Communicating the green features of the Trudy Fitness Center:

An analysis of current and future methods

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Executive Summary

Colgate University's (Hamilton, NY) most recent building, the Trudy Fitness Center, is expected to receive Leadership in Energy and Environmental Design (LEED) silver certification in the next year. While Trudy has intrinsic economic and ecological value as a green building, its social value as a campus asset has yet to be fulfilled because few members of the Colgate community, defined for the purpose of our survey as students, staff, faculty, and Hamilton patrons, are aware that it is a green building. Thus, the purpose of this study is to find (1) what Colgate University has done thus far to communicate Trudy's sustainable[1] features, as well as it's tentative LEED certification, (2) whether or not these previous methods were effective, (3) which of Trudy's sustainable features are most important to the community to learn about, and (4) how individuals in the Colgate community would like to receive sustainability information.

An extensive literature review was performed to gather background information on the subject matter. Next, interviews were conducted to: (1) direct the project, and (2) provide an extension of the survey. Additionally, a survey was administered to the Colgate community to determine: (1) general levels of knowledge about LEED buildings, (2) sources from which individuals have gained this knowledge, (3) how they would like to be informed of the sustainable aspects of the Trudy Fitness Center, and (4) which features of the fitness center the community values most.

Of the 254 people who responded, 38% of those surveyed knew what LEED certification was and 22% knew that the Trudy Fitness Center was scheduled for certification, which represents relatively low knowledge because all respondents had used the gym. The majority of those who knew about Trudy's expected LEED certification found out through word of mouth or to a lesser extent from the Colgate University website. Of those surveyed, most said they would prefer to receive sustainability information from the Colgate University website, followed by on-site placards and in-class exercises. It was found that energy efficiency and the indoor ambience, the most recognizable features of a green building, were most important to the respondents. Of professors surveyed, 7 out of 23 (about 30%) were interested in using the fitness center as a teaching tool in their classes. This number is significant in light of the fact that the Trudy Fitness Center is not applicable to some courses.

Based on the results from this study, we recommend that Colgate University (1) hosts a "certification day" celebration when the fitness center becomes LEED certified, (2) use the website as well as on-site education tools, such as placards, to increase awareness of the Colgate sustainability movement, and (3) facilitate conversation about including the Trudy Fitness Center in the formal curriculum.

[1] Sustainability is defined as "the ability to maximize current and future living, working and academic standards, while minimizing negative ecological, economic, and social impacts."

Table of Contents

Executive Summary **2**

Acronyms and Key Definitions **4**

Introduction **5**

Literature Review **5**

LEED and the value of green buildings 5
Communication in green buildings 7
Role of communication *7*
Importance of communication *9*
Sustainability on college campuses 10
Sustainability at Colgate 11
The Trudy Fitness Center 12

Methods **12**

Surveys 12
Interviews 13

Results **15**

Summary statistics 15
Trudy Fitness Center use and quality 15
General LEED knowledge 15
Importance of sustainable features 16
Communication preferences 17
Professor use of Trudy as a teaching tool 18
Interviews 18

Discussion **19**

Trudy Fitness Center use and quality 19
General LEED knowledge 19
Importance of sustainable features 20
Communication preferences 20
Professor use of Trudy as a teaching tool 21
Community members outside the scope of this study 21

Recommendations **22**

Certification-day event 22
Online content 23
On-site education tools 24
Professor use of Trudy as a teaching tool 25
Prospective students 25

Conclusion **25**

References **26**

Appendices A and B **29-34**

Acronyms and Key Definitions

AASHE- Association for the Advancement of Sustainability in Higher Education

ACUPCC- American Colleges and Universities Presidents' Climate Commitment

Green Building- "The practice of creating structures and using processes that are environmentally responsible and resource efficient throughout a building's life cycle from siting to design, construction, operation, maintenance, renovation, and deconstruction" (EPA, 2010).

LEED- Leadership in Energy and Environmental Design

Sustainability- the ability to maximize current and future living, working, and academic standards while minimizing negative ecological, economic, and social impacts.

Trudy, TFC- the Trudy Fitness Center

UNESCO- United Nations Educational, Scientific, and Cultural Organization

USGBC- United States Green Building Council

WBL, WBLFC- William Bryan Little Fitness Center

Introduction

Society is undergoing a rapidly progressing cultural shift where sustainability is becoming more prominent in our day-to-day consciousness. This creates the need for widely accepted standards by which individuals and organizations can better scrutinize efforts to become more sustainable. The Leadership in Energy and Environmental Design (LEED) certification system, created by the United States Green Building Council (USGBC), is the current standard in green building certification. A building earns points based on specific sustainable aspects of its construction, features and operations. The Trudy Fitness Center is expected to earn LEED certification within the next year. While Trudy has intrinsic value as a green building and may attract sustainability-minded students, communication and community involvement is an important part of the LEED certification process. It is in this context that this study began with the following 4 questions:

1. What has Colgate done so far to communicate the sustainable features of Trudy?
2. Were these methods effective?
3. Which of Trudy's sustainable attributes do the community value highest?
4. How do individuals prefer to get sustainability information?

In order to answer these questions, a survey was administered to the Colgate community and interviews were conducted with key stakeholders. Answers to these research questions will provide the basis for a series of recommendations to Colgate University's administration and sustainability about how Trudy's value can be maximized. The report will be organized as follows: (1) a literature review to set the context of the study and inform the recommendations, (2) methods in which the study was conducted, (3) results using the data collected, (4) a discussion of these results, (5) recommendations for Colgate University, and (6) concluding remarks.

Literature Review

LEED and the value of green buildings

LEED is a certification program created by the USGBC that establishes a framework for green building design and construction. Since its inception in 1998, LEED certified buildings have been constructed in approximately 40 countries. A flexible point system is one of the reasons why the program is so widespread. The point system allows builders to purse points in categories that they find relevant and achievable (USGBC, 2009). The rating system—composed of seven components—is used to evaluate potential LEED projects.

The point system is out of 100, with ten bonus points awarded for Innovation in Design and Regional Environmental Concerns. The five main categories include Sustainable Sites, Water

Efficiency, Energy and Atmosphere, Materials and Resources, and Indoor Environmental Quality.

In the "Sustainable Site" category, points are awarded for pollution prevention during construction, access to public transportation, using existing infrastructure, maximizing open spaces, and redeveloping old sites. The "Water Efficiency" category focuses on the reduction of water usage for potable water, wastewater treatment, storm water control, and minimization of buildings overall water consumption (USGBC, 2009). Given growing pressures to minimize the use of fossil fuels, the "Energy and Atmosphere" category is a major component in the LEED certification process. This category focuses around the full commissioning of the buildings energy systems, fundamental refrigerant management, and the use of renewable energy (USGBC, 2009). "Materials and Resources" category focuses less upon the building performance, and more upon the construction process. This category awards points for storage and collection of recyclables, materials used during construction such as certified wood, reusing existing materials, and promoting the use of local materials (USGBC, 2009). The next category, "Indoor Environmental Quality," centers on the building's ventilation system and ambient light/thermal uses. These functions are monitored for the building's entire life and are reported back to the USGBC annually. Finally, bonus points are awarded to two categories: Innovation in Design and Regional Environmental Concerns. The former focus on how innovative the project is, while the latter centers on improvements and the use of local products. USGBC shows that "based on existing and proven technology, [LEED] evaluate[s] environmental performance from a whole building perspective over a building's life cycle, providing a definitive standard for what constitutes a green building in design, construction, and operation" (USGBC, 2009, p. xi). Each aspect examines the complicated relationship between buildings and humans.

