Carsharing Vendor Analysis

Amani Gaillard

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Acknowledgements

I would like to express gratitude to my mentor, Dr. Harold Glasser, for all the advice and guidance he gave me throughout the course of my thesis. Dr. Timothy Palmer was also a great help; he assisted in giving give me direction and was always there to answer all of my questions. I would also like to make a special acknowledgment to Kim Ballard for all of her assistance and support. In addition, I am grateful to Dr. Susan Shaheen, who is the Director of Innovative Mobility, at the University of California at Berkeley, for willingly sharing her carsharing expertise. Finally, I offer a special thanks to Kriya Gaillard for all her help.

I could not have developed this thesis project and paper without you all and I am truly appreciative.

Personal Statement

When I sat down to define my goals for my thesis, I decided I wanted to do more than just fulfill the Honors College requirement. Of course, I wanted to add to my skill set through learning about what action research entails and to grow my networking skills by doing research that would require connecting with a variety of people. More than anything else, though, I wanted to do something that would add value to Western Michigan University. This school has done so much for me, and I wanted to do something that would benefit current and future students and faculty. I believe I have selected a very important topic, and I hope this thesis will be helpful in starting a successful carsharing program on campus.

Introduction

For years Western Michigan University (WMU) has sought to become more sustainable while offering its students the best campus experience possible. Carsharing offers students and faculty the benefits of having access to a vehicle without the hassles that come along with vehicle ownership and it is also a way to help a campus reduce its carbon footprint.

Carsharing at a university benefits faculty and students because it gives them regular access to a vehicle and lets them avoid or reduce such car-related expenses as gas and upkeep. In addition, most carsharing companies have a minimum age requirement of 18 years old for drivers, while most car rental agencies require that a driver be 21 or older. Carsharing allows students of all ages to have easy access to a vehicle while they leave their private vehicles at home or forgo a planned vehicle purchase. Students can also avoid spending money on an expensive parking permit or may be able to eliminate the costs and headaches of parking tickets when they cannot find a parking space.

At WMU the implementation of a successful carsharing program will have many benefits. The purpose of this thesis is to identify the best-suited carsharing vendor for a WMU carsharing program.

To review what vendor would best suit WMU's needs, I focused on four universities that have similar demographics to WMU and also have partnerships with one of the four major carsharing companies, Wecar, Ucarshare, Hertz on Demand, and Zipcar. I contacted the administrators in charge of each school's carsharing program and surveyed them. The aims of the survey were to differentiate between the vendors based on what they require of the university, to discover why each university selected a particular vendor, to understand the

benefits each vendor brought a particular user/university, and to gauge each university's overall level of satisfaction with their chosen vendor.

The survey results indicated that all vendors offer similar benefits to their user/university. Each vendor also has similar requirements from the universities. The distinctive factor that set the vendors apart is the level of satisfaction each university has with the selected vendor.

Carsharing Defined

Carsharing is essentially an organized short-term car rental service. The history of carsharing programs dates back to 1948 when a small cooperative was started in Zurich, Switzerland (Shaheen, 1999, p. 20). Economics was the primary reason for starting the program. Individuals who could not afford a car but still needed regular transportation were drawn to the program. "Over sixty years later, the principle behind carsharing remains the same: individuals gain the benefits of private cars without the costs and responsibilities of ownership" (Shaheen, 1999, p. 18). Carsharing services require that individuals pay a membership fee to join an organization that maintains a fleet of vehicles parked at convenient locations. Members reserve the use of any of the vehicles in the fleet at any time they please. Generally, an hourly or daily usage fee is charged.

WMU's Sustainability Efforts

Sustainability is a high priority for WMU. "President John Dunn signed the American College and University President's Climate Commitment (ACUPCC) on July 17, 2009, committing WMU to complete a greenhouse gas emissions inventory, create a plan for future carbon neutrality, immediately reduce greenhouse gas emissions, and integrate sustainability into the curriculum" (Office for Sustainability). WMU has taken a number of steps since assuming this commitment.

Construction is one area of sustainability that has been a WMU focus. "WMU designs facilities to minimize environmental impact and requires Leadership in Energy and Environmental Design (LEED) certification for all major projects. Recent LEED projects include Sangren Hall, Western View Apartments, Brown Hall, and several others" (Office for Sustainability). A number of additional projects and initiatives are currently underway through the WMU Office for Sustainability. "Current projects include an annual Student Sustainability Survey, National Campus Sustainability Day, bike and pedestrian friendly campus research, student permaculture gardens and the EcoMug™" (Office for Sustainability). These projects are led by students, faculty, and staff. More information on WMU's sustainability efforts can be found at the Office for Sustainability website, http://www.wmich.edu/sustainability.

Dr. Paul Pancella, Professor of Physics, and Dr. Harold Glasser, Director, Office for Sustainability, with the help of many others, prepared and submitted the Climate Action Plan on behalf of Western Michigan University on April 13, 2012. The plan proposes a variety of strategies for the university to take in order to obtain the goal of net carbon neutrality by the year 2065. Though 2065 is many years away, obtaining carbon neutrality is no small task. It will only be accomplished if we begin taking proactive steps today.

The Action Plan makes seven recommendations to reduce the climate impact of commuting on campus. Number six states, "Explore ways to motivate people to make choices other than single-occupancy automobiles, perhaps by re-vamping the way they pay for parking or providing incentives for staff to live closer to campus. The current parking pass system provides no incentive to drive less, once a pass is purchased (this applies to both students and staff, whose

permits are purchased for them by WMU)" (Pancella, Glasser, 2012, p.14). Alternatives to achieve a reduction in the carbon impact of commuting include increasing the cost of permits, providing discounts for high occupancy parking and promoting carsharing on campus.

