Recommendation for Improvement of Waste Sorting at Wright Food Court

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Executive Summary

The goal of this report is to present research and solutions to improve recycling at Wright Food Court at Indiana University.

In the introduction, we explain the background of the recycling problem at hand, emphasizing its importance in regard to environmental health, and then describe our approach to coming up with a solution to the issue. Next, in the section explaining the problem in greater detail, we make the case that the waste sorting at Wright is incorrectly executed and it is causing recyclables to be landfilled, which is not in the interest of sustainability.

The report then discusses the method and scope of our investigation into the issue, detailing the interview-based research we conducted and the observations we made about the waste in the food court.

Based on this research, we present solutions to the problem. We describe constructing a waste conveyor belt in the food court, replacing disposable dishes with reusable dishware, posting informative boards that display what items are recyclable, and modifying the recycling bins.

We then explain in the discussion and conclusion that we believe the informative posters will be the best solution to the issue, and list all of the drawbacks and benefits to each proposed solution in a qualitative manner.

Finally, in the recommendation, we detail how the solution should be implemented and make suggestions that will lead to the improved environmental sustainability of Wright Food Court.
Introduction

As students of Indiana University concerned with sustainability and its interface with our daily lives, we submitted a proposal earlier this year to research methods for improving waste sorting at Wright Food Court. While IU supports environmental health by promoting initiatives to recycle its waste stream, the waste bins in Wright Food Court are not used efficiently. Our report aims to describe the research we conducted and to propose strategies to improve waste sorting at Wright, followed by ranking their potential efficacy based on efficiency and cost.

We employed a five-sided approach to research the dynamic of waste sorting at Wright, comprised of observation at the food court, interviews with students and employees, and examination of solutions currently employed at other IU dining locations as well as other universities. Our observational and interview results confirmed our preliminary observations that students are undereducated or place waste in the incorrect receptacles, and the Residential Programs and Services employees who work at the food court combine both the recycling and trash bags and place them all in the dumpster. Additionally, we combine solutions employed by other college food courts as well as techniques already partially employed by Wright in our recommendation for a low-cost solution.

To compose this report, we began by delegating research responsibilities, planning the combination and discussion of our individual results, and delegating report composition responsibilities. After collecting and aggregating our research results, we met to accurately explain our methods and results and discuss solutions, followed by agreeing upon a recommendation. The composition of summaries, research descriptions, and elaboration
and discussion of our solutions followed, accompanied by design decisions and the inclusion of visual aids to best organize the report and support our rhetorical goal.
Problem in Greater Detail

In Wright Food Court, there are eighteen waste bins arranged into sets of three. Of each three, one bin is labeled “Landfill” and the other two are labeled “Recycle, Plastics 1-7, Glass, Cans” except for two instances where one of the two is labeled “Mixed Paper” for recycling. The “Landfill” bins have large, rectangular openings through which waste is to be dropped and one of the recycling bins in each set has smaller, slot-shaped and round openings that reinforce its use as a recycling bin. However, the other recycling bin in each set has a rectangular opening identical to the “Landfill” bins’, which may make them appear as “Landfill” bins to someone not paying attention to the bin labels. To the right is an image of the waste bins.

Additionally, we have observed that up to three hours before the court closes, employees open the waste bins to remove the inner, unlabeled trash bins in order to clean the enclosures. However, the enclosures are left open or turned around for up to several hours and the current labels distinguishing recycling and landfill are concealed, as demonstrated in the picture to the left. Also, we have noticed that the use of blue bags is arbitrary and they are not always placed in recycle bins. This leads to little guidance for students separating recyclables.

It is clear that the students at Wright Food Court do a poor job
of separating their trash into either category, landfill or recycling. Many of these students deposit their entire tray of leftover food, recyclables, and non-recyclable items into one bin. This leads to a significant amount of food and landfill waste in the recycling bins. As a result, RPS employees throw away bags from the recycling bins into a dumpster bound for the landfill because the recycling is so contaminated with non-recyclables. While there is less landfill waste in the recycling bins with smaller openings than the recycling bins with large, rectangular openings, enough mixed waste is present in all three bins for employees to consistently dispose of all bags in a dumpster destined for the landfill.
This issue stands in direct opposition to the university's recycling initiative, since recycling efforts are effectively nullified by the majority of recyclables going to the landfill. In a larger context, it is also a global issue because landfilling is a practice that is harmful to the environment. Landfills leach toxic materials into the soil and groundwater, harming the ecosystem around them. Additionally, they release greenhouse gases into the air, which contribute to global warming. These negative effects are illustrated in the infographic below (see Appendix D for source).
Method and Scope

In order to adequately understand the issue and support our preliminary observations, we conducted five types of research based on observation, informal interviews, and research of potential solutions. First, we observed the materials that comprise the average daily waste in Wright Food Court and determined which items are recyclable, as well as how bins are currently labeled. We then observed students’ sorting habits with respect to the bins and waste items, followed by speaking to students about their awareness of recycling methods, current waste sorting habits at Wright or otherwise, and what might make waste sorting easier. We also spoke to RPS employees and managers about their processing methods and their opinions on potential solutions. Finally, we examined potential solutions by observing waste sorting solutions at other Indiana University dining halls and other universities, as well as determining whether they might be more effective.