Because most definitions of sustainability are divided into 3 pillars, green buildings are often forgotten. Most sustainability definitions are divided, focusing on the economic, environmental, and social aspects. However, due to recent infrastructure advances, it is essential to create a sustainably built environment centered around green infrastructure. Cidell (2009b) presents a seminal study in this area and focuses on constructing a built environment with the following characteristics: green flexibly, documentation and planning, and social sustainability.

In LEED terms, flexibility is based on reducing the overall impact of the building, and not achieving an arbitrary target figure. Indeed, flexibility is one of the most important aspects of LEED certification. Individually, these credits aren't flexible, but as a whole, it comes down to the builder and operators to make decisions about which credits they pursue. "In fact,…it is impossible for any one building to earn all possible credits, underlying the flexibility of the system for many different kinds of buildings" (Cidell, 2009b, p. 626). This is directly relevant to the innovation in design category that award points for going above and beyond in design, and incorporating new technologies.

Detailed documentation and planning is key in LEED certification. All planning and future

operational aspects of the building are documented to promote the incorporation of green features in the construction process. Cole (2000) recommends that architects, designers, building owners, and construction workers all embrace the green concepts at the earliest point in the construction process. Because creating a green building is a process rather than a product, this promotes the cooperation between a diverse LEED team. The team may include: architects, landscapers, electricians, hydraulic workers, and of course, a LEED accredited professional. LEED construction projects are well documented from the start, which promotes the integrity of green features throughout the process.

Although social sustainability is relevant in LEED certification, for the most part it takes a backseat to economic and environmental sustainability. Krueger and Agyeman (2005) build on this point, proving that sustainability is a social process with results that emerge from social, institutional, and discursive practices. LEED certified buildings are proven to provide healthier and happier working environments, which promotes productivity and therefore maximizes social sustainability benefits. Green buildings are a response to recent global environmental changes and represent a community's commitment to positive global citizenship. When paired with LEED certification, these buildings elicit a profound emotional and physical response from their users. Drawing upon Cidell (2009b), Singh (2010) explores the profound effect that the indoor environmental quality of green buildings has on their users. Overall, workers had improved health, less depression, and increased well-being. These improvements lead to less sick days, and an increase in productivity.

Finally, it is important to remember that green buildings as a whole are greater than their components. Heerwagen (2005) finds that occupants are more connected to the entire building, rather than specific LEED elements. These connections can be seen through the sense of pride users of green buildings have, the values that are conveyed in the building, and a further connection to the natural environment. Green buildings create a sense of value that helps to promote a foundation for "the development of…positive, sustainable architecture" (Heerwagen, 2005, p. 25).

Communication in green buildings

Role of communication

Communication, for sustainability or any other field, must be approached strategically to ensure it is effective in conveying the creator's message. According to Day & Monroe (2000) this is done through four steps: (1) set a clear goal, (2) select the audience, (3) learn the audience's "media diet", and (4) write the message accordingly. This framework will be as a reference the creation of the communication methods in this study. UNESCO (1978) lays out five different goals for environmental education programs, which are (1) to acquire an awareness of environmental problems, (2) to gain a basic knowledge of these problems, (3) to acquire a set of attitudes towards environmental improvement, (4) to learn the skills necessary to solve these

problems, and (5) to encourage active participation in environmental solutions. However, these five objectives cover a large part of how sustainability can be communicated and should be reduced. Owens (2006) found that "simply informing individuals about the environment does not necessarily provide sufficient impetus for changing behavior" meaning that the first two points by UNESCO (1978) should not stand alone for effective environmental communication. Part of the value of communicating the LEED features of a building is instilling sustainable behavior in the user. Owens (2006) later points out that all sustainability communication should seek to increase awareness as well as influence attitudes.

According to Day & Monroe (2000) effective environmental communication is achieved through selecting the audience. Davis (1995) found that it is more effective for communication to target smaller, homogeneous groups rather than larger, heterogeneous ones. This will help to make the later decisions of the media vehicle for the message and how the message is framed much easier. A similar conclusion was reached by Lee (2008), who found that segregating the target audience by age can have a significant impact on the effectiveness of the message. Moving beyond segregation by age, Franz-Balsen & Heinrichs (2007) suggest segregation by gender can increase the effectiveness of environmental communication. Franz-Balsen & Heinrichs (2007) also highlight the importance of learning the audience's "media diet" by stating that "audience research is essential." They found that while online communication is very important (with over 90% of respondents saying so), in-person communication is still more important (96% of respondents). This is emphasized by what is known as the "human factor", an important component in "breaking down the barriers to foster communication". Additionally, they recommend the use of "all kinds of communication instruments" due to the fast-paced and highly globalized nature of today's world. Oskamp (2002) recommends using popular literature sources due to the ease of relating to those sources and the simpler form in which they normally occur. Also, he suggests providing online resources as well because these can provide more information for those who want it on their own time.

The final aspect of effective environmental communication, writing the message accordingly, has been heavily researched. Davis (1995) emphasizes the importance of targeting a message to a specific audience. Davis argues that targeting the message towards impacts on current generations instead of impacts on future generations. It is easier for one to relate with damage to him/herself rather than to damage to a generation or two in the future, likely having more persuasion for the person to act. Lee (2008) expands on this by stating that local environmental problems, such as water and air quality, are likely to be viewed as more serious due to the situation being more relatable for the person that the communication is targeted at. Davis (1995) concludes with a reprise of his optimal communication strategy: "…communications which present simple, clear, and understandable actions presented in a context which stresses how the target will be personally, negatively affected if they continue to be inactive participants in environmentally-responsible behaviors." In terms of the tone of the message, Lee (2008) found that messages that seek an emotional response are likely more effective on teenagers while

rational messages appeal more to adults. Finally, Franz-Balsen & Heinrichs (2007) emphasize the high importance of continuous visibility of sustainability efforts on campus. This can mean keeping messages and websites up to date as well as sending out updates using mass media. However, they also warn that too much sustainability-related communication is counterproductive, so an optimal number of updates must be found.

Importance of communication

Communicating the attributes of a green building is an important element of the green building process. According to the USGBC, "Greening a campus requires effective occupant education that includes clear and concise information about the attributes of the green campus and the occupants' role in ensuring that energy and conservation goals are met" (Humblet et al., 2010, p. 89). Not only does communication of the existence and benefits of green buildings raise awareness about sustainable issues and encourage individual sustainable practices, it also creates an opportunity for organizations to market and advertise a valuable aspect of their community. This element of the green building process is so important that it is going to be written into future LEED certification point systems (J. Moore[2], personal communication, October 28, 2011).

Colgate Vice President for Finance and Administration David Hale, who oversaw the construction and financing of the fitness center, described three benefits of building a green building: (1) the fiscal benefits of reduced operating costs, (2) the good public relations opportunity created, and (3) the symbolic value of doing something environmentally and globally responsible as a school (D. Hale, personal communication, October 21, 2011). While fiscal benefits of constructing green buildings are important, the other two benefits Hale describes cannot be realized without proper communication. Colgate Director of Public Relations and Marketing Barbara Brooks expressed similar sentiments about the importance of communicating the benefits of an environmentally responsible building like the Trudy Fitness Center:

> "As a point of pride for the community, and for alumni, it's important. I think it shows, also, that Colgate is taking energy efficiency, not just from a cost standpoint, but from a good planet citizen standpoint. I think there was a time when all of this green building LEED stuff started where people were a bit skeptical, and people would say who knows what that is, is it even worth it, but I think that we're beyond that. I think people realize that this is a real meaningful step…so there is real benefit in communicating this" (personal communication, October 21, 2011).

