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2022

Case Study: University of Vermont Faculty and Staff Transportation Modes and Carbon Emissions

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Abstract

Vermont's transportation emissions per capita are greater than the United States' transportation emissions due to Vermont's rural nature combined with urban sprawl. Using a Chittenden Area Transportation Management Association (CATMA) survey of the University of Vermont's (UVM) faculty and staff's transportation trends as a case study, I explore the theoretical changes in carbon emissions as people currently driving alone switch to a sustainable mode. Utilizing more sustainable transportation methods is essential to reducing carbon emissions enough to mitigate our current impact and reach 2030 emissions goals of both UVM and Vermont. While switching to a sustainable mode and reducing emissions is viable for most, a small subset who are unable to switch produces more than half of carbon emissions in the dataset. This issue goes beyond public transportation availability to state and city planning as well as personal motivations and other outside factors.

Keywords: carbon emissions, GIS, sustainable transportation, rural, urban sprawl, Vermont,

Introduction

Transportation is the highest carbon emitting sector in the US, making up 28.7% of all carbon emissions as of 2021. According to the latest data spanning from 1999-2017, Vermont's transportation sector makes up 39% of yearly carbon emissions (Air Quality and Climate Division, 2021). Yet, in 2007 Vermont was ranked as the number one greenest state according to Forbes, when emissions were arguably higher in all sectors (Owen, 2009). How can this be the

case? Vermont does have, per capita, the greatest number of buildings certified by the Green Building Council's benchmark certification, known as Leadership in Energy and Environmental Design (LEED). However, there is a lot more to being sustainable than LEED certified buildings; "[Vermont] has no truly significant public transit system (other than its school bus routes), and, because its population is so dispersed, it is one of the most heavily automobile-dependent states in the country" (Owen, 2009). This dispersed population, creating a phenomenon known as urban sprawl, is incredibly toxic to the environment, needing more roads, parking lots, and homes that create habitat loss and fragmentation as well as degradation of other natural resources like soil and water (Bueno-Suarez and Coq-Huelva, 2020). Additionally, Burlington city grew by 5.5% from 2010 to 2020 (VTDigger, 2021). With this growth comes pressure on housing availability, forcing people into the suburbs, and thus increasing sprawl. This suburbanization and the lack of effective, far reaching public transportation furthers urban sprawl and issues of sustainably. Issues of sustainability arise when commuting into Chittenden County, where the majority of Vermont's population is employed (US Census Bureau, 2019). These factors culminate, resulting in Vermont's per capita emissions being higher than any other northeastern state (Vermont Department of Public Services, 2020). This high dependence on automobiles is best reflected in the fact that of the 3.39 Million Metric Tons of Carbon Dioxide Emissions (MMTCDE) produced in Vermont each year from transportation, motor gasoline contributed to 75.1% of those emissions and light-duty gasoline vehicles contributed to 84% of that 75.1% (Air Quality and Climate Division, 2021). In summation, transportation is the sector with the highest emissions in the state, and the majority of those emissions can be attributed to personal gasoline cars.

A reduction in sprawl and an increased investment in sustainable transportation is necessary to cut back on these emissions. Reducing emissions not only benefits the environment, but it also greatly benefits human health and wellbeing (Speck, 2012). Obesity is a prevalent issue in US culture. A study in Australia found that "men who cycle to work are significantly less likely to be overweight and obese (39.8%) compared with those who drive to work (60.8%). Men who use public transport to get to work are also significantly less likely to be overweight and obese (44.6%)" (Zheng, 2008). There are also economic benefits of investing in low emissions transportation, including reductions in non-commercial travel time, increases in output, productivity, income, property values, employment, and real wages, a rate of return greater than or equal to the social cost of capital, and an overall improved quality of life (Bhatta and Drennan, 2003). These can be described as co-benefits of using and investing in public transportation, which extend much further than just the social and economic sectors (Dirgahayani, 2013). Increasing education about the co-benefits of switching to sustainable transportation as well as the availability of public transportation will help greatly in reducing carbon emissions from cars (Vallett, McRae, and McCutcheon-Schour, 2014).

In addition, teleworking is an effective solution to reducing emissions from commuting, especially when no sustainable commuting options are available. Teleworking produces zero transportation emissions and allows companies to save money on office space, electricity, parking, and more. Working from home also reduces work-life separation which in turn betters' family relationships and helps companies prepare for health issues such as a pandemic, all while increasing overall employee productivity (O'Keeffe, 2008).

Objectives

The overall goal of this research is to determine how carbon emissions can be reduced by individuals to reach carbon goals of the state. The objectives of this research are to visualize the geographic spread of UVM faculty and staff across Vermont, to assess the availability of public and or sustainable transportation to UVM faculty and staff, and to explore barriers to using sustainable transportation methods.

Methods

Survey Data Collection

To understand where exactly sprawl is happening in Vermont and what it means for carbon emissions, I am using a survey[1] collected by Chittenden Area Transportation Management Association (CATMA) from October 30, 2019 to November 18, 2019. This anonymous survey poses questions such as where faculty and staff members at the University of Vermont (UVM) reside, how they most frequently commute, what kind of vehicle they own, and why they use that particular commuting method. The survey was sent out by direct email solicitation to each UVM employee via Survey Monkey.

Spatial Analysis and Carbon Emissions

To visualize UVM faculty and staff's range of location and transportation methods, I began by geocoding the dataset so I could upload it into ArcGIS on a coordinate plane. This consisted of taking the homeloc_1 and homeloc_2 attributes, denoting the intersection closest to their home, and finding the corresponding latitude and longitude coordinate points. To ensure these were the correct locations, homeloc_3 and homeloc_4, denoting the town/city and zip code,

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[1] A data dictionary for this survey is available in the appendix section of the paper. Pertinent categories are highlighted.

respectively, was looked at as needed. Additionally, I added a geocoded point for UVM's main campus using its latitude and longitude.

Once I obtained these points, I then went through the dataset to make sure each point made sense to use in my analysis. Since I only wanted to focus on those living in Vermont and working on UVM's main campus, I removed points that reported working at UVM extensions or living outside of Vermont. This left me with a dataset of 1246 total points.

Once uploaded into ArcGIS, I symbolized the dataset by the "modesUsedMain" attribute to determine any visible spatial relationship between distance lived from campus and mode of transportation used, which include drive alone, walk, bike/e-bike, park and ride, public bus, carpool, dropped off, taxi/uber, motorcycle, and campus shuttle. I also uploaded a layer containing Green Mountain Transit (GMT) bus stops as well as one containing park and rides across the state of Vermont; GMT bus stop data came from GMT and Vermont park and ride data came from the Vermont Center for Geographic Information (VCGI). Then, I generated near tables to understand the proximity of points to one another. I created three tables: one with the distance of each point from the main campus, one containing the distance of the closest bus stop from any point, and one containing the distance of the closest park and ride from any point. These distances were produced in decimal degrees, so I used a conversion of (near_dist * 111000 * 0.000621371) to convert this distance to miles. I then joined the near tables with my dataset to view all attributes in one table.

To determine mean distance from destinations, I separately selected all points that reported their modesUsedMain as walk or bike, public bus, or park and ride. Once I had a group selected, I found the mean distance to the destination using the aforementioned near distances. For walk or bike, this destination was the main campus (2.36 miles), and for public bus and park

and rides this destination was the closest bus stop or closest park and ride (1.03 miles, 2.70 miles), respectively. Considering the mean walk distance falls within the mean bike distance, I chose to group these together because one in this distance may choose to walk OR bike.

I then used the mean distances above to create three new layers, now looking at unsustainable "drive alone" points: one with those falling within 2.36 miles of main campus, one with those within 1.03 miles from a bus stop, and one with those within 2.7 miles from a park and ride. I will be referring to these distances as "change distances" for the rest of this paper because those within one of these distances have the ability to change to a sustainable mode.

Because one point may fall into multiple change distances, I created an attribute, "changeType", to mitigate overlap. First, I gave each point that already reported a sustainable commute method as their main mode a change type of "N/A". Since walking or biking produces the lowest emissions, I prioritized this group first, setting any point within 2.36 miles of main campus and a change type of "NULL" to changeType = "walk/bike". Then, I did the same for bus, the next lowest emissions. If a point is within 1.03 miles of a bus stop and changeType = "NULL", I set the change type to "bus". Then, I did the same for park and rides using 2.7 miles as the distance. Finally, for all points whose changeType remained "NULL", I set the changeType to "None", meaning they do not commute sustainably, nor do they fall in any distance to change their commute.

Once I had each set, I began calculating carbon emissions. Using a "Commuting GHG" dataset from Sightlines, I generated a factor of miles to emissions for single operating automobiles, or "drive alone" points. To generate emissions for buses, which tend to be 1/3 of that of personal automobiles due to ridership, I simply divided my auto factor by 0.33 (Hodges, 2010). I also generated more near tables that I joined with my original dataset to see the distance

of each point for each bus stop, park and ride, and main campus. These received the same

decimal degree to miles conversion mentioned above. These calculations were derived from the

Sightlines dataset and were:

$$Automobile\ emissions = \frac{Miles\ from\ home\ to\ main\ campus}{2776.3}$$

$$Public\ Bus\ emissions = \frac{Miles\ from\ closest\ bus\ stop\ to\ main\ campus}{8413}$$

$$Park\ and\ Ride\ emissions = \frac{Miles\ from\ home\ to\ closest\ park\ and\ ride}{2776.3} +$$

$$\frac{Miles\ from\ park\ and\ ride\ to\ main\ campus}{8413}$$

There were no calculations for walk/bike as this produces zero emissions. In order to generate

emissions per school year rather than emissions per mile, I multiplied emissions by two for each

way of the commute, by five for each day of the week, and by fifteen for each week in the school

year. I used these equations to calculate current emissions based on modesUsedMain as reported

by the employees as well as proposed new emissions based on the changeType attribute and

distances from sustainable transportation. I then ran a t-test and an ANOVA as appropriate to

explore the statistical significance of the differences in current vs proposed emissions and drive

alone vs other emissions, respectively.

I created six maps to produce the final product. The first set of maps display points that

fall within change distances (main campus, bus stops, park and rides, and no change). These are

symbolized by the modesUsedMain attribute. Each map contains points of the destination in

question (main campus for walk/bike, bus stops for bus, and park and rides for park and ride). I

decided to include all points in these maps, despite any overlap, to convey how many people

have the option to change. In the final emissions calculations, this overlap is accounted for. The final two maps display emissions; one for current emissions and one for proposed new emissions.

To create the story map, I uploaded different maps containing layers to symbolize modes used, emissions, and change groups to my ArcGIS Online account. I then synthesized the story map, supplementing the maps with results found through my analysis and methods. In order to make the maps as easily understood as possible, I removed irrelevant attributes so that when looking at data points, the observer will only see mode used, if the person owns a vehicle and what type of fuel it uses, the change type a point falls in, and current as well as proposed emissions. The maps also all contain a layer of Vermont county boundaries, and appropriate maps contain layers of park and rides, bus stops, and main campus depending on the map's intention.

Results and Discussion

Preferred Mode of Transportation

From this analysis I found that the favored mode of transportation among UVM faculty and staff is overwhelmingly to drive alone. In this dataset, 812 out of 1246 entries (65%) reported driving alone as their main method of commuting to campus. This mode tends to be the case no matter the distance lived from campus, as seen in Figure 1. This is especially interesting when thinking about larger trends across the state. Given UVM's reputation as a school with people who care about the environment and sustainability, it may be assumed that UVM faculty and staff trends err on the sustainable side when compared to others in the state.

Main Transportation Mode Reported and Distance Lived from Main Campus
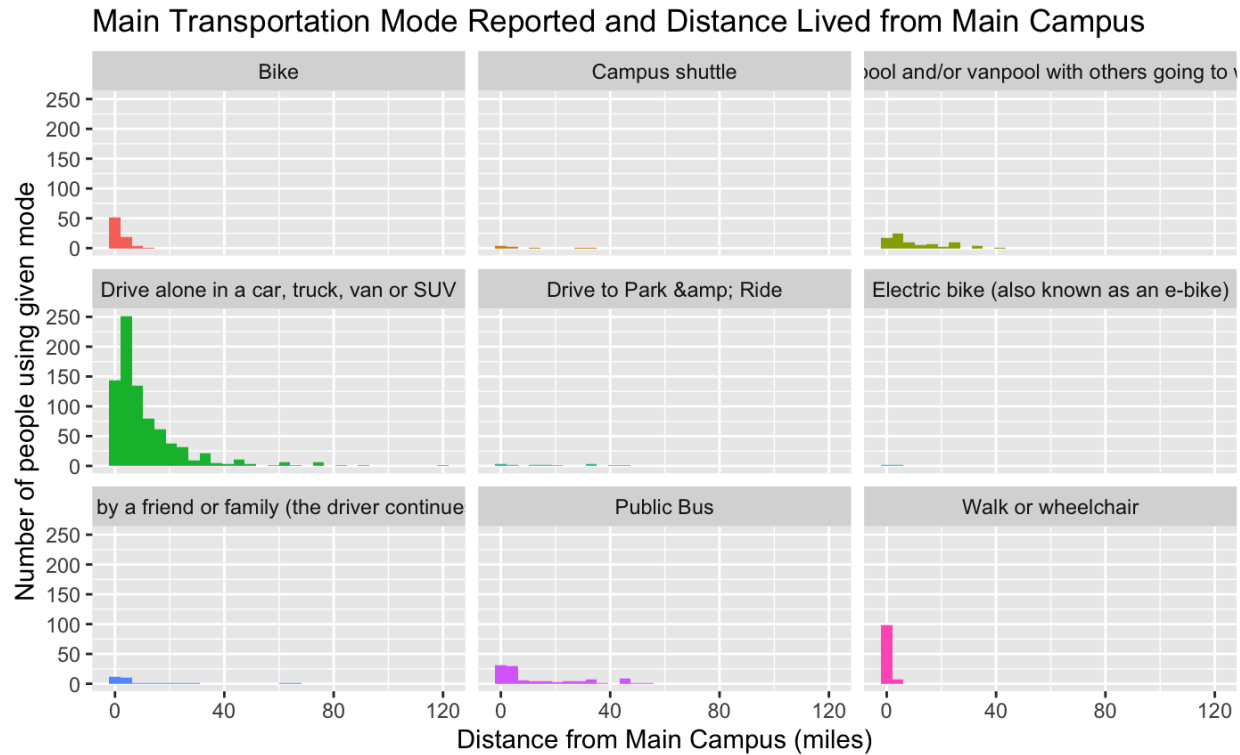
Figure 1: Distance from Main Campus in miles by reported "mode used main" attribute. Drive alone sees the widest range and highest count of users.

