UVM Service Learning Collaboration with Chittenden County Solid Waste District:

Drop-Off Center Improvement Plans

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Service Learning Partners: Chittenden Solid Waste District

Project Summary

Overview – In the fall of 2018, a class of first year students at the University of Vermont, enrolled in Professor Cheryl Morse's, Place, Landscape and Environment in Vermont (GEOG061A), worked with the Chittenden Solid Waste District (CSWD) in a service learning project. The objective of the project was the talk to members of the CSWD community – staff and customers– to understand their drop-off facility systems. Our research revealed that some aspects of the systems were not working as well as they could be, so students collected data and information, and, compiling all they had found, proposed some improvements that may help the district to operate more efficiently.

Methods – Before we were able to begin working with any members of CSWD, we had to do some preliminary research to get an understanding of the larger perspective surrounding solid waste disposal in Vermont. In preparation we read about various environmental and human induced changes to the landscape and ecology that Vermont has gone through in the past couple hundred years. By the time we read about more contemporary issues, we had come to an understanding of why is it so important to be conscious of how our actions may contribute to larger change in the land around us. We then took some times to read about and think over why it is important to do service learning work – with the help of Lucia Possehl, a Geography major at UVM – and came up with some objectives for our project. Our first step towards our project was to meet with Rhonda Mace – CSWD's school outreach coordinator – who gave us an overview of how their system works and general information about CSWD. After this, the class was split into three groups, a day was taken for each group to visit one of three different CSWD drop-off sites: the South Burlington, Essex, and Williston branches. Each team had:

- a photographer (someone to take pictures of the sight: signage, traffic, bunkers, etc.),
- a cartographer (someone to map out the drop-off sight)
- more than one ethnographer (someone to take notes on the flow of people through the facility; they observed traffic patterns, if people read signage, if people seemed to be making the same mistakes, etc.)
- an interviewer (someone who talked to workers and customers at drop-off sites, asking them their opinions on the facility).

When all the data was collected, teams gathered to discuss their findings regarding what worked well at their assigned facility, and what aspects could use some improvement. Each team came up with a *high resource* and a *low resource* set of specific suggestions for changes and presented them to the other groups, as well as Professor Morse and Lucia, for constructive feedback. Following this, revisions were made, and groups created visual representations to show their new ideas for CSWD in a clear, comprehensive way. This was then presented to members of CSWD to give them some clear ideas for improving the efficiency with which their facilities operate.

Big Findings – Though each site had its own setup for the most part, there were some suggestions that seemed to apply to all CSWD sites. One was to create an **online application**, operational on cell-phones, to help customers figure out what they can and cannot drop-off before they arrive. Another, was to create **signage that would relate across all the sites**, making it easier to understand quickly for customers. The last suggestion was simply to **improve regular communication with the public** to

help them understand what it is CSWD does for their county and how they can get involved.

Acknowledgments – Thank you to CSWD for being our partner in our service learning project. A special thank you to Rhonda Mace and all individuals who we interacted with at the CSWD drop-off sites. Thank you to Lucia Possehl for working with us to understand the impacts of our service and how to best partner with CSWD. Thank you to the UVM CUPS Office, the UVM Special Collections, and the CAS Liberal Arts Scholars Program for giving us this learning opportunity and supporting our process.

Williston Site Report

Julianne Burns, Jack Mitchell, Maxine Miller, Grace Bugler, Holly Kuhn

Introduction- The Williston CSWD drop-off center is currently in very good condition, and while there are many changes that can be made to the center, it is important to recognize areas of the center that are especially effective. The road leading into the center is in good condition and plenty of parking spots are available; entry lanes, parking spaces, and other road markings are easily visible and did not pose any issues for customers. The Williston center also uses art and color in many of its containers, which makes the center more welcoming and friendly so that people are more willing to ask for help instead of guessing where an item goes. Several of the signs at the Williston center are also intuitive and straightforward, such as the signs for tires and overflow recycling. However, there are still some signs that are vague or overly wordy, such as the "bulky items" sign and the lightbulb signs. Also, some areas do not have any signage, such as the tree stump area and the outside of the "special waste" area. Another issue is the amount of empty space that could potentially be used to store collected items. The former "reuse zone" and the green shed for drywall and cardboard could both be used to store more items, as the reuse zone does not currently serve any purpose (besides the bulletin board on the outside of the building) and the green shed is nowhere near capacity. The current bulky items container is also in an awkward size, shape, and location. Given the abundance of space at the Williston facility, there is lots of potential to utilize this space more efficiently; this section of the report will outline some possible changes to the Williston drop-off center.

