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SANDBOX

Waste Audit Report

June 2019

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Summary

A solid waste audit was conducted at The Sandbox Centre by Busch Systems' waste diversion team on June 13th 2019. The purpose of this study is to analyze performance of The Sandbox Centre's collection program during an event. The material analyzed was accumulated from a public event held the day before, June 12th 2019, with approximately 25 people in attendance.

This audit was executed by measuring weight of material collected at all stations throughout The Sandbox Centre. The Sandbox was split into four divisions; Work Spaces, Washrooms, Kitchen, and Boardrooms in order to understand the distinct generation patterns of each space. It was found that in all divisions combined, organic waste made up the largest percentage of material generated. Material from the event included 33% organics, followed by waste at 30%, mixed recycling at 28%, and paper at 9%.

The combined weight of material collected has an average diversion rate of 37%. However, if organic waste was being properly diverted average diversion would be 70%. Further analysis of material composition from sample stations revealed moderate contamination with wooden plates and paper towel causing confusion at the bin. Analysis of the waste profile from this event allowed Busch Systems' waste diversion team to make recommendations on how to reduce contamination and improve overall diversion rate.

Introduction

The Sandbox Centre for Shared Entrepreneurship and Innovation is located in downtown Barrie, Ontario Canada. The Sandbox focuses on connecting businesses of all sizes with professional development, peer support, and opportunities for growth in one meeting space. Frequent meetings and public events are hosted at this location, meaning the individuals using the waste collection system are not consistent. Busch Systems conducted a solid waste audit on June 13th 2019, analyzing the waste generated at a public

event. The purpose of the audit is to assess the waste diversion program and develop next steps and recommendations for improving the system. Busch Systems Waste Diversion Specialists will continue to support The Sandbox with implementing recommendations.

The building consists of communal working spaces, washrooms, private boardrooms, and a kitchen area. A separate office area of The Sandbox is shared with The City of Barrie employees; which was not analyzed for the purpose of this study.

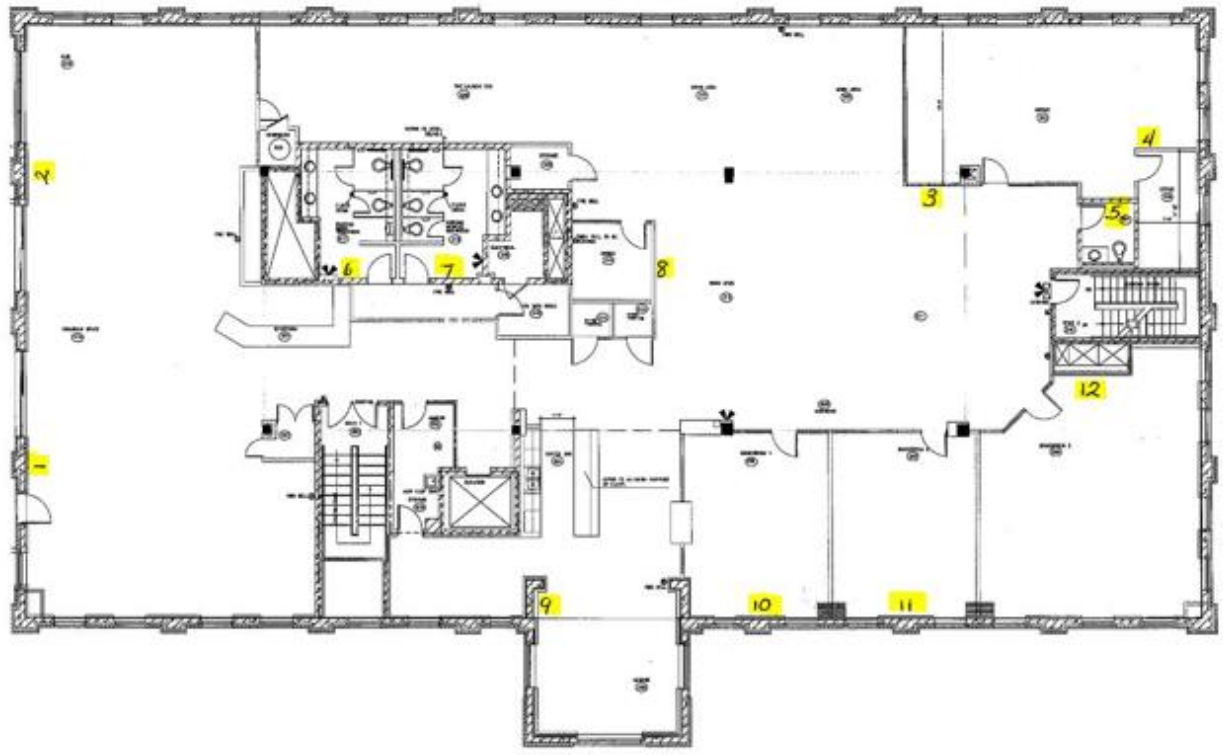
The data collected throughout this study was entered into the Resource Center analytics software. This generated station and stream specific insights, graphs, and charts reflecting waste profile information.