The following graph shows that commuting represents the source of 21% of total WMU GHG emissions. It is apparent that decreasing this number will be vital to achieving carbon neutrality by 2065.

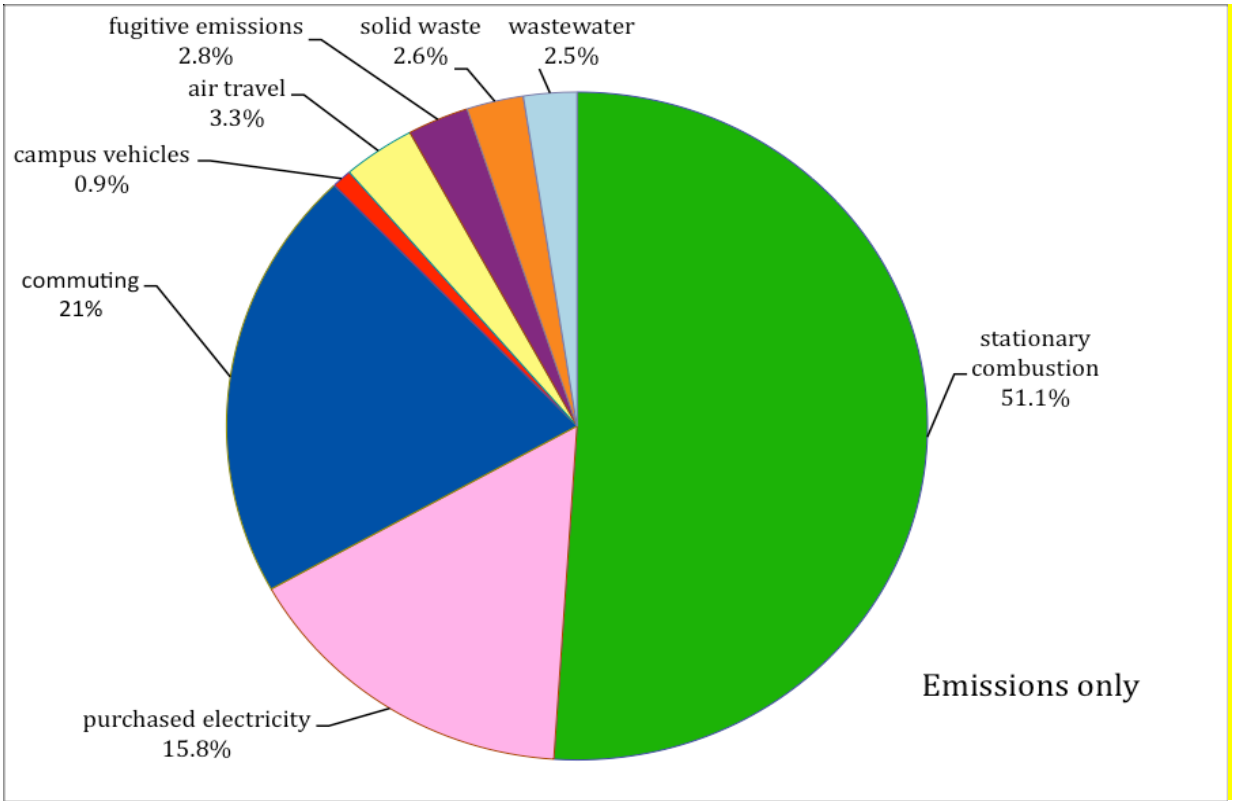


Figure 1. WMU GHG Emissions by source, as % of total emissions; data from Climate Action Plan

Methodology

The sample size of the universities researched is small. However, the universities examined are not arbitrary carsharing sites. My mentor, Dr. Harold Glasser, and I came up with specific criteria that each university needed to meet in order to be selected for study. The criteria are listed on the next page:

1. Climate Action Plan in place.

2. 20,000- 30,000 total student body population.

3. 2-3 years minimum with the carsharing program.

4. Population Density (Similar "urban" campus, but not in a big city)

5. Climate similar to Kalamazoo.

I started my search for each school by creating a list of schools that currently have partnerships with one of the four carsharing companies. I compiled this list through Google, searching with the keywords, "Carsharing vendor name," University. I also searched the carsharing vendors' websites to find universities with whom they partnered. Once I had a list of 80 schools, (20 for Ucarshare, 10 for Hertz on Demand, 20 for Wecar and 30 for Zipcar), I went through the list one school at a time. I searched the school's website to find if that school had a climate action plan in place and a total student population between 20,000-30,000. When a school met these criteria, I then Google searched the city in which the school is located to determine if that city has a similar population density to Kalamazoo. Next, I used www.bestplaces.net, a website that lists the average rainfall, snowfall, and number of sunny days for many cities, to determine this information for the four cities. I also looked at each school's website to find when the school began its carsharing program, but not all schools listed that information on their websites. After I narrowed down my list to schools that met all the other criteria, I sent emails to the Directors of the Transportation Department at the schools remaining on my list, asking when their carsharing program started.

I ended up with eight universities that met all the criteria. I made calls to each school requesting to conduct a telephone interview with the administrator in charge of the carsharing

program. Of the multiple calls I made to each school, I was only able to reach voicemail. None of the administrators returned my calls. I decided on another approach. I got the email of the administrators, either from their administrative assistant or from their profile on the schools website. I emailed each one explaining what my project was and asking if they would take a brief survey that I had created on www.surveymonkey.com. Of the eight administrators emailed, only four took the survey. The four universities whose administrators responded to the survey became the universities I studied.

After I received the survey information, I emailed each administrator with a follow up question. I asked, "Do you have any complaints with your carsharing vendor?" All four administrators answered this question. Please see Appendix 1.1 and 1.2 for a copy of the blank survey and generic email.

