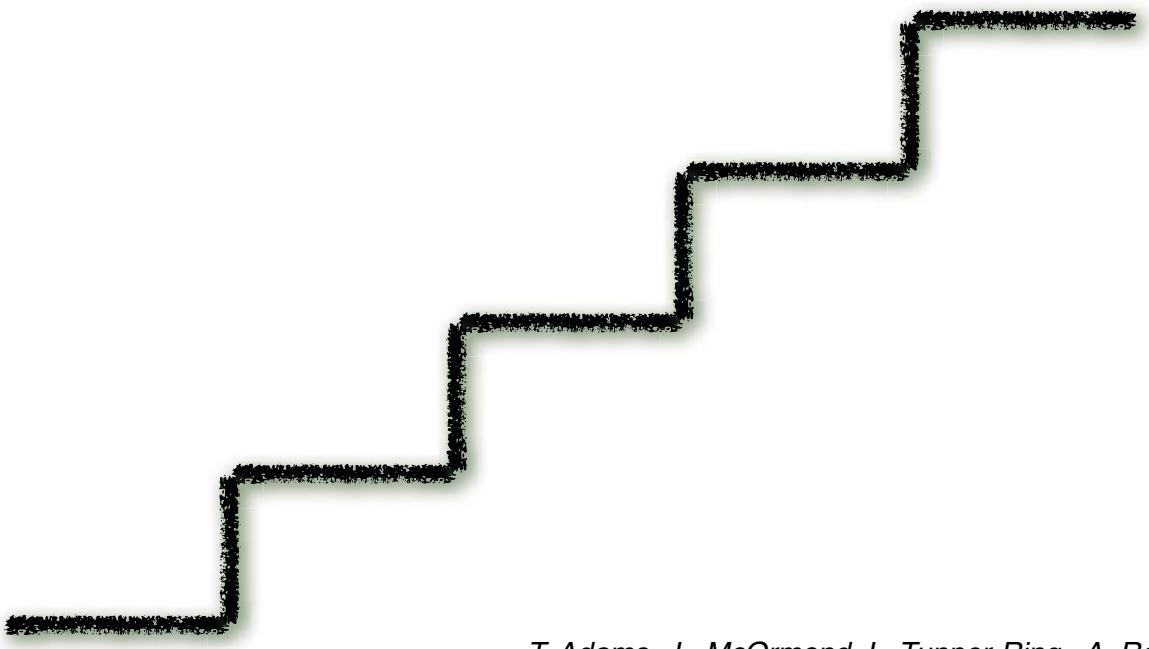
# Recommendations for promoting stair use in the Dalhousie Tupper Building



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# Executive Summary

There is an increase in the proportion of people engaged in sedentary careers, which promotes a more inactive lifestyle. Promoting physical activity across Dalhousie campus is a major part of the *Healthy Dalhousie's* program initiative. One of the suggested modes to increase physical activity of staff and faculty at the workplace is to promote stair use. Our research indicated that there are several health benefits associated with taking the stairs. Ascending the stairs improved cardiovascular fitness, reduced cholesterol levels, decreased body fat, and increased the strength of the lower limbs. These results support the idea of promoting stair climbing to help increase the physical activity of staff, which will lead to an overall increase in their health and well- being.

This study chose to focus on one building of particular interest regarding stair use: the Tupper Building. Located on Carleton street, it is the tallest building on campus, standing 18 stories tall and housing the most staff and faculty. Promoting the use of stairs rather than the elevators in the Tupper Building is an interest for *Healthy Dalhousie's* Program. The purpose of this study was to identify physical, social, environmental, and behavioural barriers to stair use in the Tupper Building so that active wellness programs can be created to address the barriers and increase stair usage.

The results of the survey confirmed that most people do not take the stairs at work. Over half of the respondents either take the stairs once a week or never, while at work. Upon comparison of individual body mass index (BMI) to their usual mode of transportation a positive correlation between elevator use and increasing BMI was observed. These findings indicate that there is potential to increase the health of the faculty and staff at Dalhousie through increasing their use of stairs at work.

Our recommendations for future buildings include: art in stairwells, improved ventilation, improved cleanliness, and alternative door closing mechanisms. Placing art in the stairwells would create a more interesting, engaging, and welcoming atmosphere and could be a feasible option to implement not only in future buildings, but buildings that already exist. This result is supported by previous studies, which have found that increased stair use can be obtained with improved aesthetics.

# Background

Dalhousie University is a very important sector of the Halifax Community. It not only educates thousands of students per year, but it also provides many job opportunities for the local economy. It employs 5,700 faculty members, administrative staff, and custodial staff, all of whom help to create and enhance the learning environment for the students at Dalhousie University (Dalhousie HR, 2012). The large geographical area of Dalhousie on the Halifax Peninsula creates many different working atmospheres for the staff. Buildings range from homes on Le Merchant Street, to large science buildings like the Dunn and Life Science Centre (LSC) on Coburg Street and Oxford Street respectively, to high rise buildings like the Tupper Building on Carleton Street. Each of these working atmospheres has unique elements, which influence the mental, physical, and social well-being of the staff.

Over the past century, larger themes have had impacts on the workforce. New economic and industrial innovations have reduced the need for primary workers in many industries by increasing automation and labour-saving devices in many production industries (A Recommendation to Improve Employee Weight Status, 2009). Additionally, there is an increase in the proportion of people engaged in sedentary industries, which promotes a more inactive lifestyle. This creates a burden on multiple health care systems (A Recommendation to Improve Employee Weight Status, 2009). To combat the more sedentary workforce many institutions such as Dalhousie have implemented wellness programs to promote well-being of faculty and staff. Dalhousie University's program, *Healthy Dalhousie*, offers advice on many health aspects of the staff, such as nutrition, physical activity, mental health, and healthy workplace atmospheres (Healthy Dalhousie, 2012).

**"increase in the proportion of people engaged in sedentary industries, which promotes a more inactive lifestyle"**

Figure 1: Our Client Janice McInnis walking up the stairs.

Our Client Janice McInnis, figure 1, heads up the *Healthy Dalhousie* Program at Dalhousie. Promoting physical activity across the Dalhousie campus is a major part of *Healthy Dalhousie's* initiative (Healthy Dalhousie, 2012). One of the suggested modes to increase physical activity of staff at the workplace is by


Figure two: Tupper Building Dalhousie Campus.

promoting stair use. One building of particular interest concerning stair use at Dalhousie is the Tupper Building, figure 2, located on Carleton street, which houses a large number of medical departments. The building is the tallest on Campus, standing 18 stories high and it has the most staff and faculty. Promoting the use of stairs rather than the elevators in the Tupper Building is a goal for Healthy Dalhousie.

## Literature Review

A study performed by Kong Chuan The and Abdul Rashid Aziz found there were many health benefits to climbing the stairs (2002). Ascending the stairs improved cardiovascular fitness, reduced cholesterol levels, decreased body fat, and increased the strength of the lower limbs. Their study also suggested there were public benefits of taking the stairs rather than using a gym because of convenience, privacy, no specialized equipment required, and low cost to the users. Overall their study indicated that

stair climbing meets the minimum requirements for cardiorespiratory benefits and can therefore be considered a viable form of exercise for most people (The & Aziz, 2002). These results support the idea of promoting stair climbing to help increase the physical activity of staff, which will lead to an overall increase in their health and wellbeing.

Several studies have looked at how to promote stair use in buildings. Eves and his colleagues (2012), studied the idea of promoting stair use by likening the behaviour to climbing a mountain. Instead of reaching for a health goal, the staff were encouraged to climb the height of specific mountains by taking the stairs and self-recording their progress. Each set of stairs they climbed added to their total elevation, which steadily increased over the time period to be as high as the chosen mountain. The results of their study indicated the staff liked the idea of climbing a mountain, but overall it failed to drastically improve their usage of stairs. It was recommended that explicitly communicating the health benefits of stair climbing may be more self-sustaining and more effective than just the challenge of climbing a mountain.

Other studies promoting stair use have looked at the effective usage of visual signs. Lewis and Eves (2012) found that using visual signs as point of choice (elevators or stairs) in combination with a message at the top of the stairs increased the use of stair climbing at a local train station. Another study by Boutelle and Colleagues (2001), found that only the addition of artwork and music increased stair usage, not signs. Kerr and colleagues (2004) similarly found that music improved stair usage, as well as improved aesthetics of the stair well. In a four story building studied by Titze and colleagues (2001) stair usage increased when incentives like apples or other fruit were given to stair users or when the elevators were symbolically closed for one day of the week. These studies all reveal one or more ways to improve the usage of stairs in buildings, which could be applied to the Tupper Building at Dalhousie.

In order to promote stair use, it is important to also identify barriers that cause people to not use the stairs. By identifying the barriers, active wellness programs can be created to address the barriers in order to increase stair usage. Orlander and Eves (2011) identify some of the barriers associated with taking the elevator over the stairs. Studies show that the time of day and the level of pedestrian traffic plays an important role in behaviour. The location of the stairs compared to the elevator such as distance from the front door, type of door, and speed of the door to get to the stair wells. Orlander and Eves (2011) also identify social implications that can influence choosing the elevator over the stairs such as, large groups, groups traveling with a disabled person, and the social interaction

experienced while being in an elevator. All of these factors are involved in the decision making process of choosing the elevator over the stairs.

