

Transporting Dalhousie: An Analysis of Factors Influencing Students' Transportation Choices to and from Dalhousie's Studley Campus



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Final Report

April 10, 2017

ENVS/SUST 3502

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1.0 EXECUTIVE SUMMARY

This study analyzed and identified factors influencing student transportation choices to and from Dalhousie's Studley Campus, addressing the knowledge gap in student transportation behavior. Our aim was to understand specific needs and influencing factors contributing to the state of sustainable behavior at Dalhousie. Our survey received 175 responses, and included 13 close-ended multiple choice questions, providing qualitative descriptive data. We discovered that the majority of respondents live within 2 kilometers of campus, and acknowledge distance as the deciding factor in their transportation choices. The majority of students walk to campus, contributing to minimal or no influence of public transit access on decision making. The most significant findings were a lack of awareness of transportation services offered by Dalhousie, such as the Bike Centre, Halifax CarShare programs, and Dalhousie transportation sustainability guidelines, with only 13.4% of respondents being confident in their knowledge of these services. Additionally, we were surprised to discover more than half of the respondents to this survey reported environmental impacts as having no or minimal impact on their transportation choices. This study provides a solid base for future, more specific Dalhousie transportation research, and we recommend the administration use this information to move forward in better serving student transportation needs.

2.0 Introduction

2.1 Project Definition

This study aims to identify the factors influencing students' choice of transportation to and from Dalhousie University's Studley Campus. The role of influencing factors such as; distance from campus, environmental attitudes, economics, access to public transportation, and personal preferences have in the decision-making process of Dalhousie undergraduates in their daily commutes will be explored in this study.

2.2 Research Question

The following research was built on the question:

What factors contribute to undergraduates' mode of transportation to and from Dalhousie University's Studley campus?

2.3 Background and Rational

Transportation is a significant contributor to greenhouse gas emissions (GHG) and global trends currently point towards increased car use (Mathez et al. 2013). In 2005, transportation alone was responsible for 23% of the world carbon dioxide (CO₂) emissions from fuel combustion, with the road sector having the most significant contribution (Mathez et al. 2013). Investing in and promoting alternative methods of transport, such as public transportation or cycling, will be key in helping to reduce GHG

emissions. As an institution of higher education, Dalhousie plays an important role in influencing student's transportation mode of choice to and from Studley campus. The cost and availability of parking on and around campus as well as access to bike lanes and racks are potential factors that may influence how students choose to commute to and from school. Currently, Dalhousie offers a transit pass (included in annual fees for full time students), approximately 1050 bike parking spaces, access to CarShare HFX spaces on campus, and around 2000 parking spaces between the Studley, Carleton, and Sexton campuses in Halifax (Dalhousie Office of Sustainability, 2016). However, many students may be unaware of these services available to them, therefore this study will look at the factors influencing student's transportation choices to positively impact student behavior in a shift towards creating a more sustainable campus.

A study based in China, explaining the effects that student behaviours have on the amount of energy a university consumes, influenced why we chose to conduct this study. China, being the world's leader in energy consumption and CO₂ emissions, needs to focus on urban planning, green engineering and behavioral solutions to reduce its impact on the changing climate. One sector that can help develop these important solutions is education. There are over 2700 universities in China, home to 30 million students. The education sector accounts for approximately 40% of the total public sector energy consumption, making it an important subject for increasing sustainability in China. Focusing on Tongji University, the study develops a personal carbon footprint analysis that accounts for all emissions connected to a student's daily activities. To collect this information, the Tongji study used an online survey tool with questions in five categories: Background Information, Daily life, Academics, Transportation and Green Campus (Li, Tan & Rackes, 2015). The survey structure and questions used by Tongji University are used in this study to collect data. After the respondents answered the survey questions, the results could be calculated in real time, stored for statistical analysis and showed the student what his/her carbon footprint is. This way, the survey could not only be a data collection tool, but increase student awareness about their GHG emissions as well. The results of the study showed that the average personal carbon footprint was 3.84 tons CO₂ equivalent, 20% accounting for transportation activities. By using this method, universities can create scenarios and predictions when looking to increase campus and student sustainability (Li, Tan & Rackes, 2015). If the data collected from our survey proves to have relevance to the Dalhousie community, an interactive personal carbon footprint activity could potentially be implemented.

Green transportation initiatives are becoming more popular on university campuses, and one that is increasing in abundance is bike share programs. One bike sharing program is being created every month somewhere in the world, and is recognized among the most environmentally sound models of transportation. Bike sharing programs have been around for approximately half a century, and have overcome various challenges including theft and vandalism. Now that electronic bikes are becoming more popular around the world, researchers believe that creating an e-

bike sharing program could increase use and remain environmentally friendly (Ji, Cherry, Han & Jordan, 2014). A study that we considered before starting our research was a pilot project implemented at the University of Tennessee-Knoxville. In 2011, the university installed the first e-bike sharing program pilot test in North America (Ji, Cherry, Han & Jordan, 2014). The program consisted of two stations each with 10 pedal assisted e-bikes. The user checks out an e-bike by swiping a magnetic card to enter credentials at the automatized kiosk. The system then releases a battery and the user inserts it into the unlocked e-bike, commencing their trip. They can use the bike for 4 hours without penalty and return the bike by re-entering the credentials from earlier. The results from the pilot test at UTK showed that with the proper efficiency and pricing strategies to increase trip duration, e-bike programs can find a way into the world's transportation system. They expand potential markets to individuals that are not inclined to use traditional forms of cycling, while still increasing sustainability in the transportation sector (Ji, Cherry, Han & Jordan, 2014). Using this study for comparison, we will analyze our results to consider the feasibility of implementing a similar program at Dalhousie.