Carbon Emissions

As for emissions, initial emissions from the dataset amount to 1184.2 Metric Tons of Carbon Dioxide Emissions (MTCDE) per school year. These emissions do not account for travelling outside of school days or commuting for essential services or leisure, only for strict to and from campus distance from each person's reported intersection closest to their home. The breakdown of these emissions is seen in Table 1. Driving alone represents 65% of the dataset, yet it accounts for 83% of emissions. The next most reported mode, taking the public bus, accounts for 8% of the dataset yet only 4% of emissions. These ratios make it clear that driving alone is the main contributor to carbon emissions from UVM faculty and staff.

Table 1: Modes Used and Associated Emissions

Mode Used Main	Count	Associated Emissions (MTCDE/year)	% of Dataset	% of Emissions
Drive Alone	812	982.3	65.17	83.0
Public Bus	109	52.4	8.75	4.42
Walk/Wheelchair	105	0	8.43	0
Bike/E-bike	80	0	6.42	0
Carpool	77	84.2	6.18	7.11
Dropped off	36	42.8	2.89	3.61
Park and Ride	15	14.2	1.20	1.20
Campus Shuttle	9	7.7	0.72	0.65
Motorcycle	2	0.4	0.16	0.02
Taxi/Uber	1	0.2	0.08	0.01
TOTAL:	1246	1184.2	100	100

Furthermore, once change groups had been initiated and emissions recalculated, driving alone was still the main cause of carbon emissions. When I began my research, I thought this may occur due to a lack of access to public transportation, but that does not seem to be the case. Broken down in Table 2, the change groups divide the main data into sustainable modes

(walk/bike, P&R, bus, and N/A, meaning they already reported a sustainable mode), and NONE, indicating no change group. These change group cutoffs are 2.36 miles to walk or bike to main campus, 1.03 miles to walk to a bus stop, and 2.7 miles to drive to a park and ride. Overwhelmingly, people live within a reasonable distance to begin commuting in a sustainable mode if they are not already. There are 562 people within a reasonable distance to either walk, bike, bus, or use a park and ride to get to campus. If they were to make the switch, combined with those already commuting sustainably, this results in 993 people commuting sustainably to campus daily, or 80% of the dataset. This leaves 253 people, 20% of the dataset, driving alone each day. Theoretically, these two sets should account for about 80% and 20% of emissions, respectively. This is not the case. Instead, those driving alone account for 58% of total emissions and those commuting sustainably account for 42%.

Table 2: Change Types: Current and Proposed Emissions

Change Type	Count	Current Emissions in set (MTCDE)	Proposed Emissions (MTCDE)	Reduction (MTCDE)
MC	170	25.8	0	-25.8
BUS	318	294.4	97.2	-197.2
PR	74	159.4	65.9	-93.5
None (no change)	253	503.1	503.1	-0
N/A (already sustainable)	431	201.3	201.3	-0

TOTAL	1246	1184.2	867.5	-316.5

Spatial Analysis of Transportation Preference

      In Table 3, modes used main and their respective average distances from main campus, bus stops, and park and rides are given. As expected, those who walk or bike are close to campus, those who use the public bus are close to bus stops, and those who use park and rides are close to them. Interestingly, those who walk or bike are also in a close proximity to take the bus, but those who use the public bus live an average of 13.8 miles from campus. This reveals that those who live close to campus prefer to walk or bike despite bus availability, and those who live moderately far from campus are still able to utilize the bus, indicating that there is greater access to public transportation than initially expected. However, the mean distance overall in each category is greater than the distance within a proximity to change, pointing to greater urban sprawl. Additionally, those who drive alone fall outside of each target distance. These mean distances are likely driven up by those living extremely far from the main campus.

Table 3: Mode Used and Average Distances from Main Campus, Bus Stops, and Park and Rides

Mode Used Main	Average distance from main campus (mi)	Average distance from bus stop (mi)	Average distance from park and ride (mi)
Drive Alone	11.2	2.48	3.78
Public Bus	13.8	1.03	3.17
Walk/Wheelchair	1.1	0.08	2.93

Bike/E-bike	2.36	0.35	3.62
Carpool	10.1	1.78	3.44
Dropped Off	11.0	3.34	3.14
Park and Ride	18.2	3.37	2.70
Campus Shuttle	8.6	1.52	2.17
Motorcycle	1.8	0.11	3.01
Taxi/Uber	1.5	4.10	0.03
Mean Distance	9.98	1.99	3.58

Carbon Emissions and Transportation Changes

Tying this all together, Figure 2 shows current CO_2 emissions associated with reported modes used by faculty and staff. Those living close to campus, regardless of their mode, produce relatively low yearly carbon emissions. Moving further from campus, emissions rise, yet bus and park and ride emissions are clearly lower than surrounding emissions from driving alone; lightly colored points fall further away from campus than darker points due to lesser emissions coming from taking the bus versus driving alone.

Current CO2 Emissions
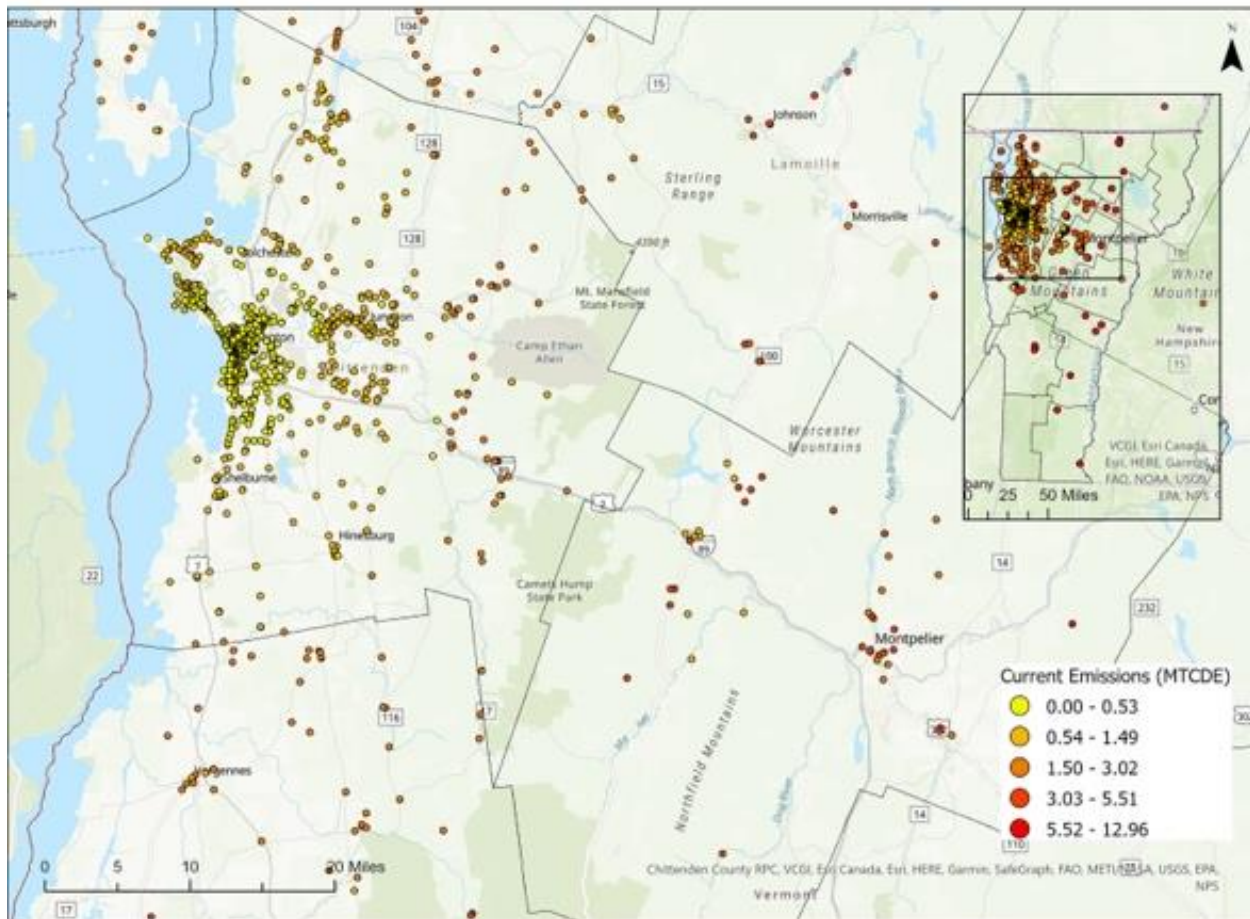
Figure 2: Map of current CO2 emissions associated with UVM employee's reported "modes used main". Calculated for school year commutes from home to main campus.

Figures 3, 4, 5 and 6 show change proximities, similar to what is reported in Table 2.

Figures 3-5 show main campus, bus, and park and ride change proximities, respectively. Figure 3

details points that fall within 2.36 miles of UVM's main campus, suggesting they may switch

from driving alone this short distance to either walking, biking, or e-biking to reduce emissions

to zero. In total, if all 170 people in this set switched to either walking or biking, yearly

emissions would be reduced by 25.8 MTCDE. On top of that, Figure 4 shows the 318 points

within 1.03 miles of a bus stop; if each person began taking the bus rather than driving, yearly

emissions would decrease by another 197.2 MTCDE. Furthermore, Figure 5 shows all points

within 2.7 miles of a park and ride. These 74 people can reduce 93.5 MTCDE per year in their

