

2010

Summary of the McMaster
Transportation Survey –
Walkable and Cycleable Areas



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Introduction/Overview

The Survey

In order to obtain information pertaining to the mode choices of the staff, faculty, and students who commute to and from the campus a survey was designed by Dr. Antonio Páez, and with the assistance of the Office of Sustainability the survey was emailed to the staff, faculty, and students who attend the university. The survey was sent to members of McMaster University in the fall of 2010. There were 5652 respondents for the survey.

The survey looked at people who commuted to and from nine McMaster University locations including: the main campus, Innovation Park, the Downtown Centre, the Frid Building, Henderson Hospital, Chedoke Hospital, St. Joseph's Hospital, the General Hospital, and the Ron Joyce Centre, with an option to choose "Other" if the respondent did not commute to one of the mentioned places. However, for this report, only the respondents commuting to the main campus were analyzed.

The respondents were asked demographic information, such as age, postal code, gender, whether they were full-time or part-time staff, faculty, or students, their level of study (if students), the department they work in or faculty they are part of, to name a few. The respondents were then asked to respond to questions pertaining to their specific mode choice for commuting, i.e. the in vehicle travel times, the wait times, etc. The respondents were then asked to rate 37 different attitudes on a five-point scale (strongly agree/enjoy to strongly disagree/dislike).

The Need to Alter our Means of Travel

Climate change is an issue, as Karl and Trenberth (2003) point out in Modern Global Climate Change, that greenhouse gases (GHG) have incredibly long atmospheric lifetimes, and these combusted fuels act as shields and block the heat leaving the earth and cause it to be pushed back towards the earth, causing the global warming effect. The concern of climate change was addressed within the Kyoto Protocol through setting emission related targets to assist countries in reducing their GHG emissions (Cosgrove, 2009).

Fuelled transport vehicles are a main cause of GHG emissions (Ferris *et al.*, 2007), in 2001, there was roughly 800 million metric tonnes of CO_{2e} emitted from the production of motor vehicles (Hertwich and Peters, 2009). Vehicles are not sustainable because they do not have the advancement in technology to allow them to reduce their GHG emissions to sustainable levels, the there is still the need to limit demand and attempt to shift mode choice (Hertwich & Peters, 2009). If people continue to commute in single occupancy vehicles (SOV) there will be no reducing the amount of GHGs and the resulting problems from having GHG in the atmosphere will exist for generations to come. This is a multi-level problem, it occurs at a personal level (what an individual creates in their personal life), industry and institutional level (what is created by and because of the industry and institution), government level (mandates that are created to manage levels of GHGs produced).

McMaster can play a role in reducing their carbon emissions by promoting members of the university to commute in ways that create the least amount of emissions possible. In order to do this, there needs to be an understanding of why people who live in areas where they can walk or cycle, take transit, or carpool are not making these mode choices, but instead prefer to travel

alone to the campus. By McMaster promoting greener mode choices, they can be an example for other institutions and businesses to start trying to reduce their GHG emissions as well.

What is a Carbon Footprint?

“The carbon footprint is a measure of the exclusive total amount of carbon dioxide emissions that is directly and indirectly caused by an activity or is accumulated over the life stages of a product” (Wiedmann & Minx, 2008). The definition includes who creates the emissions (businesses, governments, individuals, etc.), what will be measured (direct and indirect CO₂ emissions), and when (during a specific activity such as driving or the manufacturing of a product—from raw material to finished product) (Wiedmann & Minx, 2008). The World Resources Institute (Bokowski *et al.*, 2007) states that when institutions calculate their footprint they should look at these three scopes:

- Scope 1:** Direct Control Emissions—these can be affected by the institution through policies put into place by the administration.
- Scope 2:** Electricity Emissions—which are used by the institution, but are generated off the premise
- Scope 3:** Indirect Emissions—that are caused by the institution, but it has no power over it

This survey fits under the third scope, since the university can only influence the mode choices of the different people commuting to the campus.

What Are Cycleable and Walkable Areas?

Walkable Area

Within the City of Hamilton’s Transportation Master Plan: Policy Paper 22 states that a walkable distance is two kilometres from the destination and if the individual’s house is within this area, they live within a walkable distance, this data was obtained from the 1996 Transportation Tomorrow Survey (Stantec, 2005). A buffer was created around the main campus

for McMaster with a radius of two kilometres, using a geographical information systems (GIS) package called ArcGIS and all of the respondents who live within this area were included. Their responses were then studied based off the understanding that they live within a two-kilometre distance, which enables them to walk to the campus as a main mode of travel.

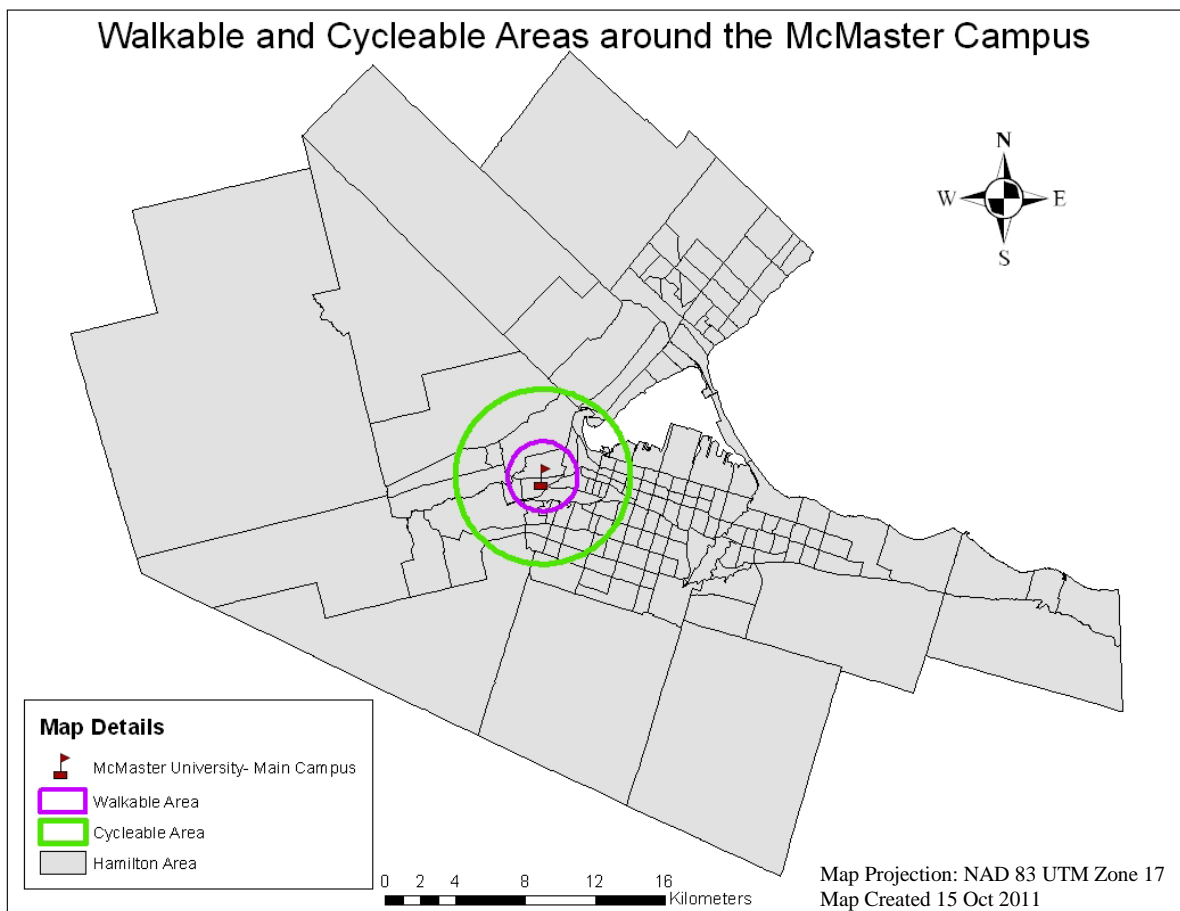


Figure 1: map of the location of the McMaster main campus and the buffer areas for walkable and cycleable distances from the campus

Cycleable Area

Within the City of Hamilton's Transportation Master Plan: Policy Paper 22 states that a cycleable distance is five kilometres from the destination and if the individual's house is within this area, they live within a cycleable distance, this data was obtained from the 1996 Transportation Tomorrow Survey (Stantec, 2005). A buffer was created around the main campus for McMaster with a radius of five kilometres using GIS and all of the respondents who live

within this area were included. The respondents' answers to the survey were studied keeping in mind that they live within a five-kilometre distance of the campus and could cycle to the campus as a main mode of transportation. However, not all of the respondents own bicycles, which could prevent them from using this form of transportation.

Areas Studied and Methods

The McMaster Transportation Survey (created by Dr. Antonio Páez and the Office of Sustainability) was distributed via email to staff, students, and faculty in September 2010. The respondents commute to a number of different McMaster locations, including the McMaster Downtown Centre, the McMaster Innovation Centre, and the Ron Joyce Centre in Burlington, to name a few, however the respondent level was the most significant for the McMaster main campus located at 1280 Main Street West, in Hamilton, Ontario. There were 5,652 respondents, after cleaning the data, and removal of all staff, students, and faculty who do not commute to the main campus were removed the working total was 3,974.

Table 1: Number of Respondents used for Survey Analysis Report

Category	Sample Population
Total Respondents	5652
Total Main Campus Respondents (after removal of errors and incomplete surveys)	3974
Total Main Campus Respondents (after wrong postal code removal)	3936
Total Main Campus Walkable Area Respondents	1333
Total Main Campus Cycleable Area Respondents	2145

Buffers were then created to determine the walkable and cycleable areas around the campus. As stated earlier, two kilometres were used as the radius for the walkable area and five kilometres were used as the radius for the cycleable area. Once the respondents were plotted, and the ones who fell into these areas were selected and used to generate the report for the responses of those whom live in the walkable area and cycleable area of the main campus.

