

Action Research Team: Hospital Sustainability

Final Report

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Table of Contents

Abstract.....	3
Executive Summary.....	4
Overview.....	6
Initial Conditions.....	8
Research Methodology.....	9
Data.....	11
Key Findings and Recommendations...	12
Significance.....	14
Conclusion.....	14
Appendices.....	16

Abstract

The Education for Sustainable Living Program contains a two-quarter research based project that specifically addresses an area of the UCLA campus that is interested in increasing sustainability. This report concerns the work of the Hospital Sustainability Team that worked with the UCLA Health System and its Sustainability Programs Manager, Teresa Hildebrand. This year the team focused on two buildings, the Ronald Reagan Medical Center (RRMC) and the Medical Plaza in Westwood. Through collection of original data and analysis the team was able to carry out three objectives: assess the possibility of energy efficient appliances in restrooms, aid in the planning of the first Earth Day Fair held on site at RRMC, and reveal the need for recycling resources in public areas.

Executive Summary

After three years of working with the UCLA Health System, the Hospital Sustainability Action Research Team had the experience to focus on narrow goals rather than analyzing overall practices within the health system. The main objectives for the team this year were to be focused on staff-requests as well as individual tasks given to us by our stakeholder, Teresa Hildebrand. Using the responses recorded from the Steering Committee's Earth Day Contest of 2012, the team found three popular themes that we could tackle over the following two quarters: energy efficiency in restrooms, sustainable awareness, and waste reduction.

Operational matters within restrooms were of particular concern to several staff members in terms of lighting and hot air hand dryers. We quickly discovered that the possibility of motion sensor lights being installed in public restrooms was not entirely logical because of high foot traffic. Our next step was in evaluating the possible exchange of current hot air hand dryers with the energy efficient Dyson Airblade. After collecting data and calculating the return on the investment, the new appliances proved to have a payback period of over a decade. Making this large of an investment is not possible with the current budget. However, upon sharing this data with Environmental Services (EVS) Manager, Andrei Roudenko, a proposal was made to begin composting in these same restrooms. Our suggestion was successful and exceeded our goal of half of paper waste being collected as compost to all of the waste accumulated being sorted as compostable. On April 14, 2013 all of the waste generated in public restrooms in the Medical Plaza 200 Building was collected as compost and after one month of the additional waste, approximately .7 tons was added to the total tonnage collected. Further data is needed to accurately analyze the effects of adding restroom waste to compost and with its success we hope to see the same change implemented at the Ronald Reagan Medical Center.

Our primary stakeholder, Teresa Hildebrand who was joined with the Wellness Coordinator of the hospital, then asked our team to help plan an Earth Day Fair to be held on hospital grounds at both campuses. We formulated ideas for potential activities using our experiences at previous fairs and provided a list of student groups that could potentially have a presence at the Westwood fair. Both the Santa Monica and the Westwood campuses held simultaneous fairs and successfully implemented an annual large scale Earth Day event. Our team volunteered on the day of and our fellow peers in the ART program were able to present their work on the new Tobacco Free Campus Initiative. Through the educational activities held and the campaign for reusable bottle and coffee mugs, the fair was able to spread awareness of important issues concerning sustainability as well the health system's own efforts in the matter.

Our final task for the year was a waste mapping project requested by Mr. Roudenko. In order to have accurate knowledge of placement for each waste bin within public areas in both buildings we plotted their positions on floor plans provided to us by our stakeholder. We identified whether a bin was designated as "landfill" waste or recycling waste in order to see the distributions of each. We also took photographs of each bin's exterior and its contents in order to analyze how it was being used. We found a large discrepancy in distributions of each bin with several floors not containing a single recycling bin available in public areas. The majority of the landfill waste bins were filled with recyclable waste such as plastic bottles, cans, newspapers, assorted paper goods, etc. Often times the bins were found during the collection period and saw that bins were emptied with only a few pieces of waste in each bag. Upon presentation of our data to Mr. Roudenko we were able to identify the significant areas that were in need of additional recycling bins immediately and the need of a standardized two-bin system within the

entire health system. Future research on an efficient, aesthetically pleasing, side-by-side bin system must be done in order to help the health system decrease its landfill waste generation.

