

An Exploratory Study of Bicycle Commuting in the City of Bloomington, Indiana

by

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Nothing compares to the simple pleasure of a bike ride. ~John F. Kennedy

## EXECUTIVE SUMMARY

Bicycling has long been recognized as a widespread form of recreation in the United States and across the world both historically and currently, and in many places, bicycle commuting has now become more prevalent (Sorensen, 2008). Bicycling for recreation and for commuting purposes has also gained popularity in the local community of Bloomington, Indiana. Although some research has been completed regarding topics of bicycle commuting, there is a large gap in the current research. As Chapter 1 explains, this study examined the motivations, benefits, constraints, and needs of residents of the City of Bloomington who choose to commute via bicycle. Existing research was explored in Chapter 2 and suggested the motives and benefits of choosing bicycle commuting included a lack of another choice in transportation, reduction in cost of transportation, pure enjoyment of the activity, concern for health and physical activity, environmental concern, and integration of sustainable practices (Brown, 2007; “First Person,” 2008; Maia, 2007). Much of this research however does not provide a solid foundation of knowledge as to why bicycle commuters are choosing to do bike commute. This study has contributed directly to the body of knowledge by providing views of real bicycle commuters so that others may gain more insight into this population and learn more about this small group.

Chapter 3 discusses the arrangements that were made for this study and explains the process that took place. The study was conducted from May to June 2009 and involved 21 one-on one interviews lasting approximately 30 minutes with bicycle commuters in Bloomington, Indiana. The interviewees were asked broad questions about why they chose to bicycle commute, what benefits they received, what constraints they

faced, and what needs they had as bicycle commuters. Participants were also asked four demographic questions in order to give a general profile of the bicycle commuter sample. The entire interview script can be found in Appendix G. The information gathered during the interview process was then analyzed using a method of coding to find themes that emerged regarding motives and benefits and constraints and needs. The results of the data analysis can be found in Chapter 4. The following is a brief description regarding the demographics and cycling habits of the bicycle commuters:

- A total of 14 males and 7 females were interviewed.
- The 25-32 year-old age bracket represented the highest number of participants with 33%.
- The lowest category of the household income, less than \$15,000, was the most frequently chosen response.
- Regarding the occupation question, the two categories of student and academic/teacher each represented a quarter of the participants.
- Of bicycle commuters interviewed, 80% biked not only to work, but also for utilitarian trips like shopping or dining out.
- The average commuter biked 4.76 days a week, for 31.85 minutes, traveling a distance of 5.35 miles.
- Most frequently, though, bicycle commuters bike 5 days a week, for 20 minutes, going 2 miles.
- When asked how long they had been commuting via bicycle, participants responded in a wide range from 1 to 42 years.

The detailed description of the findings regarding motives, benefits, constraints, and needs can be found in Chapter 4. Frequency counts were used to identify each theme, and the following provides a brief description of the emergent themes:

- Regarding motives and benefits, 6 major themes emerged from the data analysis.
  - The most frequently mentioned theme for motives and benefits was physical fitness and health.
  - Specifically regarding motives, most frequently mentioned were recreation and enjoyment, and secondly, improvement to physical fitness and health.
  - The most frequently mentioned benefits were improvement to physical fitness and health and benefit to surrounding environment through a decrease in burning of fossil fuels.
- Regarding constraints and needs, 7 themes emerged from the data analysis.
  - The most frequently mentioned theme for constraints and needs was lack of facilities.
  - The four major themes concerning constraints were weather, clothing and gear, traffic and fear of drivers, time and distance, and mental, cultural, social barriers.
  - The one major theme concerning needs was for action on behalf of the City of Bloomington, community, or Indiana University.
  - Lack of facilities and street-specific issues and road conditions were viewed as both constraints and needs.

As Chapter 5 explains, overall, bicycle commuters were happy with their decision to choose bicycle commuting and thought benefits were more important than constraints

and needs. The findings below give a general idea of the information collected and analyzed from the bicycle commuters.

- Bicycle commuters chose to commute because they enjoyed cycling as a recreational pursuit, to meet physical fitness and health goals, convenience of accessible parking and time saved, or they did not own a car.
- Benefits included higher levels of physical fitness, bettering of local environment, saving gas, conserving resources, and setting an example for friends, family, and coworkers.
- Weather and the necessary clothing and gear that accompany it, traffic and fear of drivers, and time and distance were mentioned as major constraints.
- Needs expressed included covered bike parking on the Indiana University Campus and the City of Bloomington, more adequate routes traveling east and west in the city, more bike lanes and bike route signs, more convenient off-street trails, driver/cyclist education, and safer alternatives to East Third and Atwater Streets, and West Second and Third Streets.

Chapter 5 also gives implications of this study of which examples are listed

below:

- This study has the potential to impact community life and decision-making in the City of Bloomington.
- Benefits learned through this study could be used in a marketing campaign if one is advocating bicycle commuting.

- The City of Bloomington can use the results of this study to show how less car use and more bicycle use keeps road in better condition for longer periods of time, which in turn, cuts expenses for the City.
- Because driver/cyclist education was so frequently mentioned as a need, perhaps the City, in collaboration with local bicycle shops, could offer free bicycle riding workshops.
- The City of Bloomington may be able to use this study as justification for repairing problem areas like West Second and Third streets and re-analyzing bicycle lanes.
- A more widespread survey could be created to reach a larger sample of the Bloomington population.
- The city government may be able to use findings to assess whether goals set by the City are being met.
- This study gives insight of the bicycle commuter population to non-cycle commuters.
- Indiana University may be able to use the study in many of the same ways as the City of Bloomington.

Lastly, Chapter 5 gives recommendations for future study of similar topics including:

- The researcher found it unnecessary to contact club members first for a roster, but instead could have sent the participant email out initially.

- The methods used of convenience and snowball sampling could have produced biased results, and future study could include selecting a more random sample using various ideas.
- Further studies could include evaluating quantitative differences between health or fossil fuel use among car drivers and bicycle commuters, evaluating social community of bicycle commuters, further exploration of constraints of non-cycle commuters, or a quantitative study of needs and preferences.

## TABLE OF CONTENTS

### Chapter 1

INTRODUCTION .....	1
Statement of the Problem .....	3
Study Purpose .....	3
Need for Study.....	3
Delimitations .....	5
Limitations.....	6
Assumptions .....	6
Research Questions.....	7
Definition of Terms .....	7

### Chapter 2

REVIEW OF RELATED LITERATURE .....	9
Previous Research Regarding Bicycle Commuting.....	9
Background of Bicycling and Bicycle Commuting in Bloomington, Indiana .....	19
Summary.....	21

### Chapter 3

METHODOLOGY .....	23
Arrangement for Conducting the Study.....	23
Selection of Subjects .....	23
Instrumentation.....	25
Data Collection .....	26
Data Interpretation.....	28

TABLE OF CONTENTS Con't.

Trustworthiness of the Study ..... 29

Chapter 4

FINDINGS ..... 32

    Overview of Participants ..... 32

    Findings Regarding Motives and Benefits ..... 37

    Findings Regarding Constraints and Needs..... 47

    Summary..... 61

Chapter 5

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS..... 62

    Summary..... 62

    Findings ..... 63

    Implications ..... 65

    Recommendations for Future Study ..... 70

REFERENCES ..... 74

APPENDICES

    (A) Club Contact Email..... 80

    (B) Participant Email..... 82

    (C) Participant Email Reminder ..... 84

    (D) Phone Script..... 86

    (E) Flyer ..... 88

    (F) Thank-You Card..... 90

    (G) Interview Script ..... 92

TABLE OF CONTENTS Con't.