## Objectives

**Identify:**
- ☑ **individual barrier to taking the stairs**
- ☑ **external environmental factors influencing the behaviours**

- ☑ **Provide recommendations to promote stair use**

This investigation seeks to determine individual behavioural factors that affect stair use at work and what external environmental factors could influence these behavioural patterns. The ability of the environment to influence health enhancing physical activity is supported by Foster & Hillsdon's (2004) paper, 'Changing the environment to promote health-enhancing physical activity.' They conclude that, before developing environmental interventions, further objective measures should be used to study the nature of the relationship of the environment to health enhancing physical activity. This study attempts to fill this research gap in order to identify environmental interventions that could be implemented to increase stair use by the staff and faculty of Dalhousie.

The purpose of this study is to determine physical, social, environmental, and behavioural barriers to stair use in the Tupper Building on Dalhousie University Campus. The study also aims to measure patterns of stair use in order to determine who uses the stairs as well as what number of levels people will travel before opting to use the elevator. This information can be used to implement effective and appropriate strategies to reach the goal of increasing stair use in the Tupper Building. By developing a comprehensive survey (See Appendix A) about stair use within the Tupper Building we were able to interpret the results to determine what strategies would be most effective in promoting stair use. The survey contained both qualitative and quantitative questions in order to ensure that individuals were able to suggest and discuss their personal ideas while also providing contextual data that could be analyzed and interpreted. This study aimed to collect data that can be used to help increase stair use in the Tupper Building as well as be applied to other buildings on campus in order to increase the health and happiness of all employees of Dalhousie University.

## Methods

### Study Design and Justification

A survey, figure 3, was used to collect the behavioural information needed to

understand the connection between stair use and environmental factors. A survey was chosen because they enable the collection of quantitative information on people's thoughts and feelings from a representative sample of the population of interest (Conducting Survey Research, 1999). Focus was on quantitative data collection due to Foster & Hillsdon's (2004) recommendation and because the objective of this study and quantitative research is to collect rich, contextual information from the participants in order to understand their perspectives (Haggard, 1998). However, the survey was also used to collect some qualitative information as well. This is because qualitative information can add a service-user perspective to research that may enrich the data and possibly enhance interpretation of the findings (Harland & Holey, 2011).

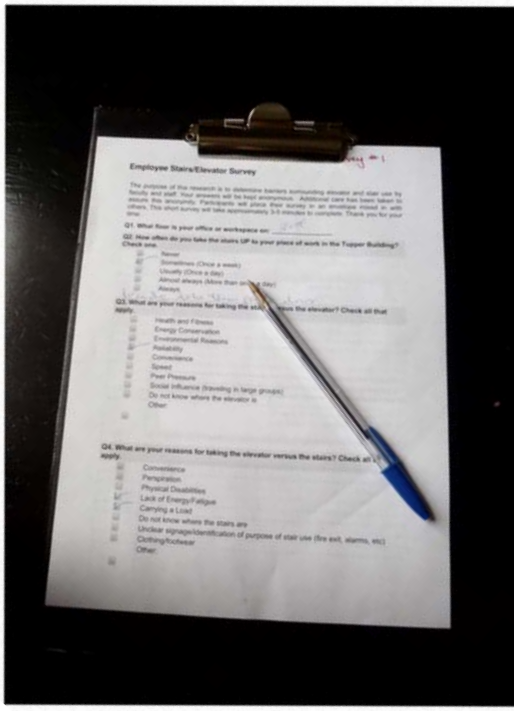


Figure 3: Our Survey.

The majority of the survey consisted primarily of close-ended questions (See Appendix A). This was the most appropriate way to quantitatively measure people's perceptions, opinions, feelings, knowledge and behaviours (Conducting Survey Research, 1999). These questions were of the rating, ranking, and multiple choice varieties. A few qualitative, open-ended questions were included to allow for unanticipated responses and to determine individual attributes of the participant.

The surveys were employed through both face-to-face interviews and an online survey system. These two styles were chosen based on feasibility, likelihood of sufficient response rates, and to minimize the bias inherent in any one survey style. Funding of up to $50 was available, which covered the printing expenses associated with the surveys (See Appendix B). The online survey software used was Dalhousie's Opinio, which is a free service to University students. By providing two options of surveys our response rates were likely to be increased as one style may be more accessible to certain individuals than the other. There is a social desirability bias associated with face-to-face interviews that may affect the accuracy of results obtained (Conducting Survey Research, 1999). This bias was minimized by the

collection of information through the online survey.

The method of sampling was used because it would not have been feasible to survey every member of the target population. Sampling allowed us to minimize cost and effort while still obtaining information from a sufficient sample size (Conducting survey research, 1999). Simple random sampling was employed because it gives everyone in the population an equal opportunity to participate and it is the least complicated of the sampling strategies.

**Delimitations and Limitations**

The scope of our study focused on the 500 staff and faculty of the Dalhousie Tupper building (G. Mcnutt, personal communication, March 20, 2012). This population was the main concern of our client, Janice McInnis, and thus became our target audience. The Tupper building was chosen because of our client's recommendation and because it has 18 floors, making it the tallest building on campus with the most faculty and staff (R. Owen, personal communication, March 6, 2012). Increasing stair use in this building would therefore have the greatest impact on the largest single grouping of staff and faculty at Dalhousie.

Limitations of our study were caused by personnel, time, and financial constraints. The available budget only permitted one set of surveys, consent forms (See Appendix C) and advertising posters (See Appendix D) to be printed. This project was developed for the ENVS 3502 class at Dalhousie whose length limited the conduction of the investigation to approximately two months. There were four researchers involved, all of which had personal time constraints as they were full-time students at Dalhousie at the time. As such, each style of survey could only be performed once. In total, 121 surveys were completed which represents 24% of the Tupper faculty and staff.

An additional limitation occurred due to the threat of the staff and faculty of Dalhousie going on strike. The approval for the ethics form for this study (see Appendix E) was received on March, 6th, 2012 and the strike was scheduled to occur the following Monday. If the strike were to have occurred, there would have been no way to survey the target population. An executive decision was made to conduct the face-to-face surveys prior to the looming strike. As a result, there was not enough time to perform a pilot test prior to the launch of our survey.

**Procedure**

The first step in this investigation involved meeting with Janice to determine her goals for the project. Once those were understood, a thorough review of relevant literature was

conducted. Based on the findings, relevant and appropriate survey questions were created. The survey was designed and an ethics form was then completed and submitted for approval.

The face-to-face surveys took place between 9:30 am and 11:30 am on Friday, March 9th, 2012. The four researchers moved around the Tupper building to locate potential participants. Each would ask the potential participant if they were either staff or faculty of the Tupper building. Upon receiving positive confirmation, the researcher then asked if the individual would complete a survey regarding stair and elevator use in the Tupper building. Upon agreement, the researcher passed the individual a clipboard which held one consent form (See Appendix C) and one survey (See Appendix A). In order to ensure anonymity, the individuals were instructed to separate their completed forms and place each into the appropriate folder. The folders were provided by the researchers and were separately labelled 'consent forms' and 'surveys'.

Experience from the face-to-face surveys indicated that modifications must be made to some of the questions prior to the launch of the online survey. An additional question regarding gender was added and changes were made to questions 2, 3 and 6 (See Appendix A). The online surveys were available from 12:00 am on March 21st, 2012 until 12:00 pm on March, 27th, 2012. Posters (See Appendix D) were distributed throughout the Tupper building on March 21st to advertise the online survey and provide the web address . The same information was sent out through e-mails to the Tupper staff and faculty on March 21st, 2012.

The results were then converted into binary code, which were graphically represented using the program inumbers. Body Mass Index was then calculated within the program by the following equation:

$$BMI = \frac{mass(kg)}{(height(m))^2}$$

The BMI results were then cross referenced with quantitative data to show the relationship between body composition and stair use.

**Reliability and Validity**

A reliable survey will obtain very similar results each time it is employed (Haggard, 1998). Although our sample size was limited, the results of both the face-to-face survey and the online survey showed very similar trend patterns. Reliability is also enhanced through the process of triangulation. It is important to use multiple indicators to measure important variables. This was achieved by asking multiple questions that addressed various dimensions of the barriers to taking the stairs. As such, the

information gathered in this study is thought to be reliable.

The answers provided by the participants may have been subject to various forms of bias. For example, it was noted that some survey participants were talking aloud to each other when filling out the surveys. Also, our client and her interest in promoting healthy activity across the Dalhousie campus are well known to the staff and faculty in the Tupper building. In fact, on February 24th, 2012, she ran a stair climbing event in the Tupper building to raise awareness. Participants may have been aware of her affiliation with this investigation. These biases may have reduced the validity of this study as answers may have been falsified due to social influence (Conducting Survey Research, 1999). That is, the extent to which our survey actually measured what it appeared to be measuring may have been reduced.

