St Paul's Hospital Recycling Communications and Engagement Project

June 7, 2019

Marianne Dawson
Sustainability Consultant
Energy and Environmental Sustainability
marianne.dawson@fraserhealth.ca

GreenCare™

Contents

Overview

Recycling in clinical settings has its own set of unique and complex challenges that can make the process confusing for staff. Simple rules for municipal recycling do not always apply in a clinical setting due to real and perceived risk of hazardous and biomedical materials ending up in the recycling bin. The Energy and Environmental Sustainability (EES) team works to educate staff and make recycling in health care easier. The St. Paul's Hospital recycling communications and engagement project tested new recycling engagement tools meant to improve recycling in clinical areas.

EES engaged Be the Change Group, a consulting company, to research and design new recycling bin stickers, inspirational posters, and clinical recycling guides as well as facilitate user focus groups. Six clinical units at St. Paul's Hospital were chosen to receive the new signage along with education opportunities over a pilot period of three months, while quantitative and qualitative data was collected before and after the pilot to test the effectiveness of all the tools.

The results show an overall decrease in recycling bin contamination and increase in staff engagement with recycling although unexpectedly, results were mixed or negative for waste diversion and active use of recycling bins. These surprising results highlight the ongoing complexity and nuances of recycling in the health care context where patient care priorities, product changes, and recycling logistics often work against recycling improvement.

Overall learning highlights include:

- Access to recycling bins in convenient areas for staff is key. Space planning in new builds and renovations to accommodate waste and recycling bins will be important for waste diversion improvements.
- Staff engagement is needed to maintain momentum. Encouraging staff to join the Green+Leaders, a volunteer network for environmental sustainability leaders, can keep recycling top of mind even after project completion.
- Ongoing long-term waste studies are needed to understand the waste and recycling data in clinical areas. One-time audits are not enough to get a comprehensive view of what is going on.
- Multiple, overlapping communications initiatives is the most effective way to engage with clinical staff

Introduction

The recycling communications and engagement project at St. Paul's Hospital (SPH) consisted of the development of new recycling materials and an on-site pilot to test the new materials and engagement tools over the span of three months.

The objectives of the project were to:

1. Reduce contamination in recycling
2. Increase waste diversion rates
3. Increase desire to recycle, satisfaction, and ownership of recycling
4. Make recycling easier for users

The project addressed recommendations from the 2016 Human Factors Report on Waste Segregation at Point of Care (see Appendix A) as well as a cross-jurisdictional review of recycling in health care and key informant interviews.

Background

The Recycling Renewal program (now the Blue Bin program) was launched in 2010 and included standardized recycling equipment and bin stickers at 57 owned and operated hospital and residential sites. The bin stickers have undergone several small updates since then, and this project was created to test a more radical change (Figure 1).

Development of Assets

Frontline staff have consistently indicated that the images on the bin stickers are not always relevant for their work, since the current bin stickers showed generic household recyclables. The Energy and Environmental Sustainability (EES) team hired a consultant to research modern recycling bin sticker design and to create new bin stickers. This research confirmed that colour images of real products staff encounter are more effective for correct waste segregation.

FIGURE 1. Progression of bin sticker updates from 2010, 2015, and 2018 respectively

The research also showed that changing bin stickers alone is not an effective method of changing behaviour. The scope of the project was increased to include the development of posters designed to foster a desire to recycle and a Recyclopedia document for knowledge and education. In order to test the effectiveness of the new materials, a pilot project was developed at St. Paul's Hospital in six test units: the operating room and surgical suites (OR), Medicine, Maternity, Renal, Laboratory, and Pharmacy. In addition to the new materials, the pilot project would also include education opportunities via in-services.

Asset deliverables included the following (please see Appendix B for images of assets):

1. Digital photo library of:
    a. Typical recycling/waste items found in all test units and;
    b. Staff working/disposing of waste in OR, Maternity, and Medicine
2. Redeveloped recycling bin stickers with photographs of unit-specific waste items
3. Campaign posters to foster a desire to recycle
4. Recyclopedia booklet with unit-specific waste items

After initial asset development a focus group was run with frontline staff. Their feedback was used to further update the bin stickers and inform the design direction of the campaign posters.

Pilot Description and Experimental Design

The pilot project was undertaken at St. Paul's Hospital in the Providence Building and ran over the course of three months from December 6, 2018 – March 6, 2019. A visual audit of the recycling bins in Providence Building was completed in October 2018 and again in March 2019 after the pilot was completed. Staff surveys were sent out before and after the pilot to collect staff perceptions on recycling at work.

The project charter is available in Appendix C.

Pilot Deliverables

The pilot deliverables included:

1. Pre and post pilot staff survey (see Appendix D) in all test units to measure desire to recycle
2. Pre and post visual audit of 80% of recycling bins in all units located in the Providence Building
3. Implementation of updated recycling bin stickers in all test units
4. Implementation of campaign posters in primary test units
5. In-person recycling training (in-services) in primary test units

Assumptions

1. Different combinations of communications and engagement initiatives will have different impacts on staff desire to recycle
2. Increased desire to recycle via the poster campaign combined with improved knowledge via the redeveloped stickers and in-person training, will result in a reduction of contamination in recycling waste streams and an increase in diversion rates
3. The test units are high generation waste units and best represent a cross-section of units in acute care facilities

Concurrent Projects

A separate but related project at SPH included a garbage waste composition study (see Appendix E). This study detailed the composition of a 12 or 24 hour collection of garbage waste from the test units. This study was performed in November 2018 with a duplicate study in February 2019 to verify the results. From this study, we were able to determine the number of recyclables in the garbage waste stream in each test unit and use that data as a proxy for a unit-specific waste diversion rate.