(H) Bicycle Rack Locations ..... 95

(I) City of Bloomington Map ..... 97

(J) Institutional Review Board Approval Documents ..... 99

(K) Study Information Sheet ..... 102

## LIST OF TABLES AND CHARTS

Table 1. Bicycle Commuters by Age .....	33
Table 2. Bicycle Commuters by Household Income.....	34
Table 3. Distance Commuted Per Day .....	36
Table 4. Years as a Bicycle Commuter .....	37
Table 5. Frequency of Motives/Benefits Mentioned During Discussion.....	38
Table 6. Frequency of Constraints/Needs Mentioned During Discussion .....	48
Chart 1. Number of Times Bicycle Commute Per Week .....	35
Chart 2. Time Spent on the Bicycle Per Day .....	36

## Chapter 1

### INTRODUCTION

**Get a bicycle. You will not regret it if you live.** ~Mark Twain, "Taming the Bicycle"

Bicycling may be considered one of the most prevalent leisure activities in the United States and in the world. In the U.S., fifty million adults and forty million children own and ride bikes (Sorensen, 2008). Likewise, bicycling ranks as popular among residents of the City of Bloomington with annual events like The Central Indiana Bicycling Association's Annual Hilly Hundred which began in 1967 ("Hilly Hundred," 2008; van Arsdale, 2006), and the Indiana University Student Foundation's Little 500 Race. The City of Bloomington created the Bicycle and Pedestrian Safety Commission in 1989 (J. Fish, personal communication, April 17, 2009). Eleven miles of bike lanes, 17 miles of side-paths and multi-use trails, 20 miles of unimproved trails and greenways, 35 miles of designated signed bike routes, and 241 miles of sidewalk exist within the City of Bloomington's bicycle and pedestrian network ("Greenways System Plan," 2008).

Even though bicycling has long-standing popularity in recreation, in the U.S. only two million bicycle owners are bicycle commuters (Sorensen, 2008). While many of our foreign counterparts, like China and countries in Europe place importance on bicycle commuting, the United States struggles to follow with approximately only one percent of trips taken by U.S. citizens via bicycles, and many of these trips are under a half of a mile (Dill & Voros, 2008; Sorensen, 2008).

Recently, there has been more advocacy in urban planning to include facilities for bicycle and pedestrian commuters. Priesnitz (n.d) notes cities like Paris, France and Vancouver, British Columbia, are searching for new methods of redesigning communities

in order to accommodate bicycle commuters because of perceived benefits like increased physical activity and less environmental impact (p.23). These two cities are not alone as other areas including Tucson, San Francisco, Arlington County, Virginia, and Minneapolis are beginning their own community bicycling programs. Even private companies like Google, Inc. are becoming involved in bicycle commuting advocacy (“First Person,” 2008; “Pedal Power,” 2007). Bicycle activism, promoting cycle commuting and the rights of cyclists to ride on roadways, has received more media attention recently with monthly events like Critical Mass and annual events like Bike-to-Work Day, May 20<sup>th</sup> (Cantarero, n.d.). The League of American Bicyclists is an active group that sponsors National Bike Month and Bike-to-Work day as well as provides resources for small communities, municipalities, and states in order to promote a more bicycle-friendly nation (“First Person,” 2008). Bicycle legislation has also been reported in the news more frequently as of late due to a new refund benefit commuters may receive as a tax deduction (Wiebe, 2008). Even the federal government is beginning to become involved in bicycle commuting issues as the U.S. Congress passed bills like the Intermodal Surface Transportation Efficiency Act (ISTEA) and the Transportation Equity Act for the Twenty-first Century (TEA21) which require alternative transportation programs for cities (Dolesh, 2008).

There has been some research of bicycle commuters providing basic information as to the typical bicycle commuter characteristics, their preferences, as well as some of the benefits, motives, and constraints (“CFLRI Research Report,” 2003; deJong, 2009; Dill & Voros, 2007; Dolesh, 2008; Killingsworth & Schmid, 2001; Moritz, 1997; Nankervis, 1999; Williams, 2002; Zahran, Brody, Maghelal, Prelog, & Lacy, 2008).

Much of this research however does not provide a solid foundation of knowledge as to why bicycle commuters are choosing to do bike commute. By investigating existing bicycle commuters in a specific area through a qualitative study, more accurate findings may result. The outcomes of this research may be disseminated and used by urban city planners, transportation planners, local, state, and federal governments, and other organizations committed to promoting bicycling and bicycle commuting in order to better understand the bicycle commuting population, encourage others to be apart of it, and meet the needs of the bicycle commuters.

#### Statement of the Problem

The problem explored in this study was to examine motivations, constraints, needs, and benefits of residents of the City of Bloomington, Indiana, both students and non-students, who chose to commute via bicycle.

#### Study Purpose

Most research existing on bicycle commuting refers to urban community planning such as built-environment and street connectivity (Dill & Voros, 2007). However, the goal of this exploratory study is to investigate a specific sample of bicycle commuters and give insight to this population through their motives, benefits, needs, and constraints. This study will contribute to the greater body of knowledge by providing a better understanding of bicycle commuters for further bicycling research such as safety and community planning, advocacy, and recreational activities.

#### Need for Study

Bicycle commuting has been studied within the framework of built-environment, urban planning as well as physical environment conditions (Brown, 2007; Dill & Voros,

2007; Humpel, Owen, & Leslie, 2002; Nankervis, 1999). Organizations have advocated for promotion of the bicycle as a tool for commuting, a form of recreation, and as a means to improve physical fitness (deJong, 2009; “First Person,” 2008; Killingsworth & Schmid, 2001; Moritz, 1997; Priesnitz, n.d.; Zahran, et al., 2008). What little research does exist specifically on bicycle commuting explains the choice made to bicycle commute as having no other means of transportation, a concern for the environment and reducing carbon dioxide emissions, incorporating sustainable practices into one’s lifestyle, enjoying bicycling as a recreation pursuit, cost reduction of transportation, and the opportunity to improve physical fitness (Brown, 2007; deJong, 2009; “First Person,” 2008; Maia, 2007; Zahran, et al., 2008). Based upon previous research, bicycle commuting seems to be a source of benefits to both individuals and communities, yet there is a lack of research specifically seeking the motivations to pursue these benefits and why.

Bicycle commuters choose their mode of transportation for a variety of reasons or benefits, yet some have faced constraints that had to be overcome prior to becoming a bicycle commuter. Because bicycle commuters regularly use city streets, lanes, side-paths, and other multi-use paths, they may be more mindful of needs for bicycle commuters that community transportation decision-makers might not be aware of. This study makes a difference by focusing on a specific sample of bicycle commuters and seeking detailed information regarding their personal motives, benefits, constraints, and needs. Because of the shortage of research existing on bicycling and bicycle commuting, this study contributes directly to the body of knowledge, providing perspectives of the bicycle commuter in order to further bicycling research and advocacy. This study is made

distinct by taking place in the City of Bloomington, Indiana, which has been rated by the League of American Bicyclists as a “Bicycle Friendly Community” (“City of Bloomington,” n.d.). While opportunities for commuters might be greater because of Bloomington’s status as bike friendly, the fact that there might be more commuters to participate in the study is very advantageous. Because the City has begun to increase emphasis on bicycle commuting facilities as well as other forms of alternative transportation, interviewing users of these facilities will provide insight as to whether they are being used, commuters’ motivations for using them, the value of the facilities, and how they may be improved. The results of this study will be particularly useful for City of Bloomington administrators to understand why residents commute and how to better accommodate current bicycle commuters in an effort to attract more commuters. This examination of an existing bicycle-friendly city and its commuters will result in a resource that may be used by other community leaders and decision makers, the general public, and advocacy organizations in order understand bicycle commuters’ motives, benefits, constraints, and needs, and perhaps, serve as a model in creating similar bicycle-friendly communities.

#### Delimitations

This study was delimited to the following:

1. All those who responded to a request for interviewees through email on the Bloomington Bicycle Club listserv, the Indiana University Cycling Club listserv, and the Indiana University Outdoor Adventure Trip Leader listserv.
2. Data gathered by interviewing community bicycle owners via face-to-face interviews.

3. Interviews were approximately 30 minutes in length and the line of questioning was controlled by the primary investigator.
4. The primary investigator had the ability to probe, follow up and ask for specific details and elaboration during the one-on-one interview.

#### Limitations

This study was limited by the following:

1. The selected subjects' response time to the request for interviewees.
2. The amount of time available for interviewees to participate in an interview.
3. The ability of respondents to understand and relate the questions in the interview to their personal bicycle usage.
4. The presence of the investigator may have biased responses of interviewees.
5. Selected subjects may or may not include university students skewing results as transportation habits of students are different and inhabitable.

