

University of Toronto at Mississauga: Waste Management

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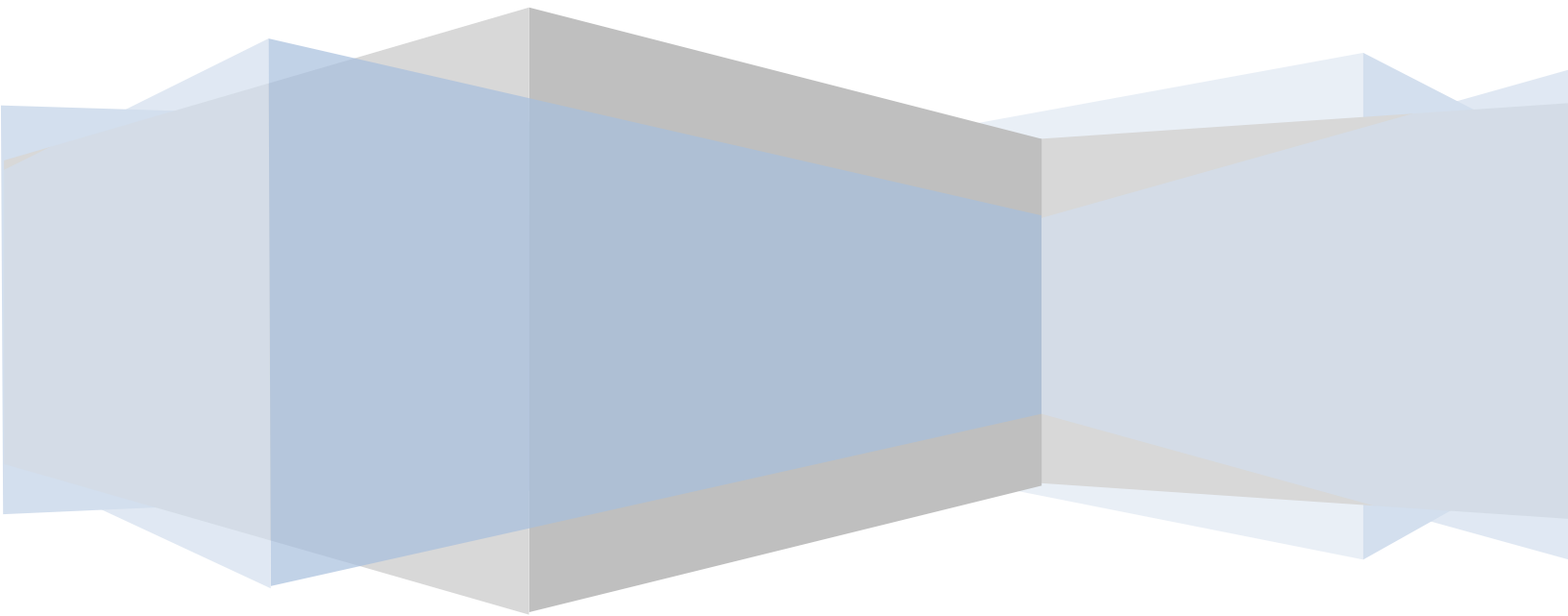


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Abstract

This report aims to summarize the waste management habits of UTM students and staff. It analyzes the both recent and previous waste audits conducted on the UTM campus by professionals and also by the UTM Green Team. Through these waste audits, student survey, and further research the main objective of this paper is to establish some usable and practical recommendations which can be implemented on the UTM campus to help reduce the amount of waste produced and also help manage the waste that is produced properly.

Introduction

This project is essential on several levels. Most importantly, it is something that is part of our everyday lives. Whether we buy a cup of coffee in the morning, a soup for lunch or even prepare our own lunches for the day, managing our waste is unavoidable and something that we all have in common. The only difference is that some of us manage our waste better than others. This is where our project comes in. Waste management does not solely include proper recycling habits, but it also includes trying to minimize the amount of waste that we produce in general.

As important as recycling and waste management is, it is not the only solution to the problem. If we make a united decision to reduce the amount of bags, cups, bottles, paper etc. we use on a daily basis then much can be accomplished. The truth of the matter is that the less waste is purchased by consumers in the form of paper cups, plastic wrapping, and tin foil, then the less is manufactured. In turn, the decrease of manufactured waste results in a decrease of the amount of natural resources extracted from the earth as well as a reduced area of destroyed natural habitats. Also, if waste is not managed properly it can endanger and pollute much of our water ways such as streams and rivers

potentially making our water unsafe for consumption (Brown, 2009). Thus, through the use of reusable mugs, water bottles, and containers we could potentially reduce our impact and ecological footprint. The benefits to a more waste conscious mindset are not only environmental. In fact, financially it is cheaper to use a reusable mug or water bottle. Most coffee shops give you a discount when you bring in your own reusable mug for their coffee, and even though you may only save 10-15 cents, the savings can add up to \$20.00 a year if you purchase coffee or tea daily. Furthermore, bringing your lunch in reusable containers also results in financial gain. Not only do you not have to worry about what you are going to eat in between meetings or classes, but you can also avoid the long line ups in the cafeteria. In fact, a lot of people are turning to a more waste-conscious way of living. From “green” bags to reusable mugs and water bottles, you can see everyone from your next door neighbour to A-list celebrities using reusable water bottles. It is a simple change we can all incorporate to benefit not only ourselves but the planet as a whole. The bottom line is that the choice is ours—yours and mine (Brown, 2009).

