ILLINOIS SUSTAINABLE TECHNOLOGY CENTER
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Waste Characterization Report

Urbana City Building,
400 S. Vine St.
Urbana

For:
City of Urbana

Prepared by:
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The Illinois Sustainable Technology Center (ISTC)

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UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

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Study Background and Purpose

The data collected through this waste characterization study will help the City of Urbana fulfill the following objectives:

- Examine the composition and quantity of recyclable materials discarded;
- Evaluate the effectiveness of existing waste reduction and recycling programs;
- Provide baseline metrics to increase waste diversion rates and create directed institutional policies;
- Identify opportunities for increased materials recovery.

Summary of Study Methods

The city of Urbana provided a complete list of the collection dates and locations of the dumpsters for the building to be sampled at the City Building. Containers were identified and the size was recorded by ISTC staff. The City Building waste sort was conducted a day before the garbage and recycling receptacles were collected by the contractual haulers. To ensure that the sampling results were representative, the loads were obtained after the BSW personnel shift had ended; at the close to the end of the business day.

For the Urbana City Building, 400 S. Vine St. Urbana, a total of three samples were collected during a period of a week. The garbage dumpster is emptied on Mondays and Thursdays so the audited load was obtained on Sunday and Wednesday for the sort. The commingled recycling carts are emptied on Mondays so the audited load was obtained on Sunday for the sort. The 'cardboard only' dumpster is emptied on Fridays so the audited load was obtained on Thursday for the sort. The entire contents of each receptacle was sampled, sorted, categorized, weighed and summated to create a weekly generation profile.

A kickoff meeting was held on Friday November 15th, with Scott Tess, Environmental Sustainability Manager-City of Urbana, Courtney Rushforth, Recycling Coordinator--City of Urbana, Vince Gustafson, Public Facilities Supervisor--City of Urbana, Seth Rients, Waste Research Specialist-ISTC and Shantanu Pai, Waste Research Specialist-ISTC. The following matters were discussed:

- The level of detail the sort would entail.
- Trailer parking and quick rundown on the complete sort event.
- Previous waste studies conducted in the Urbana metropolitan area.
- Data that would be needed to complete the report.

The current waste management system at the facility was mapped out to determine the quantity and type of collection containers present. The Urbana City Building has a specific solid waste management system that is tailored to fit its needs; thus the map of the waste management system allows a survey of the generation patterns and user involvement. Table 1.1 shows the distribution of waste receptacles at the Urbana City Building.

A building walkthrough was held at the Urbana City Building on Thursday December 19th, with Seth Rients, Vincent Powell, and Shantanu Pai.

Table 1.1 Solid Waste containers distribution

Location	Intended use	Container Distribution	Capacity	Quantity	Total/location
Outside	Trash	Large Cylinder	35 gal.	3	**3**
Basement	Paper	Shredder Small	28 qt.	5	**27**
		Small	28 qt.	16	
		Green Bin		1	
		Shredder Large	35 gal.	2	
		Large	35 gal.	3	
	Trash	Small	28 qt.	27	**43**
		Small	35 qt.	4	
		Medium	23 gal.	8	
		Large	35 gal.	4	
	Comingled Recycling	Medium	23 gal.	3	**3**
1st Floor	Paper	Small	35 qt.	7	**37**
		Small	28 qt.	28	
		Green Bin		1	
		Shredder Large	35 gal.	1	
	Trash	Small	28 qt.	46	**52**
		Medium	23 gal.	4	
	Comingled Recycling	Medium	23 gal.	3	**3**
2nd Floor	Paper	Small	35 qt.	6	**40**
		Small	28 qt.	27	
		Shredder Small	28 qt.	6	
		Shredder Large	35 gal.	1	
	Trash	Small	28 qt.	36	**40**
		Medium	23 gal.	4	
	Comingled recycling	Medium	23 gal.	3	**3**

Waste Sampling Procedures:

The methodology and procedures for this study were derived to be able to collect a complete week long profile for each building sampled. All samples were hand sorted into 31 waste categories (listed in Table 1.2). The material class describes which material categories are either compostable, or recyclable, or neither (thus landfilled). Table 1.2 also shows the observed composition of each material category. Collected sample loads were sorted into labeled containers with known weights. When a container was full, it was weighed and the data was recorded through the computerized handheld unit for the data collection and management system. The container was then emptied and returned to the sorting area for continued use.