#### Assumptions

The following assumptions were made about the study:

1. Respondents to the request for interviewees were, in actuality, bicycle commuters.
2. Respondents provided answers that were honest and accurate to all questions during the interview.
3. Request for interviewees was the most appropriate method for reaching bicycle commuters.

## Research Questions

The study was designed by asking the following research questions:

1. What themes do bicycle commuters identify with regard to motivations and benefits?
2. What themes do bicycle commuters identify with regard to constraints and needs?

## Definition of the Terms

The following terms are defined to clarify their use in this study:

Active living. A way of life that integrates physical activity into the daily routine (“Active Living Research,” 2006).

Benefit. A gained advantage or an addition to one’s well-being.

Commute. The act of traveling back and forth regularly, as from one’s home to one’s place of work.

Constraint. A concern or hindrance to participation in activity.

Exercise. Performing and practicing in order to develop, improve, and display a physical capability or skill (Caspersen, Powell, & Christenson, 1985).

Motive. A possible combination of desires and needs that cause a person to act, or is the reason for behavior.

Leisure. Originating from the ancient Greek word for leisure, schole; an activity without the pressure of necessity, usually voluntary and pleasurable (Godbey, 2003).

Physical Activity. Activity promoting body movement and overall fitness. (Caspersen, et al., 1985).

Recreation. An activity done in opposition to work that refreshes and restores the individual (Godbey, 2003).

Sustainability. Meeting the needs of the current generation without impairing the ability to meet the needs of future generations. (Cairns, 2000; Berke, 2008; “The Many Dimensions,” n.d.)

## Chapter 2

### REVIEW OF THE RELATED LITERATURE

**The bicycle is the most civilized conveyance known to man. Other forms of transport grow daily more nightmarish. Only the bicycle remains pure in heart.**

~Iris Murdoch, *The Red and the Green*

Previous research has been completed concerning various topics regarding bicycling and bicycle commuting. However, there is a lack of worthwhile research specifically exploring motives, constraints, needs, and benefits of bicycle commuters and much more investigation needs to take place. This literature review will present a comprehensive overview of existing research regarding bicycle commuting as well as explore the background of bicycling and bicycle commuting in Bloomington, Indiana.

#### Research Regarding Bicycle Commuting

While the knowledge base containing literature about bicycle commuting is small, the topics are broad and vary among several topics. These topics include general knowledge of bicycle commuting, benefits, motives, and constraints, health in relation to bicycle commuting, sustainability or environment in relation to bicycle commuting, existing community commuting programs, and current governmental legislation.

#### *General Knowledge of Bicycle Commuting*

Much of the previous research contains information about who cyclists are and how often they bicycle commute. Bicycling has long-since been a part of leisure activity in the United States with fifty million adults and forty million children in the U.S. owning

and riding bikes. Yet, only two million are using their bicycles to commute to and from work or school (Sorensen, 2008). In contrast, bicycle traffic in China, Europe, and Japan, demand more space on streets than cars during rush-hour. Dill (2008) explained only about one percent of trips taken by U.S. citizens are on bicycles, and many of these trips are under a half of a mile.

A survey conducted by the Canadian Fitness and Lifestyle Research Institute showed that most bicycle commuters are either of mid-size communities, 10,000-74,000 residents, or of large communities, over 300,000 residents. Most are also highly educated with advanced degrees and have annual earnings in the range of \$35,000 to \$54,000. The majority of bicycle commuters are between the ages of 16 and 44 years old. About 70% are male bicycle commuters and about 30% are female. The survey also found over 50% of the cyclists commuted five and half miles or less. Surprisingly, 13% of the bicycle commuters, traveled over 15 miles each trip. Lastly, the survey reported that commuting remained steady in participation numbers throughout summer, fall, and spring, but that commuting dropped in half during winter (“CFLRI Research Report,” 2003). Another survey conducted throughout all regions of the United States and Canada for one year from May 1995 to May 1996 showed that the ‘average’ bicycle commuter was a 40 year-old professional with an annual salary over \$45,000 who biked over ten months of the year. The ‘average’ trip was a little over seven miles, took around 30 minutes, and was made about eight times a week. Of the survey respondents, 71% chose bicycling as their primary form of commuting (Mortiz, 1997).

Other research pertaining to general bicycle commuting information pertained to bicycle commuters preferences. One study surveyed commuters about various bicycle

commuting facilities (Krizek, 2006). This study used the adaptive stated-preference (ASP) survey to understand how bicycle commuters in the Minneapolis-St. Paul, Minnesota, metropolitan area valued different travel environments like off-street trails, bicycle lanes on streets without roadside parking, bicycle lanes on streets with roadside parking, streets without bicycle lanes or parking, and streets with roadside parking and no bicycle lanes. The study results showed that commuters enjoyed bicycle lanes on streets and would add a 75% increase in time to their commute in order to use this kind of facility. A bicycle commuter will increase time by about 44% to use a street with no roadside parking and by about 25% to use an off-street trail (Krizek, 2006). This study conveyed a quantitative method for helping city planners weigh benefits of implementing different types of bicycle commuting facilities.

Another study provided several factors that may influence the choice to bicycle or walk as a form of commuting (Zahran, Brody, Maghelal, Prelog, & Lacy, 2008). The researchers found cycling and walking transportation behavior to be dependent upon the local environment's characteristics. Areas with temperate climate in the summer and lower humidity, as well as topographic differences tend to have more bicycle and walking commuters. The built environment also affects frequency of cyclists and walkers as areas with high street connectivity and a shorter distance between trip origins and destinations encourage more cycling and walking. Areas with lower population densities have less bicycle and walking commuters, but areas with higher air pollution levels also have less bicycle and walking commuters. Another factor revealed areas with more wealth, human capital, and stricter organizational infrastructure have a higher frequency of walkers and

bikers. These areas also tended to have local advocacy groups providing education and encouraging physical activity.

### *Benefits Related to Bicycle Commuting*

Gaining a better understanding of benefits, motives, and constraints of bicycle commuters is the focus of this study because as the following findings revealed, there is a lack of research in this field. The most cited benefits to bicycle commuting include physical fitness and combating obesity and diabetes (Dolesh, 2008; “Grapevine,” 2008; Silver, 2008). A related benefit is that bicycle commuting helps form a healthy lifestyle and is considered a part of active living (Brown, 2007). The term active living has become more important recently and is defined as a way of life that integrates physical activity into the daily routine (“Active Living Research,” 2006). Bicycle commuting has been cited as a method of active living, and research regarding physical activity, including bicycle commuting, is now receiving more attention from leisure researchers in gratification to organizations like Active Living Research of the Robert Wood Johnson Foundation which are giving more grants for this type of research (Sallis & Linton, 2005). Physical activity and recreation activities like bicycling, walking, and jogging are beneficial as leisure pursuits as well as serving “utilitarian” purpose (Gobster, 2005, p. 369).

Another oft-cited benefit of bicycle commuting pertains to a reduction in air pollution. Driving a car releases harmful carbon dioxide emissions into the air, but in contrast, bicycle commuting reduces the amount of greenhouse gases as well as general air pollution (Dolesh, 2008; “Grapvine,” 2008; “My Green Town,” n.d.). With decreased traffic, pollution and congestion are also reduced with less cars on the roads (Dolesh,

2008; Williams, 2002). Other benefits regard lower cost since automobiles are generally more costly to drive due to initial purchase, maintenance, and rising gas prices (“Grapevine,” 2008, Silver, 2008; Williams, 2002). Under the new “Bicycle Commuter Act” approved by U.S. Congress in 2008, the last cited benefit is the new employer tax benefit of \$20 per month for bicycle commuters to help with costs associated with commuting (Silver, 2008).

#### *Motives of Bicycle Commuters*

Very little research exists regarding motives of bicycle commuters. A survey conducted by the League of American Bicyclists from May 1995 to May 1996 asked current bicycle commuters why they chose their method of transport. Of the 2,374 useable surveys, the results showed 93% of cyclists chose health and fitness as their number one motive for cycling. Eighty-two percent chose environment as their number two motive, 52% chose traffic congestions, and 48% said they bicycle commuted because of gas prices and taxes (Moritz, 1997).