Modal Split

What are the Modes of Choice?

There are four different modes, which will be presented in this report; they include walking, cycling, transit, and car. The transit contains users who stated that they used HSR (Hamilton Street Railway) or GO Transit (regional transit run by Metrolinx—part of the Ontario government) for their trips, however HSR was the main mode choice for transit since the respondents discussed in this report are within a walkable and/or cycleable range of the campus. For the car, this could include any form of personal vehicle used by the respondent to travel to the campus; they were given the choice of sub-compact, compact, intermediate, standard, full size, SUV (sports utility vehicle), minivan, or truck, when responding to the survey. They will all be generalized for the purpose of this report under car. When any calculations were completed, they were generalized under the Corporate Average Fuel Consumption (CAFC) for Canadian passenger vehicles (Transport Canada, 2011). The people who responded that they used a truck to commute will be generalized under this standard as well since a number of respondents stated that they used a couple of different vehicles to commute and this will allow for a simple calculated response.

Main Campus Modal Split

Firstly, the modal choice of all of the respondents who commute to the main campus was observed. In Figure 2, it can be noted that 35% of the respondents commuted via personal vehicle to the campus, with transit users coming up in a close second with 34%, and walking and cycling was chosen by 31% of the respondents. This means that roughly two thirds of the university commuters (based on the respondents of the survey) create emissions when they travel to the campus. Of the people who responded to the survey, 54% live with a cycleable area of the

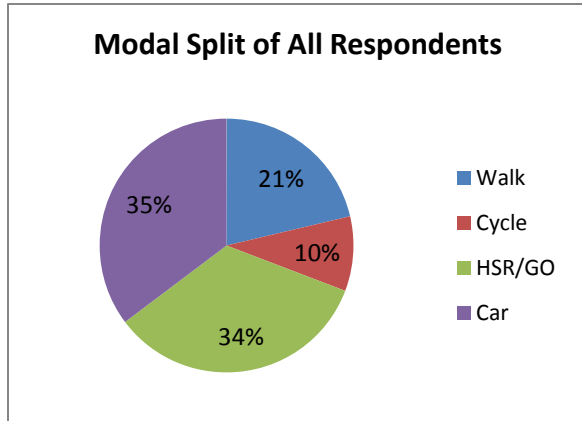


Figure 2: percentage of respondents who chose one of the four modes of transportation to commute to the main campus

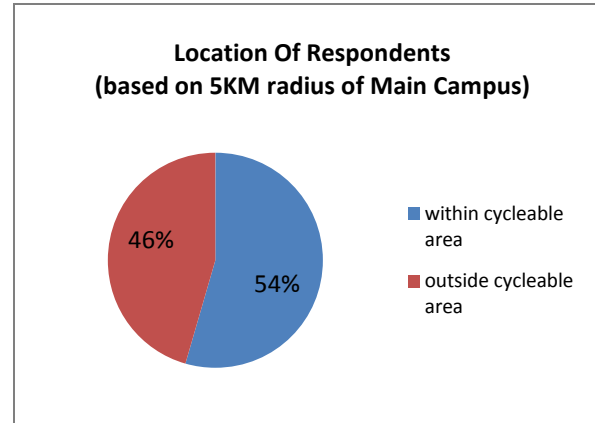


Figure 3: percentage of respondents living in and outside of a 5 km radius of the main campus

campus, meaning that there are 23% of the respondents could reduce their emissions through cycling. Later in the report, the attitudes of the respondents towards different mode choices will be discussed and ways to increase cycling and walking of local commuters will be described.

Staff/ Faculty Compared to the Students

There could be an assumption that the mode choices differ between the faculty and the students. In Figure 4, when the percentage of people who chose each mode are compared between staff/faculty and students there are a few observations made. There were more students who chose walking and taking public transit than staff/faculty. The percentage of staff/faculty that chose cycling to commute was slightly higher than the percentage of students. Finally, the percentage of staff/faculty that chose to drive was significantly higher than the percentage of students who chose to drive. This does not mean that more faculty and staff are driving to the campus than students are, but that a higher percentage of the staff/faculty portion of the respondents are choosing to drive than the portion of students who responded.

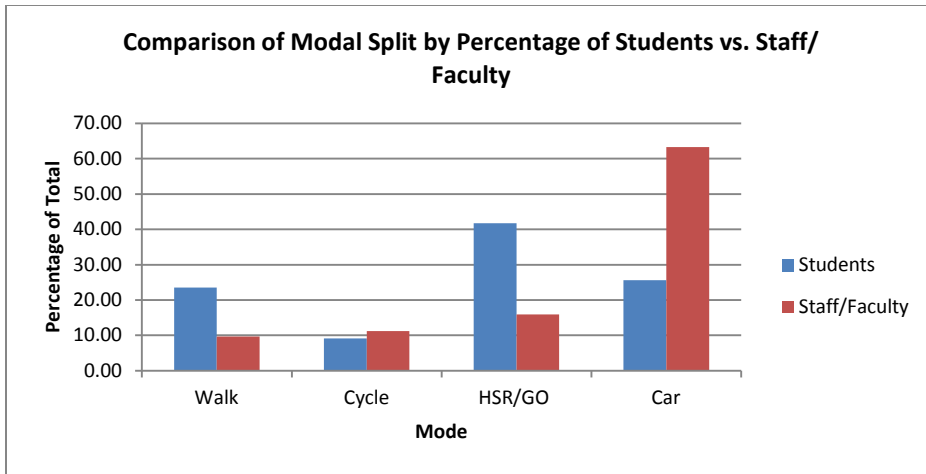


Figure 4: Comparison of modal choice between staff/faculty and students

Walkable Area Modal Split

Demonstrated in Figure 5 below, 6% of people who live in the walkable area are driving. Some of these people may need to go somewhere after they are done working at the campus, and could benefit from purchasing a Flex Pass discussed later. In addition, 22% of the people who responded to the survey are taking public transit when they live very close to the campus.

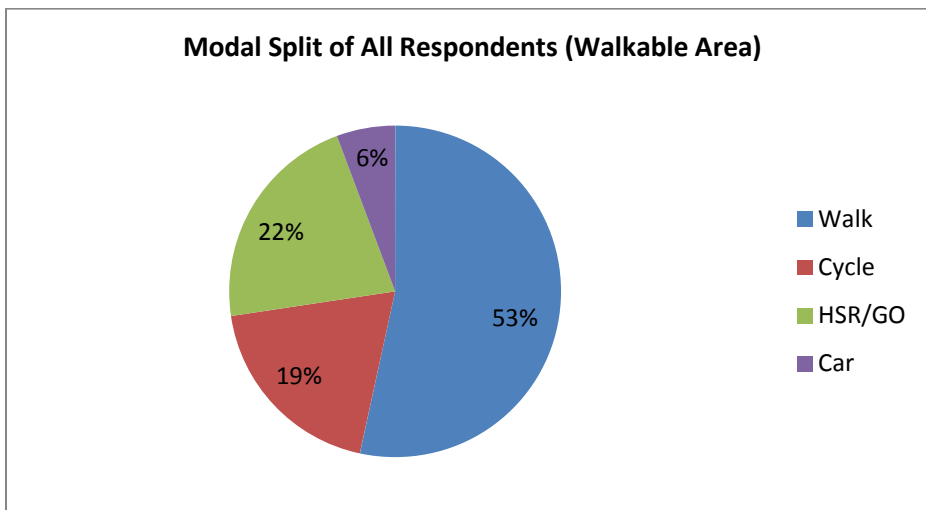


Figure 5: percentage of respondents living in a walkable area of the campus who chose one of the four modes of transportation to commute

Able-bodied people who are catching the bus in these areas can cause the system to slow down unnecessarily because time is wasted by bus drivers asking people to move to the back of

the bus so others can get on the bus (personal experience). This 28% could be reduced by finding ways to encourage the people who live within two kilometres of the campus to walk or cycle.

Staff/ Faculty Compared to the Students

The findings suggest that 15.2% of staff/faculty and 40.5% of student respondents live with a walkable distance from campus; and of those individuals, 7.5% of staff, and 2.3% of students drive to campus every day. There is a high percentage of people who are walking, which is very positive for their health and the health of the environment.

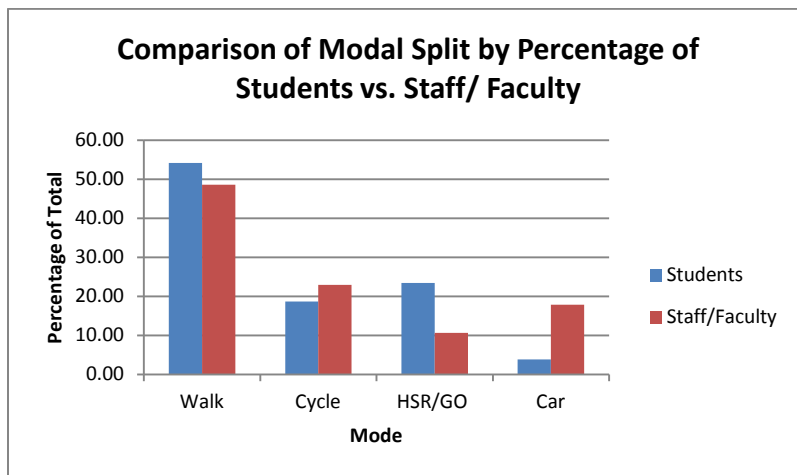


Figure 6: Comparison of modal choice between staff/faculty and students living in a walkable area of the main campus

Cycleable Area Modal Split

People who live within a five-kilometre radius of the main campus of McMaster University are considered to live within a cycleable distance from the campus; therefore, they would be able to cycle to the campus. When looking at the modal split in Figure 7, one can see that 18% of the respondents living within five kilometres of the campus are choosing to drive and 31% of the commuters are taking the bus to the campus.

