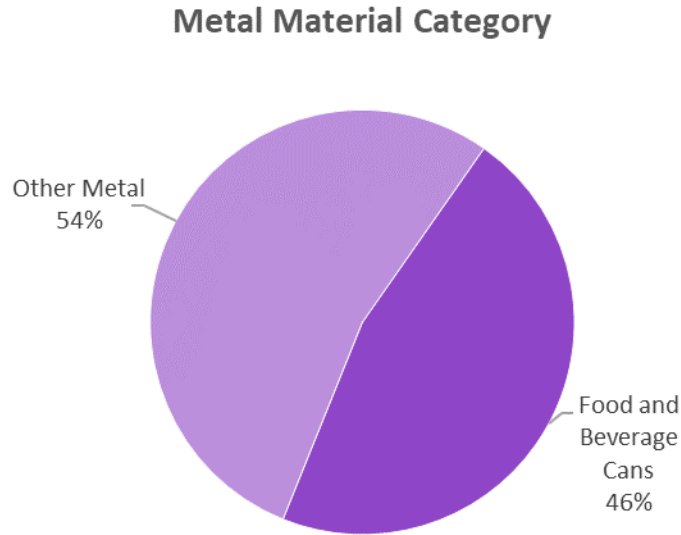


Figure 5.51. Metal material category in overall landfill stream audited at London Campus.

5.4.4 Organics

Organics accounted for 55% of overall audited waste (Figure 5.1). Below, Figure 5.52 demonstrates that the majority (53%) of the organics category was comprised of post-consumer food waste. Paper/tissue accounted for 17%, paper cups for 12%, pre-consumer food waste for 11%, and take-out containers for 7%.

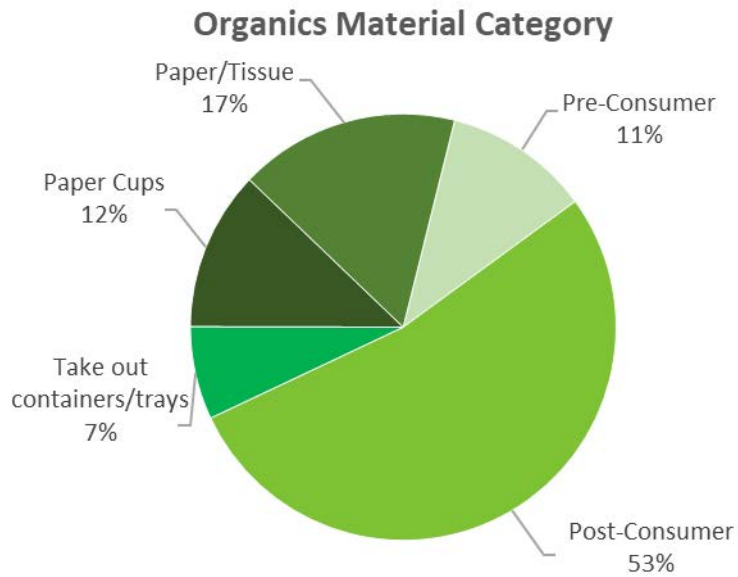


Figure 5.52. Organics material category in overall landfill stream audited at London Campus.

5.4.5 Residual Waste

Residual waste accounted for 6% of overall audited waste (Figure 5.1). Below, Figure 5.53 demonstrates that the residual waste category was comprised mostly (90%) unclassified waste, 8% textiles, and 2% other glass.

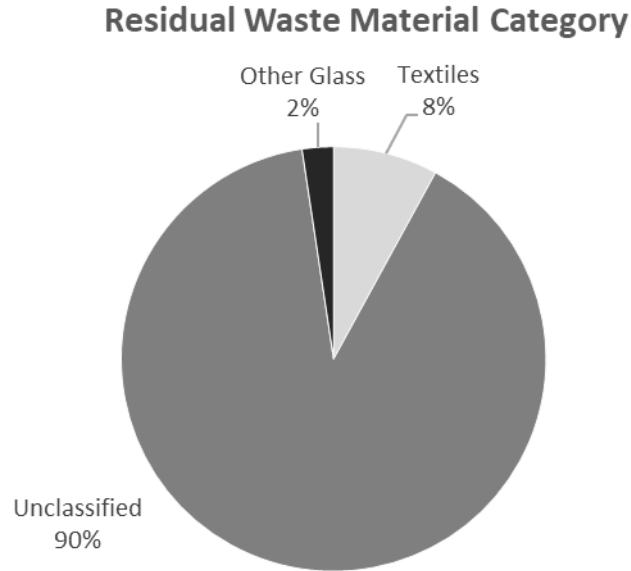


Figure 5.53. Residual waste material category in overall landfill stream audited at London Campus.

