Final Report
UNB Annual Commuting Survey 2024

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Introduction

The University of New Brunswick (UNB) has two campuses located in Fredericton and Saint John. The geographical locations of each campus present both opportunities and challenges when it comes to how the university community travels to and from campus. The Fredericton campus is centrally located in the Ward 11 of the greater Fredericton region. Some of the challenges surrounding transportation and commuting presented on this campus are the relative lack of parking in central or convenient areas on campus, as well as the physical accessibility due to the steep nature of the hill the campus is located on. The Saint John campus is located more remotely in Ward Two of the greater Saint John region, surrounded primarily by suburban areas and undeveloped greenspace. The lack of infrastructure for active transportation surrounding the campus and limited public transportation routes make commuting to campus without a vehicle challenging.

Both campuses have a significant number of students, faculty and staff that commute from the surrounding regions. This presents challenges, as there are many community members who live 15km to 100km away from campus, with limited options but to commute in a personal vehicle. In 2020, the Covid-19 pandemic changed the way people worked and studied. There was a surge of remote work and study that eliminated the need to commute for many. This experience changed many people's opinion and perspective on their daily commute.

UNB Sustainability is part of the Transportation and Parking Committee for UNB, which is a collective of relevant UNB stakeholders tasked with collaborating to improve and champion different projects related to transportation and parking at UNB. UNB Sustainability is guided by the UNB Climate Change Action Plan (2020-2025), which includes two goals pertaining to transportation: (1) to increase the number of active transportation users on campus, and (2) to reduce emissions produced by the campus community. Gaining a better understanding of commuting patterns can be useful in trying to reduce emissions while also improving the health, wellbeing, safety, and accessibility of the campus community.

Methodology

The two objectives of the modal split survey are: (1) to confirm a baseline modal split for primary commuting modes, and (2) establish a baseline estimate of commuting emissions for UNB.

The UNB Sustainability team started making plans to complete a commuting survey in fall 2023. The logistics and timeframe for the survey were confirmed with the Office of Institutional Analysis (OIA). The survey questions were designed based on the previous

modal split survey performed at UNB from January 2022. The completed survey was 19 questions long. An application was submitted to the Research Ethics Board for the completion of the survey. The project was reviewed by the UNB Research Ethics Board and is on file as REB 2023-170.

UNB Sustainability worked with the OIA to format and deliver the survey. Promotion for the survey was done on the UNB Sustainability social media pages and in MyUNB News posts. The survey opened on January 29th, 2024. An email invitation was sent on the opening day of the survey to all current UNB students, staff, and faculty. A reminder email was sent each Monday to anyone who had not completed the survey. The survey closed on February 29th, 2024. A total of 3,049 completed surveys were submitted upon closing of the survey. Participants had the opportunity to include their email address to enter a draw for one of five $50 Ucard cash prizes. A total of 2,188 emails were entered, and each email was assigned a number. A random number generator was used to select five winners. All five prizes were claimed and received.

An unanalyzed copy of the survey data was received from OIA. Incomplete and manipulated responses were then removed, and the data was analyzed based on the following categories: response rate, primary commuting mode by campus and by UNB role, commute distance, commute days, remote work/school, and bi-campus travel. Average annual commuting emissions for drive alone commuters were calculated. Feedback from participants was broadly categorised using the following categories: active transportation, bi-campus transportation, carpooling, electric vehicles, learning or working remotely, parking, public transit, and Safe Ride

Results

Survey Response Rate

Overall, there was a 23% response rate, as there were 3,049 responses of the 13,407 invitations sent.

	Fredericton responses	Moncton responses*	Fredericton response rate	Saint John responses	Saint John response rate
Total	2349	46	79%	654	21%

Table 1. Survey response by campus compared to the overall response rate of the survey.

*Moncton respondents are represented in the Fredericton response rate as students/staff/faculty there are accounted for through the Faculty of Nursing on the Fredericton campus. For the remainder of the report, data from Moncton will be included as part of the Fredericton dataset.

On the survey there was an option of 'other' when choosing a primary role at UNB, 30 individuals picked this option and will not be included throughout the rest of the survey where there is data comparing staff, faculty and students.

