

Waste Audit at Wilfrid Laurier University

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For Dr. Robinson

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As Wilfrid Laurier University students we decided to undertake a waste audit at our own school. We decided upon doing the waste audit on our campus for three reasons: because it was closer, more familiar and to help improve waste management at our school. Wilfrid Laurier is not as integrated or conscious about waste as the University of Waterloo and boasts no programs like WatGreen. After talking with John Campbell, Manager of Facilities Operations in the Physical Resources department we decided on conducting an audit on the main concourse and lounge area located in the centre of campus. When discussing several audit options Mr. Campbell noted that this concourse area produced by far the most amount of garbage on campus. We therefore selected to conduct a waste audit on the concourse area of campus because it would hopefully make the biggest impact on waste management at our school.

Auditing and Sampling Methods

The first directive taken was to contact Dr. Byrne, head of the Geography and Environmental Studies department to see about who we would need to get permission from and how to organize the audit. We were directed to John Campbell, who is the Facilities Operations Manager at Laurier.

After an initial meeting it was planned to audit the Concourse and Torque room, which are beside each other and widely used throughout the day by the student population and therefore a high waste producing area. Within this large area, it was decided to create four smaller areas by which the waste would be divided during the audit. The first would be the Concourse, which is a large open area where the student body congregates as well as being the site where marketplaces and school fairs take

place. The second is the Torque room eating area, which has a Second Cup kiosk within the area. The third category is the Torque room sitting area, where students sit between classes and study. The fourth category included the main printer room and the two computer labs that are adjacent to the printer room.

In order to get a clearer picture of the types of waste and recycling facilities that were located within the audit area pictures were taken both while it was clean and while it was messy. This helped us with the visual portion of the audit and allowed us to specifically target where large amounts of recyclables were being thrown out in relation to recycling bins.

With the four different areas laid out, computer labels were created for the janitorial staff to label each bag of waste. We left it up to the staff to pick a sample of each area's waste, which was usually one to two large garbage bags for each of the four areas. Unfortunately, we did not obtain the total sample of bags for each day or for the week so our future recommendations will reflect this.

During the meeting, the audit was originally planned to start two weeks from that time, to be completed every other weekday and lasting for 5 audit days. However, it seemed that there was some miscommunication and so another meeting was set up with Mr. Campbell to finalize the audit plans. This time the audit was planned to start on March 3rd and continued every weekday morning until March 9th.

The waste within the school is taken out daily, except on weekends, which is collected on Monday. In order to get a representative sample, the audit was completed over a week, with audits being done on five days. This ensured that one entire week, including waste from the weekend, was included in our waste audit. The week on which

the audit was carried out on was a typical week at Laurier during the school year. The garbage was typically collected between four and six am, so in order to be as little nuisance as possible to the collection staff, the audits were carried out between six and six-thirty a.m.

It was decided to separate the waste audited into seven categories for further analysis. Since no audit had previously been done in this area to our knowledge, we felt that seven categories would be sufficient enough to get a representative sample of the types of waste that could potentially be diverted. The seven categories are listed as follows:

- 1.PET Plastics
- 2.Other Plastic
- 3.Glass
- 4.Aluminum
- 5.White Paper
- 6.Coloured Paper/Newsprint
- 7.Garbage and Other Waste

Wilfrid Laurier follows the Region of Waterloo's guidelines on what is recyclable. The other plastics category would not be recyclable under this system but we thought it would be useful to separate these plastics to see if there was enough to warrant new types of recycling possibilities or waste diversion.

A combination visual and hand-sorting audit was carried out. First each bag was weighed for the total weight. After each bag had been sorted, each category was weighed and noted for the main types of waste within them (i.e. Many times most of the

other waste consisted of Tim Horton's cups). As well, a manual count of the bottles, cans, and plastic containers was recorded because many times their weight was low but there were a lot of them within the sample. All this data was recorded in a spreadsheet format for future analysis and recommendations. An error percentage was calculated for each area that the audit was being conducted. This allowed us to factor in any miscalculations done during the weighing of waste. In order to obtain this percentage we subtracted the percentage total for each category by 100%, giving the remaining percentage that was missing or calculated incorrectly.

Analysis of Laurier Waste Audit

We feel that it is beneficial to discuss any data or observations that were out of the ordinary in regards to the types and amounts of garbage that were found on various days of the week. It is important to know what influences the consumption that leads to the disposal of large quantities of garbage on each given day so that we can make better inferences as to what are the contributing factors as well as how to lower these rates. Table 1 outlines the summary of waste that was found during the audit. Specific amounts can be found in the Appendix.