This map demonstrates the current positioning of the CSWD site.

This map demonstrates our high resource plan, by including a new electronics, batteries, and bulbs building. It also includes our new bulky items bunker in replace of the stumps section. Both these new additions allow the site to remove their bulky items bin, batteries and bulbs trailer, and electronics trailer.

Big Changes - One improvement that the CSWD Williston Drop-Off Site could make would be to create longer parking spots for trucks and/or cars with trailers. This would help separate the people that need more time from the people that only have a few items. These parking spots would also make the flow of traffic smoother because there would not be cars sticking out into the turn around area. We also suggest installing poster housings somewhere in the drop off site near the compactors that could be used for educational posters. These posters could rotate on a monthly schedule and communicate information to the public about things the CSWD staff believe would be helpful. Rhonda mentioned that many customers like to learn about why certain things can and cannot be recycled. This would play off of the educational spirit of those customers and allow people to learn more about the drop-off site. Some ideas for these posters could include information about black plastic as well as a campaign telling customers which materials to look for when shopping. This information could take the form of educational flyers as well. We also suggest adding signage, creating a bulky items bunker, painting railings, and building a new building for electronics and batteries as detailed below.

High Resource Plan - Our plan that would require a great deal of resources involves a reorganization of the smaller buildings (which include batteries, light bulbs, propane tanks, and the salvation army bin) in order to make the recycling area more accessible and this area more user friendly. We propose removing the batteries/bulbs shed, appliances, salvation army drop off bin, and electronics trailer over to the empty area to the right of the entrance and creating a single new and improved building for their storage. This would consolidate all of the smaller and less used bins/sheds into one convenient area and provide an easy to navigate space for the large variety of items. Additionally, it would provide area for more parking and accessibility for the busiest area of the drop-off center, the recycling and trash area. The building would have separate entrances for each of the sections: batteries and bulbs, clothes, appliances, and electronics. As reported by the staff, the battery shed is often confusing to users because of the specific requirements for different batteries. This building, which would contain easy to follow signs on what goes where, would make the jobs of the CSWD employees much easier, as they wouldn't have to spend as much time resorting wrongly placed items into their correct location. While these changes might be expensive and take construction resources, it would certainly improve the organization of the center.

Low Resource Plan: - Our plan for a change that would require little resource has two parts. First, we would advise painting the fences along parking spaces a bright color. We witnessed a van back directly into one of the fences and although neither the fence nor the van was damaged, we believe painting the fences to make them more visible could help prevent this from happening in the future. Next, we would add signage to help alleviate problems that specific items often cause. Based on the interviews, plastic bags caused the most problems at the drop off center so a clear sign that informs customers that plastic bags are not recyclable would be helpful. Additionally, the battery and bulb recycling trailer had very little signage so adding a sign on this trailer could be an easy and cost effective way to increase the amount of people recycling their batteries and bulbs. The final part of our plan is to move the bulky items drop off to a bunker instead of an open top container. We propose moving the stumps out of the bunker they are currently in and into a section of the natural wood bunker, leaving the stump bunker open to be converted into a bulky items bunker. This would alleviate the problem of lifting bulky items

