



<http://sustain.wordpress.depauw.edu/files/2008/07/trashblog1.jpg>

## **Another Load of I.U.'s Trash?**

### **An Analysis of the Waste Composition of the Residence Halls of Indiana University**

**Prepared for the Indiana University Sustainability Task Force**

**by  
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## Executive Summary

The principal goal of conducting waste audits is to collect information about the consumption habits and waste generation of a particular community. Indiana University Bloomington is interested in knowing this type of information as part of its commitment to increasing the sustainability of the campus. Reducing the amount of trash produced by the campus would save the University money and effort, and contribute to current sustainability work. Attempts to divert waste from final disposal and increase recycling rates will be most successful with full information about what the current composition of waste is.

Waste audits were focused on residence halls this semester. The waste from seven residence halls was examined, sorted, and weighed. The waste was organized into the following eight categories:

- Glass
- Plastic
- Aluminum or steel
- Paper
- Cardboard
- Compost
- Miscellaneous or trash
- Other

The results were compiled in an Excel spreadsheet. On average, nearly 38% of the waste was recyclable, and almost 13% of the waste on average was suitable for composting. This means that in general just about half of the waste generated in Indiana University Bloomington's residential halls could be diverted from final disposal. Overall, plastic and compost had the largest presence of all the recyclable wastes in the dumpsters, for 14% each. This is exciting news for the University as it means that not only is there much possibility for making great strides in waste reduction, but also that focusing on one or two areas could make a significant difference.

## **Introduction**

### **Why is waste a problem for Indiana University?**

Indiana University in Bloomington (IUB) has approximately 38,000 students, or approximately 29% of the 2006 Monroe County population of 129,000<sup>1</sup>. The United States Environmental Protection Agency (EPA) estimates waste generation at 4.62 pounds per person per day in the United States<sup>2</sup>. This works out to be over 1600 pounds per person per year. Accordingly, the student body of IUB puts out approximately 64,000,000 pounds of waste per year.

Per capita waste generation estimates can vary widely, and depend a great deal on demographics and the state of the economy. According to the Environmental Sustainability Committee of Michigan Technological University, the average college student produces 640 pounds of solid waste each year, including 500 disposable cups and 320 pounds of paper<sup>3</sup>. For IUB, that would translate to 24,320,000 pounds of solid waste, including 19,000,000 disposable cups, and 12,160,000 pounds of paper. Regardless of which estimate is more accurate, it is safe to say that the IUB community generates a lot of trash!

There are economic, social, and environmental costs associated with all this waste generation and disposal. It is easy to be disconnected from and apathetic about one's waste when it essentially "disappears", never to be dealt with again after being tossed into a trash can. There is no longer has an operational landfill in Monroe County. All of IUB's (and Monroe County's) waste is temporarily stored and processed at the Hoosier Disposal Transfer Station located on State Road 37 before it is finally disposed of at Waste Management, Inc.'s Sycamore Ridge Landfill near Terre Haute, Indiana-approximately 63 miles and 1.5 hours away from Bloomington.

It costs an average of \$34.29 per ton to dispose of waste in a landfill in the United States<sup>4</sup>. An unofficial estimate from a garbage truck driver at IUB puts the amount of waste generated by the residence halls alone at 10-15 tons every weekday, or 50-75 tons per week. If this estimate is correct, residence halls at IUB generate between 1550 and 2325 tons of trash every academic year, not including the massive amounts of waste generated at the end of every semester when students move. Waste removal at the residence halls, then, should cost the University between \$52,700 and \$79,000 per academic year.

### **How do waste audits help resolve the problem?**

Information is needed to determine how to best influence waste issues at IUB. Source reduction and waste diversion efforts will be most efficient once details are known about the generation and composition of the University's waste. In addition, this detailed and reliable information can be used to motivate students and spread awareness of ways that they can affect IUB's waste issues.