5.4.6 Hazardous Waste

Hazardous waste accounted for 1% of overall audited waste (Figure 5.1). Below, Figure 5.54 demonstrates that the hazardous waste category was comprised mostly (94%) other hazardous waste, and 6% batteries.



Figure 5.54. Hazardous waste material category in overall landfill stream audited at London Campus.

6.0 Discussion and Conclusion

The purpose of the landfill waste audit was to identify materials being sent to landfill that could have otherwise been diverted through other means. It also assists in developing waste reduction plans by establishing which types of waste to focus initiatives on, to have the biggest impact.

Fanshawe's waste diversion rate decreased by 8.8% in 2019, when compared to 2018 (Table 2.2). Improvements include a very large increase in the amount of items donated in 2019 compared to 2018, as well as an increase in textbooks donated or resold. Shredded paper decreased by 46.6%. Total waste generated by the College unfortunately increased by 7.5%, with the amount sent directly to landfill increasing by 33%. This indicates that Fanshawe needs to focus on waste reduction practices as much as proper diversion.

Analysis of audit data shows an underutilization of the organics stream. There was little change in the amount of organic material found in landfill from 2018 to 2019, suggesting that education efforts from the past year were not adequate. When analyzed by area and building, data showed that organics made up the majority of landfill waste in all cases. Most of this was food waste and paper/tissue including napkins, paper towel, food wrappers, and facial tissues. It is worth noting that the organics waste from LDB accounted for 65% of organics in all food area waste across all buildings audited. This mostly came from the culinary labs. Increasing campus-wide awareness and use of the organics bins will be a large factor in improving Fanshawe's diversion rate. If the College captured half of the organics currently going to landfill, the diversion rate would increase by at least 20%, and save up to 130 tonnes of GHG emissions annually.

Although there is still a lot of organics making their way into landfill, the amount of paper, plastics, and metal in landfill bins is certainly a success. For example, recyclable plastic contributed to 5% of the divertible materials in the landfill stream. This is a vast improvement from 2018, where the amount of recyclable plastic waste accounted for 21% of landfill waste. It speaks to users understanding inherently that these items do not go in the landfill bin.

Outside bins pose a particular challenge. Based on waste audit findings, community members are dumping household garbage into these bins. There was a large number of infant toys found, most of which accounted for the electronics category in this area.

Overall, based on audit sort data, Fanshawe could reduce its landfill waste by up to 70% by diverting all materials in available recycling streams. This would significantly reduce hauler fees and increase the amount the College gets reimbursed for recyclable materials. There are many methods to achieving this, with improved awareness and face-to-face education being the most effective.

7.0 Comparison to Previous Audits

Fanshawe's 2019 waste audit shows decreased diversion rate, compared to 2018 (Figure 7.1). However, this rate is still much higher than those of 2014-2017. Compared to 2014, the amount of waste diverted, has increased by 136 tonnes; the amount of total waste produced has gone down by 163 tonnes, or 12.7%. This is amazing progress, considering increases in enrollment and building space.

It should be noted that some data might have been gathered differently over each year, as a different organization performed audits prior to 2016, and there may have been differences in methodology. Recycling practices have also changed since 2014 due to a change in contractor in 2018, with more non-recyclable paper being accepted into the organics stream. This includes fountain drink cups, waxed paper, and other types of paper take out containers.