#### *Constraints to Bicycle Commuting*

Constraints to activity, like bicycle commuting, are causes that hinder an individual from participation (Raedke & Burton, 1997). One constraint is the unhealthy lack of respect automobile drivers have for bicyclists, although, there is also lack of respect from bicycle commuters toward automotive traffic (“CFLRI Research Report,” 2003; “Grapevine,” 2008). A second constraint with more research was that of environmental factors including average temperature and weather (Dill & Voros, 2007). According to one study, regular commuters tended to view some weather conditions like rain, wind, temperature, and sudden changes in weather as barriers to choosing to bicycle

commute on a daily basis (Nankervis, 1999). Bicycle commuters viewed commuting as viable only during warmer months and viewed winter climate as a constraint to commute via bicycle. However, most regular bicycle users still commute during inclement weather, but may choose to travel less for discretionary trips like errands (Nankervis, 1999).

The cyclists surveyed by Nankervis (1999) additionally stated that the lack of facilities at the workplace for bicycle storage was also a barrier to cycling. Many employees felt it was hard to abide by strict arrival and departure times for work and primarily use bicycle commuting because of amount of daylight, busy traffic times, and sudden changes in weather (Nankervis, 1999).

The last constraint referred to in the literature was that of a built environment or perceived built environment (“CFLRI Research Report,” 2003). Built environment refers to street connectivity, bike lane availability, off-street bicycle trails, and other features of the environment that are man-made (Dill & Voros, 2007). Bicycle commuters were not as inclined to bike commute where connectivity and availability of bike lanes or off-street trails were low. In areas where there was positive perception of the built environment and bicycle friendliness, more cycling occurred and there was a stronger desire to cycle more frequently (Brown, 2007; Dill & Voros, 2007).

A problem with the three previous sections is that many of the benefits, motives, and constraints are not tested ideas. In fact, some of the information conveyed in the studies may be the perceived benefits and constraints which present a key issue. This particular study will help by analyzing interviews directly from bicycle commuters

explaining the actual benefits, motives, and constraints so that the implications will be more effectively realized.

### *Bicycle Commuting in Relation to Health*

Much of the advocacy literature and other research completed on bicycle commuting is in relation to health issues and environmental concerns. Organizations like the League of American Bicyclists express that areas promoting bicycle commuting are “fitter, healthier, and happier” communities (“First Person,” 2008, p. 58). Studies have shown that participation in physical activity has led to better overall health and quality of life (Henderson & Ainsworth, 2002). Physical activity has also been shown to benefit adults struggling with obesity. Even if the physical activity does not result in weight loss, the individuals live longer than other persons of the same weight (“Fitness Benefits Obesity,” 1996).

America’s health statistics convey that individuals should undertake more physical activity because of the benefits it offers. More than 200,000 deaths per year occur in the United States due to individuals being physically inactive (Killingsworth & Schmid, 2001). National surveys show more than 25% of American adults have zero activity on most days and almost 60% of teenagers fail to meet the standards set by the Surgeon General for physical activity (Active Living Research, 2006). Other research reiterates that almost one in three adults are inactive and over half are overweight (Killingsworth & Schmid, 2001).

Killingsworth and Schmid (2001) presented these statistics and then, along with others, promoted bicycle and pedestrian commuting as viable options for incorporating healthy activity into one’s lifestyle (Brown, 2007; deJong, 2009). Exercise like bicycle

and pedestrian commuting holds potential because it is physical activity that can be integrated into daily routines, an idea also promoted by active living research (Active Living Research, 2006; Godbey, 2003; Sallis & Linton, 2005).

### *Bicycle Commuting in Relation to Environmental Concern*

Another area of bicycle commuting receiving more research than others is that of environmental concern. Global climate change is currently a pressing issue worldwide. Individuals, organizations, private businesses, governments, and more are all investigating the changes that have occurred and that continue to occur in our environment and are looking for better methods for meeting peoples' needs. Upham (2000) explained that global climate and environmental change have been caused by people, use of cars, and methods and rates of production and consumption. The Intergovernmental Panel on Climate Change approximates that almost 60% of carbon dioxide in the earth's atmosphere has been generated by the burning of fossil fuels. This number has increased by 80% from 1970 to 2004 (Callahan, 2008). Also estimated is that the United States, along with other developed countries, is responsible for 60% of total greenhouse gases (Maia, 2007). Another source revealed that 30% of carbon dioxide emissions and at least two-fifths of nitrous oxide emissions come from the transportation sector (Dittmar, 2002). Dittmar also showed that "in 1998, there were 184,980,187 licensed drivers in the United States and 297,048,193 licensed motor vehicles" (2002, p. 109). This many drivers and cars compounded with the inefficiency of vehicles and their harmful emissions accounts for many of the issues dealing with greenhouse gases and climate change.

Researchers agree that these issues create a threat to sustaining life on earth and seek solutions for changing behavior (Oskamp, 2002). Scientific evidence supports the theory that using methods centered in sustainability are necessary to improve quality of life on Earth (Upham, 2000). According to an article in *Ecós Magazine* (n.d.) sustainability can be defined as “meeting the needs and aspirations of the current generation without impairing the ability of future generations to meet theirs.” According to the United Nations, sustainability is “meeting human needs while conserving the earth’s life support systems” (Berke, 2008, p. 393).

Since transportation seems to be the source from which many environmental problems stem, the need for alternative transportation has never been greater. Priesnitz (n.d.) noted several cities in the United States have been searching for new methods for redesigning travel in a sustainable manner for residents and have found bicycle commuting. In urban areas, bicycle commuting has to be promoted and used by residents as part of a global transformation to mitigate the impact of greenhouse gas emissions (Maia, 2007). Bicycles have zero impact on global climate and are fueled by the cyclist’s carbohydrates instead of fossil fuels which make them a sustainable form of alternative transportation (“CFLRI Research Report, 2003; Sorensen, n.d.).

#### *Existing Community Bicycle Commuting Programs*

Because of bicycle activism events like Critical Mass, a monthly bicycle ride to celebrate cycling and the cyclists’ right to the road, and National Bike-to-Work Day, annually on May 20<sup>th</sup>, more communities like Portland, Boulder, Tucson, and San Francisco have begun promoting bicycle commuting on their own (Cantarero, n.d.; “First Person,” 2008). In the summer of 2008, Washington, D.C. initiated the first bicycle

sharing program in the United States called SmartBike. Users pay an annual membership fee and can then check bicycles in and out of various locations throughout the city for commuting use (“First Bicycle Sharing Program Launched,” 2008). Programs like this have already existed since 2007 in Paris, France where an incredible 20,000 bikes are available at over 1,000 stations throughout the city. Users also pay with an annual membership fee and can check out and return bicycles at any location (Priesnitz, n.d.) The United Kingdom is not far behind as London plans to spend \$750 million to build off-street trails connecting residential areas with the city center. Another \$200 million is being spent in other parts of the country to increase bike lanes, bike parking, safety training for bicycle commuters, and on-street bike rental networks (Priesnitz, n.d.). Vancouver, British Columbia, and Eugene, Oregon, are two other cities noted for their considerable effort in creating more bicycle commuting-friendly cities (“My Green Town,” n.d.).

A unique program in Chattanooga, Tennessee, offers free bicycle rental to lunch-time commuters. Since employees downtown often leave work and drive to lunch, the Tennessee Department of Transportation checks out bicycles to lunch-goers for free who can ride the bicycle through the city’s bicycle-friendly streets for lunch and then return the bike afterward (“Bike to Lunch for Free in Chattanooga,” 2008). Private firms are also providing employee programs like Google, Inc. In Europe, the Middle East, and Africa, 2,000 Google employees have received free bicycles and helmets to use to commute to work (“Pedal Power,” 2007).

### *Current Bicycle Commuting Legislation*

Recently, federal dollars allocated to transportation planning are now being distributed for bicycle and pedestrian planning. The government recognizes the need for a cleaner environment and alternative transportation (Brown, 2007). Congress has begun requiring alternative transportation programs and policies for cities through three bills: the Intermodal Surface Transportation Efficiency Act (ISTEA), the Transportation Equity Act for the Twenty-first Century (TEA21) and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) (Dolesh, 2008). The benefits associated with sustainable transportation planning and these authorized bills are reductions in air pollution, traffic congestion, better energy use, as well as increased physical health (Brown, 2007; Dolesh, 2008; Williams, 2002).