## Results

There was a total of 121 people who completed our surveys. This accounted for 24% of the total staff and faculty in the Tupper Building.

The first question of the survey asked people to identify what floor they worked on. Graph number one, figure 4, shows what floor the respondents worked, and every floor was represented in the survey except floor number 14. Additionally, the highest proportion of respondents worked in the Basement, they accounted for 11.5% of our results.

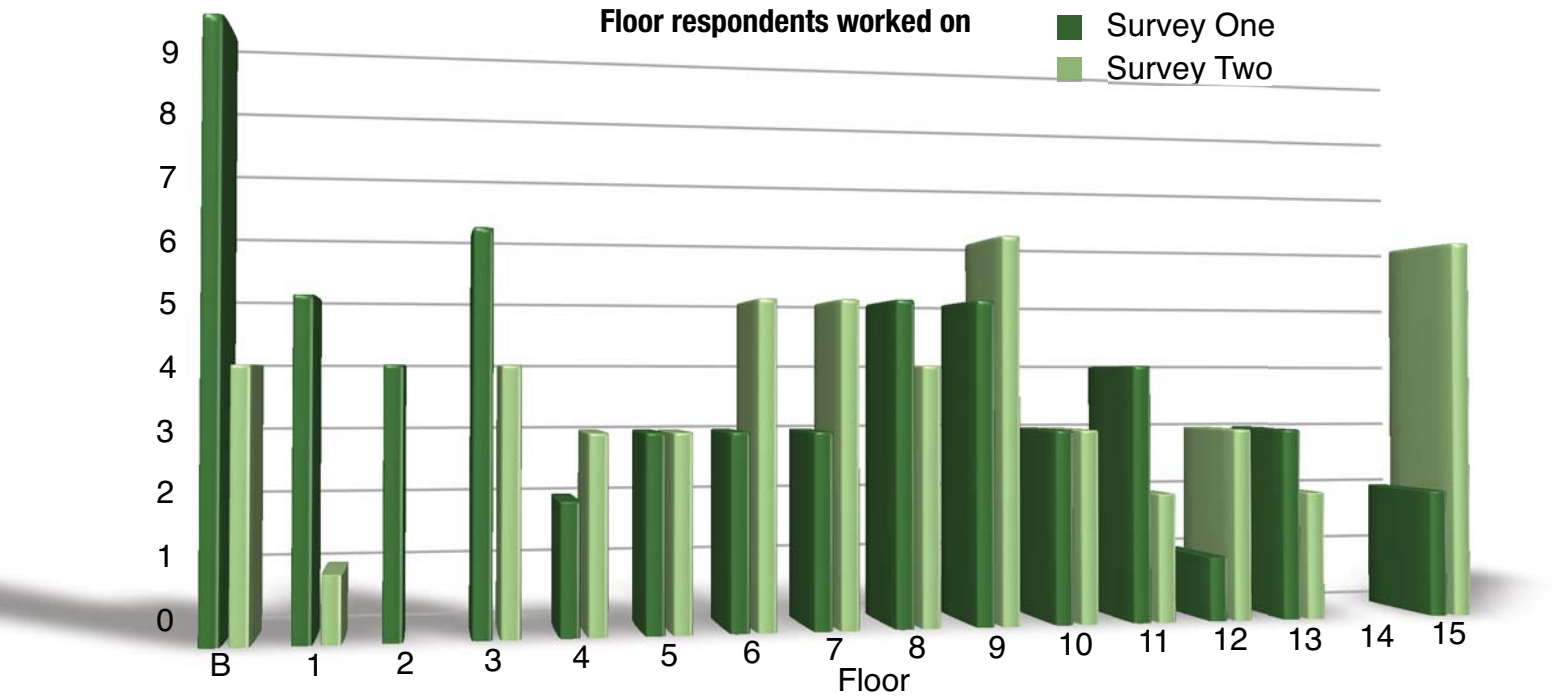


**Figure 4:** The results of question one ”What floor do you work on?”. Dark green represents survey two, and light green represents survey one. B stands for basement.

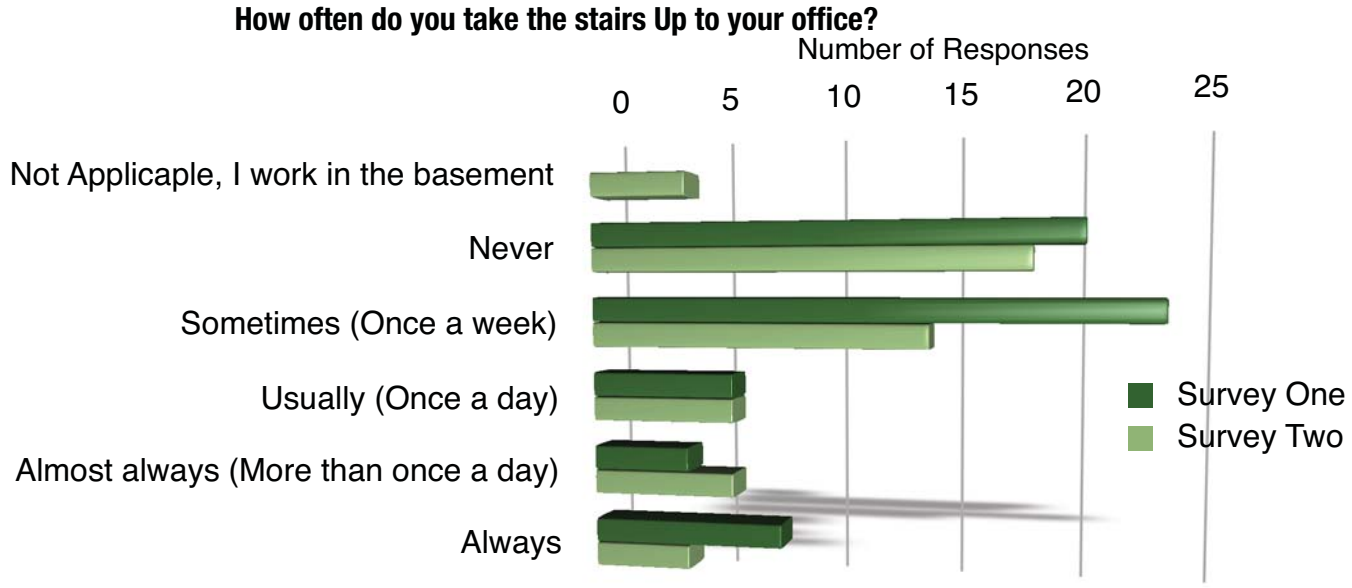


**Figure 5:** Shows survey one and two response for how often people take the stairs up to his or hers office. Note that survey two accounted for people working in the basement.

The second question in the surveys asked individuals to indicate how often he or she took the stairs up to his or her place of work. Figure number 5 displays the results for both survey number one and survey number two. When adding the results together, the surveys indicated that the majority of people never take the stairs to work. Note that survey two accounts for people working in the basement, which was added after the results of survey one were reviewed.

The next question on the survey asked people to identify what mode of transportation they take to travel between floors during the work day. The respondents were asked to select one mode of transportation between the levels suggested. The combined results

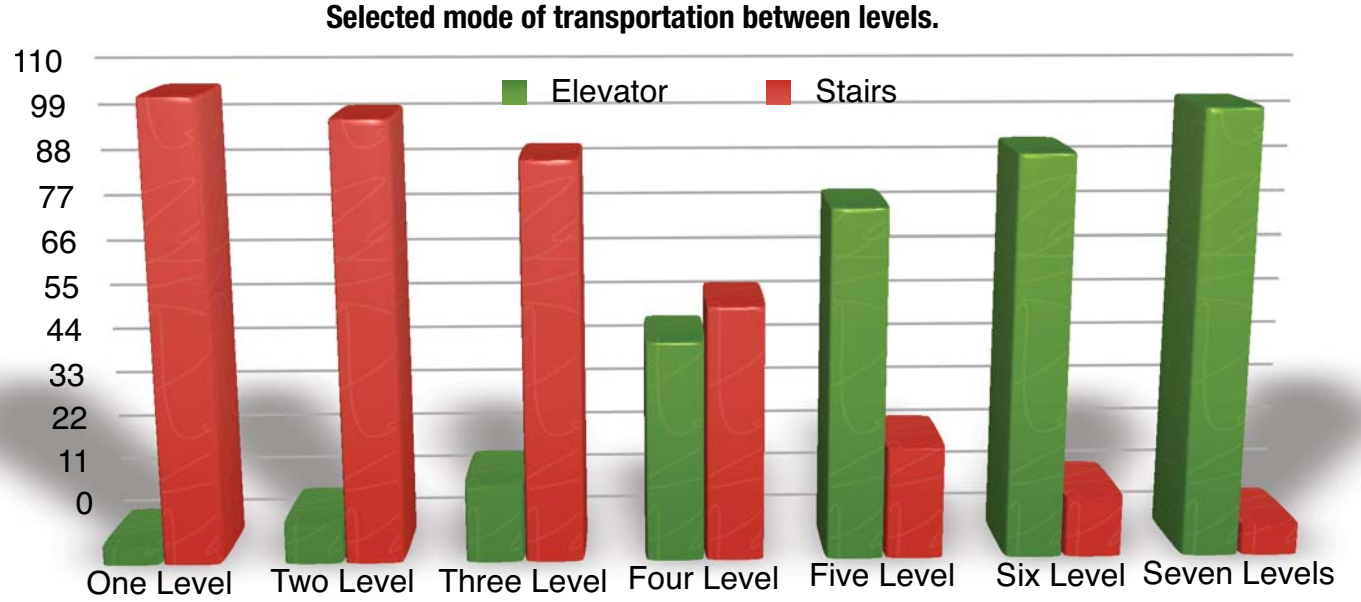


**Figure 6:** Shows the mode of transportation selection to move between one to seven levels. The data is a total of all the responses in both surveys.

of both surveys are shown in figure 6. The graph shows that as the number of levels to commute increases, more people take the elevator. When there are fewer levels to commute, many people take the stairs.