Overview

For the past twenty weeks, the Hospital Sustainability Action Research Team has worked toward two goals: environmental awareness and implementing sustainable practices. Because both the UCLA Ronald Reagan Medical Center and the 200 Medical Plaza have a large presence of sustainable infrastructure, our team had three main focuses the past winter and spring quarters. The first was to focus on improving restroom operations. Secondly, we helped promote awareness of current sustainable practices already in place at the hospital through the Earth Day Fair. And lastly, we undertook a waste mapping project to see the efficacy of placement of trash and recycling bins.

In the previous year, the Hospital Sustainability team had focused on incorporating clinical care into the Green Office Program while simultaneously helping office-based departments assess their office practices. With the completion of their project, this year our team followed Teresa's guidance and looked through the 2012 Earth Day Contest responses to find a specific project to work on. Each team member selected a few ideas they wanted to work on and submitted a list to Teresa for approval, leading to our project of improving restroom operations. We began by pursuing the option to install motion light sensors in public restrooms in order to cut down electricity usage. With further research it was realized that these restroom experienced high usage, which would render the sensors useless if the lights were consistently needed.

We then focused on changing the out-dated hot air hand dryers to the new, energy efficient Dyson AirBlade hand dryers. We surveyed all public restrooms to determine what model hand dryers were being used and then completed a cost-benefit analysis for switching the

existing hand dryers to the Dyson AirBlade. Teresa presented our data for approval of the installation of the Dyson AirBlade, however, due to the lengthy payback period, the project was not feasible with current budgets. Furthering our efforts in improving restroom operations, we looked into composting the paper towel waste in the restrooms. Our team collected data to evaluate the types of waste receptacles in the restrooms and with the help of the EVS department and its manager, Andrei Roudenko, we proposed the composting of all waste in the restrooms. This change has appeared to make a significant increase in the amount of composting the hospital collects.

The team also assisted Teresa with the health system's first annual Earth Day Fair. The purpose of the fair was to bring attention to the UCLA Health System's own efforts in sustainability and help educate staff on what they could personally do. Our efforts included providing Teresa with ideas and information that we felt should be represented in the Earth Day Fair. Our team was present at the fair on Monday, April 22nd to work and ensure it would run smoothly.

Lastly, the action research team also conducted a waste mapping project, which was recommended to us by Mr. Roudenko. This project required mapping trash and recycling bins in the public areas of both the Ronald Reagan Medical Center and Medical Plaza. After mapping and taking pictures of all trash and recycling bins in both buildings, we presented our data to both our stakeholder and Mr. Roudenko. Our efforts showed a desperate need for recycling bins throughout the health system. Future teams will be able to work with the EVS Department and all powers necessary to make permanent changes in bin placement, specifically in adding a two-bin system for the entire health system.

Initial Conditions

The Hospital Sustainability Team is in its third year for the 2012-2013 academic year. Due to the team establishing a stronger foundation from years past, we had a substantial basis upon which to build off of. During the 2010-2011 academic year, the team explored the various departments of Ronald Reagan for obvious green protocols. Since Ronald Reagan, in accordance with UCLA, is one of the most advanced hospitals in sustainability, the team ran into obstacles when it came to infrastructural changes. They finally decided to create a survey that assessed the amount of sustainability knowledge among the nursing staff.

Then, in the 2011-2012 academic year, the team could not continue the work on the survey due to unavailability of certain contacts. So, they returned to exploring the hospital for possible departments in need of sustainability improvements. The team observed that although there were several managers in charge of making their respective departments green, there lacked cohesive force bringing each individual department to a similar high standard. They set out to create a new section in the Green Office Program that could be applied to clinics and adjusted the rest of the calculator to accommodate hospital offices. Through their research they also created a “Green Guide” for hospital staff that could be referenced when searching for sustainability facts or resources such as vanpools.