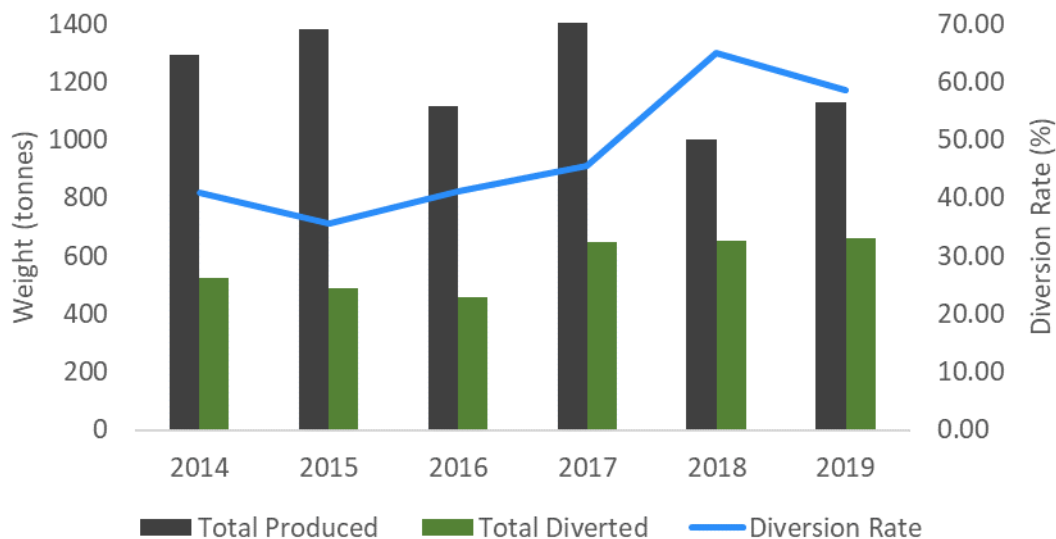


Figure 7.1 Comparison of total waste produced and diverted from 2014 to 2019.

There are a number of changes noted when comparing landfill audit data from 2018 to 2019. The amount of office paper recycling produced at the College has decreased by 23%, owing to improved use of paperless business methods in offices and more course work moving to paperless formats.

Overall office waste composition improved significantly. The amount of recyclable items found in landfill decreased by 15%, organics decreased by 14%, and proper landfill waste increased by 29%, which is what we want to see in these cases. Ideally, over time, we will see an increase in the percentage of true landfill waste in landfill bins, and a decrease in materials that could otherwise have been diverted. In hallway bins, 10% less waste was recyclable plastics, although the amount of compost increased by 5%.

Each building showed changes in some areas of landfill composition compared to last year's audit. Although the amount of compost found in B building waste increased by 23%, recyclables decreased by 41%, which is a huge improvement. In D and H buildings, recyclables decreased by 12% and 22%, respectively. LDB showed a 14% decrease in the amount of recyclables in the landfill stream, however there was a large increase (15%) in compostable material found in this stream.

8.0 Waste Reduction Work Plan and Recommendations

8.1 General Recommendations

8.1.1 Data

To improve data reliability, it is important to capture and report material weights. All waste leaving the College, whether it is through a hauler or the receiving department, needs to be weighed and recorded in a database. This will ensure accuracy of data, and assist in creating a more focused and measurable waste management plan. Over the past year, efforts by the College's receiving staff have improved collection of data from specialty recycling streams, however, that data is not always kept secure or electronic, and therefore gets misplaced.

Fanshawe's waste hauler does not weigh roll-off containers, instead recording an estimate per pick up. It is recommended Facilities Operations and Sustainability work with the hauler to get accurate average estimates to use in these cases. For organics, weighing a bin full of food waste and a bin with mostly tissue/paper in it and taking that average will give a decent estimate. This should be done a couple times a month to verify the estimate. This same process can be repeated for paper collection bins.

8.1.2 Awareness

Creating awareness about the impacts of waste can make a difference in the decisions people make. Instead of just advertising that Fanshawe has certain diversion programs, it is ideal also to advertise why it is important to use them. For example, running a campaign to educate staff and students on the greenhouse gas impact of not composting.

Another way to build awareness on the impacts of certain waste on the environment would be to have a focused topic each month where everyone is encouraged to either reduce, reuse, or recycle certain items, and reasons why. For example, September could be reusable water bottle month, where everyone is encouraged to participate, and information pages advertised, explaining the process of bottling water, the environmental impacts, etc.

The College should hold engagement events on campus every October, during Waste Reduction Week, to promote waste reduction and diversion. This could be in the form of a trade show/fair or symposium with guests from different sectors and a lot of involvement from the waste hauler contractor.

A sustainability column should be taken out in the student newspaper, to provide an avenue to regularly educate the College community about sustainability issues, what the College is doing, and to make sustainability thinking more prevalent. This is something that should be consistent, so people know to look for it. A journalism student could be hired to write articles.

