

Not the Normal Commute:
Bicycling for Transport in Columbia, Missouri

A thesis
presented to
the Faculty of the Graduate School
at the University of Missouri-Columbia

In partial fulfillment
of the requirements for the Degree
Master of Arts

by
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MAY 2017

The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

NOT THE NORMAL COMMUTE:
BICYCLING FOR TRANSPORT IN COLUMBIA, MISSOURI

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ACKNOWLEDGEMENTS

I would like to thank several individuals and organizations who made it possible for me to complete this thesis research project. First and foremost, I would like to thank Dr. Foulkes for being my thesis advisor, guiding me from the early stages of project idea development all the way through data collection and analysis. He maintained the perfect balance between offering suggestions and listening to my ideas, and he was as interested in the topic of this study as I was. I also want to thank my other two committee members, Dr. Urban and Dr. Wilhelm Stanis, for offering ideas for improvement to the structure of the study and for agreeing to participate in my thesis defense process. Thank you to Martin Wills for connecting me with local cycling advocates and providing input on the survey and interview questions.

It is also important that I thank all the participants from the study. Thank you to all of the cyclists who completed the online survey for taking a moment to share your thoughts and experiences on bicycling in Columbia. A special thanks to the cyclists who participated in an interview, which took even more time but provided a deeper level of insight into the local cycling experience. I want to thank Lawrence Simonson for providing input on the survey and interview questions and participating in an interview. I would like to thank PedNet and Columbia Parks and Recreation for distributing the survey. Thank you to Janet Godon, Ian Thomas, Darwin Hindman, Chip Cooper, and the Walt's bike shop employee for participating in interviews.

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NOT THE NORMAL COMMUTE: BICYCLING FOR TRANSPORT IN COLUMBIA, MISSOURI

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ABSTRACT

The objective of this research study is to assess the bicycle transportation system in Columbia, Missouri using structuration theory. Each component of this system is part of the structure or an agent inside the structure. The structure consists of infrastructure and culture, which includes roads and trails, local government, and bicycling advocacy groups. The local cyclists are the agents, although advocacy groups and members of local government can act as agents as well. Two questions are addressed to reach the study objective: 1) How have structural conditions impacted the behavior of bike commuters? And 2) How have bike commuters and other agents impacted the local structure for cycling? In order to gain a detailed understanding of the impact of these forces, the study includes an online survey of local cyclists, in-depth interviews with bike commuters, and interviews with key figureheads such as members of local government. Study results provide an enhanced understanding of how the local bicycling system works and changes, including the relationship between structure and agency.

CHAPTER 1: INTRODUCTION

There are many different ways that people can commute to work. Cars are well-liked in the United States, and as a result much attention has been paid to making it easier to drive a car. Even so, many people commute by bike instead of driving (Gatersleben and Appleton 302-303). When people alter their main means of transportation, a process called mode shift, difficulties may arise. This is especially true for a switch from cars or public transport to bikes. Some long-term or recurring difficulties likely remain even for experienced bicycle commuters. Bike commuting is becoming easier, though, as cities across the country incorporate cycling infrastructure into their transportation system to expand travel options and reduce traffic in an environmentally friendly manner.

As much as people have researched the issue of bicycle commuting and tried to come up with ideas to get more people commuting by bike, there does not seem to be any in-depth qualitative analysis of the experiences and opinions of people who are already bike commuters. Researchers have examined what people like and dislike about bicycling (Gatersleben and Appleton; Winters et al.; Schoner et al.; Wahlgren and Schantz), and they have highlighted the best places to ride to work within a city (Huang and Ye), but these studies have not asked the people who commute by bike why or how they do it. Mode shift requires plenty of forethought, and cyclists are the best source of information on this topic. While cyclists are a necessary component to a research study of a cycling system, it is also important to incorporate the structural forces shaping the

bicycling infrastructure and culture, such as advocacy groups and members of local government. This research study describes the cycling system of a small Midwest metropolitan area, including local cyclists, key figureheads, and infrastructure.

The objective of this study is to assess bicycle commuting in Columbia, Missouri using structuration theory. The sub-questions are: 1. How have structural conditions impacted the behavior of bike commuters? And 2. How have bike commuters and other agents impacted the local structure for cycling? As per the case study methods described by Yin, interviews and surveys are used to answer the research questions. The study is thus a case study of Columbia, Missouri's cycling structure. The agents are the cyclists and key figureheads from advocacy groups and local government. The structure is the transportation infrastructure and culture, which is largely controlled by local government and advocacy groups. In the Columbia metro area between 2011 and 2015, approximately 0.9% of residents rode a bike to work, which is higher than the percent of commuters who travelled by bike in Missouri (0.2%), in the Midwest (0.5%) and in the U.S. overall (0.6%). Columbia ridership is higher than in Kansas City (0.2%), St. Louis (0.2%) and Springfield, Missouri (0.4%) (U.S. Census Bureau, "S0801 Commuting Characteristics by Sex"). The high ridership is likely partially attributable to the quality of the local cycling system. This study seeks to uncover the reasons why Columbia's system is particularly appealing.

An electronic survey was distributed via e-mail and social media to the members of PedNet, which is an organization in Columbia, Missouri of people who are interested in bicycling and walking and want to provide better opportunities for these activities. The link was also shared with the e-mail list for GetAbout Columbia, which "is a

collaboration between Parks and Recreation and Public Works” (City of Columbia Public Works). This group was selected because these individuals have probably ridden their bikes more often than the average Columbia resident, and are thus more likely to have commuted by bicycle. Bicycle commuters must be sought out in this manner, for a survey of the general public would not provide enough applicable data (Wahlgren and Schantz; Gatersleben and Haddad 43). In addition, people involved with PedNet or GetAbout are more personally concerned with the local cycling system, so they are willing to take a moment to complete a bike-related survey, and will deliberate over their responses (Brown and Kyttä). The survey has questions about the person’s demographics, their bicycle(s), history of cycling, experience with bicycle commuting, obstacles to bicycle commuting, and bicycling advocacy. If the person indicated that he or she is a “dedicated daily bike commuter” (PedNet Coalition, “Board of Directors”), the survey asked the person if they wanted to take part in an in-depth interview. The electronic survey results were analyzed and presented as descriptive statistics.

Interviews were conducted with 11 people who deemed themselves a “dedicated daily bike commuter” (PedNet Coalition, “Board of Directors”). These individuals were asked about bicycling advocacy and infrastructure. They were also prompted to describe why and when they started commuting by bicycle and the obstacles that they have encountered while commuting by bicycle. Audio for interviews was recorded, and thematic coding was used to summarize the results. Relevant quotes that illustrated key themes were transcribed.

Interviews were also conducted with individuals who are considered key figureheads in the local cycling structure due to their employment or position in

advocacy groups. Interviewees included local government employees, advocacy group leaders, and a bike shop employee. These interviews included questions about how Columbia's cycling structure has changed and who or what has brought about these changes. Analysis of survey results and themes from interviews provided an understanding of the relevant forces and connections between agency and structure in Columbia's cycling system.

CHAPTER 2: LITERATURE REVIEW

Section 1: Car Culture

In order to conduct a research project focused on bicycle commuting, it is important to assess the current transportation situation in the United States, starting with the roots. In his book *Bike Battles*, James Longhurst says "...the likelihood that any individual will choose to travel by bike depends on a complex history leading to a system of economics, politics, culture, and physical infrastructure that might support or discourage that choice" (232). It is therefore necessary to examine some historical events and changes.

Neither American roads, laws, nor citizens accommodate bicycles particularly well (Longhurst). Jonathan Levine exposes and condemns the fact that mobility has taken precedence over accessibility, meaning society is not thinking about utility of transportation (Levine). As Todd Litman explains it, "a mobility perspective...favors solutions that increase motor vehicle system capacity and speed" (5), and "[accessibility] values modes according to their ability to meet users' needs, and does not necessarily favor longer trips or faster modes if shorter trips and slower modes provide adequate access" (6). Transportation is only feeding suburbanization, which directly conflicts with accessibility, and present-day transportation lacks connectivity between citizens and vital everyday services (Levine). Because mobility overshadows accessibility, there has not been much effort to make it easier to ride a bike (Litman).

Larger scale legal and financial arrangements in the United States do not work in bicyclists' favor, and tend to favor cars. The jaywalking law is an example of a legal change that was intended to make transport easier for auto operators, and auto operators only—this law was created to get pedestrians off the road so drivers would not have to slow down or face the risk of running people over (Lewis). One of the reasons we do not have more cycling infrastructure is that states have never been forced to use finances from the federal government for anything specific, and cycling infrastructure is not always a primary concern for state government (Longhurst 208; Handy 6). Another reason there isn't more bike infrastructure in the U.S. is that the people riding bikes preferred having access to roads when many Americans were biking in the 1970s (Longhurst). There was concern that with cycling infrastructure, access to roads would be eliminated (Longhurst 224), but this concern no longer exists (235).

Another problem with bicycling for transport is that it is sometimes associated with specific personal traits. While around 50 years ago, cultural pressure limited cycling to younger people (Longhurst), today, some people think cycling is for financially well-off individuals (Schneider 134; Akar and Clifton 165). Birgitta Gatersleben and Hebba Haddad noticed that people who do not ride their bike much will be prone to shy away from commuting by bike, so long as they are in the mindset that riders normally use their bikes as a hobby (47). In addition, sometimes it seems that riding a bike is more normal for men (Gatersleben and Appleton 309).

Section 2: Mode Shift

Even though there is a strong car culture in the United States, some people ride a bike for transport rather than driving. Researchers have used several different approaches to examine the topic of bicycle commuting and the process of mode shift, wherein an individual alters their main means of transportation. Research questions and conclusions generally focus on either infrastructure or people. Some studies integrate both types of questions.

Part 1: Infrastructure-based studies

Some studies are centered on the existing transportation infrastructure. In certain studies, researchers want to determine the condition of the existing infrastructure. In Copenhagen, individuals in the community have done “participatory mapping.” (Olafsson and Skov-Petersen 162). Schlossberg and Brehm’s PPGIS project (public participation geographic information systems) sought to assess travel by foot/bike. Most inquiries were factual, but opinions were included with the goal of understanding what makes roads and sidewalks attractive (Schlossberg and Brehm 86). An alternative method would be to simply have people document and relay information on difficulties they experience when riding their bike, which is essentially the strategy that has been implemented in Copenhagen (Olafsson and Skov-Petersen 162). Lina Wahlgren and Peter Schantz had people who bike to work specify which traits, such as plants and cars, made their ride noticeably better or worse.

The more an individual is associated with and passionate about a topic, the more desirable and descriptive the data they can add to a PPGIS (Brown and Kyttä). It would

therefore make sense to conduct a survey of local cyclists about cycling infrastructure in a specific city or town. Fritz Kessler used a few different online bicycle mapping programs and realized that each one is loaded with data but not nearly enough analyses have been carried out with this data (267). These programs did not incorporate cyclist *problems*, though. It seems, then, that perhaps a different program that allows cyclists to warn and help each other or even transportation planners would have great potential.

Another way researchers study infrastructure is by determining the suitability of a city's transportation network for cycling. For example, in a thesis completed at the University of Missouri-Columbia in 2015, Anna Clausen implemented a suitability model to see where the local government could place bike rental racks in hopes of convincing some people to switch from driving to biking. Clausen concludes that her research could be extended by figuring out the most ideal roads and trails to take to reach different places in town (153). GetAbout Columbia made a map that scored streets in Columbia, Missouri with regards to cycling, and Clausen included this map in her thesis. The scores were determined by speed limit and road type. Gatersleben and Appleton make a suggestion similar to Clausen's idea (310). Huang and Ye demonstrate the extreme utility of GIS for bicycling infrastructure assessment. Plenty of data in the proper format is downloadable from the internet—for example, the authors found U.S. Census roads data for their bike mapping in Berkeley—and data can be manipulated within GIS (Huang and Ye 77). They created a map of the best places to ride using this roads data along with other data layers such as elevation.

There are many different characteristics of a road that can make it easier or more difficult to ride on, such as elevation (which was in the Huang and Ye study), presence or absence of a pedestrian signal, congestion of trails, road surface material, and others. It would be very difficult to record and analyze data on all variables of interest, and researchers might not even think of certain variables that are rather important to cyclists. Studies of infrastructure should incorporate bike commuters and their input on what makes roads and paths better or worse for riding.

Part 2: Individual-based studies

Several studies have been conducted at the individual scale to figure out what people like and dislike about bicycling, either from experience or assumption (Gatersleben and Appleton; Winters et al.; Akar and Clifton; Schoner et al.; Wahlgren and Schantz). Although these studies ask more individualistic questions, the conclusions sometimes point to broader structure-based solutions. Akar and Clifton implemented a survey at the University of Maryland in an attempt to discover the primary reservations people have with using a bike for their commute, and they noticed that dissatisfactory routes are troublesome (171). Another significant observation from this study is that improved awareness of existing cycling infrastructure is a promising strategy (172).