Motivations for Carsharing

Participating in carsharing has many benefits both on micro and macro levels. There is substantial evidence making it very clear that climate change and high energy costs are problems that we cannot wait any longer to address. "Within the United States (U.S.), transportation activity accounts for close to 30% of all Green House Gas (GHG) emissions and nearly 70% of all petroleum consumption" (Shaheen, 2011, p. 1). A study by the Transportation Sustainability Research Center (TSRC) at the University of California, Berkeley, in which an online survey was conducted to evaluate the change in annual household emissions by respondents that participated in carsharing programs, found that, "The collective emission reductions outweigh the collective emission increases, which implies that carsharing reduces GHG emissions as a whole" (Shaheen, 2011, p. 1). Carsharing presents a tremendous opportunity to reduce GHG emissions if we can change the traditional way we view transportation options.

One way carsharing contributes to reducing GHG emissions is by taking many privately owned vehicles off roads. "Each carsharing vehicle removes an average of 15 privately owned

cars from the community, as participants sell a vehicle or forgo a planned purchase" (McKenzie, 2008, p. 3). If a carsharing program at WMU were to one day grow to 20 plus fleet vehicles, we would be making a significant impact to reducing GHG emissions at our campus. A 20 fleet vehicle program would equate to 300 privately owned vehicles being taken off the road.

In addition to carsharing reducing GHG emissions, research has shown that there is a correlation between joining carsharing programs and increasing the use of other modes of transportation, such as cycling, public transit and walking. In another study by the TSRC, a 6281 respondent survey was completed in late 2008 by members of major North American carsharing organizations. The survey results found both increases and decreases in other modes of transportation adopted by carsharing members. "When these shifts were combined across modes, more people increased their overall public transit and non-motorized modal use after joining carsharing than decreased it" (Shaheen, 2011, p. 4). The benefits of using alternative modes of transportation include, but are not limited to, vehicle congestion relief, health and fitness, vehicle cost savings, parking cost savings, pollution reductions, and energy costs savings. It must be noted that correlation does not characterize causation. There are other variables to take into account that determine if carsharing users will increase their use of alternative modes of transportation. These variables include, but are not limited to, quality/availability of public transit, transportation needs, lifestyle, and level of environmental conscientiousness.

Carsharing is becoming more and more popular on college and university campuses. The Table in Figure 2 lists some of the Michigan universities that currently have carsharing programs on their campuses. Starting a program at WMU will help avoid these other schools using carsharing as a competitive advantage.

University	Univ. of Michigan	Michigan State Univ.	Wayne State Univ.	Eastern Michigan Univ.	Grand Valley State Univ.
Vendor	Zipcar	Zipcar	Zipcar	Hertz Connect	Wecar
Number of Vehicles	6	6	4	2	2

Figure 2. Table of Michigan Universities Currently Using Carsharing

Vendor Analysis

In this section, I explore in detail competitive options for carsharing on campus. The Director of the Office for Sustainability, Dr. Harold Glasser, has been having discussions with representatives from Zipcar for the past three years. Zipcar has presented WMU with several proposed contracts that define the terms of this discussion. The most recent contract spells out both WMU's and Zipcar's responsibilities. The following details Zipcar's proposal.

University Requirements

Under the current proposed contract, WMU will be responsible for assigning a university employee the task of transporting the Zipcar vehicles to the designated maintenance locations. This employee will coordinate all maintenance activities with Zipcar's Fleet Manager. WMU will need to assign an administrator to serve as a point of contact for billing and confirming that membership applicants are, in fact, current students and employees of WMU. The university will need to designate a marketing coordinator to coordinate the marketing and promotion of the Zipcar service to the university's employees and students. WMU will be responsible for providing highly visible, dedicated and reserved parking locations for each Zipcar provided. The university must maintain the parking locations free of debris, snow, ice and hazards.

Zipcar Requirements

In the initial proposed contract implementation, Zipcar is responsible for providing, at no cost to WMU, two dedicated carsharing vehicles, one of which must be Plug-In Hybrid Electric, (PHEV). Zipcar will provide signage and tow-away notices for the dedicated parking spots. All marketing production and distribution costs will be covered by Zipcar. All vehicle maintenance costs will also be covered by Zipcar.

Demographic Information

I selected the four most widely used carsharing companies in the United States for my analysis. These companies are, Zipcar, Ucarshare, Wecar, and Hertz on Demand. Zipcar is currently on 165 university and college campuses in the United States. Wecar is on 57. Ucarshare is on 38. Hertz on Demand is on 12.

I then chose eight universities to study; each company was represented by two universities. Four responded to my survey. Luckily, these four represented each of the companies. I selected the universities according to their ability to meet specific criteria, matching them to the WMU context. The criteria are as follows:

1. Climate Action Plan in place.
2. 20,000- 30,000 total student body population.
3. 2-3 years minimum with the carsharing program.
4. Population Density (Similar “urban” campus, but not in a big city)
5. Climate similar to Kalamazoo.

Selected Universities

University of North Carolina, Chapel Hill (UNC)

UNC is located in the city of Chapel Hill, which has a population of 57,230 people. Chapel Hill is very similar to Kalamazoo in that it is in between two major cities, Durham and Raleigh. The city has an average rainfall of 46.2 inches, snowfall of 5.3 inches, and 216 sunny days per year. (Sperling) The total UNC student body population is 29,390. UNC has had a partnership with Zipcar since 2007. The university has a detailed Climate Action Plan that was submitted in 2009. Aside from climate differences, UNC fits the chosen criteria very well.