Even more recently, House Resolution 1424, a resolution to provide bicycle commuting tax breaks, was passed as part of the economic bailout bill in November of 2008 (Silver, 2008; Wiebe, 2008). Employers can offer fringe benefits to bicycle commuters of up to twenty dollars a month which they will deduct as a business expense. Bicycle commuters will be able to receive these benefits untaxed (Wiebe, 2008). While other transportation fringe benefits like public transit passes and parking expenses receive more funding, the “Bicycle Commuter Act” will give more incentive for employers to encourage bicycle commuting (Wiebe, 2008).

### **Background of Bicycling and Bicycle Commuting in Bloomington, Indiana**

Bicycling has gained popularity among residents of the City of Bloomington since the early 1970s when cycling for recreation, leisure, and sport became more popular (van Arsdale, 2006). A popular tour of long-standing tradition, The Central Indiana Bicycling

Association's (CIBA) Annual Hilly Hundred, began in 1967 ("Hilly Hundred," 2008; van Arsdale, 2006). CIBA, based in Indianapolis, is one of the largest and most active bicycle clubs in the United States ("Hilly Hundred," 2008). The Hilly Hundred ride has grown to attract around 5,000 cyclists each year and has been given numerous awards by both *Bicycling Magazine* and the League of American Bicyclists ("Hilly Hundred," 2008). The Bloomington Bicycle Club was begun in 1976 by community members and local bicycle shop owners. Since then, the club has continued to stay active with variable commitment throughout the years, and although the club began primarily as a racing team, now, the group is mostly composed of recreational, or touring, cyclists and those committed to regular riding and commuting (van Arsdale, 2006).

The City of Bloomington municipal government includes the Bicycle and Pedestrian Safety Commission within the Department of Transportation. The Bicycle and Pedestrian Safety Commission was created in 1989 (J. Fish, personal communication, April 17, 2009) to help develop bicycle and pedestrian facilities convenient to the residents. The Commission works to advocate the use of trails, bike lanes, side-paths, and sidewalks in order to "reduce traffic congestion in the City and improve the health, fitness, and quality of life of Bloomington residents" ("City of Bloomington," n.d.). Currently, the City of Bloomington reports a bicycle and pedestrian network consisting of 11 miles of bike lanes, 17 miles of side-paths and multi-use trails, 20 miles of unimproved trails and greenways, 35 miles of designated signed bike routes, and 241 miles of sidewalk ("Greenways System Plan," 2008.) At this time, it is not feasible for the commission to record usage on the already existing network. One established trail, the Clear Creek trail, has permanent counters, but others either remain entirely

uncounted, or the City's Public Works Department has studied some intersections on a case-by-case basis (J. Fish, personal communication, April 17, 2009).

The city council of Bloomington established "The Alternative Transportation and Greenways System Plan" in 2001 under Resolution 01-24 ("City of Bloomington," n.d.; "Greenways System Plan," 2008). This fluid document was then reapproved in 2008 under Resolution 08-02. The reauthorization of this plan took two key pieces of council legislation into account which were Resolutions 06-05 and 06-07. These resolutions mandated the Council to consider support for the Kyoto Protocol and the reduction of the community's greenhouse gas emissions as well as recognition of world peak petroleum production in all further created legislation ("Greenways System Plan," 2008). The "Greenways System Plan" also cited other goals to accomplish such as:

further enhancing the community image, further enhancing local quality of life, promoting healthier lifestyles, reducing commuting costs, expanding tourism opportunities, building the City's assessed value, increasing and stabilizing property values, enhancing local economy, aiding business recruitment efforts, providing opportunity for people unable to drive or people without cars, improving the natural environment, and preserving natural areas (2008, p. iv).

### Summary

Bicycle commuting is beginning to be taken more seriously by transportation planners, local, state, and federal governments, and individuals. Previous research rarely expands into in-depth, peer-reviewed research of the benefits, motives, constraints, and needs of bicycle commuters. This study will make a contribution to the bicycle

commuting knowledge base by focusing mainly on the benefits, motives, constraints, and needs of real bicycle commuters living in the City of Bloomington, Indiana. The findings will be able to be used by city planners, local government, and advocacy organizations to better understand the advantages of bicycle commuting to the individual as well as the greater good, the needs of current bicycle commuters, and the barriers necessary to overcome by non commuters in order to become bicycle commuters.

## Chapter 3

### METHODOLOGY

**[T]he bicycle will accomplish more for women's sensible dress than all the reform movements that have ever been waged.** ~Author Unknown, from Demerarest's Family

Magazine, 1895

This study examined motives, constraints, benefits, and needs of residents in the City of Bloomington, Indiana, both students and non-students, who choose to bicycle commute. This study will follow a method organized in the following components: (a) arrangements for conducting the study, (b) selection of subjects, (c) instrumentation, (d) data collection, (e) data interpretation, (f) and trustworthiness of the study.

#### Arrangements for Conducting the Study

This study took place in the City of Bloomington, Indiana, through the Department of Recreation, Parks, and Tourism at Indiana University with approval from the Institutional Review Board at Indiana University. Permission to contact club members and shop patrons was obtained from the Indiana University Cycling Club, Bloomington Bicycle Club, Indiana University Outdoor Adventure Trip Leaders, The Bicycle Garage, Inc, Bikesmiths' Cycle Shop, Revolution Bike and Bean Bicycle Shop, and the Community Bike Project. The investigator visited the shops and contacted representatives from each group to introduce the study.

#### Selection of Subjects

Sampling was a difficult task in this study as bicycle commuters are not a large population and are not easily accessible. Therefore, a combination of nonprobability

sampling techniques were used. Purposive sampling includes selecting a particular sample because a belief is held that this sample will accurately represent the entire population (Henderson & Bialeschki, 1995). Convenience sampling is an incidental type of sampling where the sample “happens to be available” and snowball sampling refers to a sample in which the investigator approaches people he or she knows to ask for recommendations of potential members of the sample (Henderson & Bialeschki, 1995, p. 131-132). A combination of these methods was used in this study to survey a sufficient sample of bicycle commuters. There was not a set number for the sample as sampling ceased at the point of saturation, meaning no additional new information was found during the interviews (Henderson, 1991).

Using purposive sampling, only bicycle commuters were solicited for this study. The method to meet bicycle commuters consisted of obtaining a list of club members from the Indiana University Cycling Club, the Bloomington Bicycle Club, and the Indiana University Outdoor Adventure Trip Leader Club from each club contact member. The contact member from each club was sent an email introducing the study and requesting the names and emails or phone numbers of club members (Appendix A). Once the list was received, each member was sent an email introducing the study and requesting the individual’s participation (Appendix B). This email explained who was conducting the study, why the study was being conducted, and outlined the parameters for participation. If the individual replied to the email and agreed to participate in a one-on-one interview, the investigator coordinated a time and place for the interview to take place. If the original email did not receive a reply within five days, a second reminder email was sent (Appendix C). If there was no reply to the second email, the investigator

did not make any further contact. For club members who did not have an email address, a phone call was made and a script was followed to explain who was conducting the study, why the study was being conducted, and outlined the parameters for participation (Appendix D). If the individual expressed interest in participating in a one-on-one interview, while still on the phone, the investigator coordinated a time and place for the interview.

Another method was used to draw bicycle commuters into the sample. Three local bike shops, the Bicycle Garage, Inc., Bikesmiths' Cycle Shop, Revolution Bike and Bean Bicycle Shop, and the Community Bike Project were asked to help advertise the study. The Community Bike Project is a non-profit organization whose mission is to help provide bike transportation to Bloomington area residents. The Bike Project implements programs on bicycle maintenance and basics as well as provides resources for cyclists to learn bike routes and ride safely ("Community Bike Project," n.d.). Flyers were placed at each of the locations and were available for store patrons to take (Appendix E). The flyers introduced the study and included the investigator's email address and phone number so that interested cyclists could voluntarily contact the investigator to set up a one-on-one interview.