However, if there some individuals do not own bikes, it will be hard to promote them to cycle to the campus, and individuals living beyond a two-kilometre radius are less likely to walk.

According to the survey responses, 46% of the people living in the five-kilometre radius of the campus, do not own bikes. This could be used as a reason to bring a bike share to the McMaster University area. Bike shares are discussed in the recommendations section of this report.

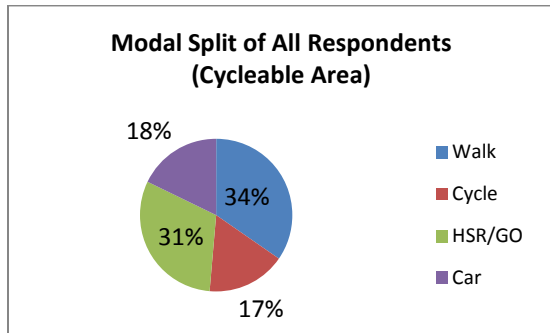


Figure 7: mode choice of respondents living within a 5 km radius of the main campus

It was also noted that of the people who live within the cycleable area of the campus who are choosing to drive (18%), that 56% of them own bikes and have the ability to ride their bike to campus. Possible reasons for people to avoid riding their bikes to school/work could

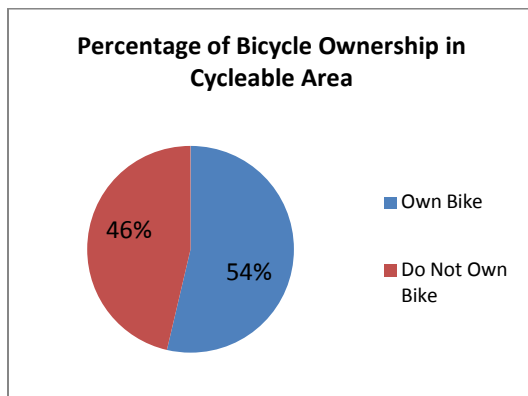


Figure 8: percentage of people who own bikes within a 5 km radius of the main campus

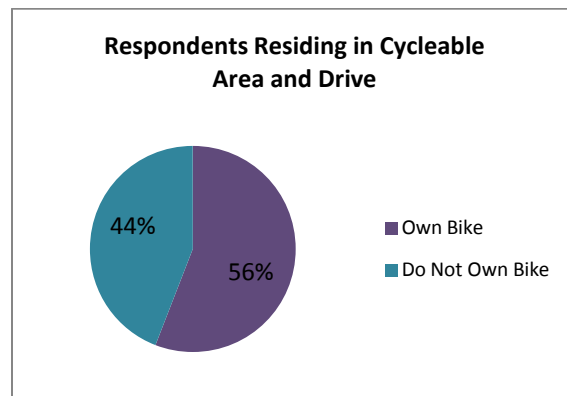


Figure 9: respondents who have the ability to cycle, but are choosing to drive instead

include poor riding conditions (roads in poor repair or not ploughed), safety, comfort, and security (potential to have their bike stolen). McMaster does provide a number of security measures for those worried about bike theft. These include bike lockers and a fenced in bike lock compound.

Staff/ Faculty Compared to the Students

When the staff/faculty were compared to the students, there were similarities in mode choice between the walkable and cycleable areas. For both a higher percentage of students walked and used transit and a higher percentage of staff/faculty rode their bikes and drove. However, in the cycleable area the amount of staff/faculty that chose to drive increased by about 25% with the increased radius of three kilometres. The student portion increased the transit use by about 10% and the car use by about 8% and decreased the bicycle use by roughly 3%. This could demonstrate that even though it is assumed that people are willing to cycle up to five kilometres to commute to work/school, this does not mean that it will always happen and there are determinants, such as lack of bicycle ownership, attitudes, etc., which can contribute to these increases and decreases.

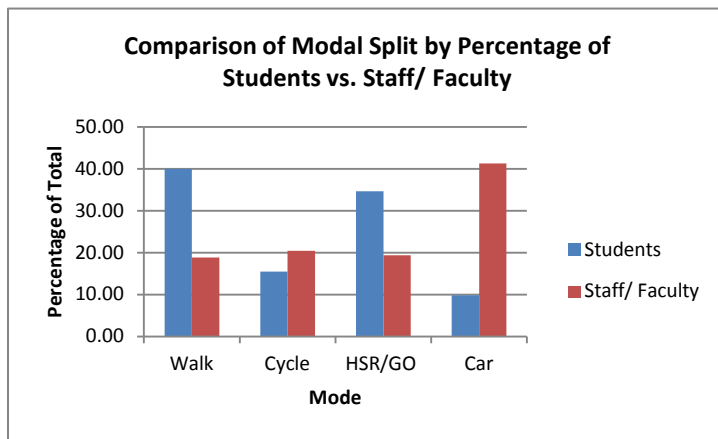


Figure 10: comparison of mode choice between the percentages of staff/faculty and students living in within 5 km of the main campus

Carbon Footprint

Carbon Footprint of McMaster Commuter Emissions

In order to look at the carbon footprint of McMaster the results from the sample survey would need to be related back to all of the members of the university (staff, faculty, and students)

who are commuting to the campus. Universities such as UBC (University of British Columbia) and Simon Fraser University have looked at their commuter emissions as well, their papers can be found under “References and Further Readings”. This analysis will be completed in the future; for the purpose of this paper, a rough analysis was completed. The analysis completed below uses approximations based on the survey when discussing the ‘total number’ of people who use each mode.

Commuter Emissions of the Respondents to the McMaster Transportation Survey

In order to offer an idea of the amount of emissions an individual could create based on their mode choice, the average emissions created per day were calculated for commuters using a car or taking transit. It was assumed that on the average day anyone who commutes to the campus, regardless of the number of days each week the commuter does come to campus, would be commuting (the assumption means that people commuting to campus at least one day a week were included). The following table includes the amount of emissions used when calculating the total emissions created in one day commuting to and from the campus, which is why the formulas in Table 2 were multiplied by two. Since the respondents who chose driving as their mode choice travelled 34,340 km, this can be inserted into the equation for the mode choice for car. Therefore, from the commuters who chose to use their car create roughly 13,520 kg of CO₂ a day.

The transit function has the bus emissions divided by the number of people that could take the bus since it could be assumed that the bus is full. The people commuting via HSR were the only ones used in the transit calculation. There are two types of buses used by the HSR, one bus is articulated (carrying a maximum of approximately 114 people (sitting and standing)), the other bus is roughly 40 feet long (carrying a maximum of approximately 80 people (sitting and

standing)). The articulated bus (60 feet in length) burns 61 L/ 100 km and the 40-foot bus burns 55 L/ 100 km (City of Hamilton). In order to complete the calculation some assumptions were made:

- (1) both buses pass through the campus and contain commuters—therefore the fuel consumption will be averaged;
- (2) both bus types carry commuters to the campus—therefore the bus capacities will be averaged;
- (3) it will be assumed that the buses are full of commuters since there is a varying amount of commuters during the day.

There were 1,410 respondents who chose transit as their mode choice, whom travelled a total of 20,851.7 km. However, approximately 97 people travel on a bus, which means that 11 buses (rounded from 10.3 buses) travel approximately 20.85 km, which totals 229.35 km travelled. The 229.35 km can be inserted into the equation for the mode choice for transit. Therefore, from the commuters who chose to use transit create roughly 354.24 kg of CO₂ per day.

At this time, there was not enough information to determine the emissions of people who are commuting by GO transit to the campus.

Table 2: Calculation of Emissions Produced on an Average Day at McMaster by the Respondents

Mode Choice	Formula	Emissions Produced (kg CO₂)
Walking	---	0
Cycling	---	0
Transit (HSR)	(total distance traveled x [58L/100km***] x [2.663kg CO ₂ /L *]) x 2	354.24
Car	(total distance traveled x [8.6L/100km**] x [2.289kg CO ₂ /L*]) x 2	13,520

* This was obtained from the Mobile Combustion Table from Environment Canada (<http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=AC2B7641-1>)

** This was obtained from Transport Canada’s Fleet Average Goal for Passenger Cars in 2007 (<http://www.tc.gc.ca/eng/programs/environment-fcp-cafctargets-385.htm>)

***This was obtained from averaging values obtained from the Hamilton Street Railway Office (City of Hamilton)

In order to have an idea of what is being produced daily by the entire population of McMaster University, the results in Table 2 were divided by the number of people using each mode. The entire university population was divided by the proportions mentioned under “Modal

Split”. The results from dividing the school by mode choice were then multiplied by the divided results from Table 2. This will give a rough estimate of the emissions produced by the university population on an average day. These results can be found in Table 3 below. Based on the estimated amount of carbon emissions for the commuters, it can be assumed that McMaster has a carbon footprint of 121.68 tonnes of CO₂ produced per day by commuters.

