Recycling at RU Bus Stops

Going green at Rutgers University

Tag Words: recycling,

Authors: Arora, Garima V., Bano, Shama, Meseroll, Ben, Shah, Darshini, Shah, Neeti with Julie M. Fagan, Ph.D.

Summary
The Issue: Lack of Recycling

Introduction (SB)
Having and promoting the use of recycling containers in your school, colleges, or universities is incredibly important. Schools are important forums educating young people and the community about the solutions, challenges, and problems of solid waste management. Students can be encouraged to put waste in appropriate bins so that they can make recycling a part of their lifestyle. Recycling programs in schools provide a learning experience for everyone involved. Recycle bins must be placed at various easily accessible places like at bus stops, parking lot and other places on campuses to promote and create awareness among students, teachers, and other staff. More recycle bins around a campus can reduce the amount of time spent by staff on certain recycling responsibilities. Recycling programs require special planning and careful implementation to make recycling experience easier for students. The program should involve placing recycling bins at locations which are easily accessible; the students should go naturally to the recycling bins rather than to the trash bins. Recycling multi-compartment bins can be used for easy sorting and save money and time. The bins can be labeled with recycling decals that display the messages about the importance of recycling. Students can be educated about recycling by using school newspaper, web pages, e-mail, and student orientation. The successful use of recycling bins can improve a school’s reputation, as well as its social performance as an educator and example to better living. Also, a good recycling system provides a clean environment to a school and good health to a student.

History of Recycling at Rutgers (DS)
Rutgers State University has the most successful recycling program in the nation. In the developing years of this university, a lot of waste was produced and in 1987, the state legislature passed the New Jersey Source Separation and Recycling Act. This law made mandatory for the state institutions to recycle at least 60% of their solid waste by 1995 (Meisel, 2005). However it wasn’t clear on what to recycle and what not to so in 1992, the university senate unanimously passed the recycling and reduction policy and the recycled products procurement and use policy. These policies were modeled as the guidelines for recycling and soon an educational program was established to inspire a “reduce, reuse, and recycle” mentality within the university. Soon enough recycling was adopted by all the campuses of Rutgers. The recycling bins were put out everywhere around the campus including the bus stops and went above and beyond 60% of recycling that was mandated by the state legislation. Alonzo Lewis is the maintenance manager for recycling and is known as the recycling guru. Under his maintenance, in 2001, the university won an outstanding achievement award for recycling from the New Jersey Department of Environment protection. In 2004, Rutgers University contributed to 14,322 tons of recycled materials with all three campuses combined (Meisel, 2005).

As the university grew, they realized that they couldn’t keep polluting the environment with waste (Dianne Gravatt, director of environmental services and grounds in New Brunswick). Rutgers institute is one of the top recyclers in the nation and in 2004; the university spent approximately $247,000 on recycling (Meisel, 2005). Rutgers has a very successful recycling program and also takes part in the recycling mania.

Legislation (GVA)
Back in 1987 the state Legislature of New Jersey passed the New Jersey Source Separation and Recycling Act. The Act mandated Rutgers to recycle minimal 60% of the total solid waste generated by the year 1995 to maintain its state university status. The Act however did not describe how to carry out recycling and administer any programs related to recycling on campus. In May 1992 in an act of protest Rutgers rallied against the 1987 Act. Thereafter the University Senate passed Recycling and Reduction Policy and the Recycled Products Procurement and Use Policy. Policies defined the process of recycling and recyclables in depth (Meisel, 2005).

Facts about Recycling at Rutgers (GVA)
The first ever Rutgers recycling program dates to nearly two decades ago. Kevin Lyons, Director of Purchasing Department and Research Professor for Supply Chain Environmental Archeology at Rutgers New Brunswick, was hired in 1988. Taking a lead on the Act passed by New Jersey State Legislation in 1987 Lyons launched university wide “waste avoidance” to cut back on the amount of waste generated on all Rutgers campuses (Hignite, 2010). Lyons has given a new outlook to recycling program at Rutgers. Because of his efforts Rutgers is now involved in something called Green Purchasing. Also known as green procurement or eco-procurement act of green purchasing attempts to buy and utilize only those products which are environmental safe and friendly (Rutgers University Faculty and Staff Experts Directory.” Department of University Relations - Home Page, 2010).