Table 1: Summary of Audit Wastes

| Daily Summary of Total Weight by Category (kg) | | | | | |
|--|-------|-------|-------|---|--|
| Category | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 |
| White Paper | 0.04 | 0.2 | 0.22 | 0.5 | 0.15 |
| Coloured Paper | 0.6 | 0.01 | 0 | 0 | 0.01 |
| Newsprint | 2 | 0.1 | 0.22 | 2 | 0.36 |
| Food and Beverage Glass | 3.1 | 4.6 | 2.5 | 13 bottles | 14 bottles |
| Food and Beverage cans | 0.7 | 0.5 | 0.6 | 24 cans | 18 cans |
| PET plastic bottles | 2.4 | 3.9 | 2.8 | 26 bottles | 21 bottles |
| | | | | 1 large juice container, 15 cups, 15 large takeout containers, 5 small takeout containers | 3 cups, 19 large takeout containers, 10 small takeout containers |
| Other Plastic products | 1.2 | 1.8 | 1.4 | | |
| Miscellaneous | 12.8 | 14.2 | 16.9 | 10.6 | 12.5 |

Day 1 – Wednesday, March 3rd

We began the waste audit on a day of the week that we thought would represent an average garbage distribution and quantity. This way we would have a better idea of what should be expected on days such as Monday, which we assumed would have a higher accumulation of waste from the weekend. Wednesday’s total garbage weight was 28.6 kilograms for 6 bags. In comparison with weights from other days, we were surprised to find that this was in fact the heaviest total weight. It is hard to pin point the reason as to why there was so much waste collected on this day, as the garbage is collected on a daily basis, but it can be assumed that perhaps the janitorial staff had randomly chosen bags with more garbage content just by chance.

Day 2 – Thursday, March 4th

The total weight of the garbage collected for analysis was similar to that collected on Wednesday. Weighing in at 27.2 kilograms, it was the second largest amount of garbage collected through the whole process of auditing. We would make the assumption

that this was caused by the release of the weekly Cord newspaper, which comes out each Wednesday; however the recorded weight of newsprint came to only 0.1 kilograms. This was partially due to contamination caused by unfinished beverage disposal in the Torque Room Lounge garbage bins. When we separated the waste, we put the wet newsprint into the miscellaneous waste category, therefore adding no weight to the newsprint section. After the audit process was completed we asked the janitorial workers what they do with the newspapers that they find laying around the general area that our audit covered. They proclaimed that all the collected newsprint gets bound and recycled at the end of each day. This left no obvious reasons as to why Thursday seemed to have more waste than others.

Day 3 – Friday, March 4th

The concourse seemed to have a higher proportion of white paper on this day. One key contributor to this would be The Hub. This is a central photocopying center for students, which is available for use throughout the day and in the early evening. It could produce a lot of paper waste on any given day depending on errors made in photocopying. There may have also been extra-unwanted photocopies left behind from Thursday.

Day 4 – Monday, March 8th

We expected Monday to have the largest quantity of garbage because of the accumulation that we assumed would occur over the weekend. However, weighing in at 19.7 kilograms, we discovered that the sample had the least volume. We were wrong in

our assumption about there being more waste on Mondays and we have come to realize that this makes perfect sense. There are not as many students who have classes on Fridays, and both Saturdays and Sundays the campus is not very active. The lower quantity of waste is due to the minimal utilization of the concourse and surrounding area over the time period from Friday morning to Monday morning. Less activity in those areas means that there will be less consumption and essentially less garbage produced. The Second Cup, Tim Horton's and the Hub photocopying center are closed on the weekends, resulting in less overall consumption on those two days. We also have to take into account the fact that there was one less bag of garbage provided to us by the janitorial staff. This is purely a human error that contributed to skewing the data. In order to create comparable data, we could have scaled up the amount, however this would have also caused imprecision in the data because the distribution of garbage onto the various categories is impossible to reproduce accurately.

Day 5 – Tuesday, March 9th

Seven bags of garbage were collected on Tuesday as opposed to the 6 that we had been used to getting. However the quantity of material in the bags was much less. The total weight of garbage collected for the audit on this particular day was 21.7 kilograms and there was nothing out of the ordinary that could have been influenced by the occurrences of the previous day.

Where Did All the Waste Come From and Why?

When we began this audit process there were several assumptions made about the results that turned out to be incorrect. For example, we assumed that sorting out the garbage into the separate areas of the concourse, computer labs, torque room lounge and Second Cup eating area would render different results. Other than the quantity of garbage that was found in, we didn't see much variation in the sorts of garbage found within each area. For example, there was not one area that had on average more of one item than another. It is because of this that it is difficult to analyze each separate area.