Table 3: Total Emissions of McMaster University by Mode Choice

Mode Choice	Formula	Emissions Produced (kg CO₂)
Walking	$0 \times (0.21 \times 35920)$	0
Cycling	$0 \times (0.1 \times 35920)$	0
Transit (HSR)	$(354.24/1410) \times (0.34 \times 35920)$	3,068.27
Car	$(13520/1433) \times (0.35 \times 35920)$	118,613.71

The totals for students, faculty, and staff found at <http://www.mcmaster.ca/avpira/documents/factbook/FactBook20102011.pdf>

Alternative Modes to use for Commute

According to the survey, 13.9% of staff and 3.8% of student respondents, who live within a walkable and cycleable distance from the main campus, drive to campus every day even though another mode is a viable option.

Walking and Cycling

Of the people who live within a walkable or cycleable area around the main campus, they have the option to walk or cycle opposed to driving or taking the HSR. There are benefits of walking and cycling, it will increase the health of the individual completing the activity and it will reduce carbon emissions, and reduce the strain on the HSR coming into the campus, allowing the HSR to reach stops on time.

For the people who do not feel safe walking or cycling home in the evening, whom live within a 30 minute walking radius of the campus, the MSU (McMaster Student Union) runs a program called S.W.H.A.T. (Student Walk Home Attendant Team), which is a group of

volunteers who will walk people home between the hours of 7 pm to 1 am. There will be two volunteers, one male and one female, who will walk the individual home or around campus.

Transit

Students who live within the City of Hamilton regardless of location have the option to take the HSR to campus. There are a number of bus routes, which run in front of and through the campus at least twice an hour. The buses travelling through the campus include the 1A-King, 5C-Delaware, 5B-Delaware, and the 51-University. The buses, which travel in front of the campus and to the McMaster Hospital, are the 10-Beeline, 5E-Delaware, and the 52-Dundas. Students are able to use their student card from September 1st to April 30th as bus passes since the cost is included in the cost of the tuition. During the summer, reduced cost bus passes are also available to students enrolled in summer school. If an individual is new to an area, they can use the HSR website (City of Hamilton, 2011) or Google Maps to determine the routes they need to take to get from home to work/school or other necessities (www.maps.google.ca). Faculty, however, have the option of purchasing monthly passes or reduced rate tickets (5 tickets for \$10), or they can use PRESTO.

PRESTO is a tap pass designed to be used with transit systems across the GTHA (Greater Toronto and Hamilton Area). It automatically calculates the cost of the trip and only requires the user to load the card with a minimum of \$10 at any time they choose. This program is still in its infancy, however, it does allow people to save money and if they do not use their monthly pass as much as they thought, there is a loss of funds, whereas, the money loaded onto the PRESTO card will carry over, which is a benefit (www.prestocard.ca).

If an individual lives in the GTA, GO Transit is an option to commute to the campus. GO Transit utilizes trains and buses in order to service many locations from Niagara Falls (weekend

service) to Peterborough to Waterloo, and many locations in between. (Map attached in the Appendix.) GO Transit users can purchase ten trip tickets, one trip tickets, day passes, and monthly passes, or they can use PRESTO.

Carpooling

According to the survey, 76% of the respondents commute to campus in a personal vehicle are by themselves, while 24% are carpooling. This means that potentially 76% of the parking lots are filled with cars that took one person to the campus on any given day. The average passenger vehicle can carry up to five passengers including a driver, this means that if those cars were completely full on any given day, there is the potential to reduce the number of vehicles by roughly 61% (this was determined by dividing the total number of respondents who chose SOV for travel by 5).

McMaster University offers carpool options to the university members who choose to drive. In order to qualify for a carpool there must be two or more people who travel together three or more times a week and are willing to commit to carpooling for a minimum of three months (Office of Sustainability, 2008). The cost of the parking permit is divided between the people who commit to the carpool and there is an option to purchase parking vouchers if there are days that they cannot carpool (Office of Sustainability, 2008).

In order to promote carpooling, Smart Commute Hamilton (a segment of Metrolinx) has designed a website to help individuals find people who they can carpool with to the campus. Several times during the year there are contests designed around carpooling and other green mode choices.

Attitudes of Students, Faculty, and Staff

There were a number of questions regarding the attitudes towards different components of travel (i.e. safety, comfort, enjoyment, moods, etc.). In order to observe what the top attitudes were the respondents were divided into groups (transit, pedestrians, cyclists, and drivers [personal vehicle—SOV]) and the total respondents who commute to the main campus. Their responses were then aggregated into a Likert-type scale, which included five categories of “Strongly Disagree/Dislike” to “Strongly Agree / Enjoy”, and these were then sorted and analyzed. This section discusses some of the findings from the survey responses.

Attitudes Commuters Agreed/Enjoyed from Each Mode

The Top Five attitudes (Strongly Agree/Enjoy and Agree/Enjoy) of the respondents who commute to the main campus were:

- (1) people want to have shops and services within a walkable distance of their home (80.8%),
- (2) they feel safe when walking around in their neighbourhood (79.5%),
- (3) they believe a cost-effective solution to air pollution can be found (76.2%),
- (4) personal vehicles are comfortable (74%), and
- (5) enjoy walking and cycling to campus/work (55.7%).

It is surprising that the four of the top five attitudes deal with walking and reducing emissions when 27% of the respondents commute in a personal vehicle. When the attitudes of the people who chose driving as their mode choice were compared, the Top Five Attitudes (Strongly Agree/Enjoy and Agree/Enjoy) were:

- (1) their personal vehicles are comfortable (86.8%),
- (2) they feel safe when walking around in their neighbourhood (85.8%),
- (3) they believe a cost-effective solution to air pollution can be found (73.8%),
- (4) they want to have shops and services within a walkable distance of their home (70%), and
- (5) enjoy travelling in a personal vehicle (67.6%).

Again, it was noted that within the top five attitudes that there was a strong desire for services and shops in a walkable area and the safety while they walk to them, and to reduce the emissions.

When the attitudes of the respondents commuting to the main campus via bicycle were analyzed the Top Five Attitudes (Strongly Agree/ Enjoy) were:

- (1) enjoy walking and cycling (93.2%),
- (2) they want to have shops and services within a walkable distance of their home (88%),
- (3) they feel safe when walking around in their neighbourhood (84.7%),
- (4) they believe a cost-effective solution to air pollution can be found (78.1%),
and
- (5) they limit their auto travel to help improve congestion and the environment (68.3%).

These respondents also wanted to have amenities in walkable distances, this would allow for them to cycle there easily. They also feel that there should be more public transportation and are willing to pay higher taxes to do so; this was 9th with 57.7% of cyclist agreeing. These people could still be using public transportation to commute to grocery stores, clothing, entertainment, etc. and want to have better services or service that is more frequent.

When the attitudes of the respondents commuting to the main campus via walking were analyzed the Top Five attitudes (Strongly Agree/Enjoy and Agree/Enjoy) were:

- (1) they want to have shops and services within a walkable distance of their home (90%),
- (2) enjoy walking and cycling (80.8%),
- (3) they believe a cost-effective solution to air pollution can be found (79.1%),
- (4) they feel safe when walking around in their neighbourhood (76.4%), and
- (5) they find the personal vehicles they travel around in to be comfortable (71.1%).

Pedestrian commuters also want a walkable neighbourhood, which is understandable since their commuting on foot and would be less inclined to do so if they could not feel safe in their neighbourhood. For those who live close to the campus, there are a number of stores located in

the Westdale area, which include a grocery store (Metro), convenience stores, restaurants, bookstores, hobby shops, etc., making the area around McMaster University a pedestrian friendly area. It was unexpected that any of the personal vehicle attitudes would rank within the top five attitudes. This demonstrates that comfort is something that most people are looking for in their commute.

When the attitudes of the respondents commuting to the main campus via transit were analyzed the Top Five attitudes (Strongly Agree/ Enjoy) were:

- (1) enjoy taking GO Transit to work/campus (85.1%),
- (2) they believe a cost-effective solution to air pollution can be found (76.4%),
- (3) they feel safe when walking around in their neighbourhood (73.3%),
- (4) they find the personal vehicles they travel in to be comfortable (65.7%), and
- (5) they believe there is a need for more public transportation, even if taxes have to pay for many of the costs (57.8%).

When looking at the top attitudes of respondents who use transit, it was surprising that the comfort of a personal vehicle ranked. This could have occurred because some of the respondents have access to a vehicle sometimes and enjoy what a personal vehicle has to offer (i.e. comfort, ability to travel where the driver wants to go, etc.). However, these respondents do not drive to the campus, possibly because they do not have vehicle access or parking is expensive, or there is not a lot of parking close enough to campus.

Attitudes the Respondents Disagreed/Disliked from Each Mode

When asked about their attitudes towards travel, there were certain attitudes the respondents strongly disagreed to or disliked. When the responses were aggregated into mode choice of the respondents, there were similarities between attitudes the different groups did not relate to, these are discussed in this section.

When asked if travelling made the respondents nervous, 34.8% of drivers, 37% of cyclists, 32.8% of pedestrians, and 34.9% of transit users stated that this was not true. This means that their mode choice allows them to feel comfortable during their commute.

The attitude “getting stuck in traffic doesn’t bother me too much” was another highly disagreed with statement. There were 33.3% of drivers, 30.5% of cyclists, 29.9% of pedestrians, and 27.5% of transit users strongly disagreed. This demonstrates that no one enjoys being stuck in traffic, mostly because time is important to people and being stuck in traffic can delay people and potentially cause them to be late. Pedestrians would most likely have a chance to experience being stuck in traffic other times aside from their commute to the campus, which is why they were included.

Another attitude dealing with increasing gas prices to reduce congestion and air pollution was not highly liked by auto drivers (42.4%), pedestrians (26.8%), and transit users (26.9%). This attitude fell within the top three least agreeable attitudes, whereas it was the eighth for cyclists. It is understandable why vehicle users would not want gas prices to increase, since it could increase their travelling cost. However, with the increase of the cost of travel, necessary commodities, such as food, need to be delivered, and the increased cost to transport could be reflected in their cost. This could be a reason that pedestrians and cyclists would not want to have this cost increased.