Experimental Design

Category	Unit	Bin Stickers	Recyclopedia	Posters	In-service
Primary	OR	X	X	X	X
Primary	Maternity	X	X	X	X
Primary	Medicine	X	X	X	X
Secondary	Renal	X	X		
Secondary	Laboratory	X	X		
Secondary	Pharmacy	X	X		

TABLE 1. The design of the pilot included communications and engagement tactics being arranged in two categories (primary and secondary) with 3 units in each group

Pilot Methods and Results

Objective 1: Reduce Contamination in Recycling

To measure the contamination in recycling, a visual audit of recycling bins in Providence building was completed before and after the pilot. Each unit was only visited once per audit. The visual audit consisted of taking off the lid of the recycling bin and counting all visible contamination. Contamination was considered to be any item that did not belong in that recycling bin, including a misplaced recyclable. Contamination was divided into two categories: non-medical and medical. Non-medical contamination included misplaced recyclables and non-hazardous garbage waste. Medical contamination included items specifically banned by the site's recycling vendor (e.g. gloves, personal protective equipment, tubing, etc). A full list of visual audit results can be found Appendix F.

Primary test units saw a drop in recycling contamination levels after the pilot project (*see additional explanation on Maternity unit in the Confounding Factors section below).

In the secondary test units, Renal and Pharmacy saw drops in contamination levels while Laboratory had a substantial increase from 6 items to 12. Further inquiry will be necessary in order to determine why Laboratory had an increase in contamination. In general, contamination data is difficult to determine from one-time spot checks as opposed to long-term studies. Long term recycling contamination studies are outside the scope of EES with its current resources. As a control, all other units in Providence Building were audited and their contamination levels were averaged to create the control average. The control average saw a small, but insignificant, decrease from 7 items to 5 with medical contamination found in both pre and post audits (Figure 2).

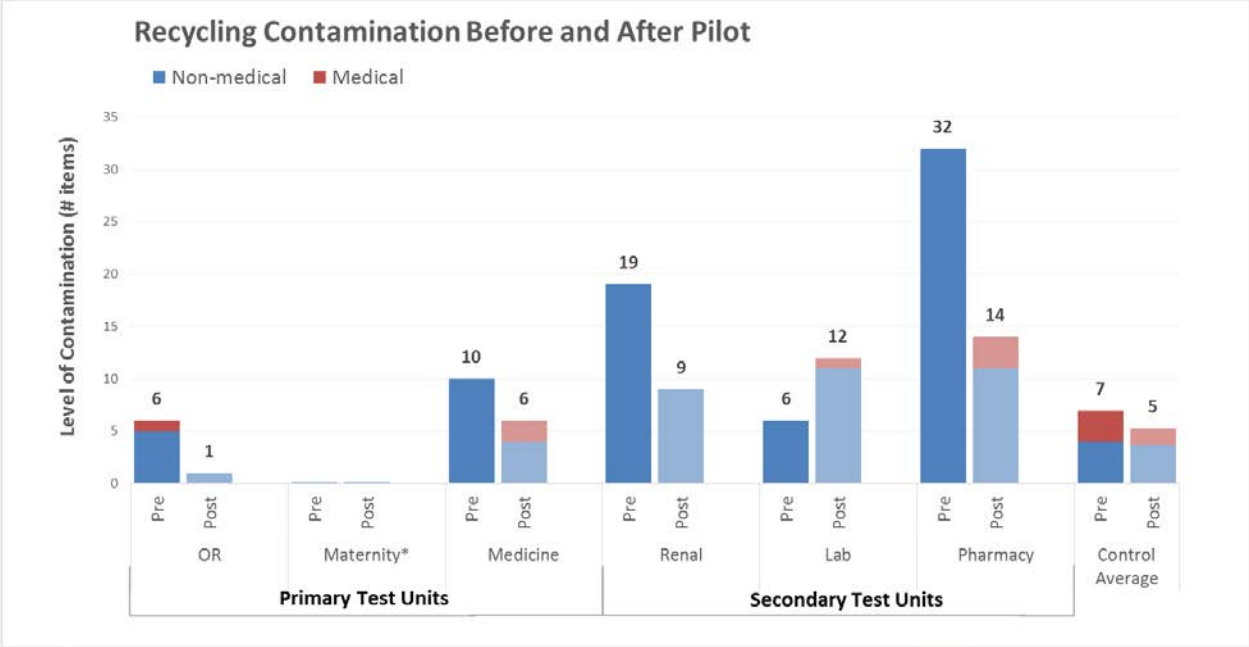


FIGURE 2.Recycling contamination before and after pilot in the six clinical test units compared against the average of the control units

Objective 2: Increase Waste Diversion Rates

The concurrent waste composition study provided insight into how many recyclables were ending up in the garbage and is used here as a proxy for a unit-specific waste diversion rate. The data shows a general increase in recyclables found in the garbage waste stream when comparing the 2018 study to the 2019 study with the single exception of the Medicine unit (Figure 3). Possible explanations include patient care priorities, contact precautions, and daily variations in recycling abilities. However more research is needed to draw stronger conclusions about recycling rate trends in the units and to provide more specific data on unit waste diversion rates.