This year, our team set out to establish our goals early on. Three main resources and influential factors guided this year’s team and acted as the building blocks for our goals. The first being ideas submitted in the 2012 Earth Day Contest created by the hospital’s Sustainability Steering Committee. This survey asked staff to provide their best idea of how sustainability could be increased in the health system. Over 270 responses were submitted, giving us the insight to understand the hospital in the same manner as employees and administration to aid us

in determining what reforms were feasible. As our team read through the responses, a few major patterns appeared: energy conservation, waste reduction/mitigation, and paper use efficiency. The second factor was that we observed enthusiastic employees who wanted to minimize the waste, but just did not have enough information on how to implement changes. This became a target area for improvement. Lastly, the guidance of our stakeholder, Teresa, was crucial in determining the hospital's needs and how we could help.

Research Methodology

Energy Efficiency in Public Restrooms:

Based on the employees' concerns about energy efficiency in the public restrooms of the hospital, we decided to see if implementing Dyson Airblade hot air hand dryers would be an economically and environmentally efficient alternative to the current hand dryers. Each member of the hospital sustainability team was assigned two floors of the Medical Plaza 200 Building and took note of the hot air dryer model/serial number, unit design of paper towel dispensers, and quantities of each unit (Appendix A). Using the data collected, we looked up the current model installed and found the technical specifications that gave us average wattage output and duration of drying time. Dyson provided information on their own product and using both sets of data we were able to calculate the energy and financial savings of replacing the current hot air hand dryers with the Dyson Airblade (Appendix B).

Health System Earth Day Fair:

To raise awareness about sustainability measures taken within the hospital, the first ever Earth Day Fair on hospital grounds took place on April 22nd, 2013. Teresa partnered with the wellness coordinator and sustainability groups to plan and run this event. In order to help Teresa with the event, she asked the Hospital Sustainability team to brainstorm some ideas for activities

and information booths that could be at the fair. One example was to have a trivia game with a spinning wheel with questions about current hospital practices that increase sustainability so that awareness would be spread amongst employees. An interactive idea was to have a sustainable cooking tutorial as well as a small farmers market where fresh produce could be sold. A waste-sorting game was also suggested that would allow participants to engage with the fair and learn how to properly dispose of commonly used items at the hospital.

Once the ideas were submitted to the stakeholder, she informed us that since this would be the first year of the Earth Day Fair that it would have to be on a smaller scale than we imagined. It would only consist of information booths focused on spreading awareness about sustainability issues on campus and at the hospital. Due to fire marshal disapproval, having a farmers market was not yet feasible and a sustainable cooking activity would also not be possible. Teresa encouraged the team to find campus environmental groups that would volunteer at the fair to promote awareness about their cause, one of our fellow ESLP Action Research Teams (Tobacco Free Campus Team) volunteered to spread awareness about the new tobacco free campus initiative. In addition to helping Teresa come up with ideas for booths at the fair, we also helped on the day of the event. We helped set out the tables and chairs, answered questions about the fair and helped recycle eyeglasses and used cell phones.

Waste Mapping Project:

One of the sustainability issues that hospital employees wanted to be addressed was the lack of recycling bins in public areas of the hospital. In order to address this issue, EVS Manager, Mr. Roudenko suggested we engaged in a waste-mapping project of all waste bins in public areas of Ronald Reagan Medical Center and Medical Plaza 200 Building. Teresa gave the team official floor plans of both Ronald Reagan and the Medical Plaza (Appendix E for

example) and each member was assigned to map out all the waste bins in certain areas of Ronald Reagan and one floor of the Medical Plaza.

Each team member was responsible for plotting the exact location of the bin on their assigned floor plan using a small square to stand as a trash bin and a circle for recycling bins; each bin was numbered individually within the symbol. The following step for each member was to take a picture of the exterior of each bin with a card stating which number bin it was on the floor plan. A picture was also taken of the contents in each bin in order to show if people were throwing recyclable materials in the trash bins or trash in the recycling bins. Pictures were also taken of the hallways where the waste receptacles were to display whether or not there were enough bins available to the public and how they were positioned on the floor. All the pictures taken were compiled into separate presentations, one for each building, organized by floor (Appendix F for example of presentation, whole file can be found separately).

Data

Data referenced previously can be found in the appendices.