Background

The focus of our project has been the UTM campus. In particular, we focused on high traffic areas such as the Student Centre and the South Building Meeting Place. Through previous professional waste audits, previous waste audits conducted by the Green Team, and conducting a waste audit with the Green Team this year, we were able to acquire important information with regards to waste and recycling habits of UTM students and staff. In particular, the new waste audit conducted this year was held in the Student Centre on March 3rd. Comparing this new waste audit to previous waste audits

conducted in 2001, 2007 and 2009, we were able to gain valuable knowledge as to how waste management trends have changed over the years at UTM.

UTM has changed tremendously in the last 10 years, and with the addition of new buildings, a significant increase in student population and the addition of new eating areas, our project's importance is that much more intensified. With a growing school comes the cost of a growing amount of waste and garbage produced, therefore proper waste management has never been more important especially with the construction of even more new buildings on our campus. The waste audits gave us concrete data and statistics as to how much waste is recycled and how much of it unfortunately ends up not reused or recycled.

Although concrete data is essential in any project, there are also other factors that need to be considered. These include student attitudes and opinions when it comes to handling their waste in a conscientious manner. For this reason we have also conducted a survey in Prof. Murck's ENV100 class which allowed us to gain insight as to why students chose to properly dispose of their waste as well as why students don't properly dispose of their waste. Also, the survey allowed us to interpret student opinions when it comes to reducing the total amount of waste they produce on a daily basis. Some of our survey findings included education as one of the top motivators for students to become more conscious of their waste, and it is for that reason that we decided to educate ourselves further as well.

In March of this year we went on a trip to the Peel Waste Management Facility in Brampton to get a firsthand look as to how everyday waste is managed and handled. Although many important things were learned that day, such as what exactly is reusable, how waste is sorted, and how it is transported, nothing struck us like the sheer volume of waste produced by our region on a weekly basis. It is this fact that has led us to conclude that the answer not only lies in recycling and managing

our waste properly, but a significant part of the answer is to simply reduce the amount of waste generated in total. It is with this in mind that we have attempted to try and find some solutions to the waste problems encountered on our campus.

Methods

Throughout our research we have found the benefits and costs of recycling and the general process which all recycled goods must undergo. Also, as previously mentioned, we have conducted a waste audit in the Student Centre on March 3rd 2010 with UTM's Green Team. This allowed us to compare recent Waste Audit data to the Green Team's previous Waste Audit conducted in 2007. Also two professional waste audits conducted in 2001 and 2009 were compared. Furthermore, a survey was conducted in March 2010 in Prof. Murck's ENV100 class to gain insight into student attitudes and opinions when it comes to managing their everyday waste. Lastly, a trip to the Peel Waste Management Facility in Brampton further increased our understanding of the costs of recycling and the recycling process in general.

Results

There has been a great amount of research conducted in order to suggest recommendations for UTM. The research includes analysis of old waste audits, a survey, research on recycling and waste management, and conducting our own waste audit this year.

Old Waste Audits

One of the most important parts of this project's research is the old waste audits. There are two professionally conducted waste audits for the years 2001 and 2009. The two waste audits are difficult to compare since UTM has changed greatly from 2001 to the present. In 2001 there were not as many buildings as there are presently. Furthermore, the population of UTM has doubled since 2001. The waste audit conducted in 2001 also had different categories compared to 2009, however incorporating the different categories into the general categories in 2009 waste audit solved this. Taking all this into consideration, there have been certain trends found in the waste audits. One of the main concerns for UTM is the large amount of paper that has increased from 2001 and 2009. The paper waste increase has more than doubled from 2001 to 2009, which illustrates that UTM has not progressed in the paper category. Figure 1 in Appendix A displays a graph of the comparison between the two years. Also, Figure 2 in Appendix A displays a graph on paper that can be recycled, which was found in the waste. Figure 1 displays a large decline from 2001 to 2009 in the other categories; however the other category for 2001 has been inflated since there were some categories in 2001 that were incorporated, resulting in a large number for 2001. There has been some progress from 2001 to 2009 in terms of glass, and metals. There can be two reasons for this; one can be that there may be less usage of metals and glass, or the second reason can be because the community at UTM has started to recycle these materials properly.