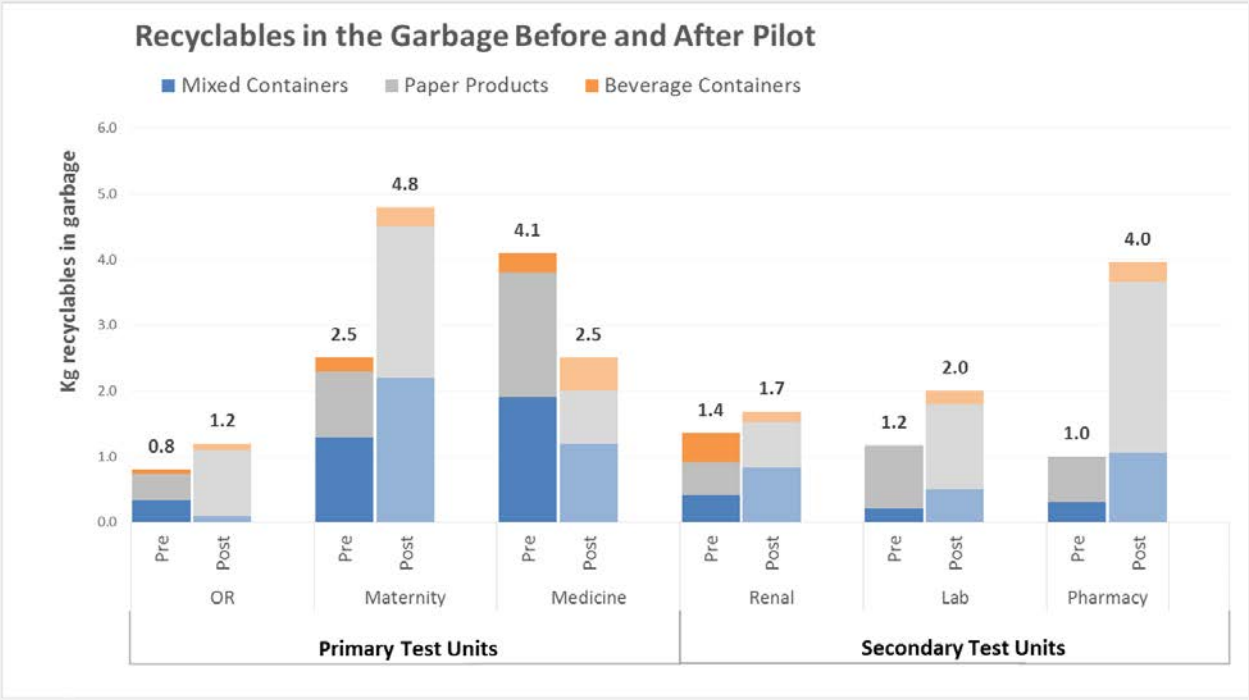


FIGURE 3. Recyclables found in the garbage waste stream in the six clinical test units

Objective 3: Increase Desire to Recycle

A staff survey done before and after the pilot compared how staff felt towards recycling at work. Staff were asked to indicate their level of agreement with two different statements. A third question asked staff to indicate how often they recycle at work:

1. Recycling is a part of my job
2. I care about recycling at work
3. How often do you use the recycling bins to recycle items on your unit?

Overall results of all test units show a slight increase in number of respondents that agree with the first two statements (Figure 4).

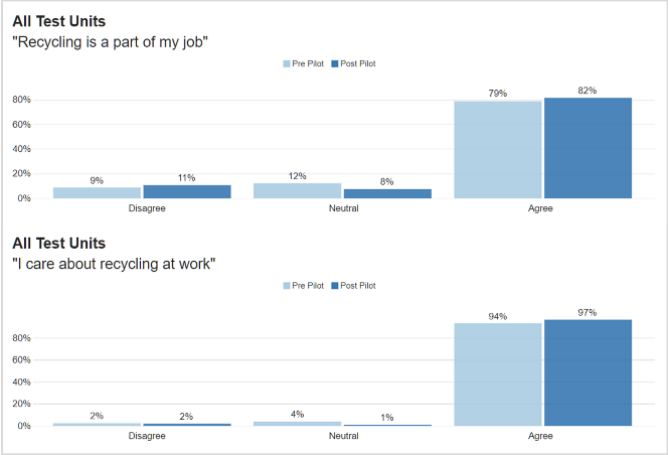


FIGURE 4. Staff in all six test units ranked their agreement with each statement before and after the pilot

When the results are filtered for primary and secondary test units we start to see some differences. In the first statement, the number of respondents in primary test units that agree changed significantly from 77% to 82%, however after the pilot respondents were more divided, with an increase in respondents who disagreed and less that were neutral. For the second statement, we see a small, but insignificant, increase in agreement from 94% to 96% of the respondents agreeing that they care about recycling at work (Figure 5).

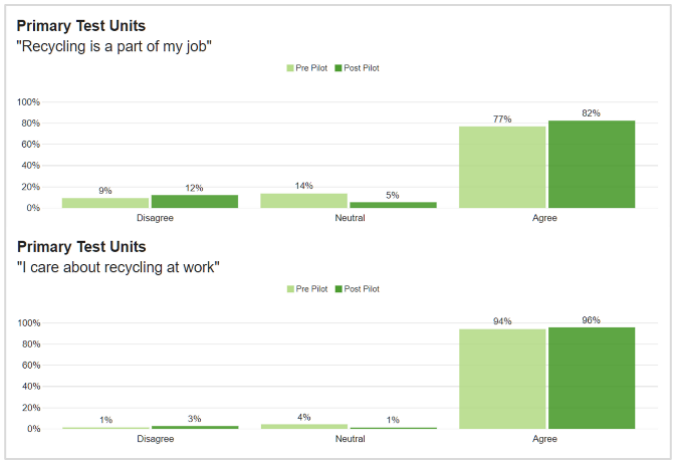


FIGURE 5 Staff in primary test units ranked their agreement with each statement before and after the pilot

The results were quite different in the secondary test units (Figure 6). Here we see a decrease in the number of respondents agreeing with the first statement from 83% to 76%, however we see a significant increase in the number of respondents who say they care about recycling at work, from 93% to 100%. Survey response rate from secondary units decreased with 61 responses in the pre pilot survey to 18 responses in the post pilot survey. With only 18 responses from secondary units in the post pilot survey, results could be subject to variation.