### Instrumentation

This study was composed in a qualitative method. Because little previous research has been done in this area, specifically with cycling, it is more effective to begin study of this topic as an exploratory study (Creswell, 2009). Therefore, one-on-one interviews were conducted between the primary investigator and bicycle commuters. The interviews were set in either a mutually agreed upon location or in the participant's home,

according to the level of comfort for the participant. The interviews were semi-structured and lasted approximately 30 minutes. The interview script was composed of five essential questions asking the bicycle commuter for some background information and then moving on to a broad question for each area of motivations, benefits, constraints, and needs (Appendix G). This question-and-answer sequence gave the primary investigator the necessary information in order to meet the study purpose of giving insight to the bicycle commuter population through their motives, benefits, needs, and constraints. The interview script also included four questions regarding the participants' demographics (Appendix G).

With the collaboration of research project director, Dr. Sarah Young, and committee member, Dr. Charles Chancellor, of the Indiana University Department of Recreation, Parks, and Tourism, the interview script was created to accurately assess the research question and comply with the standards of the Institutional Review Board (Appendix G).

### Data Collection

This study employed several different strategies to ensure valid and trustworthy results. The method of data collection can be considered a small case study (Holliday, 2007). A case study is a rigorous exploration of a specific unit, and this study was an intense examination of bicycle commuters in the City of Bloomington, Indiana using interviews (Henderson, 1991; Yin, 1984). Case studies are often given a second critical glance because of their inability to be generalized; therefore, this case study also employed other techniques (Campbell, 1979).

Interviewing was used as the main method to gather information because it can provide such rich information (Henderson, 1991). Establishing trust and building rapport was important to ensure the participant felt comfortable in order to give true responses to interview questions (Creswell, 2009; Spradley, 1979). The interviewer did this by conversing in an open and warm tone with study participants through emails, phone conversations, and finally, within the interview. As suggested by Henderson (1991), the first few minutes of the interview were used by the interviewer to establish casual conversation, introduce herself to the participant, and then explain how the interview would be conducted. The interview script (Appendix G) was used as a basic outline, but probe questions followed the participant's responses (Creswell, 2009). The questions were written to be open-ended, neutral, and clearly understood (Henderson, 1991; Holliday, 2007). Throughout the interview, field notes were taken via laptop computer at each interview as well as an audio-recording, again based up on the level of comfort for the participant. A more experienced qualitative researcher attended the first interview with the primary investigator in order to provide feedback and make sure technique as well as professionalism was maintained.

Audio-recording was employed in data collection in cases where the participant felt comfortable. Audio-analysis was chosen because of the advantage it offers in its ability to capture what the researcher could not observe and note during the interview and also does not appear to affect the quality of data being collected (Henderson, 1991). The tapes were then viewed after interviews and transcribed within a week after the interview.

After interviewing took place, each participant was mailed a thank-you card in order to express the investigator's gratitude of contribution to the study (Appendix F).

Participants were also asked if they would like to be issued a copy of the report once completed.

### Data Interpretation

Taking complete field notes was important throughout the entire data collection and interpretation process (Lincoln & Guba, 1985). Notes were typed on a laptop computer throughout the interview and then continued afterward. Digital audio recordings were transcribed within one week of the interview in order to keep information as organized as possible (Henderson, 1991). Information was recorded from individuals, and each individual was given a pseudonym to ensure confidentiality. A master list of individuals and their pseudonyms was kept until all data interpretation was complete at which point it was destroyed as required by the Indiana University Institutional Review Board (Henderson, 1991).

The process of theoretical sampling was used simultaneously throughout data collection and interpretation. Theoretical sampling is a method of collecting, coding, and analyzing data in order to find themes (Henderson, 1991). As the interviews were collected and transcribed, categories emerged and were coded (Denzin & Lincoln, 2000). The researcher was able to keep interviewing participants as long as new information revealed itself during interviews, and once the data became repetitive, the investigation could be considered saturated and data collection did not need to continue (Henderson, 1991).

In order to use this method, it was imperative to use the coding technique while data was still being collected. Coding is a difficult skill to master and includes categorizing data by reducing it to its essential content in order to see the themes appear

(Henderson, 1991). The primary investigator used a series of steps in order to code the transcribed interviews. First, information was highlighted where broad themes surfaced. Then, all specific details in each theme were labeled so that the emergent categories were as refined as possible (Denzin & Lincoln, 2000). Coding was used on all data collected and changed throughout the process. A filing system was also created to help keep data organized.

Strategies and advice recommended by Henderson (1991) were applied in order to create the best possible interpretation with useful results. One such strategy was to make sure the interpretation process was not halted too soon. In order to do this, the researcher made sure not to settle into a pattern or create automated codes, and to also continue to read and re-read field notes, observations, and transcriptions with different questions and perspectives (Henderson). Triangulation and constant comparison techniques were implemented in this study by using a variety of data sources and several interviewees, taking field notes, observations and using multiple methods to review data (Denzin & Lincoln, 2000; Holliday, 2007). Using both of these methods is important to qualitative studies because it protects the researcher from using data that is from one single source or includes his or her own bias (Henderson, 1991). Quantitative modes were also used to supplement descriptive data. Interview questions asked for some answers that generated quantitative responses such as commuting frequency per week and length of commute, and data codes were counted and charted (Henderson, 1991).

#### Trustworthiness of the Study

In order to establish trustworthiness for a study, four qualifications should be met by the researcher's methodology: credibility, transferability, dependability, and

confirmability (Henderson, 1991; Lincoln & Denzin, 2000; Lincoln & Guba, 1985).

Trustworthiness of a qualitative study can be hard to prove because there is no clear and consistent method for data collection, interpretation, and the report of findings.

Credibility is synonymous with internal validity, and means that the data was collected without narrow methods which could create the findings the researcher wants to know (Henderson, 1991). Credibility was established in this study by using triangulation, several repeated interviews, and the provision of quotes in the findings. Credibility was also established by using member checks, in which the researcher asked participants to verify responses of other participants. After the first five participants were interviewed, member checks were used during all following interviews.

Transferability is the same as the term, external validity, meaning the ability of the study to be used in support of other research and be generalized (Henderson, 1991; Lincoln & Guba, 1985). Transferability was attempted by showing how findings and research questions from this study could be used in other studies. Dependability refers to reliability, or how well the study findings may be replicated in a similar study (Henderson, 1991). Using triangulation as well as other researchers to check coding helped maintain dependability in this study.

Confirmability, or objectivity, means that the study findings are a true reflection of the participants' responses, not the bias of the researcher (Henderson, 1991). During interviews, when a participant answered, the researcher often repeated the conclusion back to the participant to ensure she understood the statement. The primary investigator asked another experienced qualitative researcher to review the first three interview

transcriptions to check coding and data organization. Using other researchers also helped in adhering to confirmability.

## Chapter 4

### FINDINGS

**The bicycle is a curious vehicle. Its passenger is its engine.** ~John Howard

This study was designed with the purpose of examining motivations, constraints, needs, and benefits of residents of the City of Bloomington, Indiana, who commute via bicycle. This qualitative study took place with 21 interviews conducted with bicycle-commuting residents of Bloomington, Indiana during May and June 2009. This chapter will discuss (a) an overview of the demographics and commuting habits of the participants, (b) findings from the interviews regarding motives and benefits of bicycle commuters, (c) findings from the interviews regarding constraints and needs of bicycle commuters, and (d) summary.

#### Overview of Participants

##### *Response Rate*

A total of 30 participants replied to study advertisements and/or emails and 21 were interviewed. Of the remaining nine participants who were not interviewed, six replied to the initial contact, but failed to reply to subsequent emails in order to schedule an actual interview. The remaining three replied after the primary researcher had determined the point of saturation had been reached, and consequently, were sent an email thanking them for their interest and explaining the data collection of the study had been completed.

### *Demographics*

At the end of each interview, participants were asked to answer four multiple-choice questions regarding age, gender, household income, and occupation in order to obtain a profile of bicycle commuters participating in this study. In terms of age, the 25-32 year old bracket represented the highest number of participants with 33.33% (N=7). Table 1 illustrates the total frequency of all categories.

Table 1.