	Staff	Faculty	Student
Fredericton response Rate	25%	9%	64%
Saint John response rate	15%	10%	74%
Total response rate	23%	10%	67%

Table 2. Survey response rate by role. For each role, response rates were calculated by comparing the number of completed surveys from that role on each respective campus to the total number of completed surveys on that campus. The overall response rate for each role was calculated by comparing the total number of responses in that role, to the total number of completed surveys.

Modal Split – Primary Commuting Mode

Individuals were asked what their primary mode of transportation is for their commute to campus. 17% of respondents did not answer this question and were not included as a part of the data in Figure 1 and Table 3. For this question, the category 'other' refers to individuals who use electric bicycles and scooters, motorcycles, or Uride (and other Taxi services).

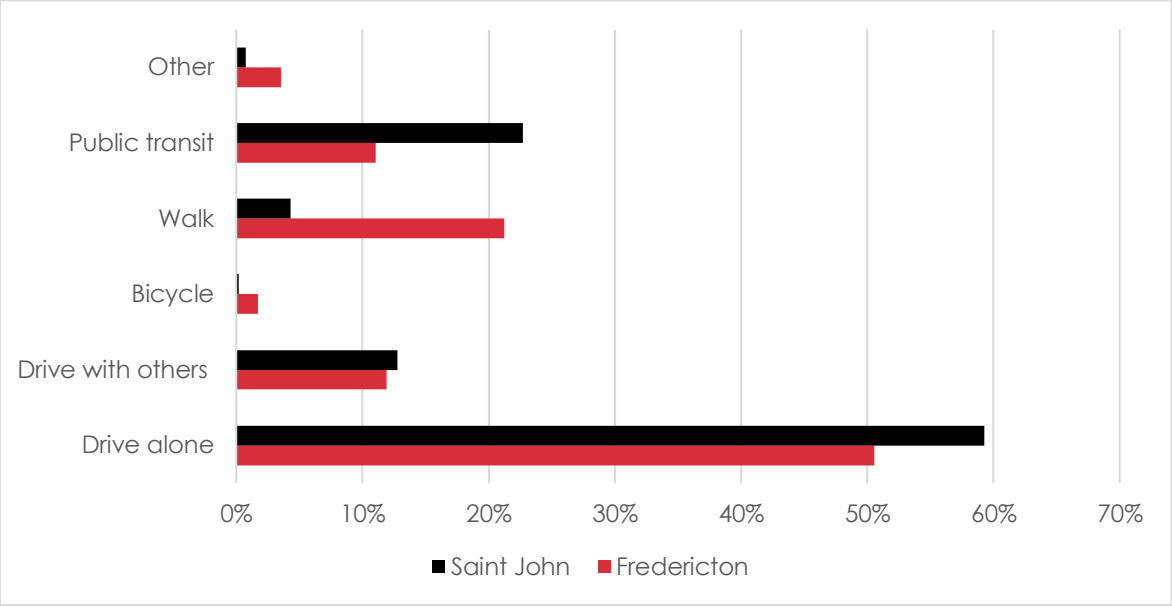


Figure 1. Modal split of primary commuting method by campus.

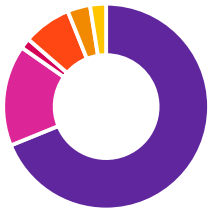
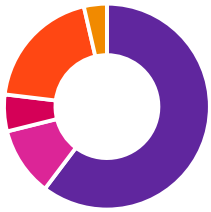
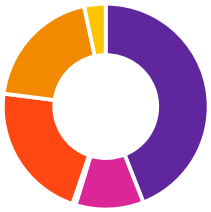
				
		Staff	**Faculty**	**Student**
	Drive alone	69%	60%	44%
	Drive with others (carpool, get dropped off, etc.)	16%	11%	11%
	Bicycle	2%	6%	1%
	Walk	8%	19%	22%
	Public transit	3%	4%	19%
	Other	2%	0%	3%

Table 3. Staff, faculty, and student modal split of primary commuting method.

Commute Distance

Respondents were asked to report the distance of their commute to campus.15% of individuals did not respond to this question and were not included in the following data. As shown in Figure 2, the majority of individuals who go to the Fredericton campus have a shorter commute than those who attend the Saint John campus.