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<sup>1</sup> <http://www.stats.indiana.edu/profiles/pr18105.html>

<sup>2</sup> <http://www.epa.gov/osw/nonhaz/municipal/pubs/msw07-rpt.pdf>

<sup>3</sup> <http://www.esc.mtu.edu/docs/NationWideStatistics.pdf>

<sup>4</sup> [http://wiki.answers.com/Q/How\\_big\\_is\\_an\\_average\\_landfill](http://wiki.answers.com/Q/How_big_is_an_average_landfill)

## **Methods**

### **What methods were employed to audit the waste?**

A schedule of residence halls (see Appendix C) was selected with the intention of auditing every dorm at least once throughout the semester. A regular time was set for the audits- every Saturday from 2-4 pm. On audit day, I would bring buckets, tarps, latex gloves, a 50-lb scale, and trash bags to the designated dumpster. Volunteers would then sort through trash, keeping track of the number of bags opened and organizing the waste into the following eight categories:

- Glass
- Plastic
- Aluminum or steel
- Paper
- Cardboard
- Compost
- Miscellaneous or trash
- Other (please specify)

After sorting the waste for a few hours, we would weigh and tally the numbers, wash our hands really, really well, and eat pizza donated by Mad Mushroom Pizza. An e-mail list was used to disseminate information about timing and location of interested parties. All data was recorded on a “Waste Audit Form” (see Appendix D), and then transferred to an Excel file.

## **Results**

### **What information was gained through the waste audits?**

A preliminary analysis of the data obtained from investigating the waste of six residence halls show definite trends (see Appendices A and B). A total of 54.5 bags containing 608.25 pounds of trash was examined, sorted, and weighed. On average, nearly 38% of the waste was recyclable, and almost 13% of the waste was suitable for composting. This means that, on average, just about half of the waste generated in IUB’s residential halls could be diverted from final disposal.

Overall, plastic and compost had the largest presence of all the divert-able wastes, for 14% each. This is perhaps more significant for plastic than for compost as the waste was analyzed by weight, and plastic is generally considerably lighter than food. The number of plastic bottles in the trash was overwhelmingly large.

### **What were the limitations of the waste audit project? How could it expand?**

This project could be made more successful in the future by better publicizing and generating more student involvement. More efforts should be made to include the residents of each dorm in their own dorm’s waste audit. Perhaps a competition could be created to generate the kind of campus-wide excitement felt in the “Energy Challenge.”

Another limiting factor this semester was the weather. The original goal was to audit every residence hall, but several were missed due to rain and snow. In addition, only a fraction of the

information needed has been collected by examining the residence halls. A serious effort is needed to investigate the waste composition of the Indiana Memorial Union and the academic buildings. In general, it would likely be useful to conduct multiple waste audits of each location at different times of the year to account for any seasonal variations in waste composition and generation. It may be enlightening to look at waste from a volume perspective as well as weight.

## **Conclusions**

### **What could be next for Indiana University?**

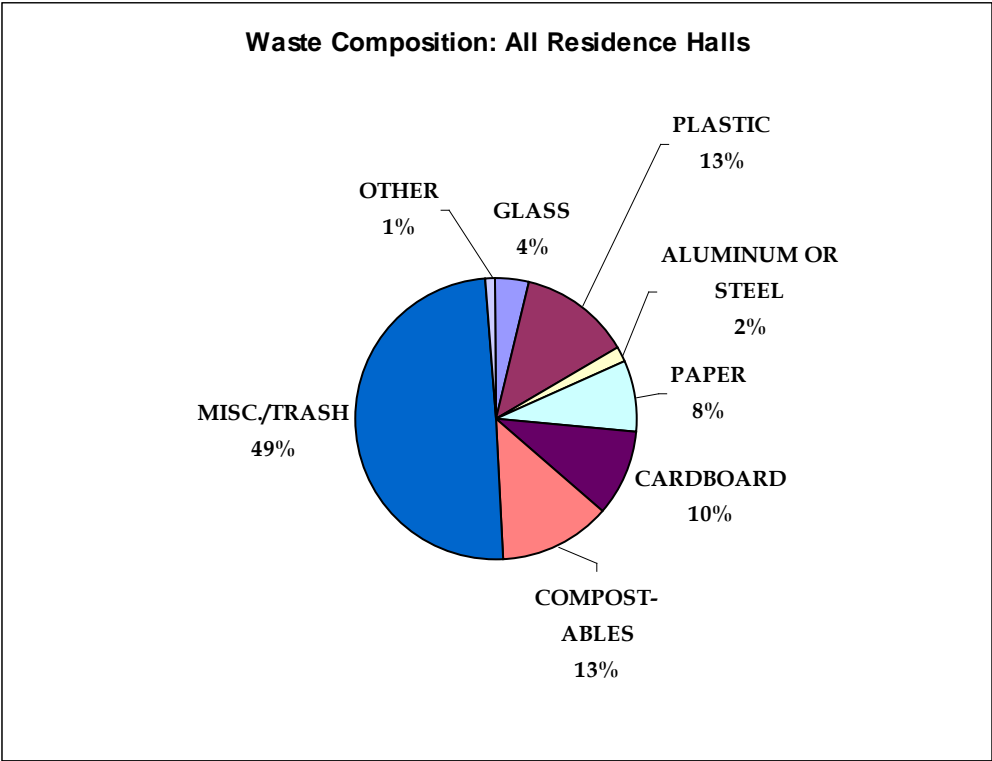
There is much room for improvement in IUB's recycling efforts. Gathering additional information would greatly help efforts to tackle this issue. Focusing efforts on student awareness and making it easier to recycle on campus would likely increase recycling rates, but knowing the composition of the waste would help determine specifically where and how to focus those efforts. If half of IUB's waste could be recycled or composted, the amount of money spent on final disposal could, theoretically, be cut in half. Tackling this problem will benefit the economic, environmental, and social fabric of the University.