#### Bicycle Commuters by Age

Age Bracket	Frequency	Percent
18-24 years old	3	14.29%
25-32 years old	7	33.33%
33-45 years old	5	23.81%
46-55 years old	2	9.52%
55+ years old	4	19.05%
Total	21	100.00%

Males represented the majority of interviewees with 66.66% (N=14) and females represented 33.33% (N=7). Household income was asked as a part of the demographic survey in order to gain a general idea of the participant's socioeconomic status. The lowest category, less than \$15,000, represented the highest number of participants with 33.33% (N=7). Table 2 illustrates the total frequency of all income categories.

Table 2.

## Bicycle Commuters by Household Income

Income Bracket	Frequency	Percent
Less than \$15,000	7	33.33%
\$15,001-\$30,000	2	9.52%
\$30,001-\$45,000	4	19.05%
\$45,001-\$60,000	1	4.76%
\$60,001-\$80,000	3	14.29%
\$80,001-\$100,000	1	4.76%
\$100,000+	3	14.29%
Total	21	100.00%

For the occupation question, respondents could choose from seven different options.

Two categories, student and academic/teacher, each represented 28.57% (N=6). The general/skilled labor category represented 19.04% (N=4), and the administrative category represented 14.29% (N=3). The managerial and other categories each presented 4.76% (N=1). No interviewees chose clerical, health care, or civil service.

#### *Bicycle Commuting Habits*

The sample of bicycle commuters interviewed represents a broad range of habits with regard to bicycle commuting. Interviewees were asked five questions about habits including how many times they commuted to work, or class in the case of some student participants, via bicycle per week, total distance per day, total time spent on the bicycle

per day, whether they biked for utilitarian trips as well, and how long they had been a bicycle commuter. Almost all bicycle commuters, 80.95% (N=17), had the habit of biking for utilitarian trips like shopping, dining out, running errands during the work day, or taking kids to school while 19.05% (N=4) represented those who do not bike other than to work.

The average bicycle commuter biked 4.76 days a week, for 31.85 minutes, traveling an average distance of 5.35 miles. However, the mode may give a better illustration showing that most frequently, bicycle commuters bike 5 days a week, for 20 minutes, going 2 miles. Charts 1 and 2 and Table 3 illustrate frequency regarding bicycle commuting per week, time spent on the bicycle per day, and distance commuted per day.

Chart 1. Number of Times Bicycle Commute Per Week

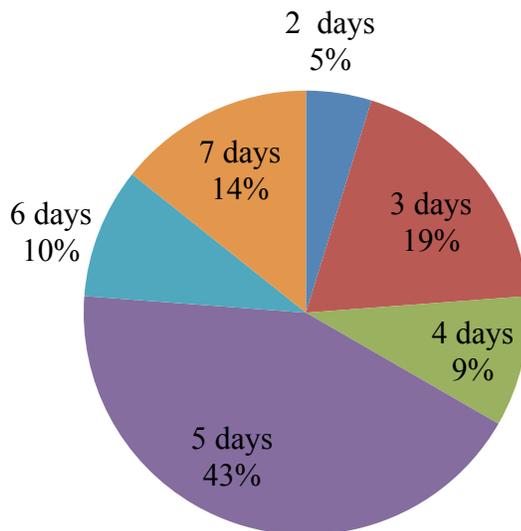


Chart 2. Time Spent on the Bicycle Per Day

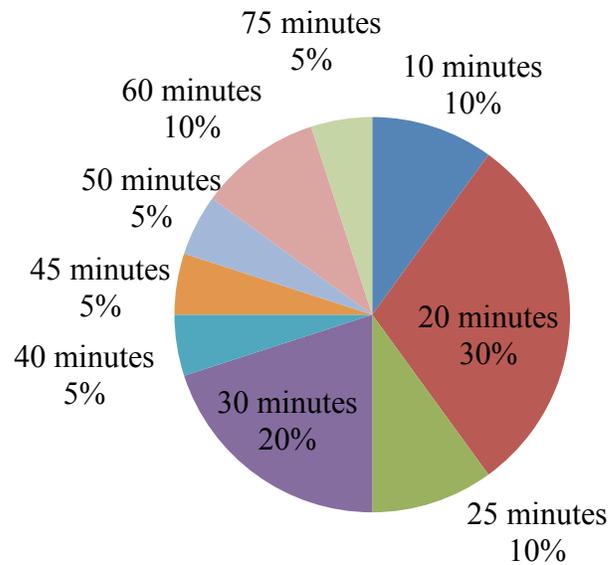


Table 3.

Distance Commuted Per Day

Distance	Frequency	Percent
1-3 miles	9	42.86%
3.1-5 miles	4	19.05%
5.1-9 miles	5	23.81%
9.1+ miles	3	14.29%
Total	21	100.00%

The final question regarding the habits of bicycle commuters asked how long the individual had been commuting using a bicycle. This category had the broadest range

with answers varying from 1 year to 42 years. Most frequent answers were 2 years and 20 years each representing 9.52% (N=2). In order to give a better understanding, Table 4 gives the information in ranges.

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Table 4.

Years as a Bicycle Commuter

Years	Frequency	Percent
1-5 years	8	38.10%
6-15 years	7	33.33%
16-30 years	4	19.05%
31+ years	2	9.52%
Total	21	100.00%

---

#### Findings Regarding Motives and Benefits

Throughout this presentation of findings, quotes from interviewees are cited using a pseudonym. Each pseudonym contains the combination of a number and a letter and assigned to each interviewee, e.g. Subject 5e. When interviewed, bicycle commuters were eager to discuss why they chose to bicycle commute and the benefits to their decision. Overall, six separate themes emerged from the interviews conducted by the primary investigator. Similar to the literature review results, physical health and environmental concern were most frequently mentioned. Table 5 indicates the six themes.

Table 5.

## Frequency of Motives/Benefits Mentioned During Discussion

Theme	Frequency
Physical Fitness/Health	45
Environmental Concern & Saving Gas	41
Recreation/Fun/Enjoy	33
Money Saved	32
Convenience – Parking, Time Saved, Faster	31
Cultural/Social – Setting an Example	18

*Physical Fitness and Health*

Like the review of literature found, among the discussion with bicycle commuters during interviews, fitness and health were found as the most frequently occurring benefit and motive mentioned (Dolesh, 2008; “Grapevine,” 2008). Specifically, interviewees explained the choice to bicycle commute was the result of an effort to include more physical activity into daily life similar to both Brown (2007) and Sallis and Linton (2005). Many bicycle commuters noted the reason for beginning to bicycle commute was the result of a decision to lose weight, become more physically fit, and live a healthier lifestyle.

I had gained a lot of weight after having kids and I was at Marsh one day. I saw a person biking with her kids and all her groceries, and she looked so fit and happy...I wanted to be like her. I started out slow but pretty soon I was losing weight and feeling great (Subject 21v).

Many participants expressed the same idea that they were motivated to bicycle commute in order to contribute to personal health. Other participants were recreational cyclists who needed a way to keep up their level of fitness during the week. At least three interviewees were competitive cycling athletes who used the daily cycling to boost their miles and natural physical fitness higher.

I like to bike daily, whether it's just to class or to work, because it keeps up my level of fitness and the strength in my legs so as to keep a higher regular fitness level. So then when I'm training for a race or a triathlon or even just a running race, I can start training from that level and not start again from the bottom. The short rides are almost a part of my training because I can do some sprints up the hills, and then I can see the results when I go out for my long weekend recreational rides (Subject 1b).

Physical fitness and an improvement in overall health were also referred to as benefits. "My weight has gone down, my cholesterol has gone down, and my blood pressure has all gone down a lot. Never had a lot of problems anyway, but it's nice to have a check-up and hear positive things like that" (Subject 7g). Physical fitness and activity before and after work gave commuters good feelings about personal health and fitness goals. "It's a physical thing, I feel better when I bike to work in the morning, and I feel fit" (Subject 15p). A secondary health benefit was the mental stimulation bicycle commuting provided, especially on a morning commute. Mental stimulation was mentioned nine times throughout the interviews.