Constructing green buildings represents a commitment from the University in both financial and ideological terms. Building a LEED certified building specifically takes significant planning and human resources. In order to capitalize on this significant investment by the institution and take

[2] Jason Moore is the LEED Accredited Professional who advised Colgate University on the LEED certification of the Trudy Fitness Center.

full advantage of the opportunities provided by having a green building on campus, the existence and advantages of green buildings on campus must be adequately and effectively communicated.

Sustainability on college campuses

Creation of sustainability programs is a recent trend in diverse organizations worldwide. Whether it is in economic development or individual behavior, societies are recognizing that their actions impact the environment in different ways. One particular domain that has become a strong leader in sustainability is the world of academia (Emanuel, 2010). For many colleges, sustainability has evolved from a simple term to a way of life. Now more than ever, universities and colleges around the country are implementing sustainable initiatives to their campuses. Due to student demand and ability to establish comprehensive programs, colleges and universities are ideal settings for the development of sustainability (AASHE Digest, 2009; Yudelson, 2008).

While all campuses are sovereign entities they are also united as institutions of learning and progress (AASHE Review, 2010 & Sharp, 2002). As a result, many colleges are pursuing universal goals through specific means. One notable effort is the American Colleges and Universities Presidents Climate Commitment (ACUPCC), a countrywide effort that encourages campuses to lessen their impact on global climate change. Universities that wish to join the effort not only pledge to strive for climate neutrality but also enact an action plan for the entire campus in accordance with the policy. By providing a central goal that can be reached through different methods, colleges are given a vehicle for accountability and comparison that also encourages creativity and ingenuity (Emanuel, 2010). Since its inception, over 670 colleges and universities have signed the ACUPCC, of which 81.7% have committed to at least two campus-specific actions (ACUPCC Reporting System, 2011). The commitment lists several action categories, including efficient buildings and appliances, carbon offsets, recycling, investment in renewable resources, public transportation, and sustainable shareholder proposals (ACUPCC Reporting System, 2011 & Dougherty, 2010). Supplying different categories is advantageous because it allows institutions to advance sustainability using mechanisms that are most applicable to their campus culture, similar to the way LEED certification works. As a result of these initiatives and many more, sustainability programs in higher education continue to expand. The Sustainable Endowment Institute reports that between 2009 and 2011, college commitments to carbon reduction increased by 14%, emission inventories increased by 38%, and renewable energy purchases increased by 9%. (College Sustainability Report Card, 2011).

In support of a growing effort to combat the effects of climate change, many institutions are investing in energy-efficient green buildings. The USGBC's manager of Higher Education, Jaime Van Mourik underscores the important fiscal rationale behind this movement: "Higher education is leading in green...With the budgets drying up, we're starting to see energy retrofits and a focus on green building policies and procedures on campus" (AASHE, 2010). In addition to economic costs, buildings are responsible for 35% of global energy demand and produce half of global greenhouse gas emissions (Sharp, 2002). Due to their immense energy expenditures,

buildings are important factors to consider in sustainable programs. Investing in green buildings is expanding. In 2009, only a seventh of all campuses had a green roof and less than half had green building projects. Today, over half of all institutions have at least one LEED certified building. In order to support more sustainable ventures, universities are augmenting their endowments to various projects. From 2009 to 2011, colleges that have invested part of their endowments to renewable energy increased from 35% to almost 50%. Such investments include renewable energy funds and campus water/energy efficiency ventures (College Sustainability Report Card, 2011).

Advancing sustainability not only heightens campus efficiency, but also assists in attracting potential students. Studies from the Princeton Review show that over 60% of prospective students include "Commitment to Sustainability" when selecting a college (Princeton Review, 2008). Campus sustainability is now a common method for comparing different colleges. Not only does documenting a campus' sustainable achievements attract potential students, but also enhances public relations and expands environmental stewardship (Yudelson, 2008). Third party organizations like the Association for the Advancement of Sustainability in Higher Education (AASHE), the United States Green Building Council (USGBC), and The Institute of Sustainable Endowment's College Sustainability Report Card are examples of universal methods for comparison in the world of academia. According to Dougherty (2010), third parties will remain a continuous presence to promote an institution's accountability and commitment to the environment. With these organizations, colleges are able to showcase their achievements not only to other academic institutions, but the community and beyond (Yudelson, 2008).

Sustainability at Colgate

While sustainability has been an important issue at Colgate University for many years, the university formalized its commitment to sustainability by hiring its first Sustainability Coordinator, John Pumilio, in April 2009. This decision was made in response to a national desire for sustainability programs in universities as well as significant student interest in sustainability, as represented by the establishment of Colgate's Sustainability Fund, which was created and has been supported by the Class Gifts of the classes of 2008 and 2010. Under Pumilio's guidance, existing sustainability agendas including student groups such as The Green Thumbs, the Composting Club, the Green Summit, and the Green Bikes program have been strengthened. In addition, new initiatives like the Green office program and the "RecycleMania" program have been created. The result of all this hard work culminated in 2011 when Colgate was the recipient of Second Nature annual Climate Leadership Award.

President Jeffrey Herbst, who took office in 2010, re-invigorated the sustainability program by making it one of his top priorities—an effort that was emphasized by his endorsement of an aggressive Climate Action Plan calling for carbon neutrality by 2019. The Climate Action Plan was submitted to the American College and University Presidents' Climate Commitment (Pumilio, 2011).

One of the most important elements of Colgate's Climate Action Plan is the Energy and Buildings section. While Colgate already maintains low heating costs and emissions through the use of a biomass burning plant to heat its buildings, the plan capitalizes on this success by recommending that new construction and major renovations are built to sustainable construction standards when possible (Colgate University, 2011). Green building and construction could reduce the university's energy consumption and the carbon footprint of its construction projects significantly. In order to achieve its goals for sustainable construction, Colgate has used the widely recognized LEED certification program as a benchmark.

Trudy Fitness Center

The Trudy Fitness Center, Colgate's newest building, opened its doors on January 31, 2011. Construction lasted about one year, with a total cost of $7.8 million. The building replaces the William Bryan Little Fitness Center (WBLFC), which served as Colgate's main fitness center from 1994 to 2011. Spanning 15,000 square feet, the new building boasts an array of new cardiovascular and weight training equipment (Guenther 2011, Mayne 2011). In addition to these new and improved fitness features, the Trudy Fitness Center will also be the first building on Colgate's campus to receive LEED certification. The building is expected to receive LEED Silver certification, scoring a tentative 69 out of 110 points (see Appendix C).

Methods

Surveys

In order to understand user knowledge and perspectives on green buildings and LEED certification, an anonymous survey was administered to faculty, staff, students, and residents of Hamilton that use the gym (see Appendix A). Faculty and staff received a survey with an additional question which was meant to gauge interest in using the green features of the fitness center as a teaching tool (see Appendix B). A summary of the variables included in the survey can be found below in Table 1.

Surveys were emailed to students, faculty and staff in early October. Students were selected using a random number generator in excel which selected 20% of the student emails. The faculty/staff were selected by choosing every fifth person in the current faculty and staff directory. While this is not completely random (because the directory is in alphabetical order) it was done out of convenience because Colgate would not provide a list of emails. The survey was live for 2 weeks after initial emails were sent to recipients. Recipients also received a reminder email one week after the initial email. In total, 625 student surveys were administered with 176 responses and 195 faculty and staff surveys were administered with 56 responses, resulting in a 28% response rate. Surveys were administered by hand to Hamilton residents who use the gym but are not affiliated with Colgate. Hard copies of the survey were distributed to members by Fitness Center staff as they checked in, and 22 people elected to take the survey.