In general, we found that Tim Horton's produced a large amount of the miscellaneous waste. This is because there is a Tim Horton's coffee shop located just on the other side of the Torque room lounge area. It is ideal for students to access and its location close to a primary study area on campus adds to the attraction of sitting down to study with a coffee in hand. The excess in cups from this corporation was also caused by the fact that Tim Horton's is running a 'Roll Up The Rim To Win' contest. This influences the public to purchase disposable cups for a chance to win as opposed to using a reusable travel mug. Discussing the impact that the contest had on the amount of waste produced with a couple of the Tim Horton's staff reinforced our thought on this issue. They said that the contest is causing a significant increase in sales and that travel mugs were almost never used since the contest began.

Another factor that has contributed to the various types of waste is the close proximity of many coffee shops and convenience stores. The popularity of this area on campus is evident because the University has placed many vendors such as Second Cup, The Hub, The Laurier Bookstore, the on campus convenience store and even vending

machines in close proximity. These near-by conveniences are influencing students and staff to purchase more than necessary, thus increasing waste in this area. Packaging from snacks, sandwiches and other material goods were a main portion of the waste found in this section of the school.

The existence of the “One-Card”, which is a card that can hold money on various accounts for purchasing food and other items on campus is also adding to the already high consumption rate of students. It gives the user a false reality on money expenditure, much like credit cards do. One feels like they are not spending money when they use the One-Card and this means that more will be bought and more importantly, more will be thrown away. This is evident by the types of waste that were found. Empty food containers, beverage bottles and cans, napkins and also wrappers were among the discarded objects.

It should be noted that the amount of recyclables found in the garbage cans was more than what we had expected. There are recycling bins located near most of the major garbage cans, so we assumed that they would be used for the majority of glass bottles and cans. I suppose that this was not done because of people being in a rush, not wanting to put in the effort of deciding where to dispose of something properly. Also, it could be that the janitorial staff has not provided adequate labeling to the bins.

After analyzing all the data, it is clear that there are no real differences between sample areas in regards to types of disposed material. It was also noticed that the quantities of materials collected are relative to size and proportion of the room and bins in which they were taken. The recyclables are not ending up where they should be and this is a huge issue. If we are going to invest the time and effort into implementing a

recycling system here at WLU then I think that students should be better aware of how much money and effort goes into running one.

Recommendations

1. Stricter no food/drink policy in the computer labs

The computer labs have no food/drink signs posted at the doors but the majority of waste from this area is food waste, PET bottles, cans and numerous plastic food containers. If the 'no food/drink' policy was more strictly enforced it may not cut down total waste on campus but it would keep the labs cleaner and possibly prevent damage to equipment.

2. Recycling bins in the concourse without lids that need to be flipped up

Located in the concourse are large recycling bins for newspapers, glass bottles, cans and PET bottles. Not all these bins have openings on the top for the recyclables to be put in. This means that people can not just drop items in but have to lift up the tops first before dropping in recyclables. For people who do not have an extra hand to open the tops of the bins they may just decide to throw the items directly into the garbage. If it became easier to drop recyclables into these large bins, then this may divert newspaper, glass bottles, cans and PET bottles from the garbage to the bins.

3. Better signage for newspaper, glass bottle and can and PET bottle recycling bins

Larger and clearer signs especially on the bins would help prevent confusion and assure better sorting of recyclables. If people have to look for the label on the side of the bin because it is not clear enough then they may not recycle or improperly sort the items.

4. Tim Horton's and Second Cup help pay for garbage disposal since they contribute the majority of waste

The most common source of waste in the garbage was Tim Horton's cups and bottles as well as cups and other containers from Second Cup. These two stores are the two closest places offering food and beverage to the area we audited and were a main source of waste. Because they contribute much waste maybe there could be a reduction plan or other things done to cut down the amount of waste from these stores such as making them responsible for waste disposal near their store.

Conclusion

We feel that the audit was an overall success in showing the potential for waste reduction strategies and diversion. Future audits can and should be done within the same area to address some of the issues that were raised during this audit, including weighing the total amounts of waste that are produced in the area. In order to reduce waste, which benefits the environment and the school, since it pays to have its garbage picked up, we have decided that the best course of action to take right away is to put waste disposal in a prominent place and give clearer instructions on what is allowed to be recycled. These steps will help to reduce the overall amount of waste taken out to the compactor everyday and perhaps raise awareness within the Laurier community to help with waste reduction practices.

APPENDIX: RESULTS

Day 1- Wednesday March 3, 2004

The results section will be separated by area to gain a better understanding of how general use of each area influences the waste stream. Being the most used space of the campus, this area and its subdivisions we identified have quite similar results for the five days of the audit. The first day of this study was a learning experience in that it was the first time any of us performed a waste audit. As a result, our data is perhaps not as accurate as the subsequent days. Table 1 below lists the total weight for each bag collected and the weight of items separated from each bag as well for day 1.