An engagement program should be developed for staff and faculty to ensure all employees have the same information regarding proper waste diversion on campus. An option would be to include a link on Fanshawe's internal portal main page, or requesting space on the annual health and safety calendar that is sent out. A representative could also request to attend program and divisional meetings, to confer one-on-one with employees. The N.E.W. Employee Orientation program would also be a great way to introduce new full-time employees to sustainability practices on campus.

Finally, increased presence at orientation, student events, and in the classroom is essential to engage the student body face to face and promote the use of all diversion streams. In addition, attending faculty meetings to present the findings of the waste audit could have a positive effect, by showing

employees the sort of impact they could have. Unfortunately, just sharing the waste audit online is not effective in creative awareness of initiatives at Fanshawe, and areas that need to be improved.

8.1.3 Vendors

Work with on campus food vendors to decrease the amount of waste produced on site. For example, Subway could be encouraged to ask people if they want a bag, instead of automatically bagging sandwiches. Staff in Oasis kitchens should be encouraged to always ask if meals are “for here or to go”. This will prompt some students to think about their choice instead of defaulting to the disposable container.

When going out to tender contracts, keep as much consistency as possible. Over the past few audits, what items are placed in which bins, and what is acceptable in recycling has changed numerous times. This makes the process confusing to users, who may continue with the old way, or refuse to continue diverting waste because of the changes. If there are necessary changes, what they are and the reason for the change needs to be very clearly communicated en masse.

8.1.4 Policies

The Fanshawe Eco-Advisor Committee is in the process of implementing a sustainability policy to assist the College in becoming more sustainable. A guideline that will see all events at Fanshawe become zero-waste will be part of this policy. The policy outlines what people can and cannot bring into the College for their events, as well as what kinds of waste are suitable for disposal. The FEA Committee also created an action checklist and a certificate program to make help the event holders hold zero waste events easier. Holding zero waste events throughout the College will help create a sustainable culture. It will greatly raise the awareness of waste reduction and diversion and set an example of zero waste operations.

Sustainable packaging can greatly reduce and divert the amount of waste in the waste stream. Review current purchasing policies to ensure guidance is given for the purchase of environmentally friendly products, especially products with less packaging and/or with recyclable packaging materials. Less packaging waste means less single use plastic, especially Styrofoam, and less cardboard waste.

8.1.5 Provincial Programs

Fanshawe should become a regular participant in the Waste Reduction Weeks hosted by the Recycling Council of Ontario. This is an annual event to encourage waste reduction initiatives and lifestyle changes. More information and downloadable resources can be found on their website at https://www.rco.on.ca/wrw_ontario.

The provincial legislation in Ontario for Food Waste is aiming to reduce the amount of waste that is created through the Industrial, Commercial, and Institutional Sector (ICI). The Ontario Government has put forth a Food and Organic Waste Framework to help mitigate the amount of waste created from both the consumption and production demands. The Food and Organic Waste Framework outlines 17 action items in their timeline that are set to occur between 2018 and 2021. A number of these action items may impact Fanshawe directly, such as Action Item #6: Province to support research aimed at reducing and recovering food and organic waste”. The Provincial government is looking to invest in further research and technologies to help institutions develop novel approaches to recover organic waste. There is potential for funding for food reduction research to help improve the College’s current practices of waste collection.

8.2 Category Specific Recommendations

8.2.1 Organics

The culinary programs need to enforce waste diversion practices in kitchen labs. Currently, organics waste from LDB accounts for 65% of organics in all food area waste across all buildings audited. Lab technologists and faculty need to be informed and encouraged to make sure students follow waste diversion guidelines. This could be done through orientation workshops, mandatory training before students enter the lab, and meeting with faculty and technologists to make sure they understand what is expected of them. It is also recommended that instructors in the labs are consulted to ensure the expected practices will meet their needs while improving diversion.

There are still some waste diversion stations across Fanshawe that do not have organics bins as part of them. More organics bins should be added throughout the College to encourage their use. If students are eating in class or while moving between classes, it is unlikely they will seek out a cafeteria to properly dispose of their food and other organics waste. All lounge and seating spaces should have organics bins available, as people will tend to eat in those areas. Organics bins should become commonplace with all sets of bins.