In addition to professional waste audits, there were two waste audits conducted by Green Team in 2007 and 2010. However, once again there are some differences between the two waste audits. In 2007, the placement of the waste audit was in the Meeting Place of the South Building, and in 2010 it was in the Student Centre. This changes the results because there is a lot more traffic in the

South Building in comparison to the Student Centre. There are different foods available, and different usage for the two buildings. Thus, it is difficult to measure whether there is a progress in waste disposal patterns. One of the highlights of the two waste audits is the increase of Styrofoam in the waste; please see Figure 3 in Appendix A for the comparisons of the waste audits. There has been an increase because Styrofoam is used more often in the student centre as takeout food containers from the pub. The Styrofoam is recyclable; however it is not being recycled. Also, inside the containers is all of the waste produced from the meal such as chicken bones, ketchup packets, and napkins. Due to all the waste in the container, it cannot be recycled due to contamination. Another increase displayed in the results is the waste category. There may be a larger increase in waste because there were different categories for 2007 and 2010. In the waste audit conducted in 2010, there was one category designated to waste, and in 2007 the categories were a lot more specified which might have impacted the result. Additionally, the result of both of the waste audits illustrates a decrease in paper products such as cardboard. This may be progress, however, this decrease can be due to the difference in the buildings.

Student Survey

Another important component of the research is the student survey conducted in the ENV100Y5 class. It was done through Iclickers, and 140 students participated in the survey. The survey's main purpose is to understand student's behaviour towards waste disposal. In total, there were seven questions, and the list of questions is provided in Appendix B. Of course, the answers may be biased because they were asked to an environment class, in which some students have a strong interest in environmental issues, however, the course is also taken as an elective. During the analysis component of the research, there was a selection of three questions, which were the most important for this

project. The students were asked how often they brought lunch from home from this week, and a majority answered never, however, there are a large number of students that have answered two or three times a week, and some that have answered always. Therefore, the garbage does not only come from the campus but also from home. The implications of this will be discussed later in the report. The result for this question can be found in Appendix B, Figure 4.

Furthermore, students were asked how often they bring reusable items such as mugs and water bottles. The result for the question can be found in Appendix B, Figure 5. Majority of the students responded sometimes, and some said every day. The more students that use reusable items, the better it is for UTM in terms of waste being produced since it will be minimized, resulting in throwing out less.

Finally, students were asked what could motivate them to recycle more at UTM. The result for this question can be found in Appendix B, Figure 6. Widely held answer to this question was more recycling bins, and the fewer categories for recycling bins. This illustrates what constraints students face when disposing their waste. Students feel confused with the multiple bin system, and sometimes don't understand where certain items go. They would like to see a reduction in bins to simplify the system and make it easier for them to use.

Recycling

Much of the research has looked into the recycling process, and the advantages and disadvantages of recycling. The recycling process for Peel Region includes picking up the recycled materials, transporting it to a facility that separates into different categories, and finally companies purchase the recycled materials (Region of Peel, 2009). Companies are selected depending on the highest bids; usually the items are exported to different countries (Region of Peel Waste Management Facility, 2010). There is a cycle that occurs, in which the

packaging is imported to Canada, it is used in Canada, and then foreign companies buy the recycled material to manufacture packaging once again, and then it is imported once again by Canada.

There are many advantages for recycling, one is that it allows less usage of natural resources, which also signifies less depletion of resources. “Recycling decreases demand for landfill space, saves energy, and reduces greenhouse gases” (Region of Peel, 2009). Recycling paper can also save the habitats of animals because fewer trees would be cut down. However, there is a reason in the hierarchy of “reduce, reuse, and recycle” why recycling is last. Many feel that by recycling, they are doing their part. The implication of this is that people will keep buying and think they will just recycle it. Thus, people disregard the reducing and reusing aspects of waste management, although those are the most important ones, recycling should be last. Recycling requires a lot of energy to transport the goods to different places for processing, and although it is a better option than putting things in the garbage, it is still environmentally taxing.

Waste Management

In addition to researching on recycling, a portion of the research went into waste management. This includes research on ways to reduce waste. Interestingly, “School lunches are a major source of waste in Ontario – the average student’s lunch generates a total of 30 kilograms of waste per school year, or an average of 8500 kilograms (18,700 lbs) of waste per school per year” (Recycling Council of Ontario). As mentioned earlier, the survey result demonstrated that many students brought lunch from home. Much of the waste can come from lunches by students bringing lunch in a plastic bag, and all other plastic used to package their lunch, such as juice bottles, juice boxes, waxed paper, and Ziploc bags, instead of bringing it in a reusable container. However, it is also true many do not bring a lunch

from home, thus buying lunch at UTM. Many students buy bottled water, or coffee, and this can cause a lot of waste because coffee cups are not recyclable. Bringing a reusable mug to Tim Horton's can save staff and students approximately \$20 over the course of the school year since a discount of 10 cents is offered with every beverage purchased. Coffee bought more than once a day and during the summer, will add to even more savings! If a reusable mug is brought to Starbucks, staff and students can save approximately \$30. These incentives can decrease the amount of waste produced at UTM and save staff and students money, which everyone enjoys doing, and it requires little effort.