Another study that influenced our research was a US based study that focused on the role that US college campuses can play when communicating sustainability, and their ability to change societies transportation patterns to more environmentally friendly options. Not only does the US have an extremely high automobile dependence, but planning processes are focused around car use (Balsas, 2003). Because of federal requirements concerning air quality, lack of land for parking and traffic impacts, many college campuses are exploring the implementation of environmentally appealing solutions to decrease traffic congestions and improve safety for students. Looking at eight campuses that are walking and bicycling friendly, it can be noted that these campuses are de-marketing automobile travel and promoting active transportation modes (Balsas, 2003). To create more cycling and walking friendly campuses, efforts need to focus on organization, planning, facilities, promotion and education of this matter. The implementation of these measures will likely encounter opposition and one cannot expect change to happen immediately. Yet, universities have the possibility to take a leadership role and promote more sustainable practices (Balsas, 2003).

In conducting a research project exploring student transportation choices to and from Studley Campus, our research project can provide the Dalhousie University community with important data which holds the potential to inform change and influence the implementation of new transportation policies and infrastructure on campus.

3.0 Methods

3.1 Description of study design

The intention of this project was to gather information on the choices and motivations of undergraduate students with respect to transportation to and from Studley campus. To that end we designed an online survey research tool. This 13

question survey (appendix A) was hosted on google forms and collected information on how far from campus students lived, what modes of transport were used by students most frequently and transportation related spending. Additionally, this survey used close-ended questions to evaluate student opinions, attitudes and levels of satisfaction with various aspects of transportation on Studley campus, such as bike lanes, bus stops and the availability of parking spots.

Our sampling frame, Dalhousie undergraduate students, is a population of 15,554 individuals (Dalhousie University Office of the Registrar, 2016). We launched our survey with the aim of collecting 200 responses in order to obtain a representative sampling of this population, the survey was live for 5 days and collected 175 responses in total, 3 of which had to be discarded due to failure to complete the survey. This left us with a total sample of 172. The number of potential respondents was limited to only those students with access to the internet. Our potential respondents were also limited to students who were aware of this study, which was advertised on social media in Dalhousie specific Facebook groups, and those who chose to complete this survey. Our sampling procedure was non-probabilistic sampling, defined as strategically chosen samples which are not statistically representative of a population (Palys and Atchison, 2013). We used the method of convenience sampling as we did not have access to a randomizable list of our sampling frame. As stated above the only method of distributing this survey was social media advertising and we exercised no control over who could take the survey. There was no mechanism in place for randomization of participants.

3.2 Justification of study design

Our research question was one which could be answered by close-ended questions, meaning a survey was more appropriate than an interview to collect relevant data. We chose to implement an online survey as it represented a way to collect data from a large number and wide variety of students within the short period of time which our survey was restricted to. An online survey had the benefit of requiring low levels of researcher supervision throughout its use, allowing for maximum respondent population despite limited response gathering time. An online survey also had the benefit of direct recording and organization of data over a pen and paper survey, expediting our analysis process and allowing us to remain on track for our short research time-frame.

In our research we discovered many studies exploring the theme of transportation choices also used questionnaires as research tools. Studies such as "Incentives, morality, or habit? predicting students' car use for university routes with the models of Ajzen, Schwartz, and Triandis" (Bamberg and Schmidt, 2003), " Short-term planning and policy interventions to promote cycling in urban centers: Findings from a commute mode choice analysis in Barcelona, Spain" (Braun et al, 2016), and "Exploring the relationship between undergraduate education and sustainable transport attitudes"

(Kim, Schmöcker and Fujii, 2016), examined the travel habits of a population using the method of descriptive questionnaires. These studies provide support as to why we are conducting our study and provide a framework for formulating our research tool.

3.3 Data analysis

This survey was descriptive and opinion based in nature, however questions were close-ended. The results were visually presented using pie charts and the data was interpreted using the percentage of each response to each question. Conclusions were drawn from comparing specific responses to certain questions. The data collected by the survey was exported directly to Microsoft excel which was the program used to perform all statistical analysis.

3.4 Reliability and validity concerns

Reliability of this survey presents some challenges, as responses are completely anonymous and survey participation was entirely voluntary. Based on the voluntary and non-probabilistic nature of the sampling there were no controls in place to assure that students participating in the research were not overly representative of specific majors or social groups, skewing the results. Additionally, the anonymous nature of the survey means students are not accountable for their responses, a factor which could allow for inaccurate or false self-reporting. While we took care in writing the survey questions to avoid normative phrasing, there is still a risk that students could have over-reported their own more sustainable behaviors while under-reporting less sustainable transportation behaviors, due to respondent biases.

The validity of this study was limited by the brevity of the survey used for information gathering. While we created a survey tool which touched on all major methods of student commuting (car, bus, bike, walking), a more in depth survey could provide stronger data and a more complete answer to the question of what influences student modes of transportation. Despite this limitation in scale, our survey retains validity as all questions related directly to student transportation on campus, examining student habits and self-identification of factors which influence transportation choices. As stated above our survey included questions specifically addressing all major modes of student transportation, leading to data suitable for a reasonably comprehensive analysis of student behavior.

3.5 Limitations and delimitations

This study was limited foremost by time, with only one week available for data collection. Additionally, we were limited by a lack of funding meaning we were restricted to advertisement on free platforms such as social media posts and we could not offer survey participants compensation, factors which may have restricted the total number of participants in our survey. Finally, our sampling procedures were limited as we did not

have access to a complete list of undergraduate students, making all forms of probabilistic sampling unavailable for this study.