Currently, staff members work in cafeterias over lunchtime most days during the week, with the purpose of encouraging students to divert their waste properly. This practice has not shown much success, based on the amount of organics still going into landfill in B- and D-buildings. A rework of this initiative is imperative to make the time spent more effective. Possibilities include prizes, whistles, games, etc.

8.2.2 Paper

Set all printing defaults to two-sided printing on employee and student computers, for printers that have the capability. If IT Services cannot implement this in a campus-wide rollout, having a reward campaign where anyone who changes their default will receive a prize would be effective.

Marketing documents are continuously over ordered, whether it is program specific handouts, or college-wide handbooks. Discussions with Reputation and Brand Management and the Registrar's Office on ways to reduce amounts are essential to combating this wasteful practice.

It is essential to review availability of office paper bins and their location.

8.2.3 Plastics

One thing that will greatly reduce single-use plastic waste in landfill is Oasis switching from plastic to compostable to-go containers. This is currently under investigation. It is recommended that Fanshawe Sustainability follow up with Oasis stakeholders to ensure the best alternatives possible are chosen.

Instituting a plastic bottle ban is ideal, though very challenging. The majority of plastic bottles come from vending machines. To change this, contracts with Coca Cola would have to be amended to only allow aluminum cans in vending machines.

Retail services is in the process of phasing out single-use plastic bags, and will instead be offering reusable bags for purchase, as well as encouraging people to bring their own bags, carry their items in hand, or use their backpacks.

8.2.4 Electronics

Better tracking of e-waste and assets is essential for accurate data collection. A proper system needs to be implemented, whereby IT employees properly mark obsolete electronics so that asset disposal employees know which items can be sold and which need to be sent to electronics recycling. It could be as simple as a coloured sticker system. This would significantly increase the number of electronics being resold, reducing the amount that is being sent for recycling, also creating revenue for Fanshawe.

Improved advertising of proper e-waste disposal on campus will help to reduce the amount found in landfill. Offices can send any e-waste to receiving for proper disposal, though they might not be aware of this. It might also be good to include small e-waste bins in offices, to prevent individuals needing to be responsible for proper disposal.

8.2.5 Paper Coffee Cups

A reusable mug program is essential to reducing the number of paper cups found in waste streams. Fanshawe College disposes of approximately 2 million paper coffee cups to the landfill every year, which is roughly 6.5% of total waste sent to landfill annually. The reusable coffee mug program will not only reduce the amount of total waste but also raise the awareness of having a sustainable and responsible lifestyle. Other Colleges and Universities have successful reusable mug programs. It is essentially to put together a case study of these programs to see what would work best for Fanshawe. Vendors need to be included in the entire process.

Reusable mugs save you \$0.10 on every fill up at Tim Horton's. Increased advertising of this benefit could improve awareness and give people a monetary incentive to bring their reusable mugs.

Another opportunity to raise awareness would be to have volunteers monitor line-ups and loudly award free coffees to anyone in line with a reusable mug. Word of mouth will spread this incentive, which will increase the number of people using them.

8.2.6 Assets and Equipment

When departments are ready to upgrade old equipment, it is recommended they contact the Sustainability Coordinator to evaluate the possibility of items being donated, resold, or recycled. This can be accomplished through the Management of Change Process that is already in place.

There needs to be more attention toward improving data collection for asset surplus sales. Recently, Sustainability Assistant Work Study students have been working with asset managers to record numbers before and after sales, to have a more accurate estimate of e-waste and other asset weights. This needs to continue on a regular basis. It is recommended that a digital system for recording asset disposal is created and used.

8.2.7 Donations

Create and disseminate a list of standard donation recipients that can be used for items in good condition. This will allow students and employees to easily donate items without needing to do the research themselves. It will also be a good avenue to stress the importance of collecting data and tracking the weight of items donated.

8.2.8 Specialty Recycling

Increased awareness of Fanshawe's cigarette recycling program would improve participation immensely. This could be in the form of volunteers walking around to smoking areas and talking to people there, as well as giving prizes to those they see using the disposal units.

The College should explore additional opportunities to divert other specific materials through continued use of Terracycle programs and other companies that may exist. Opportunities include zero waste boxes for nitrile and latex gloves or used toothpaste tubes and brushes from the dental program.