Table 1.2 Material Classes and Categories

Material Class	Material type	Categories	Composition
Compostable	**Organics**	Organics	Food, wood based materials, liquids
		Potential Organics	Bathroom napkins, Food soiled paper (coffee cups, take out containers)
Recyclable (U-Cycle)	**Metals**	Aluminum	Aluminum cans
		Steel & Tin	Items made from steel or tin
		Aerosol Cans	Aerosol cans
	Glass	Glass	Glass bottles and other glass items
	Corrugated Cardboard	Corrugated Cardboard	Corrugated Cardboard
	Paper	Paperboard	Items made of paperboard
		Aseptic Cartons	Containers made from poly-coated packaging lined with an aluminum layer
		Magazines	Magazine and catalog quality paper products
		Books	Books of both softcover as well as hardcover
		Telephone Directories	Telephone directories
		Junk Mail	Junk mail
		Office Paper	High grade continuous form computer paper, white paper including bond, photocopy or notebook paper and colored ledger paper primarily from offices.
		Newspaper	Black and white newspaper news print including other paper normally distributed inside a newspaper such as colored advertisements, comics, fliers, tabloids
	Plastics	Plastic grocery/ retail bags	Includes both clear and colored plastic shopping bags and other bags used for product packaging
		Other Film	Plastic bags and clear plastic film
		Plastic #1 PET	Plastic items that are clearly labelled with a #1
		Plastic #2 HDPE	Plastic items that are clearly labelled with a #2
		Plastic #3 PVC	Plastic items that are clearly labelled with a #3
		Plastic #4 LDPE	Plastic items that are clearly labelled with a #4
		Plastic #5 PP	Plastic items that are clearly labelled with a #5
		Plastic #6 PS	Plastic items that are clearly labelled with a #6
		Plastic #7 OTHER	Plastic items that are clearly labelled with a #7
		All other plastics	All other plastic products
Recyclable (Other local recyclers)	**Textiles**	Textiles	Clothing and apparel, shop rags, blankets, shoes, leather products such as wallets, purses, belts, and scrap leather
	Universal Waste	Electronics	Items containing a printed circuit board and or wires
		Household Hazardous Waste	Items including vehicle automotive fluids, oil based paints, medicines, poisons, corrosives, flammables, and sharps
		Lamps/Bulbs	Electric light bulbs
		Batteries	Any type of battery including lead acid storage batteries, household batteries, and rechargeable batteries
Landfill	**Other**	Misc. Solids	All items not fitting into any other material category
	Polystyrene foam	Foam (Styrofoam)	Materials made from polystyrene expanded polystyrene.

Following the completion of each waste sort, all of the data collected in the data collection and management system was uploaded to the computer server. At the end of each sort the data was reviewed to ensure the following:

- Individual entries are unique;
- Specific comments on the unusual aspects of the sample are legible and understandable;
- Post-sort weight totals aligned with the pre-sort weight totals.

Preliminary data

The following preliminary results from the waste characterization study depict the composition of material that is disposed of and landfilled at The Urbana City Building for a one week period.

Table 1.4 Percentage of Material Class for Urbana City Building

Material Class	Urbana City Administration Building
Recycled	**35%**
Compostable	21%
Recyclable	34%
Non-recyclable	10%