Table 1: Variables in the Survey

Variable	Description	Scale
TFC_like	How much individual likes TFC	5=most satisfied; 1=least satisfied
WBLFC_like	How much individual liked WBLFC	
TFC_use	How often individual uses TFC	1=least often; 6=most often
WBLFC_use	How often individual used WBLFC	
water	How important are various features of a green building	1=most important; 6=least important
teach		
energy		
materials		
space		
low_costs		
heard_LEED	Has individual heard of LEED	1=yes; 2=no
TFC_LEED	Did individual know that TFC is on track for LEED	
sust_educ	How important is sustainability education to individual	5=most important; 1=least important
gender	Individual's gender	-
group	Individual's group	
class	Individual's class year	
use_teach	Would use Trudy as a teaching tool	

Interviews

Understanding more than just Colgate community opinions and knowledge of LEED required interviews with key professionals both at and away from Colgate. Table 2 provides a list of all persons interviewed, their positions, and what information was gathered from the interview. Most interviews were conducted in person, but some necessitated email or over the phone communication due to distance restrictions. These interviews helped to inform the research questions and provide an extension to the survey.

Table 2: **Interviews conducted and topics covered**

Name	**Position**	**Topics discussed**
John Pumilio	Sustainability Coordinator	-Colgate's green building policy -Importance of LEED certification -Importance of communication
Emily Malugen	Admissions Office Intern, responsible for campus visits	-Discussion of Trudy on tours -The structure of how tours are created -Prospective student interest in green building.
David Hale	Vice President of the University for Finance and Administration	-The process of building a LEED certified building -The benefits of communicating green features -The cost of LEED certification
Barbara Brooks	Director of Public Relations and Marketing	-Communications at Colgate -Communication of issues related to sustainability -Timing and methods of communicating
Annemarie Heinrich	Sustainability Communications Intern	-Communication of issues related to sustainability -Communicating with social media and other methods -Student interest in the sustainability movement
Christina Amato	Director, Trudy Fitness Center	-Working in a LEED certified building -Green practices at Colgate
Mark Thompson	Director, Counseling Center and Wellness Initiative	-Green building and wellness -Fitness -Community building
Bob Pils	Director of Housekeeping and Maintenance	-Green building and wellness -LEED certification -Cleaning practices
Gary Nagle	Project Manager	-Changing past garbage discourses -Challenge of timescale -Green cleaning/watering systems
Paul Fick & Joe Bello	Director of Facilities & Director of New Construction	-Importance of Trudy -Importance of green buildings
Jason Moore	LEED Accredited Professional	-Importance of communication -Importance of LEED certification -Trudy's building process and accreditation

Results

Summary statistics

Table 3 shows summary statistics of the variables in the survey and Table 4 provides a summary of the demographics of the sample population. No significant differences were found for any variables when classified by gender or class year. However, many differences were found when classifying by group, which will be discussed in the appropriate subsections. Age was asked for only the Hamilton residents but not enough data was collected to perform a thorough statistical analysis.

Table 3: Summary statistics

Variable	**Mean *[SE]***
TFC_like	3.61 *[1.885]*
WBLFC_like	1.90 *[1.681]*
TFC_use	3.13 *[1.410]*
WBLFC_use	2.11 *[1.577]*
water	3.56 *[1.482]*
teach	4.88 *[1.482]*
energy	2.10 *[1.278]*
materials	3.79 *[1.407]*
space	2.78 *[1.650]*
low_costs	3.88 *[1.560]*
sust_educ	3.16 *[1.031]*
N	254
response rate	28.41%

Table 4: Demographics

	Groups			
Variable	*male*	*female*		
gender	91	151		
	faculty	*staff*	*student*	*resident*
group	25	28	177	22
	2012	*2013*	*2014*	*2015*
class	42	39	44	45

Trudy Fitness Center use and quality

Of all individuals surveyed, the average person likes the Trudy Fitness Center more than William Bryan Little (WBL) Fitness Center and uses Trudy more often. These results are both significant at the $p<0.001$ level, shown by the paired sample t-test in Table 5. Students had the largest mean difference between their quantity and quality of use at Trudy and WBL Fitness Center, with the faculty/staff mean difference being smaller. Interestingly, it was found that Hamilton residents like Trudy *less* than WBL Fitness Center, but this difference is small and not significant. No significant differences were found when comparing by class year or gender.

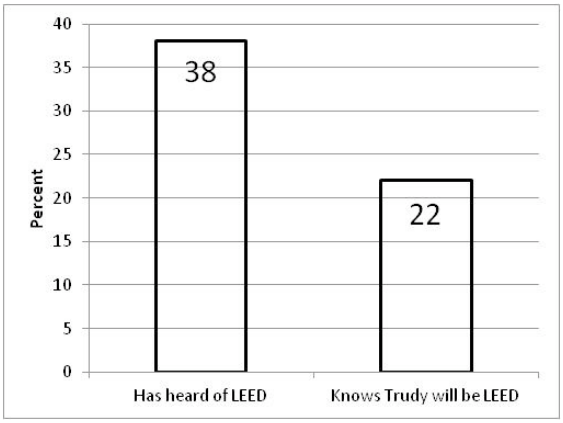
Table 5: Paired sample t-tests for entire sample population

Variables	Mean Difference	Std. Error	t
TFC_like and *WBLFC_like*	1.709	0.137	12.47
TFC_use and WBLFC_*use*	1.020	0.105	9.736

General LEED knowledge

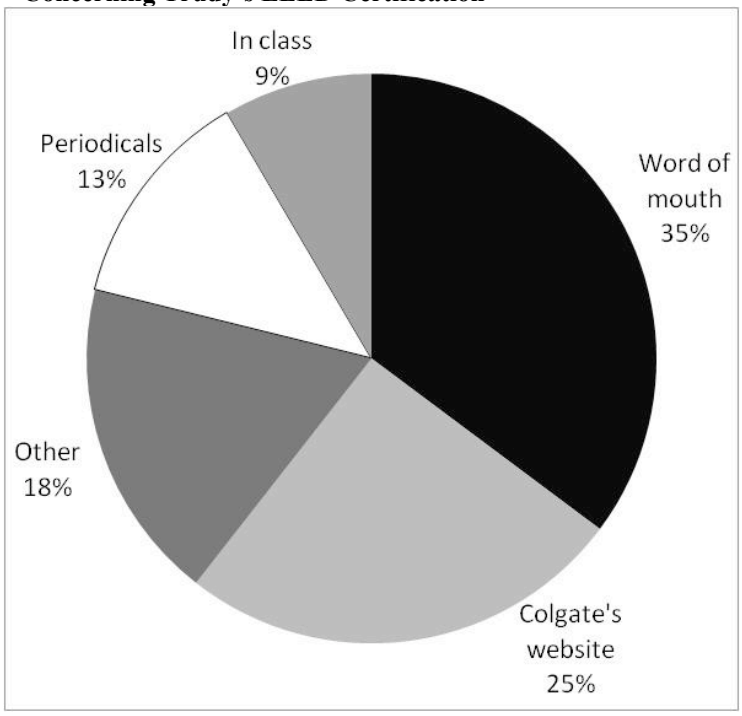
Participants were asked if they know what LEED certification is, and 38% responded with "yes". Participants were also asked if they know that the Trudy Fitness Center is expected to become LEED certified, and 22% responded with "yes" (Graph 1). Out of those who said they

Graph 1: Individuals' knowledge of LEED



did know that Trudy is expected to be LEED certified (22% of those surveyed), the sources of information varied, with the most (35%) stating "word of mouth" as their source and 25% stating Colgate's website (Graph 2). The largest amount of people heard about Trudy's expected LEED certification from another. Differences in knowledge between Hamilton residents, students, and faculty/staff were all significant. Hamilton residents were the least knowledgeable about LEED and faculty and staff were the most knowledgeable. No significant differences were found when comparing class year or gender.