commutes if they begin utilizing park and rides near them. Additionally, those riding the bus will save significant money commuting due to UVM faculty and staff receiving free rides on GMT buses. In total, 316.5 MTCDE in Vermont may be reduced per year by just this subset of UVM faculty and staff in work commute emissions alone. This decrease in emissions may actually be higher when looking at specific bus ridership reported by GMT. In other subsets of emissions and Vermont residents, the true reductions from switching to sustainable transportation is likely much greater considering about 75% of Vermont residents drive alone to work (US Census Bureau, 2019).
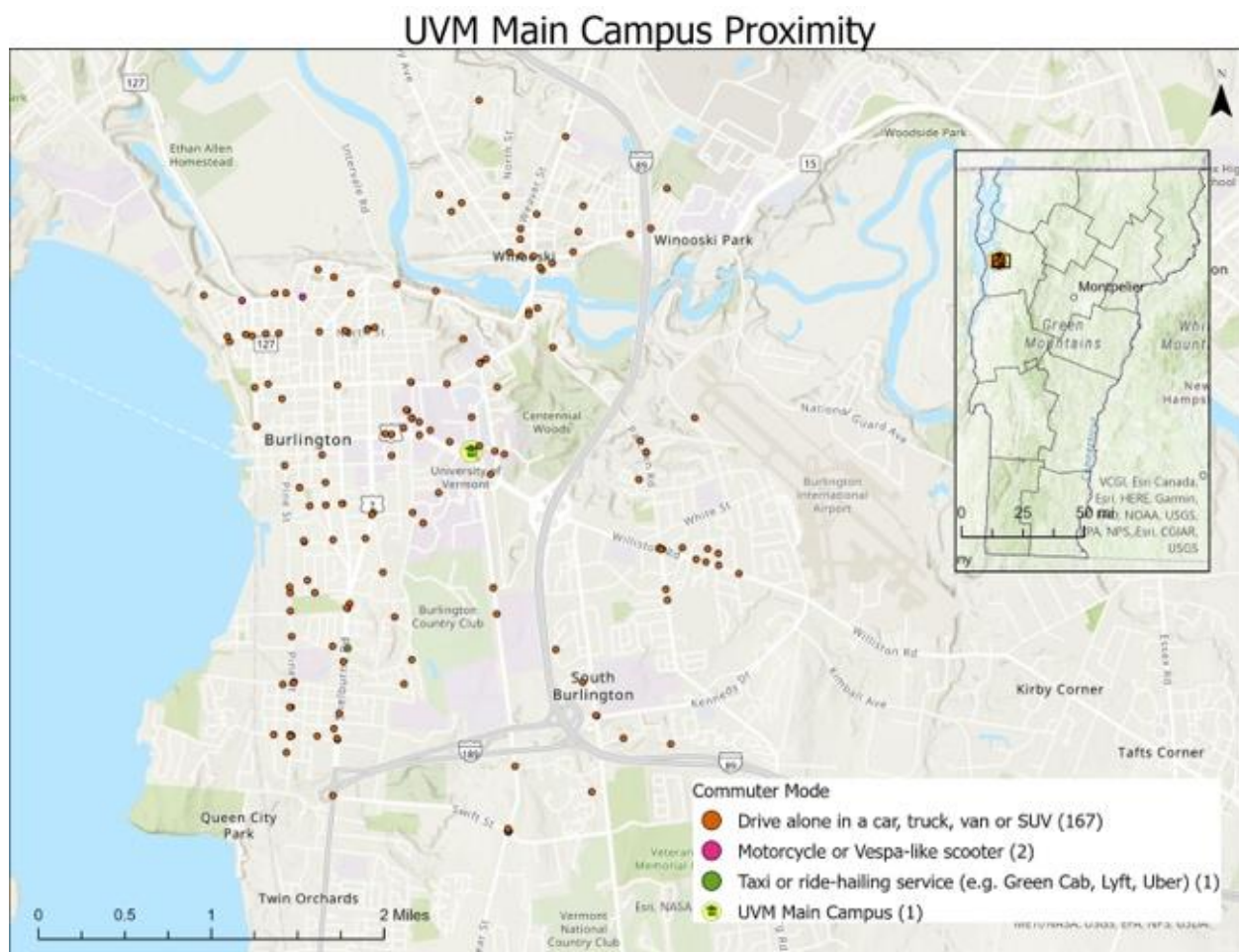
Figure 3: This map shows all UVM employees who did not report a sustainable mode and live within 2.36 miles of UVM's main campus. Theoretically, they can all either walk or bike to campus rather than drive.
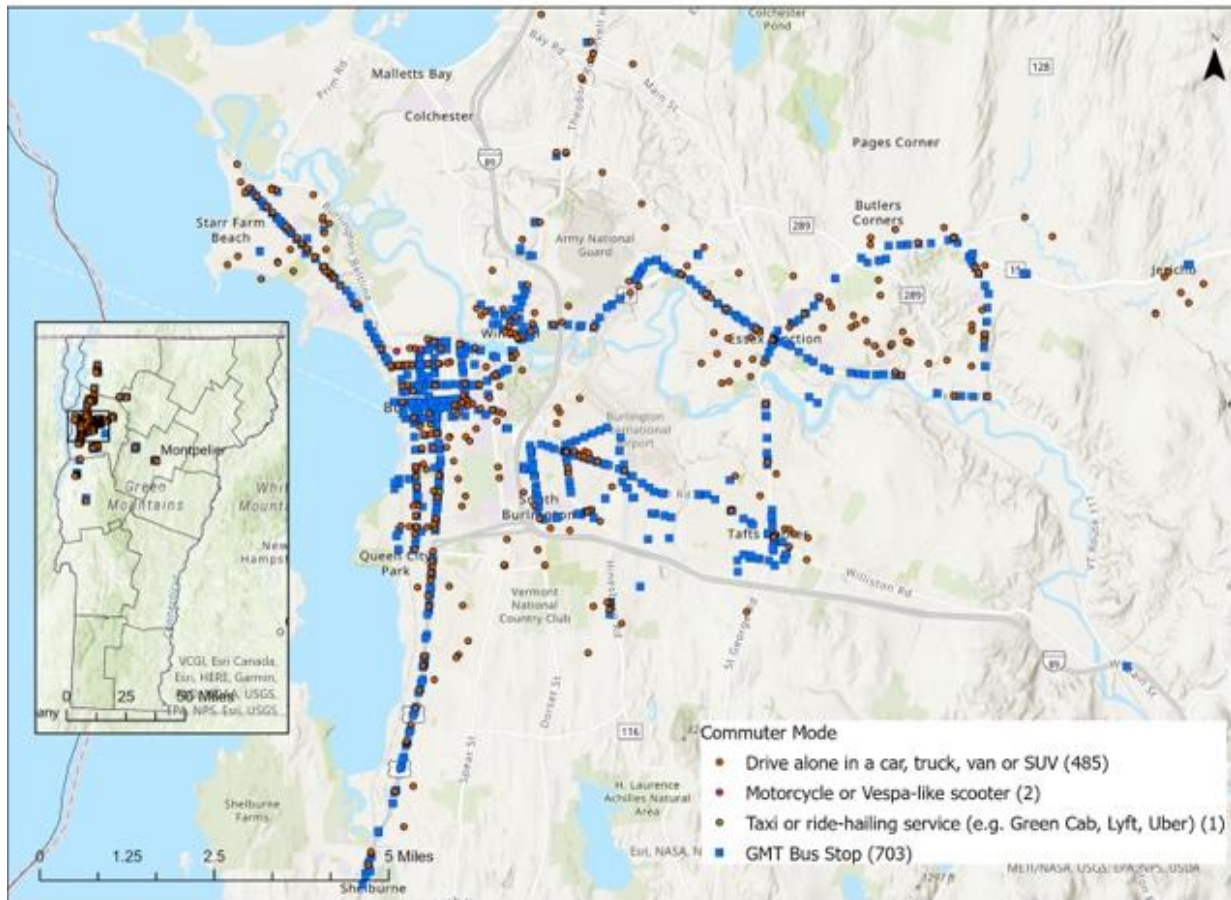
Figure 4: This map shows all UVM employees who did not report a sustainable mode and live within 1.03 miles of a GMT bus stop. This group is much larger than the bus change group, since many points also fall withing 2.36 miles to main campus and walking or biking is a more sustainable option than taking the bus. Additionally, although nearly 500 people live within 1.03 miles to a bus stop, they are concentrated mainly in Chittenden County. Thus, those living in more rural parts of the state do not have access.

Park and Ride Proximity
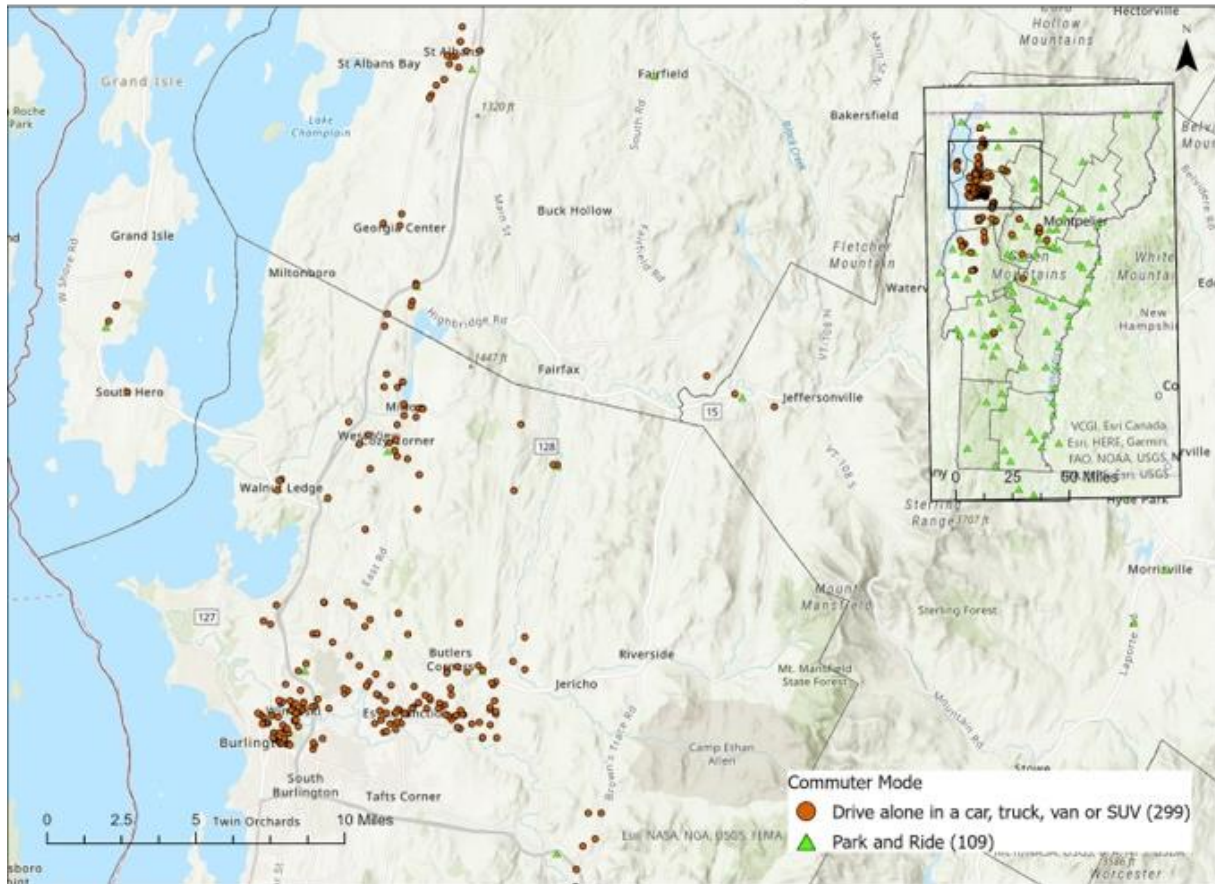
Figure 5: This map shows all UVM employees who did not report a sustainable mode and live within 2.70 miles of a park and ride. While 299 points fall within this distance, only 74 are classified in the park and ride change distance. This makes sense because most points are concentrated around Burlington and Essex Junction, where people live close enough to either walk, bike, or take the bus, and these are more sustainable and at times more efficient options than using a park and ride. Interestingly, despite park and rides spanning nearly the entire state, not many people outside of the Chittenden County area live within 2.70 miles of one. This further points to the rural nature of Vermont.

Lastly, Figure 6 shows those outside of any distance to commute sustainably. In this map, points are generally less clustered than the previous three. Of all points that fall within main campus, bus, and park and ride change distances (Figures 3-5), the mean distance from main campus is 6.24 miles. So, even if these people commute unsustainably, each only drives a maximum of 12.48 miles daily. Those outside of any change distance live a mean distance of 18.4 miles from main campus. This means on average they are driving nearly three times as far as others without a reasonable option to do otherwise. Even with availability of public transportation allowing the majority of individuals in this group to commute sustainably, those

living too far outside of Burlington to use a sustainable mode produce the majority of carbon

emissions in the entire set. Points in this map are spread all about the state and for the most part

are not clumping around certain areas, pointing to urban sprawl as the reason a sustainable

commute is less likely to happen. Further outside of the Chittenden County area, this is clearly

due to the rural nature of the state. These riders that are unable to shift modes due to home

locations continue to produce high emissions, amounting to 501.3 MTCDE per school year. This

is greater than emissions able to be reduced, despite a larger number of employees commuting

sustainably than not.

Figure 6: This map shows all UVM employees who reported an unsustainable mode that do not fall within any of the generated "change distances" used to create the maps in Figures 3-5. These points are less clumped than in the previous maps and spread much further across the state.

Mallets Bay is an exception, where there are clumps of points and a notable lack of bus stops. This presents a different case than the rest of the data, where there truly is a lack of public transportation forcing people to commute unsustainably. One way to mitigate this other than creating bus stops is carpooling; UVM incentivizes carpooling by offering reduced prices for parking passes and primary parking locations for those who carpool, and information is accessible on the Transportation and Parking Services section of UVM's website. Additionally, CATMA offers a carpool matching service to help those interested in carpooling do so.

Figure 7 shows new emissions resulting from changed commuting methods as proposed in Figures 3-6 and Table 2. It is clear when compared to current emissions in Figure 2 that emissions in the Burlington/Chittenden County area have been reduced – lighter points surround a greater distance of UVM's main campus. Moreover, there is a statistically significant reduction in emissions when comparing current emissions to proposed emissions ($t = 26.48$, $p < .05$). However, the maximum emissions are still the same as in the initial calculation due to those driving very far distances each day; the 253 people with no change ability who must continue to drive alone produce 501.3 MTCDE total each year. Of those not driving alone, we only find 364.2 MTCDE in emissions. So, while there is a significant decrease in emissions, drive alone emissions are still significantly higher than emissions from all other modes ($F = 27.415$, $p < .05$). This further points to the state's rural nature as a driver of carbon emissions.
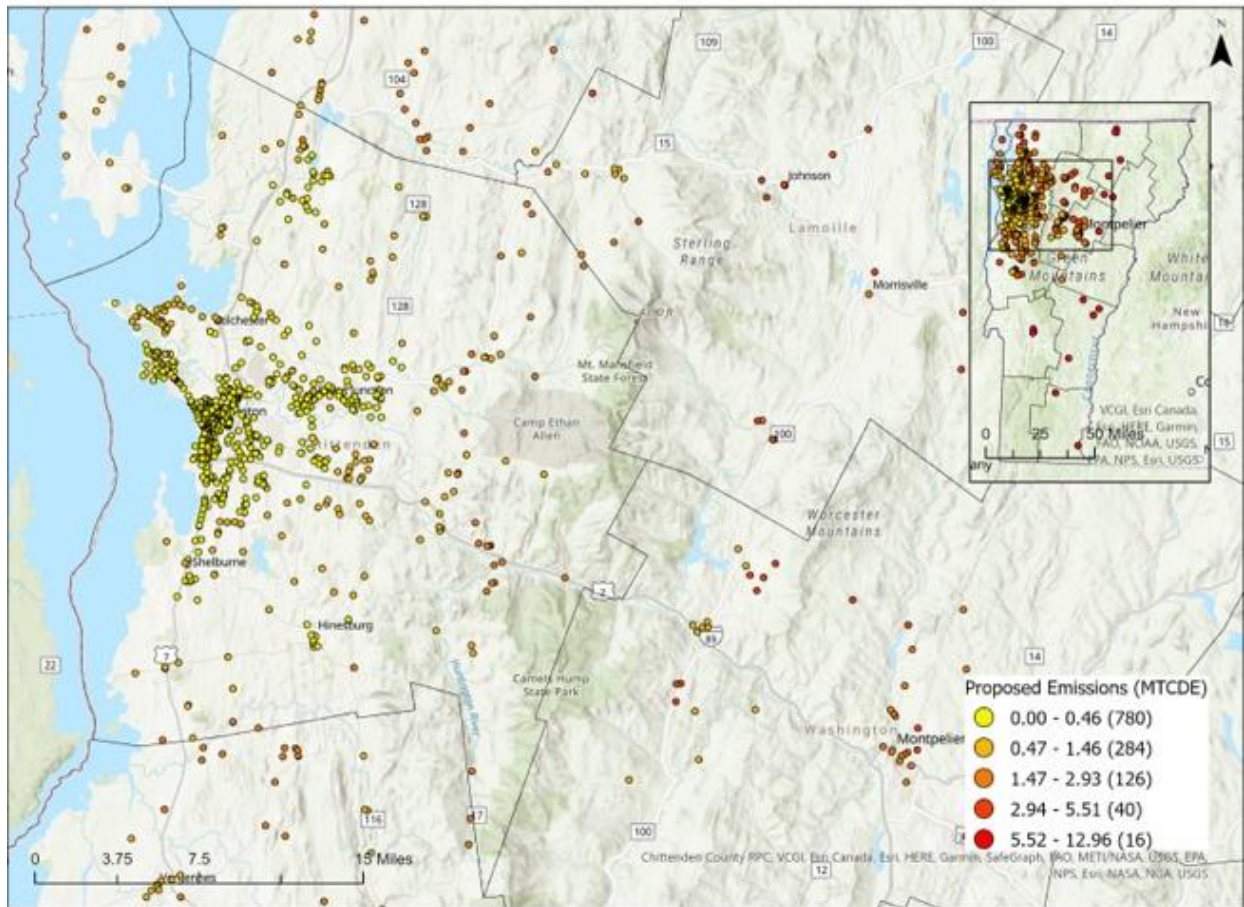
Figure 7: This map shows newly calculated carbon emissions using the "change group" mode rather than the mode reported. The yellow points reach much further past UVM's main campus than in the original emissions map, showing how emissions can be reduced.