Recommendations

Through conducting our own waste audit this March, and by analyzing past waste audits from UTM we have discovered trends and patterns that are reoccurring. This is because the issues that cause these problems have never been tackled effectively, and we hope that our recommendations can either reduce or help eliminate some of the reoccurring problems.

One recommendation that we would like to make is to increase awareness about bringing your own reusable containers, such as water bottles, mugs, and lunch containers to campus. Just by doing this we can cut down on a lot of waste being produced, and there are a lot of incentives to do so. It is a financial benefit, an environmental benefit, and a health benefit. When we conducted our student survey we found that 68% of students brought their own lunches from home to campus at least once a week, and 27% of those students never use reusable containers. If we could encourage this change it would make a big different to UTM's waste output since many of our students are commuters and bring a lunch every day.

We plan on increasing awareness through an educational presentation. We have prepared a PowerPoint presentation that we will distribute to different student groups and clubs on campus, encouraging students to educate each other on these issues. Many people are not aware of this problem so this would be an easy and fast way to provide students with a basic understanding of recycling and waste management.

In order for the community to recycle appropriately, reinforcement is very important. As a result, we propose that the Green Team organize two workshops per year on campus to allow students, staff, and faculty to be educated about recycling. Students from different regions, such as international students, would be unaware of appropriately recycling. In addition, there needs to be reminders around the campus to enforce recycling. This can be done by posting what can be recycled on pop machines, and the different food vendors such as Tim Horton's, and Pizza Pizza. We have made signs for these locations and you can see them in Appendix C.

We also recommend that our school community tries to reduce the amount of waste produced to begin with, which would in turn decrease bin contamination. This can be accomplished through the reduced use of paper towels and napkins. As we have seen in the past few months, a lot of the paper towel machines have been removed from washrooms and replaced with hand driers instead. We would encourage this trend to continue but also encourage that it is taken further. For example, the waste audit conducted this year indicated that a lot of napkins are wasted in the student centre. Therefore, by not giving students handfuls of napkins when they order their food, and by implementing single-napkin dispensing systems, it would help reduce the amount of napkins wasted. In addition, similar trends appeared when it came to condiments. Packets of ketchup, mayo, etc. were wasted in large

amounts in the student centre. We would recommend getting rid of the individual packets and replace them with bottles instead. The south building cafeteria already has pump-bottles of ketchup where students can serve themselves as need be instead of once again, grabbing handfuls of packets most of which only end up in the garbage.

In addition, according to the collected survey results, individuals would be more willing to recycle if the process of recycling was simplified. Thus, we recommend that the various bins for paper, glass, plastic, etc., be reduced to only two bins; one for recycling paper and one for recycling glass, cans, bottles, etc. Since the city of Mississauga no longer demands to separate recyclable materials, it would not only be more appealing for students and staff to recycle, but it would also be easier and more efficient.

Lastly, in order to help reduce waste, we recommend that more recycling bins are placed in areas which predominantly have only garbage bins. Certain areas in the Library only contain garbage bins where most of the waste produced is paper. More recycling bins and less garbage bins would encourage individuals to recycle more and help reduce bin contamination.

Conclusion

We have learned that further education is key to successful waste management and recycling. Many students at UTM are just uneducated and unaware of this problem. By having workshops available to them, they will learn proper habits that they can use on campus. This will help reduce waste overall and also reduce the contamination rate.

Reinforcement is also important because students need to be reminded of what can and cannot be recycled on campus. It is different for all regions and they need to be educated about Peel Region's policies on recycling and waste management.

We are hoping that our recommendations will be taken into consideration and possibly implemented throughout campus. We are sure there would be some improvements made, resulting in a more educated UTM community.

Appendix A

Figure 1: Comparison of Waste Audit 2001 (Immacutec System Tech, 2001) and 2009 (Green Squad, 2009).