Table 1: Weight of bags and total weight of each item separated- Day 1

| Category | Total Weight (kg) | | | | | | | |
|-------------------------|-------------------|-------|---------------|-------|--------------------|-------|------------------------|-------|
| | Concourse | | Computer Labs | | Torque Room Lounge | | Second Cup Eating Area | |
| | bag 1 | bag 2 | bag 1 | bag 2 | bag 1 | bag 2 | bag 1 | bag 2 |
| Total Weight | 5.5 | 1.1 | 4.5 | | 4 | | 5.8 | |
| White Paper | 0.01 | | 0.01 | | 0.01 | | 0.01 | |
| Coloured Paper | 0.3 | | 0.1 | | 0.1 | | 0.1 | |
| Newsprint | 0.5 | | 0 | | 1.1 | | 0.4 | |
| Food and Beverage Glass | 1.1 | | 0.5 | | 1.5 | | 2 bottles | |
| Food and Beverage cans | 0.2 | | 0.2 | | 0.3 | | 2 cans | |
| PET plastic bottles | 0.1 | | 0.6 | | 0.7 | | 1 | |
| Other Plastic products | 0.5 | | 0.1 | | 0.2 | | 0.4 | |
| Miscellaneous | 3.6 | | 2.6 | | 2.6 | | 4 | |
| Total | 6.31 | | 4.11 | | 6.51 | | | |

Table 2 below displays the percentage of the total weight for each item separated.

Table 2: Percentage of total weight- Day 1

| Category | Percentage of Total Weight (%) | | | |
|-------------------------|--------------------------------|---------------|--------------------|------------------------|
| | Concourse | Computer Labs | Torque Room Lounge | Second Cup Eating Area |
| <i>Total Weight</i> | 6.6 | 4.5 | 6.4 | 9.3 |
| White Paper | 0.16% | 0.23% | 0.15% | 0.11% |
| Coloured Paper | 4.50% | 2.30% | 1.60% | 1.08% |
| Newsprint | 7.50% | 0 | 17.19% | 4.30% |
| Food and Beverage Glass | 16.60% | 11.12% | 23.44% | |
| Food and Beverage cans | 3% | 4.40% | 4.69% | |
| PET plastic bottles | 1.50% | 13.33% | 10.94 | 10.75% |
| Other Plastic products | 7.50% | 2.30% | 3.13% | 4.30% |
| Miscellaneous | 54.50% | 57.80% | 40.63% | 43.01% |
| <i>Total</i> | <i>95.26%</i> | <i>91.48%</i> | <i>101.77%</i> | <i>63.55%</i> |
| <i>Error</i> | <i>4.74%</i> | <i>8.52%</i> | <i>-1.77%</i> | |

Concourse

The two concourse bags totaled 6.3 kg of waste. It should be noted that the second bag audited was only partially full. As shown in table 2 below, miscellaneous waste has the largest percentage of the total weight at 54.5%. Food and Beverage glass is next at 16.6% of the total weight. This percentage is so large because many of the bottles were found to be partially full. This gives a misrepresentation of the actual weight of the garbage. An error of approximately 4.7% was calculated. In other words, 4.7% of the total weight was lost in recording and calculating the data for the concourse area.

Computer Labs and Print Room

The computer labs yielded similar results although the bags from the garbage cans in the computer labs and print room are smaller than most others in the area. Their approximate size is 50cm in width by 60cm in depth. Again, miscellaneous waste had the largest percentage of the total weight (57.8%), which in this case totaled 4.5kg. PET bottles weighed 13.3% of the total followed by food and beverage glass at 11.1%. In this case, there was an 8.5% error when calculating the total weight of all categories of waste. This is quite a significant number likely due to miscalculations in subtracting the weight of the weighing medium, in this case small milk crates and small plastic garbage cans.

Torque Room Lounge

The total weight of garbage recorded in the Torque Room Lounge area was 6.4kg. This was from two partially filled large garbage bags. Unexpectedly, the percentage of miscellaneous waste (40.6%) was lower here than all other areas audited. Again, food and beverage glass contained the second highest weight percentage at 23.4%. This

number is so high possible due again to the fact that many bottles still contained a portion of their contents. The error recorded from the Torque room lounge waste was approximately -1.8%. The summed weight of all categories of waste separated actually exceeded the initial total weight recorded. This error is purely from human causes, mainly in reading the scale weights inaccurately.

Second Cup Eating Area

Finally, the Second Cup eating area had a combined total weight of 9.3kg from one large bag and one small bag. The miscellaneous waste contained the highest percentage of the total at 43%. This was expected, since much of the contents of waste from this area are food products of all sorts. 10.8% of the total weight consisted of PET bottles. This number is likely skewed due to the bottles being partially filled however our notes do not indicate this. Including the bottles and cans not recorded, the recording error almost 30%, leaving these weights virtually unusable in determining a trend of contents in this waste stream.