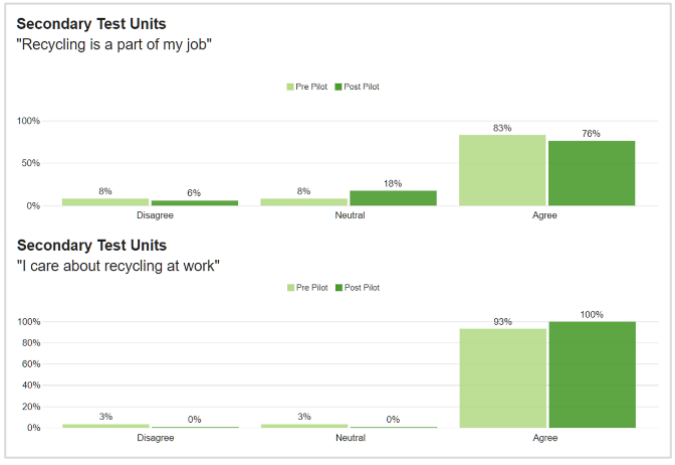


FIGURE 6. Staff in secondary test units ranked their agreement with each statement before and after the pilot

The third question was intended to measure recycling user types before and after the pilot project. User types were grouped into four categories: Low Users = recycle 0% - 25% of the time, Passive Users = recycle 26% - 50% of the time, Regular Users = recycle 51% - 75% of the time, and Active Users = recycle 76% - 100% of the time. The overall results across all test units show a small decrease in Active Users and Regular Users with a corresponding large increase in Passive Users (Figure 7).

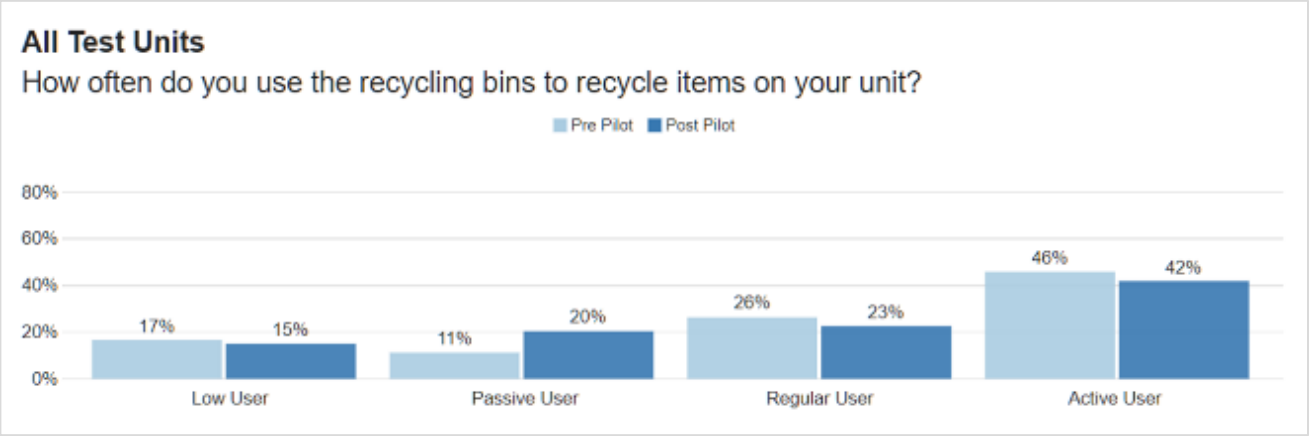


FIGURE 7. Staff answered how often they use the recycling bins at work
(Low User = 0-25% of the time, Passive User = 26-50% of the time, Regular User = 51-75% of the time, Active User = 76-100% of the time)

While this is an unexpected result, we get more information when the results are filtered down to the unit level. We then see a large increase in Active Users in the OR unit with corresponding decreases in all other user type categories. In the Medicine unit we see the opposite: a decrease in Active Users and corresponding increase in Passive Users (Figure 8).

In order to interpret the results, this data was corrected to include only the post pilot survey responses from respondents who stated they had also completed the pre pilot survey (Figure 9). Here we see an increase in Active Users from 46% to 52%. In-person unit interviews revealed that the Medicine unit has very high staff turnover. These survey findings indicate that high staff turnover may have a noticeable effect on recycling desire and diversion rates since we cannot consistently engage with the same staff in that unit.