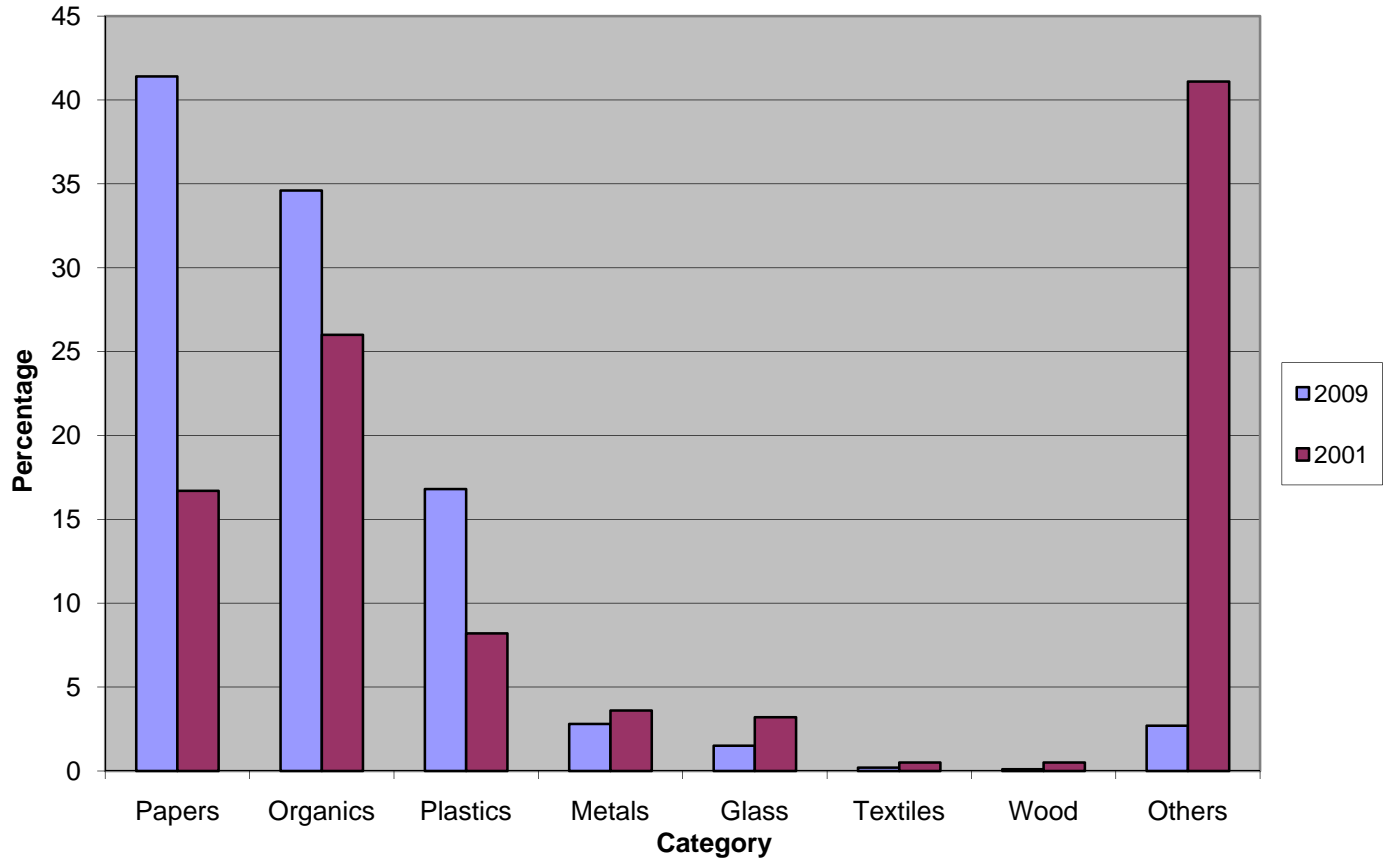


Figure 2: Categorization of paper in waste, 2009 (Green Squad, 2009).