Graph 2: Individuals' source of knowledge Concerning Trudy's LEED Certification



Importance of sustainable features

Individuals were asked to rank in order of importance six different features of sustainable buildings: water efficiency (*water*), ability to be used as a teaching tool (*teach*), energy efficiency (*energy*), recycled material use (*materials*), quality of indoor space (*space*), and cost savings (*low_costs*). Descriptive statistics for the variables can be found in Table 4, showing that the ranking of importance goes (from most to least): *energy, space, water, materials, low_costs, teach.* Paired sample t-tests between all of the variables were performed and resulted in the relative importance matrix (Table 6). This matrix shows the magnitude and significance of the differences between. As shown by the table, all but 3 differences are significant at the $p<0.01$ level. One of the pairs not significant at the $p<0.01$ level (*water* and *low_costs*) is significant at the $p<0.05$ level. The pairs *water*/*materials* and *materials*/*low_costs* are not statistically significant, meaning it cannot be said that individuals value these features differently. When this question was asked to Hamilton residents, many did not answer the question properly, so only 5 out of 22 residents are captured by these results.

Table 6: Relative importance of different sustainable features

		2					
	Variable	*water*	*teach*	*energy*	*materials*	*space*	*low_costs*
1	*water*	-	1.321**	-1.460**	0.228	-0.781**	0.321*
	teach		-	-2.781**	-1.093**	-2.101**	-1.000**
	energy			-	1.688**	0.679**	1.781**
	materials				-	-1.008**	0.093
	space					-	1.101**
	low_costs						-

Note: The values signify the mean difference between the variable in the left column (1) and the variables in the top row (2). Positive values signify that the column variable is more important than the row variable and vice versa.
* signifies $p<0.05$ and ** signifies $p<0.01$.

Communication preferences

Individuals were asked their preferences for receiving sustainability information on campus, with results presented in Table 7. The majority (55%) of individuals chose Colgate's website as a method they would prefer. Next, 19% of individuals preferred on-site placards and in class lectures. All three of these methods have different benefits and are outlined further in the "Discussion" section. The next five methods fall in relatively the same percentage range (7 to 12) and because of this, would not likely be the primary method for communication. 9% of individuals selected that they do not care about sustainability on campus. Students and Hamilton residents do not have significantly different responses, excluding in/out of class lectures. Faculty/staff preferred to receive information from the website significantly more than students and Hamilton residents do.

Table 7: Preferred communication method

Communication method	**Number**	**Percent**
Colgate's website	133	55
On-site placards	46	19
In class	45	19
Periodicals	30	12
Out of class lectures	25	10
Individual doesn't care about sustainability on campus	22	9
Social networking	21	9
On-site handouts	19	8
Video media	17	7
Other	2	1

*Note: The percentages do not add up to 100% or numbers add to the total number of respondents because each individual had the option to choose 2 methods. Additionally, percentages are rounded.

Professor use of Trudy as a teaching tool

In the survey to faculty and staff, teaching faculty were asked if they would be interested in using the Trudy Fitness Center as a teaching tool, such as incorporating it in lesson plans or taking students there. Out of 23 teaching faculty surveyed, 7 said they would be in favor of using Trudy as a teaching tool, representing about 30% of the respondents.

Interviews

Initially, interviews revealed that Colgate does not have an official policy about future construction and LEED certification. Nevertheless, facilities staff implied that LEED will be strongly considered whenever possible for future construction and renovation.

One important theme in literature that was emphasized in the interviews was behavioral change through access to LEED buildings. For example, Christina Amato, the Director of the Trudy Fitness Center, stated that she has noticed a change in her personal behaviors since working at the Fitness Center and in Colgate's sustainability-minded community. She now makes a more concerted effort to recycle and started riding her bike to work in the summer. She conveyed that she enjoys her experiences working in the Trudy Fitness Center and compared its pleasant indoor ambience to the ambience of the old fitness center. Despite Amato's positive experience, Gary Nagle implied that more behavioral change needs to occur. For example, even though recycling bins are provided at Trudy, users often do not separate their trash.

One benefit of communication that was revealed during the interviews involved Colgate's effect on aggregate energy in the town of Hamilton. Colgate's energy is sourced through woodchips and hydroelectric energy, with the town being allotted a certain amount of hydroelectric energy each month. After this quota is reached, the energy switches to a more expensive source. If Colgate can reduce its energy consumption through LEED certified buildings, there is the potential to lower energy bills for the Hamilton community, releasing some of the tension surrounding this issue.

Interviews uncovered many relevant points about communication at Colgate. First, Barbara Brooks explained that Colgate's communication department is primarily responsible for communication directed at alumni and prospective students. Communications about Trudy to the actual users of the building would not fall under the responsibilities of their department. Additionally, Sustainability Communications Intern Annemarie Heinrich revealed that prioritizing communication is difficult because the Colgate community is saturated with information. Reiterating Heinrich's point about over-communication of sustainability issues, LEED Accredited Professional Jason Moore cautioned that it is important not to "greenwash" a building by providing too much sustainability information.

An interview with Emily Malugen, the Admissions Intern in charge of the Tour Guide Program, explained that prospective student tours do not go through the Trudy Fitness Center

because of time restraints. While the tour guide handbook mentions that Trudy was built with sustainability in mind and students may ask for a specific tour of the Fitness Center if they are interested, most tour guides have limited knowledge of the building's green features and LEED in general.

Discussion

Trudy Fitness Center use and quality

As shown in the results, Colgate community members significantly use the Trudy Fitness Center more than the WBL Fitness Center and have a more positive experience. While it was not asked what features cause individuals to use and like Trudy more, we expect that some of this preference may be attributed to improved equipment in the new facility. This data does show that a new fitness center helps to encourage more use and a better experience by the user, but cannot differentiate the effect between a new fitness center and a new LEED certified fitness center. Nevertheless, spending time in a LEED certified building has a beneficial impact on its users. As Singh (2010) demonstrates, individuals who spend more time in certified buildings are happier, healthier, and more productive. In other words, time spent in a LEED building is positively correlated with mental and physical benefits. These sentiments were echoed by Christina Amato, the Director of the Trudy Fitness Center.

General LEED knowledge

Almost the entire sample surveyed said that they use the Trudy Fitness Center, making the percentage of people who know about Trudy's expected LEED certification seem low. Many interviewees acknowledged that Colgate is not communicating Trudy's LEED benefits yet because the certification is not official. Nevertheless, this still represents a lack of communication that necessitates an updated communication plan. However, caution should be taken because those surveyed reported a desire to learn about sustainability that is slightly above neutral. Thus the average Colgate community member is not very enthusiastic about sustainability education. Pushing sustainability education too much, as cautioned by Franz-Balsen & Heinrichs (2007), may not lead to increased awareness. This was echoed by Annemarie Heinrich when she stated that Colgate community members are exposed to a large amount of communication materials already. She further explained that students are uninterested in any information that adds to this accumulation of materials. Therefore, reluctance to learn about sustainability may not represent a lack of interest in sustainability, but a negative sentiment towards receiving more communication.

Our study found that class year and gender have no effect on differences in knowledge or preferences for communication material. Thus, there is no need for future communications to target a certain demographic, contrary to what was written about in some relatable literature.