Figure 1-1 Weighed Material Class at Urbana City Building

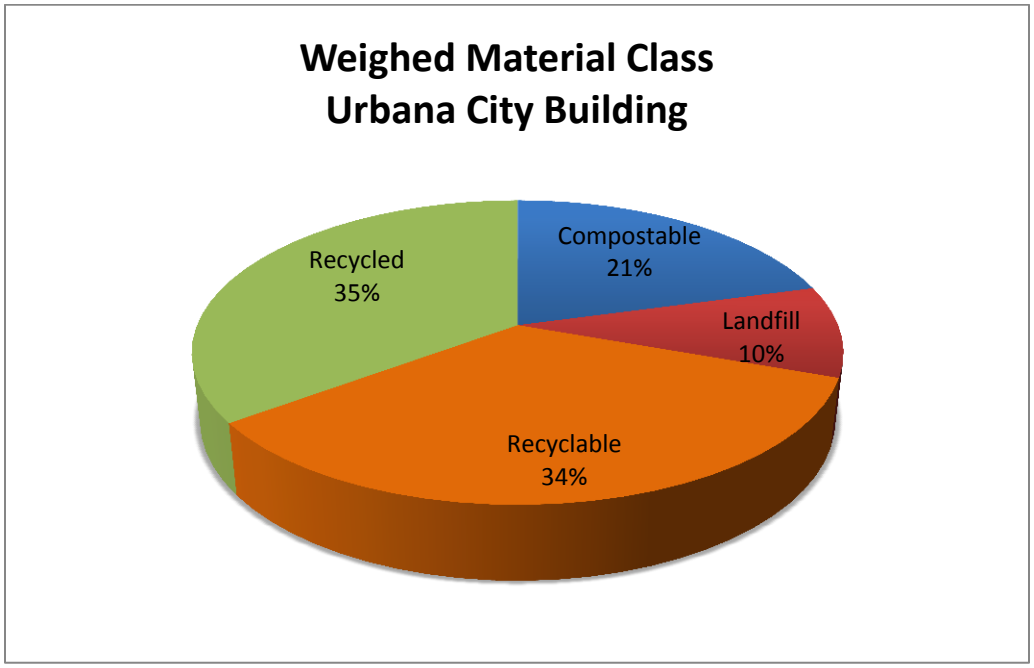


Figure 1-2 Actual Material Class at Urbana City Building