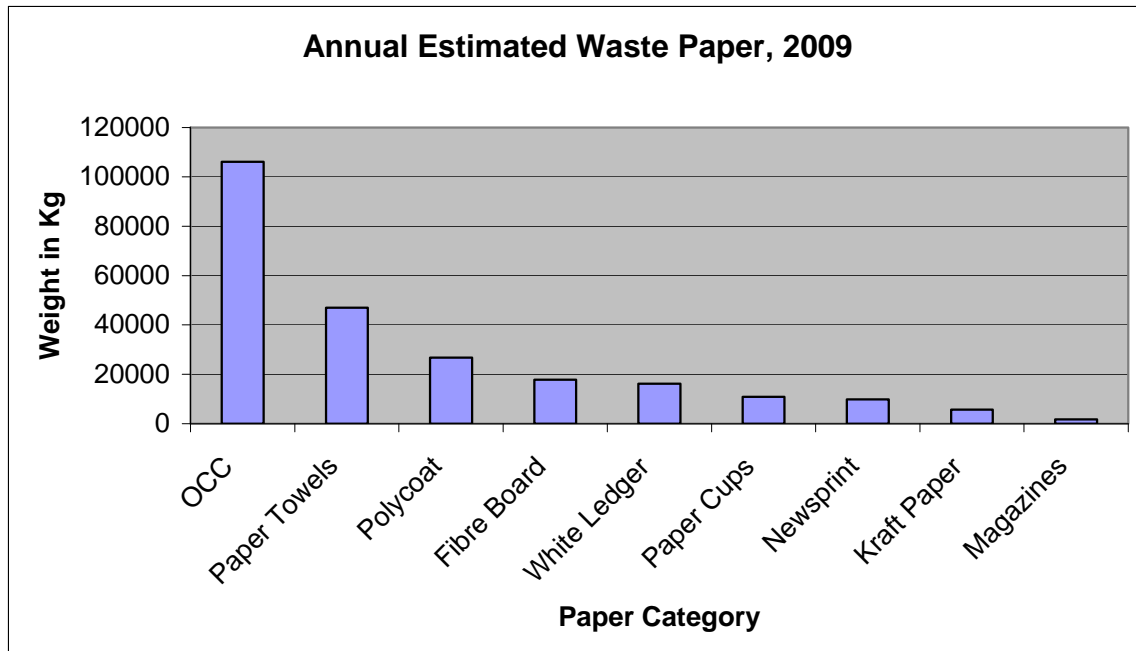
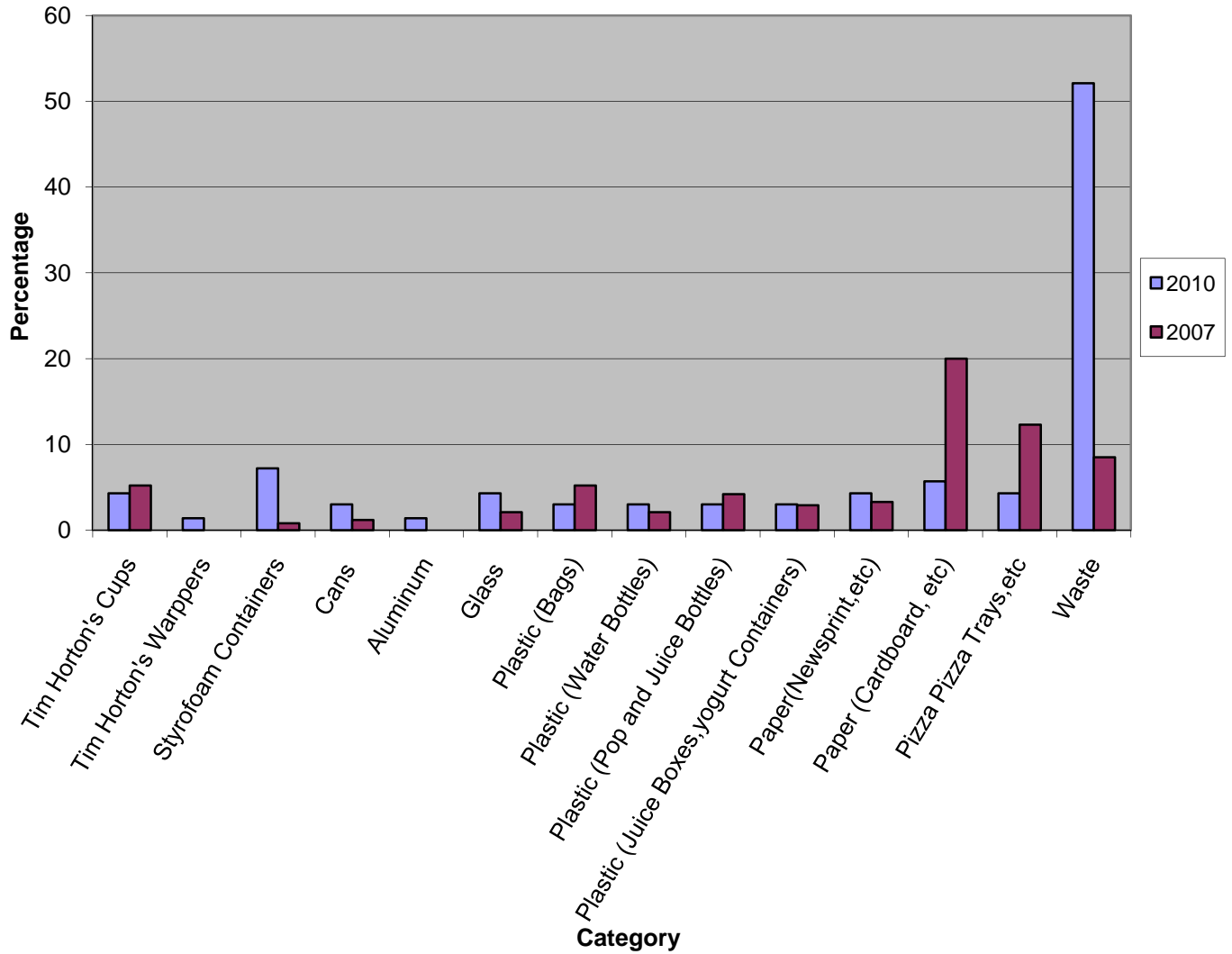


Figure 3: Comparison of Green Team waste audits 2007 (Green Team, 2007), and 2010 (Green Team 2010).



Appendix B

Survey Questions

- 1) How often during a school week do you throw something away?
 - a) Never
 - b) Once a week
 - c) Two or three times a week
 - d) Every day
 - e) Too many times to estimate

- 2) How often during a school week do you use the appropriate bins to sort your garbage or recycling when throwing something away?
 - a) Never
 - b) Once a week
 - c) Every day
 - d) Always

- 3) During this past week, how often did you buy lunch on campus?
 - a) Never
 - b) Once
 - c) Two or three times
 - d) Every day

- 4) During this past week, how often did you bring lunch from home?
 - a) Never
 - b) Once
 - c) Two or three times
 - d) Every day

- 5) How often do you bring reusable items to school? (Such as mugs, reusable water bottles, lunch bags, etc.)
 - a) Everyday
 - b) Sometimes
 - c) Never

- 6) Would you use a green bin (for composting your leftover food items) if they provided it on campus?
 - a) Yes
 - b) No

- 7) What would motivate you to recycle more at UTM?
 - a) If it is less effort to recycle.
 - b) More recycling bins.