Importance of sustainable features

The most important sustainable feature, according to the Colgate community, is energy efficiency. This is not surprising, given that energy efficiency and fiscal responsibility are some of the most recognized benefits of sustainable buildings. While water efficiency is traditionally coupled with energy efficiency, central New York does not have water security issues, so water efficiency may not be a priority for users. In this analysis, cost savings ranked 5th. It is possible that part of the importance of cost reduction from energy and water savings is captured by those variables. Another feature of LEED buildings that users easily notice is the high quality of the indoor atmosphere. Thus, it is expected for a user to value this highly. The inclusion of the teaching tool variable with the other may not fully capture how people value a LEED certified building as a teaching tool. This is because learning about sustainable features is only possible if the other five features are included in the building design. Thus, the estimate for the value of using the building as a teaching tool may be lower than what this analysis suggests.

Communication preferences

A large majority of those who responded to the survey said they preferred to get their sustainability information via the Colgate web-page. This is not surprising because the Colgate web-page is most accessible to a wide range of viewers including students, faculty, staff, prospective students and alumni.

Respondents also selected on-site placards as a preferred communication source. On-site placards also have the benefit of being a non-optional form of communication. Because we found that students are saturated with information, this may be a way to educate the public without overwhelming them. On-site placards also have the advantage of connecting the information conveyed to the space itself. A disadvantage of this method is that it leaves out prospective students and non-users of the gym who can still benefit from learning about Trudy's sustainable features.

Participants in the survey also indicated that they would prefer to receive sustainability information in class. While learning about the Trudy Fitness Center in class helps to increase knowledge by conveying a wealth of information and allows students to ask questions, it is only helpful for students taking a class in which sustainability is relevant. Additionally, this leaves out staff and residents because they are not taking classes.

Social networking, on-site handouts, and video media were communication mediums that few respondents identified as effective. Social networking, as indicated by Sustainability Communications Intern Annemarie Heinrich, is one of Colgate's over-saturated and over used communication methods and thus may be ineffective. Respondents may have indicated low interest in on-site handouts because a gym is an inconvenient facility to receive tangible communication. Additionally the use of on-site hand outs may waste paper and conflict with the building's sustainable message. Finally, the importance of video media may have been captured

in respondent's preference for web-based communication, which usually includes some form of video media.

In conclusion, in order to improve communication of LEED certification, it is important that the message is relevant and up to date (Davis 1995). As discussed in the recommendations, the Trudy Fitness Center can be better communicated through the Colgate website, on-site educational tools, and through the creation of placards.

Professor use of Trudy as a teaching tool

Students selected "in class" as one of their top two preferred methods for education about sustainability. Complementing this data, 30% of faculty respondents said that they would be interested in using Trudy as a teaching tool. While this number may seem low, learning about the Trudy Fitness Center does not apply to all departments or majors at Colgate, even though the survey was sent to individuals across the university. This suggests that the inclusion of the fitness center in the formal curriculum could be beneficial for both faculty and students.

Community members outside the scope of the survey

The interviews helped to determine that alumni, prospective students, and Hamilton residents that do not use Trudy are an important target audience for Trudy Fitness Center communications, despite our inability to survey them. Both John Pumilio and Dave Hale indicated that communication to alumni is important for recognizing the building as a point of pride for the school. Because alumni donations are an integral part of funding any construction budget, their support for LEED certified projects is thus important.

As demonstrated by Dougherty (2010), prospective students consider sustainability an important factor when selecting a college. In an interview with Barbara Brooks, Brooks indicated the significance of sustainability to prospective students.

> "We think that [sustainability] matter to undergraduate applicants. And when we look at other people's viewbooks and see what our peer schools are telling prospective students we can see that they think it also matter. Because it's always a big piece of the message about a schools identity" (personal communication, October 21, 2011).

Therefore, communications targeted at prospective students should be conducted with sustainability and LEED certification in mind.

Our interviews indicate that Colgate's energy consumption has a significant effect on energy costs in the town of Hamilton. This issue has caused strain between the university and town residents. In light of this conflict, any communication to Hamilton residents indicating energy reductions on the part of the university would reflect positively on town university relations.

Recommendations

Initial research on communication of sustainability and green buildings indicates that the value of green buildings is increased when there is a high level of community knowledge about a green building's sustainable attributes. Furthermore, the decision to pursue LEED certification on the Trudy Fitness Center represents a financial and symbolic investment by the university. Increased communication would help to maximize the value of the building by capitalizing on the full value of this investment and support the building's potential to serve as a beacon or symbol for Colgate's extensive sustainability programming (J. Pumilio, personal communication, October 5, 2011). Our data reveal that the level of knowledge about Trudy's sustainable features and LEED certification is low. In light of these findings, we recommend the preparation and implementation of a strategic plan for communications about the Trudy Fitness Center. Table 8 outlines the recommendations present in this section.

Table 8: Recommendations

Recommendation	Comments	Rationale	Time frame
Certification day event	-Kicks off LEED communication -Speeches from key stakeholders	-Spread LEED knowledge and celebrate achievement	Day of official certification
Online content	-Interactive tools - accessible to multiple audiences	-Preferred method of communication as indicated by survey	Short term
On-site education tools	-Placards placed around Trudy -QR codes to engage online content	-Second most preferred method of communication -"Non-optional" type of communication	Post-certification
Engage formal curriculum	-Open forum to discuss possibility of inclusion in formal curriculum	-In line with academic mission of school -Significant student and faculty interest	Long term
Prospective student material	-Inclusion in viewbook -Tour guide education -Optional tours	-Uses green building as a marketing tool	Long term

Certification day event

As previously mentioned, one likely reason the Trudy Fitness Center's green features have not been significantly communicated as yet is because the building has not actually been certified. Because the university is reasonably sure that the building will achieve certification, the day or time period in which the building gets certified represents an opportunity for the school to kick off communications that involve the building's green features. Based on the success of the event that opened the Fitness Center originally and other green events on campus,

we recommend that the school celebrate the achievement of LEED certification with an on-site event (Brooks, personal communication, October 21, 2011).

An event of this scope would need to be coordinated by a combination of the Offices of Sustainability and Communications to ensure high attendance and smooth execution. The event would include statements from President Herbst, John Pumilio, and other key stakeholders that were involved in the LEED process. The video that was produced in association with our project could be shown, and key stakeholders could give sustainability-minded tours of the building. We believe an event of this nature is the ideal way to celebrate the magnitude of this accomplishment.

Online content

Because the Colgate website is the place where most of our survey respondents prefer to get their information on sustainability, we recommend that Colgate include information on Trudy's LEED certification on the website. The website is an ideal location for the highest volume of information about the building because users would be able to view the amount of information relevant for them. Placing sustainability information on the website is also advantageous because it makes information available to a wide audience, including users of the fitness center, non-users, alumni, prospective students, and those outside the direct Colgate community. We recommend that this content be available through the Sustainability section of Colgate's website as well and advertised on the "recent news" section of the school's home page.

We believe that the most effective form of online content for the Trudy Fitness Center would be an entire page on the website devoted to the building. The web page should have an interactive visual tool that would allow viewers to connect sustainable qualities with physical places on the building. There should be visual media, including the video that was created for this class. Because many of our survey respondents were concerned with the energy efficiency of the building, we recommend a section on the page that updates Trudy's water and energy savings, on a monthly basis, specifically focusing on when the water and energy-efficient features of the building will pay for themselves.

Other schools with LEED buildings have done an effective job of creating websites for them that Colgate could use as a model. One example of this is Middlebury College's Franklin Environmental Center. This center has a "Building Dashboard" designed by Lucid Design Group, that tracks real time energy and water use, shows its sustainable features, and how the building works ("Franklin Environmental Center Building Dashboard", n.d.). St. Lawrence University has a webpage dedicated to their LEED Gold certified science building named Johnson Hall of Science. The webpage features an interactive tour and several links to resources about green buildings and LEED certification ("The Science Project", n.d.). Both of these can serve as good templates for Colgate to base a webpage on.