Studies from Gatersleben and Appleton and Winters et al. were quite similar to one another and offer excellent ideas for cycling research. These studies implement the same theory. Winters et al. cite James Prochaska and Wayne Velicer's work "The Transtheoretical Model of Health Behavior Change," in which the authors explain that:

The transtheoretical model uses a temporal dimension, the stages of change, to integrate processes and principles of change from different theories of intervention, hence the name transtheoretical. This model emerged from a comparative analysis of leading theories of psychotherapy and behavior change (38).

Prochaska explains that anyone striving to alter their behavior needs to place the advantages of the desired alternative lifestyle at the forefront of their mind and reduce their preoccupation with the disadvantages, and that the right mentality towards the alternative lifestyle has the power to secure someone within the new lifestyle (Prochaska 848). It is not hard to see how these notions could be imposed for bike transport developments. If someone thinks bicycling is a positive practice, he or she will want to embrace this practice. The characterization of subjects are similar amongst Winters et al. and Gatersleben and Appleton's studies: "potential cyclists," "occasional cyclists," "frequent cyclists," and "regular cyclists" in the former study (155) correspond to "contemplation," "prepared for action," "action," and "maintenance" in the latter study (305). One significant difference amongst these two studies was their conclusions. Winters et al. determined that the key to drawing people in to bicycle commuting is devoting energy towards providing increasingly tolerable places to ride. Gatersleben and Appleton did not reach such simple, infrastructure-based conclusions—they recognized the fact that individual-level experiences and opinions have a strong impact on bicycle commuting.

Part 3: Integrating infrastructure- and individual-based questions and conclusions

Structuration theory is well-suited to analyzing bicycle commuters, as it calls for integrating infrastructure- and individual-based questions and conclusions. Anthony Giddens' structuration theory claims that "the structural properties within a particular society are constantly reiterated and expressed in everyday actions at the level of the individual. Simultaneously these everyday actions are reproducing the structural properties of that society" (Cresswell 202). In terms of bicycling, this means that adding more bike lanes and trails is only half of the matter; people need to actually be riding on these trails in order for bicycling to become an established part of transportation culture (Gatersleben and Appleton 303). Although "Giddens offered a compelling analysis of how capitalism radically changed the fundamental contours of class relations and culture" (Warf), social scientists can easily use this theory to understand more specific aspects of society. For example, Hugh Prince used structuration ideas to study American wetlands and the various people and groups who determine the condition of that environment. These ideas could easily be transferred to a study of a bicycling system, and would facilitate creation of research questions that integrate individuals and infrastructure, combining major strategies from previous cycling research.

Gatersleben and Appleton's study examined various components of cycling systems. They found that for swaying the public towards bicycle commuting, there are distinct techniques that are catered to the stages they created using the ideas of Prochaska and cohorts (310). For the "contemplation" class, better infrastructure means greater likelihood of riding; for the "action" class, providing assistance with

integrating bicycle commuting and life's main obligations is a more promising method; and for the "maintenance" class, the best strategy is to work on keeping a positive mentality and perhaps pride in bicycle commuting (310). In many places, bicyclists join forces to advocate for alterations to the structure, and such advocacy groups are a part of structuration that's neither strictly "agency" or "structure" but rather a vital middle ground that ties everything together (Phipps 2709). Politicians and researchers can help connect the two sides as well (Prince 1-2). There are towns in this country where structuration is evident in transportation planning (Marshall). In such towns, roads see minor alterations that better incorporate cyclists, and if bicycling gains popularity, more drastic alterations in favor of cycling may be made to the infrastructure (Marshall). There was a town where "community groups" provided an idea for an alteration, which is similar to the suggestion of using bicyclist GIS data discussed above (Marshall).

While minor infrastructure changes address the structure side of structuration theory, the agents need to be addressed as well. Some researchers (Gatersleben and Appleton 311; Schneider 134) feel that the best idea is to start by explaining strategies for the technical or practical matters of bicycle commuting, and they have tried to break down and understand the process of mode shift. For example, multiple studies show that in some cases, baggage is hard to incorporate in a bicycle commute (Gatersleben and Appleton 309; Winters et al. 158; Akar and Clifton 168). In addition, weather has a big impact on bicycle commuting (Winters et al. 158). So-called "dedicated daily bike commuters" (PedNet Coalition, "Board of Directors") have clearly come up with a way to ride even with these dilemmas (Gatersleben and Appleton 302-303), and can act as a

case study and share their stories of how they deal with the existing infrastructure (Steinberg and Steinberg 93).

Robert Schneider notes that the transtheoretical model, which was part of both Gatersleben and Appleton's research and the research of Winters et al., is not formatted properly for bicycle commuting (130). This model is tempting for such studies in that it allows finer and more meaningful descriptions of people based on their stance in regards to bicycle commuting beyond "commutes by bike" and "does not commute by bike," which is important because there are many levels in between (Gatersleben and Appleton 303; Winters et al.). These descriptions could be too hard-set, though, as everyone constantly faces different transportation options (Schneider 130). Schneider writes:

[The theory of routine mode choice decisions] suggests that there are five steps in the mode choice decision process...The first part, (1) awareness and availability, determines which modes are viewed as possible choices for routine travel. The next three elements, (2) basic safety and security, (3) convenience and cost, and (4) enjoyment, assess situational tradeoffs between modes in the choice set. These middle three steps may be considered simultaneously or in various sequences. The final part, (5) habit, reinforces previous choices and closes the process loop. Socioeconomic characteristics explain differences in how individuals view each part of the process (129).

This layout can easily be connected to structuration theory; bicycling has to be a part of the transportation structure for someone to even move past "awareness and availability." Then "situational tradeoffs" can tip the scales towards bicycling if a person

knows how to use the infrastructure they have. To determine the plausibility of his theory, Schneider interviewed nearly 30 people near San Francisco, California, arguing that this data collection method creates the most complete picture of people's mindsets and conduct (130). His data came from patrons at a public vendor (130), and seemingly agree with his theory (135). Schneider's theory and methodology could be further refined by focusing on the differences between people who have actually ridden their bikes for commuting and the people that have not, in a manner similar to Gatersleben and Appleton's strategy.

The concepts that form structuration theory have already been used for bicycling systems. These concepts are very consciously employed in Copenhagen, Denmark, where higher quality bicycling systems have resulted from opinions of people who ride bikes and political figures (Sally). In Columbia, Missouri, these concepts have been employed, but to a somewhat lesser extent than in Denmark. For the Active Living By Design project in Columbia, the opinions of people riding bikes were documented, including their thoughts on alterations to the bicycling infrastructure (Alta Planning + Design and GetAbout Columbia). The impact that bicycle commuters have had as agents enhancing the structure (Phipps 2709) has not been nearly as large in Columbia as in Copenhagen. It is therefore important to assess how Columbia, Missouri, has reached its current stage in bikeability by reviewing its history of bicycling infrastructure development and identifying the key people that have taken part in this development. The existing literature has examined bicycling at different scales, but researchers have not fully integrated all of the different structures and agents that are involved in bicycling systems. As a result, their perceptions of these systems have been incomplete, for as

Hugh Prince reveals in his study of wetlands, structures involving humans contain many pertinent scales of structure and agency that each need to be studied in order to understand how the structure works and develops (1-2). This thesis study reveals the people and entities affecting the bicycling structure in Columbia, Missouri, with an emphasis on bicycle commuting. Interested groups such as transportation planners, advocacy groups, and individual cyclists can take these results into consideration and respond accordingly.

CHAPTER 3: METHODS

Section 1: Online survey

The study included an online survey of a select group of Columbia residents regarding their experiences using the local cycling system. The purpose of the survey was to assess the agency component of the local cycling system, which includes people who ride bikes. Individuals who do not ride bikes for transport were invited to take the survey as well, and were provided a separate set of questions. Non-cyclists were included with the goal of understanding why people refrain from becoming agents in the cycling system.

A list of multiple choice, short answer, and “check all that apply” questions was compiled for the online survey. These questions were grouped into the sections “Demographic Information,” “Bicycling History,” “Advocacy,” “Bicycling for Transport History,” and “Bicycling for Transport.” All respondents were asked the questions from the first three categories. Only the respondents who have ridden their bike for transport in Columbia (defined as commuting, running errands, or other trips) were asked the questions in the “Bicycling for Transport History” section, which is about commuting experiences. Only the respondents who have not ridden their bike for transport in Columbia were asked the questions in the “Bicycling for Transport” section, which simply asks “Why haven’t you ridden your bike for transport? (Check all that apply)” and provides a list of options, including “other.” A local bike commuter and the assistant director of PedNet helped review and edit the survey questions.

The survey questions were entered in to a Google Forms file. The local bicycling

advocacy group PedNet shared the link via social media in early October 2016 (Fig. 1) and included a link to the survey in their member newsletter e-mail. In the middle of November 2016, PedNet sent out the link via social media again, and the Columbia Public Works/Parks and Recreation program GetAbout (City of Columbia Public Works) sent the link to their e-mail listserv. Survey participation occurred essentially during the months of October and November. There were 62 responses, but three were deleted because they were duplicates. Only one respondent had not ridden their bike for transport in Columbia, so this response was excluded because there were not enough responses from non-commuters for substantial analysis on this category of individual. Ultimately there were 58 useable responses, one of which was an individual who abstained from the demographics questions. The results were downloaded as an excel spreadsheet. Responses were modified for certain questions to obtain logical agreement amongst responses. For example, some respondents responded “N/A (don’t have children)” to the question “Is there at least one other adult besides yourself who acts as a caretaker for the children in your household?” yet they did not respond “zero” to questions regarding the number of children in their household, so these responses were changed to “zero.” Some graphs and charts of results were automatically generated in Google Forms, and supplemental charts were created in Microsoft PowerPoint.



Figure 1: Advertisement for online survey on PedNet's Facebook page

Section 2: Interviews with Bicyclists

In addition to the survey of local cyclists, this study included in-person interviews with a small group of people who commute by bike regularly. The purpose of these interviews was to determine the experience and impact of agents in the local cycling system. There was a prompt in the online survey that said "If you (or another member of your household) use a bike for transport regularly (i.e. at least once a week, average) and are willing to participate in a follow-up interview, please provide the e-mail address of the interested individual." Starting at the top of the survey results table, an e-mail

was sent to every other respondent who provided an e-mail address until a total of 11 interviews were conducted, exceeding the initial goal of ten interviews. Two interviewees were personal acquaintances of the primary researcher, while the other nine interviewees were participants in the online survey. The interested cyclists were asked to select a time and public location such as a coffee shop for the interview.

Interviewees first completed a paper form with the same demographics questions used in the online survey, then responded verbally to questions about cycling experiences and advocacy. The interview audio was recorded. Demographics information was entered into a Microsoft Excel sheet. The key researcher listened to the audio recordings and recorded key themes and quotes from the interviews in a separate Excel sheet. These themes were organized into flow charts in Microsoft Powerpoint for ease of understanding and to construct a comprehensive summary of the interviewees' thoughts.

Section 3: Interviews with Key Figureheads

Because this study aimed to examine the entire cycling system in Columbia, data needed to be gathered on the structure component to supplement the data regarding agency. Several key groups and individuals in Columbia are involved with the structure component of the cycling system, such as people in local government, advocacy groups, and bike shops. It was therefore vital to incorporate their perspectives in this study. Interviews were conducted with 6 such individuals:

1. Janet Godon – employee for Columbia Parks and Recreation, former PedNet employee
2. Ian Thomas – city council member, co-founder of PedNet
3. Darwin Hindman – former mayor of Columbia (1995-2010)
4. Chip Cooper – co-founder of PedNet
5. Lawrence Simonson – assistant director of PedNet
6. An employee from Walt's Bike Shop

The audio was recorded. The researcher listened to the audio recordings and recorded key themes and quotes from the interviews in an Excel sheet. These themes were organized into a flow chart in Microsoft Powerpoint for ease of understanding and to construct a comprehensive summary of the interviewees' thoughts.

CHAPTER 4: RESULTS

Section 1: Online Survey

Part 1: Demographic information

The average age of respondents was 43. Most respondents had lived in Columbia for at least five years. Males constituted two thirds of the sample (63%) while one third of the sample was female (37%). About two thirds (68%) of the bike commuters were in the top two income quintiles for Columbia. The vast majority of respondents had at least a bachelor's degree (88%), and roughly a third of respondents had a post-bachelor's degree. Few respondents lived alone (16%), while many lived with one other person (46%) or more (39%). Most respondents did not have any children in their household (61%), and those who had children typically had another adult caretaker—only 14% of respondents had children they care for alone.

Most respondents lived in a household with two or more cars (67%), while some had one car (28%) and very few had no car at all at their household (5%). While only three individuals indicated that there are zero cars at their household, the responses to the question “Why do you ride your bike for transport?” indicated that six respondents did not have a car, and three of these individuals did not live alone, so presumably another person in the household had a car and the respondent did not.