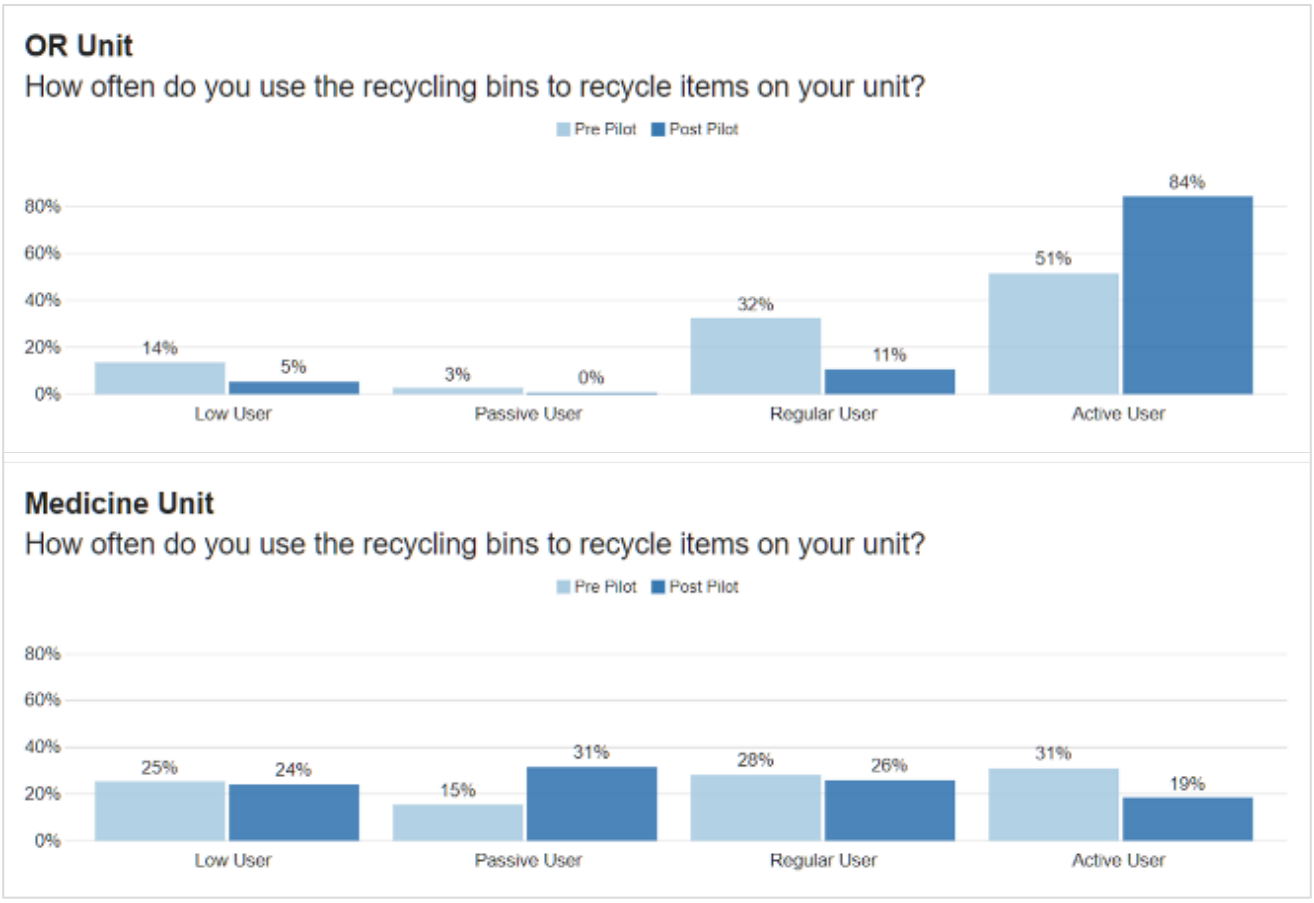


FIGURE 8. Significant unit differences in pre and post pilot results
(Low User = 0-25% of the time, Passive User = 26-50% of the time, Regular User = 51-75% of the time, Active User = 76-100% of the time)

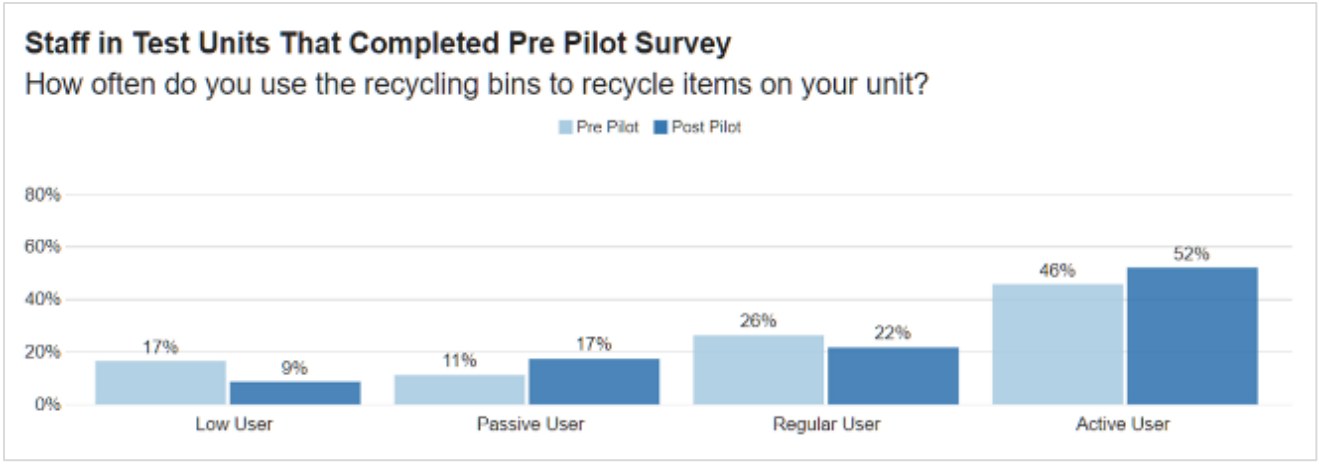


FIGURE 9. When corrected to include only respondents who also completed the pre pilot survey, the results show an increase in number of active recycling users. This may indicate that staff turnover affects recycling rates
(Low User = 0-25% of the time, Passive User = 26-50% of the time, Regular User = 51-75% of the time, Active User = 76-100% of the time)

Objective 4: Make Recycling Easier for Users

Ease of recycling is a difficult metric to measure and often depends on multiple factors including placement of recycling bins, specific products staff are trying to recycle, and job duties including patient care priorities. While those factors were outside of the scope of this pilot, staff were asked in the survey to rate the different tools on how effective they were on communicating about recycling.