University of Missouri-Columbia (Mizzou)

The University of Missouri-Columbia is located in Columbia, Missouri. Columbia has a population of roughly 100,000 people. The college town is similar to Kalamazoo in that it is about a two-hour drive from the two major cities of St. Louis and Kansas City. Columbia has an average rainfall of 40.4 inches, snowfall of 24 inches, and 192 sunny days per year. (Sperling) The total Mizzou student body population is 33,805. The university began a partnership with Wecar in August 2010. The university submitted their Climate Action Plan in January 2011. The University of Missouri-Columbia fits the criteria better than any other school.

University of North Carolina at Charlotte (UNCC)

UNCC is located in Charlotte, NC. Charlotte has a total population of 751,087. The city has an average rainfall of 44.2 inches, snowfall of 3.9 inches, and 218 sunny days per year. (Sperling) UNCC has a total student population of 25,063. The university began a partnership with Hertz on Demand in 2009. The university submitted a detailed Climate Action Plan in 2008. The large population and climate differences of Charlotte made UNCC not meet the criteria to ideal

standards. However, UNCC's demographics fit better than any other school partnered with Hertz, that I researched.

University of Utah (U of U)

The University of Utah is located in Salt Lake City, which has a population of 189,000 people. The average yearly rainfall is 17.4 inches. The average yearly snowfall is 50.7 inches. There are an average of 222 sunny days. (Sperling) The University of Utah has a total student population of 28,211. The university partnered with Ucarshare in 2009. The university submitted their Climate Action Plan in September 2010. The large population of Salt Lake City means the U of U did not meet ideal criteria standards. However, all the other criteria were sufficiently met to make this school the best selection.

Western Michigan University

To put the data for these four universities into perspective, here are the demographics of WMU. Kalamazoo has a population of 74,200 people. The average yearly rainfall is 35.1 inches. The average yearly snowfall is 61.8 inches. There is an average of 161 sunny days per year. (Sperling) The total student population of WMU is roughly 25,000. As previously stated, WMU submitted a Climate Action Plan in April 2012.

The following table lists how many carsharing vehicles each university has in their fleet and the vehicle types. Generally, as a carsharing program grows membership, more vehicles are added to the fleet. The table, listed on the next page, gives a picture of how much growth each program has experienced based on how many vehicles are in the fleet.

University	UNCC	U of U	Mizzou	UNC
Date Program Started	2009	2009	2010	2007
Number of Vehicles	3	4	4	6
Vehicle Types	2 Nissan Altima Hybrids 1Chevy Equinox	2 Toyota Priuses 2 Toyota Yarises	2 Ford Focus Hybrids 2 Ford Focus Sedans	1 Honda Insight Hybrid 1 Nissan Sentra 1 Toyota Prius 1 Honda Civic 2 Ford Focuses

Figure 3. Table of Number of Vehicles and Vehicle Types at Each University

Survey Analysis

I created a survey to send to the administrator in charge of the carsharing program at each university. The aim of the survey was to differentiate each vendor based on what they require of the university, why they were selected by the university, what benefits they offered the user/university, and what was the university's overall level of satisfaction with the vendor. The survey consisted of the following eight questions:

Question 1. When did your car sharing program begin?

Question 2. Who pays for the designated car-sharing parking spaces?

Question 3. Is fuel cost included in daily/hourly rate?

Question 4. How does vehicle maintenance work?

Question 5. Are there requirements for your university to promote the carsharing program?

Question 6. Is insurance included in the hourly/daily rate?

Question 7. Why did you choose the company?

Question 8. How would you rate the overall service of your car-sharing company?

There were no significant differences in the responses to the survey in questions 2, 3, 4, 5, and 6. All four vendors require the university to pay for the designated parking spaces, (Question 2). Fuel is included in the daily/hourly rate of all vendors, (Question 3). Maintenance costs are covered by all four vendors, (Question 4). All four vendors have requirements for their respective universities to promote the carsharing program, (Question 5). One limitation of question 5 was that it did not ask the respondents to identify what these requirements were. Each vendor covers the marketing/promotion costs. Insurance is included in the hourly/daily rate of all vendors, (Question 6).

The only significant differences appear to be with questions 7 and 8, the reasons why each university selected particular vendors and their satisfaction level with the vendor. UNCC reported "satisfactory" service from Hertz on Demand. The University of Utah reported "poor service" from Ucarshare. The University of Missouri reported "satisfactory" service from Wecar. Zipcar had the highest rating of all four vendors, with an "above average" rating from UNC.

I followed up the survey with questions sent via email to the administrator surveyed. I asked Collin Simmons, Administrative Manager, Commuter Services, University of Utah, what the reason for the "poor rating" was and if he had any particular complaints with Ucarshare. Mr. Simmons stated that Ucarshare does not keep the cars clean on a regular basis. He said there are often technical errors with the website, such as the website not matching what cars are actually available. Mr. Simmons went on to say that the customer service at headquarters is "non-existent."