Most of the respondents had moved in their lifetime (93%). Amongst the respondents who had moved, half of them rode their bike for transport at their previous place of residence, and half did not. Two-thirds of the individuals who did not ride at their previous residence lived outside Columbia, while about half of the individuals who

rode at their previous residence lived outside Columbia.

The demographic information from the survey may have important implications about bicycle commuting. The fact that most respondents had lived in Columbia for more than five years might indicate that people are most comfortable bicycling for transport when they feel familiar with the city in which they live. Most respondents were male, which could be related to typical gender roles that often place housekeeping and childcare demands on women. This pool of respondents was particularly wealthy. Given that bicycling for transport is much cheaper than owning and driving a car, there are likely many lower income individuals who bike for transport in Columbia, but few such individuals participated in this survey. On the other hand, lower income individuals may have different everyday life demands that inhibit their ability to ride a bike for transport (i.e. they might have greater childcare demands). Very few respondents lived alone, which might imply that people are more comfortable riding for transport knowing that there is another person they can reach out to for assistance if something goes wrong during their bike commute (i.e. flat tire). There were only a handful of single parents in the survey sample, a possible indication that childcare demands are a significant inhibitor to bicycle commuting (Fig. 2). Most respondents lived in a household with two or more cars, and this shows that this group of individuals did not seem to bike for transport out of necessity (Fig. 3). The fact that most people who did not bike for transport in their previous place of residence lived outside Columbia suggests that Columbia is particularly bike-friendly, although this could be related to life stage changes that often align with a change of residence, rather than enhanced infrastructure.

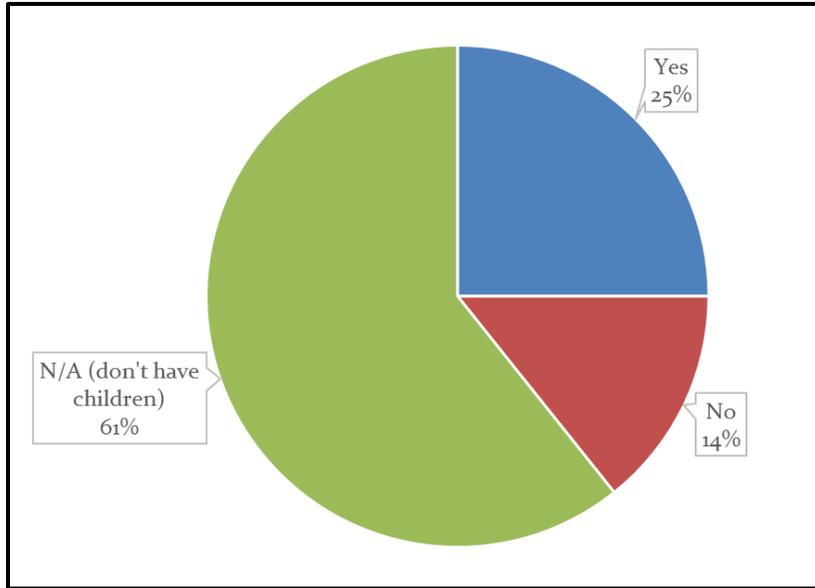


Figure 2: Responses to the question “is there at least one other adult besides yourself who acts as a caretaker for the children in your household?” (total responses: 56)

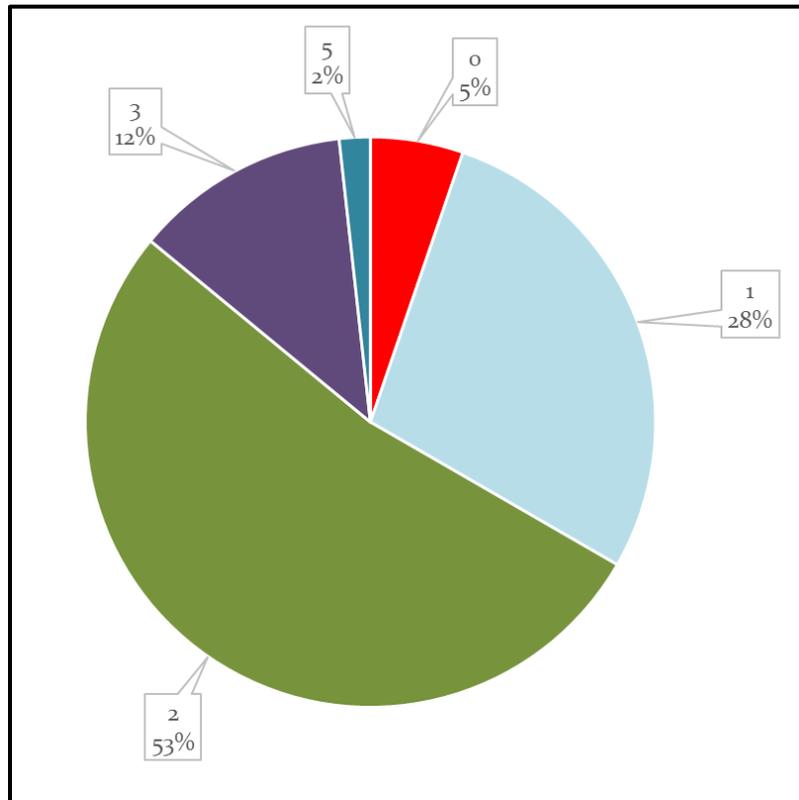


Figure 3: Number of cars present in survey respondent households (total responses: 57)

Part 2: Experiences with bicycling for transport

Most respondents owned a road bike (64%), and the other most common types of bike were cyclocross, mountain, hybrid, and commuter. All but six respondents had bike lights. Rain gear, racks, and fenders are the other types of gear that most people owned. All but five respondents had participated in other cycling activities, and the most popular activities were fun rides, club rides, and charity/fundraiser rides. Four reasons for cycling for transport were selected by at least half of the respondents: “I like the feeling of riding,” “I want/need the exercise,” “I want to help the environment,” and “I want to save money on gas” (Figure 4). Nearly all respondents selected “I like the feeling of riding” (91%). The top two difficulties faced while bicycling for transport were “drivers are not sufficiently alert/aware” and “cars drive too close.” Tied for the third most common response were “rain” and “rocks or glass on the road/bike lane” (Figure 5).

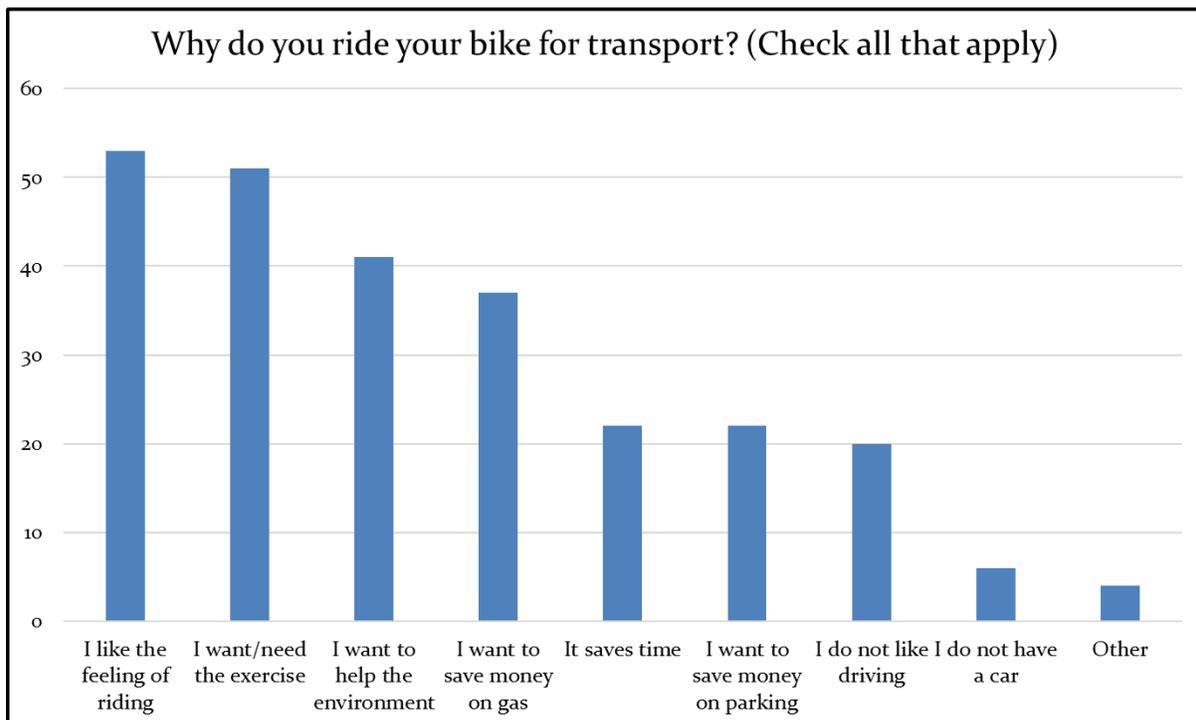


Figure 4: Responses to the question “why do you ride your bike for transport?” (total responses: 56)

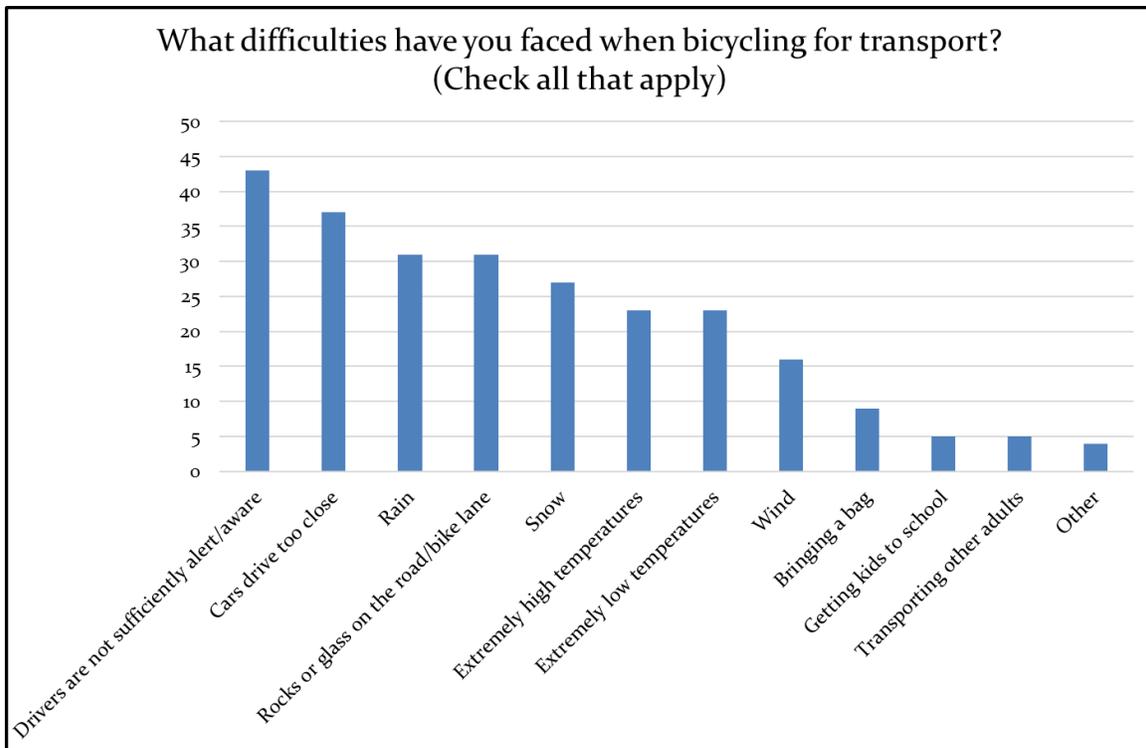


Figure 5: Responses to the question “what difficulties have you faced when bicycling for transport?” (total responses: 55)

Out of all the respondents, seven indicated that they ride their bikes for transport every day in every season (12%). Over half of respondents said they ride most days or every day in summer and the same is true for spring, whereas less than a third of respondents ride most days or every day in winter (28%). Over half of respondents said they will not ride in a thunderstorm (60%), but only about a third are deterred by regular rain (36%). Less than one third of respondents have performed a hybrid commute, wherein part of the commute distance is completed by bike and the other part is completed by car or bus. Only seven respondents have used a bus for a hybrid commute, which may indicate that there are problems with the local bus system that make this type of commute too difficult or inconvenient.

The only open-ended question from the survey was the prompt: “Finish this sentence: Bicycling in Columbia would be easier/better if...” The primary researcher

read through all of the responses and grouped the responses into five categories: infrastructure, drivers, cyclists and laws, drivers and cyclists and laws, and greater number of people on bikes. Table 1 contains a few sample responses for each theme and a count of the number of times each theme appeared across all responses. A tally count was recorded for the number of responses that fit within each category, and this allowed the researcher to determine major themes. Respondents most often provided comments related to infrastructure or drivers. Some mentioned that drivers and bicyclists need better knowledge of laws, while only a couple mentioned bicyclists but not drivers with regards to this problem. A few respondents said the city would benefit from an increase in the number of cyclists.