Terminology

- **Contamination:** presence of non-accepted material in a specified diversion stream, such as waste in the recycling or organics stream.
- **Composition:** the specific materials that make up the refuse profile.
- **Diversion Rate:** expressed as a percentage; the amount of refuse diverted from landfill by recycling and organics collection.
- **Division:** a high-level grouping of the areas being audited. There are several different stations within each division. Example: The Women's Washroom is a station that exists in the Washroom division.
- **Organics:** biodegradable material, including food waste, that can be collected for composting.
- **Recyclables:** material that can be reprocessed into feedstock to make new products.
- **Station:** group of collection bins in the same immediate location; each station including multiple streams. Example: waste, recycling, and organic bins together make one station.
- **Stream:** distinct categories by which refuse material are separated for collection; The Sandbox has four collection streams for waste, organics, mixed recycling (containers), and paper.
- **Waste:** disposed material that cannot be recycled or composted; sent to the landfill.

Station Locations

The building has a total of 12 collection stations. For the purpose of this audit, stations were split into divisions of Work Space, Washrooms, Kitchen Space, and Boardrooms. Refer to the Figure 1 below for station names and location.



Work Space	Washrooms	Kitchen Space	Boardrooms
1: Collision Space 1	**6:** Women's Washroom	**9:** Kitchen	**10:** Small Boardroom 1
2: Collision Space 2	**7:** Men's Washroom		**11:** Small Boardroom 2
3: Common Space 1	**5:** Small Washroom		**12:** Large Boardroom
8: Common Space 2			

***4** represents the City of Barrie's office station, which was not analyzed for this audit*

Figure 1: The Sandbox Centre floorplan, showing station locations.

Current Collection Procedure

The Sandbox Centre has a system of centralized waste and recycling stations to which users are expected to take their discard materials for sorting. The Sandbox Center currently has indoor containers that collect

waste, mixed recycling, paper, and organic streams. Paper is sorted separate from mixed recycling (containers). Although organic streams exist, materials collected in this category are currently going to landfill. Therefore, weight of organics was not included in diversion rate calculations. The container capacity and number of streams vary depending on location.

Within the Washroom division there is one women's washroom, one men's washroom, and one small washroom. Stations within this division are made up of two white Busch Systems Spectrum containers (Figure 2). Each stream has a capacity of 8-gallons and is labelled for collecting waste and organics to account for material generated in this area.

The two stations in the Collision Space are Busch Systems Summit containers (Figure 3). This station is triple stream with each compartment having a capacity of 15-gallons each. These stations are white with a colour coded lid and labels indicating waste, mixed recycling, and organics streams are available.

Figure 2: Spectrum Ellipse Slim washroom station

Figure 3: Summit triple stream Collision Space station

Two Triple stream Aristata containers form Busch systems are located in the Common Space (Figure 4). Each stream has a capacity of 15-gallons. Labels identify streams as waste, mixed recycling, and paper.

Figure 4: Aristata triple stream Common Space station

The Sandbox has three Boardrooms, one large and two smaller in size. These areas collect three streams with Busch Systems Billi Boxes (Figure 5). Each station includes waste, mixed recycling, and paper with a capacity of 10-gallons per container. Lids are colour coded, labelled to identify stream, and equipped with restrictive openings to communicate to the user what is accepted.