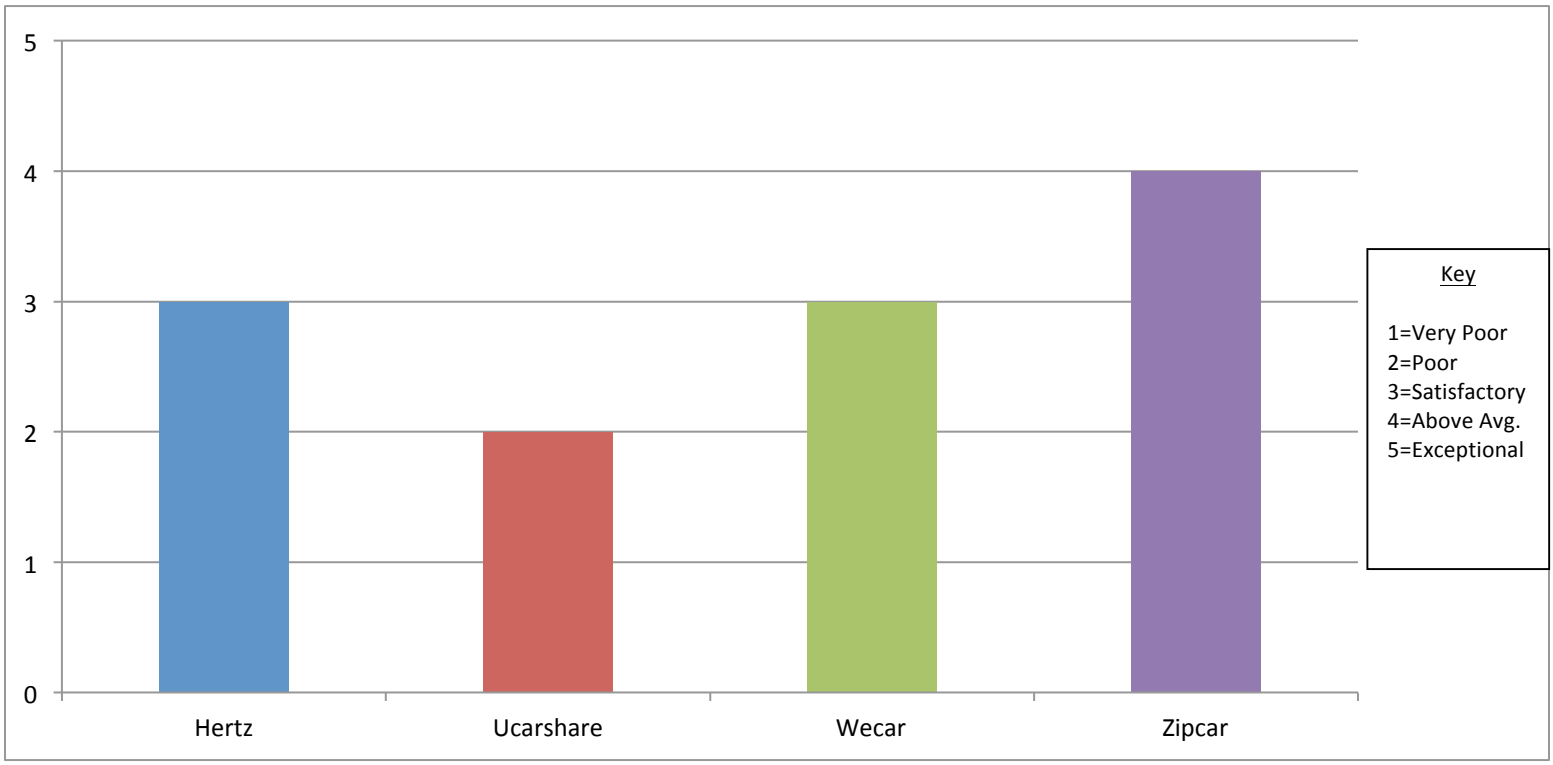
In another follow up email questionnaire, I asked Starr Wimberly, UNCC's Transportation Manager, if she had any complaints with Hertz on Demand. She said the only complaints are sub-par customer service, as well as maintenance issues. She said the maintenance of the fleet vehicles has been delayed without notice on a few occasions, resulting in members' reservations not being honored. In all of these cases the members were given a free 6-hour rental for their inconvenience.

Michelle Froese, Marketing and Public Relations Manager Student and Auxiliary Services, University of Missouri, reported no particular complaints with Wecar.

Amanda Simmons, Transportation Manager, UNC, also reported no complaints with Zipcar. Ms. Simmons went on to say that the customer service is excellent and that she would highly recommend Zipcar.