Effectiveness of Tools

For primary test units they rated the effectiveness of the bin stickers, campaign posters, in-service, and Recyclopedia (Figure 10). The secondary test units rated the effectiveness of the bin stickers and Recyclopedia. Primary test units rated the in-service the most effective tool followed by the new bin stickers. The results show mixed opinions on the effectiveness of the posters with in-survey and in-person comments indicating that while the posters did not help staff to recycle better or more, it opened up further conversations around recycling in general. Other in-survey and in-person comments indicated that many staff did not see the Recyclopedia, however the OR has shown a strong desire to improve the Recyclopedia by adding more images and making it a regular education tool for staff.

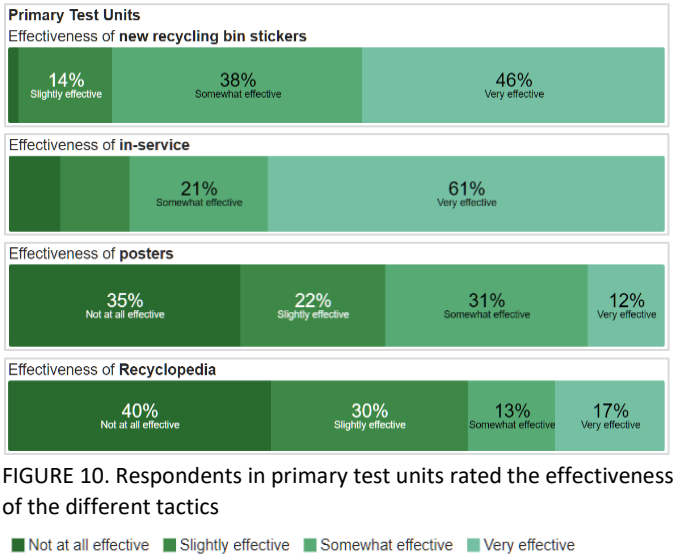


FIGURE 10. Respondents in primary test units rated the effectiveness of the different tactics

Secondary test units had very similar responses with the new recycling bin stickers being rated the most effective and the Recyclopedia getting mixed responses (Figure 11).

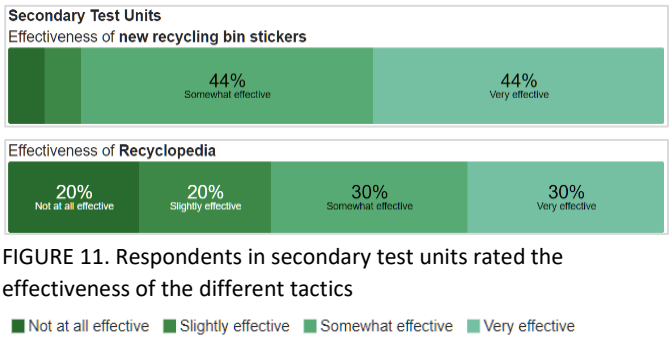


FIGURE 11. Respondents in secondary test units rated the effectiveness of the different tactics

Confounding Factors

During the initial pilot planning meetings, it was identified that the Maternity unit only had two recycling bins on their whole unit (one Mixed Containers and one Mixed Paper), both located in the patient nutrition centre, which staff rarely use. An order was placed by the site for an additional two recycling stations which were meant to be placed at each of the two feeding carts in the hallways, areas which staff regularly use. However these bins did not arrive during the pilot period so Maternity was effectively unable to participate in the pilot project. Additionally, during the pre and post visual audits of the two recycling bins, both bins had recently been emptied and there was little to no waste in them, making a contamination comparison impossible.

One month before the implementation of the new tools, the main contact in Renal left their position. Two new contacts were eventually identified to continue the project however Renal missed most of the window for the collection of pre survey responses and only two responses were recorded. This makes it impossible to correctly perform a pre and post pilot comparison of staff desire to recycle and ease of recycling in Renal.

Unit Feedback

In-person interviews were completed in the primary test units with the main contact in each unit. This informal interview was intended to have candid conversations about the pilot: the logistics, challenges, effectiveness, and next steps. Summary notes from these interviews can be found in Appendix G. Main themes that were heard from all three primary test units included:

- Having unit staff on the posters was effective at drawing attention to the message
- Multiple engagement tools all done at one time are more effective than changing just one tool e.g. only changing bin stickers or only putting up some posters
- In-services were useful and regular education sessions would be desirable
- Due to the complexity of the products staff encounter, there is still on-going confusion over what can and cannot be recycled and disappointment over how much cannot be recycled

Other Results

The pilot allowed the Energy and Environmental Sustainability team (EES) to engage with clinical units at St. Paul's Hospital which resulted in other benefits not specifically outlined as project objectives. Some of these benefits included:

- Creation of new green team in the OR
- Promotion of Green+Leaders network, with two new leaders trained in the Medicine unit
- Identification of recycling issues to address such as bin placement and additional bins needed
- Fostering personal relationships with clinical contacts to further inform our work

Conclusion and Next Steps

This pilot project was intended to inform the future direction of clinical recycling communications and engagement and to share learnings and best practices with the rest of St. Paul's Hospital and to other sites. Through this project we learned that personal, inspirational posters capture attention but staff will lose interest in them over time as poster fatigue sets in. We learned that a clear bin sticker design with real products on it is key, and when complemented with in-person education, staff retain information. However most staff are still not satisfied with the amount and placement of their recycling bins but a lack of space is an ongoing competing issue. This reaffirms the importance of planning space with waste streams in mind rather than fitting them in as an afterthought. And finally, we learned that multiple communication methods at one time yields the best engagement results. When staff have multiple touch points with a topic like recycling, they are more likely to engage with it. However this is time-consuming and with EES's limited resources we need to be strategic with special projects and choosing sites to work with.