Potential Errors and Things to Note

Some potential errors to note include the size of the dataset, the statistical power of the dataset, and the spatial accuracy of the data. Due to the format of the data I used, I manually geocoded each point. This creates a margin of human error, and while I have repeatedly checked the dataset for accuracy, there still may be some errors in point locations. Additionally, due to how users entered their home information, some people may not actually live within a change distance but rather reported an intersection near their home that falls within one. This can be true for the reverse situation as well. This means that change groups may not be fully accurate.

Another thing to note is the size of the dataset. This set has only 1,246 entries while UVM has an employee size of more than 4,000 people. A larger dataset would give a better understanding of UVM employee's modes and habits, and although this survey is able to be generalized for the entire population due to the randomness of its collection, a survey given randomly to Vermont residents would be extremely beneficial to use for statewide calculations and understanding of transportation modes.

Additionally, because the dataset is relatively small, only fifteen people reported park and rides as their main mode of transportation. This does not allow for the most realistic generation of a mean point, considering one person reported a distance of 7 miles from the nearest park and ride to their home and the mean distance was 2.7 miles. In a set of 15, this skews the mean and makes the change distance considerably higher, allowing more people to fall within this change group.

Furthermore, because UVM's core beliefs and values encourage sustainability, it is likely that the people in this dataset are more likely to use public or sustainable transportation than the general public population of Vermont. This may skew analysis again, as UVM affiliates will walk, bike, and bus further and more often than most. In fact, when I began this research, the sustainable transportation coordinator at UVM, Abby Bleything, gave me general cutoff distances to use: 1.0 miles for walking, 2.0 miles for biking, 0.25 miles for bus stops, and 2.0 miles for park and rides. Clearly, UVM employees using each of these modes reported traveling further distances than these general cutoffs; 1.09 miles for walking, 2.36 miles for biking, 1.03 miles for public buses, and 2.7 miles for park and rides. Moreover, 65% of this dataset reports driving alone to work daily and 75% of all Vermonters report driving alone daily, as referenced from the US Census Bureau earlier in the paper. This is another reason it would be beneficial to

analyze a survey given to a more general Vermont population. However, as this survey was not mandatory nor was it sent to a random population, there may be additional bias in those who chose to respond. Since the survey was not distributed to a representative population, we cannot draw any solid conclusions about the nature of UVM employee's or Vermont resident's sustainability preferences.

Finally, the last thing to note is more specific to ArcGIS functions. I used near tables to determine distances from points to destinations. These were computed in a straight-line distance, finding the shortest path between two points. This may be less accurate of a distance than using a routes network analysis, which requires a network dataset and "credits" to complete. Since I did not have access to these, I was unable to complete the analysis in such a way. However, because distances have all been generated in the same way, the analysis should still be accurate for those within certain distances from destinations even if the travel distance is slightly off.

Conclusion

The analysis of this survey data shows that UVM faculty and staff can better utilize public or sustainable modes of transportation to significantly reduce their carbon emissions. This suggests that there is greater availability of sustainable transportation than currently being made use of. However, those outside of any viable distance to walk, bike, bus, or use a park and ride still produce the majority of emissions despite being the minority of the dataset.

For the majority of UVM faculty and staff, using a sustainable mode of transportation is entirely feasible if they do not already. However, a small group of employees live outside of a reasonable vicinity to do so, accounting for the majority of all currently unchangeable emissions. There are many ways to mitigate this, including shifting to telework for those unable to commute

sustainably, implementing smart growth in Chittenden County and Vermont, reducing parking on campus, and further incentivizing sustainable transportation. Shifting to telework not only completely removes commute emissions, but also reduces the need for parking, office space, and energy use on campus. Smart growth includes reducing travel demand, which can be done by "building public transportation, sidewalks, and bike paths to increase lower-emission transportation choices" (EPA, 2019). Creating safe walkable and bikeable cities will increase usage of those modes.

Another way to create smart growth is by zoning so that necessities are concentrated within a single area, reducing the need to drive. Reducing parking on campus is another way to discourage driving alone; less parking spots allow less people to drive and instead force them to find a more sustainable option. Lastly, in conjunction with all above methods, incentivizing public transportation may be the best way to increase use. This must be paired with education regarding how to understand and ride a bus, as this uncertainty informs decision making. On a larger scale, carbon taxes to discourage car usage may be useful.

Overall, by switching to available modes of sustainable transportation, UVM faculty and staff can help reduce their carbon emissions as well as UVM's scope 3 emissions to meet climate goals of the university and the state. On top of this, using sustainable transportation has many co-benefits such as improved health and community ties. Ways to increase sustainable transportation use include comprehensive sustainability and usage education as well as incentivizing use.

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Appendix

Field Name	Survey Question	Values
CollectorNm		
RespondentID		
CollectorID		
StartDate		
EndDate		
IPAddress		
CustomData1		
CustomData2		
CustomData3		
CustomData4		
CustomData5		
employer	Who is your employer?	1.00 CCRPC 2.00 Champlain College 3.00 City of Burlington 4.00 Seventh Generation 5.00 UVM Medical Center 6.00 University of Vermont 7.00 VHFA 8.00 YMCA 9.00 None of the above
jobType_ED	Which of the following best describes your job?	.00 Other (please specify) 1.00 Full-time staff 2.00 Part-time staff 3.00 Full-time faculty 4.00 Part-time faculty
jobType_ED_OTH	Other (please specify)	
jobType_UVMMC	What shift do you normally work?	.00 Other (please specify) 1.00 Day 2.00 Evening 3.00 Night 4.00 Rotating Shifts
jobType_UVMMC_OTH	Other (please specify)	
jobType	Which of the following best describes your job?	.00 Other (please specify) 1.00 Full time 2.00 Part time
jobType_OTH	Other (please specify)	

jobSite_COB	Which department do you work for?	.00 Other (please specify)
		1.00 Assessor's Office
		2.00 Attorney's Office
		3.00 Burlington Electric Department
		4.00 Burlington International Airport
		5.00 Church Street Marketplace
		6.00 Community & Economic Development Office (CEDO)
		7.00 City Arts
		8.00 Clerk/Treasurer's Office
		9.00 Permitting and Inspections
		10.00 Community Justice Center
		11.00 Fire Department
		12.00 Fletcher Free Library
		13.00 Human Resources
		14.00 Innovation and Technology
		15.00 Parks, Recreation & Waterfront
		16.00 Planning
		17.00 Police Department
		18.00 Public Works Department
		19.00 Retirement Administration
		20.00 Water Resources
jobSite_COB_OTH	Other (please specify)	
jobSite_CC	At which Champlain College site do you primarily work?	.00 Other (please specify)
		1.00 Champlain College, Main Campus
		2.00 Champlain College, Lakeside Campus/Miller Center
		3.00 Champlain College, 40 Sears Lane
jobSite_CC_OTH	Other (please specify)	
jobSite_UVM	At which UVM site do you primarily work?	.00 Other (please specify)
		1.00 Main Campus
		2.00 ACC/Medical Center Campus
		3.00 Athletic Campus
		4.00 Colchester Site
		5.00 Fanny Allen Campus/Medical Office Building
		6.00 Fort Ethan Allen
		7.00 One South Prospect
		8.00 Redstone Campus
		9.00 Trinity Campus
		10.00 UVM Waterfront
		11.00 UVM Innovation Park
jobSite_UVM_OTH	Other (please specify)	

jobSite_UVMMC	At which UVMMC site do you primarily work?	.00 Other (please specify)
		1.00 ACC/Medical Center Campus
		2.00 89 Beaumont Ave
		3.00 Essex Brickyard
		4.00 112-114 Colchester Avenue
		5.00 115 Colchester Avenue
		6.00 199 Main Street, Burlington
		7.00 128 Lakeside Ave
		8.00 462 Shelburne Road
		9.00 East Avenue
		10.00 Ethan Allen Drive
		11.00 Fanny Allen Campus/Medican Office Bldg
		12.00 Hinesburg Rd
		13.00 40 IDX Drive
		14.00 St. Paul Street
		15.00 One South Prospect
		16.00 Pearl Street
		17.00 St. Paul Street
		18.00 San Remo Drive
		19.00 Technology Park
		20.00 Joy Drive
		21.00 Tilley Drive
		22.00 Timerblane
		23.00 University of Vermont Main Campus
		24.00 Colchester Water Tower Hill (Mtn View Dr)
		25.00 Rathe Road, Colchester
jobSite_UVMMC_OTH	Other (please specify)	
jobSite_Y	At which YMCA site do you primarily work?	.00 Other (please specify)
		1.00 Barre
		2.00 Burlington - College Street
		3.00 Burlington - St. Paul Street
		4.00 Duxbury
		5.00 Essex
		6.00 Fairfax
		7.00 Fletcher
		8.00 Jericho
		9.00 St. Albans
		10.00 Underhill
		11.00 Waterbury
		12.00 Westford
jobSite_Y_OTH	Other (please specify)	
homeLoc_1	Street #1:	
homeLoc_2	Street #2:	

homeLoc_3	City:	
homeLoc_4	Zip Code	
modesUsed_1	What transportation options have you used to commute to work? Check all that apply.	1.00 Drive alone in a car, truck, van or SUV
modesUsed_2	What transportation options have you used to commute to work? Check all that apply.	1.00 Drive to Park & Ride
modesUsed_3	What transportation options have you used to commute to work? Check all that apply.	1.00 Carpool and/or vanpool with others going to work
modesUsed_4	What transportation options have you used to commute to work? Check all that apply.	1.00 Get dropped off by a friend or family (the driver continues on elsewhere)
modesUsed_5	What transportation options have you used to commute to work? Check all that apply.	1.00 Motorcycle of Vespa-like scooter
modesUsed_6	What transportation options have you used to commute to work? Check all that apply.	1.00 Walk or wheelchair
modesUsed_7	What transportation options have you used to commute to work? Check all that apply.	1.00 Bike
modesUsed_8	What transportation options have you used to commute to work? Check all that apply.	1.00 Electric bike (also known as an e-bike)
modesUsed_9	What transportation options have you used to commute to work? Check all that apply.	1.00 Non-motorized cooter, skateboard, or skates
modesUsed_10	What transportation options have you used to commute to work? Check all that apply.	1.00 Electric skateboard or electric scooter
modesUsed_11	What transportation options have you used to commute to work? Check all that apply.	1.00 Public Bus

modesUsed_12	What transportation options have you used to commute to work? Check all that apply.	1.00 Campus shuttle
modesUsed_13	What transportation options have you used to commute to work? Check all that apply.	1.00 Taxi or ride-hailing service (e.g. Green Cab, Lyft, Uber)
modesUsed_14	What transportation options have you used to commute to work? Check all that apply.	1.00 Other (please specify)
modesUsed_OTH	Other (please specify)	
modesUsedMain	Which transportation option do you consider the primary way you commute to work?	1.00 Drive alone in a car, truck, van or SUV 2.00 Drive to Park & Ride 3.00 Carpool and/or vanpool with others going to work 4.00 Get dropped off by a friend or family (the driver continues on elsewhere) 5.00 Motorcycle or Vespla-like scooter 6.00 Walk or wheelchair 7.00 Bike 8.00 Electric bike (also known as e-bike) 9.00 Non-motorized scooter, skateboard, or skates 10.00 Electric skateboard or electric scooterz 11.00 Public Bus 12.00 Campus shuttle 13.00 Taxi or ride-hailing service (e.g. Green Cab, Lyft, Uber) 14.00 [Insert text from Other]
modesUsedFreq_1	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	
modesUsedFreq_2	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	
modesUsedFreq_3	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	
modesUsedFreq_4	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	
modesUsedFreq_5	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	

modesUsedFreq_6	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	
modesUsedFreq_7	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	
modesUsedFreq_8	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	
modesUsedFreq_9	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	
modesUsedFreq_1 0	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	
modesUsedFreq_1 1	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	
modesUsedFreq_1 2	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	
modesUsedFreq_1 3	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	
modesUsedFreq_O TH	Over the past week (7 days), how mnay times did you use each of the following transportation options for your commute to work?	
ownVeh	Do you have a personal vehicle?	1.00 Yes, I have a vehicle 2.00 I can borrow a vehicle or use a car sharing service when needed 3.00 No, I do not have a vehicle
ownVehWhy_1	Why do you have a vehicle? Check all that apply.	1.00 To get to work
ownVehWhy_2	Why do you have a vehicle? Check all that apply.	1.00 To run errands
ownVehWhy_3	Why do you have a vehicle? Check all that apply.	1.00 For convenience
ownVehWhy_4	Why do you have a vehicle? Check all that apply.	1.00 I prefer driving my car to other transportation options (bike, walk, bus, carpool, rideshare)
ownVehWhy_5	Why do you have a vehicle? Check all that apply.	1.00 Other (please specify)
ownVehWhy_OTH	Other (please specify)	