Figure 5: Billi Box triple stream Boardroom station

The Kitchen Space has one station of Busch Systems Spectrum containers (Figure 6). Containers are colour coded and labelled to identify streams for waste, mixed recycling, paper, and organics. Additionally, the waste container includes a label with a list of items accepted. The waste and organics streams have a capacity of 8-gallons while the mixed recycling and paper have 10-gallon capacity.

In addition to these stations, The Sandbox Centre recycles lanyards used by visitors. All components of the lanyards are collected in Busch Systems Waste Watcher containers (Figure 7). Employees then empty the bins and lanyards are reused at future events. This is a great reuse strategy that limits the need for new materials. The contents of the lanyard recycling program were not included in the scope of this audit.

All containers are serviced by facility staff twice a week on Tuesdays and Thursdays. Waste and recyclables are transferred to dumpsters for pick-up by the hauler. The Sandbox Centre shares waste and recycling pick-up with The City of Barrie office space within the same building. Organic material is currently going to landfill while The Sandbox Centre develops a strategy to have this stream properly diverted.

Figure 6: Spectrum quad Kitchen station

Figure 7: Lanyard recycling station

Methodology

Material generated at the June 12th event was left in containers until it was collected and analyzed on the morning of June 13th. For the purpose of this audit, all waste profile measurements and observations were recorded by weight value. The sample size of this event was small, generating a total of 19.2 lbs of refuse material.

Labels identifying location and stream were created by Busch Systems employees prior to the audit date. These were used when collecting, weighing, and recording data to identify the source of each bag (Figure 8). Bags were collected and labelled before being brought to a central

Figure 8: Busch team collecting and labelling material

area to be analyzed. Each bag was weighed in pounds on a mailing scale and data was recorded on preprinted audit sheets (Figure 9).

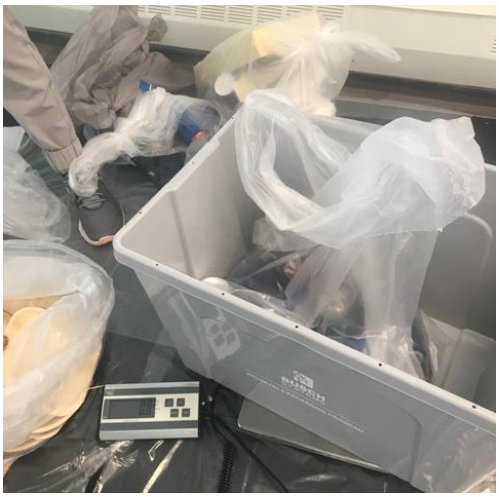


Figure 9: Weighing material

The two Collision Space stations, three Washroom stations, one Common Space station, the Kitchen station, and Small Boardroom 2 station were weighed. Weight data for the Large Boardroom and Small Boardroom 1 was not collected as these spaces were in use during the time of the audit. Weight data from one Common Space container was not collected as the bags were mostly empty with a few pieces of paper in two of the three streams (Figure 10).

A composition study of specific items in the waste profile was conducted for Collision Space, Common Space, Kitchen, and Washroom samples. The contents of sample stations were emptied, sorted by material type, and weighed by category. Categories with an amount of material too small to register a weight were recorded as less than 0.1 lbs.

Figure 10: Empty station in Common Space

Benchmark Observations

Due to the small size of the sample that was analyzed at The Sandbox Centre, data will only reflect the waste profile of the specific event that occurred on June 12th. In order to obtain data more reflective of day-to-day operations of the organization, a larger sample size and longer time period of assessment is needed. The waste audit revealed that the waste profile differed based on division. It was found that

materials such as paper towel and wooden plates were spread across multiple streams, indicating that users were unclear which stream these items belonged in.

All Divisions

Across all divisions, 5.8 lbs of waste, 5.4 lbs of mixed recycling, 6.3 lbs of organic material, and 1.7 lbs of paper was generated; totaling 19.2 lbs. The material assessed revealed the largest weight of material was generated in the Work Space division, followed by the Kitchen, Washrooms, and Boardrooms (Figure 11).