- c) A greater understanding of what happens to the recycled materials.
- d) One bin to collect ALL recyclables rather than having to sort into types
- e) Not applicable

Figure 4: Survey results for Question 4.

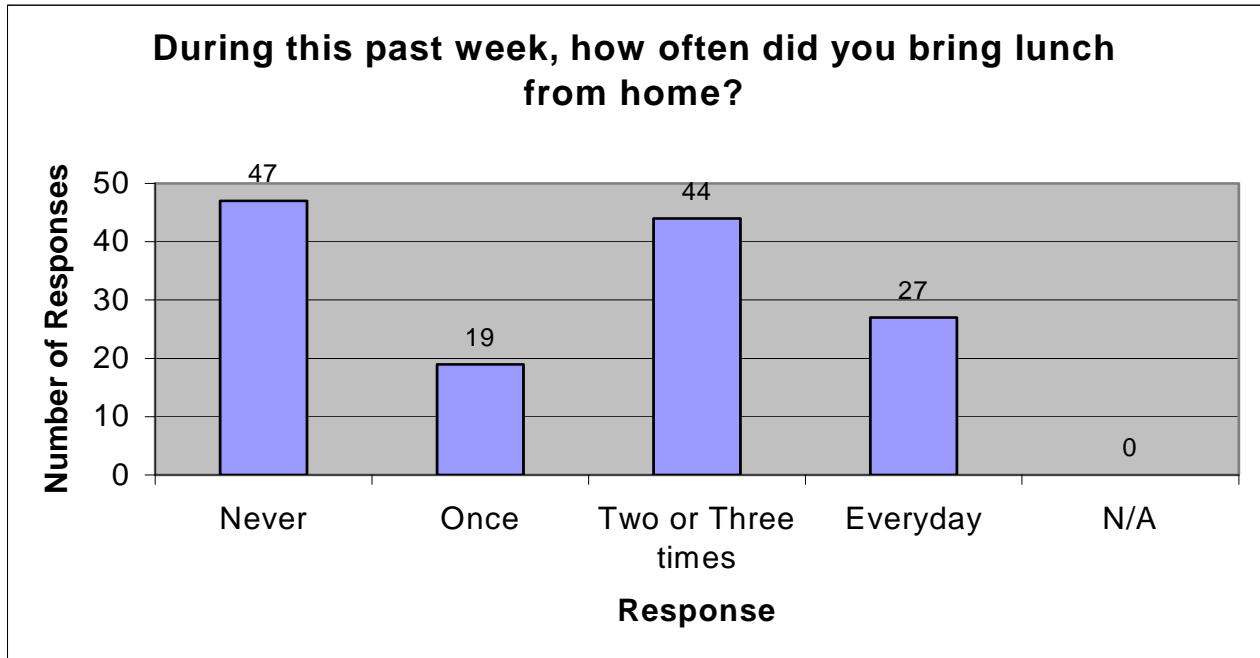


Figure 5: Survey results for Question 5.