Every year Rutgers recycles about 65% of its total solid waste. In the year 2009 Rutgers successfully recycled over 15,643 tons of solid waste. Rutgers Recycling Program reduced 6,249.45 metric tons of carbon equivalent introduced into the atmosphere which is equivalent to removing 4,300 cars from the road in a year, saving 14,825 mature trees and 2,863 barrels of oil (Gravatt, 2010).

Effects of Recycling at Rutgers (NS)
One single statement, “We should recycle to save the environment,” justifies why recycling is so important. It is thought that recycling has more negative effects than positive effects, but that is wrong. Nevertheless, the benefits of recycling outweigh the risks. Some positive effects of recycling are that it saves energy, saves environmental conditions, reduces pollution, saves natural resources, saves space for waste disposal, saving money (Ghosh, 2010). Recycling products saves more energy than manufacturing products from scratch. The new products that are manufactured from the raw material that is recycled saves a lot more energy than when new products are manufactured from virgin materials (Ghosh, 2010). It requires energy to acquire and transport the virgin materials from their origins or natural sources, but with recycling this energy is saved. For example, recycled glass takes about 40% less energy to make into another glass product than making it from scratch (University Facilities & Capital Planning, 2008). Even though recycling uses some energy for sorting, transporting, etc., it does not compare to the amount of energy it saves. This amount of energy used in recycling is being minimized all the time because waste management companies are always looking for ways to make the vehicles used to pick up recycled materials more energy efficient.

Recycling could reduce global warming and pollution. Carbon dioxide is a greenhouse gas that is a major contributor to global warming. When certain products are manufactured, they release a lot more carbon dioxide than recycling those products would (Ghosh, 2010). For example,
manufacturing aluminum goods from scratch produces 95% more carbon dioxide than recycling the old aluminum products. Also, for each ton of paper recycled, 15 trees are saved from being cut down (University Facilities & Capital Planning, 2008). It is known that trees use up carbon dioxide from the atmosphere; one tree absorbs almost 250 pounds of carbon dioxide each year. However, for each ton of paper recycled, 15 trees are saved from being cut down which reduces the amount of carbon dioxide in the environment. There are other harmful gases emitted from industries like methane and sulfur dioxide, which pollute the environment. With reducing energy, recycling minimizes the amount of harmful gases emitted which will reduce the amount of pollution.

Proper recycling can help us preserve our natural resources. Since, it is known that recycling involves the processing and usage of the core elements of an old product for the production of new products it can help in saving our natural resources (Ghosh, 2010). For example, once an old newspaper is recycled we do not need to use the resource of another tree to produce new paper products. Most of the landfill sites are filled up with a lot of waste products that could have been recycled efficiently. However, recycling these waste products would enable the proper usage of them and save space for landfills. Also, the amount of landfills with free space has been decreased to a great extent because many of the landfills are either filled up already or filling up very quickly (Ghosh, 2010). Also, recycling has a huge economic benefit. It takes more money to manufacture products including expenses for acquiring the raw materials, transferring them from their origin to production places, and processing them.

As you can see, something as simple as recycling has some very rewarding effects that could make the environment better. Therefore, whenever you think about “why you should recycle,” think about how you could be one of the millions of people to help the Earth.

The Economics of Recycling at Rutgers (BM)
Rutgers has an enormous pollutive footprint that generates over 13,000 tons of waste per year and participates in a global recycling program called Recyclemania. Within Recyclemania, Rutgers competes with over 600 institutions to try and be the number one recycling institution and carry a very prestigious title within academia.
Recycling, in general, carries various financial and environmental impacts, both of which can be either easy or difficult to measure. Financially, recycling involves general cost savings that can be measured by the amount of material needed to be recycled, the cost of recycling that material versus the costs saved by reusing the recycled material, and the costs of recycling versus using a landfill. The financials are easy to pin point and figures can be generated by the tonnage.
The environmental impacts of recycling are harder to measure and in economic terms they are considered externalities. Externalities would include the pollution in the air, on the ground, and in lakes and rivers. Scientific measurements can be applied to extrapolate useable figures for positive externalities that Neeti has already discussed.