Attitudes of the Respondents Living within a Walkable/Cycleable Distance of the Campus who Drive

The people who live within five kilometres of the main campus have a couple of choices when it comes to mode selection. They could walk (especially if they live within two kilometres), cycle, or take transit. Students receive a reduced cost bus pass during the time they

are in school, so they definitely have the opportunity to take the bus opposed to driving a personal vehicle. In order to have an understanding as to why people who have other options choose to drive their personal vehicles. This could assist in determining ways to advocate walking and cycling to those who live within five kilometres. The following section discusses some of the similarities and differences between the attitudes of people who live within a walkable and cycleable area of the campus, but are driving and the previously mentioned attitudes.

The Top Five Attitudes (Strongly Agree/Enjoy and Agree/Enjoy) for the people who live within two kilometres of the campus and drive are:

- (1) Having shops and services within walking distance of their home is important to them (82.9%)
- (2) The personal vehicles they usually travel in are comfortable (81.6%)
- (3) We can find cost-effective technological solutions to the problem of air pollution (78.9%)
- (4) feel safe and secure when walking in their neighbourhood (75%)
- (5) Enjoy walking and cycling to work/campus (67.1%)

They also enjoyed driving a personal vehicle, which came in 6th for top attitudes with 65%. It seems that these people drive their vehicles based off comfort. They enjoy having walkable neighbourhoods with amenities close by, feel safe, and enjoy walking, however they enjoy being comfortable in a personal vehicle more than they enjoy walking/cycling. When comparing the attitudes to the total for the mode choices (pg. 18-21) of walking and driving it was noted that similarities which included comfort of personal vehicles, feeling safe in their neighbourhoods, wanting to have amenities within walking distance of their homes, and believing that a cost effective technological solution can be found to solve the air pollution problem.

The Top Five Attitudes (Strongly Agree/Enjoy and Agree/Enjoy) for the people who live within five kilometres of the campus and drive are:

- (1) Having shops and services within walking distance of their home is important to them (87.2%)
- (2) We can find cost-effective technological solutions to the problem of air pollution (77.7%)
- (3) They feel safe and secure when walking in their neighbourhood (76.8%)
- (4) Enjoys walking and cycling to work/campus (70.3%)
- (5) The personal vehicles they usually travel in are comfortable (69.8%)

Again, comfort of the personal vehicle is within the top five top attitudes, continuing to prove that comfort during travel is important. Having a safe and walkable neighbourhood with local amenities is also important to the people who are driving when they live within a cycleable distance of the campus. It was interesting to see that these people state that they are willing to limit their auto use to reduce congestion, when they are willing to drive opposed to bicycle or take transit. The assumption that they may be driving other places after they attend McMaster may be the reason for them to drive to the campus.

Parking on Campus

Who is Parking on Campus—Parking Permits

McMaster has several parking lots on the campus and one large parking lot on the West side of Cootes Dr.; this can be seen in Figure 12 below. There are 59.2% of the people driving to the campus own parking permits, according to the survey. There are roughly 40% of respondents parking outside the campus. Some reasons people may not be parking on the campus could be that parking is expensive (flat rate \$20.00 to park in Lots A-I and the Stadium, and \$6.00 for the rest of the lots, compared to free if one is parking off campus) or that it is too far from the central area of campus (Lots K-P).

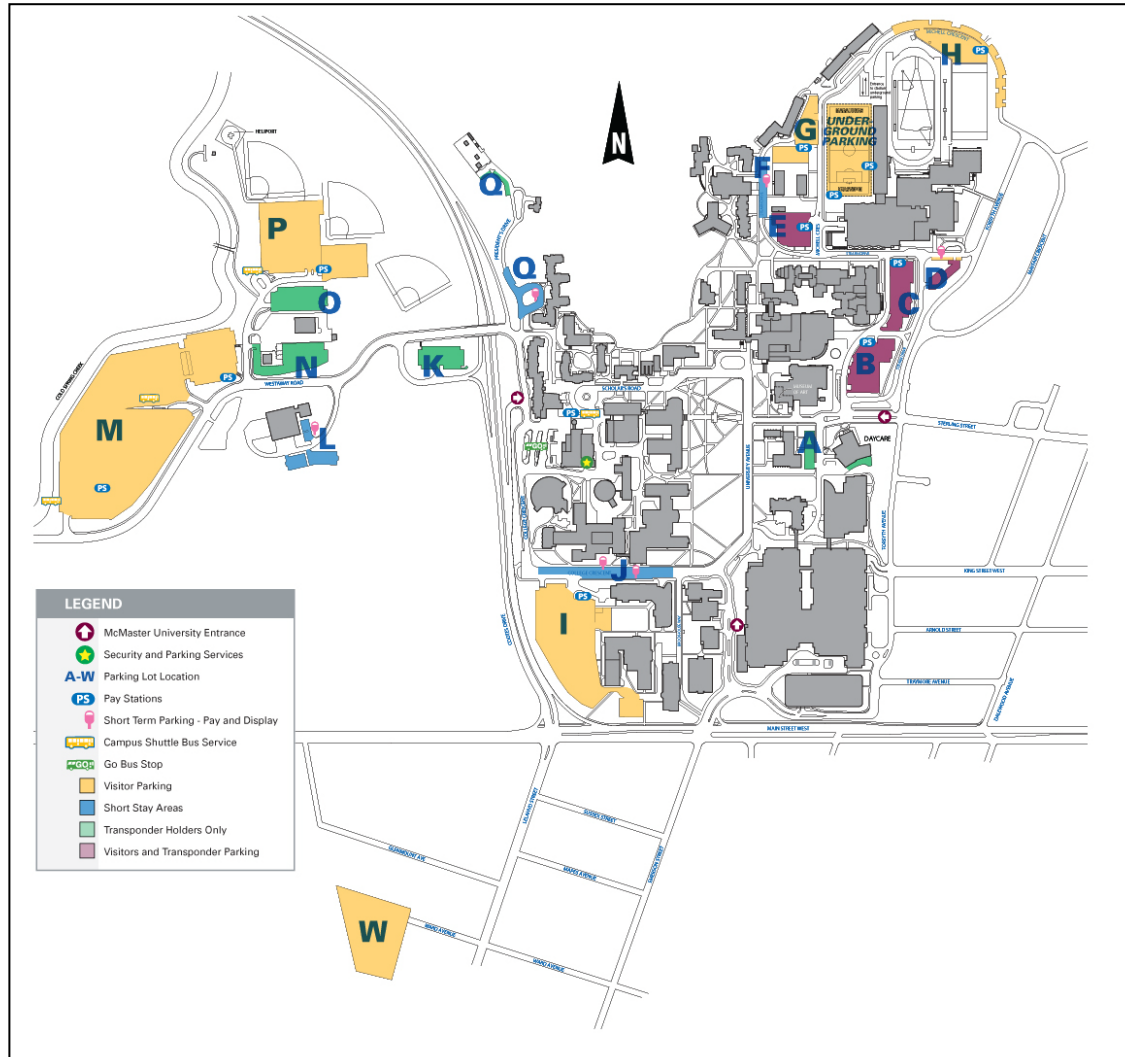


Figure 12: Map of Campus Parking Locations (<http://parking.mcmaster.ca/Map.html>)

When looking at the respondents of the survey who live within a walkable and cycleable distance of the campus, it was determined that 3% and 11% of the people who live in these areas own parking permits, respectively. These people may own parking permits for a number of reasons; however, a few may be that they have other places to go aside from the campus (i.e. grocery shopping, meetings, work, etc.). These people could benefit from the Flex Pass mentioned below, since they could walk and/or cycle to the campus most days and on the select

few days they need to do something on top of going to the campus, they could use their Flex Pass.

Flex Pass—Who could it Benefit?

The Flex Pass is designed as an option to owning permit parking on the campus. An individual can purchase this pass and park on campus ten times, and it can be used over a couple of months (although they do not expire), which can promote commuters to use other modes opposed to an SOV. This will have the most benefit for the people who commute three or less days a week, or people who live within walkable and cycleable areas of the campus and do not need to drive to the campus. Of the respondents to the survey who commute three or less times a week, 55% of them could benefit from the Flex Pass since they are commuting by car.

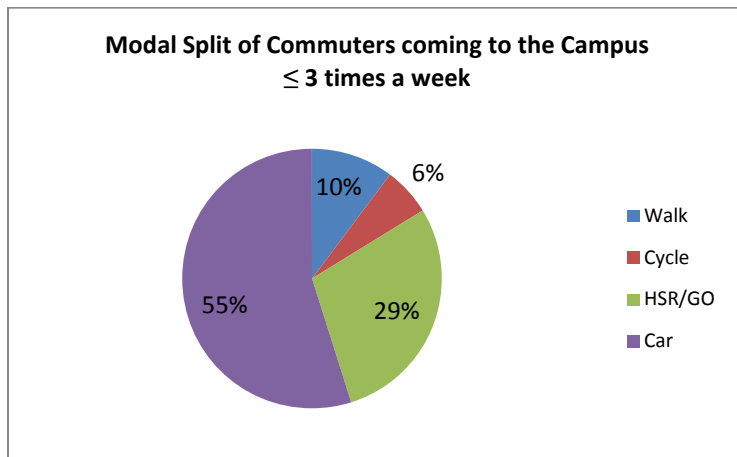


Figure 13: the percentages of mode choice of people who commute ≤ 3 times a week

Of the people who are commuting three or less days, 56.5% of the people who live within a cycleable distance of the main campus own a bike and could be cycling, and 17.4% whom live within a walkable distance, could walk opposed to driving if they do not have places they must drive to after work/school.