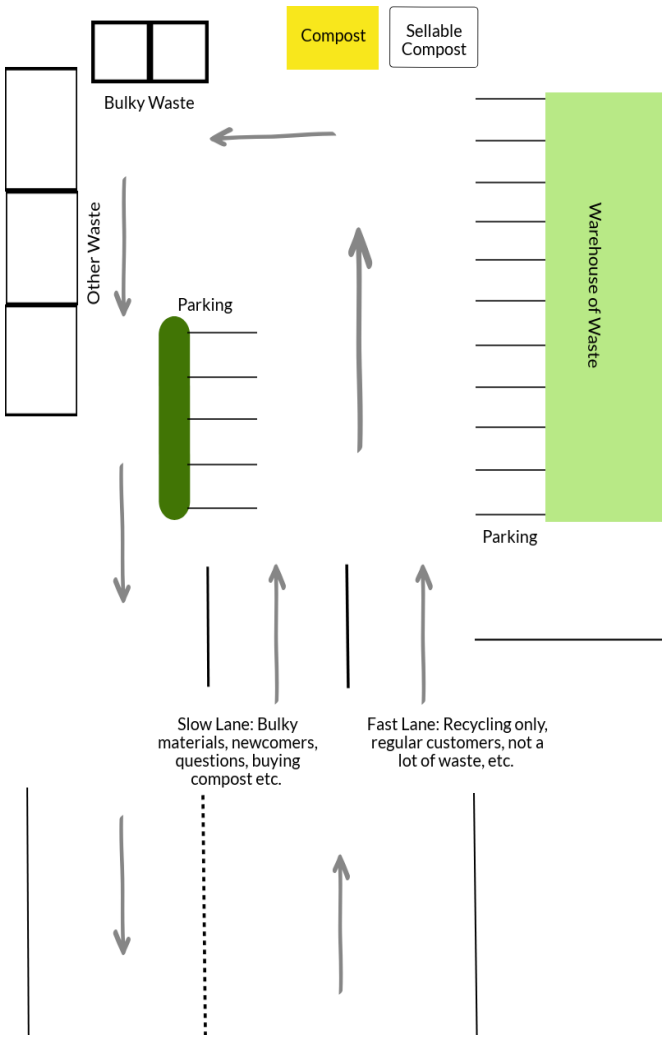
and dropping them over a fence as well as no longer requiring operators to move items around that stuck out over the top of the box. Both of these problems were brought up during interviews and the Essex drop off site currently has a bunker for bulky items that is working well. We believe these changes would be a cost effective way to improve the Williston drop off center.

Essex Site Report

Shaina Lee, Will Krulak, Olivia Mead, Zach Hart,
Liviya Kovacevic, Shira Berkelhammer, Juliet Malkowski

Introduction - The Essex drop-off center had many positive and negative aspects. One of the most prominent positive elements of the site was the friendly and helpful staff team, who interacted with and assisted customers needing help, and ensured that items were placed in the correct bins. Furthermore, there was plenty of parking and potential space for reorganization of the site. However, we noticed several negative aspects that could use improvement. One of the major issues was the long line of cars at the entrance where customers would wait in line for forty-five minutes only to spend two minutes disposing of their waste. Another issue was the compost, which was relatively small and hard to locate. As a result, the area was not being utilized to its full potential, where people would be more likely to throw perfectly good compost into the trash. Lastly, in the site many of the signs were either too small, too wordy, or placed poorly. Signage improvement would increase the efficiency of the site and decrease the confusion of the customers.

Improved Site Map:



High Cost Improvement

Extra Lane - One of the most noticeable negative aspects of the Essex location was the huge line at the entrance. To mediate the large amount of backup that occurs, we decided to redesign the entrance to accommodate two entrance locations. This is an important addition to the site because while making observations at the Essex site, customers were timed as they checked items at the booth. The times included 1:30, 0:08, 0:08 and 1:38 minutes. These were representative of the data set because about half of the times were under ten seconds and the other half were over a minute and thirty-seconds. Creating two lanes would allow both the fast and slow customers to have equal access. One entrance is for the bulky items bunker, newcomers, and buying compost. The other lane provides access to the regular recycling and waste drop off. The idea behind the addition of a lane and the widening of the entrance area would be to lower time spent waiting in line. Having a separate lane for newcomers who may not be as familiar with the system would help reduce the wait time for the more frequent customers. The workers, Dave and Tod, made frequent comments about the length of the line and how the amount of time spent at the entrance varies customer to customer. Some are more experienced and take no time at all while some can take a couple minutes. While visiting Dave said the most helpful part of the site was the bunker for bulky goods, providing an accessible way to dispose of large objects that doesn't take too much time. Adding the second lane, which has a more direct route to the bunker, could further speed up entrance time, reducing the line.