Day 2- Thursday March 4, 2004

In total, 6 bags were collected to audit on day 2. Day 2 yielded very similar results as day 1. The total weights recorded for each bag and each category of waste separated are listed in table 3 below. Additionally, table 4 below displays the percentage of the total weight for items separated from the waste. Each area will be explored in greater detail.

Table 3: Weight of bags and total weight of each item separated- Day 2

| Category | Total Weight (kg) | | | | | | | |
|-------------------------|-------------------|-------|---------------|-------|--------------------|-------|------------------------|-------|
| | Concourse | | Computer Labs | | Torque Room Lounge | | Second Cup Eating Area | |
| | bag 1 | bag 2 | bag 1 | bag 2 | bag 1 | bag 2 | bag 1 | bag 2 |
| Total Weight | 6.5 | 6.7 | 5.5 | | 3.3 | 0.9 | 4.3 | |
| White Paper | 0.1 | | 0 | | 0 | | 0.1 | |
| Coloured Paper | 0 | | 0.01 | | 0 | | 0 | |
| Newsprint | 0.1 | | 0 | | 0 | | 0 | |
| Food and Beverage Glass | 3.1 | | 0.3 | | 0.3 | | 0.9 | |
| Food and Beverage cans | 0.2 | | 0.2 | | 0 | | 0.1 | |
| PET plastic bottles | 1.6 | | 1.4 | | 0.1 | | 0.8 | |
| Other Plastic products | 1 | | 0.2 | | 0.3 | | 0.3 | |
| Miscellaneous | 6.2 | | 3.4 | | 2.5 | | 2.1 | |
| Total | 12.3 | | 5 | | 3 | | 4.3 | |

Table 4: Percentage of total weight- Day 2

| Category | Percentage of Total Weight (%) | | | |
|-------------------------|--------------------------------|---------------|--------------------|------------------------|
| | Concourse | Computer Labs | Torque Room Lounge | Second Cup Eating Area |
| | Total Weight | | | |
| Total Weight | 13.2 | 5.5 | 4.2 | 4.3 |
| White Paper | 1.54% | 0% | 0% | 2.33% |
| Coloured Paper | 0% | 0% | 0% | 0% |
| Newsprint | 1.54% | 0% | 0% | 0% |
| Food and Beverage Glass | 23.48% | 5.45% | 7.14% | 20.92% |
| Food and Beverage cans | 1.51% | 3.64% | 0% | 2.33% |
| PET plastic bottles | 12.12% | 25.45% | 2.38% | 18.60% |
| Other Plastic products | 7.58% | 3.64% | 7.14% | 6.97% |
| Miscellaneous | 46.97% | 61.18% | 59.52% | 48.84% |
| Total | 94.74% | 100% | 76% | 99.99% |
| Error | 5.26% | 0% | 24% | 0.01% |

Concourse

Two bags from the concourse were collected totaling 13.2kg of waste. Of this total, 47% included miscellaneous waste and 23.5% food and beverage glass. Another fairly significant percentage worth noting is other plastic products being 7.6% of the total weight. Traces of white paper were found that were uncontaminated and therefore still considered recyclable. There was 5.3% error in recording and calculating the data.

Computer Labs and Print Room

Only one bag was collected for the two computer labs and Torque printer room on day 2. The total weight of the bag was 5.5kg. Approximately 61.2% of this total was

miscellaneous waste, whereas no weights were recorded for any type of paper product. There were similar percentages of cans glass and other plastic products found in this bag at approximately 4% to 5%. Roughly 26% consisted of plastic PET bottles. No error was recorded.

Torque Room Lounge

The waste collected and separated for the Torque Room Lounge area contained a relatively small amount of waste paper products. The paper was contaminated with liquid and therefore could not be separated and recorded separately. The contaminated paper was included with miscellaneous waste as a result. Almost 60% of the waste from this bag was considered miscellaneous with many other plastic products totalling 7.1%. 24% error was recorded for this area rendering this data highly misrepresentative.

Second Cup Eating Area

Finally, the Second Cup eating area waste totalled 4.3kg from one large bag. 48.8% of this total weight was miscellaneous waste. Much like the above area, this bag included a large amount of contaminated paper and some household waste was also found. 20.9% of the total waste included food and beverage glass bottles. 18.6% included PET bottles. Only 0.01% error was calculated for this area.