Theme (and count)	Sample Responses
Infrastructure (28)	<ul style="list-style-type: none"> • there were safer bike infrastructure • the trails were all connected & led to each area of town • there were more and safer ways to travel across I-70
Drivers (16)	<ul style="list-style-type: none"> • drivers were more accepting of bicyclists on our roads • motorists understood how to interact with cyclists better • motorist were less distracted and more respectful
Cyclists and laws (2)	<ul style="list-style-type: none"> • all fellow bicyclists knew to follow traffic laws • people would learn ride bikes
Drivers and cyclists and laws (5)	<ul style="list-style-type: none"> • drivers and cyclists would utilize the road and bike ways in responsible and safe manners • riders and drivers followed the rules of the road more closely • if all parties on the road understood and followed the rules of the road. Cyclists and cars
Greater number of people on bikes (3)	<ul style="list-style-type: none"> • more people rode bicycles • more people biked

Table 1: Themes with example responses to survey prompt “Finish this sentence: Bicycling in Columbia would be easier/better if...” and a count of the number of times each theme appeared

This group of cyclists seems to consist of well-seasoned cyclists who have purchased extra gear for carrying things and riding in various weather conditions. The fact that nearly all respondents said they ride because they “like the feeling of riding” supports the notion that in general, these individuals do not ride out of necessity. It is therefore understandable that they are less likely to ride in the winter or when there is a thunderstorm. Several respondents have struggled with drivers when bike commuting.

Part 3: Cyclist advocacy

About one third of respondents were not PedNet members. The most common reason for joining PedNet was “I like biking,” followed by “I want safer cycling infrastructure,” “I want more pedestrian and bike trails,” and “I want to encourage other people to ride bikes more.” Those four responses were each selected by at least half of the respondents. Roughly one fifth of respondents had not participated in bicycling advocacy. Most respondents had given donations (62%). The next most common forms of advocacy were volunteering (43% of respondents), sending letters to legislators (40% of respondents), and fundraiser participation (40% of respondents).

It is peculiar that such a large proportion of respondents were not PedNet members. The most common form of advocacy, and the only one selected by over half of respondents, was donations, which is not a particularly active form of advocacy. Still, most respondents were members of PedNet and had participated in some form of bicycling advocacy.

Part 4: Applying survey results to structuration theory

The results to the online survey provide useful insight as to how bicyclists fit within the bicycle commuting system in Columbia. In applying structuration theory to this study, local bike commuters are viewed as agents. These individuals can use the existing bicycling structure, but they can also modify the structure if they have the desire to do so and are willing to collaborate (Phipps 2709). The structure consists of the physical bicycling infrastructure and the cultural environment, including political entities.

It is difficult to determine whether people who commute by bike start riding

because the infrastructure is particularly inviting or if they are usually people who already enjoy biking and would probably ride regardless of the condition of the infrastructure. Most likely, some combination of these two scenarios exists in Columbia. The group of bike commuters that participated in this survey consisted mostly of people who had lived in Columbia for at least five years. Furthermore, amongst respondents who had changed places of residence and did *not* ride for transport at their old home, most previously lived outside Columbia. It appears that the bicycling infrastructure in Columbia has a strong, positive impact on bicycle commuting. Even so, cyclists did report problems with the infrastructure. In response to the prompt “finish this sentence: Bicycling in Columbia would be easier/better if...,” many commented that there should be a greater amount of infrastructure or higher quality infrastructure.

Respondents also provided thoughts on the cultural environment with regards to bicycling. The demographic data indicates that there were not many single parents within this survey respondent group, which could be a sign that in the current cultural environment, single parent lifestyles are naturally too demanding for bicycling for transport to be an option. Some respondents said drivers and/or cyclists do not know or do not obey the laws related to road use, which is a cultural problem. Another respondent thought cycling would be better if “more places of employment had shower and/or lockers,” which is partly an infrastructure problem but also possibly another large-scale cultural problem—workplaces in the U.S. may be less likely to consider the possibility that their employees might want to commute by bike. The respondent whose results were excluded because they were the only non-commuter mentioned other problems with work. When asked “why haven’t you ridden your bike for transport?”

Check all that apply,” this individual selected the responses “The route is too hilly” and “there is more than one place I need to go on a normal day,” and provided a write-in response saying “my car is needed to transport materials for my job.” A couple respondents looked at the problem more broadly, saying cycling would be better if “land use was not so auto-centric” and “we put equal priority toward bicycle infrastructure as we do toward motor vehicle infrastructure.” These respondents provided solutions involving larger-scale adjustments to the cultural mindset that shapes infrastructure development, thus addressing both components of the bicycling structure.

Riding a bike for transport is generally more difficult than driving in the United States, so it was expected that the cyclists in this study would express some problems they have had in their commutes. As agents in the local bicycling structure, some cyclists had advocated on their own for improvements to the local cycling structure. Many of the cyclists were involved with PedNet, which is a more powerful method of bringing about positive changes (Phipps 2709). Simply being a member of this group and donating to bicycling-related causes in other ways are forms of advocacy that require minimal effort. It makes sense then that the most common form of advocacy amongst respondents was donations, which for some respondents might have consisted of a membership fee paid to PedNet. Nonetheless, over one-third of respondents were not PedNet members. Donations and group membership cannot bring about the larger scale cultural change that cyclists seemed to call for in their survey responses. The most prominent problems described in the survey were infrastructure and road use, and there is a strong desire to increase the knowledge of cyclists and/or drivers about how to behave on the road. While over a third of

participants have sent letters to legislators and several have been to city council meetings, and these actions are effective means to address infrastructure problems, a different approach seems necessary for addressing cultural problems in the cycling structure.

Section 2: Interviews with Bicyclists

After demographic question sheet information and themes from interview audio were recorded in Microsoft Excel tables, two flowcharts were generated based on the results from cyclist interviews. One flowchart is titled “Bike commuter life,” and this chart contains general information on cyclists’ commuting route and habits, reasons for commuting by bike, and problems they have faced while commuting by bike (Figure 6). This flowchart was meant to provide background information on the interviewees’ everyday commutes. The second flowchart is titled “Bicycling for Transport in Columbia, MO” (Figure 7). This second flowchart contains responses to more in-depth descriptions and opinions of the Columbia bicycling system, and provides insight into the relationship cyclists have with this system. Themes from the interview response Excel sheet were grouped into 4 main themes that encompass most of the cyclists’ thoughts: adjustments to incorporate (bike commuting) into life, personal advocacy, room for improvement (in the local cycling system), and positive aspects (of the local cycling system). Some themes or topics that were mentioned by cyclists did not fit within these main themes. The outlying topics include comparison of bike commute time to car commute time, freeze-thaw on the trail, advocacy via fun rides, improper riding on campus, and preferences for road or trail riding.

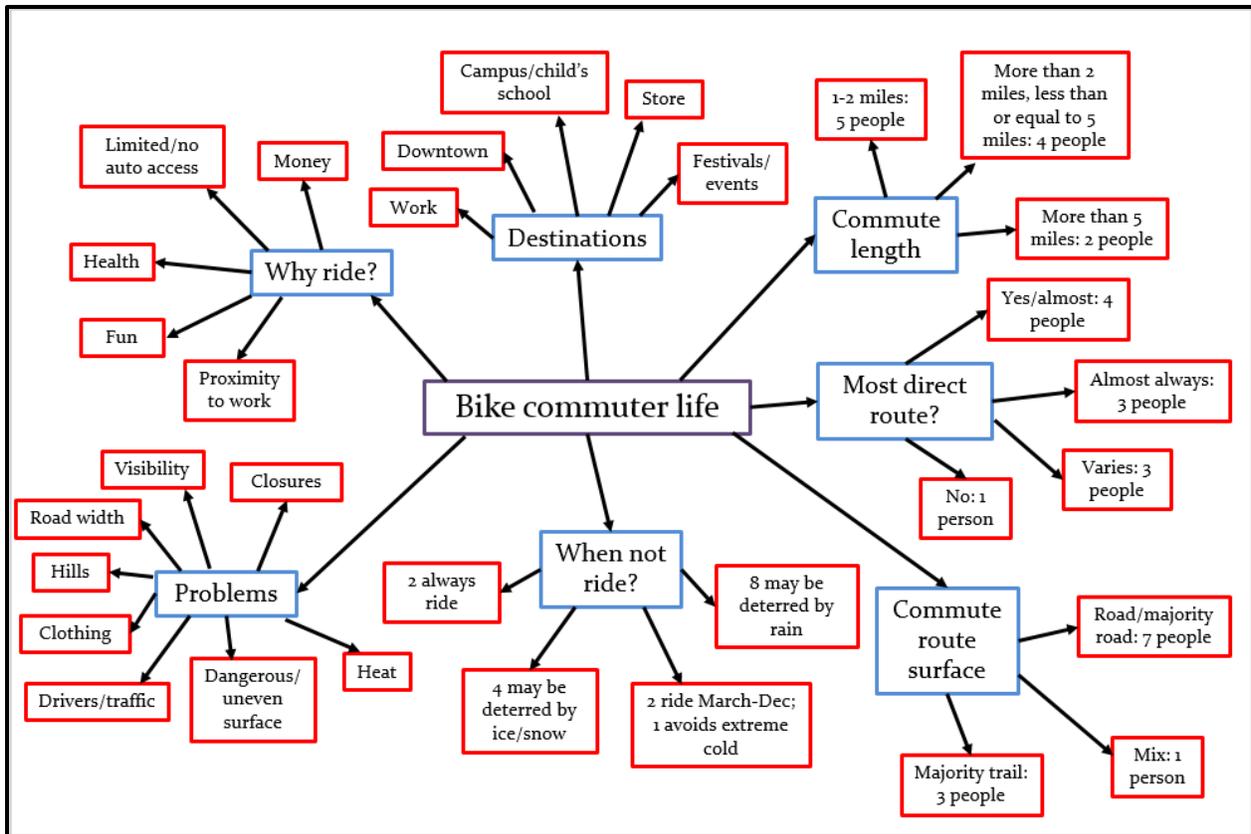


Figure 6: Flowchart titled “Bike commuter life” describing everyday bike commute experiences

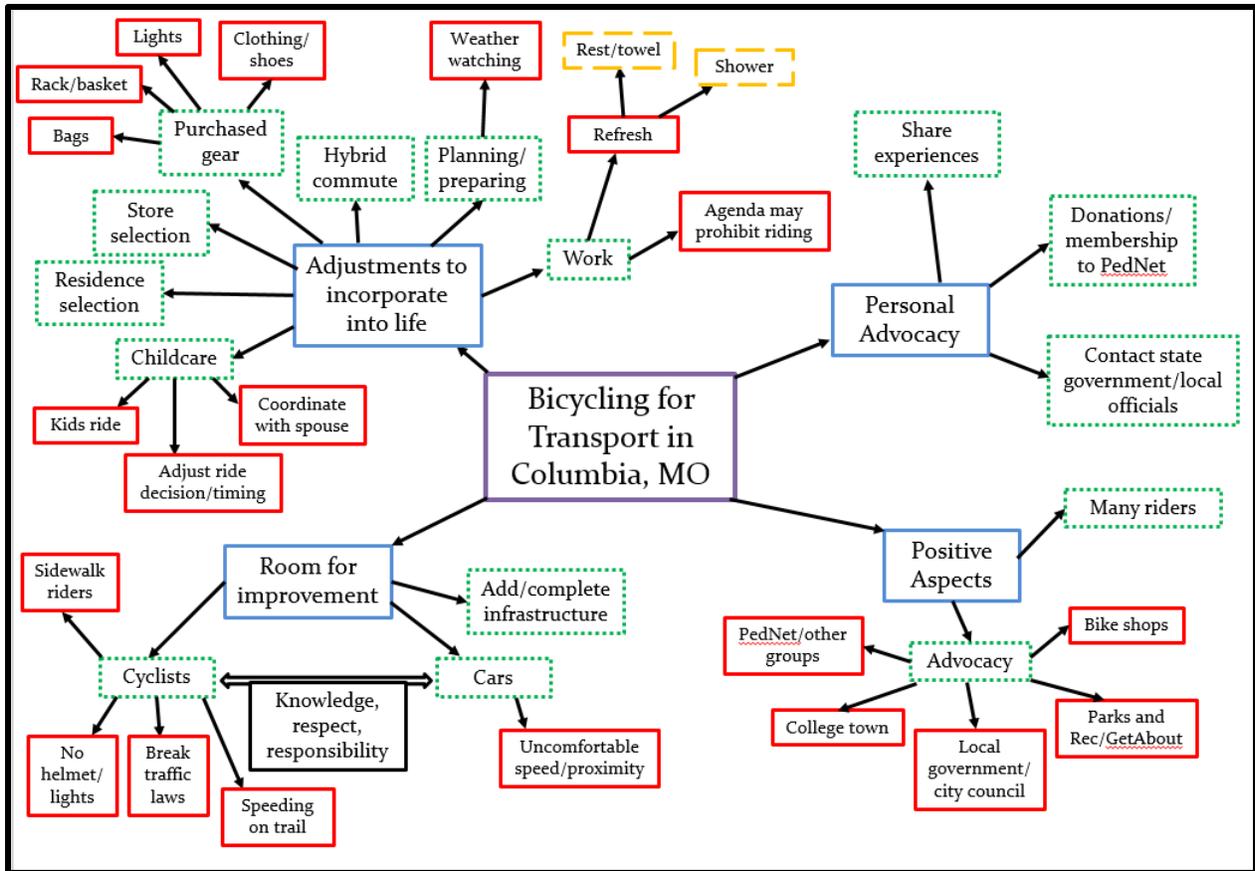


Figure 7: Flowchart titled “Bicycling for Transport in Columbia, MO” describing cyclists’ relationship with the local cycling system as agents

Part 1: Demographic information

The interviewee group, which consisted of 11 interviewees, was more evenly spread across the income quintiles than the online survey respondents, but a larger proportion of the interviewees were male. Over two-thirds of interview participants lived in a household with two or more cars. Five of the interviewees had children, but only one was a single parent. Only one individual lived alone. Four of the interviewees had lived in Columbia for less than five years.