Appropriate training on specialty waste collection needs to become a regular occurrence for custodial staff. Over the past year, very little coffee pods were collected and dropped off at the collection bins. Unfortunately, the bins in office kitchens are being emptied and the bag of coffee pods put directly into the garbage.

8.3 Building Specific Recommendations

8.3.1 B Building

There is a large and very busy cafeteria in B building, where the majority of post-consumer food waste for this building is generated. Targeted engagement programs would likely improve diversion. Also, having examples of what is compostable from the vendors at that cafeteria posted on the bins would help to reduce confusion. In this case, pictures specific to Smoke's Poutine

The office in B building had 63% residual waste, which was mostly a large bag of black powder. It is assumed this was toner ink that was not properly disposed of. Of the organics, food waste and paper tissue made up the most of it. It is recommended a meeting be held with B office staff and faculty to discuss proper waste diversion, as well as a more comprehensive bulletin explaining where the main culprits go. It is also essential that users are reminded of how to properly dispose of e-waste and hazardous waste.

Hallway bins in B building need to be reviewed to make sure there are enough compost bins available. This building has a lot of lockers, so is very limited in wall space. Some other bins, such as paper, may need to be replaced with compost.

8.3.2 D Building

There are two very busy cafeterias in D building, where the majority of post-consumer food waste for this building is generated. Targeted engagement programs would likely improve diversion. Also, having examples of what is compostable from the vendors at that cafeteria posted on the bins would help to reduce confusion. In this case, pictures specific to Harvey's, Subway and Pizza Pizza.

The amount of paper and food waste found in D office waste suggests a review is needed of bins available throughout the offices, as well as some targeted education for staff and faculty.

D classrooms had a lot of wood and paper waste. It is recommended that a review of bins takes place. There are some art labs that may not have adequate recycling bins. The availability of wood waste collection in each art lab also needs to be ensured.

8.3.3 H Building

Increased paper waste in H classrooms is likely due to paper bins being replaced with compost bins. Unfortunately, with a number of these classrooms being labs for visual arts, a lot of paper waste is generated. It is recommended that paper bins be put back into these labs. Discussions with program coordinators will help reveal which rooms to focus on.

8.3.4 M Building

M building office waste contained a large portion of paper waste, but was mostly food and paper/tissue organic waste. It is recommended that M office bins are reviewed to make sure there are recycle bins near landfill bins, and targeting education is done for staff and faculty. Unfortunately, this office does not have a lot of space available, so there may need to be some creative solutions to allow for multiple streams.

8.3.5 LDB Downtown

With culinary labs in LDB accounting for 65% of organics in all food area waste across all buildings audited, it is recommended that focused education is done in culinary programs before students start using the labs. The infrastructure is in place, and all labs have compost bins. There now needs to be more emphasis on educating students and having professors monitor use during labs.

Production of materials for professors to deliver to culinary students, and training for the professors themselves, will help improve food waste diversion at LDB.

The Chef's Table Café currently uses compostable cups and stir sticks, however there is no compost bin provided for these materials. It is recommended a bin be installed for these items. Space is at a premium here, so it may need to be a small counter-top bin that gets emptied periodically by those working in the café. A discussion with coordinators will help to determine the best course of action.

8.4 Area Specific Recommendations

8.4.1 Food Areas

Recent updates to the large waste stations in food areas removed paper bins and added compost. These bins now each have 4 compost, two containers, and two landfill receptacles. Rings around the holes on top were also added, to help reduce confusion surrounding which hole corresponds to which bin. Mini audits of these bins will help to determine whether these changes have been successful in diverting more waste from landfill.

Providing prizes as giveaways to the staff assigned to monitor the bins over the lunch hours may improve perception of their roles and make them more effective.

8.4.2 Hallways

Due to the variety of items accepted into the organics stream at the College, it is essential to make sure there is always a compost bin available where other bins are. There have been advances over the last couple of years, however there is still room to improve.

A waste audit specifically of paper bins to determine contamination rates is ideal. It is possible that paper bins are not as essential and could be converted to compost bins where needed.

8.4.3 Classrooms

There is still a lot of recyclables making it into landfill bins in classrooms, a lot of which is paper and plastic. There may be a need for some classrooms to have paper bins put back in them for this reason. A review of bins in classrooms is needed.