Recommendations

There is the possibility to bring a bike share to Hamilton. A bike share works similar to a car share. One can go to one of the locations the bicycles are stationed and they pay per use via a membership (Anderson, 2011). The bike share can be used to commute to and from the campus if the bike share stations are located close to the people who would use them. Based on the responses to the survey, 46% of the respondents living within the cycleable area do not own bicycles. Provided that the stations are within a walkable distance of the people who live within the cycleable area of the campus, there is an option for these people to use cycling as a mode choice opposed to driving or taking transit.

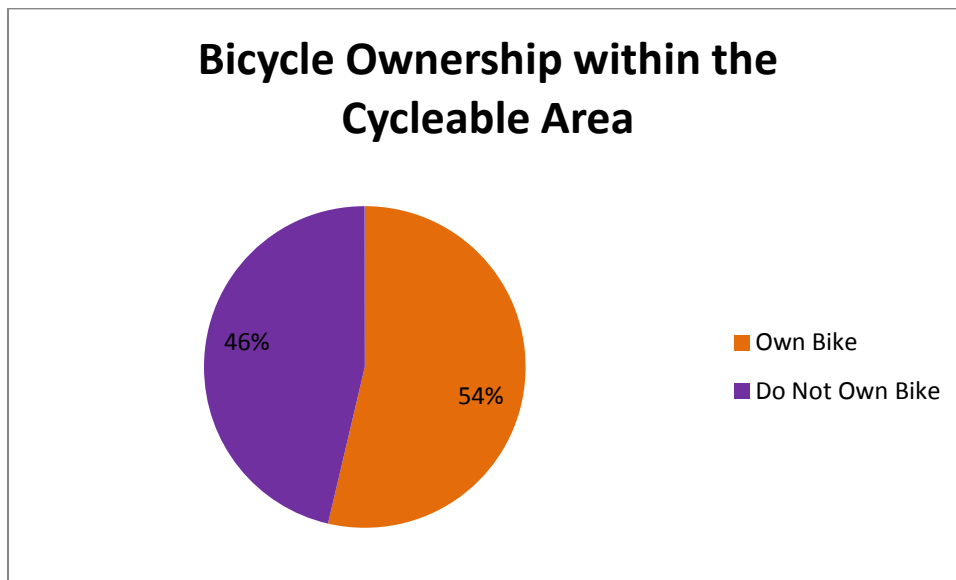


Figure 14: The percentage of people who own bicycles and the people who do not own bicycles within a 5 km radius of the main campus

The City of Hamilton has been in discussion pertaining to the possibility of bringing a bike share to Hamilton. In the Appendix, there are links with information on the bike share from the City of Hamilton, Green Venture, and McMaster University.

Carpooling needs to be promoted more heavily on the campus in order to reduce the number of people commuting in SOV. When analyzing the attitudes of people who are driving it

was noted that there are groups of people to target. These are the people who find driving to be boring (24.3%) and could have their commute livened up by adding a friend to the vehicle. There are also 26.3% of people who do not like to drive alone, and carpooling means they could have up to four other people travelling with them. There are 28.9% of the drivers would rather be a passenger, which means that there are potentially 28.9% of the respondents looking to join a carpool as a passenger. Advocating to these types of people can be done by building stronger relationships with Smart Commute Hamilton and the community, and by creating more incentives for people choosing to carpool to the campus such as having more priority parking, reduced parking costs, etc. and increasing the promotion these options on the campus and to the people choosing to drive specifically.

Conclusion

This report looked at the mode choices of the people commuting to the main campus of McMaster University, who responded to the McMaster Transportation Survey conducted in the fall of 2010. The respondents were then divided based on whether they lived within a walkable or cycleable distance of the main campus.

Their mode choice and their attitudes towards commuting, their neighbourhoods, and different modes of transportation were analyzed. Based on the results there is a better understanding of the reasons why people choose to drive instead of walk or cycle, when they live within two-five kilometres of the campus.

In the future, the total emissions for the campus should be calculated, which should include all modes of transportation for the entire campus. This will allow for more detail and a higher accuracy since the emissions stated in this report are assumptions based on mode choice of the respondents opposed to using demographics to look at commuting patterns, which could

offer better accuracy. This is important in order to determine the amount of emissions, which need to be reduced in order for McMaster to have fewer GHG emissions. This information can be used to advocate to the people commuting to the campus how altering their mode choices can benefit the environment, along with discussing the health benefits.

It is also important to determine whether the Flex Pass will create a positive change in the number of people who drive to campus on a regular basis. This was briefly discussed in the report. If a survey was completed, which looked at whether people would be interested in owning a Flex Pass, the university could look at a Flex Pass as being a positive step in reducing the number of people driving to the campus for the sake of driving since they are paying insurance and parking fees already. Given the option, people may choose to cycle or walk instead of driving every day.

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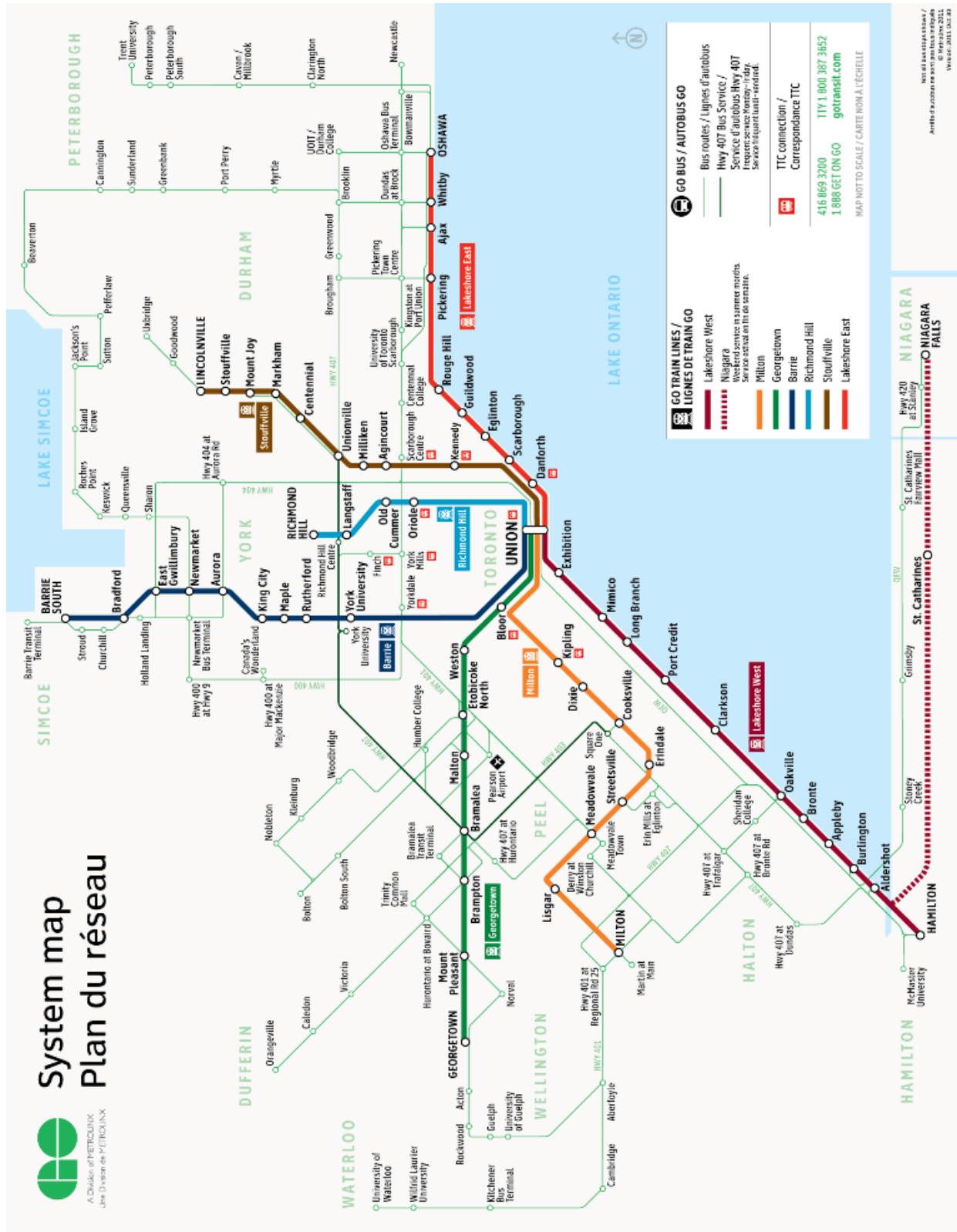
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Appendix



Bike Share Information

Matt Sweet- Station Locations

http://www.smartcommutehamilton.ca/media/uploads/Bike-Share%20Workshop%20/Matthew_Sweet%20Stakeholder%2028%20Nov%20-%20Station%20Locations.pdf

Peter Topalovic- Introduction

http://www.smartcommutehamilton.ca/media/uploads/Bike-Share%20Workshop%20/Peter_Topalovic%20BikeShare%20Presentation%20-%20Nov.%2028%20workshop.pdf

Dean Anderson- Business Plan

http://www.smartcommutehamilton.ca/media/uploads/Bike-Share%20Workshop%20/Dean_Anderson%20Nov_28_Presentation.pdf

MBA Student- Market Analysis

http://www.smartcommutehamilton.ca/media/uploads/Bike-Share%20Workshop%20/MBA_Mac%20The%20City%20of%20Hamilton%20BikeShare%20Project%20-%20to%20city.pdf