Low Cost Improvements

Signage - A prominent issue at the site was the inefficient design of its signage. Many of the signs are visually difficult to read, having small font and an abundance of text, and are aesthetically displeasing. Along with this, the information on the signs is convoluted, making them difficult to use as a quick resource. Speaking with CSWD staff members, we heard many of these concerns raised. Dave, an employee, felt that the signs "had way too many words squished together, and not enough pictures." Tod, another employee, expressed that some people don't bother reading the signs, saying "people can be in a real hurry, and just want to dump and go." The combination of poor design and inefficient time use of reading suggest our proposal that the signs need to be more vibrant, easier to read, and include pictures. Many people do not read the signs or look confused when they do, so more attractive/efficiently informative signs could increase reading and therefore proper disposal. As expressed in a talk given by psychologist Dan Ariely titled *Choice Architecture*, many decisions aren't made out of actual thought but out of laziness. No one wants to put their drop-offs in the wrong location, they just don't want to have to think about it. If the signs at the center clearly depict what needs to go where, and if they're situated in a way where people don't have to crane their heads to read a long list, then more people would be willing to acknowledge and follow proper disposal. The more elementary the better. When it comes to following instructions, we're all children. If a child couldn't look at the sign and tell you where something goes, then there's a flaw in design.

Sign Placement - Overall, the signs that we saw at the drop off center were generally placed at eye level, however we noticed that some people had trouble actually finding the signs because they were either too small or partially hidden, especially on the left side of hooded area of the drop off center. We have several suggestions on where to place signs so that more people are able to easily view it.

First, by creating a map with the layout of the entire site (and all of its different waste sections) and placing it at the entrance of the waste site, customers would have a clearer understanding of where their their waste may go. Generally, according to the workers, there is a long line of cars waiting to get to the drop off center, especially on Saturdays. So, while people are waiting in line, they can look at the map to figure out where each type of waste goes. Hopefully doing this would result in less confusion and overall a more efficient time at the drop off center. Secondly, there was no sign for the large and "bulky" furniture at the drop off center, and it would be beneficial to place a very large sign at eye level near the entrance of it. Additionally, there must be a larger and clearer compost sign that advertises for it, as it is currently not being utilized to its potential. This is because the sign is small and not very eye catching. The large trash and recycling sign above the trash and recycling bins is in a good location and does not need to be moved. People are able to see it clearly, and after being redesigned it will be more helpful than it currently is. The main issue with that sign is the layout, which can be changed easily. Hopefully these initiatives will be beneficial to the customers who most likely simply want to perform their task quickly and without much effort. By placing signs at eye level and clearly in front of their designated sections, there will ideally be less confusion. Our suggestions would follow the Principles of Universal Design by minimizing potential errors, enforces perceptible information as well as simple and intuitive use.

Compost - The compost was another major issue that needs to be addressed. Currently, the compost that people bring to dispose of was located at the back of the site, next to the "hot dog stand" shed that was not in use. The sellable compost was located on the opposite side on the right of the entrance. It was off to the side and needs to be displayed in a better way. In order to create a more efficient layout we believe it would be most beneficial to move all of the compost to one area. Since the shed was not in use, we suggest placing the sellable compost inside of it. When people are entering the site they can purchase the compost the same way as they did before. Consolidating the compost would minimize the clutter around the site as well. Most importantly, the compost area needs to be more visible to people. Compost is currently disposed in small bins next to the shed and there was no signage that draws people's attention to it. By creating a large and improved sign and placing it next to the compost, people will see it as they pull into the site. While we were at the site we noticed that many people would throw out items in random bins, whether they were supposed to go in there or not. If they were unaware of the compost area, they may simply throw their compost into the regular trash bin, especially if they were impatient after waiting in line for so long. New signage would result in more people at the site composting correctly or create an incentive for people to bring their compost to the site and compost it there instead of composting at home. Overall, consolidating both the compost being disposed and the sellable compost as well as creating new signage would improve the Essex site.