Waste Mapping Data allowed us to pin point key areas:

- RRMC: Floor 1 urgently needs recycling bins on the entire floor, there weren't any near the main elevators used, main entrances, main waiting areas. Every other floor completely lacked recycling bins in the highlighted areas, none were found in highlighted areas. About 80% of the waste in these areas is recyclable: coffee/water cups (paper and plastic), plastic bottles, aluminum cans, newspaper/magazine/patient handouts, plastic wrapping, etc. All these items dominate the contents of every bin we examined.
- Med Plaza: The same conclusion was met for Floor 1 of this building as well, with the addition of the Urology Clinic waiting area. They requested some form of advertising

material in addition to recycling bins because of the water cooler in the waiting area.

Floors 2 and 4 had a single recycling bin. Floors B2, 3 and 5 didn't have any recycling bins at all. Floor 6 didn't have any kind of bin at all.

Key Findings and Recommendations

This year has been extremely productive as we took on many projects that moved the Ronald Reagan Medical Center and Medical Plaza closer to optimal sustainability. Our main objectives were replacing the current outdated hot air hand dryers with energy efficient Dyson AirBlade hand dryers, helping plan the Earth Day Fair, and evaluating current waste bin placement. Although a few ideas were determined to be unfitting or lacked follow up, nearly all of the projects were pushed through to completion.

Our proposal for the hot air dryers was based on the intention to reduce paper use; predicted energy consumption was calculated to determine the feasibility of replacing them. Ultimately, the proposal was rejected due to the high cost of installation and lengthy payback period of 13.8 years. Although this component of the restroom could not be changed, the paper towels in the Medical Plaza will continue to be composted. Since this started, the composting mass has increased by about .7 tons/month; composting in the cafeteria alone had averaged about 6 tons/month and the month of April saw 7.8 tons collected. This is expected to maintain an increase as compost programs are started within Ronald Reagan in the future. We recommend that these programs be revisited in the future to complete an analysis on their impact by observing several months of compost weight.

April marked the first annual Earth Day Fair for the Ronald Regan Medical Center and it was well received by the staff. The strategic location along the passageway facing Westwood Boulevard yielded many staff members who were on their way to work and effectively educated

them through interactive, engaging activities such as the waste sorting game. Nonetheless, it was noted that some activities lacked interaction, thus were less effective, so we recommend that each booth have activities that require participation and enthusiasm to captivate the audience. The variety of the booths present contributed to the energy of the fair, though we also believe that allowing a larger array of sustainability-focused student organizations (Appendix C) would bring more character and excitement to the event. In terms of preparation, we suggested including pre-planned tasks for volunteers to alleviate the coordinator's load, which would increase efficiency and prevent idling. Lastly, the most important recommendation concerning the fair would be increases in advertising for the entire fair and for specific programs. Collection/distribution programs at the fair need much more campaigning in order for staff to prepare in advance (i.e. used cell phone collection and reusable water bottle distribution did not have the targeted traffic). In spite of these possible improvements, the fair was a great success and has set the bar high for the following years (Appendix D for fair layout).

Our final project aimed to evaluate the need for recycling bins in both major buildings. To our surprise, there were very few recycling bins, if any, available in the public areas and much of the items thrown into the trash were recyclable. After discussing the situation with Mr. Roudenko, most aspects are still uncertain such as placement and when the changes will be made, but placement of temporary bins can be done immediately. Regardless of when this will be fully implemented, this is a tremendous step forward for sustainability in both buildings, as it will reduce a great amount of waste when a standardized two-bin system is implemented.

Through each project the tedious process of bureaucracy was present so it was very helpful to have both Teresa and Mr. Roudenko to help proposals through quickly. Major barriers to sustainability included: limited staff awareness of the hospital's environmentally friendly

practices, limited funding, and public access to recycling bins. With these in mind, we can effectively leave our work to be continued by next year's team.

Significance

The work done this year by the action research team made significant progress in identifying key areas of a hospital that can implement relatively quick change. Hospitals are not usually considered to be low-waste institutions but we were able to see how adding composting programs outside of the cafeteria were both feasible and efficient with helping with low-waste goals. Increasing awareness of what is already being done by the health system encourages staff to take initiative in their own departments. The Sustainability Steering Committee has been active for a year now and increasing participation can be targeted in next year's fair. Not only should hospital staff be more involved with these programs but students on campus can also utilize increased promotion of the fair in order to see the extent of UCLA sustainability. Finally, the waste-mapping project was particularly revealing and shed light on a serious lack in simple infrastructure. Giving patients and staff more opportunities to dispose waste responsibly will help the hospital reduce the landfill waste accumulated on its grounds without making product changes or forcing behavioral changes. The University of California mandated goals for 2020 that apply to the health system and with the help of our team and future teams it can reach these goals quicker than imagined.