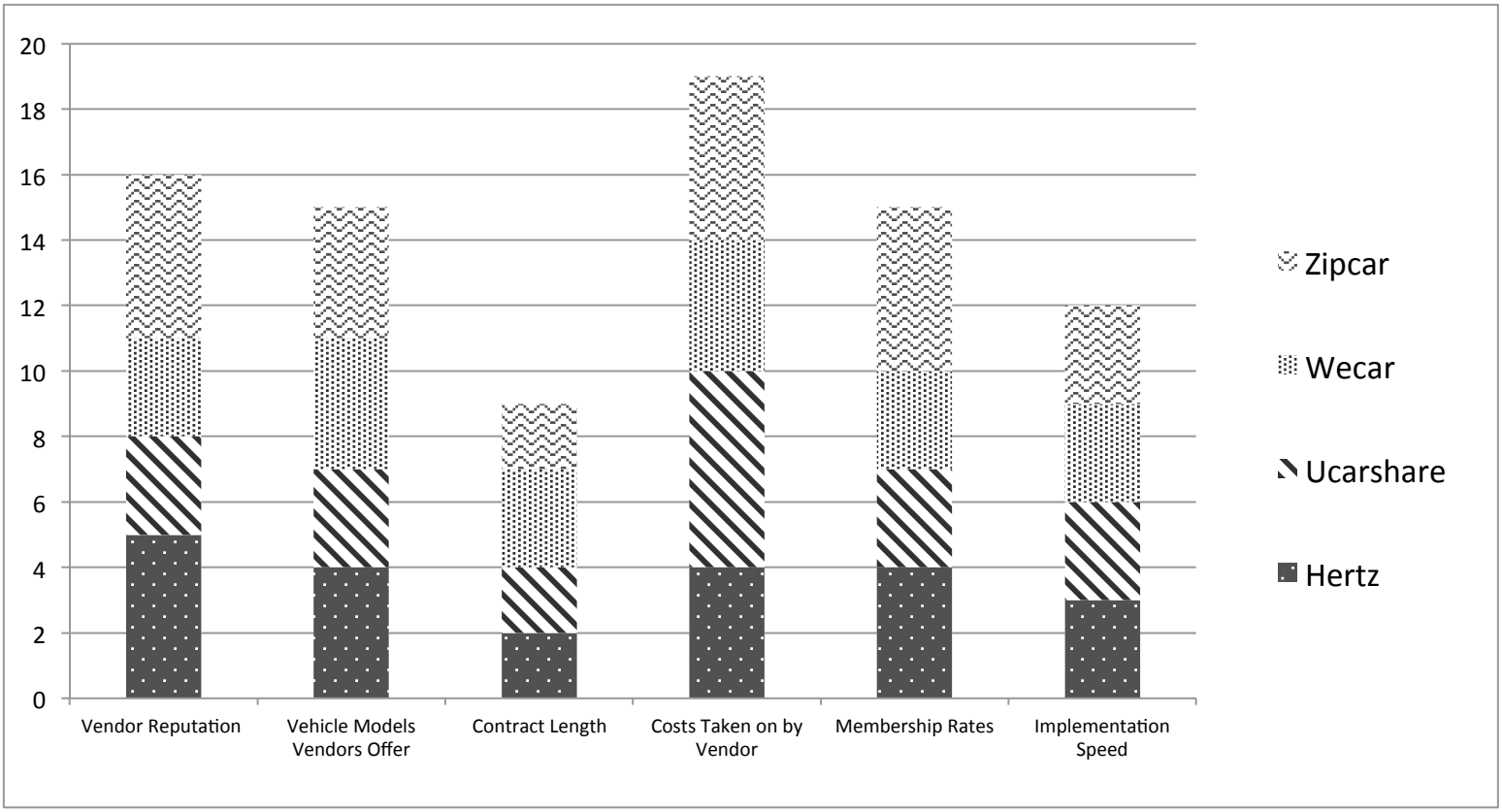
Survey Data Graphs

Figure 4. Bar Graph of Vendor Satisfaction



The bar graph in Figure 4, on the previous page, shows the ratings the universities gave their carsharing vendors. There is a significant distinction between each of the ratings. A "very poor" rating characterizes continuous customer service problems, constant lack of honoring predetermined agreements, and maintenance of fleet vehicles never done on time. A "poor" rating represents consistent customer service problems, some predetermined agreements not being upheld, and maintenance not done in a timely fashion on a regular basis. A "satisfactory" rating depicts occasional customer service problems, occasional agreements not being upheld, and infrequent maintenance issues. An "above average" rating characterizes rare customer service problems, predetermined agreements constantly upheld, and maintenance consistently done in a timely fashion. An "exceptional" rating portrays zero customer service problems, all predetermined agreements upheld, and all maintenance done in a timely fashion.

Figure 5. Bar Graph of Administrator's Reasons for Selecting their Vendor



The bar graph in Figure 5, on the previous, page shows which criteria were most important to the universities in selecting their carsharing vendor. This data helps identify which areas each university focused on most when making a vendor selection. Each respondent was asked to rate each reason on a scale of 1 to 5, with 1 being "no importance" and 5 being "critical importance."

Overall, the vendor's reputation and willingness to take on costs associated with the program were the most important reasons for selection. Examples of costs taken on by the vendor include marketing/promotion, parking signage, and maintenance costs. Length of contract and speed of implementation were the least important reasons. The differences became more distinct when respondents answered the "other, please specify" prompt.

Ms. Froese, from the University of Missouri said, "A key point for us was to identify a company that had a solution for drivers under the age of 21. Wecar will allow drivers under the age of 21 to become members as long as they can provide proof of insurance carried by their parents."

Amanda Simmons, from UNC, said they used an innovative Transportation Demand Management (TDM) initiative. The TDM initiative was created with the goal of creating successful strategies and policies aimed at reducing single-occupancy private vehicles. Ms. Simmons said the initiative made it clear that Zipcar was, "The only company promoting this service with minimum risk to the University."

Both UNCC and the University of Utah respondents said they selected their vendor using a bid process. Each qualified vendor placed a bid, and the universities evaluated and selected the most attractive bid.

Recommendations

Periodically, WMU students have raised the idea of a carsharing program to Dr. Glasser. President Dunn has also expressed interest in starting a carsharing program on campus. Earlier surveys have been conducted to assess WMU students' views towards the campus sustainability. Many students have requested carsharing in these surveys. It is clear that there is interest for carsharing at WMU. It is my recommendation that WMU run a well-structured pilot program to assess the real demand.

Initial guidance supports that Zipcar is the best vendor for WMU to run a pilot program. The pilot program could start with just one or two fleet vehicles. Zipcar would cover all marketing and promotion costs. WMU would have to assign someone to be in charge of transporting vehicles for maintenance, marketing coordination, and billing. However, Zipcar would cover all of these costs. The only cost to WMU would be providing visible parking spaces for the fleet vehicles. There would only be one or two parking spaces needed for the pilot program.

Risks and costs associated with running a pilot program are relatively low. If students and faculty take to the program well and the fleet vehicles are used to full capacity, WMU could add another vehicle. Additional vehicles would gradually be added to meet demand.

The limitation of my research is the fact that I only gathered data for each vendor from one university. It is possible that other schools have had different experiences with the vendors. Because of this limitation, I cannot make an absolute recommendation for Zipcar. It would be helpful to gather secondary data before making a final decision. 165 universities are currently using Zipcar. These universities could be surveyed to assess their overall satisfaction level with Zipcar. However, this research may not be necessary. The data collected from my small sample

distinguishes Zipcar as the best suited vendor for WMU. The facts that Zipcar is on 165 campuses and is the largest carsharing vendor in the U.S. are also a testament to that vendor's quality of service.