### **What recommendations came from this project?**

If the University wanted to tackle just one component of waste reduction, I would advocate strongly for reducing the amount of plastic bottles used on campus. In addition, there is a great deal of interest throughout campus in implementing composting operations. This would be another area of focus that would greatly affect the University's waste output. Cardboard (10%) and paper (8%) were the next largest categories of divert-able waste, followed by glass (4%), aluminum or steel (2%), and other (1%). It may be economically in the University's best interest to increase the amount of paper recycling due to the historically strong payback for that item.

Due to time constraints, this report is being written before the final audit has been completed. There are two waste audits left for the semester, so additional information will be forthcoming. Conducting the waste audits was interesting, informative, and occasionally disgusting. I would very much like to further the efforts of the Sustainability Task Force if such an internship becomes available again.

**Appendix A: Analysis of all residence halls**



**Figure 1**The waste composition of all the residence halls shows that over 50% of waste could be diverted from final disposal.

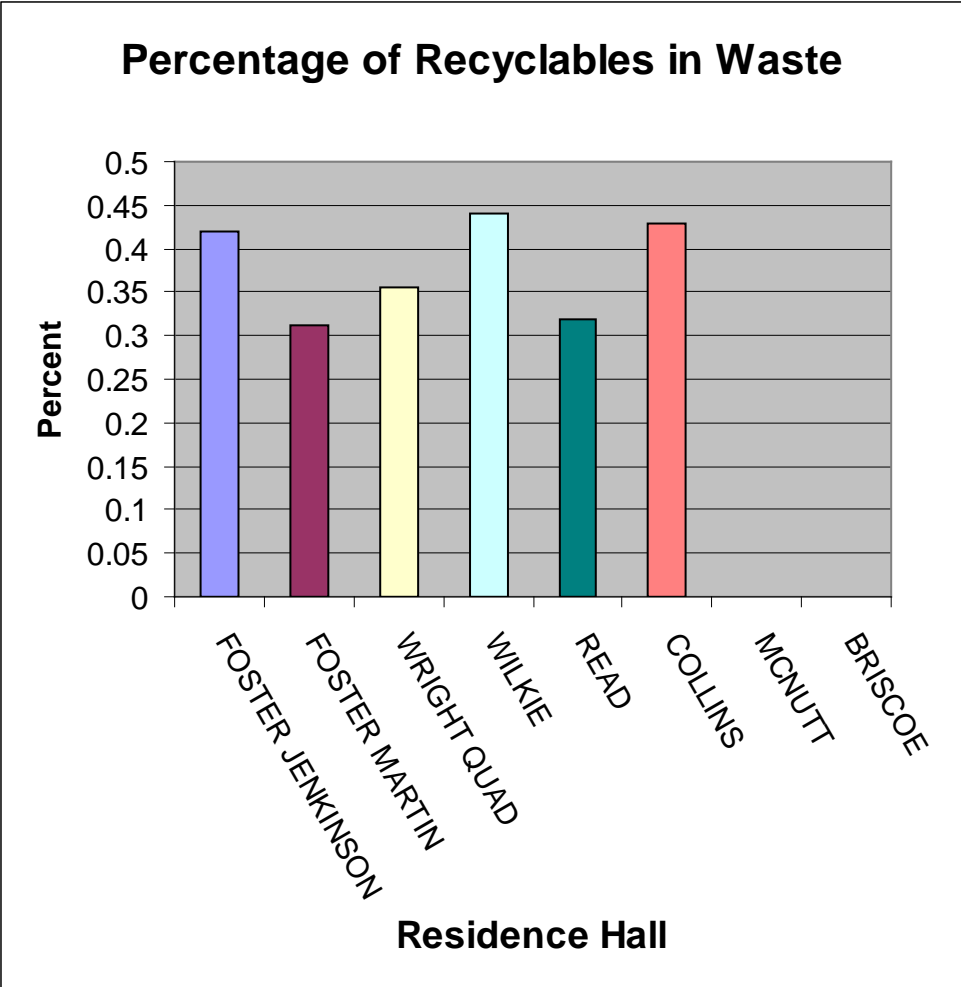


Figure 2 The amount of recyclables in the trash ranged from 31% (Foster Martin) to 44% (Wilkie).