The Data
Rutgers currently ranks number one in the 2010 Gorilla Prize within the Recyclemania competition (Mania). The Gorilla Prize measures the amount of total recyclables gathered by each campus regardless of size. Currently, Rutgers is blowing away the competition with 1,177,813 recyclable pounds, meaning Rutgers generates tons of materials (Mania). Recycling is
clearly a major part of campus life at Rutgers. Unfortunately, Rutgers is trailing behind California State University to be the Grand Champion so more work is still needed to be done on campus to promote recycling. Regardless of how well Rutgers is doing in the competition, Rutgers saves a lot of money on recycling. For example, based on New Brunswick Campus 2007 data: (Recycle)

Cost of materials which were sent to a landfill:

<table>
<thead>
<tr>
<th>Weight in Tons</th>
<th>Disposal Cost Per Ton</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>13,827.99</td>
<td>$58</td>
<td>$802,023.42</td>
</tr>
</tbody>
</table>

Cost of materials which were recycled:

<table>
<thead>
<tr>
<th>Weight in Tons</th>
<th>Recycling Cost Per Ton</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>13,827.99</td>
<td>$4.34</td>
<td>$60,071.00</td>
</tr>
</tbody>
</table>

By recycling, Rutgers New Brunswick realized a cost savings of $741,952.42 which is a very significant figure especially during rough economic climates like we are experiencing today (Recycle). Colleges are always looking to cut their costs and recycling is clearly a part of campus life Rutgers should focus on to do so.

Process of Recycling at Rutgers (NS)

The first step of recycling is collecting the recyclable materials from the areas around the university such as residence buildings, bus stops, and any other buildings that collect recyclable materials (The Recycling Process, 2010). We are mainly focusing on bus stops because that is the one places students pass by at least once if not twice a day. There is usually a waste management company that comes to pick up the recyclable materials. The second step involves processing the recyclable materials. This means sorting the materials into groups, cleaning them, and making them presentable to be sold to manufacturers who will turn them into new products (The Recycling Process, 2010). The third step is the actual manufacturing of the product and the final step is the purchasing of the recycled products.

Common Recyclables allowed by Rutgers University: New Brunswick campus (DS)

1) Paper and Cardboard
- All types of papers such as computer paper, shredded papers, manila paper, bound or paperback books, magazines, junk mails, envelopes, pizza boxes, notebooks, cardboard trays etc.

2) Metal cans (must not be washed but the containers must be empty)
- Both aluminum and steel food and beverage cans are recyclables

3) Glass
- Any color glass beverage or food containers are recyclables.
- Not acceptable- light bulbs, laboratory glass, dishes, or window glasses.

4) Plastic
- All plastic containers with 1-7 plastic such as water bottles, detergent containers, milk container, caps for the plastic bottles etc are recyclables.

5) Polystyrene packing material such as Styrofoam.

6) Lead and nickel cadmium batteries

7) Concrete
The Service Project: Promote Recycling

Recycling is clearly a cost saver for Rutgers, so the most logical move is to promote more recycling and help the New Brunswick campus save more money in the long run. It will take an initial investment in order to see a cost savings a year or two down the road. The idea is to promote Commingled Recycling around the New Brunswick campus. Commingled recycling is where most recyclables, such as paper, aluminum, plastic, and glass are put together in the same recycling bin that we want to place at each bus stop on the New Brunswick campus.

Commingled recycling is great because it makes the recycling experience easy since commingled recycling requires no sorting by the individual wishing to recycle; in this case the average student with empty materials getting on and off a bus. Studies have shown a higher success rate of recycling when sorting isn't required by the individual.

Of the 13,828 tons of materials recycled by Rutgers New Brunswick in 2007, about 2082 tons were commingled materials.