Next steps will include creating generic bin stickers for each recycling stream in the new design and making all stickers (including the unit-specific stickers outlined here) available for ordering on the print shop. In a future year the pilot could be replicated in a different PHC site with small updates to the posters and bin stickers. Findings from that site would build on results from St. Paul's Hospital and allow EES to improve recycling communication and engagement tools and tactics. EES continues to work on multiple Zero Waste initiatives to improve waste diversion and waste reduction.

Acknowledgements

The Energy and Environmental Sustainability team would like to recognize the support and assistance from St. Paul's Hospital and Providence Health Care, without which this project could not have succeeded. Specific thank you to our Project Sponsor Camille Ciarniello, clinical support from Allison Barrett, Natalia Elmajian, Mitra Fatemi, Kristine Fernando, Wayne Fritz, Yonette Harrod, Melissa Kim, Winnie Ma, Peter McLellan, Theresa Parent, Mary Radmanovic, Ashley Schwab, Holly van Heukelom, Louise Van Vliet, Nadia Vrtacic, Nicole Whittle, site support from Benson Low and Sarah O'Neill, project collaboration with Be the Change Group, and additional support from Urban Impact.

Appendices

Appendix A
Relevant Excerpts from the 2016 Human Factors Assessment of Waste Segregation at Point of Care

3.0 Assessment

3.1 Environmental Scan and Observations

a) Signage and labelling used for recycling streams is not specific to the type of supplies/waste produced for the area. Most of the examples are food or general consumer products, not examples of medical waste.

4.0 Recommendations

4.1 Education and Training

a) Face-to-face training is the preferred method by staff. The online training module may be a useful tool for initial staff orientation, but refreshers, updates and clarifications are best provided in person.

4.3 Physical Environment

a) Signage and bin labels:

- Bins in clinical areas should reflect type of waste generated (i.e. examples of recyclable medical plastics), rather than food/consumer waste. Mixed containers in particular should display more clinically relevant items or other common, high volume items (e.g. plastic water cups).
- Garbage bin labels could also include relevant medical items, especially those that typically end up the in wrong stream (e.g. tubing, IV bags). Recycling champions and unit educators may be a good resource to collaborate on list of items to include. Further focus groups with frontline clinical staff may help to determine what type of signage might be most relevant. In public areas (e.g. lobbies, waiting rooms, cafeteria), current signage is still appropriate.
- Quick reference posters for recycling streams should be available on units, not just online. Similar concept could also be provided for other waste streams to provide direct side-by-side comparison. It is easiest to determine where to put something when item in question is explicitly labelled in one of the streams. Input from clinical staff should be gathered to source most representative items.