Part 2: Experiences with bicycling for transport

The bicycle commuters from this study had various reasons for commuting and different cycling habits. These individuals explained that they ride to save money, because they had limited or no auto access, for health benefits, because they lived close to work, because it is fun, or some combination of reasons. Only two cyclists had a regular commute length that exceeds five miles, while the others are roughly split between commutes that are 1-2 miles and commutes that are 2-5 miles. One interviewee did not typically ride the most direct route to their destination, and three of them altered their route regularly and thus did not always take the most direct route. Some participants had deliberately extended their commute for recreational or exercise purposes. Only three of the respondents had a commute that was majority trail, whereas seven of them rode mostly on road, and one had a commute that was mix of the two surface types. Destinations for cycling included work, downtown, campus, child's school, the store, and festivals/events. Interviewees said they may alter their decision to ride based on the weather; two only ride between March and December, four may be deterred by ice or snow, and eight may be deterred by rain. Only two of the respondents explained that they basically always ride, regardless of weather.

Interviewees encountered problems in their commutes and had made some adjustments to their lifestyles to incorporate bicycle transport. They had struggled with physical environment or infrastructure problems such as hills, dangerous or uneven surfaces, road width, and street/trail closures. Other concerns included heat, visibility, drivers/traffic, and clothing. These individuals had purchased special gear for cycling, such as bags, a rack or basket, and clothing or shoes. Interviewees said they must plan

and prepare for their commute, and were generally aware of the weather forecast. A couple of the cyclists had performed a hybrid commute wherein they ride the bus for a part of the distance, and at least one cyclist had used their car for a hybrid commute to attend an event.

Parenthood and employment had a notable impact on cyclists' habits. The cyclists with childcare obligations sometimes needed to coordinate with their spouse, adjust their ride timing, or decide not to ride. One interviewee worked from home and he and his children all rode bikes together to the kids' school, and another cyclist mentioned that she had ridden for transport with her child as well. Some interviewees had a shower at work, while others said they just rest and possibly use a towel to refresh upon arrival at work. Dress codes at work fostered cycling in some cases, and in others they deterred people from cycling sometimes. One of the interviewees said she would not ride at all if she had a meeting at work, whereas a different interviewee said his workplace had generally shifted towards casual dress codes, which was an advantage to him as a bike commuter. Yet another cyclist explained that he must wear a specific uniform at work and did not mind changing into that same outfit every time he arrived at work via bike.

The desire to bike for transport sometimes influenced a person's store selection, and in some cases, even their residence selection. Some of the interviewees would not necessarily go to their preferred grocery store when they were riding their bike if there was a closer option. In some cases, they bought a limited number of items when biking. One cyclist said they picked their house in part because of its proximity to the bicycling and pedestrian trail, and another cyclist said they intended to choose a house that is

near their workplace the next time they are searching for a new place of residence so that riding is easier.

Part 3: Cyclist Advocacy

The interviewees were asked how they had participated in cycling advocacy. A couple cyclists mentioned that they had told acquaintances what it is like to commute by bike, and this might be considered a form of advocacy. Some of the cyclists had contacted state government and local officials with regards to bike advocacy. Another way the interviewees participated in advocacy was by donating to or being a member of PedNet.

Part 4: Cyclists' praise for local cycling system

Many positive thoughts about cycling in Columbia were expressed across these interviews. Some of this praise was directed towards the infrastructure. One cyclist said "the trail is a fantastic way to get around town" and another said "overall this is a pretty easy place...to bike for transportation, or for recreation, too, the trails system is awesome." Many of the cyclists normally rode on the road, though.

Most of the positive comments were related to the cycling community and advocacy. A couple of the cyclists felt there is a noticeable cycling community in Columbia. One said: "I think, you know, when our local and state representatives see the kind of usage numbers that we do that they respond accordingly." Another cyclist explained that the cycling system is empowered by local advocacy:

I think Columbia does a really good job of letting biking be a regular part of your life. You see so many people commuting, you see them giving out lights at every opportunity. So I think that's a really special community that I'd not been a part of before, where...they really want you to make that part of your life if you can, or help you in any way they can.

Cyclists pointed to several sources of cycling advocacy, including bike shops, Parks and Recreation, GetAbout (a federal grant for cycling infrastructure, as explained by Janet Godon and Ian Thomas in their interviews), local government, and PedNet and other groups. Some specific praise was offered toward GetAbout by a cyclist who said "...they've done a really good job over the last, it's probably been ten years or so now, to increase infrastructure, increase visibility, create new opportunities for cyclists just to get people engaged." Two of the cyclists mentioned that Columbia's cycling system quality is attributable to the presence of a university. One explained that "because we're in a university area and people are coming through all the time, I think that can actually strengthen the bike culture and improve Columbia, so that's an asset that we have. It's like a cultural exchange." In the eyes of these cyclists, Columbia's cycling system is especially strong in terms of advocacy.

Part 5: Cyclists' critiques of local cycling system

While the cyclists were fairly happy with the advocacy in Columbia and have some positive thoughts on the infrastructure, they had several critiques of the cycling system as well. Multiple cyclists mentioned a need for additional infrastructure, and a couple of them connected infrastructure changes to cultural changes. In one

interviewee's mind, more infrastructure would bring about a cultural change:

...with the addition of like bike parking and bike lanes, I think...it's one of those things if you see somebody else doing it "oh, why can't I do that?"...I think if more people do it, you can get more buy-in from people by eliminating...parking...or by increasing parking fees and by creating bike lanes and safe passages for it.

On the other hand, a different cyclist said the cultural change should come first, though he did not think this would happen easily. He said "I know it's a fantasy but it would be awesome if we could...invert the transportational hierarchy so that we're so much less about cars and more about bikes."

Some cultural critique was centered on cyclists. Interviewees highlighted the errors of other cyclists, including sidewalk riding in inappropriate locations, speeding on the trail, failing to use a helmet or lights, and breaking traffic laws. A couple of the interviewees explained that improper riding is detrimental to the relationship between people on bikes and those in cars, and one said:

We want all these entitlements, we want all these expectations, you know, to treat us with respect and to give us just as much rights as the cars do, but then we don't reciprocate that and feel like we're above the law when it comes to...riding on the road...That gives motorists a bad perception of us, and then they're less inclined to want to have more cyclists...

Another cyclist explained the need for smarter cycling in a more practical sense, arguing that "a car can only watch out for a bicyclist...so much, but it's really up to the cyclist's responsibility to like be defensive, be aware and observant."

Cyclists also mentioned difficulties with drivers, and some even stressed a need

for education and cultural change amongst all citizens, regardless of whether they opt for cycling or driving. In the words of a participant: "bikes need to follow the rules and cars do too, so, just seeing it from both sides is an important part of it." The problem is extremely complicated and difficult to deal with, as explained by another cyclist:

You've got hard-core commuters that are emblazoned with lights and safety yellow vests and signal and stop and do everything right; you've got a hybrid of that, which would be like me who also rides and races and stuff like that, lights, signals, I try to obey the traffic laws, I don't want to cause problems. But then you've got people who are just on bikes, maybe a homeless guy on a bike, or something like that, doing everything wrong, but to a person in a car, who's not a cyclist, that's a cyclist, you know, because they're on a bike...When you think about it, there's lousy drivers, there's drivers with no driver's license, there's drivers without insurance. So it exists in—in both realms, it's just, cyclists stand out cause we're easy to see. ...If everybody thought about it, honestly, when they drive, how many people roll a stop sign, how many people forget to use their turn signal, how many people speed? A majority of them, I would say. But that's a big giant can of worms, right, that's a huge, never will be resolved, really big argument, in my opinion.

Part 6: Applying interview findings to structuration theory

The local cyclists are agents in the cycling system in Columbia. On the one hand, they live in the existing culture and infrastructure, and although the system can be conducive to cycling, cyclists usually must somehow alter their behavior to adapt to the

structure (Warf). On the other hand, cyclists have ideas for improvements to the system, but they do not always have both the desire and the means to advocate for such changes in the manner described by Phipps (2709).

As agents in the existing system, cyclists' lifestyles and routines require adjustments from a typical car commuter lifestyle. Planning and preparing for the daily commute, being clean and properly dressed at work, and childcare are typically more complicated for cyclists. They might have to purchase specific gear. Some particularly devoted cyclists will even prioritize proximity to trails or work when selecting a place of residence just so that bike commuting is easier.

While cyclists have adapted to the existing structure in some ways, they also expressed a desire for changes to the cycling system. Interviewees unsurprisingly wanted additional cycling infrastructure. They also mentioned a need for much broader changes in culture. Across all residents of Columbia in cars and on bikes, there needs to be an increased level of knowledge, respect, and responsibility with regards to using and sharing public roads. The interactions amongst drivers and cyclists are part of the culture. Although culture is a fairly established part of the cycling system, it can be changed if enough agents opt for more cooperative behavior. This possibility of change is explained by the aforementioned idea from structuration theory that "the structural properties within a particular society are constantly reiterated and expressed in everyday actions at the level of the individual. Simultaneously these everyday actions are reproducing the structural properties of that society" (Cresswell 202). In other words, the current cyclist-driver dynamic is only a part of the culture because people continue to behave in the same manner. If most people stopped following the norm, the

culture could change. Aside from ensuring proper riding practices, cyclists can change the structure through advocacy. Interviewees mentioned a few different ways they had personally participated in advocacy. They also spoke well of the relatively fixed sources of advocacy in the local infrastructure such as GetAbout.

The cyclists in this study were mostly pleased with the Columbia cycling system. Yet even with the adjustments they had made to their lifestyles to commute by bike and the present sources of advocacy, there is much room for improvement to the local cycling structure. Some infrastructure changes would make the structure better. More importantly, larger cultural problems need to be addressed. Any such change will take plenty of time and cooperation amongst residents, advocacy groups, and local government.

Part 7: Applying cyclist data to mode shift theories

Together, the data from the online survey and from the cyclist interviews shed some light on the validity and utility of the mode shift theories from the literature review, although these theories were not the main framework for this study. The results indicate that the transtheoretical model used by Gatersleben and Appleton and Winters et al. in previous cycling studies is a valid means of describing people's relationship with bicycling as a mode of transport. The theory of routine mode choice decisions described by Schneider is more useful for understanding these study results, and is more detailed (129).

The five stages of the transtheoretical model, when applied to cycling, are: "potential cyclists"/"contemplation," "occasional cyclists"/"prepared for action," "frequent

cyclists”/”action,” “regular cyclists”/”maintenance” (Winters et al. 155; Gatersleben and Appleton 305). All 11 cyclist interviewees self-identified as people who use a bike for transport regularly (i.e. at least once a week, average), which means they could probably be labeled as “regular cyclists” (Winters et al. 155). The same is true for the 33 respondents (out of 58) in the online survey who said they ride their bike for transport at least 1-2 times a week in every season. All other survey respondents are either “occasional cyclists” or “frequent cyclists” (Winters et al. 155). Certainly many residents of Columbia have not ridden a bike for transport, and they fall into the “potential cyclists” class (Winters et al. 155) or even “precontemplation” class (Gatersleben and Appleton 305). The five-stage classification provided by the transtheoretical model is thus a useful way to categorize the population in Columbia in terms of participation in the cycling system.