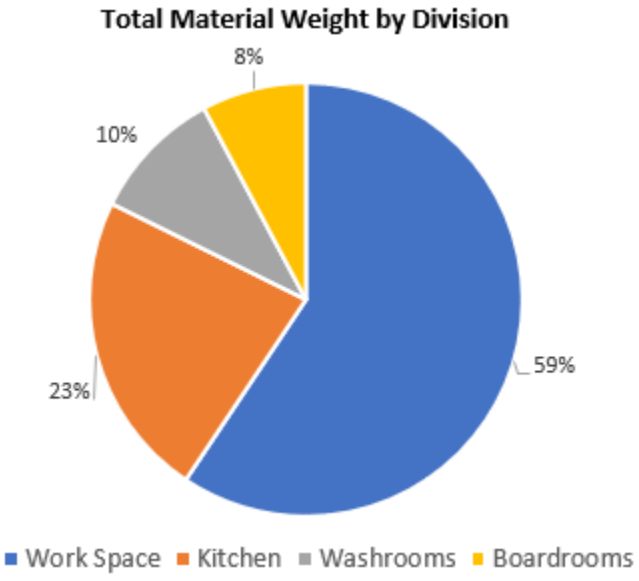


Figure 11: Graph of total material weight by division

By weight, data showed an average diversion rate of about 37% across all divisions for this event (Figure 12). Organic material is being source separated, but not properly diverted for processing; therefore, this stream is not included in current diversion rate. Upon analyzing the material collected from the event, a high presence of organic material generated from take-out or catered food was observed. If this material was being properly diverted, The Sandbox Centre's diversion rate for this event would have averaged at 70% (Figure 12). There was a high percentage of mixed recycling, including aluminum cans and plastic containers. Individual milk and cream containers were commonly found in the collection program profile.

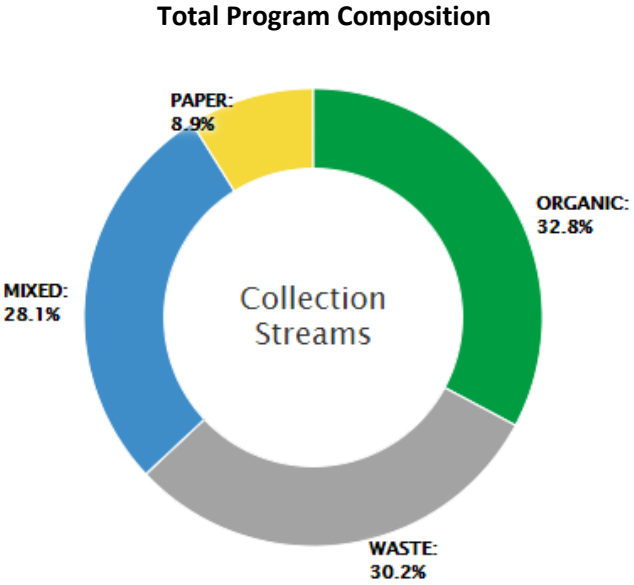


Figure 12: Graph of stream percentage over all divisions

Work Space Division

The division categorized as Work Spaces includes two stations in the Collision Space and two stations in the Common Space. As one station in the Common Space was near empty, weight data was unattainable for this bin. In total, stations in this division contained 3.7 lbs of waste, 4.1 lbs of mixed recycling, 0.8 lbs of paper, and 2.8 lbs of organics (Figure 13). Mixed recycling accounted for most material by weight, followed by waste, organics, and finally paper.