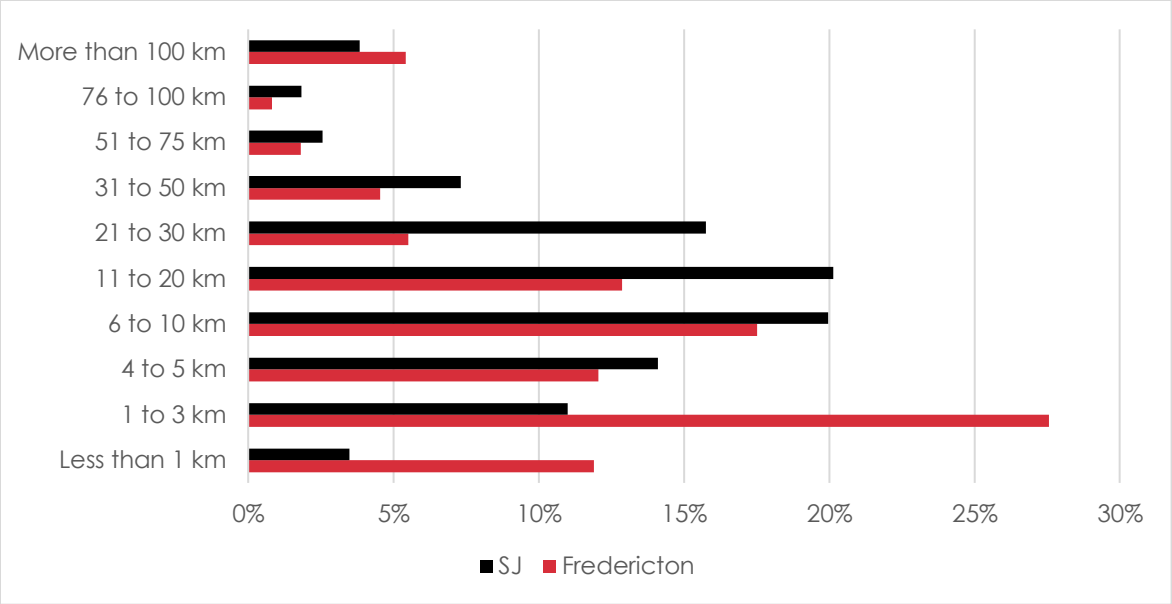


Figure 2. Distribution of commute distance by campus.

Average Commute Days per Week

The survey asked for the average amount of days in the week that individuals commute to campus from September till April, 21% of respondents did not answer this question and were not included in the following data. As we can see from Figure 3, the average UNB population commutes to campus five days a week during the academic year.