<table>
<thead>
<tr>
<th>Weight in Tons</th>
<th>Disposal Cost Per Ton</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,082</td>
<td>$58</td>
<td>$120,756</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight in Tons</th>
<th>Recycling Cost Per Ton</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,082</td>
<td>$4.34</td>
<td>$9,035.88</td>
</tr>
</tbody>
</table>

Rutgers New Brunswick saw a cost savings of $111,720.12 by recycling commingled materials. Our proposal will boost the tonnage Rutgers New Brunswick would net each year of commingled materials, thus increasing their cost savings.

Proposal Costs

Our proposal requires commingled recycling bins located at a majority of the bus stops located around the New Brunswick campus. Whether or not a bus stop requires a recycling bin would depend on whether the stop already has a suitable recycling bin that is eye catching and memorable.

The costs associated with our proposal not only depend on the number of bins required, but also the quality of the bins. The bins range from $400-$1000 based on durability. We will go with a middle of the road approach for an economical and durable bin of $700. Our proposal would require approximately 30 recycling bins around Rutgers so our total cost would be about $21,000 for the entire campus. Most bins have a 10+ years lifetime which means the initial investment will last for at least a decade. In New Jersey, state grants funds have been the main way for communities to raise money to purchase outdoor containers. Notable manufacturers of containers are the Belson Outdoors and Haul-All manufacturing, thus we will turn to them for a competitive price quote that will suit the New Brunswick Campus.
Proposal:
Facilities Maintenance Services - B/L
6 Berrue Circle
Piscataway, NJ 08854

April 20, 2010

Dear Ms. Gravatt,

We are a group of students from School of Environmental and Biological Sciences (SEBS) on a mission to promote recycling at Rutgers bus stops. First of all, we would like to congratulate you for the commendable job that you and your team do every year to promote and perpetuate recycling at Rutgers. We would also like to congratulate you for the work you have put forth for the Recycle mania 2010 competition.

We are students of Dr. Julie Fagan from the class Ethics in Science and we have been working on a proposal “Recycling at RU Bus Stops” to promote recycling around the bus stops of Rutgers University, New Brunswick. As a group, we managed to walk around all campuses on New Brunswick and Piscataway to search for recycling bins at bus stops. We recorded that out of 49 total bus stops 15 of the following mentioned bus stops are consistently missing recycle bins. We also noticed that the recycle cans at the rest of bus stops look very similar to trash can present in vicinity. By means of our project we suggest placing commingled trash cans and recycling cans at bus stops that do not have them. We also recommend that recycling cans should be made more eye-catching, apparent and easily distinguishable from the trash cans.

We understand that most bus stops have recycling cans but as students we have witnessed the absence of recycling cans at these specific bus stops:
- Katzenbach Hall
- Jameson Hall
- Henderson Apartment
- Labor education building
- Public safety building south
- Public safety building north
- Rockoff Apartment
- Library of Science and Medicine
- Johnson apartments
- Train station: Somerset Street and George Street
- Paterson street
- Burger King (Paterson Street)
- Liberty Street
- Zimmerli Art Museum

We appreciate your efforts to recycle a great percentage of trash generated on campus however a significant percentage of potential recyclables end up in trash cans because of the similarity in appearance of recycling and trash cans. We propose a cheap and effective way to encourage
recycling at the bus stops. We propose that the recycling bins should be painted blue or green which are universally regarded as the colors of recycling and also represent the “Go Green” movement. We often see students discarding their trash in the closest bin as they are rushing on and off the buses. Separate colored cans would only assist students in discarding trash in the appropriate bins and facilitate recycling habits. Colored bins will also prove cost efficient in the current times of financial crunch. The amount of recyclables being sent to landfills can be reduced appreciably with the initial investment in colored cans.

As per our research weatherproof colored recycling bins could range from about $24.45 to $929.00, but we suggest a bin that costs closer to lower end of price range mentioned above; such as $399. Our proposal will require about 15 bins to add to the bus stops that do not have them. This would yield a total cost of $5985. Most recycling bins have a life expectancy of 10+ years. Therefore, the initial investment would last for at least a decade or so. As for the bus stops that do already have recycling bins, we suggest to paint them either a bright blue or green color.

As a team constituted of environmentally aware students we aspire to bring some changes which revolutionize the outlook of students towards recycling while generating more savings for Rutgers University.