Materials Observation

To compose an understanding of the materials that comprise the waste at Wright, we observed the different types of food containers and supplies available to students at the food court. While we were familiar with these items as regular patrons of the food court ourselves, a more objective study was necessary. By spending time both in the food serving area as well as in the dining area, we compiled a list of the common items students might use and dispose.

Student Observation

In conjunction with our materials observation, we observed students disposing of their waste after eating, noting whether they placed all their waste into a single bin regardless of
the waste type, if they sorted into the trash and recycling bins, and which bins they used in either case.
Student Interviews

We conducted short, informal interviews with students with whom we were acquainted and whom we knew regularly ate at Wright Food Court. We asked two open-ended questions and recorded their answers. First, we asked if they were familiar with which items frequently used at the food court are recyclable. Second, we asked what might encourage them to recycle at Wright and if they had recommendations for improvement of the sorting system. In total, we polled 13 students (Appendices A and B).

RPS Employee Interviews

We also conducted informal, open-ended interviews with RPS employees who we observed removing the bags of waste from the bins. We asked whether they noticed the distribution of waste in the bags as well as their habits when taking the bags to the collection site outside the building (Appendix C).

Solution Research

In order to collect a list of possible solutions, we combined the interviewed students’ suggestions, waste sorting solutions at other universities that we gathered from peer communication, and observation of other dining halls on the Indiana University Bloomington campus.
Solutions

We examined how other food courts and other colleges managed their sorting of recycling materials. With our observations and research, we have compiled a list of potential solutions that could be applied at Wright Food Court. In evaluating these possible solutions, we used three criteria: Cost, Effectiveness, and Efficiency.

Cost: We determined whether the cost of implementing a solution is going to be inexpensive, moderate, or expensive. In evaluating the costs, we considered monetary expenses and the labor required for installing the solution.

Effectiveness: To evaluate effectiveness, we determined how well the solution fixes the problem, which would be how well the recycling would be sorted. Solutions are rated as effective, moderately effective, or marginally effective.

Efficiency: When determining efficiency we considered how much labor is required to maintain the solution, and how expedient the process is. Solutions will be compared to the current waste system at Wright as more efficient, equally efficient, or less efficient.

Installing a Waste Conveyor

The Restaurants at Woodland at IU and food courts at Ohio State University use this technique of having students and guests return their trays, with all their waste on it, to a conveyor (as in the
image to the right). The conveyor then delivers the trays and waste to employees to separate the recyclable waste and wash the trays.

**Cost:** This solution would be very *expensive*. For this solution to be implemented, infrastructure would have to be constructed. A portion of a wall would likely need to be knocked out, the conveyor would need to be bought and installed, and waste sorters would need hiring.

**Effectiveness:** This solution would be *effective* in solving the problem. Recyclable material would be sorted by employees trained to do so, potentially resulting in a complete elimination of mixed recyclables and waste materials.

**Efficiency:** This solution would be *more efficient* than the current method of waste and recycling management. They conveyer would reduce the frequency of which employees would need to empty waste bins and retrieve trays and bring them in to be washed.

**Introducing Reusable Dishware**

Many food courts are trying to eliminate waste altogether, including recyclables. This process includes serving fresh foods on washable dishes and would reduce some of the pre-packaged food. For example, milk would be served in washable glasses instead of cartons and carrots with ranch dip would be served fresh rather than pre-packaged.

**Cost:** The cost of implementing this solution would be *moderate*. There would be the initial cost of purchasing the washable plates, cups, and eating utensils, but it would be an up-front cost and only continue with the replacement of broken dishes. We are assuming that the existing infrastructure and equipment for washing trays and cookware would suffice for washing the dishes, so there would be no added cost there.
Effectiveness: This solution would be moderately effective on its own. It would be hard to totally eliminate waste, such as straws, plastic plates, and utensils for taking food to-go. There would still be waste to be sorted into recyclables and non-recyclables.

Efficiency: By itself, this solution would be less efficient than the current methods of waste management. The waste bins would still need to be regularly emptied, and there would be more materials to be brought in to be washed.

Informative Posters

This solution involves positioning posters around trash and recycling bins. These posters would contain information about specific items sold at the food court and whether they are recyclable or not. The layout could be a simple two column design with pictures of items in the food court sorted either into the recyclable column or the non-recyclable column, like the figure to the right (see Appendix D for source). Or, there could be two separate posters for each category. This method has previously been used at Gresham Dining Hall on campus.