Some delimitations we imposed on our survey were our restriction of participants to only undergraduate students. This choice restricted our survey frame to a more unified group which would allow for a more valid and accurate analysis. We also chose the delimitation of a purposefully brief survey, consisting of only 13 questions. This was a choice made to ensure our survey was not overly taxing on participants (especially since no compensation was offered) and to protect against participants becoming discouraged and abandoning the survey before completion. We refrained from collecting personal identifying information on our participants to limit potential ethical concerns. We also limited our study to Dalhousie's Studley campus. This campus was chosen as it is the largest of the three Halifax campuses and one of the main campuses which undergraduates travel to and from. The decision to only consider the Studley campus also helped narrow our research question and study focus. Our final delimitation was to limit our total survey responses to 200. This choice was made in accordance with the outside limitation of a restricted timeframe, as a discrete number of responses will allow for easier analysis after the data collection period. Ultimately we did not achieve this goal, however the responses we were able to collect did yield results we could successfully analyze.

4.0 Results

The survey received 175 responses, three of which were taken out of the analysis since no actual answers to the questions were recorded, therefore the final sample size was $n=172$. The results of the survey found that majority of participants (78.5%) lived off campus (Figure 1, Appendix B), 40% of these students live within a 0-2 km range, followed by 15.9% living 2.1-5km, 6.5% within 5.1-10km, and 19.4% living 10.1 or more km away (Figure 2, Appendix B). The main methods of transportation were walking at 55.2% followed by public transit at 31.4%, and then driving was a small portion of 13.4%, no respondents reported to use biking as a method of transportation (Figure 3, Appendix B).

It was found that distance from campus was one of the main deciding factors of transportation method for most students; 43% reported it was the main influence and 31.4% reported it was a significant influence (Figure 4, Appendix B). Cost of transit was found to have very little influence on choices of transportation method with 45.9% reporting it was no influence and 24.4% reporting that it had minimal influence (Figure 5, Appendix B). Environmental impact was found to have the least amount of influence on student's choice of transportation with 37.8% reporting it had no influence, and 41.9% reporting it has minimal influence (Figure 6, Appendix B). Access to public transit was

the main influence for 9.9% of respondents, and a significant influence for 42.40% of respondents when deciding on their method of transportation (Figure 7, Appendix B).

Students strongly agreed (29.7%), slightly agreed (30.8%), were neutral (14.5%), slightly disagreed (15.10%), and strongly disagreed (9.9%) that information on bus routes and schedules to and from Studley campus is easy and convenient (Figure 8, Appendix B). When asked if there were enough bike resources on Studley campus 52.3% reported they were neutral on this topic (Figure 9, Appendix B). When asked their scale of agreement on their awareness of services offered at Dalhousie such as the Dal bike centre, car share, and student parking, 39% of students reported that they slightly agreed, followed by 25.6% reporting they slightly disagreed, the next highest percentage of respondents was 13.4% reporting they strongly disagreed (Figure 10, Appendix B).

Students were asked how much they spent on transportation in an average week, 44.8% reported they spend 0\$, and 25.6% reported they spent between 0\$-10 (Figure 11, Appendix B). This question was followed by asking if the students' preferred method of transportation would change if the economic impact on them was reduced, out of 172 responses only 30.2% reported yes, while 41.3% said it was no applicable, and 28.5% said no it would not change (Figure 12, Appendix B). The final question asked whether or not students thought there were enough parking spaces on the Dalhousie Studley campus; 53.8% of respondents strongly disagreed, reporting there are not enough available parking spaces (Figure 13, Appendix B).

5.0 Discussion

5.1 Summary of research question.

The aim of this study was to identify what key factors influence undergraduate students' transportation choices to and from Dalhousie's Studley campus. This study examined factors such as economics, distance from campus, access to public transportation and environmental impacts, and how these factors influence student behaviours. To answer this question, we developed an online survey tool, polling student attitudes and habits regarding transportation to and from campus. Based on students' self-reported transportation preferences we hoped to gain a more complete understanding of student environmental impacts as well as to identify areas of dissatisfaction and ways in which campus transit can be improved.

5.2 Significant Findings

It was found that students do not consider environmental impact an important factor in making transportation choices (Figure 6, Appendix B). This could be explained by lack of awareness or because majority of students walk or take public transit, therefore environmental impact does not cross their mind. Since the distance which

students must travel to and from campus was found to be mainly between 0 km and 10km (Figure 2, Appendix B), may help explain why a majority of students walk or take transit. These results are consistent with a sustainability survey conducted by Dalhousie in 2014, which also showed the majority of students live between 0km and 10km from campus and the majority also walk or take transit (Hafezi & Habib, 2015).

No respondents reported that they bike to school (Figure 3, Appendix B), this result coincides with the result found when asked if there were enough bike resources, majority reported neutral (Figure 9, Appendix B), most likely because it did not apply to them. Relatively low usage of bicycles is consistent with similar studies conducted on sustainable transportation methods at Kent State University (Kaplan, 2015). Evergreen State University, where 80% of students commute, remedies this by providing secure locations for storage of belonging, bags and bikes, as well as private showers for commuters (York, 2008).