Conclusion

The preliminary data I gathered during the process of this thesis suggests carsharing could be a viable option for WMU. A successful program would be a proactive step to meeting the goals advanced in the Climate Action Plan. If the recommended pilot program were to eventually grow to 20 plus vehicles, carsharing would make a significant contribution in decreasing GHG emissions at WMU.

The results of my research and the reputation and benefits of Zipcar support that Zipcar is the best option for a WMU pilot program. Additional surveying of other universities currently using Zipcar could help make this decision more definitive.

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Appendix 1.1 Survey

1. When did your car sharing program begin?

2. Who pays for the designated car-sharing parking spaces?

- ☐ University
- ☐ Car-sharing Company
- ☐ Members
- ☐ Other (please specify)

3. Is fuel cost included in daily/hourly rate?

- ☐ Yes
- ☐ No

4. How is maintenance of the fleet vehicles dealt with?

5. Are there requirements for your university to promote/ advertise the car-sharing program?

- ☐ Yes
- ☐ No

6. Is insurance included in the hourly/daily rate?

- ☐ Yes
- ☐ No

7. Why did you choose the company?

	No Importance	Slight Importance	Average Importance	Above Average Importance	High Importance	Critical Importance
Company reputation	○ No Importance	○ Slight Importance	○ Average Importance	○ Above Average Importance	○ High Importance	○ Critical Importance
Vehicle models offered by vendor	○ No Importance	Slight Importance	○ Average Importance	○ Above Average Importance	High Importance	○ Critical Importance
Length of contract	No Importance	Slight Importance	○ Average Importance	○ Above Average Importance	○ High Importance	○ Critical Importance
Costs associated with program taken on by vendor	○ No Importance	○ Slight Importance	○ Average Importance	Above Average Importance	○ High Importance	Critical Importance
Membership rates	○ No Importance	○ Slight Importance	○ Average Importance	○ Above Average Importance	○ High Importance	○ Critical Importance
Speed of implementation	○ No Importance	Slight Importance	Average Importance	○ Above Average Importance	High Importance	○ Critical Importance

Other (please specify)

8. How would you rate the overall service of your car-sharing company?

○ Very Poor ○ Poor ○ Satisfactory ○ Above Average ○ Exceptional

Appendix 1.2 Email to Contact Administrators

Dear “Administrator’s Name”

Thank you very much for participating in my carsharing survey. The information you provided will be very helpful.

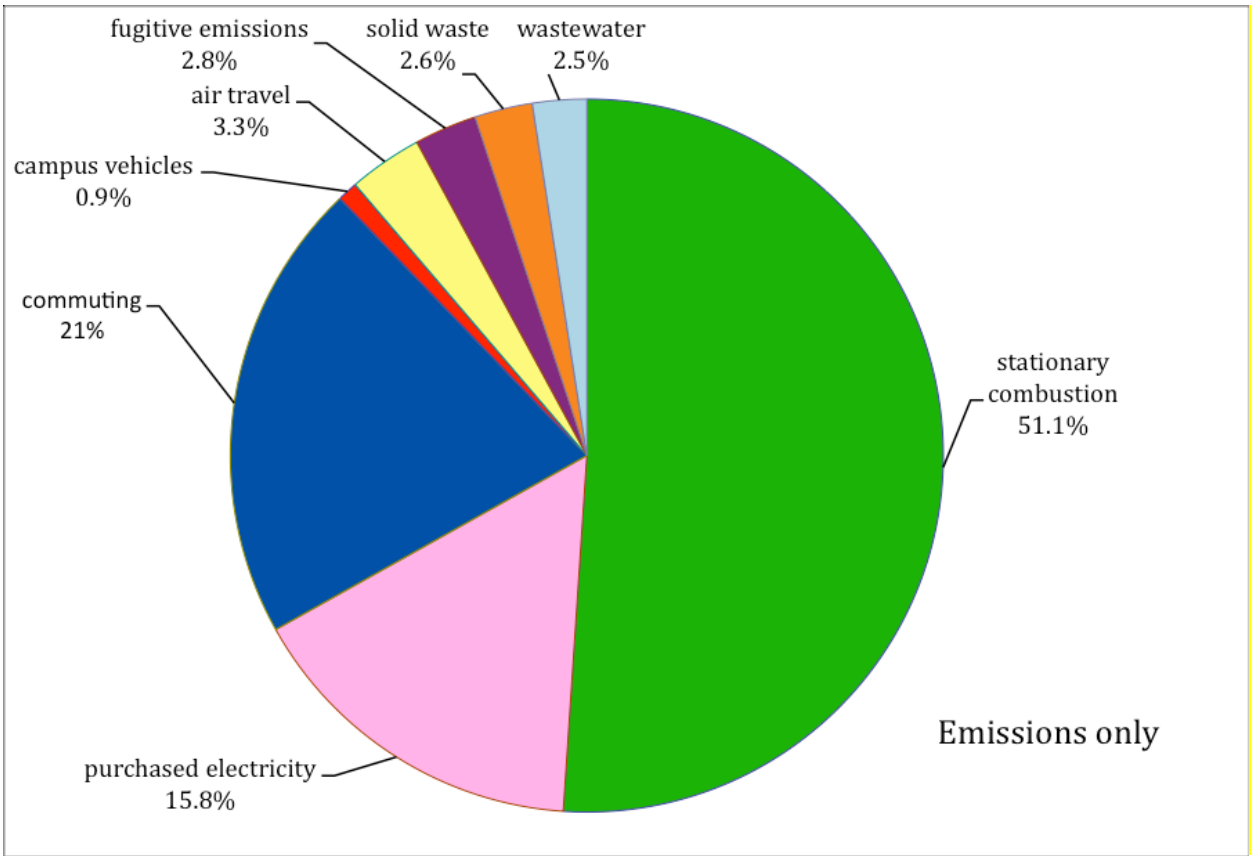
I have one last question. Can you explain in detail any complaints you have with your carsharing vendor?