Carpooling Information

McMaster University—Office of Sustainability

http://www.mcmaster.ca/sustainability/at_carpool.html --*Information*
http://www.mcmaster.ca/sustainability/at_carpoolpolicy.html --*Policy*

Smart Commute Hamilton

<https://mcmaster.carpoolzone.smartcommute.ca/en/my/>

Table 4: Percentage of Responses for each Attitude based on Total Responses of Respondents Commuting to the Main Campus and the Mode Choice for Drivers and Cyclists

Attitudes	Total Main Campus (%)					Drivers [cars] (%)					Cyclists (%)				
	SD	D	N	A	SA	SD	D	N	A	SA	SD	D	N	A	SA
Feeling about travel to campus/work: using GO transit	14.0	17.7	54.3	12.3	1.7	16.2	19.4	53.2	10.3	0.9	9.9	16.0	64.5	9.3	0.3
Feeling about travel to campus/work: using HSR	11.4	23.1	43.7	19.4	2.5	18.1	27.5	43.9	9.6	0.9	7.6	21.0	48.8	21.3	1.3
Feeling about travel to campus/work: walking/cycling	7.8	8.8	27.7	36.6	19.1	11.3	10.5	35.6	32.8	9.8	0.3	1.8	4.7	37.2	56.0
Feeling about travel to campus/work: in a personal vehicle	7.8	13.1	25.5	36.4	17.2	2.0	7.5	22.9	45.0	22.7	20.2	23.6	31.2	19.9	5.0
Getting stuck in traffic doesn't bother me too much	30.5	39.3	16.0	12.6	1.6	33.5	39.8	12.8	13.0	1.1	30.6	40.1	18.1	9.4	1.8
Getting there is half the fun	10.0	25.7	35.0	25.0	4.2	12.6	27.2	34.6	21.9	3.8	6.8	22.3	34.1	29.1	7.6
Having shops and services within walking distance of my home is important to me	1.1	6.0	12.1	47.0	33.9	2.0	11.1	16.9	48.3	21.7	0.8	2.9	8.4	41.1	46.9
I am uncomfortable being around people I don't know when I travel by public transportation	11.6	38.2	25.1	20.9	4.3	9.3	36.3	26.1	23.5	4.8	16.8	44.8	20.2	15.2	3.1
I feel safe and secure to cycle around town	8.6	23.4	27.1	32.4	8.5	10.9	27.0	27.8	27.8	6.6	3.9	16.4	14.4	45.7	19.6
I feel safe and secure when walking in my neighborhood	1.3	5.4	13.9	54.5	25.1	0.9	3.3	10.0	55.3	30.5	0.5	5.3	9.5	53.8	30.9
I know my neighbors well	10.8	31.0	25.0	26.8	6.4	4.8	21.7	25.6	37.7	10.2	12.6	31.2	26.2	25.1	5.0
I like to live in a neighborhood where there's a lot going on	2.5	19.3	31.3	37.1	9.8	3.2	25.6	31.1	32.6	7.6	1.8	11.5	29.0	42.3	15.4
I like traveling alone	4.2	23.4	38.8	28.4	5.3	3.7	22.6	38.9	29.4	5.4	4.4	18.8	44.1	26.9	5.7
I limit my auto travel to help improve congestion and the environment	4.9	23.3	29.0	30.6	12.1	7.3	35.4	27.5	25.5	4.4	3.1	11.5	17.0	37.4	30.9
I often worry about my safety when I travel	12.5	44.4	21.9	18.2	3.0	11.9	42.7	21.9	20.9	2.7	14.7	47.2	22.8	12.9	2.4
I use my commute time productively	9.1	28.9	29.4	27.1	5.5	11.1	31.6	28.4	24.7	4.2	5.3	20.6	34.0	31.9	8.2
My commute is a real hassle	13.9	36.1	24.7	18.2	7.2	12.0	34.4	24.4	21.0	8.3	22.8	47.2	18.9	9.7	1.3
My commute trip is a useful transition between home and school	6.8	21.1	30.3	34.0	7.7	7.3	24.1	28.8	33.5	6.3	4.2	17.3	29.9	38.3	10.2
Shelters and other public transportation facilities that I commonly use are of good quality	3.9	17.5	38.5	37.8	2.3	3.8	16.7	52.9	25.2	1.3	1.8	18.9	32.8	43.6	2.9
The buses I usually travel in are comfortable	4.9	16.6	35.3	40.0	3.3	5.8	19.1	47.3	26.1	1.8	3.9	11.3	32.8	47.5	4.5
The only good thing about traveling is arriving at your destination	6.7	37.0	26.8	22.0	7.5	6.9	34.2	27.3	23.5	8.1	11.7	44.4	25.3	14.9	3.7
The personal vehicles I usually travel in are comfortable	1.0	5.6	19.3	57.4	16.6	0.9	3.2	9.1	60.9	25.9	1.6	6.3	30.4	51.0	10.7
The traveling that I need to do interferes with doing other things I like	5.3	29.0	24.1	31.4	10.2	5.1	28.7	22.7	32.5	11.0	9.2	42.1	21.2	21.7	5.8
There is a sense of community in my neighborhood	4.0	18.8	30.9	37.6	8.7	2.8	13.5	25.8	45.3	12.7	3.1	19.4	31.0	35.4	11.0
To improve the environment, I am willing to pay a little more to use a hybrid, electric or other clean fuel vehicle	6.0	16.6	26.5	38.3	12.6	7.8	19.3	26.2	37.0	9.7	2.6	9.9	24.3	42.7	20.4
Travel time is generally wasted time	5.3	28.2	23.6	32.4	10.6	5.2	23.8	24.5	34.6	11.8	7.3	38.3	22.3	25.5	6.6
Traveling is boring	10.3	33.6	32.0	19.6	4.6	10.1	32.8	32.9	20.0	4.3	11.8	39.1	31.8	13.6	3.7
Traveling is generally tiring for me	4.2	33.5	27.1	29.0	6.2	4.8	34.3	24.0	31.3	5.5	5.3	40.6	32.5	18.7	2.9
Traveling makes me nervous	34.7	37.0	16.5	10.1	1.7	34.8	38.2	15.6	9.8	1.6	37.2	37.7	16.2	7.9	1.0
Usually, I'd rather have someone else do the driving	11.3	26.4	23.7	27.4	11.2	15.2	33.2	22.7	21.1	7.8	12.4	28.7	28.4	22.9	7.6
We can find cost-effective technological solutions to the problem of air pollution	1.4	5.0	17.4	54.1	22.0	1.5	5.3	19.3	55.4	18.4	2.1	6.9	12.9	52.5	25.6
We need more public transportation even if taxes have to pay for a lot of the costs	4.7	17.6	25.2	35.6	16.9	6.9	19.4	27.3	33.9	12.5	2.4	15.2	21.2	33.2	28.0
We should raise the price of gasoline to reduce congestion and air pollution	31.4	34.3	16.7	12.1	5.4	42.6	34.4	11.4	8.8	2.8	14.4	27.8	21.0	24.1	12.6
When commuting to school/work, I'd like to travel _____ compared to what I do now: in any personal vehicle	10.5	17.8	44.3	15.7	11.7	9.4	26.3	40.2	12.7	11.4	12.8	14.9	62.5	6.1	3.7
When commuting to school/work, I'd like to travel _____ compared to what I do now: using GO transit	18.7	10.7	62.1	5.9	2.5	17.8	8.8	62.2	8.0	3.2	17.8	10.0	70.9	0.8	0.5
When commuting to school/work, I'd like to travel _____ compared to what I do now: using HSR	12.3	17.7	50.7	14.6	4.6	16.4	14.1	51.2	15.0	3.3	8.5	20.3	56.8	13.1	1.3
When commuting to school/work, I'd like to travel _____ compared to what I do now: walking/cycling	9.3	8.3	44.8	25.4	12.1	12.4	7.0	47.4	24.7	8.5	0.3	4.7	43.3	26.8	24.9

Table 5: Percentage of Responses for each Attitude based on Responses of Respondents Commuting to the Main Campus based the Mode Choice for Pedestrians and Transit Users