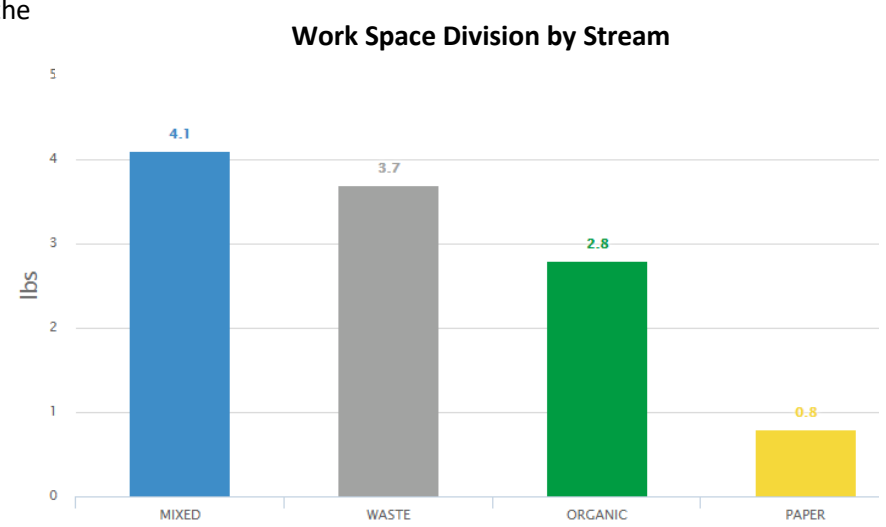


Figure 13: Graph of total stream weight in Work Space division

Majority of the material in this division was generated from the Collision Space 1 station (Figure 14). This shows that this was a high traffic and frequently used location during the event. Composition data was collected for the Collision Space 1 and Common Space 1 stations in this division.

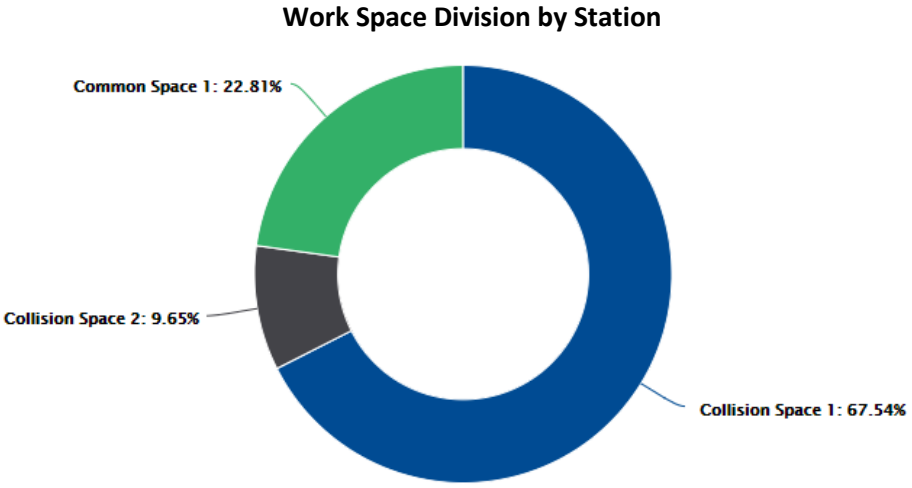


Figure 14: Graph of generation per station in Work Space division

Collision Space 1 Composition

Material from the Collision Space 1 station included about 35% mixed recycling, 34% waste, and 31% organics. Composition analysis showed top contributors in the mixed recycling stream were wooden

plates at 1.2 lbs, aluminum cans at 0.8 lbs, and plastics containers at 0.5 lbs (Figure 15 and 16). Top contributors within the organics stream include food waste at 1.5 lbs, wooden plates at 0.5 lbs, and napkins/paper towel at 0.4 lbs. Waste stream top contributors include wooden plates at 0.8 lbs, food waste at 0.9 lbs, and napkins/paper towel at 0.2 lbs. The waste stream was also composed of miscellaneous food packaging with weight that read below 0.1 lbs on the scale (Figure 17).

Figure 15: Aluminum cans in Collision Space 1 mixed recycling stream

Figure 16: Wooden plates in Collision Space 1 mixed recycling stream

Figure 17: Packaging less than 0.1 lbs in Collision Space 1 waste stream

Common Space 1 Composition

Material from the Common Space 1 station was comprised of about 35% mixed recycling, 35% waste, and 31% paper. Composition analysis showed main items within the mixed recycling stream were aluminum cans at 0.6 lbs and a plastic water bottle at 0.2 lbs. Mixed recycling was contaminated with liquids which are included in these weight values. Within the paper stream there was 0.4 lbs of paper and napkins that had been contaminated with liquids, 0.1 lbs of individual milk and creamer containers full of liquid, 0.1 lbs of take-out food packaging, and 0.1 lbs of take-out coffee cups, and polystyrene plates that registered as less than 0.1 lbs. The waste stream included 0.5 lbs of food waste, 0.1 lbs of napkins/paper towel, and less than 0.1 lbs of miscellaneous food packaging (Figure 18).