Painting bins - To enhance the visual appeal of the drop off center, we recommend painting the drop off bins in a similar fashion to those of the site in Williston, possibly with imagery relating to what needs to be placed in those bins. This would make the drop off center more aesthetically pleasing, and may appeal to a certain quirkiness/ alternative expressionism that many Vermonters value in their state. Furthermore, this would make the bins off to the sides of the main platform more noticeable, as people were rarely seen near the bulk and compost bins, possibly due to poor labeling and their elusive nature. As architect and urban design consultant Jan Gehl suggests in her book *Life Between Buildings,* people like stimulating experiences rather than dull, lifeless ones. Colorful bins would provide that visual stimulation in an otherwise dimly colored environment—one that becomes increasingly dim during the winter.

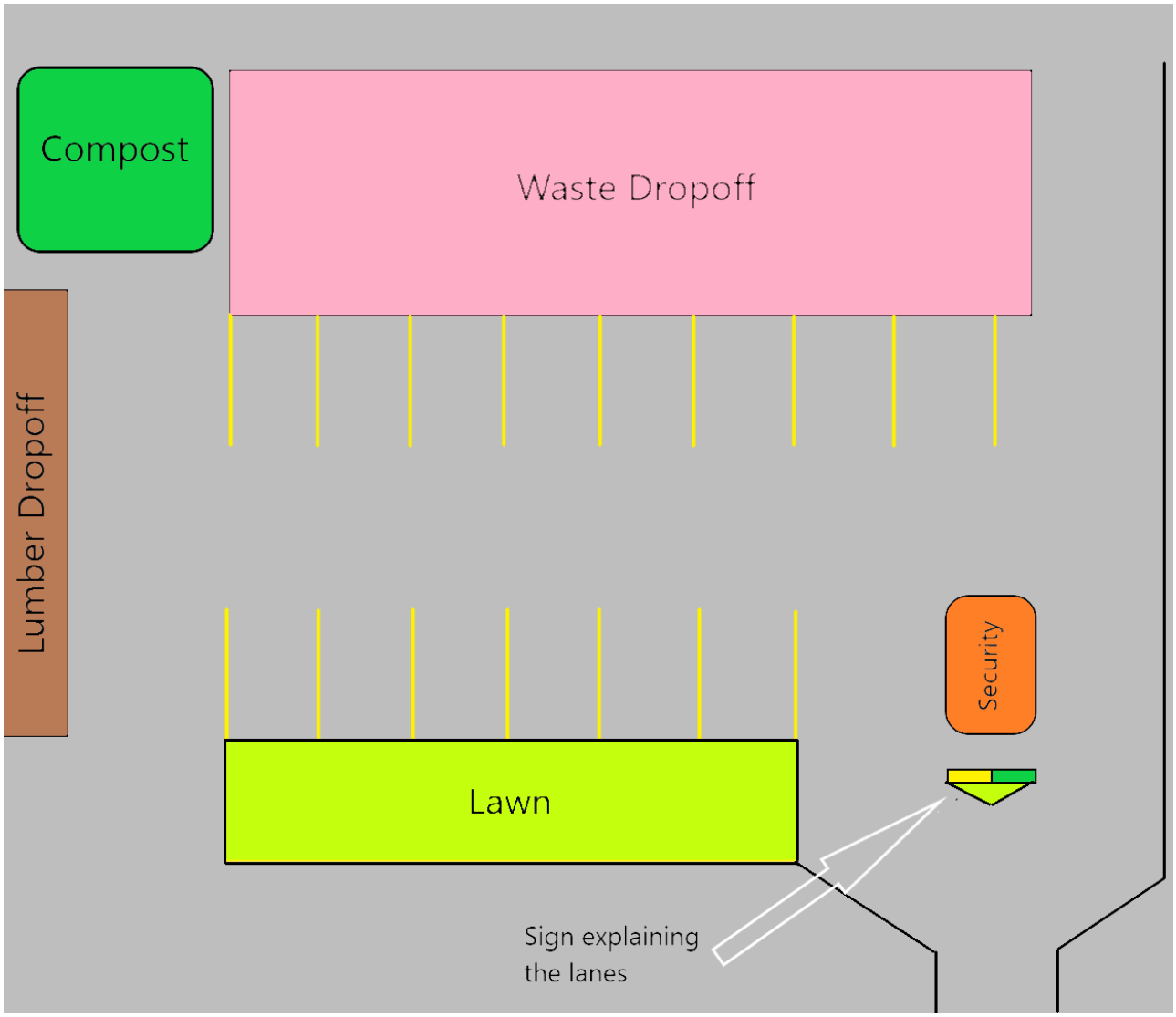
Circulating CSWD Staff - To build a sense of community and familiar space at the drop off center, we propose for the same staff to be circulated during shifts to build familiarity between the workers and users. The interactions witnessed between workers and familiar customers were incredibly valuable, as they shifted the drop off center from being more than just a necessary service provider but a micro-community as well. As one of the workers stated, "I love the people. You don't necessarily always make friendships, but you make acquaintances." These relationships, no matter how small, allow people to feel comfortable in a place. Jan Gehl emphasizes this concept in her writing on public spaces, saying "frequent meetings with people in connection with daily activities increases a sense of community." Not only would this encourage people to come to the centers, but it would also encourage people to respect the center itself by being connected to its workers, possibly motivating proper disposal. Along with this, people may feel more comfortable asking questions about disposal, as many dislike having to ask for help or have anxiety initiating a conversation.