Attitudes	Pedestrians (%)					Transit Users (%)				
	SD	D	N	A	SA	SD	D	N	A	SA
Feeling about travel to campus/work: using GO transit	15.1	21.8	52.8	9.3	1.0	0.5	3.4	10.9	48.1	37.1
Feeling about travel to campus/work: using HSR	7.6	24.5	41.1	23.9	3.0	12.4	14.0	53.4	17.0	3.2
Feeling about travel to campus/work: walking/cycling	0.5	3.1	15.5	49.3	31.5	7.7	18.3	43.5	26.3	4.2
Feeling about travel to campus/work: in a personal vehicle	12.1	18.5	31.2	29.9	8.2	10.5	12.4	33.0	33.1	11.0
Getting stuck in traffic doesn't bother me too much	30.0	37.9	17.6	12.9	1.6	8.1	13.1	23.3	35.6	19.9
Getting there is half the fun	5.8	23.5	34.5	32.4	3.8	27.7	39.3	18.0	13.0	2.0
Having shops and services within walking distance of my home is important to me	0.4	2.7	6.9	45.6	44.4	10.7	26.2	36.1	23.1	4.0
I am uncomfortable being around people I don't know when I travel by public transportation	11.2	39.9	25.7	20.0	3.1	12.7	37.4	24.9	20.2	4.8
I feel safe and secure to cycle around town	5.6	19.4	29.6	38.7	6.6	9.2	23.8	28.6	30.0	8.5
I feel safe and secure when walking in my neighborhood	0.8	6.3	16.6	54.4	21.9	2.1	7.1	17.6	53.8	19.5
I know my neighbors well	16.2	43.5	22.2	15.6	2.5	13.4	33.9	25.7	22.0	5.0
I like to live in a neighborhood where there's a lot going on	1.7	13.3	30.7	43.8	10.5	2.5	18.3	32.5	36.7	10.0
I like traveling alone	5.1	26.8	36.3	27.3	4.4	4.0	23.6	38.5	28.4	5.5
I limit my auto travel to help improve congestion and the environment	3.8	16.0	30.7	34.6	15.0	3.5	18.1	33.1	32.0	13.3
I often worry about my safety when I travel	11.0	47.1	23.8	15.9	2.2	13.4	44.0	20.5	18.2	3.9
I use my commute time productively	7.6	28.1	33.7	26.0	4.6	9.0	28.8	26.8	28.8	6.6
My commute is a real hassle	24.1	40.8	23.3	9.4	2.5	7.5	31.9	27.4	22.6	10.6
My commute trip is a useful transition between home and school	6.0	16.4	36.3	34.0	7.3	7.6	21.7	28.7	33.4	8.7
Shelters and other public transportation facilities that I commonly use are of good quality	2.5	18.3	34.3	43.2	1.7	5.5	17.6	27.2	46.3	3.4
The buses I usually travel in are comfortable	3.4	16.8	32.3	45.4	2.1	5.0	15.4	25.0	49.3	5.3
The only good thing about traveling is arriving at your destination	6.4	44.6	25.8	18.0	5.1	5.3	33.5	27.3	24.6	9.3
The personal vehicles I usually travel in are comfortable	0.4	4.7	23.8	61.4	9.7	1.3	8.6	24.5	53.3	12.4
The traveling that I need to do interferes with doing other things I like	7.0	36.1	26.9	25.2	4.8	3.4	21.4	24.9	36.5	13.7
There is a sense of community in my neighborhood	3.5	23.7	35.2	32.4	5.2	5.8	21.4	34.0	32.9	5.9
To improve the environment, I am willing to pay a little more to use a hybrid, electric or other clean fuel vehicle	4.3	14.7	27.5	39.4	14.1	6.2	16.7	26.8	37.8	12.6
Travel time is generally wasted time	5.1	31.6	25.2	32.0	6.0	5.0	27.9	22.0	32.1	13.0
Traveling is boring	11.7	36.0	29.9	18.6	3.8	9.2	31.5	32.2	21.5	5.6
Traveling is generally tiring for me	4.6	34.5	31.0	25.8	4.2	3.1	29.9	26.6	31.5	8.9
Traveling makes me nervous	32.8	38.2	17.3	10.2	1.6	35.0	35.0	16.9	11.1	2.0
Usually, I'd rather have someone else do the driving	10.5	25.1	21.9	29.9	12.5	7.2	19.4	24.4	33.9	15.1
We can find cost-effective technological solutions to the problem of air pollution	1.0	4.2	15.7	55.7	23.4	1.3	4.7	17.6	52.3	24.1
We need more public transportation even if taxes have to pay for a lot of the costs	4.8	19.8	25.4	35.7	14.3	3.0	15.1	24.1	38.0	19.8
We should raise the price of gasoline to reduce congestion and air pollution	26.9	35.4	18.3	13.2	6.3	27.0	35.4	20.2	11.7	5.6
When commuting to school/work, I'd like to travel _____ compared to what I do now: in any personal vehicle	11.5	12.6	58.4	12.2	5.4	10.5	12.6	35.6	23.5	17.8
When commuting to school/work, I'd like to travel _____ compared to what I do now: using GO transit	19.9	12.2	64.6	2.8	0.5	19.2	12.1	58.0	7.0	3.6
When commuting to school/work, I'd like to travel _____ compared to what I do now: using HSR	9.3	17.5	56.6	13.4	3.2	10.9	20.9	45.1	15.4	7.8
When commuting to school/work, I'd like to travel _____ compared to what I do now: walking/cycling	1.7	8.7	51.0	23.6	15.0	13.2	10.5	38.9	26.8	10.6

Table 6: Percentages of Responses for each Attitude from the Respondents who live within a Walkable and Cycleable Distance from the Campus and Drive to School/Work

Attitudes	Drivers within 2 km (%)					Drivers within 5 km (%)				
	SD	D	N	A	SA	SD	D	N	A	SA
Feeling about travel to campus/work: using GO transit	8.5	15.5	60.6	15.5	0.0	13.5	18.4	58.4	8.7	1.0
Feeling about travel to campus/work: using HSR	14.9	25.7	39.2	18.9	1.4	8.0	21.0	42.6	24.9	3.5
Feeling about travel to campus/work: walking/cycling	5.3	6.6	21.1	48.7	18.4	3.1	6.9	19.7	43.7	26.5
Feeling about travel to campus/work: in a personal vehicle	2.6	9.2	22.4	44.7	21.1	11.2	17.2	27.5	30.5	13.6
Getting stuck in traffic doesn't bother me too much	32.9	36.8	9.2	19.7	1.3	29.4	38.8	16.9	13.1	1.7
Getting there is half the fun	13.2	15.8	35.5	26.3	9.2	7.6	24.9	35.6	27.2	4.6
Having shops and services within walking distance of my home is important to me	0.0	9.2	7.9	50.0	32.9	0.5	3.7	8.5	45.4	41.8
I am uncomfortable being around people I don't know when I travel by public transportation	10.5	40.8	25.0	21.1	2.6	12.5	40.3	24.6	19.3	3.4
I feel safe and secure to cycle around town	12.0	25.3	28.0	29.3	5.3	8.1	22.4	26.3	34.3	8.9
I feel safe and secure when walking in my neighborhood	1.3	3.9	19.7	53.9	21.1	1.4	6.5	15.3	54.2	22.6
I know my neighbors well	13.2	26.3	27.6	30.3	2.6	14.6	36.6	23.4	20.9	4.5
I like to live in a neighborhood where there's a lot going on	0.0	15.8	30.3	44.7	9.2	1.6	15.1	30.5	41.5	11.2
I like traveling alone	5.3	18.7	38.7	29.3	8.0	4.6	23.8	38.4	28.4	4.8
I limit my auto travel to help improve congestion and the environment	10.5	35.5	19.7	31.6	2.6	3.7	18.5	28.2	33.4	16.1
I often worry about my safety when I travel	11.8	44.7	21.1	19.7	2.6	12.4	46.6	21.4	16.9	2.7
I use my commute time productively	10.5	31.6	28.9	27.6	1.3	8.3	29.1	31.3	26.3	5.1
My commute is a real hassle	25.0	35.5	18.4	17.1	3.9	19.3	40.7	24.8	12.4	2.8
My commute trip is a useful transition between home and school	5.3	25.0	38.2	25.0	6.6	5.9	18.8	33.8	33.9	7.6
Shelters and other public transportation facilities that I commonly use are of good quality	2.6	14.5	52.6	30.3	0.0	3.1	17.6	34.4	42.6	2.3
The buses I usually travel in are comfortable	6.7	26.7	30.7	34.7	1.3	4.0	16.0	32.3	44.5	3.2
The only good thing about traveling is arriving at your destination	11.8	47.4	18.4	19.7	2.6	7.3	40.7	27.1	19.7	5.2
The personal vehicles I usually travel in are comfortable	0.0	5.3	13.2	56.6	25.0	0.8	6.2	23.2	56.1	13.7
The traveling that I need to do interferes with doing other things I like	5.3	34.7	28.0	25.3	6.7	6.6	35.4	26.0	26.2	5.8
There is a sense of community in my neighborhood	5.3	17.1	28.9	36.8	11.8	4.1	21.0	33.2	34.2	7.6
To improve the environment, I am willing to pay a little more to use a hybrid, electric or other clean fuel vehicle	7.9	11.8	26.3	40.8	13.2	4.6	14.1	27.0	39.6	14.7
Travel time is generally wasted time	3.9	21.1	36.8	28.9	9.2	5.1	29.8	25.1	32.1	7.9
Traveling is boring	13.2	38.2	26.3	17.1	5.3	11.1	34.8	32.6	17.8	3.7
Traveling is generally tiring for me	2.6	42.1	25.0	27.6	2.6	4.5	35.1	30.7	25.6	4.1
Traveling makes me nervous	40.8	40.8	9.2	7.9	1.3	34.0	37.7	16.8	9.8	1.8
Usually, I'd rather have someone else do the driving	18.4	26.3	27.6	19.7	7.9	10.4	26.1	23.7	28.0	11.7
We can find cost-effective technological solutions to the problem of air pollution	2.6	5.3	13.2	55.3	23.7	1.5	4.6	16.2	54.6	23.1
We need more public transportation even if taxes have to pay for a lot of the costs	0.0	21.1	21.1	39.5	18.4	3.7	17.7	23.5	36.1	18.9
We should raise the price of gasoline to reduce congestion and air pollution	31.1	36.5	13.5	13.5	5.4	25.2	34.3	19.1	14.5	7.0
When commuting to school/work, I'd like to travel _____ compared to what I do now: in any personal vehicle	8.0	16.0	46.7	13.3	16.0	11.2	15.1	52.0	13.4	8.2
When commuting to school/work, I'd like to travel _____ compared to what I do now: using GO transit	20.0	7.1	68.6	4.3	0.0	19.9	10.3	66.7	2.4	0.6
When commuting to school/work, I'd like to travel _____ compared to what I do now: using HSR	15.1	9.6	54.8	16.4	4.1	8.9	18.3	50.9	16.4	5.5
When commuting to school/work, I'd like to travel _____ compared to what I do now: walking/cycling	5.3	4.0	40.0	34.7	16.0	4.6	8.8	40.7	30.4	15.4