Thank you in advance for your time and consideration.

Sincerely,

Garima V. Arora                      Shama Bano
Benjamin Meseroll                    Darshini Shah

Neeti Shah
References

Promoting Recycling at RU Bus Stops

At Rutgers there is a very good recycling program. However there is always room for improvement. To promote more recycling and to improve the program to help the environment, myself and four other student from Rutgers University decided to propose a suggestion to the recycling program. The proposal was to put out recycling bins at every bus stop instead of just having a trash can. Not all recycling bins are needed at bus stops such as paper, plastic recycling however a recycling bin for cans, glass, bottles etc is necessary. Students always have drinks and food in their hand at bus stops and if a recycling bin was provided at the bus stop, the recyclables could be thrown out in the proper bin instead in the trash cans. Being a Rutgers Student for 4 years, I myself have trashed many recyclables at bus stops because the recycle bins were not there and have seen many other students doing the same.

In addition, our group also suggests changing the appearance of the recyclable bins to make it more convenient for the students to differentiate between trash and recyclable bins. The appearance of recyclable bins can be changed by painting the cans either blue or green color, the standard colors of recycling. Humans are visual creature and therefore if both the cans look the same then all the trash will go into the can that’s closest to their reach.

This small improvement and effort of recycling can help our planet in the long run. Global warming is a big issue and to prevent future global warming and to keep from destroying the earth, recycling is very necessary. The planet cannot be saved by just one person recycling. Everyone should recycle because it aids in furthering the lifespan of our planet.

Darshini Shah is a senior Biochemistry major at Rutgers University in New Brunswick, NJ

** TO BE SENT TO NEW YORK TIMES EDITORIAL SECTION**
Benjamin Meseroll  
Editorial  
Recycling at RU Bus Stops  
3/24/2010

The recycling program here at Rutgers has netted the Rutgers administration a huge cost savings when it comes to recycling recyclable materials rather than shouldering the cost of handling and transporting those same materials to a landfill. I feel the recycling program could still use some changes to increase the amount of recyclables Rutgers takes in; in affect saving Rutgers more money and keep the environment clean too. My idea is a cheap and effective one; paint the recycling bins at the Cook and New Brunswick campus bus stops the universal recycling colors; green or blue. As of right now, many of the recycling bins around campus look identical to the trash cans until a person is directly on top of them. Humans are visual creatures and by the color alone students and faculty getting on or off the bus will be able to easily differentiate the trash and recycling bins from each other. Being able to easily differentiate the trash and recycling bins will increase recycling habits. The color will help make them more memorable, too.

Changing the color of the recycling bins at every bus stop will increase the amount of recyclable commingled materials Rutgers gathers. Commingled recycling is a fairly new recycling concept that makes it easier for each person to recycle. Rather than use multiple recycling bins that take only a specific material, commingled recycling uses only one bin to gather various materials such as paper, plastic, magazines, cardboard, metal, and aluminum. Studies have shown that the easier it is to recycle, the more likely people are to participate and the more successful the recycling program is. My idea of making the recycling bins at the bus stops visually more stimulating will increase the amount of commingled materials Rutgers gathers around the Cook and New Brunswick campuses.

I frequently see students throw their trash in whichever bin is closest to them as they are rushing on and off the buses. Changing the color of the recycling bins will be a cheap initial investment by the administration but in the end will break even because more materials will be recycled rather than taken to a landfill. Saving money is an important factor in the current situation of several state budget cuts. Not to mention less of these materials will be found polluting the campuses; a benefit that is so great it is immeasurable.

-Benjamin Meseroll
Dear Jersey Journal,

My name is Neeti Shah and I am a graduating senior at Rutgers University. In one of my classes, Ethics in Science, I am working with 4 other people in trying to encourage more students to recycle at Rutgers University. Even though Rutgers University has one of the greatest recycling programs in the nation, we are focusing on making recycling easier and more efficient by promoting Commingled Recycling around the bus stops at the University. We believe that the bus stops are the one place that every student passes by at least once during the day, if not more than once. Commingled Recycling is where most recyclables are put into the same bin. Studies have shown that participation and recycling levels increase when no type of sorting is required. Our project will consist of putting commingled recycling bins all around the bus stops at Rutgers University in New Brunswick.