Organics bins in classrooms have not yet reduced the amount of organics going into landfill bins. It is possible that organics bins need to be placed first when exiting classrooms. It is recommended that this is discussed with custodial staff to make sure bins are always put back in certain orders to promote this.

8.4.4 Offices

It is recommended that materials are disseminated to offices to encourage proper diversion practices. Education opportunities need to be investigated, which could take place at divisional meetings.

Mini office waste audits of all 4 streams should be performed to determine how each office is doing and areas of improvement. The results could be posted in the office and help tailor education toward items commonly put in the wrong bin.

Creation and implementation of a green office challenge and reward system would help bring sustainability to the forefront of people's daily lives at work, and create some friendly competition between offices.

8.4.5 Outside Bins

There unfortunately isn't a lot that can be done to prevent community members from using Fanshawe's outside bins. One thing that could help would be to reduce the number of bins outside. There are currently 78 sets of bins at the 1001 Fanshawe College Blvd campus alone, which is excessive and could be contributing to the general lack of consideration given when people are disposing of waste. If the number of bins were reduced, it would also deter community members from using them, as it would be less convenient for them to find bins. It is recommended all outside bins be reviewed and catalogued, and have excess bins removed. An audit after doing this is necessary to see if diversion rates improve.

Appendix A

Waste audit categories and descriptions used. Material sorting categories were used for analysis purposes in this report. Sorting category was used during the audit and data was used to direct the Waste Reduction Work Plan and Recommendations.

Material Category	Sorting Category	Description	Waste Category
Paper	Office Paper	Bound Books	Recyclable
		Fine Paper	
		Envelopes	
		Brown Envelopes	
		Manilla Folders	
		Photocopier Paper Wrappers	
		Post-it Notes	
	Writing Pad Paper	Recyclable	
	Newspaper and Mixed Paper		Brown Wrapping Paper
			Coloured Paper
Newspapers			
Glossy Magazines and Paper			
Plastic - Recyclable	#1 PET and #2 HDPE	#1 and #2 Plastic Containers	Recyclable
	#3, 4 & 7 Plastics	Rigid Plastic Products	
	#5 Tubs	Polypropylene Tubs and Lids	
	#6 Polystyrene	Rigid Polystyrene Products	
	Polycoat/Aseptic Containers	Milk Cartons, drinking boxes, ice cream containers	
Plastic - Non Recyclable	Other Plastic	General Non-Recyclable Plastic Materials, #6 Expanded Foam (Styrofoam), lids, Grocery bags, Non-Recyclable Film (e.g. chip bags, cling wrap, outer garbage bags etc.)	Landfill
Glass	Clear & Coloured	Jars, Bottles etc.	Recyclable
Metal	Food and Beverage Cans	Steel and Aluminum	Recyclable
	Other Metal	Other metal products	
Cardboard	Corrugated Cardboard	All Corrugated Cardboard Except for Waxed	Recyclable
Organics	Pre-Consumer	Food Preparation Waste (Coffee Grinds etc.)	Compostable
	Post-Consumer	Food from Plate Scrapings and Lunch Bags	
	Take out containers/trays	Paper take out containers, plates, pizza trays	
	Paper Cups	Take-Out Cups, fountain pop cups	
	Paper/Tissue	Paper Towels, Napkins, Facial tissue, waxed paper	
Wood	Other Wood	Other Wood Waste	Recyclable
Electronics	Electronics	Computers, Electrical Equipment, etc.	Recyclable
	Cartridges	Printer and Toner Cartridges	
Construction & Demolition	Construction & Demolition	Construction and Demolition Materials	Recyclable
Miscellaneous	Office Supplies	Reusable - paper clips, etc	Reusable
		Recyclable - pens, markers, mechanical pencils	Recyclable
	Coffee Pods	Various Types of Single-Use Coffee Pods	Recyclable
	Textiles	Reusable	Reusable
Hazardous	Batteries	Rechargeable and Non-Rechargeable	Recyclable
	Fluorescent Bulbs	Tubes and Compact bulbs	Recyclable
	Other hazardous Waste	Paints, Full Aerosols, Medical Waste etc.	Recyclable
Residual Waste	Textiles	Non-Reusable	Landfill
	Office Supplies	Non-reusable or recyclable	
	Unclassified	Non-Classified Materials	
	Other Glass	Other Glass and Broken Bottles	