Conclusion

UCLA's Health System has much room to grow as a leader in sustainability. Implementing programs and making infrastructural changes takes patience and detailed cost-benefit analysis that will enable administration to approve of new installations. Our work with the beginning of the Earth Day Fair enlightened us on how difficult it is to start a new legacy but

also how easily it can grow in the future. Having completed the waste-mapping project and identifying the urgent areas on each floor, future teams can see the flourishing of a new waste system. We cannot stress the importance of a standardized side-by-side system and the potential for research in finding the best option for the health system. With the help of passionate students, some of their more tedious goals can be realized quicker with the cooperation of hospital administration and staff.

Appendix A

Data collected from public restrooms in Medical Plaza 200 Building:

ART Restrooms

	Restroom #	# of Flushed Dispensers	# of Separate Trash Bins	Hot Air Dryer Model
1	666	1 (auto)	2	1 [Bradley model: recessed. Serial # 06807]
2	664	1	1	1 [Bradley, Serial #06767]
3	549	1 (auto)	1	2 [Bradley model: surface. Serial # 06807]
4	551	1	1	1 [Bradley, Serial # 06768]
5	449	1	2	1 [Bradley, Serial #-]
6	451	1	1	1 [Bradley*]
7	349	1	2	1 [Bradley*]
8	351	1	1	1 [Bradley, Serial #06769]
9	249	1	2	1 [Bradley*]
10	251	1	1	Bradley 06770
11	149	2	2	Bradley 06771
12	147	2	2	Bradley 06770
13	B165-103	1	1	NA
14	B165-101	1	1	NA
15	B265-4	1	1	NA
16	B265-2	1	1	NA

Appendix B

Cost benefit analysis based on replacing current Bradley hand dryers with Dyson Airblade hand dryers. Assumption made: 20 units purchased for Medical Plaza at a rate of \$1,055.00 per unit. All information obtained from Dyson and Bradley assumed to be accurate from respective databases.

Energy Use Comparison	Dyson Airblade hand dryer AB04 PC ABS	Current Hot Air Dryer – Bradley Model
Number of machines	20	20
Annual number of uses	1,747,200	1,747,200
Average number of uses per location	87,360	87,360
Average dry time	12	30
Operational power consumption	1,400 W	1,600 W
Standby power consumption	1.00 W	2.00 W
Power consumption per use	0.00467 kWh	0.01334 kWh
Annual standby power consumption per location	8.4688 kWh	16.064 kWh
Annual operating power consumption per location	416.15 kWh	1,181.45 kWh
Total annual power consumption	8,323 kWh	23,629 kWh

Cost Comparison	Dyson Airblade hand dryer AB04 PC ABS	Current Hot Air Dryer – Bradley Model
Operating cost per use Based on \$0.10 per kWh	\$0.00047	\$0.001334
Annual operating cost per machine	\$41.61	\$118.15
Total annual running cost	\$832.20	\$2,363.00
Total annual savings	\$1,530.80	--
Cost per unit	~\$1,055.00	--
Total Cost	~\$21,100	--
Total payback period (not including additional labor/permit costs)	13.8 years	--

Appendix C

Potential Student Groups for Earth Day Fair Booths:

Climate 411: educating how to cost-effectively reduce personal carbon pollution

Bicycle Coalition at UCLA: Advocating student biking at UCLA

Bruin SEEDs: The purpose of this chapter is to promote higher education, increase interest in ecology, ecological research and conservation in youth.

Net Impact: Integrate social and environmental values into their everyday habits

Engineers Without Borders: “Our VISION is a world in which the communities we serve have the capacity to sustainably meet their basic human needs, and that our members have enriched global perspectives through the innovative professional educational opportunities that the EWB-USA program provides.