Using the results in questions 7, 8, and 9, which asked people their age, weight, and height we calculated their Body Mass Index (BMI) and cross referenced the data with the previous questions. The results showed how people responded to what mode of transportation they used to commute based on BMI.

The average age of survey two was 39.8 years old, where as the average age of survey one was 47.12. The average height of survey two was 1.7m, and the average height of survey one was 1.697 m. The average weight of survey number two was 72.3kg, and the average weight of survey number one was 75.4kg. Thus the average BMI was 24.4, and 26.316 for survey two and one respectively.

The results of this cross reference of BMI compared to mode of transportation, figure 7, show the higher the BMI the higher the frequency of elevator use.

The next part of the survey asked respondents to identify reasons for taking the stairs or reasons for taking the elevator. Figure 8 shows the respondents reasons for taking the stairs over the elevator. Most people said they took the stairs over the elevator for health and

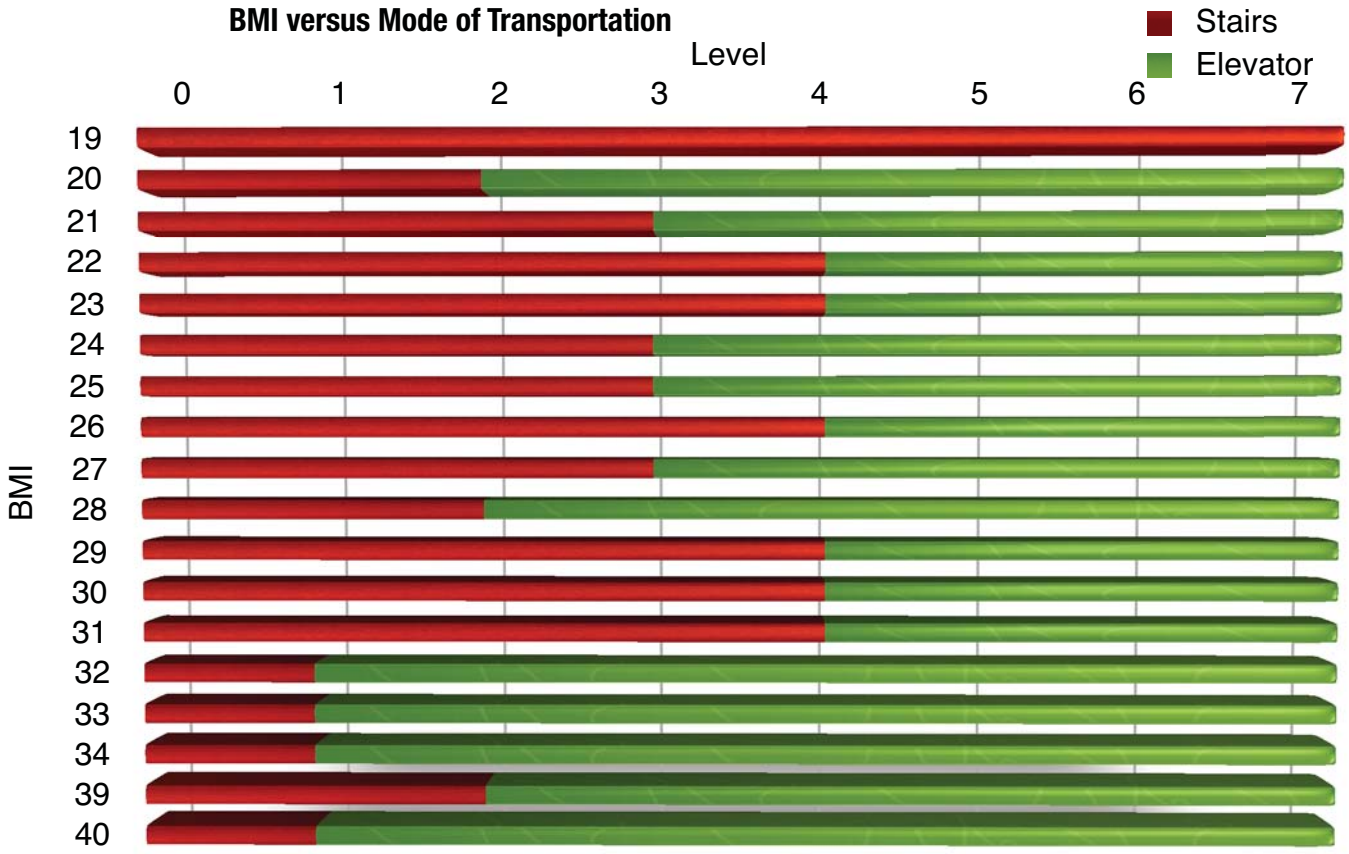


**Figure 7:** Shows the BMI data cross referenced with the Mode of Transportation.

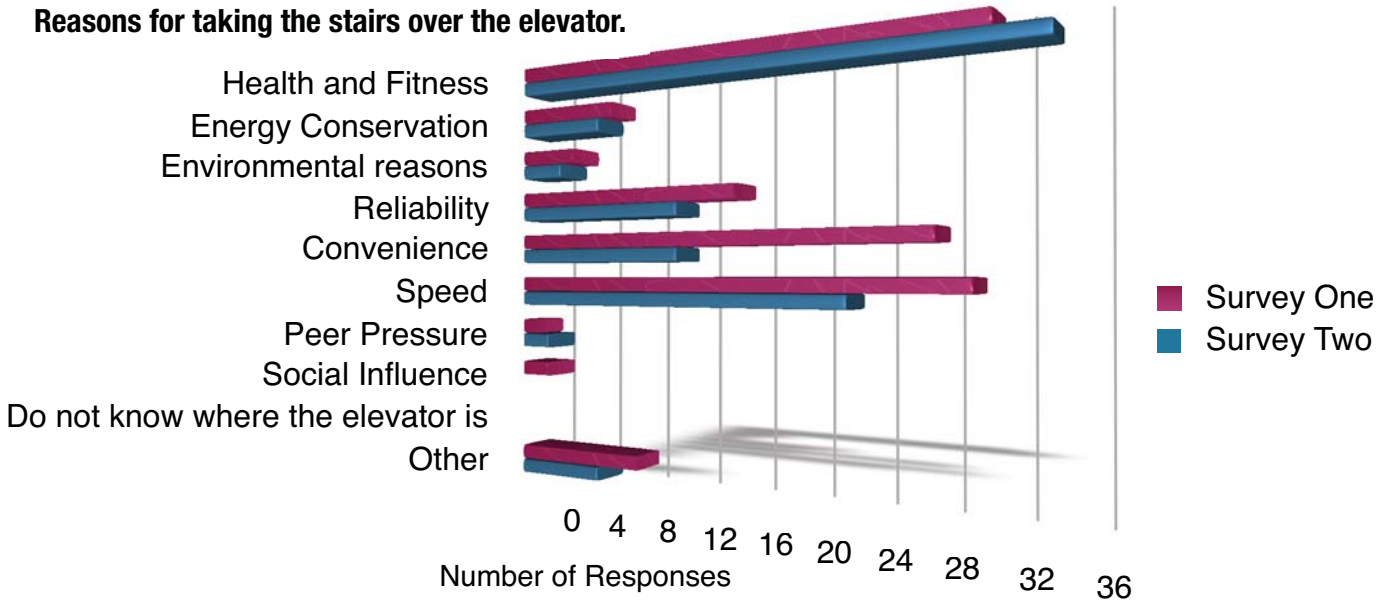


**Figure 8:** Identifies the reasons for taking the stairs over the elevator in both survey number one and two.

fitness reasons, as well as convenience and speed. No one indicated they did not know where the stair well was, and only five were influenced socially. The 'other' responses are listed in **c**hart 1 Appendix F, and indicates people take the stairs because the elevator is too slow or unavailable.