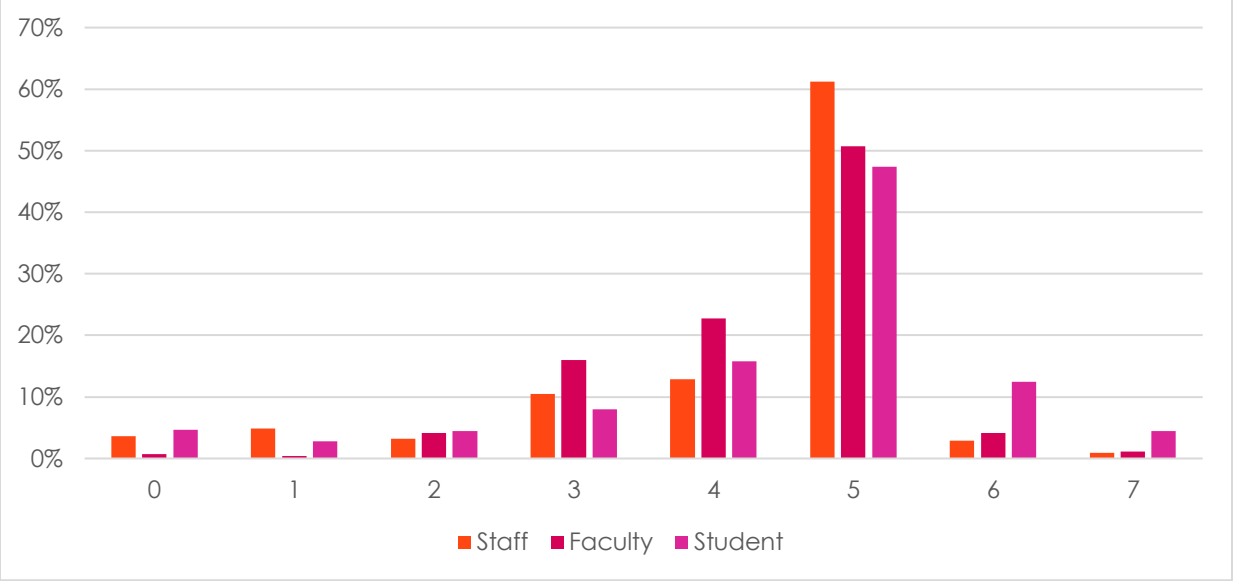


Figure 3. Distribution of average days commuting per week from September to April by role.

The survey asked for the average amount of days in the week that individuals commute to campus from May till August, 21% of respondents did not answer this question and were not included in the following data. As we can see from Figure 4, the majority of staff and faculty still commute to campus five days a week during the summer term and the majority of students do not commute to campus at all.

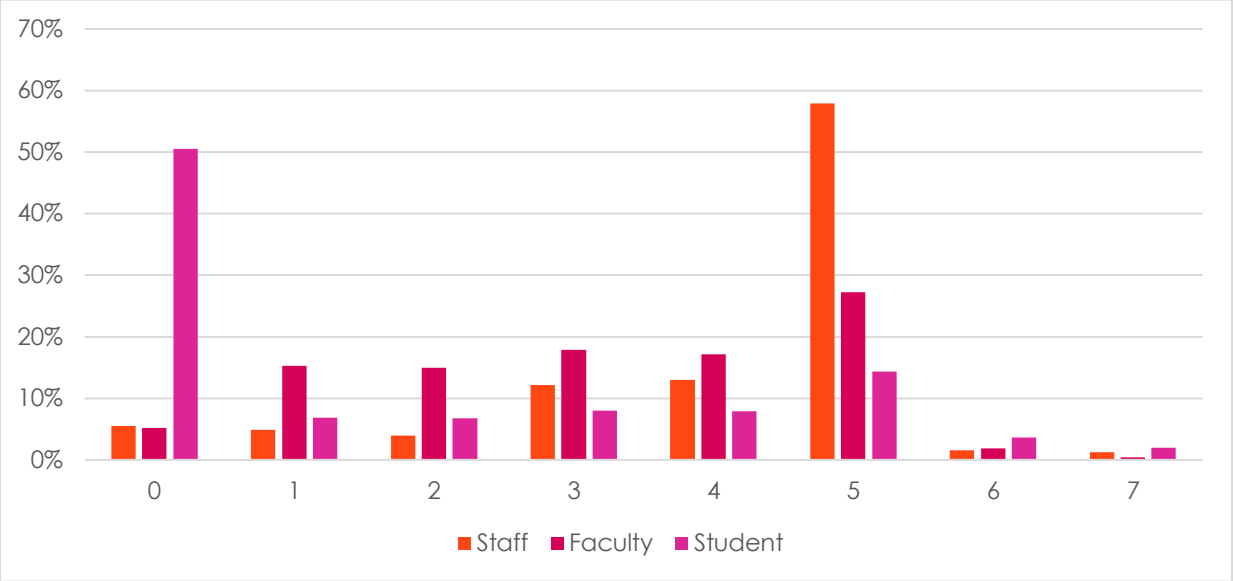
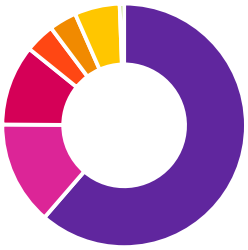
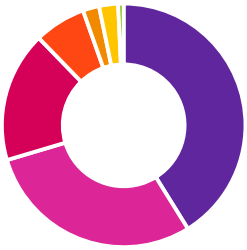
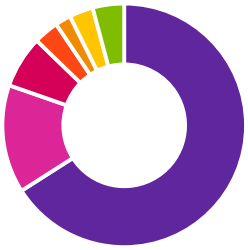


Figure 4. Distribution of average days commuting per week from May to August by role.

Remote Work or School

Remote work and school peaked during 2020 and changed how people worked and learned on university campuses. Individuals were asked about the number of days in an average week that their role on campus partakes completely remotely (through online classes, virtual group meetings, working from home, etc.) therefore completely replacing the need to commute. 6% of respondents did not answer this question and were not included in the following data.