Variable	Question	Values
vehFuel	Which type of vehicle do you have? If you have more than one vehicle, please answer for the vehicle you use most often.	.00 Other (please specify) 1.00 Gasoline or diesel vehicle 2.00 Conventional hybrid vehicle (does not plug into an outlet) 3.00 Plug-in hybrid electric vehicle (plugs into an outlet AND uses gas or diesel) 4.00 All-electric vehicle (does not use any gas or diesel)
vehFuel_OTH	Other (please specify)	
vehType	Which of the following best describes the body type of your vehicle? If you have more than one vehicle, please answer for the vehicle you use most often.	.00 Other (please specify) 1.00 Car 2.00 SUV 3.00 Truck 4.00 Van 5.00 Motorcycle
vehType_OTH	Other (please specify)	
permitStatus_CC	Do you have a Champlain College campus parking permit this fall? If yes, please indicate the type of permit that you have.	.00 Other (please specify) 1.00 No 2.00 Zone 1 - Lakeside and Short Term 3.00 Zone 3 - Main Campus 4.00 Zone 4 - Main Campus
permitStatus_CC_OTH	Other (please specify)	
permitStatus_UVM	Do you have a UVM campus parking permit this fall? If yes, please indicate the type of permit that you have.	.00 Other (please specify) 1.00 No 2.00 Affiliate - Brown 3.00 Affilitate - Green 4.00 Affiliate - White 5.00 Employee - Brown 6.00 Employee - Compound 7.00 Employee - Green 8.00 Employee - White 9.00 Occasional Use - Brown 10.00 Occasional Use - Green 11.00 Occasional Use - White
permitStatus_UVM_OTH	Other (please specify)	

permitStatus_UVMMC	Do you have a UVMMC parking permit this fall? If yes, please indicate the type of permit that you have.	.00 Other (please specify) 1.00 No 2.00 Not Applicable - Parking permits not issued at my work site 3.00 115 Lakeside, day shift 4.00 115 Lakeside, rotator 5.00 ACC permits - Non-physicians 6.00 ACC permits - Physicians 7.00 Business Needs Permit 8.00 Carpool Permit 9.00 Centennial/Day 10.00 Centennial/Rotators 11.00 Evening/Night 12.00 Fanny Allen Shuttle Lot 13.00 Fanny Allen/Rotators 14.00 McClure Residents, Nurse Practitioners, Phys Assistants, Midwives 15.00 South Lot 16.00 Technology Park/Day 17.00 Technology Park/Rotators 18.00 UVM Catamount East/Day 19.00 UVM Catamount East/Rotators 20.00 UVM Jeffords Lot/Day 21.00 UVM Jeffords Lot/Rotators
permitStatus_UVMMC_OTH	Other (please specify)	
permitWhyNo_1	What are the reasons that you don't have a campus parking permit? Check all that apply.	1.00 Not eligible for a permit
permitWhyNo_2	What are the reasons that you don't have a campus parking permit? Check all that apply.	1.00 Cost
permitWhyNo_3	What are the reasons that you don't have a campus parking permit? Check all that apply.	1.00 Available parking lot locations are inconvenient
permitWhyNo_4	What are the reasons that you don't have a campus parking permit? Check all that apply.	1.00 Prefer to park on-street for free
permitWhyNo_5	What are the reasons that you don't have a campus parking permit? Check all that apply.	1.00 Parking lot is often full

permitWhyNo_6	What are the reasons that you don't have a campus parking permit? Check all that apply.	1.00 I prefer other transportation options (bike, walk, bus, carpool, rideshare)
permitWhyNo_7	What are the reasons that you don't have a campus parking permit? Check all that apply.	1.00 Other (please specify)
permitWhyNo_OTH	Other (please specify)	
vehWhyNo_1	What are the reasons that you don't have a vehicle for your personal use? Check all that apply.	1.00 Cost
vehWhyNo_2	What are the reasons that you don't have a vehicle for your personal use? Check all that apply.	1.00 I prefer other transportation options (bike, walk, bus, carpool, rideshare)
vehWhyNo_3	What are the reasons that you don't have a vehicle for your personal use? Check all that apply.	1.00 Parking at work is not convenient
vehWhyNo_4	What are the reasons that you don't have a vehicle for your personal use? Check all that apply.	1.00 I can borrow a vehicle or use a car sharing service when needed
vehWhyNo_5	What are the reasons that you don't have a vehicle for your personal use? Check all that apply.	1.00 I do not have a driver's license
vehWhyNo_6	What are the reasons that you don't have a vehicle for your personal use? Check all that apply.	1.00 My physical or personal circumstances prevent or limit my driving
vehWhyNo_7	What are the reasons that you don't have a vehicle for your personal use? Check all that apply.	1.00 Other (please specify)
vehWhyNo_OTH	Other (please specify)	
ownBike_1	Do you have a bicycle for your personal use? Check all that apply.	1.00 Yes, I have a bicycle
ownBike_2	Do you have a bicycle for your personal use? Check all that apply.	1.00 Yes, I have an electric bicycle (e-bike)
ownBike_3	Do you have a bicycle for your personal use? Check all that apply.	1.00 No

bikeWhyNo_1	What are the reasons that you don't have a bicycle? Check all that apply.	1.00 Cost
bikeWhyNo_2	What are the reasons that you don't have a bicycle? Check all that apply.	1.00 I prefer other transportation options (drive, walk, bus, carpool, rideshare)
bikeWhyNo_3	What are the reasons that you don't have a bicycle? Check all that apply.	1.00 Bicycle parking at work is not convenient
bikeWhyNo_4	What are the reasons that you don't have a bicycle? Check all that apply.	1.00 Bicycle parking at work is insufficient
bikeWhyNo_5	What are the reasons that you don't have a bicycle? Check all that apply.	1.00 Bicycling to work does not feel safe
bikeWhyNo_6	What are the reasons that you don't have a bicycle? Check all that apply.	1.00 Bike lanes and paths do not go where I need to go
bikeWhyNo_7	What are the reasons that you don't have a bicycle? Check all that apply.	1.00 Other (please specify)
bikeWhyNo_OTH	Other (please specify)	
timeToWork	How many minutes does it usually take you to travel door-to-door from your home to work?	
fixedSched	Do you usually work a fixed schedule?	1.00 Yes 2.00 No

arrNorm	What time do you usually arrive at work during a typical week?	1.00 Midnight to 4:29 a.m.
		2.00 4:30 a.m. to 6:29 a.m.
		3.00 6:30 a.m. to 6:59 a.m.
		4.00 7:00 a.m. to 7:29 a.m.
		5.00 7:30 a.m. to 7:59 a.m.
		6.00 8:00 a.m. to 8:29 a.m.
		7.00 8:30 a.m. to 8:59 a.m.
		8.00 9:00 a.m. to 9:59 a.m.
		9.00 10:00 a.m. to 11:59 a.m.
		10.00 Noon to 12:59 p.m.
		11.00 1:00 p.m. to 1:59 p.m.
		12.00 2:00 p.m. to 2:59 p.m.
		13.00 3:00 p.m. to 3:29 p.m.
		14.00 3:30 p.m. to 3:59 p.m.
		15.00 4:00 p.m. to 4:29 p.m.
		16.00 4:30 p.m. to 4:29 p.m.
		17.00 5:00 p.m. to 5:29 p.m.
		18.00 5:30 p.m. to 5:50 p.m.
		19.00 6:00 p.m. to 6:29 p.m.
		20.00 6:30 p.m. to 6:59 p.m.
		21.00 7:00 p.m. to 7:29 p.m.
		22.00 7:30 p.m. to 9:59 p.m.
		23.00 10:00 p.m. to 10:59 p.m.
		24.00 11:00 p.m. to 11:59 p.m.

depNorm	What time do you usually depart work during a typical week?	1.00 Midnight to 4:29 a.m.
		2.00 4:30 a.m. to 6:29 a.m.
		3.00 6:30 a.m. to 6:59 a.m.
		4.00 7:00 a.m. to 7:29 a.m.
		5.00 7:30 a.m. to 7:59 a.m.
		6.00 8:00 a.m. to 8:29 a.m.
		7.00 8:30 a.m. to 8:59 a.m.
		8.00 9:00 a.m. to 9:59 a.m.
		9.00 10:00 a.m. to 11:59 a.m.
		10.00 Noon to 12:59 p.m.
		11.00 1:00 p.m. to 1:59 p.m.
		12.00 2:00 p.m. to 2:59 p.m.
		13.00 3:00 p.m. to 3:29 p.m.
		14.00 3:30 p.m. to 3:59 p.m.
		15.00 4:00 p.m. to 4:29 p.m.
		16.00 4:30 p.m. to 4:29 p.m.
		17.00 5:00 p.m. to 5:29 p.m.
		18.00 5:30 p.m. to 5:50 p.m.
		19.00 6:00 p.m. to 6:29 p.m.
		20.00 6:30 p.m. to 6:59 p.m.
		21.00 7:00 p.m. to 7:29 p.m.
		22.00 7:30 p.m. to 9:59 p.m.
		23.00 10:00 p.m. to 10:59 p.m.
		24.00 11:00 p.m. to 11:59 p.m.

arrMon	Monday - Arrive at Work	1.00 Don't travel to work on this day
		2.00 Midnight to 4:29 a.m.
		3.00 4:30 a.m. to 6:29 a.m.
		4.00 6:30 a.m. to 6:59 a.m.
		5.00 7:00 a.m. to 7:29 a.m.
		6.00 7:30 a.m. to 7:59 a.m.
		7.00 8:00 a.m. to 8:29 a.m.
		8.00 8:30 a.m. to 8:59 a.m.
		9.00 9:00 a.m. to 9:59 a.m.
		10.00 10:00 a.m. to 11:59 a.m.
		11.00 Noon to 12:59 p.m.
		12.00 1:00 p.m. to 1:59 p.m.
		13.00 2:00 p.m. to 2:59 p.m.
		14.00 3:00 p.m. to 3:29 p.m.
		15.00 3:30 p.m. to 3:59 p.m.
		16.00 4:00 p.m. to 4:29 p.m.
		17.00 4:30 p.m. to 4:59 p.m.
		18.00 5:00 p.m. to 5:29 p.m.
		19.00 5:30 p.m. to 5:59 p.m.
		20.00 6:00 p.m. to 6:29 p.m.
		21.00 6:30 p.m. to 6:59 p.m.
		22.00 7:00 p.m. to 7:29 p.m.
		23.00 7:30 p.m. to 9:59 p.m.
		24.00 10:00 p.m. to 10:50 p.m.
		25.00 11:00 p.m. to 11:59 p.m.

depMon	Monday - Depart Work	1.00 Don't travel to work on this day
		2.00 Midnight to 4:29 a.m.
		3.00 4:30 a.m. to 6:29 a.m.
		4.00 6:30 a.m. to 6:59 a.m.
		5.00 7:00 a.m. to 7:29 a.m.
		6.00 7:30 a.m. to 7:59 a.m.
		7.00 8:00 a.m. to 8:29 a.m.
		8.00 8:30 a.m. to 8:59 a.m.
		9.00 9:00 a.m. to 9:59 a.m.
		10.00 10:00 a.m. to 11:59 a.m.
		11.00 Noon to 12:59 p.m.
		12.00 1:00 p.m. to 1:59 p.m.
		13.00 2:00 p.m. to 2:59 p.m.
		14.00 3:00 p.m. to 3:29 p.m.
		15.00 3:30 p.m. to 3:59 p.m.
		16.00 4:00 p.m. to 4:29 p.m.
		17.00 4:30 p.m. to 4:59 p.m.
		18.00 5:00 p.m. to 5:29 p.m.
		19.00 5:30 p.m. to 5:59 p.m.
		20.00 6:00 p.m. to 6:29 p.m.
		21.00 6:30 p.m. to 6:59 p.m.
		22.00 7:00 p.m. to 7:29 p.m.
		23.00 7:30 p.m. to 9:59 p.m.
		24.00 10:00 p.m. to 10:50 p.m.
		25.00 11:00 p.m. to 11:59 p.m.