The result of whether or not the cost of transit was an influence on choices (Figure 5, Appendix B) is consistent with the results found on how much money was spent on a weekly average for transportation (Figure 11, Appendix B), and whether or not the reduction in economic impact would cause a change in transportation choice (Figure 12, Appendix B). These results could be explained by the student U-pass which is included in all full-time Dalhousie students' tuition, therefore public transit does not cost extra, and walking does not cost anything; the main method of transportation reported. Students are unsure in their awareness of transportation alternatives available to them on campus (Halifax car share, the Dal bike centre) (Figure 10, Appendix B), indicating that there is room for improvement on creating awareness of these services. Students also reported that there are not enough parking spaces available to them, which could also explain the main methods of transportation found in this study.

5.3 Considerations of findings in light of current research

This study addressed the knowledge gap regarding student transportation on Dalhousie's Studley campus. The study particularly addresses the lack of consideration of student transportation behaviors and the capacity for using such information to promote sustainable behavior. The current guidelines for active transportation on Dalhousie campus do not address student transportation behavioral patterns, but only considers technical standards for active transportation measures on campus, such as types of bike racks (Dalhousie University, 2015). This study therefore provides a base upon which current campus active transportation guidelines may be enhanced through analysis and consideration of how students are responding to and using provided services.

Our results regarding 'environmental impact' influencing transportation choice raise some concern as over 50% of students said it had little or no influence on their transportation choice and this may make it difficult to change student behaviours. A

study conducted by Li, Tan & Rackes in 2015 demonstrated that 98% of Chinese students agreed climate change was mainly due to human activities and 98% also wanted to take action to reduce energy use and carbon emissions. This is inconsistent with our results as they indicate Dalhousie students either do not care or that they are simply unaware of alternative methods available to them, as discussed earlier. To potentially help change student attitudes regarding their environmental impact, Dalhousie may consider implementing a personal carbon footprint calculator on their website, such as the one used by Li, Tan & Rackes (2015) in their study. This would allow students to consider how not only their transportation choice contributes to their personal carbon footprint, but also consider how their water consumption habits and food choices contribute as well. Finally, implementing such a tool may change the attitudes of students regarding the environment and Dalhousie could help influence students to make more sustainable choices.

Students who responded to our survey reported that they mostly walked, drove or took transit to and from Studley Campus. However, no respondents reported that they biked and most felt neutral about the bike services available on campus. Before conducting our study, we looked at a study by Ji, Cherry, Han & Jordan (2014) regarding a bike share program on a university campus in Tennessee. The study discusses how electric bikes are becoming more popular and how they implemented a pilot e-bike sharing program on the University of Tennessee-Knoxville (Ji, Cherry, Han & Jordan, 2014). Based on our survey results it would likely be difficult to implement a similar program at Dalhousie currently. Before a program such as this were to be implemented, our results suggest improvements need to be made in the current programs and services offered at Dalhousie. Some of these improvements could include an annual awareness campaign advertising the sustainable transport options that are available to students, such as the Dalhousie bike Centre and the Halifax car share program, or including information packages regarding transportation options in orientation week kits to ensure incoming students are aware of the services on campus. These potential improvements could influence a positive change in existing students' transportation behaviours, create lasting sustainable transportation choices with incoming students, and eventually lead to the potential implication of a bike share program at Dalhousie University.

Finally, survey respondents demonstrated that they generally lack awareness regarding transportation alternatives (Halifax Car Share, the Dalhousie Bike Centre, etc.) available to them. This lack of awareness is likely a significant factor in Student's primary mode of transportation to and from the Studley campus. Although many students do walk, those that drive may choose to drive less if they were more aware of alternative services available to them. Transportation has a large environmental impact on college and university campuses, however, universities also have the power to take on leadership role and promote more sustainable practices (Balsas, 2003). To create a more sustainable university campus, efforts such as improving facilities, promotion, education and enforcement (Balsas, 2003). These are key factors which we have also

identified as being important to creating a positive change in students' attitudes regarding transportation to and from the Studley campus.

6.0 Conclusion

In conclusion, our study may provide a base for future research in identifying those factors most influential to student transportation decisions, and highlighting the need for greater awareness of transportation services and environmental consideration of transportation impacts. Limitations to our study, in the form of limited time and resources, did not allow for the further exploration of the trend of influence of environmental impacts as noted by respondents. Additionally, given available time and resources, our study focused on transportation behaviors on Dalhousie's Studley Campus, and did not consider those factors influence student decision making for transportation to other campuses such as Sexton Campus or the Agricultural Campus in Truro. In future studies we would recommend inclusion of all Dalhousie Campuses in order to obtain a greater understanding of factors influencing transportation for Dalhousie University as a whole.

Through our study we discovered that majority of our respondents did not identify environmental concerns as an influencing factor in transportation decision making. This trend may be due to majority of respondents living within 2km of campus and using walking as their main method of transportation to and from campus. However, we see this trend as an opportunity for engagement of Dalhousie students in sustainable transportation initiatives. Given more time we would seek to conduct a focused study specifically on the trend of lack of environmental influence in transportation decision making, in order to identify why the trend is occurring. We would recommend that the Dalhousie administration explore this topic further, using the findings of our study as a base upon which greater sustainability on campus may be encouraged, and student transportation needs may be adequately addressed.

7.0 Acknowledgments

We would like to thank all participants who took time to complete the transportation survey and provide us to usable data for analysis. Thank you to our Professor, Chris Greene, for giving us the opportunity to create a meaningful and useful project. Thank you to our teaching assistant, Navya Pandit, for guiding us through the proposal and analysis of our project, providing valuable feedback and answering all our questions. We would also like to thank Professor Georgia Klein for sharing our survey with her students, helping us gain a greater number of survey respondents.