ESSN (Environmental Science Student Network): Connecting students in the major to each other and to resources for the future careers

SWC Earth: E.A.R.T.H. is the environmental health committee within USAC's Student Wellness Commission. “We believe that student well-being is inextricably related to individual efforts in achieving a clean, thriving, and healthy environment to live in!”

Bruin Culinary Community: The purpose of the Bruin Culinary Community (BCC) is to foster the formation of a community of students at UCLA who share a passion for cooking and baking, and to form a space where those who have a desire to cook or bake can come to learn.

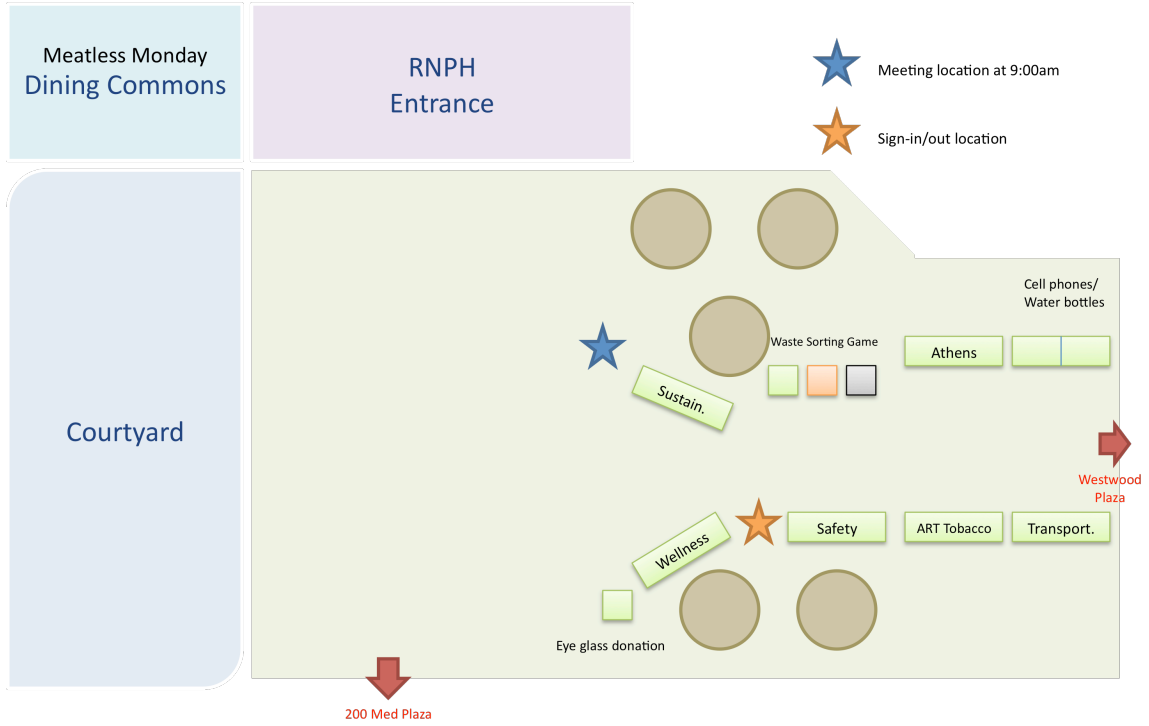
PowerSave: The PowerSave Green Campus Program seeks energy savings on university campuses through a student-led energy efficiency campaign to educate students, staff, faculty, and the local community on the importance of energy conservation and to realize energy savings by establishing ongoing environmental projects at the University of California, Los Angeles.

B-Consulting: Provides innovative solutions to businesses like water quality control and treatment issues that arise during construction activities

Public Health Student Association: The UCLA School of Public Health association.

Appendix D

Earth Day Fair Table Layout Ronald Reagan UCLA Medical Center



Appendix E

Medical Plaza 200 Building, Floor 1 Floor Plan (scaled down for appendix):



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MEDICAL PLAZA 200
UNIVERSITY OF CALIFORNIA LOS ANGELES
FIRST FLOOR PLAN
UPDATED BY E. MURABATA, 09-2012



Appendix F

Example of presentation made for Ronald Reagan Waste Mapping Data:

Floor 1



1-1