Sample Sign Ideas:

South Burlington Site Report

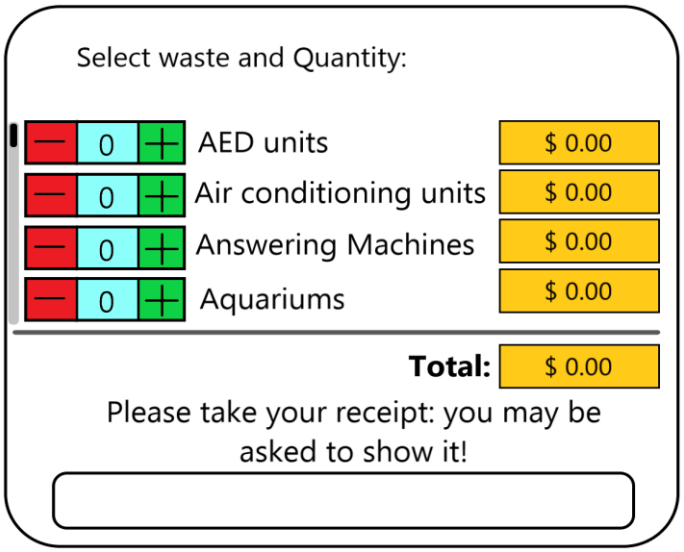
Introduction - Our team is proposing two changes to the South Burlington solid waste drop-off center, including one high recourse change and one low recourse change. The high resource change would involve the redesigning of the entrance of the site in order to reduce both congestion and confusion regarding the overall process of recycling as well as the installation of an automated machine. This would ensure the flow and encourage ease when dropping off items for both new and experienced customers. The low budget option would entail the creation of new signs in order to reduce confusion surrounding where materials can and cannot be placed. Both of these changes have been formulated using both in-person and on-site research, as well as research into how to best emplace our changes.

Redesigned Site Map:



Big Changes to Site- The major adjustments at the South Burlington site would be the overall redesign of the site to be more accommodating to traffic flow and to expedite the in-and-out process of the site. The current layout of the South Burlington site has a few areas for improvement: the line of traffic snakes all the way down the road during a rush; the signage can be confusing for some; there were always unused parking spots in the site itself; and there are potential issues with relying on an honor system in terms of patrons paying for the correct amount of waste they are bringing. The site will function more efficiently with the changes we are proposing. Experienced patrons will have a faster and easier visit, while newcomers will feel unintimidated, and learn the ropes of the site quickly and without difficulty. Clear signage is a benefit to everybody—simple directional language, large text, and fewer words all contribute to a higher level of understanding, and therefore efficiency, for all patrons at a given time. The current signs may be too overwhelming to stop and fully comprehend:

An automated console replacing a human operator, as proposed in our large-resource idea, would be a sophisticated interactive instrument to add a high-tech element to the site. The consoles would provide directions through color-coded squares on tickets that correspond with appropriate waste disposal areas in the site. They would also operate payment for the given amount and type of waste that a patron would bring to the site.



These major adjustments would make dropping off waste a convenient experience for both the patron and the employee of the site. Efficient flow and appropriate accommodations for experienced and new customers will make the disposal process easier not only for the patrons but for the employees as well.