| arrTue | Tuesday - Arrive at Work | |

depTue	Tuesday - Depart Work	1.00 Don't travel to work on this day
		2.00 Midnight to 4:29 a.m.
		3.00 4:30 a.m. to 6:29 a.m.
		4.00 6:30 a.m. to 6:59 a.m.
		5.00 7:00 a.m. to 7:29 a.m.
		6.00 7:30 a.m. to 7:59 a.m.
		7.00 8:00 a.m. to 8:29 a.m.
		8.00 8:30 a.m. to 8:59 a.m.
		9.00 9:00 a.m. to 9:59 a.m.
		10.00 10:00 a.m. to 11:59 a.m.
		11.00 Noon to 12:59 p.m.
		12.00 1:00 p.m. to 1:59 p.m.
		13.00 2:00 p.m. to 2:59 p.m.
		14.00 3:00 p.m. to 3:29 p.m.
		15.00 3:30 p.m. to 3:59 p.m.
		16.00 4:00 p.m. to 4:29 p.m.
		17.00 4:30 p.m. to 4:59 p.m.
		18.00 5:00 p.m. to 5:29 p.m.
		19.00 5:30 p.m. to 5:59 p.m.
		20.00 6:00 p.m. to 6:29 p.m.
		21.00 6:30 p.m. to 6:59 p.m.
		22.00 7:00 p.m. to 7:29 p.m.
		23.00 7:30 p.m. to 9:59 p.m.
		24.00 10:00 p.m. to 10:50 p.m.
		25.00 11:00 p.m. to 11:59 p.m.

arrWed	Wednesday - Arrive at Work	1.00 Don't travel to work on this day
		2.00 Midnight to 4:29 a.m.
		3.00 4:30 a.m. to 6:29 a.m.
		4.00 6:30 a.m. to 6:59 a.m.
		5.00 7:00 a.m. to 7:29 a.m.
		6.00 7:30 a.m. to 7:59 a.m.
		7.00 8:00 a.m. to 8:29 a.m.
		8.00 8:30 a.m. to 8:59 a.m.
		9.00 9:00 a.m. to 9:59 a.m.
		10.00 10:00 a.m. to 11:59 a.m.
		11.00 Noon to 12:59 p.m.
		12.00 1:00 p.m. to 1:59 p.m.
		13.00 2:00 p.m. to 2:59 p.m.
		14.00 3:00 p.m. to 3:29 p.m.
		15.00 3:30 p.m. to 3:59 p.m.
		16.00 4:00 p.m. to 4:29 p.m.
		17.00 4:30 p.m. to 4:59 p.m.
		18.00 5:00 p.m. to 5:29 p.m.
		19.00 5:30 p.m. to 5:59 p.m.
		20.00 6:00 p.m. to 6:29 p.m.
		21.00 6:30 p.m. to 6:59 p.m.
		22.00 7:00 p.m. to 7:29 p.m.
		23.00 7:30 p.m. to 9:59 p.m.
		24.00 10:00 p.m. to 10:50 p.m.
		25.00 11:00 p.m. to 11:59 p.m.

depWed	Wednesday - Depart Work	1.00 Don't travel to work on this day
		2.00 Midnight to 4:29 a.m.
		3.00 4:30 a.m. to 6:29 a.m.
		4.00 6:30 a.m. to 6:59 a.m.
		5.00 7:00 a.m. to 7:29 a.m.
		6.00 7:30 a.m. to 7:59 a.m.
		7.00 8:00 a.m. to 8:29 a.m.
		8.00 8:30 a.m. to 8:59 a.m.
		9.00 9:00 a.m. to 9:59 a.m.
		10.00 10:00 a.m. to 11:59 a.m.
		11.00 Noon to 12:59 p.m.
		12.00 1:00 p.m. to 1:59 p.m.
		13.00 2:00 p.m. to 2:59 p.m.
		14.00 3:00 p.m. to 3:29 p.m.
		15.00 3:30 p.m. to 3:59 p.m.
		16.00 4:00 p.m. to 4:29 p.m.
		17.00 4:30 p.m. to 4:59 p.m.
		18.00 5:00 p.m. to 5:29 p.m.
		19.00 5:30 p.m. to 5:59 p.m.
		20.00 6:00 p.m. to 6:29 p.m.
		21.00 6:30 p.m. to 6:59 p.m.
		22.00 7:00 p.m. to 7:29 p.m.
		23.00 7:30 p.m. to 9:59 p.m.
		24.00 10:00 p.m. to 10:50 p.m.
		25.00 11:00 p.m. to 11:59 p.m.

arrThu	Thursday - Arrive at Work	1.00 Don't travel to work on this day
		2.00 Midnight to 4:29 a.m.
		3.00 4:30 a.m. to 6:29 a.m.
		4.00 6:30 a.m. to 6:59 a.m.
		5.00 7:00 a.m. to 7:29 a.m.
		6.00 7:30 a.m. to 7:59 a.m.
		7.00 8:00 a.m. to 8:29 a.m.
		8.00 8:30 a.m. to 8:59 a.m.
		9.00 9:00 a.m. to 9:59 a.m.
		10.00 10:00 a.m. to 11:59 a.m.
		11.00 Noon to 12:59 p.m.
		12.00 1:00 p.m. to 1:59 p.m.
		13.00 2:00 p.m. to 2:59 p.m.
		14.00 3:00 p.m. to 3:29 p.m.
		15.00 3:30 p.m. to 3:59 p.m.
		16.00 4:00 p.m. to 4:29 p.m.
		17.00 4:30 p.m. to 4:59 p.m.
		18.00 5:00 p.m. to 5:29 p.m.
		19.00 5:30 p.m. to 5:59 p.m.
		20.00 6:00 p.m. to 6:29 p.m.
		21.00 6:30 p.m. to 6:59 p.m.
		22.00 7:00 p.m. to 7:29 p.m.
		23.00 7:30 p.m. to 9:59 p.m.
		24.00 10:00 p.m. to 10:50 p.m.
		25.00 11:00 p.m. to 11:59 p.m.

depThu	Thursday - Depart Work	1.00 Don't travel to work on this day
		2.00 Midnight to 4:29 a.m.
		3.00 4:30 a.m. to 6:29 a.m.
		4.00 6:30 a.m. to 6:59 a.m.
		5.00 7:00 a.m. to 7:29 a.m.
		6.00 7:30 a.m. to 7:59 a.m.
		7.00 8:00 a.m. to 8:29 a.m.
		8.00 8:30 a.m. to 8:59 a.m.
		9.00 9:00 a.m. to 9:59 a.m.
		10.00 10:00 a.m. to 11:59 a.m.
		11.00 Noon to 12:59 p.m.
		12.00 1:00 p.m. to 1:59 p.m.
		13.00 2:00 p.m. to 2:59 p.m.
		14.00 3:00 p.m. to 3:29 p.m.
		15.00 3:30 p.m. to 3:59 p.m.
		16.00 4:00 p.m. to 4:29 p.m.
		17.00 4:30 p.m. to 4:59 p.m.
		18.00 5:00 p.m. to 5:29 p.m.
		19.00 5:30 p.m. to 5:59 p.m.
		20.00 6:00 p.m. to 6:29 p.m.
		21.00 6:30 p.m. to 6:59 p.m.
		22.00 7:00 p.m. to 7:29 p.m.
		23.00 7:30 p.m. to 9:59 p.m.
		24.00 10:00 p.m. to 10:50 p.m.
		25.00 11:00 p.m. to 11:59 p.m.

arrFri	Friday - Arrive at Work	1.00 Don't travel to work on this day
		2.00 Midnight to 4:29 a.m.
		3.00 4:30 a.m. to 6:29 a.m.
		4.00 6:30 a.m. to 6:59 a.m.
		5.00 7:00 a.m. to 7:29 a.m.
		6.00 7:30 a.m. to 7:59 a.m.
		7.00 8:00 a.m. to 8:29 a.m.
		8.00 8:30 a.m. to 8:59 a.m.
		9.00 9:00 a.m. to 9:59 a.m.
		10.00 10:00 a.m. to 11:59 a.m.
		11.00 Noon to 12:59 p.m.
		12.00 1:00 p.m. to 1:59 p.m.
		13.00 2:00 p.m. to 2:59 p.m.
		14.00 3:00 p.m. to 3:29 p.m.
		15.00 3:30 p.m. to 3:59 p.m.
		16.00 4:00 p.m. to 4:29 p.m.
		17.00 4:30 p.m. to 4:59 p.m.
		18.00 5:00 p.m. to 5:29 p.m.
		19.00 5:30 p.m. to 5:59 p.m.
		20.00 6:00 p.m. to 6:29 p.m.
		21.00 6:30 p.m. to 6:59 p.m.
		22.00 7:00 p.m. to 7:29 p.m.
		23.00 7:30 p.m. to 9:59 p.m.
		24.00 10:00 p.m. to 10:50 p.m.
		25.00 11:00 p.m. to 11:59 p.m.

depFri	Friday - Depart Work	1.00 Don't travel to work on this day
		2.00 Midnight to 4:29 a.m.
		3.00 4:30 a.m. to 6:29 a.m.
		4.00 6:30 a.m. to 6:59 a.m.
		5.00 7:00 a.m. to 7:29 a.m.
		6.00 7:30 a.m. to 7:59 a.m.
		7.00 8:00 a.m. to 8:29 a.m.
		8.00 8:30 a.m. to 8:59 a.m.
		9.00 9:00 a.m. to 9:59 a.m.
		10.00 10:00 a.m. to 11:59 a.m.
		11.00 Noon to 12:59 p.m.
		12.00 1:00 p.m. to 1:59 p.m.
		13.00 2:00 p.m. to 2:59 p.m.
		14.00 3:00 p.m. to 3:29 p.m.
		15.00 3:30 p.m. to 3:59 p.m.
		16.00 4:00 p.m. to 4:29 p.m.
		17.00 4:30 p.m. to 4:59 p.m.
		18.00 5:00 p.m. to 5:29 p.m.
		19.00 5:30 p.m. to 5:59 p.m.
		20.00 6:00 p.m. to 6:29 p.m.
		21.00 6:30 p.m. to 6:59 p.m.
		22.00 7:00 p.m. to 7:29 p.m.
		23.00 7:30 p.m. to 9:59 p.m.
		24.00 10:00 p.m. to 10:50 p.m.
		25.00 11:00 p.m. to 11:59 p.m.

arrSat	Saturday - Arrive at Work	1.00 Don't travel to work on this day
		2.00 Midnight to 4:29 a.m.
		3.00 4:30 a.m. to 6:29 a.m.
		4.00 6:30 a.m. to 6:59 a.m.
		5.00 7:00 a.m. to 7:29 a.m.
		6.00 7:30 a.m. to 7:59 a.m.
		7.00 8:00 a.m. to 8:29 a.m.
		8.00 8:30 a.m. to 8:59 a.m.
		9.00 9:00 a.m. to 9:59 a.m.
		10.00 10:00 a.m. to 11:59 a.m.
		11.00 Noon to 12:59 p.m.
		12.00 1:00 p.m. to 1:59 p.m.
		13.00 2:00 p.m. to 2:59 p.m.
		14.00 3:00 p.m. to 3:29 p.m.
		15.00 3:30 p.m. to 3:59 p.m.
		16.00 4:00 p.m. to 4:29 p.m.
		17.00 4:30 p.m. to 4:59 p.m.
		18.00 5:00 p.m. to 5:29 p.m.
		19.00 5:30 p.m. to 5:59 p.m.
		20.00 6:00 p.m. to 6:29 p.m.
		21.00 6:30 p.m. to 6:59 p.m.
		22.00 7:00 p.m. to 7:29 p.m.
		23.00 7:30 p.m. to 9:59 p.m.
		24.00 10:00 p.m. to 10:50 p.m.
		25.00 11:00 p.m. to 11:59 p.m.

depSat	Saturday - Depart Work	1.00 Don't travel to work on this day
		2.00 Midnight to 4:29 a.m.
		3.00 4:30 a.m. to 6:29 a.m.
		4.00 6:30 a.m. to 6:59 a.m.
		5.00 7:00 a.m. to 7:29 a.m.
		6.00 7:30 a.m. to 7:59 a.m.
		7.00 8:00 a.m. to 8:29 a.m.
		8.00 8:30 a.m. to 8:59 a.m.
		9.00 9:00 a.m. to 9:59 a.m.
		10.00 10:00 a.m. to 11:59 a.m.
		11.00 Noon to 12:59 p.m.
		12.00 1:00 p.m. to 1:59 p.m.
		13.00 2:00 p.m. to 2:59 p.m.
		14.00 3:00 p.m. to 3:29 p.m.
		15.00 3:30 p.m. to 3:59 p.m.
		16.00 4:00 p.m. to 4:29 p.m.
		17.00 4:30 p.m. to 4:59 p.m.
		18.00 5:00 p.m. to 5:29 p.m.
		19.00 5:30 p.m. to 5:59 p.m.
		20.00 6:00 p.m. to 6:29 p.m.
		21.00 6:30 p.m. to 6:59 p.m.
		22.00 7:00 p.m. to 7:29 p.m.
		23.00 7:30 p.m. to 9:59 p.m.
		24.00 10:00 p.m. to 10:50 p.m.
		25.00 11:00 p.m. to 11:59 p.m.