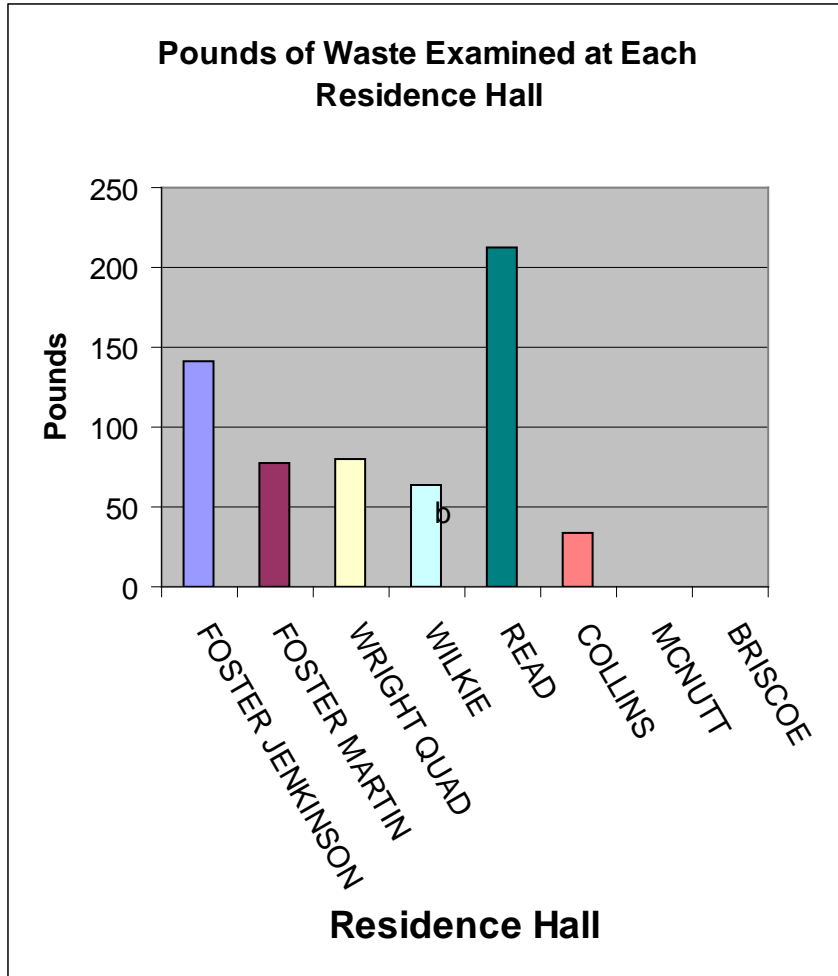
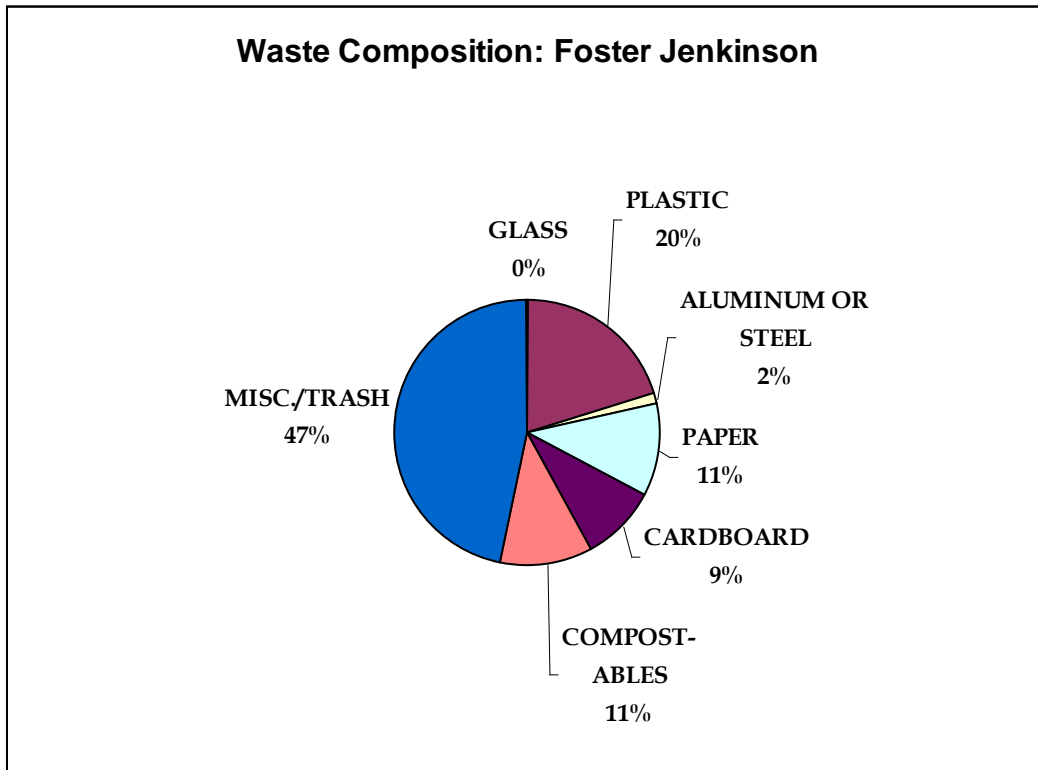
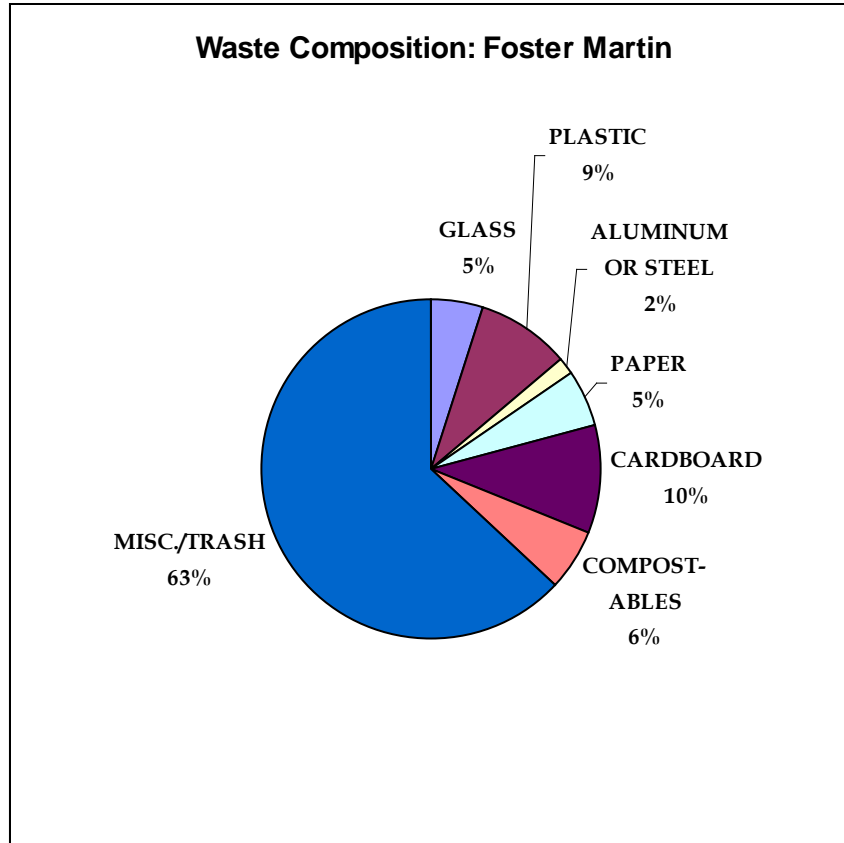


Figure 3 The amount of waste examined at each residence hall varied, depending on the number of volunteers.