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Appendix A-Survey Questions

1. Do you live on campus or off campus?
 - On campus
 - Off campus
2. If you live off campus, how far from campus do you live?
 - 0-2km
 - 2.1-5km
 - 5.1-10km
 - 10.1+km
 - Not applicable (live on campus)
3. What is your main method of commuting to and from campus?
 - Walking
 - Public transit
 - Driving
 - Biking
 - Other (please specify)
4. Indicate on a scale how much the following factor influences your transportation choice: Distance from Campus
 - Does not influence
 - Has a minimal influence
 - Has a significant influence
 - Is the main influence
5. Indicate on a scale how much the following factor influences your transportation choice: Cost of transit
 - Does not influence
 - Has a minimal influence
 - Has a significant influence
 - Is the main influence
6. Indicate on a scale how much the following factor influences your transportation choice: Environmental Impact
 - Does not influence
 - Has a minimal influence
 - Has a significant influence
 - Is the main influence
7. Indicate on a scale how much the following factor influences your transportation choice: Access to Public Transit
 - Does not influence

- Has a minimal influence
 - Has a significant influence
 - Is the main influence
8. Rate your agreement with the following statement: It is easy and convenient to access information on bus routes and schedules to and from Studley campus
- Strongly disagree
 - Slightly disagree
 - Neutral
 - Slightly agree
 - Strongly agree
9. Rate your agreement with the following statement: There are enough bike resources on Studley campus
- Strongly disagree
 - Slightly disagree
 - Neutral
 - Slightly agree
 - Strongly agree
10. Rate your agreement with the following statement: I am aware of the transportation services offered by Dalhousie University (Dal bike centre, Car Share, Student parking)
- Strongly disagree
 - Slightly disagree
 - Neutral
 - Slightly agree
 - Strongly agree
11. How much do you spend on transportation in an average week?
- \$0
 - \$0-10
 - \$10.01-15
 - \$15.01-20
 - \$20.01-25
 - \$25.01+
12. Would your preferred method of transportation change if their economic impact upon you was reduced?
- Yes
 - Not applicable (no economic impact)
 - No
13. Rate your agreement with the following statement: There are enough parking spaces available on Studley campus

- Strongly disagree
- Slightly disagree
- Neutral
- Slightly agree
- Strongly agree

Appendix B

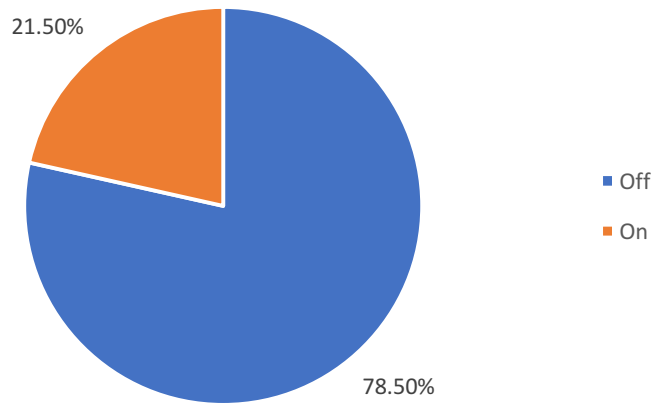


Figure 1 Pie chart illustrating the percentage of responses to the survey question "do you live on or off campus?". Sample size n=172, Survey conducted at Dalhousie University in 2017 by students of ENV5/SUST 3502.

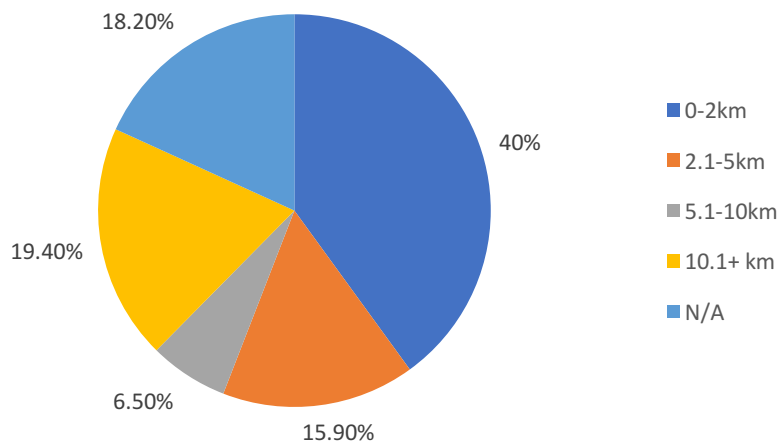


Figure 2 Pie chart illustrating the percentage of responses to the survey question "If you live off campus, how far from campus do you live?". Sample size n=172, Survey conducted at Dalhousie University in 2017 by students of ENV5/SUST 3502.

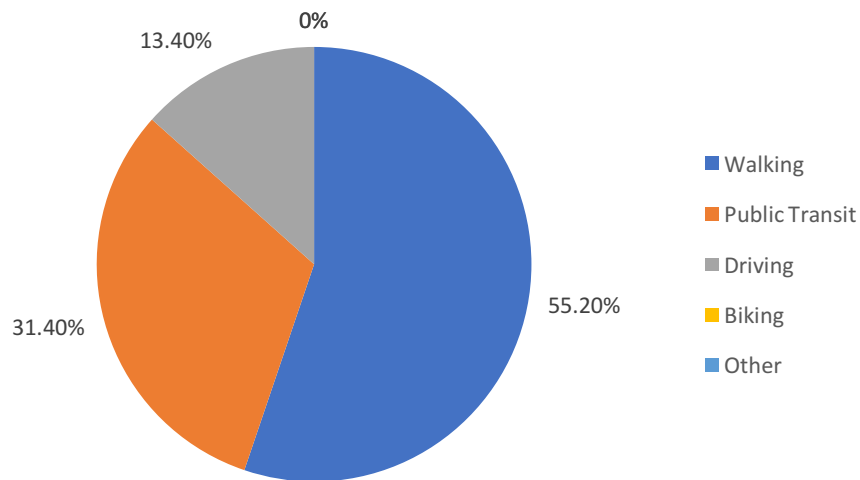


Figure 3 Pie chart illustrating the percentage of responses to the survey question “What is your main method of commuting to and from campus?”. Sample size n=172, Survey conducted at Dalhousie University in 2017 by students of ENV5/SUST 3502.