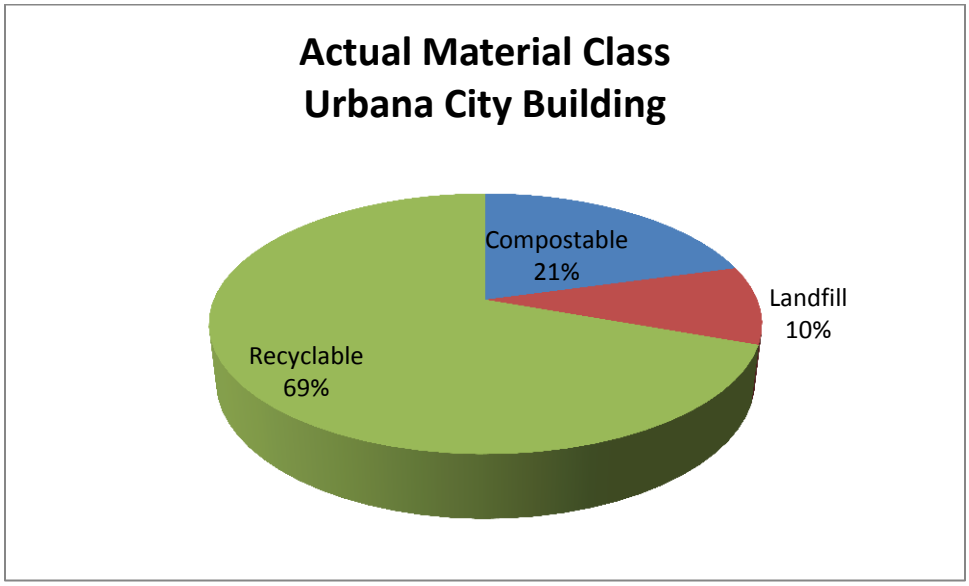


Figure 1-3 Potentially Divertible Material Classes at Urbana City Building

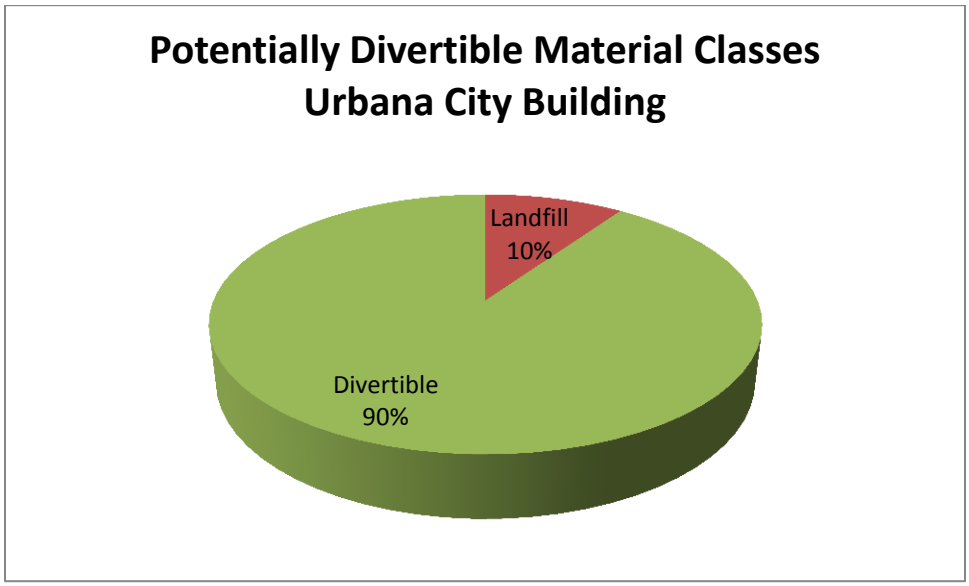
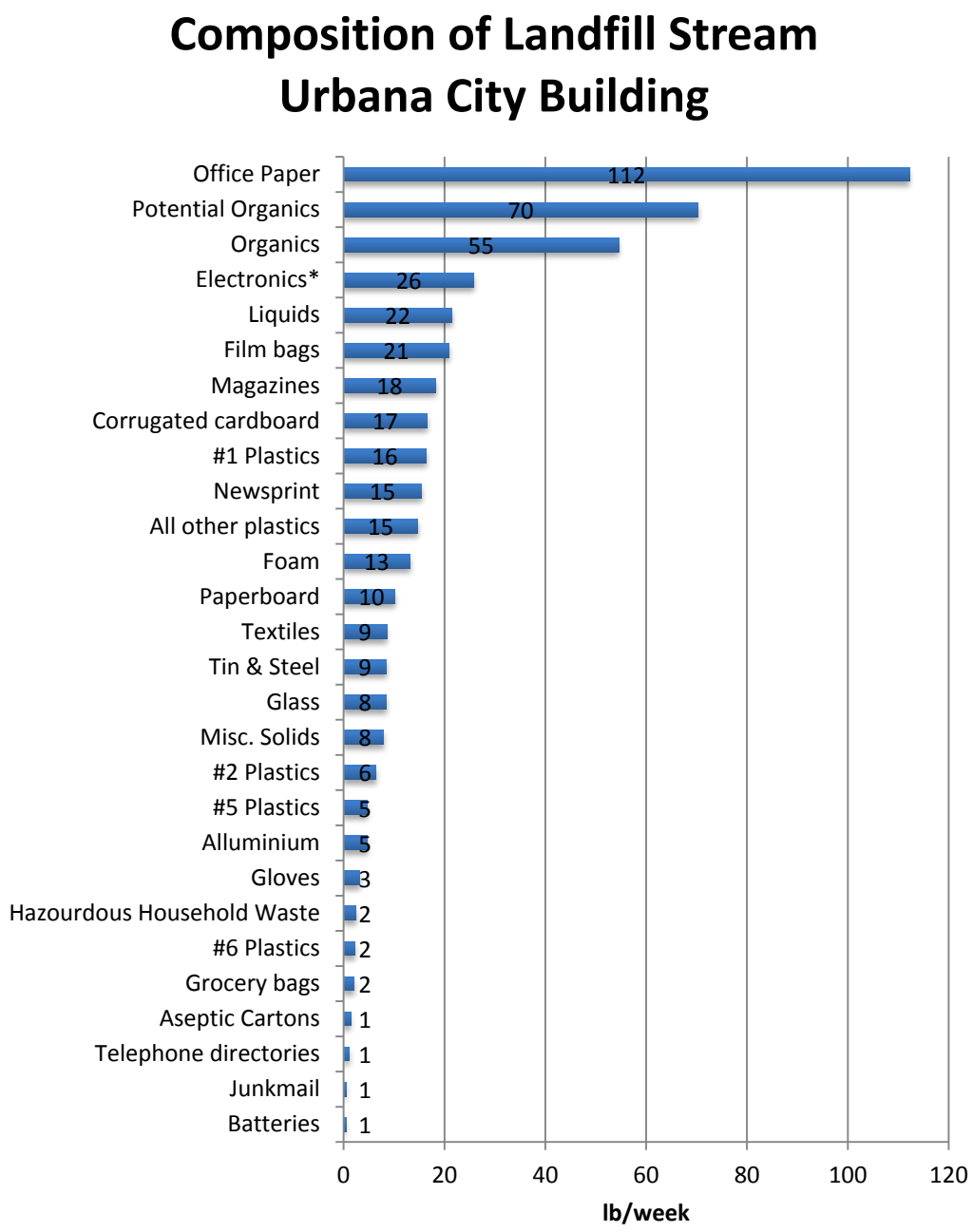