Day 3- Friday March 5, 2004

A total of six bags were collected on day 3. The majority of the bags were partially full. Judging by the results of last day, we realized that a few of the categories were not registering weights on our scale and/or they still contained a portion of their

contents. These categories are most notably white paper, coloured paper, and newsprint. Additionally, we decided that counting glass bottles, PET bottles, food and beverage plastic, aluminum and steel cans, and other plastics would yield more accurate and practical results from this point onwards. We also recorded the weights of those that we found contributed to a large percentage of the total weight for each bag. Table 5 lists the weights recorded for day 3. Additionally, table 6 lists the percentages for day 3.

Table 5: Weight of bags and total weight of each item separated- Day 3

| Category | Total Weight (kg) | | | | | | | |
|-------------------------|-------------------------|-------|----------------|-------|------------------------------|-------|-------------------------|-------|
| | Concourse | | Computer Labs | | Torque Room Lounge | | Second Cup Eating Area | |
| Total Weight | bag 1 | bag 2 | bag 1 | bag 2 | bag 1 | bag 2 | bag 1 | bag 2 |
| White Paper | 0.11 | | 0.01 | | 0 | | 0.1 | |
| Coloured Paper | 0 | | 0 | | 0 | | 0 | |
| Newsprint | 0.1 | | 0.01 | | 1 newspaper | | traces of newsprint/0.1 | |
| Food and Beverage Glass | 5 bottles/0.4 | | 4 bottles/1.1 | | 4 bottles/0.4 | | 4 bottles/0.6 | |
| Food and Beverage cans | 4 cans, 1 steel can/0.1 | | 6 cans/0.2 | | 6 cans/0.2 | | 2 cans/0.1 | |
| PET plastic bottles | 11 bottles/0.7 | | 11 bottles/0.7 | | 14 bottles/0.8 | | 12 bottles/0.6 | |
| Other Plastic products | 2 cups | | 0.4 | | 8 small takeouts, 2 cups/0.5 | | 10 takeout, 4 cups/0.5 | |
| Miscellaneous | 3.6 | | 3.1 | | 5.2 | | 5 | |
| Total | 3.81 | | 3.52 | | 5.2 | | 5.1 | |

Table 6: Percentage of total weight- Day 3

| Category | Percentage of Total Weight (%) | | | |
|-------------------------|--------------------------------|----------------|--------------------|------------------------|
| | Concourse | Computer Labs | Torque Room Lounge | Second Cup Eating Area |
| Total Weight | 6.4 | 5.3 | 7.7 | 7.2 |
| White Paper | 2% | 0.19% | 0% | 1.39% |
| Coloured Paper | 0% | 0% | 0% | 0% |
| Newsprint | 1.56% | 0.19% | 0% | 2.78% |
| Food and Beverage Glass | 6.25% | 20.75% | 5.19% | 5.56% |
| Food and Beverage cans | 1.56% | 3.77% | 2.60% | 1.39% |
| PET plastic bottles | 10.94% | 13.21% | 10.39% | 8.33% |
| Other Plastic products | 0% | 7.55% | 6.49% | 6.94% |
| Miscellaneous | 56.25% | 58.49% | 67.53% | 69.44% |
| Total | 78% | 104.15% | 92% | 94% |
| Error | 22% | -4.15% | 8% | 6% |

Concourse

The concourse waste produced some interesting results for day 3. There was a disproportionate volume of white paper waste in the sample bag collected. 5 glass

bottles, 5 cans, 11 PET bottles, and 2 plastic cups were counted. These items totaled approximately 20% of the weight of the bag. Miscellaneous waste comprised 56% of the total as well. The error recorded is quite high due to the missing data from those items not recorded but instead counted. As a result, error is no longer a factor affecting the results calculated. Instead, a visual indication of the percentage of waste can be undertaken.

Computer Labs and Print Room

The computer lab and print room waste produced very similar results. Although there were only 4 glass bottles counted, the weight recorded was much higher than that of the concourse waste, likely due to the weight of the contents of the bottles. Again, miscellaneous waste comprised almost 59% of the total weight. The recorded values for each category exceeded the total and created an error of -4.1%. In other words, the summed weight of all categories of waste separated exceeded the initial total weight recorded.

Torque Room Lounge

The torque Room Lounge area waste contained a significantly large number of potentially recyclable items. For instance, 14 PET bottles and 8 plastic takeout containers were counted, creating a larger volume however it did not significantly alter the weight percentages. As a result, miscellaneous waste remained the largest percentage of the total weight recorded. One school newspaper was found in this bag. Eight percent error resulted from the calculations.

Second Cup Eating Area

The Second Cup eating area sample waste contained a large share of food waste for this day. The two bags collected totalled 7.2 kg as displayed in table 5. Almost 70% of the waste fell under the miscellaneous category. Quite a large amount of white paper was collected as well and is worth noting that it comprised approximately 1.4% of the total. This is a significant number for white paper relative to past days and areas. Only traces of newspaper were worth recording since much of the newsprint found in this sample waste was highly contaminated.