While the transtheoretical model allows greater understanding of local residents’ role in the cycling system, the theory of routine mode choice decisions provides a richer understanding as to why people ride a bike for transport or not (Schneider). This theory explains:

that there are five steps in the mode choice decision process...The first part, (1) awareness and availability, determines which modes are viewed as possible choices for routine travel. The next three elements, (2) basic safety and security, (3) convenience and cost, and (4) enjoyment, assess situational tradeoffs between modes in the choice set. These middle three steps may be considered simultaneously or in various sequences. The final part, (5) habit, reinforces previous choices and closes the process loop. Socioeconomic characteristics explain differences in how individuals view each part of the process (129)

The survey and interview results fit nicely within this theory. All survey respondents (except one, whose responses were not included in total counts) had ridden their bike for transport in Columbia at least once, so they have reached the “awareness and availability” stage. Some respondents ride more than others, though.

The theory of routine mode choice decisions provides some reasons why a person might use a certain form of transport more often than other people. One reason is demographic variation. In this study it is clear that higher economic status and limited childcare responsibilities seem to make cycling either easier, more appealing, or both. The middle three components to Schneider’s theory are “safety and security...convenience and cost, and...enjoyment” (Schneider 129). Although only one cyclist mentioned safety as a reason for cycling for transport, the other two reasons were very common. The top reason selected by online survey respondents was “I like the feeling of riding,” and five of the interviewees said they ride because it is fun. Both answers could be described as “enjoyment.” Over half of the survey respondents said they ride because “I want to save money on gas,” over one third indicated that “it saves

time,” and over one third said “I want to save money on parking,” and these three reasons all fall into the “convenience and cost” category from the theory of routine mode choice. Finances, proximity to work, and speed were a few of the reasons for riding provided by the cyclist interviewees that fit within the label “convenience and cost.” Other reasons for riding from the survey and interviews, such as better personal health, do not necessarily fit within Schneider’s theory, but his theory is overall a good starting framework for understanding why some people ride a bike for transport.

Section 3: Interviews with Key Figureheads

Audio for all key figurehead interviews was recorded. The primary researcher listened to the audio from the interviews and created a Microsoft Excel table with themes, notes, and quotes from the interviews. These themes were grouped into five main themes that encompassed essentially all of the topics that were discussed across the interviews: general pro-cycling policies and programs, pro-commuting programs/events, powerful forces (for change or advocacy), pull factors for commuting, and push factors from commuting. This flowchart helped guide the creation of this results section.

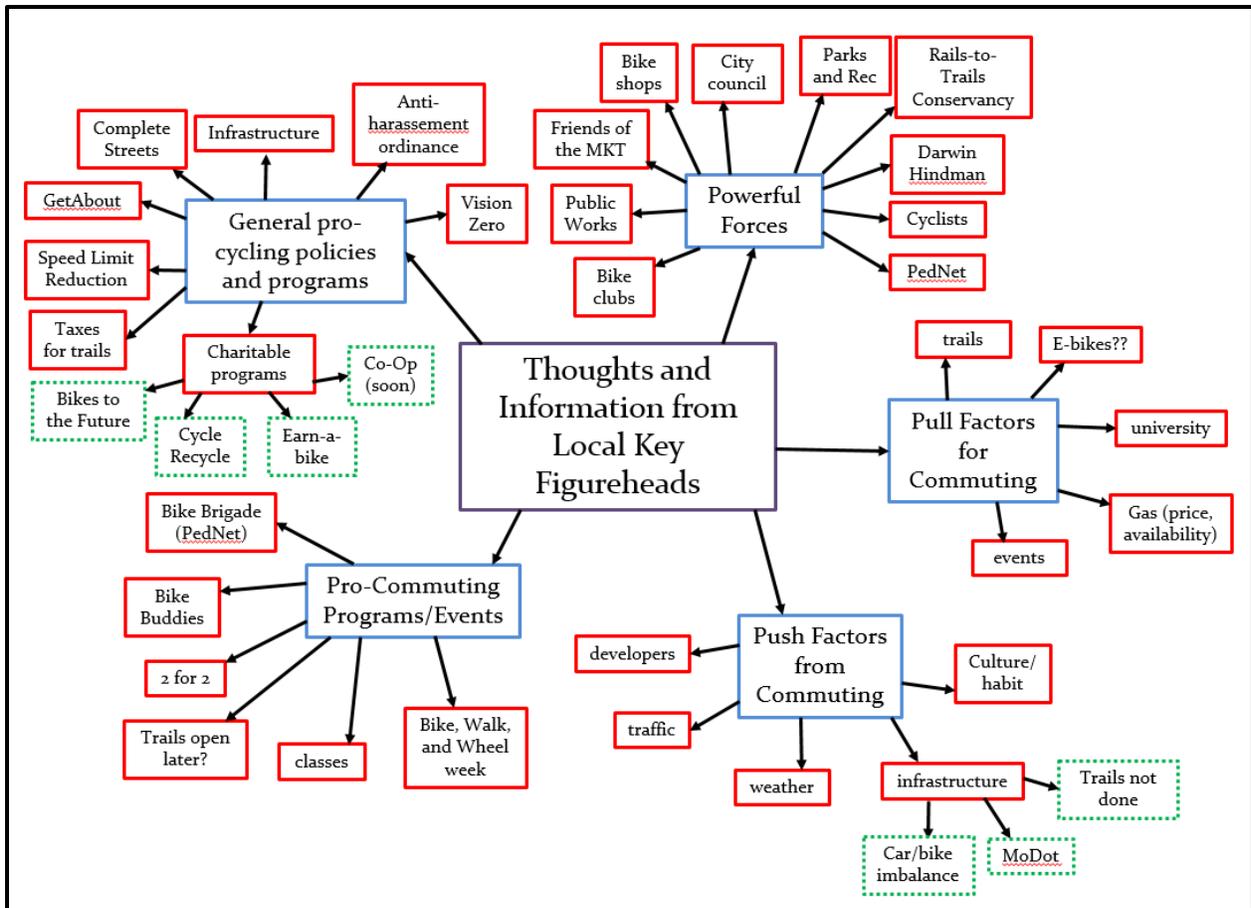


Figure 8: Flowchart titled “Thoughts and Information from Local Key Figureheads” containing main themes and ideas from interviews with key figureheads

Part 1: General pro-cycling policies and programs

The key figureheads in this study mentioned several general pro-cycling policies and programs in Columbia. The cycling infrastructure consists of the existing trails and bike lanes, taxes for trails, and ongoing construction of trails. Lawrence Simonson of PedNet explained that when new roads are built in Columbia, the Complete Streets policy dictates that it must have bike lanes. The City of Columbia has also incorporated lower neighborhood speed limits and an anti-harassment ordinance, both of which city council member Ian Thomas described in his interview. The latter prohibits automobile operators from harassing people using other transit modes, including bicyclists, as

Thomas and Janet Godon, a Parks and Recreation employee, explained. Several of the interviewees mentioned the GetAbout program. This program was initiated by a Federal grant of 25 million dollars (Thomas) that Columbia was given a decade ago (Godon) for enhancing pedestrian and bicycling infrastructure (Thomas).

The most recent big change for local cyclists in terms of policy was the integration of the Vision Zero Policy in Columbia at the end of 2016 (Favignano). The Mayor's Task Force on Pedestrian Safety created a "Final Report and Recommendations" document titled "A Vision Zero Policy for Columbia." This document explains that:

Vision Zero is a policy goal and data-driven strategy to achieve zero traffic fatalities or serious injuries across all forms of road transportation. A Vision Zero philosophy shifts away from the idea of 'acceptable' levels of risk and toward the belief that all traffic deaths and serious injuries are both preventable and ethically unacceptable. Vision Zero influences road design, enforcement, and culture to bring about a marked reduction in crashes that lead to death and serious injury (Section 3-1).

Ian Thomas, currently a city council member and formerly of PedNet, was a major figure in the creation of this policy document, which he provided a copy of during his interview. PedNet leaders were strong supporters of this policy as well, as detailed in the policy document and indicated by their presence and participation in a November 2016 city council meeting focused on this policy.

There have also been multiple charitable cycling-related programs in Columbia. Simonson mentioned that PedNet had a Cycle Recycle bike donation program, but too

few recipients were individuals of lower economic status. The earn-a-bike program from PedNet may have helped such individuals but demanded too much time from PedNet's workers. A bicycle co-op will be opening in 2017 if all setup runs smoothly, according to the Walt's employee who did an interview for this study. He said the goal of the co-op is to provide access for lower income children to bicycles and an overall positive environment for knowledge and personal growth. He also mentioned Bikes to the Future, a program for individuals who completed jail time and are returning to normal life, where they may need a bike for transport. Columbia's bicycling system is thus fairly strong in terms of not only infrastructure but also in terms of culture, as shaped by ordinances and programs.

Part 2: Bike commuting-specific programs and events

Several local programs have specifically centered on bike commuting, rather than just bicycling in general. PedNet has engaged in several such programs. Their Bike Brigade has offered children a safe means to ride bikes to school with a group (Simonson, "Middle School Bike Brigade"). In their former Two for Two program, "you had to log your miles and if you had an errand to run that was under two miles you would use your own two feet or your own two wheels, kind of a thing, and then you'd win prizes," Simonson said. He also mentioned the city's Bike Buddies program, which one of the cyclist interviewees discussed as well. Through this program, one of her co-workers spent some time riding with a trained individual in order to receive guidance on how to ride for transport. Multiple key figureheads said there are classes related to bike

commuting in Columbia, such as the “Confident City Cycling” class that is led by the Walt’s employee.

Columbia also has an event called Bike, Walk, and Wheel week, which is in May every year. This event promotes transit modes other than cars, and with regards to bike commuting, Simonson thinks “it normalizes it a lot more” in comparison to National Bike to Work Day. Godon said “it’s a community effort” and listed several participants, including Services for Independent Living, former mayor Hindman, businesses, schools, PedNet, Parks and Recreation, and the city. The public bus was free during this week in 2017, and there is a breakfast station for walkers and bikers.

Part 3: Competing with the car

The aforementioned pro-cycling and bike commuting programs, policies, and events are all aspects of the Columbia bicycling structure that are conducive to bike commuting. Yet cars present constant competition. This point was included in the literature review and was emphasized across several interviews with key figureheads, who pointed to aspects of both infrastructure and culture that favor cars over bikes.

Several interviewees explained that the balance between car and bike infrastructure needs to be adjusted. Limited gas supplies made cycling more popular during World War II, according to Hindman, but once this was no longer the case, “the culture had changed. Everything was automobile-oriented, and so the idea that the city might put money into something for a trail for people to walk on or ride their bicycles on just seemed like a total waste to a lot of people.” Although the Complete Streets policy should lead to more bike-friendly infrastructure, state-owned roads do not have to meet

policy rules, Simonson explained. Chip Cooper, co-founder of PedNet, mentioned that the state transportation agency MoDot is not particularly concerned with being bike-friendly. He thinks that "as long as you don't build a lot of parking, you won't have as many cars, and you'll have more people that need and benefit from public transportation."

The interviewees took Cooper's idea a step further and explained how infrastructure is connected to transportation behavior. Unsurprisingly, the other co-founder of PedNet, Ian Thomas, was of the same mindset as Cooper. In his eyes, "...it's just hard to get people to change their habits. Probably one of the things that is preventing it is that...Driving is still too easy, parking a car is still too cheap. There's too little discouragement from driving." Simonson explained this same point:

There's a ton of research on this out there. That it's not necessarily willpower keeping you from eating healthy or being physically active, it's what's there placed in front of you. What is the common denominator? The common denominator is to stay on your couch or to sit or whatever the case may be.

That's the same with driving and biking. The common denominator, if you go outside, this environment says 'drive.' This environment does not say 'walk,' this environment does not say 'bike.' So it's hard for people to make the switch.

These key figureheads have figured out that when infrastructure is imbalanced in favor of the car, people will drive. Former mayor Hindman commented on this matter as well, and offered a solution:

I think that you will not have a successful bicycle commuting system unless it has high recreational value. Because the simple fact is: it's easier to get in your car and drive to where you're going, and it takes less time. And so, why is it then that you're going to be able to encourage bicycle commuting? It's because it provides more pleasure.

It makes sense, then, that the federal grant which resulted in the creation of plenty of bike infrastructure (Godon) was described by interviewees as extremely beneficial to Columbia's cycling system.

Part 4: Powerful forces for change in Columbia's cycling structure

As the interviewees explained, transportation in the U.S. is auto-centric by default. Several powerful forces have been crucial to bringing Columbia's cycling system to its current state. Interviewees listed Darwin Hindman, bike shops, local cyclists, bike clubs, PedNet, the Rails-to-Trails Conservancy, Friends of the MKT, city council, Public Works, and Parks and Recreation as important sources of advocacy. These advocates for cycling are an established part of the local cycling structure, yet they also act as agents for change.