In contrast, the next question asked people to identify reasons for taking the elevator over the stairs as shown in figure 9. The main reasons people take the elevator over the stairs were identified as convenience and carrying a load. The lowest number of responses were not knowing where the stairs were or understanding the function of the stairs.

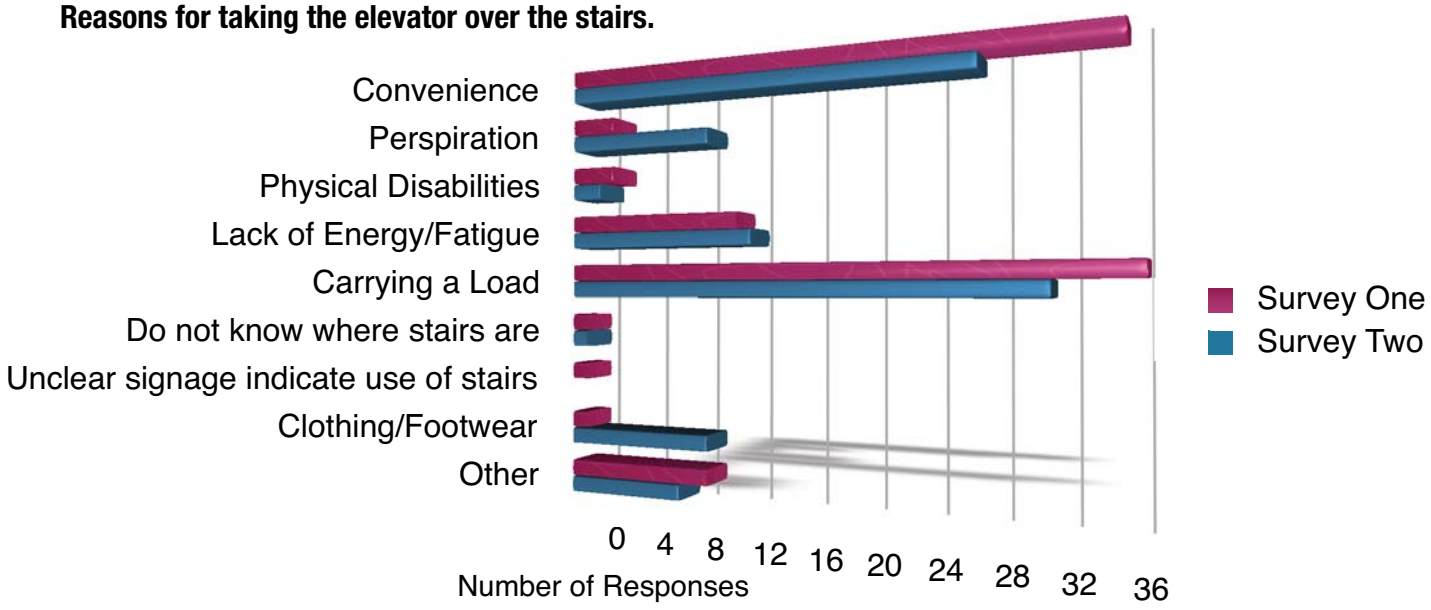


**Figure 9:** Identifies the reasons for taking the elevator over the stairs in both surveys number one and two.

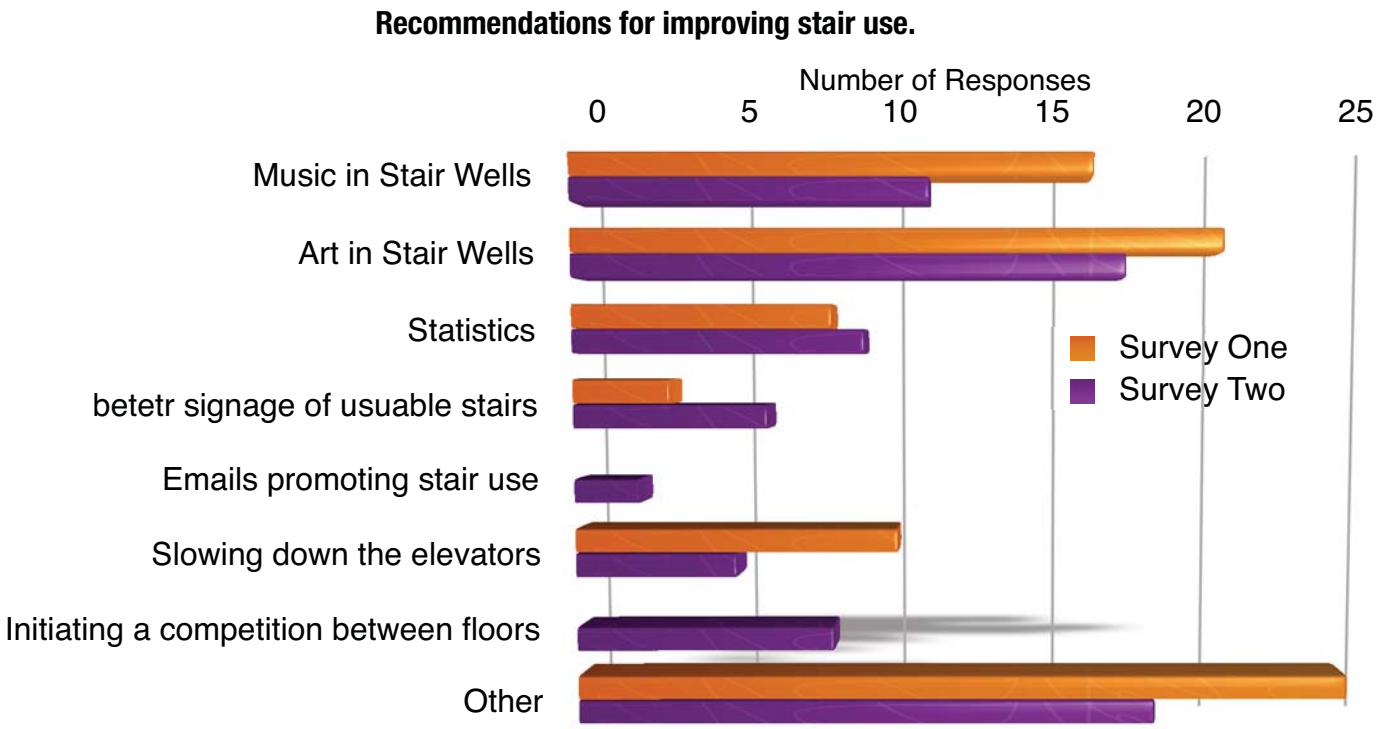


**Figure 10:** Identifies recommendations to promoting stair use.

The question also gave people the option to identify other reasons for taking the elevator over the stairs (See Appendix F, chart 3). The most frequent 'other' response indicated taking the stairs regularly above 7 floors was too many flights, thus they preferred the elevator

The final question on the survey asked people to identify any options to promote stair use, figure 10. The highest recommendations were other, art in the stairwells, and music in the stair wells. The other options (See Appendix F, chart 4) suggested improving ventilation, cleanliness, air quality, and aesthetics.

# Discussion

### Research Purpose

The overall goal for our client and this project was to increase the use of stairs by the faculty and staff of the Dalhousie community. This study attempted to fill the research gap identified by Foster & Hillsdon (2004) regarding the need for further objective measures on the relationship of the environment to health enhancing physical activity. This was necessary in order to determine environmental interventions that would work to meet our client's needs. More specifically, this investigation sought to determine individual behavioural factors that affect stair use at work and what

external environmental factors could influence these behavioural patterns.

**Significant Findings and Implications**

Our survey represented 24% of the staff and faculty in the Tupper Building. The majority of the people who took the survey worked in the basement, and every floor was represented in the survey besides floor 14, figure 4. There was input from every floor, however the high number of basement response is limiting in the study. Acknowledging people who work in the basement in both studies would have improved our results, as only the second survey had a basement option.

The results of Figure 5, confirmed the inference made by our client, that most people do not take the stairs at work. Over half of the respondents either take the stairs once a week or never, up to their place of work. However, figure 6 shows that many people do take the stairs during their work day by selecting stairs as their preferred mode of transportation at low levels on the survey. When this question was further analyzed with a comparison of BMI to usual mode of transportation Figure 7, a positive correlation between elevator use and increasing BMI was observed. These findings indicate that there exists a very real and large potential to increase the health of the faculty and staff at Dalhousie through increasing their use of stairs at work.

The priorities of the participants as indicated by the results of question three Figure 8, showed that health and fitness, followed by speed, were the most important factors in taking the stairs rather than the elevator. The study by Eves, Olander, Webb, Griffin and Chambers (2012) sought to determine the influence of likening stair climbing to a mountain, there was a discrepancy between the indication for the preference of the campaign and actual participation in the campaign. They suggested that promotion of stair use that focuses on health benefits may be more effective, which supports the results of question three. The study by Olander and Eves (2011) supports the finding that speed influences stair use as they found that stair use increases when building occupancy increases. These are important determinants to the potential influence of various environmental factors on the target population.