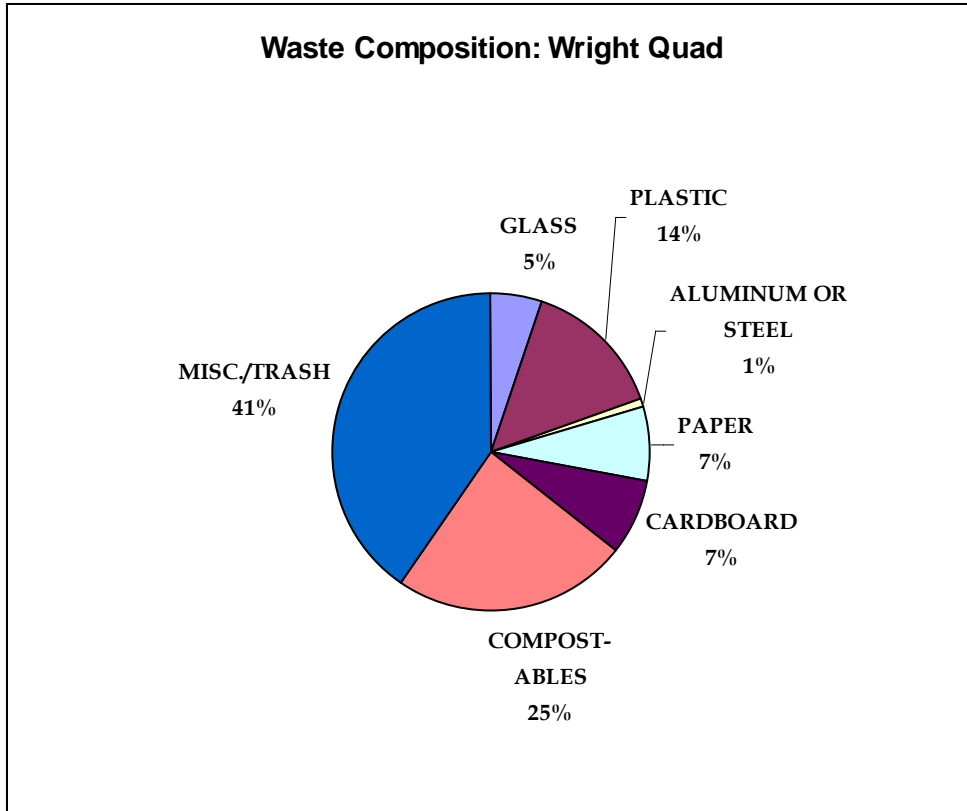
**Appendix B: Waste composition of individual residence halls**