Table 1.5 Total percentage and weights of Each Material Category Urbana City Building

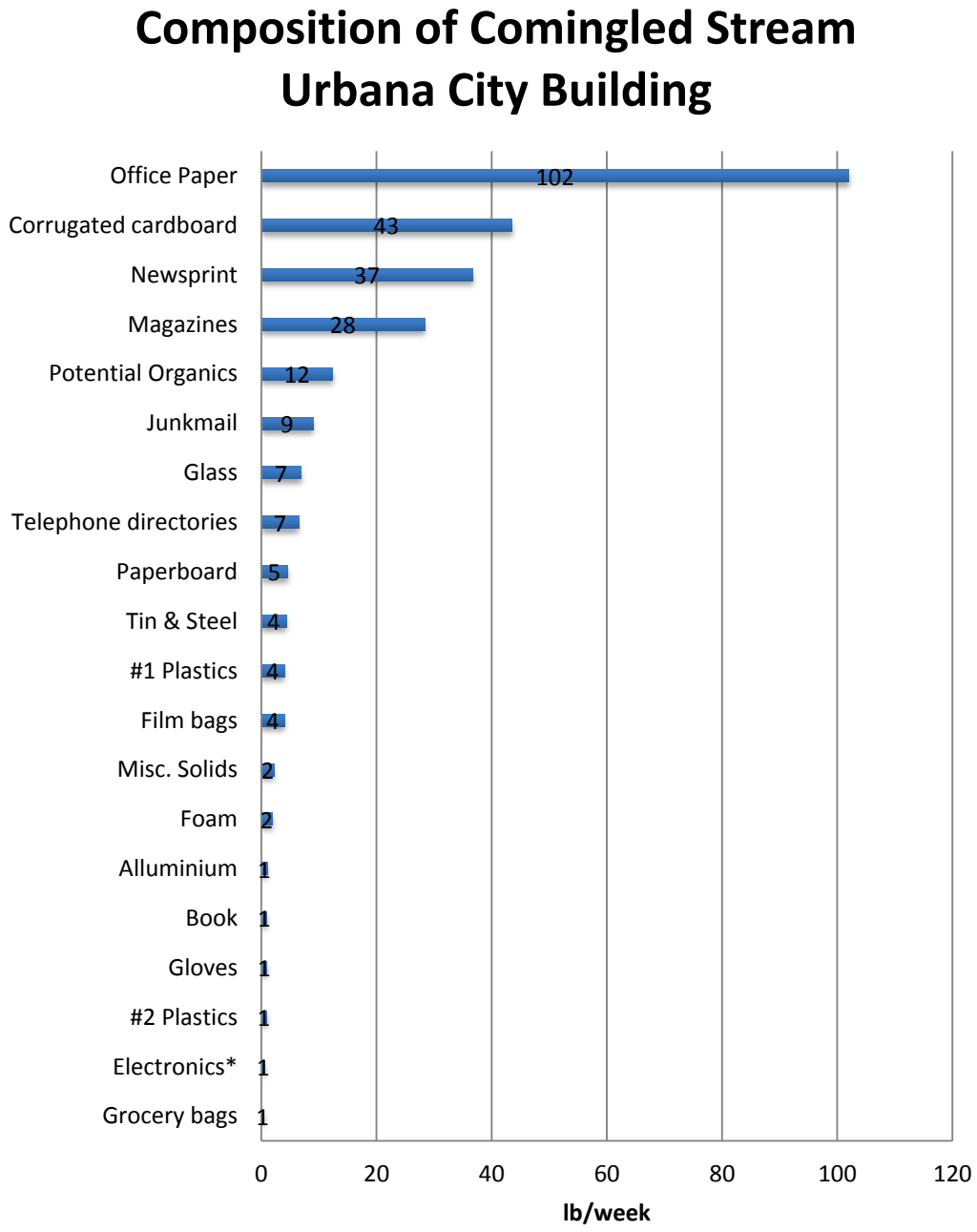
Material Category	Weight (lb.)	% Waste
Office Paper	214.2	28.0%
Potential Organics	82.7	10.8%
Corrugated cardboard	77.4	10.1%
Organics	54.5	7.1%
Newsprint	52.2	6.8%
Magazines	46.6	6.1%
Electronics*	26.5	3.5%
Film bags	24.9	3.3%
Liquids	21.5	2.8%
#1 plastics	20.4	2.7%
Glass	15.4	2.0%
Foam	15.1	2.0%
Paperboard	14.8	1.9%
All other plastics	14.7	1.9%
Tin & Steel	12.9	1.7%
Misc. Solids	10.2	1.3%
Junk mail	9.5	1.2%
Textiles	8.6	1.1%
Telephone directories	7.6	1.0%
#2 plastics	7.3	1.0%
Aluminium	5.8	0.8%
#5 plastics	5.1	0.7%
Gloves	4.2	0.5%
#6 plastics	2.7	0.4%
Grocery bags	2.6	0.3%
Hazardous Household Waste	2.5	0.3%
Aseptic Cartons	1.4	0.2%
Book	1.0	0.1%
#4 plastics	0.7	0.1%
Batteries	0.5	0.1%
#3 plastics	0.5	0.1%
Aerosol cans	0.3	0.0%
#7 plastics	0.1	0.0%
Total	**764.4**	