arrSun	Sunday - Arrive at Work	1.00 Don't travel to work on this day
		2.00 Midnight to 4:29 a.m.
		3.00 4:30 a.m. to 6:29 a.m.
		4.00 6:30 a.m. to 6:59 a.m.
		5.00 7:00 a.m. to 7:29 a.m.
		6.00 7:30 a.m. to 7:59 a.m.
		7.00 8:00 a.m. to 8:29 a.m.
		8.00 8:30 a.m. to 8:59 a.m.
		9.00 9:00 a.m. to 9:59 a.m.
		10.00 10:00 a.m. to 11:59 a.m.
		11.00 Noon to 12:59 p.m.
		12.00 1:00 p.m. to 1:59 p.m.
		13.00 2:00 p.m. to 2:59 p.m.
		14.00 3:00 p.m. to 3:29 p.m.
		15.00 3:30 p.m. to 3:59 p.m.
		16.00 4:00 p.m. to 4:29 p.m.
		17.00 4:30 p.m. to 4:59 p.m.
		18.00 5:00 p.m. to 5:29 p.m.
		19.00 5:30 p.m. to 5:59 p.m.
		20.00 6:00 p.m. to 6:29 p.m.
		21.00 6:30 p.m. to 6:59 p.m.
		22.00 7:00 p.m. to 7:29 p.m.
		23.00 7:30 p.m. to 9:59 p.m.
		24.00 10:00 p.m. to 10:50 p.m.
		25.00 11:00 p.m. to 11:59 p.m.

depSun	Sunday - Depart Work	1.00 Don't travel to work on this day
		2.00 Midnight to 4:29 a.m.
		3.00 4:30 a.m. to 6:29 a.m.
		4.00 6:30 a.m. to 6:59 a.m.
		5.00 7:00 a.m. to 7:29 a.m.
		6.00 7:30 a.m. to 7:59 a.m.
		7.00 8:00 a.m. to 8:29 a.m.
		8.00 8:30 a.m. to 8:59 a.m.
		9.00 9:00 a.m. to 9:59 a.m.
		10.00 10:00 a.m. to 11:59 a.m.
		11.00 Noon to 12:59 p.m.
		12.00 1:00 p.m. to 1:59 p.m.
		13.00 2:00 p.m. to 2:59 p.m.
		14.00 3:00 p.m. to 3:29 p.m.
		15.00 3:30 p.m. to 3:59 p.m.
		16.00 4:00 p.m. to 4:29 p.m.
		17.00 4:30 p.m. to 4:59 p.m.
		18.00 5:00 p.m. to 5:29 p.m.
		19.00 5:30 p.m. to 5:59 p.m.
		20.00 6:00 p.m. to 6:29 p.m.
		21.00 6:30 p.m. to 6:59 p.m.
		22.00 7:00 p.m. to 7:29 p.m.
		23.00 7:30 p.m. to 9:59 p.m.
		24.00 10:00 p.m. to 10:50 p.m.
		25.00 11:00 p.m. to 11:59 p.m.
busUsed_1	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Red Line (Williston and North Avenue)
busUsed_2	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Blue Line (Essex Junction and Shelburne Road)
busUsed_3	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Green Line (Pine Street and Riverside/Winooski)
busUsed_4	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Purple Line (College Street and Umall/Airport)

busUsed_5	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Orange Line (Essex Center and Williston/Essex)
busUsed_6	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Silver Loop (Essex Center Sand Hill and River Roads)
busUsed_7	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Gold Loop (City Loop)
busUsed_8	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Route 36: Jeffersonville Commuter
busUsed_9	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Route 46: 116 Commuter
busUsed_10	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Route 56: Milton Commuter
busUsed_11	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Route 76: Middlebury LINK Express
busUsed_12	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Route 86/286: Montpelier LINK Express
busUsed_13	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Route 96: St. Albans LINK Express

busUsed_14	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Route 97: Barre LINK Express
busUsed_15	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 None
busUsed_16	Which routes did you use on your most recent trip where you took a public bus to or from work? Check all that apply.	1.00 Other (please specify)
busUsed_OTH	Other (please specify)	
shuttUsed_1	In the last week, what shuttles did you use to get to your work site at the start of the workday? Check all that apply.	1.00 Champlain College Lakeside/194 SPS Shuttle
shuttUsed_2	In the last week, what shuttles did you use to get to your work site at the start of the workday? Check all that apply.	1.00 Lakeside Lot
shuttUsed_3	In the last week, what shuttles did you use to get to your work site at the start of the workday? Check all that apply.	1.00 Technology Park
shuttUsed_4	In the last week, what shuttles did you use to get to your work site at the start of the workday? Check all that apply.	1.00 UVM Medical Center Employee Shuttle (Fanny Allen, Catamount East, Centennial)
shuttUsed_5	In the last week, what shuttles did you use to get to your work site at the start of the workday? Check all that apply.	1.00 UVM Cats Shuttle, On Campus
shuttUsed_6	In the last week, what shuttles did you use to get to your work site at the start of the workday? Check all that apply.	1.00 UVM Cats Shuttle, Redstone Express

shuttUsed_7	In the last week, what shuttles did you use to get to your work site at the start of the workday? Check all that apply.	1.00 UVM Cats Shuttle, Evenings After 6pm
shuttUsed_8	In the last week, what shuttles did you use to get to your work site at the start of the workday? Check all that apply.	1.00 None
whyBusCarpool_1	Why did you commute to work by bus or carpool? Check all that apply.	1.00 Decreases my carbon emissions/environmentally friendly
whyBusCarpool_2	Why did you commute to work by bus or carpool? Check all that apply.	1.00 Saves money
whyBusCarpool_3	Why did you commute to work by bus or carpool? Check all that apply.	1.00 Makes my commute easy and fun
whyBusCarpool_4	Why did you commute to work by bus or carpool? Check all that apply.	1.00 Lessens need for vehicle ownership
whyBusCarpool_5	Why did you commute to work by bus or carpool? Check all that apply.	1.00 Increases my productivity and energy at work
whyBusCarpool_6	Why did you commute to work by bus or carpool? Check all that apply.	1.00 Social connection
whyBusCarpool_7	Why did you commute to work by bus or carpool? Check all that apply.	1.00 This is my only available travel option
whyBusCarpool_8	Why did you commute to work by bus or carpool? Check all that apply.	1.00 Incentive program offered by my employer
whyBusCarpool_9	Why did you commute to work by bus or carpool? Check all that apply.	1.00 Other (please specify)
whyBusCarpool_OTH	Other (please specify)	
whyWalkBike_1	Why do you travel to or from work by walking, bicycling, skateboard or scooter? Check all that apply.	1.00 Decreases my carbon emissions/environmentally friendly
whyWalkBike_2	Why do you travel to or from work by walking, bicycling, skateboard or scooter? Check all that apply.	1.00 Saves money

whyWalkBike_3	Why do you travel to or from work by walking, bicycling, skateboard or scooter? Check all that apply.	1.00 Makes my commute easy and fun
whyWalkBike_4	Why do you travel to or from work by walking, bicycling, skateboard or scooter? Check all that apply.	1.00 Lessens need for vehicle ownership
whyWalkBike_5	Why do you travel to or from work by walking, bicycling, skateboard or scooter? Check all that apply.	1.00 Increases my productivity and energy at work
whyWalkBike_6	Why do you travel to or from work by walking, bicycling, skateboard or scooter? Check all that apply.	1.00 Social connection
whyWalkBike_7	Why do you travel to or from work by walking, bicycling, skateboard or scooter? Check all that apply.	1.00 This is my only available travel option
whyWalkBike_8	Why do you travel to or from work by walking, bicycling, skateboard or scooter? Check all that apply.	1.00 Incentive program offered by my employer
whyWalkBike_9	Why do you travel to or from work by walking, bicycling, skateboard or scooter? Check all that apply.	1.00 Other (please specify)
whyWalkBike_OTH	Other (please specify)	
wntrMode	During the winter months, do you use different transportation options to travel to and from work compared to the warmer months?	1.0 Yes - I always use a different option in the winter than in the warmer months 2.00 Yes - I sometimes use a different option in the winter depending on the weather 3.00 No - my travel habits do not change 4.00 I don't know, I haven't worked in Chittenden County in the winter
park_CC	When you drive to work, what is your primary parking location?	.00 Other (please specify) 1.00 I do not drive to work 2.00 On-street 3.00 Champlain College, 40 Sears Lane 4.00 Champlain College, Main Campus (Zone 3,4) 5.00 Champlain College, Lakeside Campus/Miller Center (Zone 1) 6.00 Lakeside Avenue Off-site Lot (Gilbane) 7.00 Spinner Place
park_CC_OTH	Other (please specify)	

park_COB	When you drive to work, what is your primary parking location?	.00 Other (please specify)
		1.00 On Street Metered Parking
		2.00 On Street Non-Metered Parking
		3.00 On-Site Parking at Workplace
		4.00 Burlington Town Center Garage
		5.00 1 College Street
		6.00 College Street/Hilton Garage
		7.00 Courthouse Plaza
		8.00 23 Ferguson Avenue
		9.00 130 Gosse Court
		10.00 Hood Plant (King Street)
		11.00 Lake & College Street (60 Lake Street)
		12.00 Lakeside Avenue Off-Site Lot (Gilbane)
		13.00 216 Leddy Park Road
		14.00 Library Lot
		15.00 Macy's/Lakeview Garage
		16.00 Main Street Lot (Corner of Main St & So. Winooski Ave)
		17.00 20 Mansfield Avenue
		18.00 1 North Avenue
		19.00 132 North Avenue
		20.00 1397 North Avenue
		21.00 585 Pine Street
		22.00 645 Pine Street
		23.00 136 So. Winooski Ave

| park_COB_OTH | Other (please specify) |

park_UVM	When you drive to work, what is your primary parking location?	.00 Other (please specify)
		1.00 I do not drive to work
		2.00 On-street
		3.00 ACC Garage (Medical Center Main Campus)
		4.00 Centennial Field (Including Compound)
		5.00 Catamount East Shuttle Lot
		6.00 Gutterson Shuttle Lot
		7.00 Colchester Research Facility (So Park Dr)
		8.00 Fanny Allen Campus
		9.00 Fanny Allen Shuttle Lot
		10.00 40 IDX Drive
		11.00 Lakeside Avenue Off-Site Lot (Gilbane)
		12.00 McClure Garage (Medical Center Main Campus)
		13.00 Medical Center Main Campus, South Lot
		14.00 One South Prosepct
		15.00 Technology Park
		16.00 Tilley Drive
		17.00 Trinity Campus
		18.00 Taft School/Cohen Lot
		19.00 UVM Jeffords West
		20.00 UVM Jeffords East
		21.00 UVM Athletic Campus
		22.00 UVM Core Central Campus
		23.00 UVM East Avenue/Catamount West
		24.00 UVM Gutterson Garage
		25.00 UVM Redstone

park_UVM_OTH	Other (please specify)

park_UVMMC	When you drive to work, what is your primary parking location?	.00 Other (please specify)
		1.00 I do not drive to work
		2.00 On-street
		3.00 ACC Garage (Medical Center Main Campus)
		4.00 Centennial Field
		5.00 Catamount East Shuttle Lot
		6.00 Fanny Allen Campus
		7.00 Fanny Allen Shuttle Lot
		8.00 40 IDX Drive
		9.00 Lakeside Avenue Off-Site Lot (Gilbane)
		10.00 McClure Garage (Medical Center Main Campus)
		11.00 South Lot
		12.00 One South Prospect
		13.00 Technology Park
		14.00 Tilley Drive
		15.00 Taft School Lot
		16.00 UVM Jeffords West
park_UVMMC_OTH	Other (please specify)	
park	When you drive to work, what is your primary parking location?	.00 Other (please specify)
		1.00 I do not drive to work
		2.00 On-site parking at work
		3.00 On-street metered parking
		4.00 On-street non-metered parking
park_OTH	Other (please specify)	
streetPark	What street do you park on most frequently?	
parkEase	When driving to work, how often do you have trouble finding a parking space?	1.00 Almost always
		2.00 Usually
		3.00 Sometimes
		4.00 Rarely
		5.00 Almost never
		6.00 I don't drive to work
poolChange_1	Which of the following would encourage you to carpool to and from work? Check all that apply.	1.00 Preferential parking for carpools
poolChange_2	Which of the following would encourage you to carpool to and from work? Check all that apply.	1.00 Free or reduced-price parking for carpools
poolChange_3	Which of the following would encourage you to carpool to and from work? Check all that apply.	1.00 Vanpool programs/subsidies

poolChange_4	Which of the following would encourage you to carpool to and from work? Check all that apply.	1.00 Accesible and current information available on carpools or vanpools online
poolChange_5	Which of the following would encourage you to carpool to and from work? Check all that apply.	1.00 Ride matching service via social network (i.e. Wheeli, Facebook)
poolChange_6	Which of the following would encourage you to carpool to and from work? Check all that apply.	1.00 Carpool bulletin boards
poolChange_7	Which of the following would encourage you to carpool to and from work? Check all that apply.	1.00 Better transportation options while at work
poolChange_8	Which of the following would encourage you to carpool to and from work? Check all that apply.	1.00 None
poolChange_9	Which of the following would encourage you to carpool to and from work? Check all that apply.	1.00 Other service/amenity, please specify
poolChange_OTH	Other (please specify)	
busChange_1	Which of the following would encourage you to take the public bus to and from work? Check all that apply.	1.00 More available information on bus schedules
busChange_2	Which of the following would encourage you to take the public bus to and from work? Check all that apply.	1.00 Free or discounted bus fares
busChange_3	Which of the following would encourage you to take the public bus to and from work? Check all that apply.	1.00 Higher parking costs
busChange_4	Which of the following would encourage you to take the public bus to and from work? Check all that apply.	1.00 Better access to realtime data on bus location/schedule