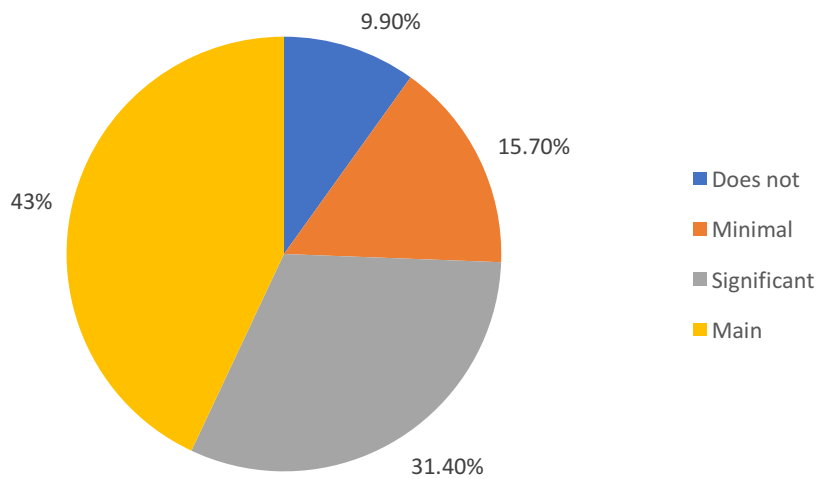


Figure 4 Pie chart illustrating the percentage of responses to the survey question “Indicate on a scale how much the following factor influences your transportation choice: Distance from campus”. Sample size n=172, Survey conducted at Dalhousie University in 2017 by students of ENV5/SUST 3502.

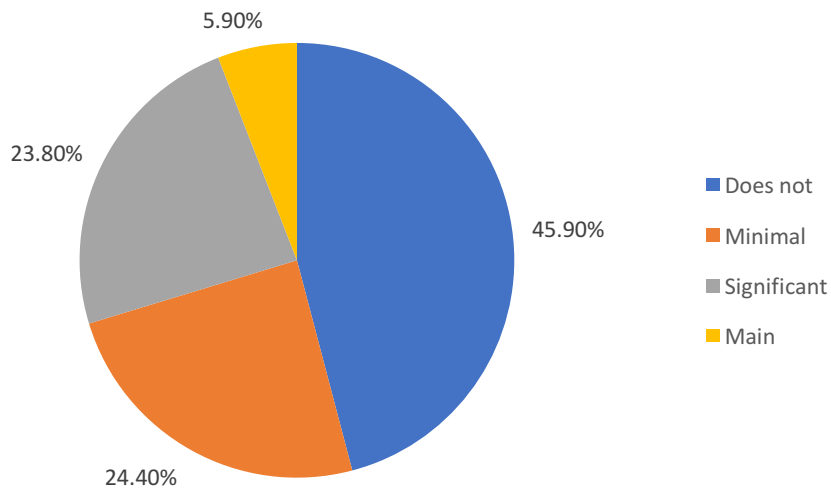


Figure 5 Pie chart illustrating the percentage of responses to the survey question “Indicate on a scale how much the following factor influences your transportation choice: Cost of transit”. Sample size n=172, Survey conducted at Dalhousie University in 2017 by students of ENVS/SUST 3502.

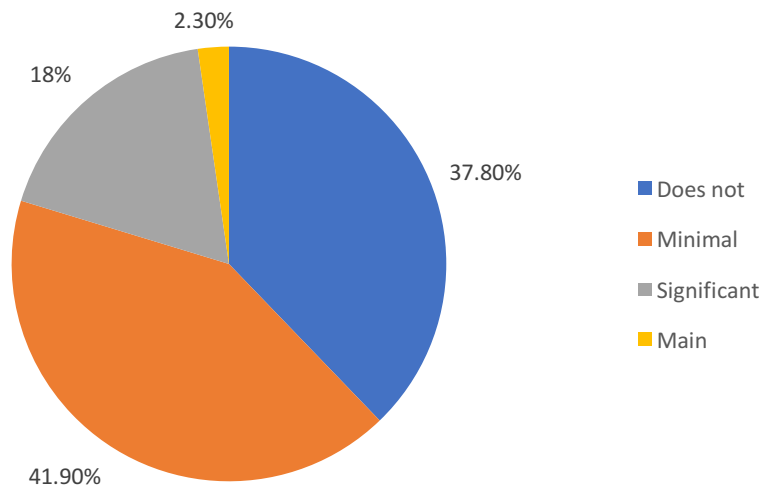


Figure 6 Pie chart illustrating the percentage of responses to the survey question “Indicate on a scale how much the following factor influences your transportation choice: Environment impact”. Sample size n=172, Survey conducted at Dalhousie University in 2017 by students of ENVS/SUST 3502.