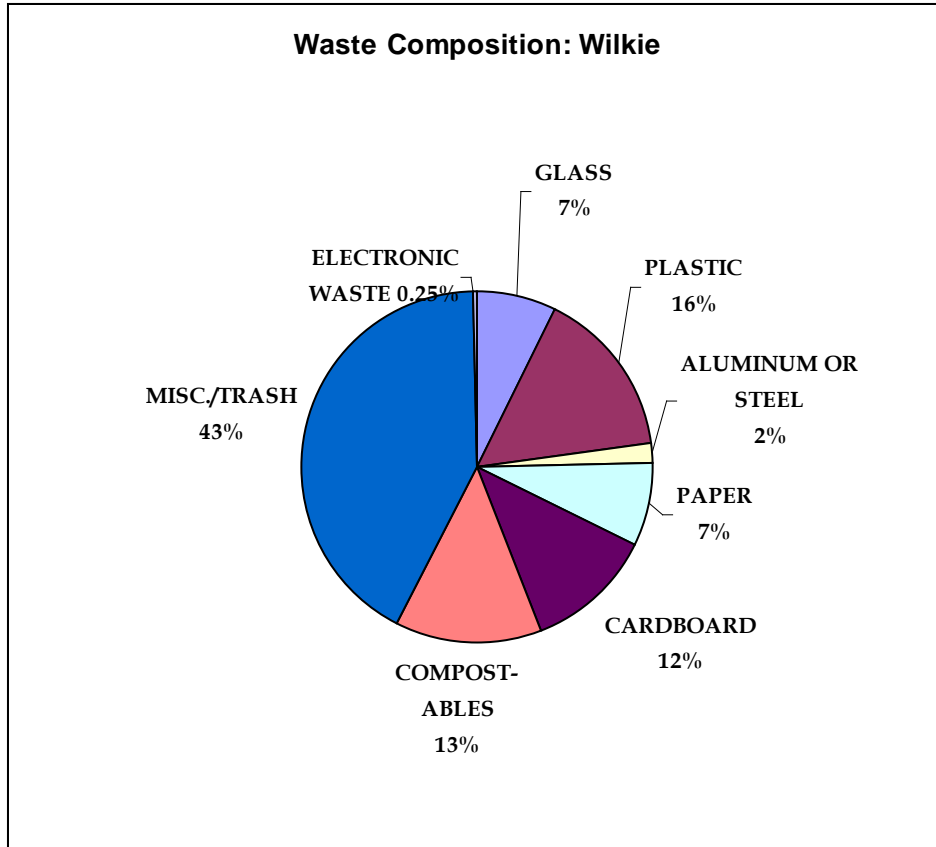
**Figure 4** The waste composition of Foster Jenkinson shows 42% recyclable and 11% that could be composted, for a total of 53% of waste that could be diverted from final disposal.



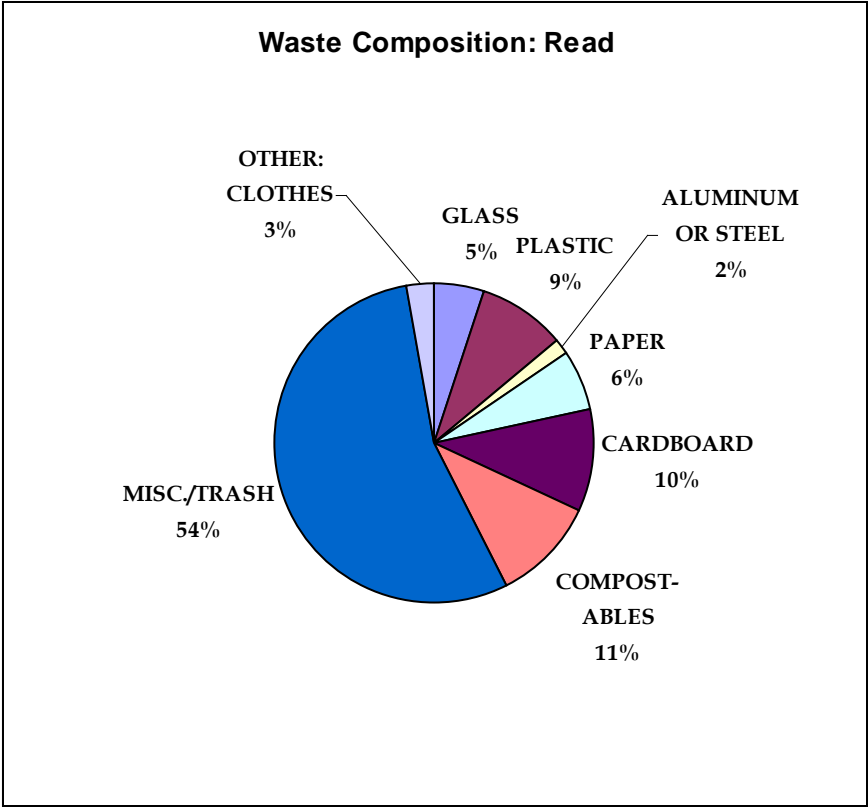
**Figure 5** The waste composition of Foster Martin shows 31% recyclables and 6% compost, for a total of 37% of waste that could be diverted from final disposal.