Thank you very much for your time.

Sincerely,

Amani Gaillard

Appendix 2.1 Figure 1. Pie Chart of WMU GHG Emissions by Source, as % of Total Emissions



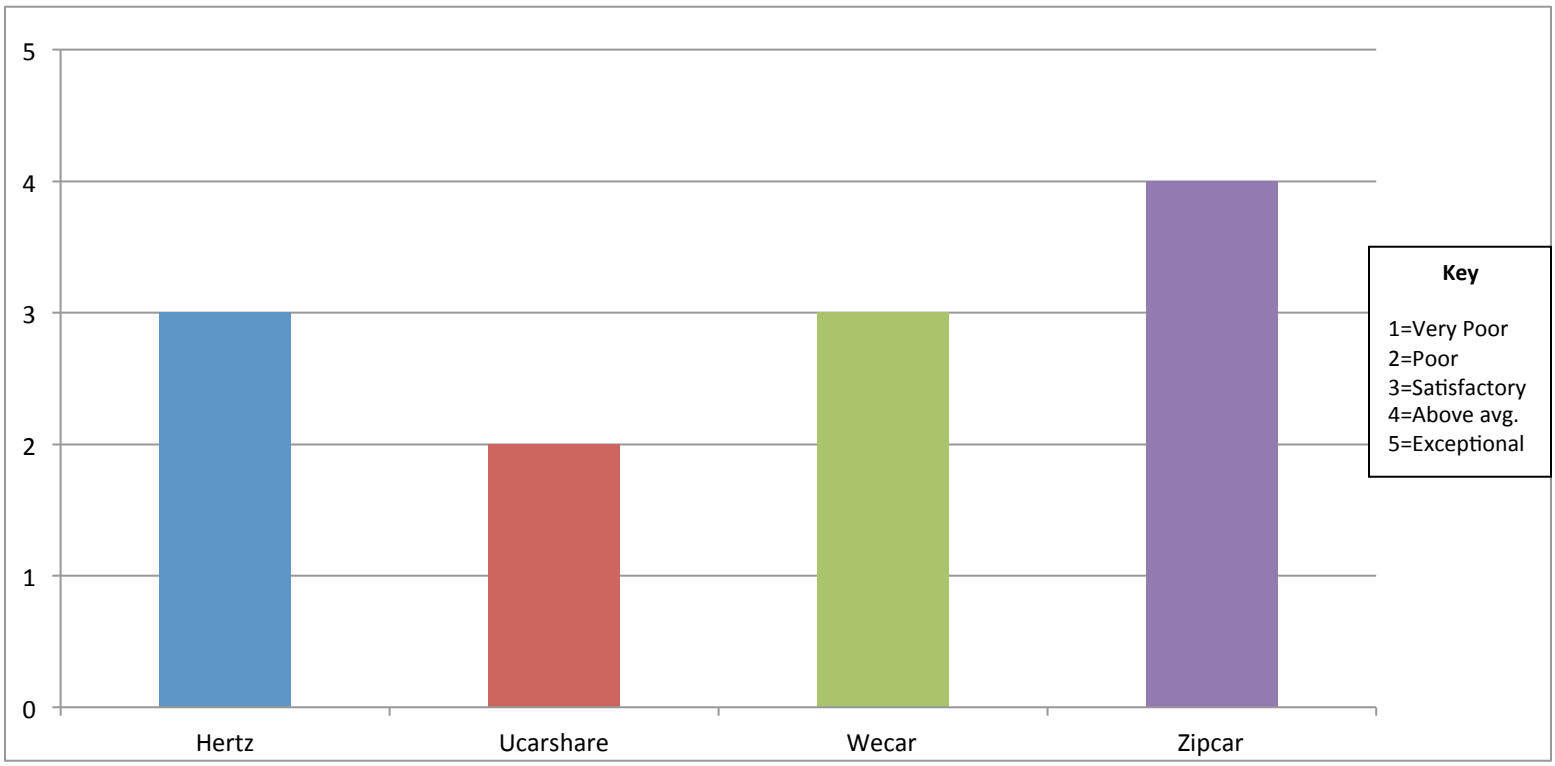
Appendix 2.2 Figure 2. Table of Michigan Universities Using Carsharing

University	Univ. of Michigan	Michigan State Univ.	Wayne State Univ.	Eastern Michigan Univ.	Grand Valley State Univ.
Vendor	Zipcar	Zipcar	Zipcar	Hertz Connect	Wecar
Number of Vehicles	6	6	4	2	2

Appendix 2.3 Figure 3. Table of Number of Vehicles and Vehicle Types at Each University

University	UNCC	U of U	Mizzou	UNC
Date Program Started	2009	2009	2010	2007
Number of Vehicles	3	4	4	6
Vehicle Types	2 Nissan Altima Hybrids 1Chevy Equinox	2 Toyota Priuses 2Toyota Yarises	2 Ford Focus Hybrids 2 Ford Focus Sedans	1 Honda Insight Hybrid 1 Nissan Sentra 1 Toyota Priuses 1 Honda Civic 2 Ford Focuses

Appendix 3.1 Figure 4. Bar Graph of Vendor Satisfaction



Appendix 3.2 Figure 5. Bar Graph of Administrator's Reasons for Selecting their Vendor