Figure 18: Miscellaneous packaging in Common Space 1 waste stream

Washroom Division

The Washroom division included stations within a women's, men's, and small washroom. 74% of the material was discarded in the organics stream and 26% in waste. This breaks down to the division having a total weight of 1.4 lbs in the organic stream and 0.5 lbs of material in the waste stream (Figure 19). The largest weight of

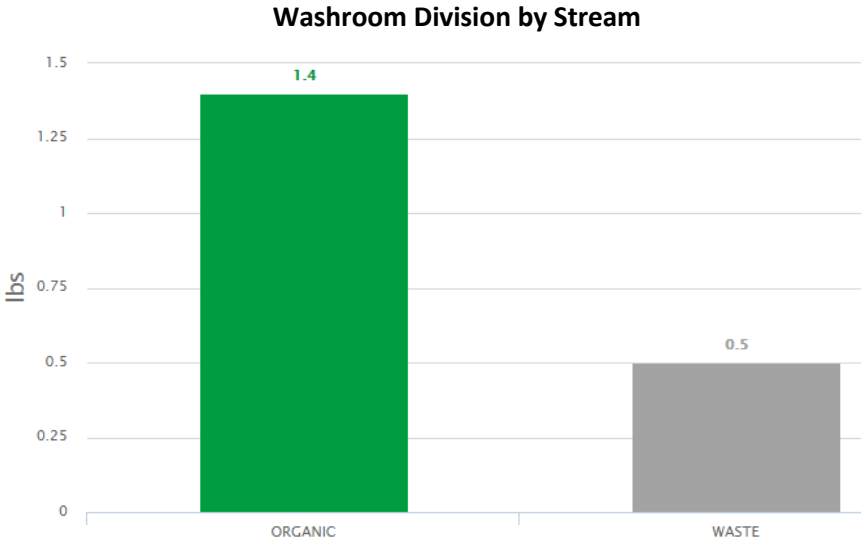


Figure 19: Graph of stream weights in Washroom division

material in this division was generated in the Women's Washroom station, followed by Men's Washroom, and Small Washroom (Figure 20).