The architectural design of the Tupper building as well as the type of work being done by the staff was determined to be an influential component to the use of stairs by staff and faculty. A large majority of participants selected convenience and/or carrying a load as reasons for taking the elevator versus the stairs Figure 9. The Tupper building is full of researchers that often carry loads between floors. The designs of the doors in the Tupper building are not conducive to slower moving people with objects in their

hands. The impact of door design on stair use was realized in Olander & Eve's (2011) paper. They recommended that door closing times be reconfigured to be slower.

Results indicating type of mode chosen between levels, Figure 6, provided a clear indication that participants would take the stairs when their destination was less than or equal to four floors away, but would take the elevator for destinations greater than four floors away. A UK study also found that employees were willing to climb an average of 4 flights at work (Keer et al., 2002 as cited in Eves & Webb, 2006). With little to no budget, the implications of these findings are not feasible to implement in the pre-existing Tupper building. However, these findings are applicable to future building designers.

The sixth question on the survey asked participants to indicate what factors would increase their usage of stairs at work. The two options that were most frequently selected were 'other' and 'art in the stairwells', Figure 10. The majority of responses to the 'other' category related mainly to maintenance issues such as, ventilation, air-quality, paint and cleanliness. Again, these changes are not feasible to implement as they are largely beyond the budget, knowledge, and authority of the members involved with this study. However, passing this information onto the relevant staff of the Tupper building is more than feasible. Art in the stairwells was indicated by the highest number of participants as something that would increase stair use. Placing art in the stairwells would create a more interesting, engaging, and welcoming atmosphere and could be a feasible option to implement. This result is supported by previous studies which have found that increased stair use can be obtained by improved aesthetics ( Boutelle et al., 2001; Kerr et al., 2004).

# Conclusion

### Recommendations

Using the results from this study future changes can be made to the Tupper Building in order to increase stair use by staff and faculty. The strategies that have been identified by the survey as the best options to promote stair use are implementing art in the stairwells and increasing cleanliness and ventilation. These options are relatively feasible options that would take little time and money to do. For art in the stairwells we recommend that Healthy Dalhousie teams up with the Sustainability department at dal. This department requires first year students to create pieces of art work as an assignment. We recommend the teaching assistants transport the art work to the Tupper Building and set up the art work in the stair wells. Displaying student art work in the stair wells at the Tupper Building

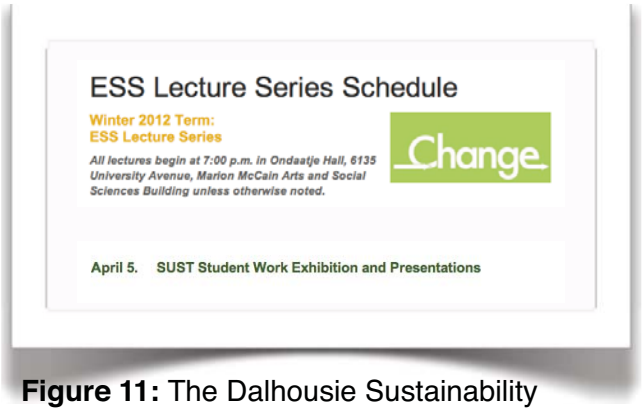


**Figure 11:** The Dalhousie Sustainability Thursday Night Lecture Series, indicating the presentation of student art work.

would reuse the students work, and create an aesthetically pleasing stair well for the Tupper Building. Increased custodial duties could easily solve the problem of cleanliness within in Tupper and painting the stairwells would be an inexpensive way to make the stairs more welcoming and interesting.

Using those results we could then apply the strategies to other buildings on campus in order to increase stair use by staff and faculty as well as the student population throughout campus. They could also be applied to future building designs on Dalhousie Campus.

### Future Studies

Upon implementation of these suggestions future research could involve redistributing our survey or one that is similar in order to see if stair use has indeed increased. Additionally, future studies could look at buildings on campus that have fewer than four stories, such as the Rowe building to determine if fewer floors result in more people taking the stairs.

The health of Dalhousie's staff and faculty is very important to the University and the students who learn from them. This research can contribute to promoting the wellbeing of faculty and staff, who make Dalhousie the excellent institution that it is.

## Acknowledgements

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# Appendix A

## Survey One: Face to Face

### Employee Stairs/Elevator Survey

The purpose of this research is to determine barriers surrounding elevator and stair use by faculty and staff. Your answers will be kept anonymous. Additional care has been taken to assure this anonymity. Participants will place their survey in an envelope mixed in with others. This short survey will take approximately 3-5 minutes to complete. Thank you for your time.

**Q1. What floor is your office or workspace on: _____**

| **Q2. How often do you take the stairs UP to your place of work in the Tupper Building? Check one.** | |
|---|---|
| ☐ | Never |
| ☐ | Sometimes (Once a week) |
| ☐ | Usually (Once a day) |
| ☐ | Almost always (More than once a day) |
| ☐ | Always |

| **Q3. What are your reasons for taking the stairs versus the elevator? Check all that apply.** | |
|---|---|
| ☐ | Health and Fitness |
| ☐ | Energy Conservation |
| ☐ | Environmental Reasons |
| ☐ | Reliability |
| ☐ | Convenience |
| ☐ | Speed |
| ☐ | Peer Pressure |
| ☐ | Social Influence (traveling in large groups) |
| ☐ | Do not know where the elevator is |
| ☐ | Other: |

| **Q4. What are your reasons for taking the elevator versus the stairs? Check all that apply.** | |
|---|---|
| ☐ | Convenience |
| ☐ | Perspiration |
| ☐ | Physical Disabilities |
| ☐ | Lack of Energy/Fatigue |
| ☐ | Carrying a Load |
| ☐ | Do not know where the stairs are |
| ☐ | Unclear signage/identification of purpose of stair use (fire exit, alarms, etc) |
| ☐ | Clothing/footwear |
| ☐ | Other: |

## Employee Stairs/Elevator Survey

| Q5. In general, during the work day what mode of transportation do you take to get between levels? Click one option per level. | | | | |
|---|---|---|---|---|
| 1 level | ☐ | Stairs | ☐ | Elevator |
| 2 level | ☐ | Stairs | ☐ | Elevator |
| 3 level | ☐ | Stairs | ☐ | Elevator |
| 4 level | ☐ | Stairs | ☐ | Elevator |
| 5 level | ☐ | Stairs | ☐ | Elevator |
| 6 level | ☐ | Stairs | ☐ | Elevator |
| 7 + level | ☐ | Stairs | ☐ | Elevator |

| Q6. What would increase your stair use? Check all that apply. | |
|---|---|
| ☐ | Music in stairwells |
| ☐ | Art in stairwells |
| ☐ | Statistics promoting health, cleanliness and energy benefits of stair use |
| ☐ | Better signage of usable stairs |
| ☐ | Emails promoting stair use |
| ☐ | Slowing down elevators |
| ☐ | Other |

---

**The following demographic information will greatly improve our data analysis. Please fill out this information voluntarily. All survey data responses will remain anonymous.**

**Q7.** Age:_____

**Q8.** Height:_____.

| Q9. Indicate your weight range by checking your corresponding weight class | |
|---|---|
| ☐ | 100-120lbs |
| ☐ | 121-140lbs |
| ☐ | 141-160lbs |
| ☐ | 161-180lbs |
| ☐ | 181-200lbs |
| ☐ | 201-220lbs |
| ☐ | 221-240lbs |
| ☐ | 241-260lbs |
| ☐ | 261-280lbs |
| ☐ | 281-300lbs |
| ☐ | 301-320lbs |

**Thank-you**

2

## Survey Two: Online

## Employee Stairs/Elevator Survey

The purpose of this research is to determine barriers surrounding elevator and stair use by faculty and staff. Your answers will be kept anonymous. Additional care has been taken to assure this anonymity. Participants will place their survey in an envelope mixed in with others. This short survey will take approximately 3-5 minutes to complete. Thank you for your time.