Day 4- Monday March 8, 2004

Only five bags were collected on the fourth day likely due to the fact that the university is less active during the weekend and hence less waste is produced. Table 7 lists the total weight of the bags collected as well as the total weights recorded for each category of waste separated. Table 8 lists the percentages of these weights for each item.

Table 7: Weight of bags and total weight of each item separated- Day 4

| Category | Total Weight (kg) | | | | | | | |
|-------------------------|---|-------|-----------------------|-------|--------------------|-------|---------------------------|-------|
| | Concourse | | Computer Labs | | Torque Room Lounge | | Second Cup Eating Area | |
| | bag 1 | bag 2 | bag 1 | bag 2 | bag 1 | bag 2 | bag 1 | bag 2 |
| Total Weight | 6.7 | | 2.9 | | 3.9 | | 4.1 | 2.1 |
| White Paper | 0.4 | | 0 | | 0 | | 0.1 | |
| Coloured Paper | 0 | | 0 | | 0 | | 0 | |
| Newsprint | 0.8 | | 0 | | 1 | | 0.2 | |
| Food and Beverage Glass | 3 bottles | | 4 bottles | | 1 bottle | | 4 bottles | |
| Food and Beverage cans | 7 cans | | 3 cans | | 11 cans/0.2 | | 3 cans | |
| PET plastic bottles | 9 bottles/0.3 kg | | 2 bottles | | 8 bottles/0.8 | | 7 bottles | |
| | 1 large juice container, 15 cups, 3 small | | 3 takeout containers, | | | | | |
| Other Plastic products | takeout/0.5 | | 2 other products | | 0.5 | | 15 takeout containers/0.6 | |
| Miscellaneous | 3.8 | | 1.7 | | 1.4 | | 3.7 | |
| Total | 5.5 | | 1.7 | | 2.9 | | 4.6 | |

Table 8: Percentage of total weight- Day 4

| Category | Percentage of Total Weight (%) | | | |
|-------------------------|--------------------------------|---------------|--------------------|------------------------|
| | Concourse | Computer Labs | Torque Room Lounge | Second Cup Eating Area |
| Total Weight | 6.7 | 2.9 | 3.9 | 6.2 |
| White Paper | 5.97% | 0% | 0% | 1.61% |
| Coloured Paper | 0% | 0% | 0% | 0% |
| Newsprint | 11.94% | 0% | 0% | 3.23% |
| Food and Beverage Glass | | | | |
| Food and Beverage cans | | | 5.13% | |
| PET plastic bottles | 4.48% | | 20.51% | |
| Other Plastic products | 7.46% | | 12.82% | 9.68% |
| Miscellaneous | 56.72% | 58.62% | 35.90% | 59.68% |
| Total | 86.57% | 58.62% | 74.36% | 74.20% |
| Error | 13.43% | 41.38% | 25.64% | 25.80% |

Concourse

Again, there was a significant number of recyclables incorporated with the waste collected. 3 glass bottles, 7 aluminum cans, 9 PET bottles, 1 large household juice container, and 15 plastic cups were found in the concourse bag. These items represent a fairly large percentage of the total weight 6.7kg. These percentages are listed in Table 8 below. As with past days, the miscellaneous category contained the largest percentage of the total at almost 57%. Thirteen percent error was recorded due to the lack of data recorded for certain items as explained in the preceding section.

Computer Labs and Print Room

The computer lab and Torque print room waste was very minimal from the weekend. As a result, there is a large amount of data missing or that could not be recorded. The total weight of the bag collected was only 2.9 kg. Almost 59% of this amount was considered miscellaneous. The resulting error was 41.4%, much too large to be able to complete admissible results. The bag still does provide a fair representation of what the trend of waste exists.

Torque Room Lounge

Similarly, the majority of waste from the Torque Room Lounge area was considered miscellaneous. PET bottles comprised a significant amount although there were only 8 bottles. This is due to a few of them being almost completely full of their contents. The weight of these bottles skewed the total and therefore the weight results are less significant. It should be noted that 11 aluminium cans were counted. A relatively large amount of newsprint was found in the waste registering a weight of approximately 200g or 3.2% of the total.

Second Cup Eating Area

Finally, two bags were collected from the Second Cup eating area totaling 6.2kg. Approximately 60% of the waste collected here was considered miscellaneous. Quite a large quantity of newsprint was found here as well from the weekend. Four glass bottles, 3 cans, 7 PET bottles, and 15 takeout containers were recorded of which each did not register a weight on the scale. These values are nonetheless representative of a significant number of recyclable products within the waste sampled.