busChange_5	Which of the following would encourage you to take the public bus to and from work? Check all that apply.	1.00 More frequent bus service
busChange_6	Which of the following would encourage you to take the public bus to and from work? Check all that apply.	1.00 Living closer to a bus stop
busChange_7	Which of the following would encourage you to take the public bus to and from work? Check all that apply.	1.00 None
busChange_8	Which of the following would encourage you to take the public bus to and from work? Check all that apply.	1.00 Other service/amenity, please specify
busChange_OTH	Other (please specify)	
bikeChange_1	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 Open, secure bike racks at work
bikeChange_2	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 Easy access to biking information (maps, routes, safety)
bikeChange_3	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 Enclosed, secure bike parking at work
bikeChange_4	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 More conveniently located bicycle racks at work
bikeChange_5	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 More conveniently located bikeshare stations
bikeChange_6	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 Access to bike maintenance service
bikeChange_7	Which of the following would encourage you to	1.00 Covered outdoor bike parking

	bicycle to and from work? Check all that apply.	
bikeChange_8	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 Access to a bicycle
bikeChange_9	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 Access to an electric bicycle (e-bike)
bikeChange_10	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 Better bicycle paths/bike lanes along route to work
bikeChange_11	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 Better bike paths/bike lanes at work
bikeChange_12	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 Less hilly route
bikeChange_13	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 Better weather
bikeChange_14	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 None
bikeChange_15	Which of the following would encourage you to bicycle to and from work? Check all that apply.	1.00 Other service/amenity, please specify
bikeChange_OTH	Other (please specify)	
walkChange_1	Which of the following would encourage you to walk to and from work? Check all that apply.	1.00 Better sidewalks along route to work
walkChange_2	Which of the following would encourage you to walk to and from work? Check all that apply.	1.00 More sidewalks along route to work
walkChange_3	Which of the following would encourage you to walk to and from work? Check all that apply.	1.00 Improved environment along route (e.g. landscaping, attractive lighting, benches, and other amentities)

walkChange_4	Which of the following would encourage you to walk to and from work? Check all that apply.	1.00 Easy access to walking information (maps, routes, safety)
walkChange_5	Which of the following would encourage you to walk to and from work? Check all that apply.	1.00 Living closer to work
walkChange_6	Which of the following would encourage you to walk to and from work? Check all that apply.	1.00 None
walkChange_7	Which of the following would encourage you to walk to and from work? Check all that apply.	1.00 Other service/amenity, please specify
walkChange_OTH	Other (please specify)	
modeNew_1	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 Drive to Park & Ride
modeNew_2	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 Carpool and/or vanpool
modeNew_3	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 Get dropped off by a friend or family (the driver continues on elsewhere)
modeNew_4	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 Motorcycle of Vespa-like scooter
modeNew_5	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 Walk or wheelchair
modeNew_6	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 Bike

modeNew_7	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 Electric bike (also known as an e-bike)
modeNew_8	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 Non-motorized scooter, skateboard, or skates
modeNew_9	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 Electric skateboard or electric scooter
modeNew_10	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 Public Bus
modeNew_11	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 Campus shuttle
modeNew_12	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 Taxi or ride-hailing service (e.g. Green Cab, Lyft, Uber)
modeNew_13	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 None
modeNew_14	If driving alone were not an option for you, which of the following modes would you be likely to use to travel to work? Check all that apply.	1.00 Other, please specify
modeNew_OTH	Other (please specify)	
progAware_1	Which of the following programs/services are you aware of? Please check all that apply.	1.00 CATMA Bike-Walk Rewards Program
progAware_2	Which of the following programs/services are you	1.00 Free or discounted bus access

	aware of? Please check all that apply.	
progAware_3	Which of the following programs/services are you aware of? Please check all that apply.	1.00 CATMA confidential carpool matching service
progAware_4	Which of the following programs/services are you aware of? Please check all that apply.	1.00 Go Vermont online carpool/vanpool service
progAware_5	Which of the following programs/services are you aware of? Please check all that apply.	1.00 CATMA Guaranteed Ride Home program (free taxi ride for members)
progAware_6	Which of the following programs/services are you aware of? Please check all that apply.	1.00 CATMA Commuter Drawings
progAware_7	Which of the following programs/services are you aware of? Please check all that apply.	1.00 CarShare Vermont discounted and department membership
progAware_8	Which of the following programs/services are you aware of? Please check all that apply.	1.00 CATMA commuter tabling events, campaigns, contests, and promos
progAware_9	Which of the following programs/services are you aware of? Please check all that apply.	1.00 CATMA e-news & communications
progAware_10	Which of the following programs/services are you aware of? Please check all that apply.	1.00 CATMA Greenride Bikeshare discount
progAware_11	Which of the following programs/services are you aware of? Please check all that apply.	1.00 None
progAware_12	Which of the following programs/services are you aware of? Please check all that apply.	1.00 Other (please specify)
progAware_OTH	Other (please specify)	
shareMem	Are you currently a CarShare Vermont member?	1.00 Yes 2.00 No
shareWhyNo_1	What are the reasons that you are not a member of	1.00 I have never heard of CarShare Vermont

	CarShare Vermont? Check all that apply.	
shareWhyNo_2	What are the reasons that you are not a member of CarShare Vermont? Check all that apply.	1.00 I have no need for this service
shareWhyNo_3	What are the reasons that you are not a member of CarShare Vermont? Check all that apply.	1.00 It is not convenient for me to use
shareWhyNo_4	What are the reasons that you are not a member of CarShare Vermont? Check all that apply.	1.00 There is not a CarShare location near my home
shareWhyNo_5	What are the reasons that you are not a member of CarShare Vermont? Check all that apply.	1.00 It costs too much to use
shareWhyNo_6	What are the reasons that you are not a member of CarShare Vermont? Check all that apply.	1.00 I do not understand how CarShare Vermont works
shareWhyNo_7	What are the reasons that you are not a member of CarShare Vermont? Check all that apply.	1.00 Other (please specify)
shareWhyNo_OTH	Other (please specify)	
bikeMem	Are you currently a Greenride Bikeshare member?	1.00 Yes 2.00 No
rideWhyNo_1	What are the reasons that you are not a member of Greenride Bikeshare? Check all that apply.	1.00 I have never heard of Greenride Bikeshare
rideWhyNo_2	What are the reasons that you are not a member of Greenride Bikeshare? Check all that apply.	1.00 I have no need for this service
rideWhyNo_3	What are the reasons that you are not a member of Greenride Bikeshare? Check all that apply.	1.00 It is not convenient for me to use
rideWhyNo_4	What are the reasons that you are not a member of Greenride Bikeshare? Check all that apply.	1.00 It costs too much to use

rideWhyNo_5	What are the reasons that you are not a member of Greenride Bikeshare? Check all that apply.	1.00 I do not understand how Greenride Bikeshare works
rideWhyNo_6	What are the reasons that you are not a member of Greenride Bikeshare? Check all that apply.	1.00 Other (please specify)
rideWhyNo_OTH	Other (please specify)	
ebikeUse_1	Have you ever tried an electric bicycle? They are also known as "e-bikes."	1.00 I own one
ebikeUse_2	Have you ever tried an electric bicycle? They are also known as "e-bikes."	1.00 I have tried one that is owned by a friend, relative or colleague
ebikeUse_3	Have you ever tried an electric bicycle? They are also known as "e-bikes."	1.00 I have tried one part of a bikeshare program such as Jump or Lime
ebikeUse_4	Have you ever tried an electric bicycle? They are also known as "e-bikes."	1.00 I have tried one through Local Motion
ebikeUse_5	Have you ever tried an electric bicycle? They are also known as "e-bikes."	1.00 I have rented one
ebikeUse_6	Have you ever tried an electric bicycle? They are also known as "e-bikes."	1.00 I have tried one in another place
ebikeUse_7	Have you ever tried an electric bicycle? They are also known as "e-bikes."	1.00 I have not tried one but am interested in trying one
ebikeUse_8	Have you ever tried an electric bicycle? They are also known as "e-bikes."	1.00 I have not tried one and I am not interested in trying one
ebikeBuy	How likely are you to buy an e-bike in the next 2-years?	1.00 Don't know what an e-bike is 2.00 Very Unlikely 3.00 Unlikely 4.00 Neutral 5.00 Likely 6.00 Very likely 7.00 I have already shopped for one
infoSource_1	Where do you generally obtain transportation information? Check all that apply.	1.00 Coworkers
infoSource_2	Where do you generally obtain transportation	1.00 Friends/neighbors

	information? Check all that apply.	
infoSource_3	Where do you generally obtain transportation information? Check all that apply.	1.00 The internet
infoSource_4	Where do you generally obtain transportation information? Check all that apply.	1.00 CATMA (website, communications, events)
infoSource_5	Where do you generally obtain transportation information? Check all that apply.	1.00 Employer (HR, security, website, communications, events)
infoSource_6	Where do you generally obtain transportation information? Check all that apply.	1.00 Newspaper
infoSource_7	Where do you generally obtain transportation information? Check all that apply.	1.00 Radio
infoSource_8	Where do you generally obtain transportation information? Check all that apply.	1.00 Television
infoSource_9	Where do you generally obtain transportation information? Check all that apply.	1.00 Web enabled mobile device (Android, iPhone, iPad)
infoSource_10	Where do you generally obtain transportation information? Check all that apply.	1.00 Other (please specify)
infoSource_OTH	Other (please specify)	
satis	How satisfied are you with your day-to-day commute experience?	1.00 Very unsatisfied 2.00 Somewhat unsatisfied 3.00 Neutral 4.00 Somewhat satisfied 5.00 Very satisfied
satisFactors_1	How satisfied are you with the following chracteristics of your commute when you travel by {{Q 12}}?	1.00 Very unsatisfied 2.00 Somewhat unsatisfied 3.00 Neutral 4.00 Somewhat satisfied 5.00 Very satisfied 6.00 N/A

satisFactors_2	How satisfied are you with the following chracteristics of your commute when you travel by {{Q 12}}?	1.00 Very unsatisfied 2.00 Somewhat unsatisfied 3.00 Neutral 4.00 Somewhat satisfied 5.00 Very satisfied 6.00 N/A
satisFactors_3	How satisfied are you with the following chracteristics of your commute when you travel by {{Q 12}}?	1.00 Very unsatisfied 2.00 Somewhat unsatisfied 3.00 Neutral 4.00 Somewhat satisfied 5.00 Very satisfied 6.00 N/A
satisFactors_4	How satisfied are you with the following chracteristics of your commute when you travel by {{Q 12}}?	1.00 Very unsatisfied 2.00 Somewhat unsatisfied 3.00 Neutral 4.00 Somewhat satisfied 5.00 Very satisfied 6.00 N/A
satisFactors_5	How satisfied are you with the following chracteristics of your commute when you travel by {{Q 12}}?	1.00 Very unsatisfied 2.00 Somewhat unsatisfied 3.00 Neutral 4.00 Somewhat satisfied 5.00 Very satisfied 6.00 N/A
satisFactors_6	How satisfied are you with the following chracteristics of your commute when you travel by {{Q 12}}?	1.00 Very unsatisfied 2.00 Somewhat unsatisfied 3.00 Neutral 4.00 Somewhat satisfied 5.00 Very satisfied 6.00 N/A
satisFactors_7	How satisfied are you with the following chracteristics of your commute when you travel by {{Q 12}}?	1.00 Very unsatisfied 2.00 Somewhat unsatisfied 3.00 Neutral 4.00 Somewhat satisfied 5.00 Very satisfied 6.00 N/A
satisFactors_8	How satisfied are you with the following chracteristics of your commute when you travel by {{Q 12}}?	1.00 Very unsatisfied 2.00 Somewhat unsatisfied 3.00 Neutral 4.00 Somewhat satisfied 5.00 Very satisfied 6.00 N/A

satisFactors_9	How satisfied are you with the following chracteristics of your commute when you travel by {{Q 12}}?	1.00 Very unsatisfied 2.00 Somewhat unsatisfied 3.00 Neutral 4.00 Somewhat satisfied 5.00 Very satisfied 6.00 N/A
satisFactors_10	How satisfied are you with the following chracteristics of your commute when you travel by {{Q 12}}?	1.00 Very unsatisfied 2.00 Somewhat unsatisfied 3.00 Neutral 4.00 Somewhat satisfied 5.00 Very satisfied 6.00 N/A
satisFactors_OTH	Other (please specify)	
modePref	Earlier in this survey you indicated that your primary transportation option to and from work was "{{ Q12 }}." Would you prefer to travel to and from work using a different means?	1.00 Yes, I would prefer to use a different transportation option 2.00 No, I am happy with my primary transportation option
modeDesired	If you could travel using a different transportation option, what would you choose?	
modeDesiredWhyNo	What are the obstacles to using this transportation option?	
yrBorn	In what year were you born?	
Hhsize_Adults	How many other people live in your household? DON'T count yourself.	
Hhsize_Children	How many other people live in your household? DON'T count yourself.	
HHveh	How many motor vehicles are available to the people in your household?	
gender	What is your current gender identity?	.00 Prefer to self-describe 1.00 Female 2.00 Male 3.00 Non-binary/third gender 4.00 Prefer not to say
gender_OTH	Prefer to self-describe	
race_1	Which categories describe you? Check all that apply.	1.00 American Indian or Alaska Native
race_2	Which categories describe you? Check all that apply.	1.00 Asian
race_3	Which categories describe you? Check all that apply.	1.00 Black or African American

race_4	Which categories describe you? Check all that apply.	1.00 Hispanic, Latino or Spanish Origin
race_5	Which categories describe you? Check all that apply.	1.00 Middle Eastern or North African
race_6	Which categories describe you? Check all that apply.	1.00 Native Hawaiian or Other Pacific Islander
race_7	Which categories describe you? Check all that apply.	1.00 White
race_8	Which categories describe you? Check all that apply.	1.00 I prefer not to answer
comment	If you would like to provide us with additional input and/or share your commuting experiences to work, please enter them in the box below.	