Cost: This solution would be inexpensive to implement. The only expenses are constructing the posters which would cost very little.

Effectiveness: The posters would be effective in helping to better separate waste and recyclables, based on our student surveys (Appendix B). However, the problem would not totally be solved as some may choose to ignore these posters.
**Efficiency:** The posters would be equally efficient to the current method of waste management. It would not reduce the need to empty waste and recycling bins, but it would not add any work either.

**Modifying Recycling Bins**

Some recycling bins around campus have small openings to help sort waste materials better. The smaller holes shaped like specific containers prevent trash from being mixed with recycling by making it harder to dump a whole tray of waste into the recycling bins. Our observations and interviews with employees indicated that bins with the smaller holes had less trash mixed in with the recycling.

**Cost:** The costs would be moderate. Some of these bins are already being used, so not all of the recycling bins would need to be replaced or modified.

**Effectiveness:** Different bins would be moderately effective in keeping recycling and trash from mixing. It does not totally eliminate mixing, but it reduces mixing.

**Efficiency:** This solution would be equally efficient. It neither eliminates any need to empty the bins, nor increases the frequency of which bins need to be emptied.

**Discussion and Conclusion**

In comparing the costs and efficiencies of each possible solution, we have come to the conclusion that informative posters and labels would be the best option for improving waste sorting at Wright Food Court.
Building waste conveyors and hiring employees to sort out recyclables is a very high cost for IU to consider and would require a large amount of remodeling of the food court. While we are interested in the most effective means of sorting waste in terms of maximizing the volume of recycled materials, which this solution provides, we also are aware that the costs of this solution are too hefty to suggest it as a priority.

**Introducing Reusable Dishware**

Reducing the use of disposable containers by replacing them reusable dishes is a method that is used by Edmondson Dining Room at Collins on campus. We believe that the costs for this solution would not be particularly high because the purchase of dishes is mostly up-front, and includes replacing broken dishes. It is a desirable solution from a sustainability standpoint because it would drastically decrease the amount of waste produced in the food court. While the infrastructure for handling dishware is in place, the size of Wright and the number of people that eat there each day is quite high and may not make the use of dishware feasible. It is a high traffic food court that many students use to grab food to-go, so dishes need to be taken outside of the dining hall. Reusable dishware would not serve this purpose. Also, many of the items in Wright that use disposable containers would still be there, so this solution would not be a complete fix for improving the waste sorting.

**Informative Posters**

Informative posters and are comparatively inexpensive as a solution because they only require posterboard, printed or drawn text, and examples or printed images of the items that can and cannot be recycled. IU and Wright would be most responsive to this idea, we believe, because the costs are low and the implementation is very easy. It may only require one or two people to complete the posters and hang them one time. In terms of improving the waste sorting, our evaluation of its effectiveness comes from the results of our
interviews of students who use the food court. As shown in the chart at left, most students were unaware of what items are and are not recyclable and suggested fixing that issue by posting examples of recyclable items at the waste stations, demonstrated in the chart on the next page. Therefore, we conclude that most students would be responsive to this information and have chosen this as our solution. We consider, though, that there still will be issues with waste sorting because some people simply do not pay attention to their actions when there is a simple option available (i.e. throwing all trash and recyclables into one bin with no thought of sorting). This may be a problem, but we believe the beneficial results of displaying informative posters would outweigh the drawbacks of those who ignore them.

### Modifying Recycle Bins

Installing different recycling bins would be feasible financially because it is only an up-front cost. We have been told by the assistant manager of Wright Food Court that this project might already be in the works. As a solution to the problem, we believe it would be efficient to some extent because, if all of the bins had small holes, it would prevent students from absent-mindedly dumping their entire tray of trash and recyclables into one bin. They would have to dispose of each item individually in order for them to fit into the holes. Since this requires more thought and effort, it will lead to students paying attention to the correct bins to use for recycling. Again, it will not completely eliminate poor waste sorting because there will always be students who ignore instructions. This solution would be beneficial,
and should not reasonably be a major annoyance, as sorting waste takes a handful of seconds. We actually do not reject this solution and are seeking feedback for the status of implementing it. If IU is already working on this project, then it will supplement the informational posters quite well.

It is clear overall from our survey results, displayed in the chart to the right, that the informative posters we propose would encourage most students to participate in recycling. The suggested solution, with the possible addition of the improvements previously discussed, is presented as a way to decrease the mixing of recyclables and landfill items to the point that RPS workers in Wright will not have to throw away all trash bags into the landfill.
Recommendation

We maintain that the solution of posting informational boards about what to recycle will decrease the amount of trash items in the recycling bins enough so that the recycling will not have to be sent to the landfill. What follows is our recommendation of how to implement this solution.