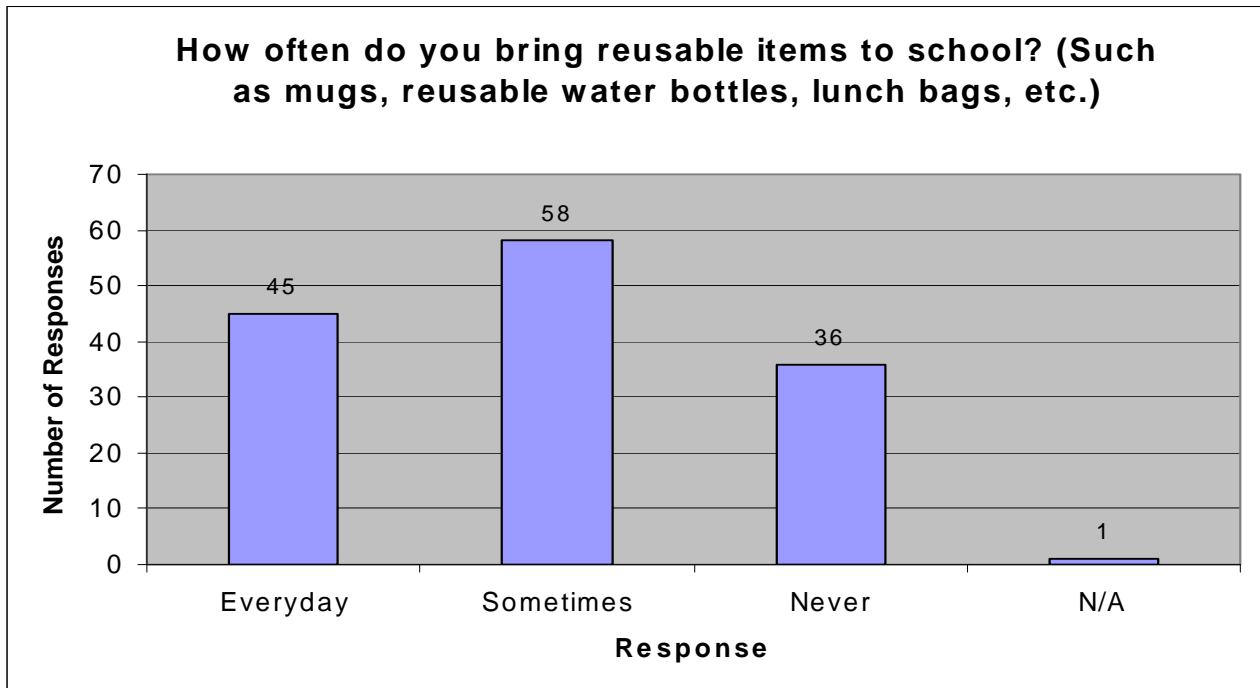
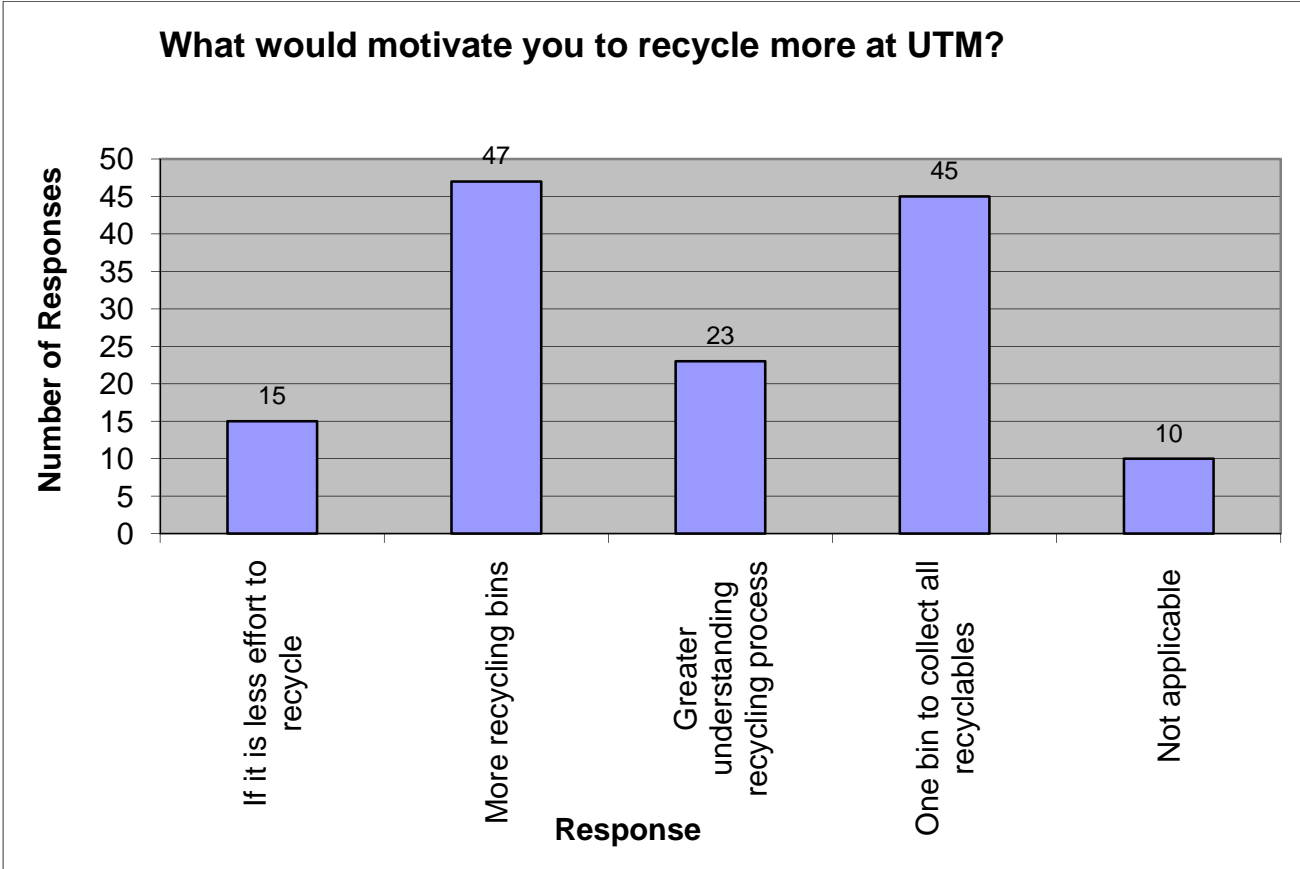


Figure 6: Survey results for Question 7.



Appendix C

Things you can recycle at Tim Horton's Sticker



Things you can recycle at Pizza Pizza Sticker





Works Cited

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