Appendix B

Images of Asset Deliverables

Operating Room Bin Stickers

Maternity Bin Stickers

Medicine Bin Stickers

Appendix B

Images of Asset Deliverables continued

Renal Bin Stickers

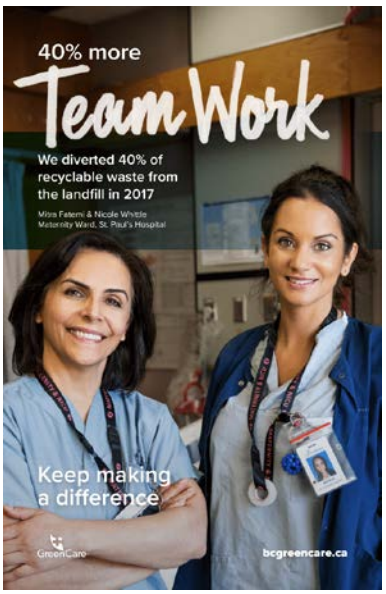
Laboratory Bin Stickers

Pharmacy Bin Stickers

Appendix B
Images of Asset Deliverables continued

Operating Room Poster

Maternity Posters



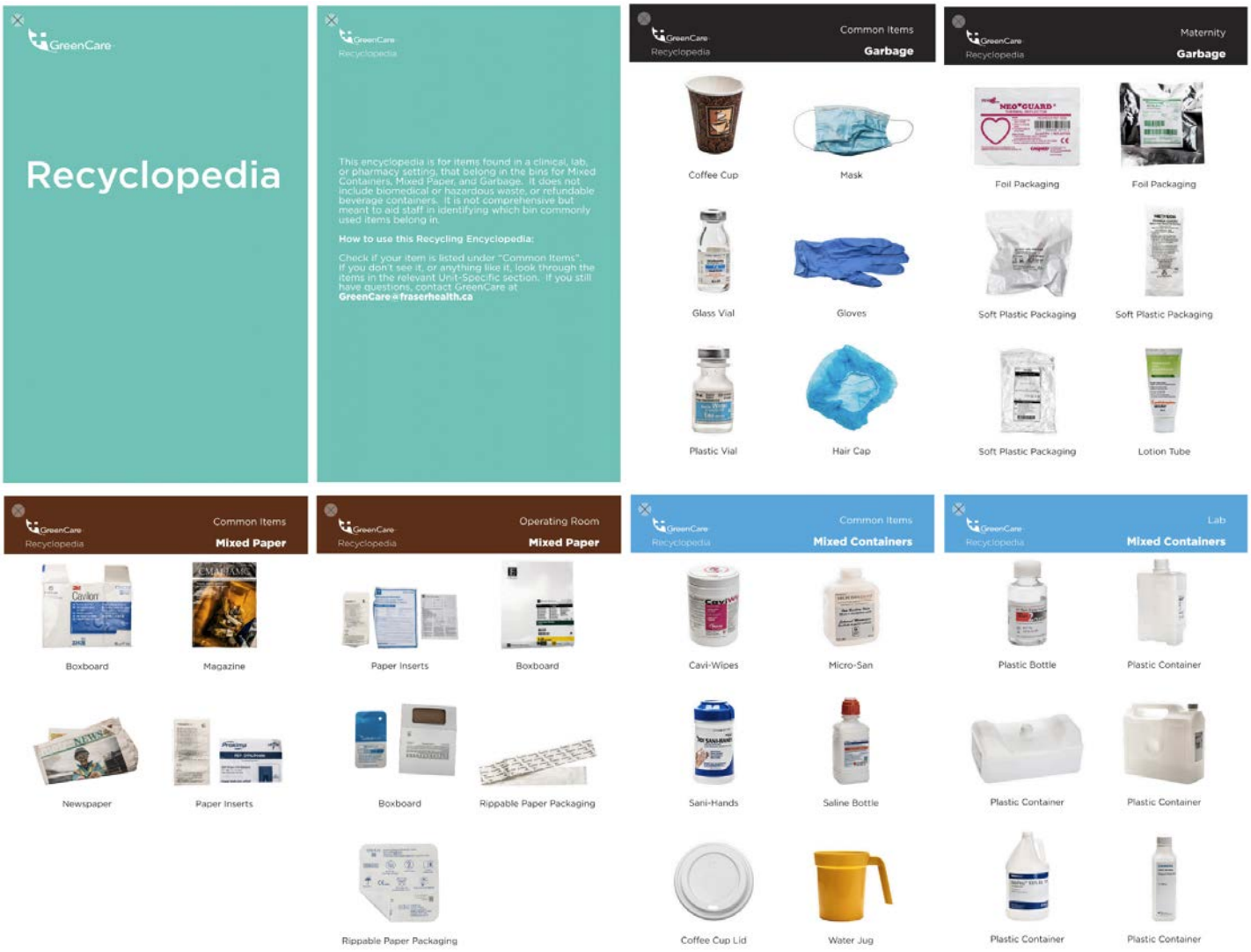
Recycling Facility Poster

Medicine Posters

Appendix B

Images of Asset Deliverables continued

Recyclopedia Excerpts



Appendix C
Project Charter

Please see included attachments for access to this file.

Look for this symbol  on the left side of the screen and click to see attachments.

PHC_MiniProjectChart
er_RecyclingCommsEr

Appendix D
Pre Survey of Test Unit Staff

Q1 What is your position? (Check all that apply)

- Nurse
- Manager/Supervisor
- Physician/Resident
- Clinical Nurse Educator (CNE)
- Clinical Nurse Leader (CNL)
- Program Director
- Technician
- Allied
- Other: please specify _____

Q3 What ward do you work in? (Check all that apply)

- Operating Room (OR)
- Maternity
- General Medicine
- Renal
- Lab
- Pharmacy
- Other: please specify _____

Q4 What is your age?

Under 20 | 20-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71+

Q5 For how many years have you worked in your career? (as a nurse, manager, etc)

0-2 | 6-10 | 21+ | 3-5 | 11-20

Q6 How much do you agree with the following statements?

	Strongly disagree	Somewhat disagree	Disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Recycling is a part of my job							
I care about recycling at work							

Q7 What percentage of the time do you use the recycling bins to recycle items in your unit?

0% to 24% of the time	25% to 49 % of the time	50% to 74% of the time	75% to 100% of the time

Q8 When you do not recycle, what are the reasons why? (Check all that apply)

- I don't have the time/ I'm too busy
- It's too confusing/ I don't know where things go
- The bins are not located in a convenient place
- I don't know what is recyclable
- The stickers/ signs are unclear
- The item is not recyclable at work
- Other: please specify _____

Appendix D

Post Survey of Test Unit Staff (same questions from pre survey were asked before the following)

Q9 Did you complete the GreenCare recycling survey (online or paper version) in Fall 2018?

Yes
No
Not sure

Q18 Over the last few months your unit has been piloting new recycling communication and engagement tools. Please rank how effective these tools were at communicating about recycling.

	Not at all effective	Slightly effective	Somewhat effective	Very effective	I didn't see this tool
New stickers on the recycling bins					
Posters					
Recyclopedia					
Online waste management module					
Recycling in-service					

Q26 Please share any comments or feedback you have about the specific tools:

Recycling bin stickers _____

Posters _____

Recyclopedia _____

Online waste management module _____

Recycling in-service _____

Q20 Please provide any additional comments regarding the different recycling tools in the pilot project:

_____

Appendix E
Waste Composition Study

Please see included attachments for access to this file.

Look for this symbol  on the left side of the screen and click to see attachments.

Waste Audit Report - Final - (April 2019).pdf

Appendix F

Visual Audit Results

Please see included attachments for access to this file.

Look for this symbol  on the left side of the screen and click to see attachments.

SPH Visual Audit Data.xlsx

Appendix G
Summary Notes from Post Pilot Interviews

Please see included attachments for access to this file.

Look for this symbol  on the left side of the screen and click to see attachments.

Summary Notes from
Post Pilot Interviews.d