On-site education tools

On-site education tools are the most effective means of giving information directly to users of the fitness center, who are an important target audience. While Trudy will receive a placard when it becomes LEED certified, we recommend that the communications department collaborate with physical plant staff to create visually appealing on-site placards and signage that advertise the sustainable features of the building (J. Pumilio, personal communication, October 5, 2011; B. Brooks, personal communication, October 21, 2011). In a conversation with Barbara Brooks, she used a current example of an effective on-site education tool:

> "I think the most effective reminder in the building, and it's my favorite thing... that thing where you put your water bottle and the water runs... That, to me, is *the one place* every person stops and should be aware of how green-minded the building is" (personal communication, October 21, 2011).

We recommend on-site placards be equipped with quick response (QR) codes. QR codes will allow users to receive more detailed information about their specific interests and create a connection between the placard and the sustainability website. The following are examples of potential placard text:

- Did you know? The Trudy Fitness Center saves energy through daylight harvesting. Large windows let in sunlight so our artificial lights use less energy during the day. *Posted on walls behind treadmills on the cardiovascular floor.
- Did you know? Trudy's advanced air ventilation system continuously circulates air to provide a comfortable indoor environment. *Posted on the walls of the weight floor
- Did you know? The Trudy Fitness Center is 20% more energy efficient than an average building of its size. The energy saved in one year could power "x"[3] number of homes. *Posted on walls of weight floor.
- Did you know? The Trudy Fitness Center is 30% more water efficient than an average building of its size. This sink saves "x" amount of water per day. *Posted on mirror next to low-flow sinks in the bathroom.
- Did you know? Trudy uses xeriscaping, a special landscaping technique which requires no watering system. *Posted in the front lobby
- Did you know? 20% of the materials used to build the Trudy Fitness Center were purchased within 500 miles of Colgate. *Posted on the wall behind the treadmills on the cardiovascular floor.

[3] The information necessary to calculate "x" will be available once the building's energy and water use data is returned.

Our group further recommends the use of on-site placards because they are a form of communication that does not need to be sought out by the consumer. Colgate's diverse and active community is engaged in a large amount of communication. While this makes our community stronger, it can create an information overload that makes people unresponsive to traditional forms of communication like the website or Colgate's printed material (A. Heinrich, personal communication, October 24, 2011). The use of on-site placards would solve this problem by promoting materials about Trudy in an area where communication materials are uncommon; on-site.

Use of the building as a teaching tool

The results of our study indicate that there is general interest on the part of faculty and students in using the building as a teaching tool and incorporating green building education into classes. Because specific content of teaching material is beyond the scope of our study, we recommend that Colgate facilitate discussion with students and faculty to explore the option of including Trudy in the formal curriculum.

Prospective students

The results of our research indicate that prospective students are an important audience for communication materials. We recommend that Colgate include a section about Sustainability and the LEED Certification of Trudy Fitness Center in the viewbook for 2012. This section should speak specifically about Colgate's commitment to sustainability and feature several pictures of the building. Currently, tour guides do not tour Trudy due to time restraints. Therefore, we recommend that tour guides receive a brief education from John Pumilio about LEED certification and the Trudy Fitness Center so that guides have the ability to take interested students on sustainability-minded tours of the building

Conclusion

Effective communication methods will allow Colgate University to become a benchmark for other institutions that are striving to become sustainable, as well as a global leader. The construction of the Trudy Fitness Center will prove to be a commitment that Colgate will celebrate and will not only allow for the growth of the university, but the growth of a greater community of Colgate students, faculty and alumni. Because of their prominence in the world of academia and beyond, universities are capable of educating and communicating the advantages of sustainable buildings. Unfortunately, many have yet to assume this responsibility. Thus, a thorough plan for communication allows LEED certified buildings to achieve their full potential.

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Appendix A: Trudy Fitness Center Survey

Trudy Fitness Center Survey

For our Community Based Perspectives on Environmental Issues class, we are conducting a survey of individuals' knowledge of sustainable building and their preferences. As a user of Trudy Fitness Center, we feel this information is relevant to you and your experience as a patron of this fitness center. It has 11 questions and should take about 5 minutes. We appreciate you taking the time to help us by taking this survey.

1. How often do you use Trudy Fitness Center? (Please circle one)

Once per day *4 to 5 times per week* *2 to 3 times per week*

Once per week *Twice per month* *Once per month* *Never*

2. Please rate your overall experience at Trudy Fitness Center. (Please circle one)

Very Poor *Poor* *Average* *Above Average* *Excellent*

3. How often did you use the William Bryan Little Fitness Center (the one before Trudy)? (Please circle one)

Once per day *3 to 4 times per week* *Once per week*

Twice per month *Once per month* *Never*

Not Applicable (new to Colgate/Hamilton)

4. How would you rate your overall experience at William Bryan Little Fitness Center? (Please circle one)

Very poor *Poor* *Average* *Above Average* *Excellent*

` *Not Applicable (new to Colgate/Hamilton)*

5. This question refers to aspects of a sustainable building. Please rank the following aspects on a scale from 1 to 6, with 1 being the most important and 6 being the least important aspect to incorporate in the construction and life of a new building. Please choose each number only once.

___ Ability to use the building as a teaching tool (e.g., educating users about a sustainable lifestyle).

___ Energy efficiency

___ Quality of indoor space (e.g. natural lighting, new ventilation system, indoor air quality)

___ Lower operational costs offsetting higher construction costs

___ Use of local and recyclable materials in the construction process

___ Water efficiency

___ I am not familiar with the sustainable features above

6. Have you heard of LEED certification? (Please circle one)

Yes *No*

7. Do you know that Trudy Fitness Center is on track to become LEED certified? (Please circle one)

Yes *No*

7.a. If yes, through what source did you get this information? (Please circle one)

Maroon News *The Scene* *Colgate's Website* *Word of Mouth*

*Other (please specify)*_____

8. Do you agree with the following statement? (Please circle one)

Learning about the sustainable aspects of the Trudy Fitness Center is important to me.

Strongly Disagree *Disagree* *Neutral* *Agree* *Strongly Agree*

9. How do you prefer to get sustainability information on campus? (Please circle two)

Periodicals *Colgate's website* *On site placards* *On site handouts*

Social networking sites *In class* *Video Media* *Other* _____

I don't care about sustainability on campus

10. In what capacity do you serve Colgate University? **FACULTY/STAFF ONLY**

__Staff Member

_____ (Please indicate department)

__Faculty Member

_____ (Please indicate department)

11. If you are a Faculty Member, would you be interested in using Trudy Fitness Center as a teaching tool? **FACULTY/STAFF ONLY**

No, I would not be interested in using Trudy as a teaching tool.

Yes, it is helpful to mention the building's sustainable qualities in class.

Yes, I would like to include Trudy in a lesson plan.

Yes, I would like to take students to the building to learn about its sustainable features..