**Q1. What floor is your office or workspace on: _____**

| **Q2. How often do you take the stairs UP to your place of work in the Tupper Building? Check one.** | |
|---|---|
| ☐ | Not Applicable I work in the basement |
| ☐ | Never |
| ☐ | Sometimes (Once a week) |
| ☐ | Usually (Once a day) |
| ☐ | Almost always (More than once a day) |
| ☐ | Always |

| **Q3. What are your reasons for taking the stairs instead of the elevator? Check all that apply.** | |
|---|---|
| ☐ | Health and Fitness |
| ☐ | Energy Conservation |
| ☐ | Environmental Reasons |
| ☐ | Reliability |
| ☐ | Convenience |
| ☐ | Speed |
| ☐ | Peer Pressure |
| ☐ | Other: |

| **Q4. What are your reasons for taking the elevator instead of the stairs? Check all that apply.** | |
|---|---|
| ☐ | Convenience |
| ☐ | Perspiration |
| ☐ | Physical Disabilities |
| ☐ | Lack of Energy/Fatigue |
| ☐ | Carrying a Load |
| ☐ | Do not know where the stairs are |
| ☐ | Clothing/footwear |
| ☐ | Other: |

## Employee Stairs/Elevator Survey

| Q5. In general, during the work day what mode of transportation do you take to get between levels? Click one option per level. | | | | |
|---|---|---|---|---|
| 1 level | ☐ | Stairs | ☐ | Elevator |
| 2 level | ☐ | Stairs | ☐ | Elevator |
| 3 level | ☐ | Stairs | ☐ | Elevator |
| 4 level | ☐ | Stairs | ☐ | Elevator |
| 5 level | ☐ | Stairs | ☐ | Elevator |
| 6 level | ☐ | Stairs | ☐ | Elevator |
| 7 + level | ☐ | Stairs | ☐ | Elevator |

| Q6. What would increase your stair use? Check all that apply. | |
|---|---|
| ☐ | Music in stairwells |
| ☐ | Art in stairwells |
| ☐ | Statistics promoting health, cleanliness and energy benefits of stair use |
| ☐ | Better signage of usable stairs |
| ☐ | Initiating a competition between floors or faculties |
| ☐ | Slowing down elevators |
| ☐ | Other |

---

**The following demographic information will greatly improve our data analysis. Please fill out this information voluntarily. All survey data responses will remain anonymous.**

**Q7.** Gender:_____

**Q8.** Age:_____

**Q9.** Height:_____

| Q10. Indicate your weight range by checking your corresponding weight class | |
|---|---|
| ☐ | 100-120lbs |
| ☐ | 121-140lbs |
| ☐ | 141-160lbs |
| ☐ | 161-180lbs |
| ☐ | 181-200lbs |
| ☐ | 201-220lbs |
| ☐ | 221-240lbs |
| ☐ | 241-260lbs |
| ☐ | 261-280lbs |
| ☐ | 281-300lbs |
| ☐ | 301-320lbs |

**Thank-you**

# Appendix B

Budget

Requested funds of $50.00 was submitted to the DSU Sustainability Office on March 5th 2012. Printing included 100 double-sided surveys, 100 consent forms (1 page, single sided), and 15 8 ½ ” x 11” posters. At $0.10/page the total cost of printing was $30.50.

# Appendix C

Consent Form

DALHOUSIE UNIVERSITY
*Inspiring Minds*

**ENVS 3502**

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## Employee Stairs / Elevator Survey

Our research group would like to express sincere appreciation for your participation in this study. The purpose of this research is to determine the barriers surrounding elevator and stair use by faculty and staff in the Tupper building. Your responses will be kept anonymous by private self-submissions into an envelope. There are some optional demographic questions included in the survey. However, this information will greatly improve our data analyses. To indicate your consent to participate in this study, please sign below.

X_____

Participant’s signature

If you would like to receive the results of this study, please provide your email below.

X_____

**Student Researcher’s Contact Information**

| | |
|---|---|
| Laura Tupper-Ring | Lr971423@dal.ca |
| Laura McOrmond | lr555187@dal.ca |
| Tarryn Adams | tr965905@dal.ca |
| Ashleigh Rowe | as604965@dal.ca |

## Appendix D

Poster

# REMINDER TO ALL TUPPER FACULTY & STAFF:

## Please complete Stair/Elevator Survey Available March 21st -27th

## Go To: https://surveys.dal.ca/opinio/s?s=14308

## or click on the link in your Dal email to complete the survey

https://surveys.dal.ca/opinio/s?s=14308
https://surveys.dal.ca/opinio/s?s=14308
https://surveys.dal.ca/opinio/s?s=14308
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https://surveys.dal.ca/opinio/s?s=14308

# Appendix E

Ethics Form

**ENVIRONMENTAL SCIENCE PROGRAM**
**FACULTY OF SCIENCE**
**DALHOUSIE UNIVERSITY**
**(version 2010)**

**APPLICATION FOR ETHICS REVIEW OF RESEARCH INVOLVING HUMAN PARTICIPANTS**
**UNDERGRADUATE THESES AND IN NON-THESIS COURSE PROJECTS**

**GENERAL INFORMATION**

**1. Title of Project:** Taking the Stairs

| **2. Faculty Supervisor(s)** | **Department** | **e-mail:** | **ph:** |
|---|---|---|---|
| Rochelle Owens | Sustainability | rjowen@dal.ca | 902-494-7448 |
| Janice MacInnes | Human Resources | janice.macinnis@dal.ca | 902-494-4568 |

| **3. Student Investigator(s)** | **Department** | **e-mail:** | **ph:** |
|---|---|---|---|
| Laura Tupper-Ring | Biology/Sustainability | Lr971423@dal.ca | 902-440-1831 |
| Laura McOrmond | Kinesiology/ Environmental Science | lr555187@dal.ca | 902-532-8158 |
| Tarryn Adams | Environmental Science/Sustainability | tr965905@dal.ca | 902-817-1037 |
| Ashleigh Rowe | Environmental Science/Sustainability | as604965@dal.ca | 902-457-2583 |

**4. Level of Project:** Non-thesis Course Project [yes] Undergraduate [yes] Graduate [ ]

**Specify course and number:** 3502 ENVS/SUST Campus as a Living Lab

**5. a. Indicate the anticipated commencement date for this project:** March 12
**b. Indicate the anticipated completion date for this project:** March 15

**SUMMARY OF PROPOSED RESEARCH**

**1. Purpose and Rationale for Proposed Research:** *Briefly describe the purpose (objectives) and rationale of the proposed project and include any hypothesis(es)/research questions to be investigated*

The purpose of this research is to determine the behaviours surrounding elevator and stair use by faculty and staff on campus, as well as to determine ways in which stair use could be increased. The focus of the study is on faculty and staff at Dalhousie University and their stair usage at the Tupper Building on campus. We have chosen this building because it is the largest on campus and holds the most staff and faculty. By determining individuals' barriers to stair use we aim to develop ways in which to increase their usage in order to decrease energy use and increase health and productivity of employees of the university (Frances, 2011).

**2. Methodology/Procedures**
**a.** ***Which of the following procedures will be used? Provide a copy of all materials to be used in this study.***
[ ] Survey(s) or questionnaire(s) (mail-back)
[yes] Survey(s) or questionnaire(s) (in person)

[yes] Computer-administered task(s) or survey(s)]
[ ] Interview(s) (in person)
[ ] Interview(s) (by telephone)
[ ] Focus group(s)
[ ] Audio taping
[ ] Videotaping
[ ] Analysis of secondary data (no involvement with human participants)
[ ] Unobtrusive observations
[ ] Other, specify _____

**b.** ***Provide a brief, sequential description of the procedures to be used in this study. For studies involving multiple procedures or sessions, the use of a flow chart is recommended.***

This study will utilize a survey to collect the necessary quantitative information. This survey will be administered face-to-face and online. There will be advertisements regarding the online survey posted throughout the Tupper building a week prior to the launch of the survey. The online survey and the face-to-face survey will be conducted in the same week. The online survey will be available for one week in March. The face-to-face survey will take place during the Monday and Tuesday of this week.

**3. Participants Involved in the Study:** ***Indicate who will be recruited as potential participants in this study.***

Dalhousie Participants:
[ ] Undergraduate students
[ ] Graduate students
[yes] Faculty and/or staff

Non-Dal Participants:
[ ] Adolescents
[ ] Adults
[ ] Seniors
[ ] Vulnerable population* (e.g. Nursing Homes, Correctional Facilities)

** Applicant will be required to submit ethics application to appropriate Dalhousie Research Ethics Board*

**b.** ***Describe the potential participants in this study including group affiliation, gender, age range and any other special characteristics. If only one gender is to be recruited, provide a justification for this.***

The participants in this study will all be affiliated with Dalhousie University. They will range in age from 18-80+ years old and both male and female participants will be included.

**c.** ***How many participants are expected to be involved in this study?*** 150

**4. Recruitment Process and Study Location**
**a.** ***From what source(s) will the potential participants be recruited?***
[ ] Dalhousie University undergraduate and/or graduate classes

[yes] Other Dalhousie sources (specify) _Employees in the Tupper building
[ ] Local School Boards*
[ ] Halifax Community
[ ] Agencies
[ ] Businesses, Industries, Professions
[ ] Health care settings*
[ ] Other, specify (e.g. mailing lists) _____

** Applicant may also require ethics approval from relevant authority, e.g. school board, hospital administration, etc.*

**b.** ***Identify who will recruit potential participants and describe the recruitment process. Provide a copy of any materials to be used for recruitment (e.g. posters(s), flyers, advertisement(s), letter(s), telephone and other verbal scripts in the appendices section.***

All group members will work to recruit participants during the face-to-face interviews through interception at the Tupper link. The individuals that are asked to fill out the face-to-face survey and decline will be given a card with the URL to our online survey. All group members will distribute posters throughout the Tupper building a week prior to the launch of the online survey in order to recruit voluntary participants.