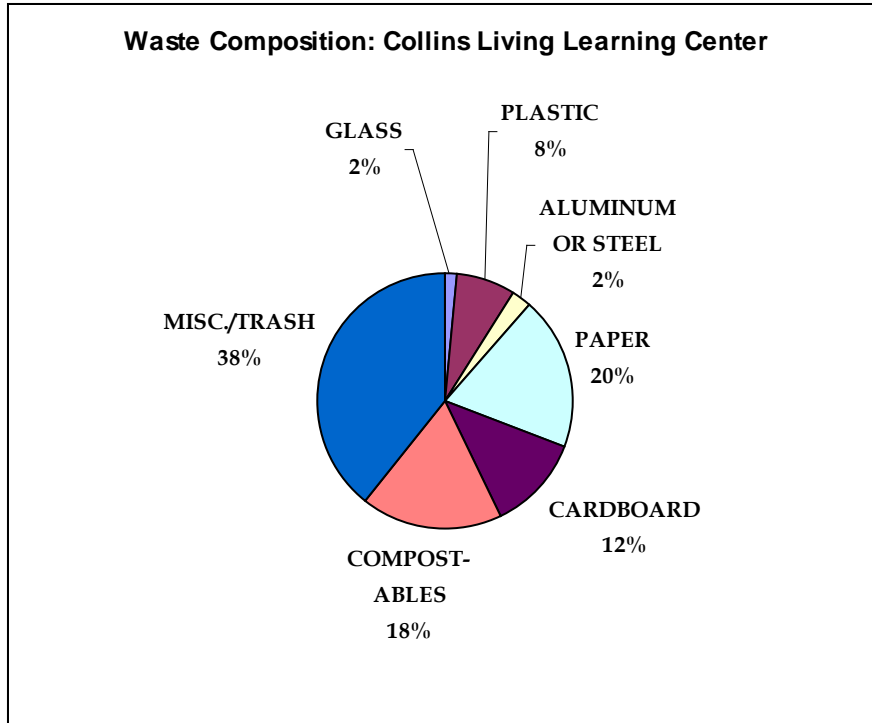
**Figure 6** The waste composition of Wright Quad shows 34% recyclables and 25% compost, for a total of 59% of waste that could be diverted from final disposal.



**Figure 7** The waste composition of Wilkie shows about 44% recyclable and 13% compost, for a total of 57% of waste that could be diverted from final disposal.



**Figure 8** The waste composition at Read shows 35% recyclables and 11% compost, for a total of 46% of waste that could be diverted from final disposal.



**Figure 9** The waste composition of Collins shows 44% recyclable and 18% compost, for a total of 62% of waste that could be diverted from final disposal.

**Appendix C: Copy of the Residence Halls Waste Audit Schedule**

<b>Date</b>	<b>Residence Hall</b>
2/28	Foster Jenkins on
3/7	Foster Martin
3/14	Wright Quad - circle drive off Jordan Ave. - two sites
3/21	spring break – closed
3/28	Eigenmann - corner of 10th and Union, trash bins at loading dock
4/4	Willkie - trash sites behind tower off of Union Ave. or trash site at loading dock used by C-store
4/11	Read Center - trash site off loading dock across from Jordan Ave. garage past International House
4/18	Collins - trash site at loading dock on Fess Ave.
4/25 <b>*Little 500*</b>	McNutt - trash sites in rear parking lot north and south as well as dining center dock - Center is on Fee Lane.
5/2	Briscoe - trash sites behind two towers, corner of Fee Lane and 17th street.
5/9	Residence Halls close

**Notes:** Waste Audits will be held Saturdays, from 2-4 pm, unless otherwise announced. We will meet at the main entrance for the dorm at 2 pm, and make our way to the dumpsters by 2:10 pm.

Appendix D: Copy of the Waste Audit Form

**WASTE AUDIT FORM**

DATE \_\_\_\_\_

LOCATION \_\_\_\_\_

MATERIAL	WEIGHT (LBS)
Glass	
Plastic	
Aluminum/Steel	
Paper	
Cardboard	
Compost-ables	
Miscellaneous/Trash	
Other (Please label)	
<b>TOTAL</b>	<b>LBS</b>

Total Number of Bags Examined \_\_\_\_\_

*Please use the back side of this page for names of attendees as well as any additional notes.*

<i>Sign-In</i>	
<u>NAME</u>	<u>E-mail, if you're not already on the list!</u>
1.	