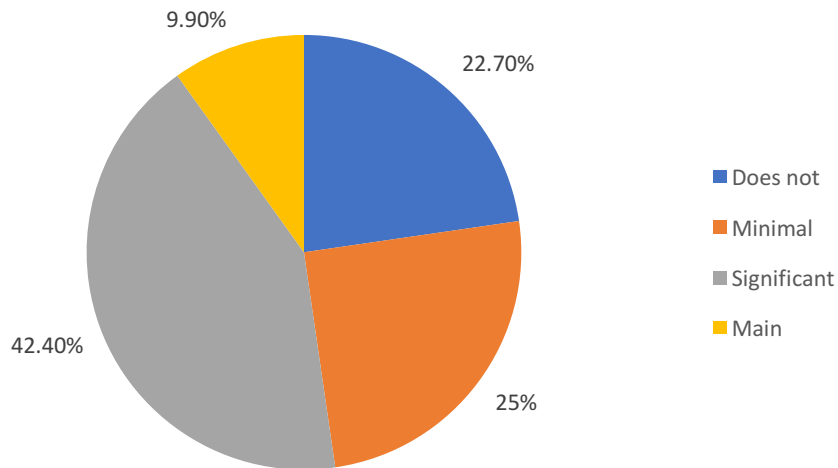


Figure 7 Pie chart illustrating the percentage of responses to the survey question “Indicate on a scale how much the following factor influences your transportation choice: Access to public transit”. Sample size n=172, Survey conducted at Dalhousie University in 2017 by students of ENVS/SUST 3502.

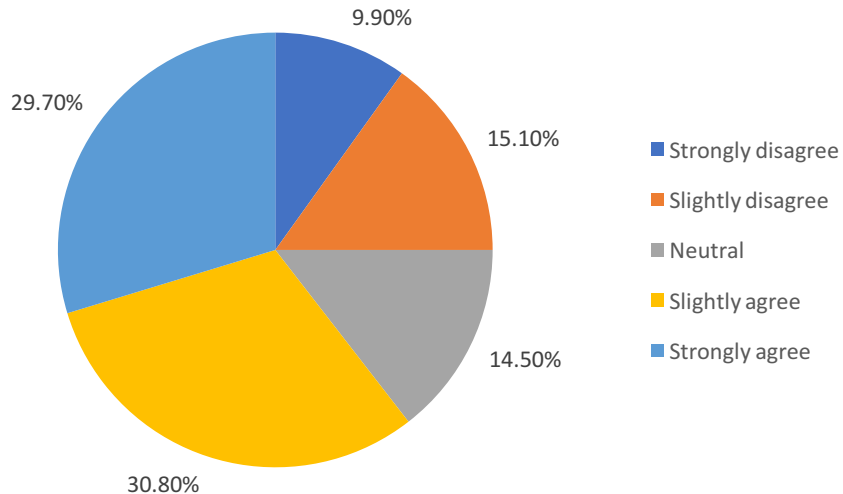


Figure 8 Pie chart illustrating the percentage of responses to the survey question “Rate your agreement with the following statement: It is easy and convenient to access information on bus routes and schedules to and from Studley campus”. Sample size n=172, Survey conducted at Dalhousie University in 2017 by students of ENVS/SUST 3502.

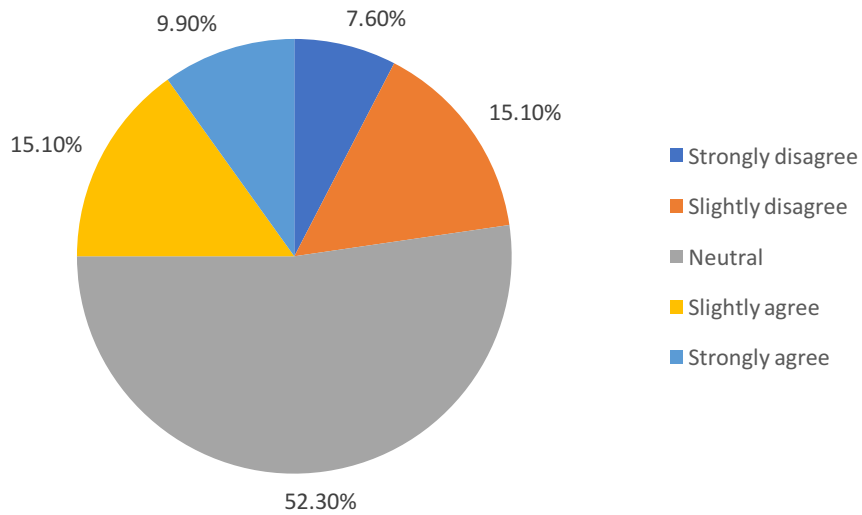


Figure 9 Pie chart illustrating the percentage of responses to the survey question “Rate your agreement with the following statement: There are enough bike resources on Studley campus”. Sample size n=172, Survey conducted at Dalhousie University in 2017 by students of ENVS/SUST 3502.