High Resource Plan - The high resource suggestions for the South Burlington drop off site will allow for more flow and higher efficiency. Changes include installing an automatic ticketing machine that would allow experienced customers to use the drop off site with more ease, as well as adjusting the flow of traffic into two lanes rather than one. By splitting the single lane into two entrances, patrons of both high and low experience can get their needs met. Those with knowledge of how the drop off site functions are able to proceed through the "fast lane" where they will approach the automated ticketing machine. The patron can then log what items they will be dropping off on the machine, where they will then be given a color coded ticket corresponding to their items. While patrons who are less experienced will be guided towards an employee who can assist them in paying and direct them towards the correct waste bin. This method presents new customers an opportunity to ask questions and become familiar with the site—decreasing the possibility of making mistakes.

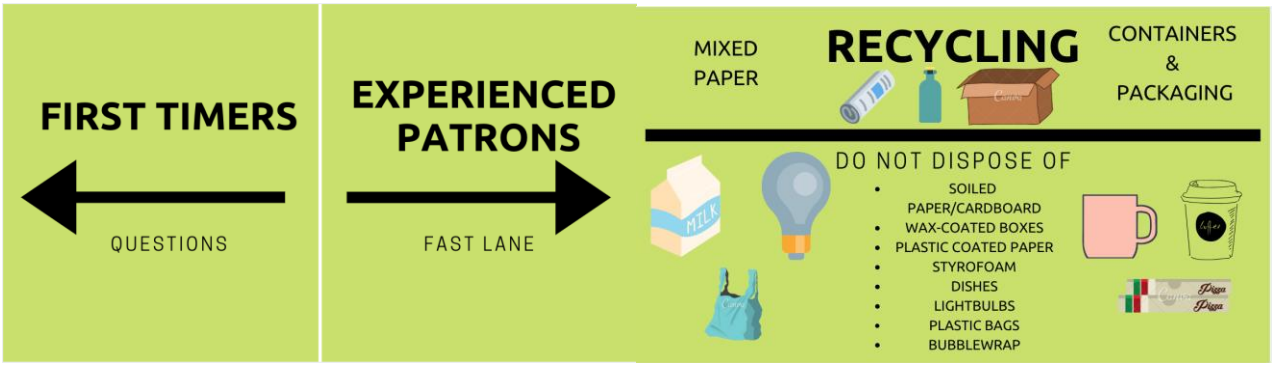
Employees expressed concern regarding waste not being thrown away in the correct bin, which often occurs with new customers. This new entrance can alleviate those worries as well as facilitate a more serene experience all together. We observed that the drop off site grew a long line at the entrance as customers were asking questions at the security gate. Some patrons took only seconds whereas others took up to a few minutes; this delay can discourage customers and cause inconvenience. If this new mechanism of dividing up the cars was implemented it would create a smoother experience for both the customers and employees.

Low Resource Plan: - Our low resource plan for the drop off site ensures that each patron understands where to properly dispose of their waste, making the drop off process more smooth and enjoyable. To do this, we suggest making news signs that clearly state what can or cannot go into each waste bin. This includes enlarging the text and minimizing the word count to direct key words only, as well as using a font that is easy to read quickly.

For example, the "All-In-One Recycling" sign has multiple messages regarding what is and what isn't allowed in that bin; these messages can be difficult to comprehend and digest at a glance. Therefore we suggest focusing on what cannot be placed in the recycling bin rather than give a lengthy list of what can. We believe that this method will grant patrons a more effortless experience and prevent mistakes.

It is understood that more mistakes are made with the All-In-One Recycling because customers often put plastic bags or other items that do not belong in this bin. With these newly developed signs we will be able to reduce this common mistake, making it easier on employees, more comfortable for patrons, and healthier for our earth.

Visuals:


FIRST TIMERS
QUESTIONS
EXPERIENCED PATRONS
FAST LANE
MIXED PAPER
RECYCLING
CONTAINERS & PACKAGING
DO NOT DISPOSE OF
SOILED PAPER/CARDBOARD
WAX-COATED BOXES
PLASTIC COATED PAPER
STYROFOAM
DISHES
LIGHTBULBS
PLASTIC BAGS
BUBBLEWRAP
MILK