I am sure everyone knows that recycling is one of the most important aspects to keeping the environment green. However, it is not just about being aware of that fact; it is about if you do your part in keeping the environment green by recycling. I am writing this to make people aware about how recycling at the University actually helps the environment and hope that Commingled Recycling encourages more students to reduce, reuse and recycle.

Last year, Rutgers University recycled over 15,000 tons of solid waste. This resulted in the reduction of almost 6,000 metric tons of carbon equivalent introduced to the atmosphere. Recycling not only helps keep the environment greener, but also saves money. Manufacturing products from scratch is more expensive than manufacturing new products from the raw material obtained from recycling. The money saved from recycling can be put forth towards many other essentials needed for the University. Aside from these benefits, recycling also saves natural resources and energy.

In my opinion, with the incorporation of Commingled Recycling around the bus stops at the University, the process of recycling can be made much easier and the amount of materials recycled at Rutgers University can be highly increased.

Sincerely,

Neeti Shah
Dear Editor,

I would like to bring the attention of readers why promoting the recycling bins in school is important? Each American generates an average of four pounds of trash per day. According to the United States Environmental Protection agency, there was a total of 209.7 million tons of municipal solid waste generated in 2006. Public places such as schools play a vital role in recycling, so promoting the recycling at school level is really important. A good system of recycling in schools can play an important role and encourages students to make recycling a part of their lifestyle. As a student, I think there is some issues that we need to deal right now to make recycling system better in schools.

By contacting recycling service companies for a trash audit, schools can get a reasonable estimate of how much trash volume and expense can be reduced with recycling bins being strategically placed throughout the campus. Bus stops are the ideal place for recycling bins to collect food and beverage container. The other issue about recycling bins is their appearance. To keep the recycling program running efficiently, it needs to be as simple and organized as possible. It is important to make sure recycling bins are well marked to ensure they will receive the intended recyclable material. Consider restricted openings or lids to cut down on contamination by trash or other material. Locate the bins close to trash containers in order to make the choice of recycle easy for students. Multi compartment recycling bins can be used for easy storing at source and save money and time.

Reducing the amount spent on waste and disposal can have financial as well as environmental benefits. By having and promoting the use of recycling containers in school can reduce their trash expense and their echo print. It also helps a school to be more sustainable and can result in money savings. Recycling helps the environment which helps everyone. Students should be educated about recycling. I suggest that the students and staff members should be educated about the program throughout the school year.

By,

Shama Bano
To whomever it may concern,

My name is Garima V. Arora and I am a junior at Rutgers, The State University of New Jersey. In the past few months I have been working on designing and writing a proposal that concerns placing recycle bins at Rutgers bus stops that don’t have them and changing the color of the same to make them easily distinguishable from trash can placed in vicinity.

In my experience as a student I have witnessed the absence of recycle cans from many major bus stops. Nobody likes to carry trash on them when they can get rid of it by chucking it in regular trash can. As a result a significant percentage of potential recyclables collected at bus stops end up in trash cans and consequently in landfills. Via our proposal, I and my group members proposed that the recycle cans be placed on the bus stops which are missing them.

In the year 2008 about 68% of the total trash generated on campuses was recycled. Similar numbers were tabulated for the year 2009. However these numbers could be appreciably higher if only recycle bins looked different from trash bin which makes it the next concern that my group proposal dealt with. I often see students discard trash in the bin closest to them in their rush to get on or off from a bus. Even when waiting on bus stops only countable numbers of students take the effort to discard their trash in the correct bin. By means of our proposal “Recycling at RU Bus Stops” we proposed to color the already existing recycle cans either green or blue which are regarded as the universal colors of recycling and represent “Go Green” movement. In these current times of financial crunch coloring recycle cans will be the cheapest and most effective way of bringing an immediate change in the habits and attitude of students towards recycling.

By means of our proposal we as team envision bringing some positive changes in the attitude of students as well as help in increasing the savings generated from recycling and preventing many recyclables from going into landfills.

Thank you

Best Regards

Garima V. Arora