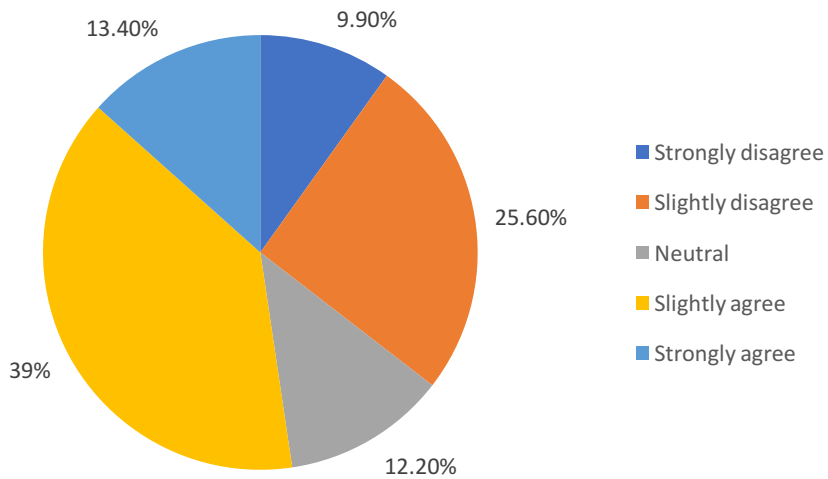


Figure 10 Pie chart illustrating the percentage of responses to the survey question “Rate your agreement with the following statement: I am aware of the transportation services offered by

Dalhousie University (Dal bike centre, car share, student parking)". Sample size n=172, Survey conducted at Dalhousie University in 2017 by students of ENV5/SUST 3502.

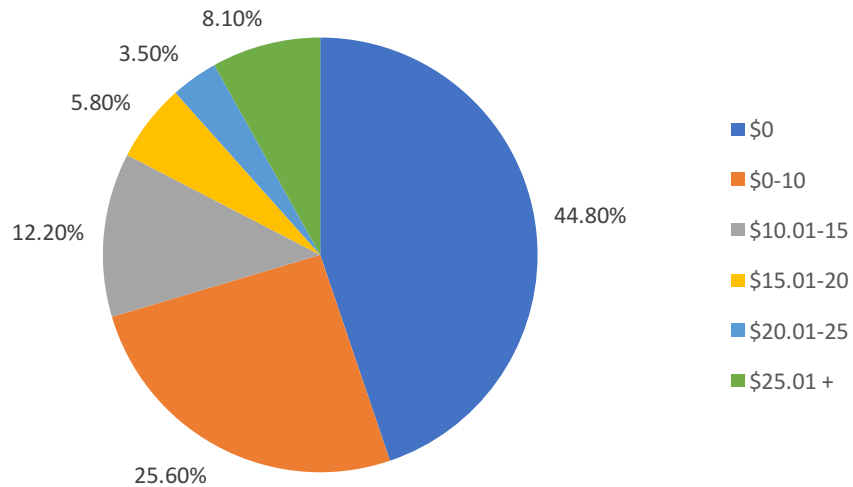


Figure 11 Pie chart illustrating the percentage of responses to the survey question "How much do you spend on transportation in an average week?". Sample size n=172, Survey conducted at Dalhousie University in 2017 by students of ENV5/SUST 3502.

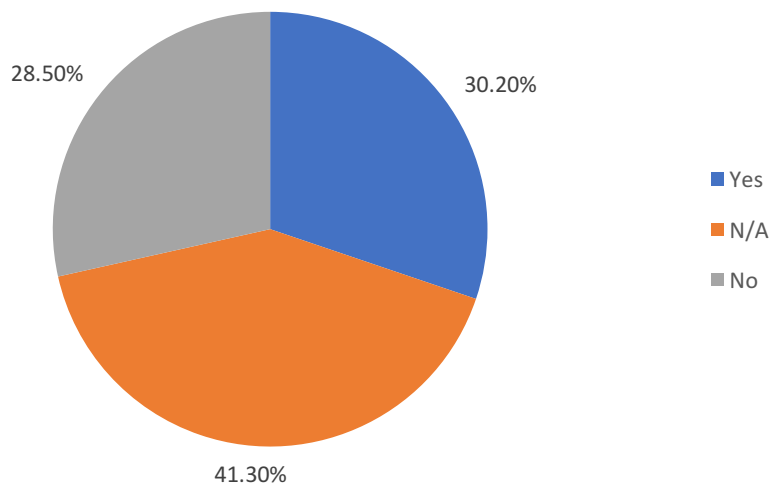


Figure 12 Pie chart illustrating the percentage of responses to the survey question "Would your preferred method of transportation change if their economic impact upon you was

reduced?”. Sample size n=172, Survey conducted at Dalhousie University in 2017 by students of ENVS/SUST 3502.

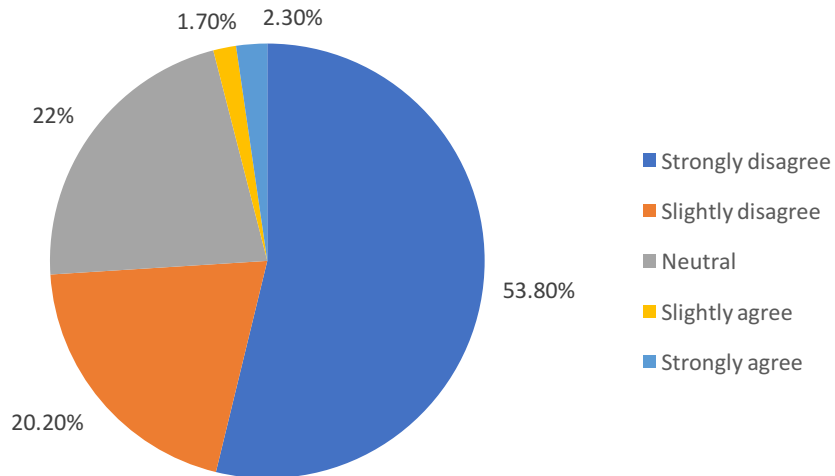


Figure 13 Pie chart illustrating the percentage of responses to the survey question “Rate your agreement with the following statement: There are enough parking spaces available on Studley campus”. Sample size n=172, Survey conducted at Dalhousie University in 2017 by students of ENVS/SUST 3502