The local government has the greatest ability to change the local cycling system, which both cyclists and key figureheads recognize. Hindman explained that "I, as mayor, worked really hard to try and change the culture of the administration of the city to put bicycling into...a priority." He was mayor through 2010, but the local government has continued his legacy. In his interview, Ian Thomas described his present strategy:

...as the town is getting bigger, you know, more populous, one of my big sort of goals on council is to not keep building parking...to continue to develop the trails system and maintain the best possible bike system on the streets that we can, and...to continue to make walking, biking and using the bus—which are all, much healthier, more economical options, lower carbon footprint—more attractive to people.

This comment followed his assertion that infrastructure and habit are connected.

PedNet and other advocacy groups have been influential to Columbia's cycling system as well. Co-founder Chip Cooper was involved with Friends of the MKT, which probably demonstrated to him the power of such groups. Speaking of cycling, he said:

It's built in to the culture, it's built in to the budget, it's built in to the policy structure. But it started outside, and it migrated in. And a lot of that has to do with the fact that, like you said earlier, you put a face to some supporters, not just have a lot of people supporting, it's like—these, here's a few thousand, would you like some more?

PedNet now has roughly 4,000 members according to Simonson, who described PedNet as follows: "Individuals sign up to be members through their donations, and we speak for them, we're they're voice...so they don't have to go to every council meeting and...advocate for cycling...we basically advocate on their behalf." Although the local government has taken steps to improve the cycling system in Columbia, part of the reason that even happens is because of PedNet's efforts, Hindman explained. By his account, "politicians really have a hard time getting anything done unless there is support for what they're going to do, and the PedNet Coalition was a huge, huge force

in making it possible for the city council to act to do the various things, there's just no doubt about it." Hindman has shown, then, that he began a trend of focusing on bicycling, and PedNet continues to push the local government to concentrate on making the cycling system better.

Part 5: Applying key figurehead interview results to structuration theory

The interviews with key figureheads revealed that the condition of the cycling structure is determined by infrastructure, policies, and cycling events, which are organized and determined by local government and PedNet. As Hindman explained, PedNet pushes the local government to think about bicycling. Simonson also emphasized the importance of PedNet, and used a metaphor to show why advocacy is necessary:

People a lot of the times...still says 'well I don't see anybody out biking, why should I build a bike lane?' or whatever. And there's a really kind of interesting quote if you think about it: Nobody's ever built a bridge because of the number of people they see swimming across a river, they built a bridge because like—I bet people would want to get there, and so we build this bridge

Groups like PedNet needed members, the cyclists/agents, to become part of the cycling structure, as Cooper explained, and they need members to remain part of the structure today.

By seeking federal funding (Godon, Simonson, and Thomas) and persuading local government to allocate funding towards trail creation, key figureheads improve the infrastructure component of the cycling system. They run events and programs

centered on bike commuting, which makes the system more bike-friendly in a cultural sense. Because key figureheads link agency and structure and they seek changes to the system in terms of infrastructure and culture, the character of the local cycling system is mostly determined by their actions. PedNet acts as an agent for change in Columbia's cycling system while also being a part of the decision-making structure through participation in local government meetings (Simonson). The local government is an established part of the structure, yet it has the ability to take action in response to the concerns of local cyclists by listening to the suggestions and appeals presented by PedNet. Furthermore, PedNet and local government act as agents for a better cycling structure on the state scale. Local ordinances and policies that protect cyclists and ensure creation of bicycling infrastructure enhance the cycling system beyond what would exist if only state laws were in place.

CHAPTER 5: CONCLUSION

Section 1: Discussion

Part 1: Study results

The local cyclists and key figureheads are both major parts of the cycling system in Columbia, the former being the agents and the latter being part of the structure. Key figureheads also act as agents. PedNet takes on an agency role when urging local government to embrace cycling-related policies and direct funding towards infrastructure improvements. Local government and PedNet take on an agency role at the state level when adding local cycling policies and infrastructure to existing state laws and requirements.

Through the survey and interviews, cyclists highlighted several sources of advocacy in the local cycling system, but they also mentioned some shortcomings of the system. The key figureheads recognized essentially the same sources of advocacy as the cyclists, and discussed similar problems with the system. The focus and reasoning of the cyclists' ideas and the key figureheads' ideas were slightly different due to the nature of their situations within the structure and because they were asked different questions for the study. Overall, though, the agents and the structural figures have similar opinions regarding the cycling system and are consequently a strong collaborative force.

Several of the same sources of advocacy were identified by cyclists and key figureheads. They both mentioned bike shops, parks and recreation, local government and city council, local cyclists, and PedNet. One cyclist from the interviews explicitly

excluded local cyclists from this group though, saying "I don't think local cyclists have done anything" and "I think we're a pretty apathetic group of people." This idea is partly supported by the fact that one third of the cyclists in the online survey were not PedNet members and one fifth had not participated in bicycling advocacy. In addition, the only form of advocacy that was practiced by over half of the cyclists was giving donations, which may not seem particularly effective in improving the cycling system. At the same time, most of the cyclists were members of PedNet. As Chip Cooper explained, PedNet has an impact because it has so many members, and as Lawrence Simonson explained, the leaders of the group perform the advocacy work. Local cyclists are therefore able to help improve the local cycling system almost effortlessly by being a PedNet member.

Cyclists in this study had positive comments about the local bicycling infrastructure, and key figureheads shared multiple examples of infrastructure improvements they have worked towards or witnessed. One cyclist said "It sort of feels like the best kept secret, like the people who do it know how great it is, and it's almost like, the other people who aren't doing it, they're missing out on something. And it's not that much of a secret cause so many people do partake in it." Hindman shared a very similar thought:

There are a lot of people who seem to haven't discovered its benefits and are not totally familiar with this fantastic interconnected system that we have developed here and are continuing to develop. That makes it sound like nobody's doing it but in fact there are a lot of people who are...

Even though the cycling infrastructure is seen as a noteworthy asset in Columbia,

commuting by bike is not necessarily as popular as expected.

Multiple key figureheads believe that further infrastructure changes are needed to enhance the cycling system. Hindman explained that people are too used to driving, and Thomas, Cooper, and Simonson said the infrastructure is still largely focused on cars. Simonson explained that "...this environment says 'drive.' This environment does not say 'walk,' this environment does not say 'bike.' So it's hard for people to make the switch." Thus even though there are bike trails and bike lanes, they are not as obvious or as developed as the car infrastructure. The figureheads know that it is very difficult to change the culture and make cycling anywhere near as popular as driving, and they think that further changes to the infrastructure are needed to bring about such change.

Cyclists expressed a desire for improvements to the cycling infrastructure as well, but they also emphasized problems with automobiles. The top two difficulties faced by survey participants were "drivers are not sufficiently alert/aware" and "cars drive too close." Some cyclists recognized that proper road behavior is not necessarily always practiced by cyclists, either. Across their responses, they highlighted a need for more knowledge, respect, and responsibility from everyone using the road, whether on a bike or in a car. Such cultural change requires a great deal of effort and careful strategizing. Cyclists can alter their own behavior and discuss proper road use with acquaintances, but that is not enough to bring about large-scale cultural change.

Local government and advocacy groups have already addressed this issue with the anti-harassment ordinance mentioned by Thomas and Godon, and with the Vision Zero policy described earlier. Several survey respondents emphasized the inability or failure of cars and bikes to share the road properly. Key figureheads are well aware of

this problem, as evidenced by the following statement from the Vision Zero policy text:

...there were three main causes of those specific pedestrian crashes that could be prevented or mitigated through educational programs:

1. Inattention and distraction
2. A lack of empathy and respect for other road users
3. Failure to understand the rules of the road (Mayor's Task Force on Pedestrian Safety Section 4-3).

The major components of the policy are "education, enforcement, and engineering," (Favignano) and "Vision Zero...places responsibility on the system design and the people who influence the design" (Mayor's Task Force on Pedestrian Safety Section 3-1). This policy aligns perfectly with the most common difficulties faced by local cyclists from this thesis study.

In Columbia, the agents and the structural figures have similar opinions of the cycling system, which allows the two to join forces in making the system even better. Participants of this study have shown that PedNet and local government have the most power to change the local cycling system, and that PedNet and its members are in a mutually dependent relationship. Both cyclists and key figureheads want improvements to the cycling infrastructure, but recognize that there are cultural issues at play as well. Key figureheads think that added infrastructure can help change local culture and make cycling more popular. Local cyclists want everyone on the road to follow the laws more closely, which could lessen the dominance of cars. The Vision Zero policy is designed to combat the difficulties that local cyclists are struggling with the most.

Part 2: Limitations and Recommendations

Together, the three main components of this study—the online survey, the interviews with cyclists, and the interviews with key figureheads—made it possible to create an outline of the cycling system in Columbia using structuration theory. Each component should be included in future studies of cycling systems, with some alterations to the data collection methods. Perhaps most importantly, future studies should strive to reach a much broader group of respondents. In addition, future studies should include a detailed analysis of local news clips, documents such as local newspapers, and other records of historical moments pertaining to the cycling system. The study results offer valuable lessons for advocates for cycling, both in Columbia and in other cities.

The online survey included only 58 participants and ran for just a few months, and as such it is inherently limited in its applicability. A future survey should make a strategic attempt to gather responses from a broader audience. Only one person who does not bicycle for transport participated in this survey, and thus the survey did not provide much information on “potential cyclists” (Winters et al. 155). Although “potential cyclists” do not use the bicycling infrastructure, they still have the power to change the local structure by voting on relevant issues, and they may begin riding bikes for transport if the bicycling structure changes in their favor. A future survey should strive to collect responses from more “potential cyclists.” This might be achieved by providing an incentive to survey participation and/or advertising the survey to a larger audience, perhaps by asking more entities to share the link (i.e. MU Info e-mails at the university). In addition to including more non-cyclists, a future survey should include a few

additional questions. Because the cyclists in this survey indicated that there is a need for greater education on road use, the survey should ask if respondents have attended any classes on road riding.

The interviews with cyclists provided an in-depth understanding of how cyclists behave as agents in Columbia's cycling system. Some themes from interviewees' responses indicate that there are some additional topics and perspectives that should be included in a study of cycling systems. This study has revealed that in Columbia, interactions between drivers and cyclists are one of the biggest difficulties bike commuters face. It would therefore be beneficial to understand what drivers think about cyclists. Many bike commuters have a decent amount of experience driving, so their thoughts on sharing the road would be valuable. Interviews with bike commuters should include some questions about personal driving experiences and differences between being on a bike and being in a car. Future studies should also incorporate interviews with drivers who have never used the cycling infrastructure. Adding these perspectives related to driving would help clarify why some cultural components of the cycling structure are detrimental to cyclists and how these components might be altered to make the structure better.

The largest, most obvious shortcoming of this study was the demographic homogeneity across respondents, which is partially attributable to survey dissemination methods. The survey respondents were mostly wealthy. A link to the survey was shared by PedNet and GetAbout, and it appears that few lower income individuals are involved with these groups. Even though PedNet does have a reduced membership fee for lower income individuals (PedNet Coalition, "Individual/Family"), such individuals

may not prioritize advocacy group membership if they are preoccupied with financial concerns. These people probably have fairly different experiences with using the local cycling system, and the absence of their input limits the applicability of the results from this study.

The interviews with key figureheads were extremely insightful and outlined the history and current state of Columbia's cycling structure, sometimes reinforcing points made by the cyclists. Fortunately, many of the interviewees in this study had held several bicycling-related positions and therefore had various viewpoints and experiences to share. A similar future study could be enhanced by including the perspectives of other local figureheads who are not bicycling advocates per se but are still affected by and have an impact on the local cycling system. This might include bus drivers, city transportation engineers, local business owners, and developers (who were tagged as relevant figures in Chip Cooper's interview).

The fact that few lower income individuals participated in this survey warrants attention by local advocates. Although PedNet does urge the local government to make changes in favor of bicycling for transport, and the local government considers and often implements ideas developed by key figureheads including leaders of PedNet, these infrastructure and culture changes probably fail to address some of the concerns of lower income cyclists. Because few lower income cyclists are involved with PedNet, their concerns are not easily recognized. These individuals are therefore not well-integrated in the cycling system, and do not have the means to be active agents, advocating for change in the system. Due to everyday life obligations or financial limitations, these people are forced to use the cycling system as it is. The key

figureheads who are part of the structure, including PedNet leaders, members of local government, and leaders of programs such as GetAbout, need to make a greater effort to incorporate lower income individuals in their development of plans for the cycling system so that they can be agents of positive change for all residents who might use this system.

The results from this study exposed relevant dynamics between agency and structure in the Columbia cycling system that can assist other cities with shaping their cycling system more effectively. In Columbia, a few key individuals were extremely passionate about bicycling. By speaking with others, creating advocacy groups and being active members, and participating in local government decision-making processes, these individuals have made immense improvements to the local cycling system. Due to their persistence, these figureheads have permanently established important sources of cycling advocacy in the local structure, including PedNet. Even though the individuals from this study will not be able to act as agents in the structure indefinitely, the groups, programs, and policies they have created will remain for years to come. Other cities with people who would like better cycling systems should note the power of groups such as PedNet, and endeavor to establish similar permanent impact groups. These groups should be careful to incorporate the concerns of all residents who would like to use the cycling system, including lower income individuals.