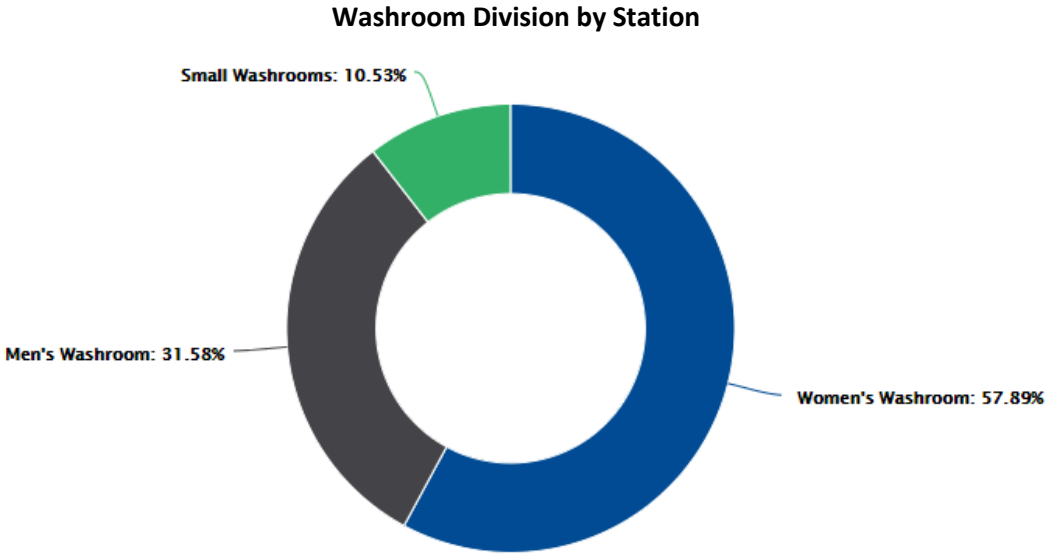


Figure 20: Graph of generation per station in Washroom division

Women's Washroom Composition

Within the Washroom division, material from the Women's Washroom station was further analyzed for composition. Assessing composition revealed that majority of the material in both streams was used paper towel. Two toilet paper rolls were found in both the organic and waste stream, which did not register a weight value on the scale. This station had 0.9 lbs in the organic stream and 0.2 lbs in the waste stream, with most paper towel correctly placed in organics (Figure 21). Correct sorting and proper organic diversion of all paper towel would potentially increase diversion rate to nearly 100%.

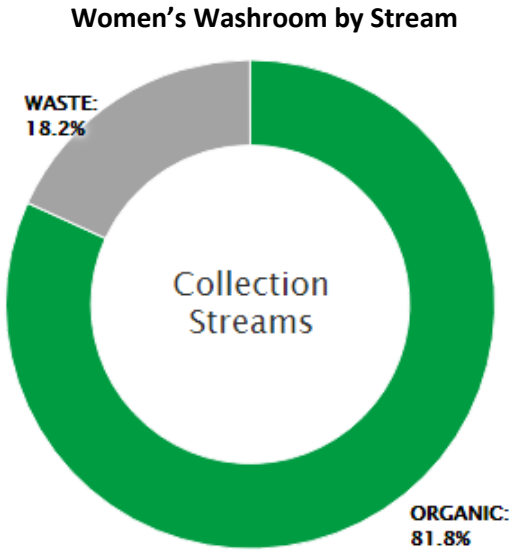


Figure 21: Graph of stream percentage in Women's Washroom station

Presence of paper towel in both streams suggests that users of the bins are unclear on which stream paper towel is collected in. As these stations have white labels on white bins and no colour coding, users may not be able to differentiate the organic from the waste stream.

Kitchen Division

The Kitchen division included 48% of material in the organic stream, 27% in waste, 18% in paper, and 7% in mixed recycling (Figure 22). Composition of the organic stream included 1.8 lbs of food waste, 0.2 lbs of napkins, one wooden plate and one coffee cup that did not register a weight. Top contributors to the waste stream were 0.6 lbs of individual milk and cream containers full of liquid, 0.2 lbs of wooden plates, and 0.1 lbs of food waste. The paper stream consisted of 0.6 lbs of mixed paper, 0.1 lbs of wooden plates, and 0.1 lbs of coffee cups. Top contributors in the mixed recycling stream were 0.2 lbs of aluminum cans and plastic yogurt cups and coffee lids less than 0.1 lbs.

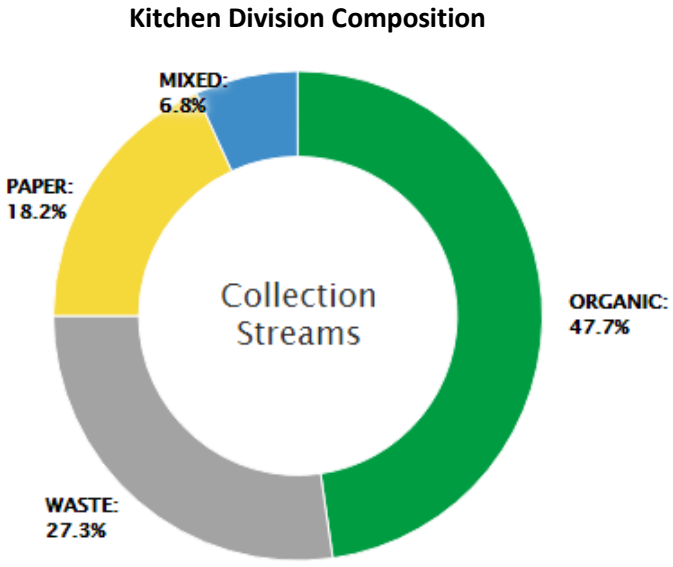


Figure 22: Graph of stream percentage in the Kitchen division

Boardroom Division

The Boardroom division is made up of one large boardroom and two small boardrooms, all of which have their own stations. Small Boardroom 2 included 0.4 lbs of waste, 1.0 lbs of mixed recycling, and 0.1 lbs of paper. This translates as mixed recycling accounting for about 67%, waste 27%, and paper 7% of total material (Figure 23). The Large Boardroom and Small Boardroom 1 were not measured as the waste diversion team did not have access to these locations during the audit.