Figure 1-2 Composition of Landfill Stream of Urbana City Building



* One desktop computer contributed most of electronic weight. The source of the desktop is unknown and might not be indicative of weekly patterns.

Figure 1-3 Composition of Comingled Stream of Urbana City Building



* One desktop computer contributed most of electronic weight. The source of the desktop is unknown and might not be indicative of weekly patterns.

Recommendations

ISTC recommends the following steps for the Urbana City Administration building to dramatically increase overall recycling rates. These recommendations are focused on the top three (by weight) divertible materials found in the building's landfill bin. These materials are:

Material Category	Definition	Vol/Week (lb.)	% of current Landfill stream
Office Paper	Computer/photocopy paper, notebook paper, and colored ledger	112	23%
Other Mixed Recycling	All currently recyclable items except office paper	138	30%
Organics	Food, liquid, wood based materials, food-soiled paper, paper towels	147	31%

Office Paper is the single largest category that is generated at the Urbana City Administration Building. Of the 215lb generated during the week of the audit only 102 lbs of office paper was recycled. Put differently, 52% of all office paper generated in the building doesn't get recycled.

Diverting just the office paper fraction from the waste stream will effectively decrease your landfill stream by about 23%.

Actions to reduce Office Paper recycling include:

1. Put "No paper" signage on trash containers.
2. Remove all the trash cans from individual desks are removed and only a comingled recycling container be placed. All trash containers are moved to common hallways and break rooms.
3. Change the default settings for all printers to print double sided
4. Purchase lower grade paper for departments that use most of their printing for internal purposes.

Actions to increase Other Mixed Recycling include:

1. Create and post consistent signage regarding which items are acceptable in your recycling program. As your current recycling hauler if they provide posters for free.
2. Conduct training for employees. Host lunch time training and include a demonstration of what is/isn't recycled, how, and where.
    a. Conduct training on a bi-annual basis to maintain the quality of your recycling program.
    b. Include all employees in your training/outreach. If maintenance and custodial staff are not able to make normal day-time training, consider hosting a special morning or evening training for them.
3. Consult the custodial staff about their current bin-emptying and recycling practices. Clarify your program in a written policy if needed. Internal signage in the appropriate languages for the custodial staff regarding where the trash and recycling is to be brought.
4. Engage employees with creative signage and competition. Consult the Recycling@Work website for fun ideas. (http://recyclingatwork.org/)

Actions to reduce the Organic stream in the trash include:

1. Start collecting organics separately. Even though there isn't an end market for organic waste currently available for the area, getting the staff acclimatized to the idea will ease the transition once there is an end market for organics collection.
2. Research drum-composting units and consider installing one in a garage/outdoor area of the building. The drum composter can serve as a pilot organics diversion effort.