*Other (please explain)*_____

10 . What is your age? **HAMILTON RESIDENTS ONLY**

_____

10. What is your class year? **STUDENTS ONLY**

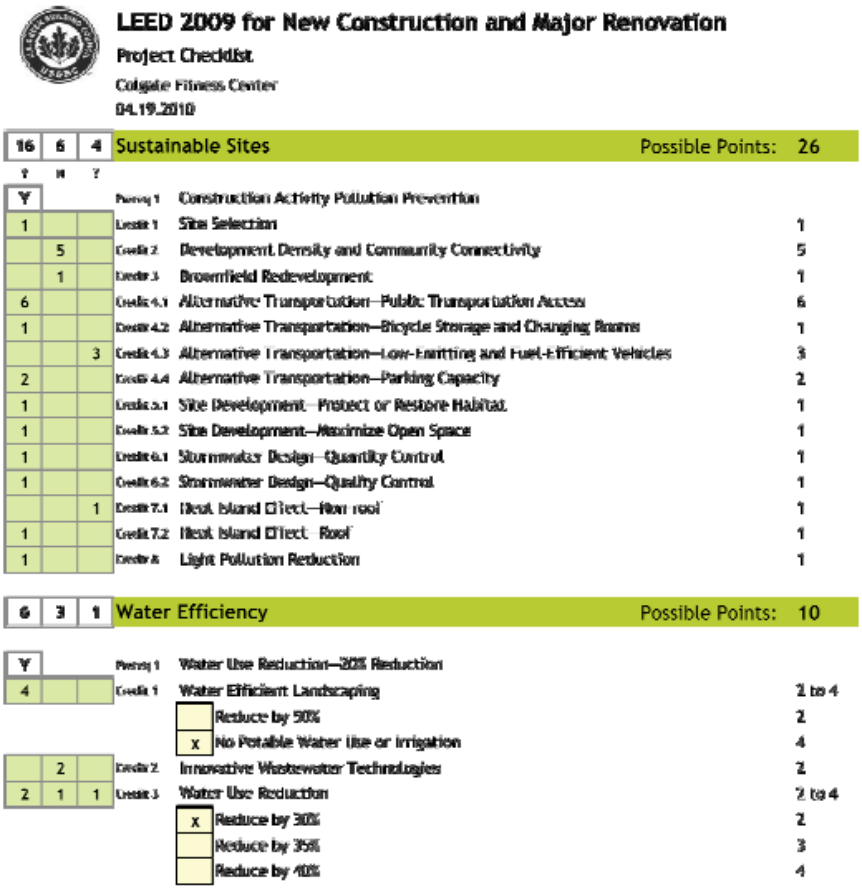
2012 2013 2014 2015

12. What is your sex?

F M

Thank you very much for taking the time to do our survey.

Appendix B: Trudy Fitness Center LEED Credits



LEED 2009 for New Construction and Major Renovation

Project Checklist

Colgate Fitness Center

04.19.2010

Y	?	N			
16	6	4	Sustainable Sites	Possible Points:	26
Y			Prereq 1	Construction Activity Pollution Prevention	
1			Credit 1	Site Selection	1
	5		Credit 2	Development Density and Community Connectivity	5
	1		Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
		3	Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation—Parking Capacity	2
1			Credit 5.1	Site Development—Protect or Restore Habitat	1
1			Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
1			Credit 6.2	Stormwater Design—Quality Control	1
		1	Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
1			Credit 8	Light Pollution Reduction	1
6	3	1	Water Efficiency	Possible Points:	10
Y			Prereq 1	Water Use Reduction—20% Reduction	
4			Credit 1	Water Efficient Landscaping	2 to 4
				Reduce by 50%	2
			x	No Potable Water Use or Irrigation	4
	2		Credit 2	Innovative Wastewater Technologies	2
2	1	1	Credit 3	Water Use Reduction	2 to 4
			x	Reduce by 30%	2
				Reduce by 35%	3
				Reduce by 40%	4

17	2	2	**Energy and Atmosphere**	**Possible Points:**	**35**
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
5			Credit 1	Optimize Energy Performance	1 to 19
				Improve by 12% for New Buildings or 8% for Existing Building Renovations	1
				Improve by 14% for New Buildings or 10% for Existing Building Renovations	2
				Improve by 16% for New Buildings or 12% for Existing Building Renovations	3
				Improve by 18% for New Buildings or 14% for Existing Building Renovations	4
				X Improve by 20% for New Buildings or 16% for Existing Building Renovations	5
				Improve by 22% for New Buildings or 18% for Existing Building Renovations	6
				Improve by 24% for New Buildings or 20% for Existing Building Renovations	7
				Improve by 26% for New Buildings or 22% for Existing Building Renovations	8
				Improve by 28% for New Buildings or 24% for Existing Building Renovations	9
				Improve by 30% for New Buildings or 26% for Existing Building Renovations	10
				Improve by 32% for New Buildings or 28% for Existing Building Renovations	11
				Improve by 34% for New Buildings or 30% for Existing Building Renovations	12
				Improve by 36% for New Buildings or 32% for Existing Building Renovations	13
				Improve by 38% for New Buildings or 34% for Existing Building Renovations	14
				Improve by 40% for New Buildings or 36% for Existing Building Renovations	15
				Improve by 42% for New Buildings or 38% for Existing Building Renovations	16
				Improve by 44% for New Buildings or 40% for Existing Building Renovations	17
				Improve by 46% for New Buildings or 42% for Existing Building Renovations	18
				Improve by 48% for New Buildings or 44% for Existing Building Renovations	19
7			Credit 2	On-Site Renewable Energy	1 to 7
				1% Renewable Energy	1
				3% Renewable Energy	2
				5% Renewable Energy	3
				7% Renewable Energy	4
				9% Renewable Energy	5
				11% Renewable Energy	6
				7 13% Renewable Energy	7
2			Credit 3	Enhanced Commissioning	2
		2	Credit 4	Enhanced Refrigerant Management	2
3			Credit 5	Measurement and Verification	3
	2		Credit 6	Green Power	2

4	9	1	**Materials and Resources**	**Possible Points:**	**14**
Y			Prereq 1	Storage and Collection of Recyclables	
	3		Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
				Reuse 55%	1
				Reuse 75%	2
				Reuse 95%	3
	1		Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
				50% Recycled or Salvaged	1
				75% Recycled or Salvaged	2
	2		Credit 3	Materials Reuse	1 to 2
				Reuse 5%	1
				Reuse 10%	2
	1	1	Credit 4	Recycled Content	1 to 2
				10% of Content	1
				20% of Content	2
2			Credit 5	Regional Materials	1 to 2
				10% of Materials	1
				20% of Materials	2
	1		Credit 6	Rapidly Renewable Materials	1
	1		Credit 7	Certified Wood	1

13	1	1	**Indoor Environmental Quality**	**Possible Points:**	**15**
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
1			Credit 1	Outdoor Air Delivery Monitoring	1
1			Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
1			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
		1	Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
1			Credit 6.2	Controllability of Systems—Thermal Comfort	1
1			Credit 7.1	Thermal Comfort—Design	1
1			Credit 7.2	Thermal Comfort—Verification	1
1			Credit 8.1	Daylight and Views—Daylight	1
	1		Credit 8.2	Daylight and Views—Views	1
1	0	2	**Innovation and Design Process**	**Possible Points:**	**6**
		1	Credit 1.1	Innovation in Design: Specific Title	1
		1	Credit 1.2	Innovation in Design: Specific Title	1
			Credit 1.3	Innovation in Design: Specific Title	1
			Credit 1.4	Innovation in Design: Specific Title	1
			Credit 1.5	Innovation in Design: Specific Title	1
1			Credit 2	LEED Accredited Professional	1
2	0	2	**Regional Priority Credits**	**Possible Points:**	**4**
1			Credit 1.1	Regional Priority: Specific Credit SSc5	1
1			Credit 1.2	Regional Priority: Specific Credit SSc6.2	1
		1	Credit 1.3	Regional Priority: Specific Credit WEc3	1
		1	Credit 1.4	Regional Priority: Specific Credit EAc1	1
59	21	13	**Total**	**Possible Points:**	**110**