				
	Average days per week	**Staff**	**Faculty**	**Student**
	0	61%	41%	67%

	1	14%	29%	14%
	2	11%	17%	7%
	3	4%	7%	3%
	4	3%	2%	2%
	5	6%	3%	3%
	6 or more	1%	1%	4%

Table 4. Number of days per week spent studying or working remotely.

Estimated Commuting Emissions

One of the objectives of this survey was to get an estimate of the commuting emissions for UNB. Based on the following criteria 1,173 responses were used in all of the emission calculations. These individuals were the ones who drove alone as their primary mode of transportation.

This was calculated in regard to the data from the primary commuting mode, no data was included from the secondary commuting mode responses. Moreover, this data does not account for multiple round trips to campus each day or individuals utilising an alternative mode of transportation some days.

To calculate commuting emissions, the commute distance, number of days commuting, and car fuel efficiency are required, the criteria for these inputs are listed below:

- The average distance for each range from the survey options was used as the distance (i.e. if 6-10 km range was selected, then 8 km was used for the calculation). The one exception was the "100+ kms" option, where 100 km was used in the calculation.
- Having accounted for the difference in frequency between the academic year and the summer, annual commute days were derived by using the average days to commute and the average amount of weeks in each term. This is shown in the following equation:
  Annual commute days = (Average commute days per week May-Aug *17.33) + (Average commute days per week Sept-April * 34.67)
- An average fuel efficiency was calculated based on survey responses. The following data was removed: outliers less than 2 or higher than 30, as well as individuals who were unsure of what their fuel efficiency was or individuals who drive an electric vehicle.

Table 5 identifies all of the answers to the calculations described above.

Criteria	Average answer
Commuting distance (one-way)	20km
Days to commute (September – April)	4 Days
Days to commute (May – August)	3 Days
Annual commute days	190.67 Days
Fuel efficiency (fuel burned)	9.5L/100km

Table 5. Calculated average based on the above criteria. These answers were used to calculate the estimated emissions per year.

Fuel	CO_2 (g GHG/L fuel)	CH_4 (g GHG/L fuel)	N_2O (g GHG/L fuel)
Motor gasoline	2,307	0.100	0.02

Table 6. Emission factors for motor gasoline in Canada. Emissions factors indicate the amount of GHG produced per quantity of fuel burned. This data was collected from the Government of Canada.

Total Emissions

The following formula was used to calculate commuting emissions for each fuel type categorized under motor gasoline, using data from Tables 5 and 6:

> Emissions from commuting = commuting distance one way * 2 * fuel burned per km * annual commute days * emission factor

	% of FTE represented	Estimated CO_2 emissions per year	Estimated CH_4 emissions per year	Estimated N_2O emissions per year	Total estimated emissions per year
Survey respondents	10%	1.67 MT	$7.25x10^{-5}$ MT	$1.45x10^{-6}$ MT	1.67 MT

Table 7. The estimated commuting emissions for individuals who responded to the survey and answered that they drive alone as a primary commuting mode calculated in metric ton (MT). Each fuel type (carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O)) were calculated individually and then added together for the total estimated emissions per year. The Full Time Equivalent (FTE) for the 2023 fall term was 11,576. This data was compiled using the Fall Enrollment and Employee FTE documents created by the OIA.

Bi-campus travel

As UNB works towards integrating Saint John and Fredericton campuses into one UNB, it will be important to understand travel between campuses. Individuals were asked how often they travel between campuses, 7% of those respondents did not answer this question and were not included in the data below. Currently, most people indicate they never or very rarely travel between campuses, this data is shown in Table 8.

Frequency	Percent of UNB population
Daily	3%
A few times per week	2%
A few times per month	2%
Once a month	2%
A few times a year	14%
Never	77%

Table 8. Frequency of bi-campus travel.

Comments and Feedback

The survey asked individuals to provide comments or feedback regarding transportation at UNB. This question was open ended, 73% of respondents did not answer this question and of the 27% of individuals who did respond; 124 responses touched on several different types of initiatives. All the feedback that was mentioned was categorised in the following broad categories.