Section 2: Summary

This study used structuration theory to assess the system for bicycling for transport in Columbia, Missouri. The goal was to understand how the agents and

structure interact and shape the cycling system. The agents in this system are the cyclists and the structure is the bicycling infrastructure and culture. Key figureheads from local government and advocacy groups are a part of the structure that can also be agents for change, and they facilitate positive relationships between the cyclist agents and the structure.

Data for this study consisted of an online survey of local cyclists, interviews with people who regularly commute by bike, and interviews with key figureheads. Cyclists were asked questions about their experiences cycling for transport including difficulties they have faced, and they were asked to share their desires for change to the system. Key figureheads were prompted to discuss how changes are made to the local cycling system, what improvements have been made, and what still needs to be changed. Both the cyclists and the key figureheads wanted more cycling infrastructure and for cyclists to feel safer on the roads. Perhaps the biggest concern amongst cyclists was that people on bikes and in cars do not follow the laws regarding sharing the road. Key figureheads recognized that local culture and infrastructure favors cars, and they are still trying to make the cycling system better. The Vision Zero policy is an excellent example of an improvement to the cycling system brought about by key figureheads. The key figureheads who participated in this study are the foundation of Columbia's cycling system, as they have participated in several big changes to the system that favor bicycling for transport.

This study provided valuable insight into Columbia's cycling system, but there are several ways this study could be improved if replicated. The online survey would ideally capture more non-cyclists so as to better understand what drivers think of cyclists and

why, because drivers use much of the same transportation infrastructure as cyclists and are influenced by local policies. It would also be beneficial to gather responses from low-income individuals and single parents, who have distinct life situations which affect their perspectives. The interviews with cyclists should incorporate more in-depth questions about the driver-cyclist dynamic on the road because it is a major concern amongst cyclists, as the study has shown. Interviews with key figureheads could incorporate business owners and other individuals who are not bicycling advocates by title but are influenced by the cycling system.

The city of Columbia and other cities can greatly improve their approach to cycling system creation and change using the results from this study. Advocacy groups such as PedNet can become part of the structure with enough membership, and function as agents for a better cycling system. These groups need to take special care to ensure that all residents who want to use the cycling system are included in the system planning process.

APPENDIX

Section 1: Online Survey Questions

Are you at least 18 years old? *(this was a screening question; if the respondent said “No,” then the survey was submitted/ended immediately)*

- Yes
- No

(Consent form text)

Do you understand and agree to the terms in the consent form above? *(this is another screening question; if the respondent said “No”, then the survey was submitted/ended immediately)*

- Yes
- No

Demographic data

- Please indicate your household income:

(Note: these categories are derived from the “Household Income Quintiles Upper Limits, 2010-2014 American Community Survey 5-Year Estimates” table for Columbia city, Missouri rounded to the nearest 1,000)

- \$0-15,000
- \$16,000-34,000
- \$35,000-58,000
- \$59,000-101,000
- \$102,000 or more

- Enter your age (in years): _____
- Enter the number of years you have lived in Columbia (if less than 1, enter 0): _____
- Your gender:
 - Male
 - Female
 - Other
- How many children under age 5 live in your household? _____
- How many children age 5-12 live in your household? _____
- How many children age 13-18 live in your household? _____
- Is there at least one other adult besides yourself who acts as a caretaker for the children in your household?
 - Yes
 - No
 - N/A (don't have children)
- How many people live in your household, total? _____
- How many cars does your household have? _____
- Highest level of education you have completed:
 - Less than high school
 - High school
 - Associate's degree
 - Bachelor's degree
 - Post-bachelor's degree

Advocacy

- How long have you been a member of PedNet?
 - I am not a member of PedNet
 - Less than a year
 - 1-2 years
 - 3-5 years
 - 6-10 years
 - More than 10 years
- Why did you join PedNet? (Check all that apply)
 - I am not a member of PedNet
 - I want safer pedestrian infrastructure
 - I want safer cycling infrastructure
 - I want more pedestrian and bike trails
 - I want to encourage other people to walk more
 - I want to encourage other people to ride bikes more
 - I like biking
 - I like walking/running
 - Other _____
- Have you participated in bicycling advocacy? If so, how? (Check all that apply)
 - Volunteering
 - Sending letters to legislators
 - Meeting with legislators

- Attending city council meeting(s)
- Donations
- Fundraiser participation
- I have not participated in bicycling advocacy
- Other _____
- Finish this sentence: Bicycling in Columbia would be easier/better if...

- If you (or another member of your household) use a bike for transport regularly (i.e. at least once a week, average) and are willing to participate in a follow-up interview, please provide the e-mail address of the interested individual: _____

Bicycling history

- Have you ever ridden your bicycle for transport (commuting, running errands, or other trips) in Columbia?
 - Yes
 - No
- In your previous place of residence, did you ride your bike for transport?
 - Yes
 - No
 - N/A (never moved)

- Was your previous place of residence in Columbia, Missouri?
 - Yes
 - No
 - N/A (never moved)
- What year did you start cycling for recreation/exercise? (enter 0 if you have never cycled for recreation/exercise): _____
- Since you started cycling for recreation/exercise, was there ever a gap of at least one year when you did not ride at all?
 - Yes
 - No
 - N/A (I do not cycle for recreation/exercise)
- What type(s) of bike(s) do you own? Check all that apply:
 - None
 - Mountain bike
 - Road bike
 - Hybrid bike
 - Cruiser bike
 - Commuter bike
 - Cyclocross bike
 - Recumbent bike
 - Fat tire bike

- What bicycling activities have you participated in? (Check all that apply)
 - Club rides
 - Charity/fundraiser rides
 - Cyclecross
 - Races
 - Fun rides (i.e. brewery tours)
 - Cross-state/long tour rides (i.e. RAGBRAI)
 - Self-supported touring
 - None of the above

Bicycling for Transport (*people who answered “No” to the question “Have you ever ridden your bicycle for transport (commuting, running errands, or other trips) in Columbia?” in the Bicycling History section completed this section*)

- Why haven't you ridden your bike for transport? Check all that apply
 - Prefer driving
 - Prefer walking
 - Prefer taking the bus
 - I do not have a bike
 - I do not like riding bikes
 - I am physically unable to ride
 - The places I need to go are too far
 - I do not like getting sweaty

- I can't easily bring a change of clothes
- I can't carry the items that I need to bring with me
- The route is too dangerous
- The route is too hilly
- I have to transport other adults
- I have to transport children
- It takes too long to ride
- There is more than one place I need to go on a normal day
- Other _____

Bicycling for Transport History (*people who answered "Yes" to the question "Have you ever ridden your bicycle for transport (commuting, running errands, or other trips) in Columbia?" in the Bicycling History section completed this section*)

- How often do you ride your bike for transport in the winter?
 - Never
 - A few times a month
 - 1-2 times a week
 - Most days
 - Every day

- How often do you ride your bike for transport in the summer?
 - Never
 - A few times a month
 - 1-2 times a week
 - Most days
 - Every day

- How often do you ride your bike for transport in the fall/spring?
 - Never
 - A few times a month
 - 1-2 times a week
 - Most days
 - Every day

- Do you ride your bike for transport if it's raining (but not storming)?
 - Yes
 - No
 - Sometimes

- Will you still ride your bike for transport if there is a thunderstorm?
 - Yes
 - No
 - Sometimes

- How long is your most regular route (in miles)? _____
- Have you ever performed a “hybrid” commute, where you travel part of the distance to your destination by bike and another part by bus or car?
 - Yes, I have combined a bus ride and bike ride to reach a destination
 - Yes, I have combined driving my car with a bike ride to reach a destination
 - No, I always ride my bike the entire distance if I am cycling at all to my destination
- What special gear do you have for biking for transport?
 - Lights
 - Basket
 - Fenders
 - Rack
 - Rain gear
 - None of the above
 - Other _____
- Why do you ride your bike for transport? (Check all that apply)
 - I like the feeling of riding
 - I want to save money on gas
 - I do not have a car
 - I want to help the environment
 - I want/need the exercise
 - It saves time

- I do not like driving
- I want to save money on parking
- Other _____
- What difficulties have you faced when bicycling for transport? (Check all that apply)
 - Cars drive too close
 - Drivers are not sufficiently alert/aware
 - Rain
 - Snow
 - Extremely high temperatures
 - Extremely low temperatures
 - Wind
 - Bringing a bag
 - Getting kids to school
 - Transporting other adults
 - Rocks or glass on the road/bike lane
 - Other _____
- Do you change clothes when you arrive at your destination?
 - Yes
 - No
 - Sometimes
 - Depends on the destination

Section 2: Cyclist Interview Questions

(the demographic information section was printed on a sheet of paper, and interviewees wrote their responses on these sheets)

Part 1: Demographic information sheet

- Please indicate your household income:
 - \$0-15,000
 - \$16,000-34,000
 - \$35,000-58,000
 - \$59,000-101,000
 - \$102,000 or more
- Your age (in years): _____
- Number of years you have lived in Columbia (if less than 1, write 0): _____
- Your gender: Male Female Other
- How many children under age 5 live in your household? _____
- How many children age 5-12 live in your household? _____
- How many children age 13-18 live in your household? _____
- Is there at least one other adult besides yourself who acts as a caretaker for the children in your household?
 - Yes No N/A (don't have children)
- How many people live in your household, total? _____

- How many cars does your household have? _____
- Highest level of education you have completed:
 - Less than high school
 - High school
 - Associate's degree
 - Bachelor's degree
 - Post-bachelor's degree

Part 2: Interview questions

- Aside from riding for transport, do you ride your bike for recreation or exercise?
 - How long have you been riding for recreation or exercise?
- Why did you start riding your bike for transport?
- How long have you been riding your bike for transport?
- Describe your bike commuting habits.
 - Do you ride only in certain seasons, do current weather conditions influence your decision to ride?
 - How many times a week do you typically ride?
- What places do you ride to regularly? Work, the store, or other places?
- How long is your most regular route, in miles? Is it mostly trails, road, or a fairly even mix?
- What problems have you faced in the transition to biking for transport? Have you had problems with the road or trails, your workplace, hills, or other factors?
- Are there any specific problem spots along your most regular route?

- Do you take the most direct route to your destination?
- Have you ever changed your route? If so, why?
- Have you ever performed a “hybrid” commute, where you travel part of the distance to your destination by bike and another part by bus or car?
 - If so, could you break down your hybrid commute?
- Have you purchased any new gear in order to make cycling for transport easier?
- What changes have you had to make to your lifestyle or routine in order to be able to bike for transport?
 - Do you need more time for travel or have to spend time preparing the night before?
 - Have you changed your destinations based on proximity, such as opting for a closer grocery store?
- Have other members of your household had to make changes to accommodate your switch to bicycling?
- In what ways have you participated in bicycling advocacy, either within or outside of PedNet efforts?
- Who are the most powerful forces in improving conditions for bicyclists in Columbia?
 - Has the state had an impact?
 - What about local government?
- What have local cyclists done to improve cycling conditions?
- Finish this sentence: Bicycling in Columbia would be easier/better if...

- Do you have any further thoughts you want to share regarding cycling for transport in Columbia?

Section 3: Key Figures Interview Questions

(A specific question set was used for the Walt's employee. The rest of the key figurehead interviews consisted of questions from the list below, selected based on personal experience. All questions were asked verbally)

Part 1: Walt's bike shop manager/employee questions

- When did Walt's start selling commuter bikes?
- Why did Walt's start selling commuter bikes?
 - Did the national market or local demand have an impact?
- Has Walt's participated in bicycling advocacy?
 - In what ways?
 - Has this changed over time?
- What is preventing more people from commuting by bike in Columbia?

Part 2: Key figurehead general questions list:

- How long has GetAbout been a part of Columbia city planning?
- How has GetAbout reacted to results from the Active Living by Design survey?
- When and why was PedNet formed?
- How has membership changed over the years?
 - Are there more or less members than in the past?

- What are typical demographics for members?
- Has PedNet ever done bike donation projects?
- Has PedNet changed its mission or focus over the years?
- What is your personal interest or experience with bicycling?
- What bicycling-related jobs or positions have you held in the past?
- What have been some big changes related to bicycling in the recent past in Columbia?
 - Are there fairly new trails?
 - Have laws changed?
- Who or what are the most powerful forces in improving conditions for bicyclists in Columbia?
 - Has the state had an impact?
 - What about local government?
 - What have local cyclists done to improve cycling conditions?
- Has the local government or PedNet ever focused on commuting by bike?
- Has Bike, Walk, and Wheel week had an impact?
 - How have different organizations and groups participated in this annual effort?
- What is preventing more people from commuting by bike in Columbia?

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