**5. Compensation of Participants: Will participants receive compensation (financial or otherwise) for participation?**
Yes [ ] No [yes] If Yes, provide details:

**6. Feedback to Participants**
**Briefly describe the plans for provision of feedback and attach a copy of the feedback letter to be used.**

An executive summary of our findings will be emailed to those individuals that indicated on the survey that they would like to receive the results summary. There will be a section at the bottom of the survey for participants to include their email address if they want to receive the executive summary.

**POTENTIAL BENEFITS FROM THE STUDY**

**1. Identify and describe any known or anticipated direct benefits to the participants from their involvement in the project.**

Results from the survey could foster environmental change within the Tupper building. For example, the survey may encourage the participant to become more active at work by taking the stairs instead of the elevator.

**2. Identify and describe any known or anticipated benefits to society from this study.**

Results from this survey could call for improvements in the stairwells such as art work, music, and aesthetics. The results could also be used to help design stairwells in future buildings.

**POTENTIAL RISKS TO PARTICIPANTS FROM THE STUDY**

**1. For each procedure used in this study, provide a description of any known or anticipated risks/stressors to the participants. Consider physiological, psychological, emotional, social, economic, legal, etc. risks/stressors and burdens.**

[ ] No known or anticipated risks Explain why no risks are anticipated:
[yes] Minimal risk * Description of risks: Possible embarrassment and/or feeling of personal invasion from questions regarding age and weight that could imply fitness level and also scrutinize personal choice.
[ ] Greater than minimal risk** Description of risks:
** This is the level of risk associated with everyday life. ** This level of risk will require ethics review by appropriate Dalhousie Research Ethics Board*

**2. Describe the procedures or safeguards in place to protect the physical and psychological health of the participants in light of the risks/stresses identified in Question 1.**

At any time during the survey people are provided the choice to opt out of the survey. The survey will be performed in private settings and through the email. During face-to-face survey participants will be provided a clip board to fill out the survey on the other side of the room. If participants do not answer all questions such as age or weight, the remaining data will still be analyzed.

**INFORMED CONSENT PROCESS**

Refer to: http://pre.ethics.gc.ca/english/policystatement/section2.cfm;
**1. What process will be used to inform the potential participants about the study details and to obtain their consent for participation?**
[yes] Information letter with written consent form; provide a copy
[ ] Information letter with verbal consent; provide a copy
[ ] Information/cover letter; provide a copy
[yes] Other (specify): *Information letter online with a check box for consent*

**2. If written consent cannot be obtained from the potential participants, provide a justification.**

Written consent cannot be obtained during the online survey therefore consent will be inferred by taking the survey as well as a check box option in the information section of the online survey to imply consent.

**ANONYMITY OF PARTICIPANTS AND CONFIDENTIALITY OF DATA**

**1. Explain the procedures to be used to ensure anonymity of participants and confidentiality of data both during the research and in the release of the findings.**

Anonymity will be ensured during the face-to-face survey through exclusion of participants name on the survey paper. Consent forms will be signed separately from the survey to ensure that participants' names are not associated with a particular survey sheet. The consent form will then be placed directly into a secure

container and then the survey will be given to the participant. Once the survey is completed it will be placed directly into another secure box by the participant. This ensures that the researchers cannot place a name or face to a particular survey. Anonymity for the online survey will be ensured because the website on which the survey will be administered does not record name, email address, or any other personal identifiers.

**2. Describe the procedures for securing written records, questionnaires, video/audio tapes and electronic data, etc.**

Once face-to-face surveys are completed and placed into the secure container the researchers will convert the answers into electronic data using Microsoft Excel. This will be done as soon as possible after collection of the data. The electronic data will be stored on the hard drive of the researchers' computer and paper copies will be stored in a sealed envelope by the same researcher. Upon completion of the research paper and project, paper copies of the surveys will be shredded and disposed of. Data from the online surveys will be processed at the end of the one week period and will be analyzed and placed into the Microsoft Excel data spreadsheet.

**3. Indicate how long the data will be securely stored as well as the storage location over the duration of the study. Also indicate the method to be used for final disposition of the data.**

[One Month] Paper Records
[yes] Confidential shredding after: one month
[yes] Data will be retained until completion of specific course.
[n/a] Audio/Video Recordings
[n/a] Erasing of audio/video tapes after _____
[One Month] Electronic
[yes] Erasing of electronic data after: one month
[yes] Data will be retained until completion of specific course.
[ ] Other _____
(Provide details on type, retention period and final disposition, if applicable)

**Specify storage location:** Electronic data will be stored on the hard drive belonging to one of the researchers. The same researcher will store the paper data in a secure location. The data will be stored until two weeks after submission of the final report and the data has been released to the public. The week after project submission the hard copy surveys will be shred and the electronic data terminally deleted.

**Appendices: ATTACHMENTS** Please check below all appendices that are attached as part of your application package:
[yes] **Recruitment Materials**: A copy of any poster(s), flyer(s), advertisement(s), letter(s), telephone or other verbal script(s) used to recruit/gain access to participants.
[yes] **Information Letter and Consent Form(s)**. Used in studies involving interaction with participants (e.g. interviews, testing, etc.)
[yes] **Information/Cover Letter(s)**. Used in studies involving surveys or questionnaires.
[yes] **Materials**: A copy of all survey(s), questionnaire(s), interview questions, interview themes/sample questions for open-ended interviews, focus group questions, or any standardized tests used to collect data.

**SIGNATURES OF RESEARCHERS** _____ _____

Signature of Student Investigator(s) Date Laura McDonald March 2, 2012

Signature of Student Investigator(s) Date Laura Lippert-Ney March 2, 2012

Signature of Student Investigator(s) Date Tarsyn Adams March 2, 2012

Signature of Student Investigator(s) Date Ashleigh Rowe March 2, 2012

Signature of Student Investigator(s) Date _____

Signature of Student Investigator(s) Date _____ _____

Signature of Student Investigator(s) Date

**FOR ENVIRONMENTAL SCIENCE PROGRAM USE ONLY:** Ethics proposal been checked for eligibility according to the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans

_____ Signature Date

_____ Signature Date

# Appendix F

**Chart 1:** Displays the 'other' response for the question asking to identify the reasons for taking the stairs over the elevator.

| Survey One | Survey Two |
|---|---|
| Not worth the trouble to wait for the elevator. | Most of the above |
| No Passenger elevator on the floor. | 13th floor. Enough said, thank you. |
| No Elevator in Link. | Lazy |
| Proximity to rooms and doors and workspace. | In a hurry |
| Elevator busy. | Too many floors! |
| Elevator slow. | Speed |
| When the elevator is too busy. | When going up/down more than 4-5 floors, or if carrying load. |
| Fire Drill. | Time constraints and fatigue when climbing to higher levels |

**Chart 2:** Displays the 'other' response for the question asking to identify the reasons for taking the elevator over the stairs.

| Survey One | Survey Two |
|---|---|
| I do take the elevator to go to the 9th/10th floor at the Tupper. But I often take the stairs down. | All of the above |
| 15 Floors | Even if I take the elevator, if someone has already pressed a button for a floor close (n+-1or2) to my destination, I get off there and then take the stairs up/down to where I am going. |
| 15 Flights of stairs is too many to take everyday | Fire drill |
| Too high, dont build building over 4 floors. | Hate waiting for elevator |
| Wheeled cart | Elevators too slow |
| Find the step very steep/hard on knees. | Not applicable |
| Always in a rush | |
| Too many flights to 7th floor. | |

**Chart 3:** Displays the 'other' response for the question asking to identify the recommendations for promoting stair use.

| Survey One | Survey Two |
|---|---|
| Recently someone has been cleaning them, yeah! | None - my choice! |
| Stair wells not clean. | Better ventilation |
| Losing Weight | More appealing stairwell |
| Too Hot | Better ventilation in stairwells - it gets hot, stuffy and the air is often stale |
| Better Ventilation | Knowing which floor you are closest too during your climb |
| Better Air | Better ventilation/ cooler temps |
| Free Muffins (Just Kidding) | None of the above |
| Improvement in my health status (knee problem) | Clearer air..seems dusty |
| I enjoy the stairs already, just not everyday. | Better air quality |
| The stairwells should be kept clean- duct is a problem. | None |
| Not discouraged from taking stairs, carrying a heavy load. | Nothing |
| Nothing | Air conditioning |
| Nothing | Maybe not necessarily art but something to look at in the stairwells. |
| No incentive would increase my stair use and slowing down the elevators would just be cruel. | Ensure that doors to basement level are not locked during the hours they are supposed to be open. |
| Do not build over 4 stories. | Air Conditioning in Stairwells |
| Better Air/ventilation in stairways | Decommissioning all elevators |
| Thanks goodness the stairwells were painted last year. The artwork would be great and make a difference I think. | Cooler air |
| Cart on all floors. | Better air handling |
| Better airflow in stairwells | |
| The red blood paint in the stairwells is terrible! | |
| Cleanliness and ventilation | |
| Better air quality/cooler temp | |
| Better air quality in stairs | |