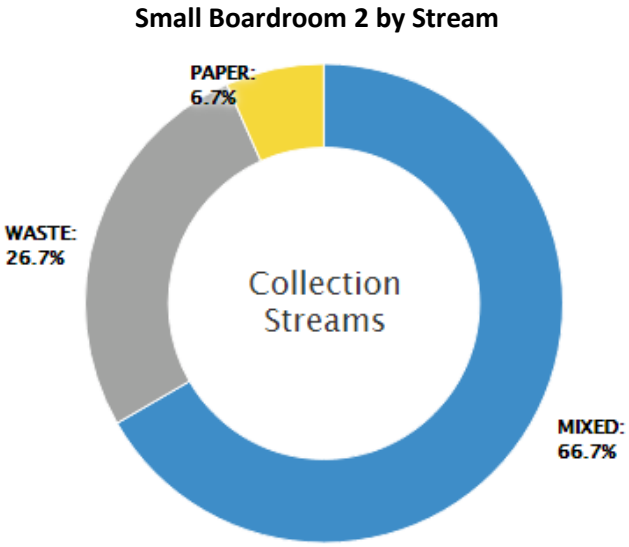


Figure 23: Graph of stream percentage in Small Boardroom 2 station

Conclusions

Although the sample size was small, the analysis at The Sandbox Centre provides understanding of what was generated at the public event held on June 12th. As this event was typical to others that The Sandbox Centre hosts, suggestions can be made for system improvements. This event generated a total 19.2 lbs of material, including 6.3 lbs of organics, 5.8 lbs of waste, 5.4 lbs of mixed recycling, and 1.7 lbs of paper. Results of the waste profile analysis confirms proper diversion of organic material would be highly beneficial to The Sandbox Centre's diversion rate; taking this event from a 37% diversion rate to 70%.

Visitors to The Sandbox are always different, meaning proper diversion needs to be clearly communicated at the bin. Waste analysis revealed that wooden plates and paper towels were being discarded in all streams. Take-out and catered food waste and associated packaging was commonly found, including

individual milk and cream containers. There was also a substantial volume of aluminum beverage containers that The Sandbox could be separating to return for a refund.

Recommendations

The Sandbox is encouraged to continue on with their journey in becoming a Green Office with the support of Busch Systems. Based on the results of the waste audit, the following recommendations have been made in order to improve the diversion rate of The Sandbox Centre.

Signage: Implement clear signage listing materials accepted in each stream at every station; if need be, contact the hauler for an accurate list. Common contaminants found when analyzing the waste profile should be included such as wooden plates, food waste, and paper towel.

Liquid Contamination: It was found that multiple paper and recycling streams were contaminated with liquids. This could cause the hauler to landfill material if deemed too contaminated. It is recommended that The Sandbox Centre communicates to users that liquids need to be emptied from containers before being recycled.

Washroom Labels: Accurate signage is best practice to include office-wide. Especially in washrooms, waste and organics bins are difficult to distinguish as they are both white with white labels that blend in. The current white apple core label identifying organics should be swapped for a paper towel icon in an alternative colour. This is critical to ensuring materials in this division are correctly sorted.

Organic Diversion: The Sandbox Centre is currently working to develop a solution to properly divert the organic material generated within the building. The Sandbox is encouraged to continue working with other local businesses and stakeholders on this.

Green Events Policy: The Sandbox Centre is encouraged to develop Green Guidelines for events and meetings that are catered. This should ensure that only reusable or compostable cutlery and plates are brought into the space and that food waste is minimal. Stocking full size milk and cream cartons can eliminate need for individual plastic containers.

Follow-up: After implementing the outlined recommendations, a follow-up audit should be conducted to assess any changes to diversion and contamination rates.