Category	Number of comments	Comments and feedback
Active transportation	103	Many comments concerned a lack of secure parking for bikes, e-bike, and e-scooters, suggesting secure indoor bike lockers or similar secure storage area. Others suggested more covered bike racks to protect from rain or snow. Additionally, making sure bike racks are cleared of snow in the winter months to allow year-round cycling. Other comments addressed the City of Fredericton infrastructure surrounding campus and ways/connections where it could be improved to make active commutes easier, this includes have bike lanes included on all roads around campus.
Bi-campus transportation	25	Comments in this category were those that expressed interest in some form of university owned shuttle/transit to commute UNB students, staff, and faculty for when they are travelling to the other campus. The idea would be to have a shuttle bus that goes from Saint John to Fredericton in the morning and from Fredericton to Saint John at the end of the day. Same thing would go to individuals who are from Fredericton.
Carpooling	16	Almost all comments here expressed respondents' desire for a system to find people in their area to carpool with. There we also some comments that would like to see a shuttle bus for the following connections: Saint John main campus and uptown buildings, Oromocto and Fredericton campus, North Side and Fredericton campus.

Electric vehicles	10	Most comments addressed wanting more chargers installed on campus to address increasing amount of people driving EVs. Some comments also suggested incentive programs for EVs such as preferred parking or parking pass price reduction.
Learning or working remotely	78	Many of the comments in this category were looking for more hybrid/remote work and school options. Particularly on days with bad weather, people would like the option to work/learn remotely if possible. Many respondents also mentioned that having remote options could help with the lack of parking on campus. Others indicated that remote work/school greatly improved their mental health and wellbeing.
Parking	168	Comments were primarily asking for more parking. Concerns about parking include not being able to get parking between 8am and 4pm during the fall and winter semesters, having to park in lots far from the respondent's destination, and people parking in the wrong spots (e.g. students parking in staff and faculty lots). Some comments here addressed concern that parking passes are oversold for the number of parking spots on campus. Other comments expressed that the price is too expensive. A few comments mentioned that staff/faculty passes should not be so expensive or more expensive than student passes. Some feedback was that there should be an easier way to purchase a day parking pass for those who need to park on campus occasionally. Others suggested a reduced or pay-per-use parking pass for those who regularly work from home or use other commute methods. Others mentioned if they must pay for a full-time pass, they are unlikely to use other modes of transit as they are already paying to park everyday.
Public transit	269	Most of the comments regarding public transit were ways in which the system could be improved to better serve the UNB community; better schedule and frequency, better/more efficient routes, connectedness through the city, serving different surrounding areas, extended hours, and Sunday service. A lot of comments also addressed the idea of a u-pass. There were many respondents who said they would want to get a u-pass and that it would benefit them, or they would start using transit because of it. Many others noted they would not like to see a u-pass implemented as it would be an additional cost and they would not use the service.

Safe Ride	32	Many of the comments pertaining to Safe Ride were people indicating they enjoy or appreciate having this service available to them. However, many comments also included feedback on how the service could be improved including more rides, an app or online service to book, a way to track availability, cancellations and drop off locations, and extended hours.

Table 9. The number of responses for each category and a summary of the most popular answers that fit into that specific classification.

Outcomes and Next Steps

UNB Sustainability would like to thank everyone who took the time to participate in this survey. The insight provided from the UNB community will help us take steps in the right direction to making transportation at UNB more sustainable. The next steps for our team will be to make a comprehensive transportation plan for sustainability related transportation projects or initiatives we would like to undertake in the coming years. These projects will cover a wide basis of commuting related projects as well as initiatives for greening the university fleet, and quantifying and reducing business and academic travel emissions at UNB. This survey provided baseline data that can be used to help achieve the following Climate Change Action Plan (2020-2025) goals: (1) increase active transportation users, and (2) reduce campus emissions from commuting. In addition, this baseline data will help in the development of new, more targeted goals in the next iteration of the Climate Change Action Plan. We will continue to work with the Transportation and Parking Advisory committee to move forward various initiatives on campus.

This survey has provided information and insight that will help us tackle a multi-faceted problem. Finding a solution that can make transportation at UNB more sustainable, cost effective, and convenient for members of the UNB community is not simple. However, we will continue to make incremental changes that progress towards a larger shift in transportation at UNB, the surrounding communities, and province.