Day 5- Tuesday March 9, 2004

A total of seven bags were collected on day 5. The majority of the bags were of a smaller size than normally was collected on the preceding four days. Again, there existed a large number of recyclable products mixed in with miscellaneous waste. This is displayed explicitly in table 9 below. This table gives a good indication of the trends that have occurred throughout the audit. Mainly, that little to no paper products are thrown

away and that the majority of the waste generated is considered miscellaneous according to the classification system outlined for this audit.

Table 9: Weight of bags and total weight of each item separated- Day 5

| Category | Total Weight (kg) | | | | | | | |
|-------------------------|----------------------|-------|--------------------|-------|--------------------|-------|------------------------|-------|
| | Concourse | | Computer Labs | | Torque Room Lounge | | Second Cup Eating Area | |
| Total Weight | bag 1 | bag 2 | bag 1 | bag 2 | bag 1 | bag 2 | bag 1 | bag 2 |
| White Paper | 0.1 | | 0.03 | | 0.01 | | 0.01 | |
| Coloured Paper | 0.01 | | 0 | | 0 | | 0 | |
| Newsprint | 0.01 | | 0 | | 0.15 | | 0.2 | |
| Food and Beverage Glass | 3 bottles | | 0 | | 3 bottles | | 8 bottles | |
| Food and Beverage cans | 7 cans | | 3 cans | | 2 cans | | 6 cans | |
| PET plastic bottles | 5 bottles | | 3 bottles | | 2 bottles | | 11 bottles | |
| | | | | | 2 large | | 6 small | |
| | | | 2 large | | takeouts, 4 | | takeouts, | |
| Other Plastic products | 5 takeout containers | | takeout containers | | small takeouts, | | 10 large takeouts | |
| Miscellaneous | 2.6 | | 2 | | 3 cups | | 5 | |
| | | | | | 2.9 | | | |
| Total | 2.72 | | 2.03 | | 3.06 | | 5.21 | |

Table 10: Percentage of total weight- Day 5

| Category | Percentage of Total Weight (%) | | | |
|-------------------------|--------------------------------|---------------|--------------------|------------------------|
| | Concourse | Computer Labs | Torque Room Lounge | Second Cup Eating Area |
| Total Weight | 4.9 | 2.2 | 4.5 | 10.1 |
| White Paper | 2.04% | 1.36% | 0.22% | 0% |
| Coloured Paper | 0.20% | 0% | 0% | 0% |
| Newsprint | 0.20% | 0% | 3.33% | 1.98% |
| Food and Beverage Glass | | 0% | | |
| Food and Beverage cans | | | | |
| PET plastic bottles | | | | |
| Other Plastic products | | | | |
| Miscellaneous | 53.06% | 90.90% | 64.44% | 49.50% |
| Total | 55.50% | 92.26% | 67.99% | 51.48% |
| Error | 44.50% | 7.74% | 32.01% | 48.52% |

Concourse

Two bags were collected for the concourse, one weighing 4 kg and the other only 0.9kg. As shown in table 10, approximately 45% of the data is recorded as error. This means that approximately 45% of the 4.9kg total weight consisted of recyclable products and/or miscalculation. These items consisted of 3 glass bottles, 7 aluminium cans, 5 PET bottles, and 5 takeout containers. 53% of the remaining waste consisted of miscellaneous waste.

Computer Labs and Print Room

Only one bag was collected for the computer labs and Torque print room and computer labs weighing only 2.2kg. Two kilograms of this total are considered miscellaneous. This weight represents just over 90% of the total. Three cans, 3 PET bottles, and two large takeout containers were counted. This is not a significant proportion of waste in terms of weight and volume in this case. The majority of items separated did not register a readable weight as shown in both tables. As a result, only 7.8% error occurred. Since little separation occurred there was less chance to generate mistakes in recording and calculation.

Torque Room Lounge

The Torque Room Lounge area waste presented similar results however with a much larger percentage of recyclables mixed in the waste. This generated a larger error percentage (32%) since less data could be recorded feasibly. Instead, 3 glass bottles, 2 cans, 2 PET bottles, 6 takeout containers, and 4 plastic cups were counted in only a 4.4kg bag of garbage. This represents a large volume of waste in 1 bag.

Second Cup Eating Area

Finally, the 2 Second Cup eating area waste samples totaled 10.1 kg. Of this total, approximately 50% of the waste was categorized as miscellaneous waste. This section contained an even larger number of potentially recyclable products. For instance, 8 glass bottles, 6 cans, 11 PET bottles, and 16 plastic takeout containers were recorded. These items represent a large volume of waste that can otherwise be diverted. Forty

eight percent error was recorded, again due to the lack of weight recordings for the separated items.