The posters should hang on the wall above the waste stations. Currently, there is a small single-page flyer hanging there explaining what to recycle, which is shown in the image to the right. This flyer is very nondescript, has small, hard-to-read text, and does not provide many specific examples of items within Wright that are recyclable. The posters we suggest should be large and have actual examples of plastic utensils, water bottles, etc. glued to the board with large text in a caption stating what the item is. One board should have large lettering across the top saying “Recycle These Items” and the other should say “Landfill These Items” with icons or imagery that emphasize the posters (i.e. green coloring and recycle symbols on the poster demonstrating recyclable materials).
From the information on the figure above, which is an IU publication, we obtained the information about what is recyclable, and we combined that with what we observed to be the actual items in the food court to determine what should be included on the posters. On the next page is a table listing each item that should go in their proper category.

Once the posters are in place, the next step is giving instructions to RPS workers. The importance of recycling should be re-emphasized in a way that will encourage them to throw away waste bags into their proper dumpsters and to not combine recyclables and landfill trash. Also, RPS workers should be instructed to remove the inner trash bins from the labeled outer bins as close to the end of the night as possible to increase the amount of time that the obvious separation of recycling and landfill bins is visible, and to minimize waste going to the landfill.

Overall, these simple steps have the full potential to increase recycling at Wright Food Court and improve sustainability at Indiana University.

**Poster Contents**

<table>
<thead>
<tr>
<th>“Recycle These Items”</th>
<th>“Landfill These Items”</th>
</tr>
</thead>
<tbody>
<tr>
<td>cardboard cereal boxes</td>
<td>wax-coated paper bowls</td>
</tr>
<tr>
<td>black plastic dishes</td>
<td>wax-coated paper cups</td>
</tr>
<tr>
<td>black plastic utensils</td>
<td>wax paper</td>
</tr>
<tr>
<td>clear plastic bottles</td>
<td>napkins</td>
</tr>
<tr>
<td>clear plastic cups</td>
<td>foil wrappers</td>
</tr>
<tr>
<td>clear plastic lids</td>
<td>mixed material items</td>
</tr>
<tr>
<td>white plastic lids</td>
<td>stickers</td>
</tr>
<tr>
<td>white plastic containers</td>
<td>food</td>
</tr>
<tr>
<td>clear plastic nacho containers</td>
<td></td>
</tr>
<tr>
<td>styrofoam bowls</td>
<td></td>
</tr>
<tr>
<td>cardboard coffee cup holders</td>
<td></td>
</tr>
<tr>
<td>paper bags</td>
<td></td>
</tr>
<tr>
<td>clear plastic wrapping</td>
<td></td>
</tr>
<tr>
<td>------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>aluminum cans</td>
<td></td>
</tr>
</tbody>
</table>
Appendices

Appendix A

Survey questions asked of fellow students, in person

1. Do you know what is and isn’t recyclable at the food courts?
2. What would encourage you to recycle at Wright, or what improvements do you recommend?

Appendix B

Student survey results

<table>
<thead>
<tr>
<th>Student</th>
<th>Knowledge of Recyclables</th>
<th>Suggestion for Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Moderate</td>
<td>IU provides recycling education</td>
</tr>
<tr>
<td>2</td>
<td>Comprehensive</td>
<td>Conveyor system similar to Woodlands</td>
</tr>
<tr>
<td>3</td>
<td>Little/None</td>
<td>Informative posters</td>
</tr>
<tr>
<td>4</td>
<td>Moderate</td>
<td>Informative posters</td>
</tr>
<tr>
<td>5</td>
<td>Moderate</td>
<td>Informative posters</td>
</tr>
<tr>
<td>6</td>
<td>Little/None</td>
<td>IU provides recycling education</td>
</tr>
<tr>
<td>7</td>
<td>Little/None</td>
<td>IU provides recycling education</td>
</tr>
<tr>
<td>8</td>
<td>Moderate</td>
<td>None</td>
</tr>
<tr>
<td>9</td>
<td>Moderate</td>
<td>Informative posters</td>
</tr>
<tr>
<td>10</td>
<td>Little/None</td>
<td>Introduction of compost bins</td>
</tr>
<tr>
<td></td>
<td>Little/None</td>
<td>Informative posters</td>
</tr>
<tr>
<td>---</td>
<td>-------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Moderate</td>
<td>Informative posters</td>
</tr>
<tr>
<td>13</td>
<td>Comprehensive</td>
<td>Labeled/separated recycling and landfill stations</td>
</tr>
</tbody>
</table>

Appendix C

Survey questions asked of RPS employees, in person

1. What do you notice about the distribution of trash and recycling in the trash and recycling bins?
2. What do you do with both the trash and recycling bags after you remove them from the bins?

Appendix D

Landfilling Image
Tumbleweed, *Why Recycle?*

Recycling Poster Example
Morrow County Health Department