In the morning, I can use the time for personal reflection and it's mentally stimulating. I feel like with all the other things going on around me and in my

life, it's kind of like meditation, and I feel refreshed after my morning bike ride, like I'm ready for the day. Especially if I get up in the morning, and read my emails, I use the time on the bike to think about more complicated issues and then I can go in and sit down and do what I need to do (Subject 8h).

Another commuter mentioned, "It's like my morning coffee, only healthier! I can just bike and it wakes me up and I'm in a pretty good mood so that helps, instead of a cup of coffee" (Subject 11k).

Because of busy schedules and long work hours, many people fail to schedule routine time for exercise into their day. As bicycle commuters, however, individuals are able to accomplish the functional aspect of going to and from work while getting the exercise they needed for the day (Active Living Research, 2006; Gobster, 2005; Godbey, 2003). "I'm going to work and I incorporate exercise while doing it, it doesn't get much easier than that" (Subject 2b).

I live almost five miles from work. I work from 8:00 am until 5:00 pm. If I ride twice a day, that's about forty to fifty minutes of solid exercise. And it's practical. If I drive it actually takes even longer, almost thirty minutes each way. So then I get no exercise and waste time (Subject 5e).

Previous research suggests that creating a community of bicycle commuters and promoting it more could also lead to better health of the entire community and impact all people (Brown, 2007; deJong, 2009; Killingsworth & Schmid, 2001).

The benefits of bicycle commuting are endless. Cardiovascularly, I feel great on my bike. If the city can do more to create an even more bicycle friendly town, we would have even more recreational cyclists who would do it, and enjoy it. Then

those recreational cyclists would start commuting. The overall fitness of the community would increase, and overall health costs would decrease. When you think about the overall impact, there is tremendous impact (Subject 18s).

The study participants seemed to agree with Brown (2007) and deJong (2009), and felt that their efforts in bicycle commuting are not only improving their own health but also have the potential to improve the local community's health.

#### *Environmental Concern and Saving Gas*

As was expected from the literature review, concern for the environment was among the top motives and benefits for bicycle commuters (Dolesh, 2008). Of the 21 interviewees, 17 mentioned environmental concern at least once as a motive or benefit. For some commuters, it was recognition that fossil fuels could be a major contributor to global warming and therefore, were motivated to begin bicycle commuting. "I began to think that maybe, although I'm only one person, perhaps if I cut down my usage of my car and began bicycle commuting, then perhaps I could help the environment, even if only just a little" (Subject 10j). Other interviewees expressed their decision to bicycle commute was based on reducing pollution and, in turn, reducing their carbon footprint as Maia (2007) suggested.

Many commuters acknowledged their actual motivation and decision to bicycle commute was largely based on more selfish reasons like personal health or recreation, however, the majority explained that they felt their decision positively affected the greater good by using a sustainable form of transportation. "I feel these happy, gooey feelings that, you know, I feel like I'm doing my part to help the environment and promote sustainability" (Subject 5e).

Related to environmental concern, saving gas was also a motive and/or benefit mentioned regularly. For some, saving gas was important because it was an expense that could be saved each month. However, many explained their concern for the overuse of a nonrenewable fossil fuel. “I knew that we were going to run out of oil, even in 1967, I knew we were going to run out of oil, so [choosing to commute] was a matter of energy and resource conservation and environmental conditions” (Subject 6f). At least two other interviewees explained that the carbon footprint idea is often a political topic that can be biased and may not present an accurate picture of the effects of carbon exhaust, yet, it is certain that oil and other fossil fuels are not able to be reproduced and will one day be exhausted. “Well I’m not a fan of the carbon debate, but I think the fossil fuel debate is legitimate, I’m going to use a renewable resource instead of a nonrenewable resource such as oil or gasoline” (Subject 5e).

The CFLRI Research Report (2003) and Sorensen (n.d.) explained that bicycles are a sustainable form of transportation, using an individual’s energy for fuel instead of fossil fuels and have little affect on global climate. Whether by precise motive or an indirect benefit, bicycle commuters generally agreed their decision to bicycle commute positively affected the surrounding environment.

### *Recreation and Enjoyment*

Eighteen of the 21 interviewees mentioned the words recreation, fun, and/or enjoyment throughout the interviews. Recreation is a form of leisure in which activity is performed in opposition to work that refreshes and restores the individual (Godbey, 2003). Bicycle commuters felt that since they were working during the day, the morning and evening commute gave them the opportunity to enjoy an activity. “You know it’s

really just my daily dose of recreation and fun for the day, I belong to a racing team and ride with other friends, and I can still do that during the week by bicycle commuting” (Subject 4d). Several interviewees mentioned that during recreation, they like to be outside, and bicycle commuting gives them the opportunity to do that.

The benefit is really just a chance to be outside. In a job like this when I’m inside I miss being outside so it’s nice to have 15 minutes outside. I need that free time to spend on a bike and not in a car so that I feel better about my day. When I retire, I’ll miss commuting (Subject 14o).

“Plus it’s fun and I just like riding my bike, it’s not like it’s work” (Subject 19t). Many commuters expressed how much fun they had by being on their bike at least once a day and that cycling is an activity they enjoy. “Sure, I’m fit and healthier, and maybe helping the planet, but in most ways, it’s selfish, if I didn’t enjoy it, then I wouldn’t do it, but it’s really quite enjoyable” (Subject 20u).

#### *Money Saved*

After environmental concern and health benefits, saving money emerged as one of the most frequently mentioned themes. Seven of the interviewees either currently did not own a car or did own a car presently, but had become bicycle commuters because they were not car owners in the past. Those who currently did not own a car were motivated to bicycle commute because they could travel faster than by bus or walking. Rising cost of gas and vehicle maintenance were cited as motives to start riding the bicycle to work as well.

Many commuters did not realize the benefit of saving money until after they began bicycle commuting and realized its impact on their budget.

...The first real benefit I noticed was the amount of money I saved by not having a second car for my family...While I was in graduate school, we owned two cars and it wasn't until I had to sell my car to pay for school, and then I realized we had more money left at the end of the month and we had spent a lot of money maintaining two vehicles. With the bike, it's not so much of a struggle to get by each month (Subject 13n).

Research advocated that bicycle commuting is economically beneficial for individuals and families because automobiles are generally more costly to drive due to initial purchase, maintenance, and rising gas prices ("Grapevine," 2008, Silver, 2008; Williams, 2002).

### *Convenience*

Convenience was cited several times and was understood to be the ease with which bicycle commuters could transport from place to place, including bike parking as opposed to car parking, the time saved, and the distance traveled. "It's fast and I can get anywhere on campus to classroom I'm teaching in, or a meeting on the other side, and I can get home and to my daughters' schools in no time at all" (Subject 4d). Commuters mentioned several times over that once they had found a route, they had an easier time getting to work by being able to move much more quickly on lesser used streets. Several commuters specifically mentioned the convenience of bike parking. Although racks are sometimes full or hard to find, usually, the bike could be parked in close location and accessed quickly if needed. "The real benefit is convenience, it would be difficult to

drive across campus and go to meetings like I do, if I had to drive and find parking, especially on this campus (Subject 14o).

I work at the Wells library on campus and parking is so precious there. So it's also that I am too lazy so I like to bike and park my bike at the front door rather than walking ALL the way from the parking lot...(Subject 21v).

Many Indiana University employees noted that parking was another way to save money by not purchasing a parking permit. "In 20 years of teaching here, I've never bought a permit" (Subject 4d). "You don't have to worry about parking, I gave up my parking sticker, especially for summertime, that's another economic benefit you don't even think of" (Subject 20u).

Being able to save time and covering distance faster was important to bicycle commuters. "I get where I need to go, when I need to go. Plus I enjoy it, and when I'm at work and need to run here or home or wherever, it takes 10 minutes and that's all I need" (Subject 18s).

### *Cultural and Social Benefits*

A broad range of responses were discussed relating the different social and cultural benefits of bicycle commuting. Bicycle commuters felt that their efforts in bicycle commuting were personally rewarding for themselves. Feeling good about self-sufficiency was mentioned at least twice, and bicycle commuters were proud they could provide their own means of transportation. Similarly, bicycle commuters felt a social stigma when telling non-bicycle commuters about their habits.

Non-bicycle commuters were impressed and perceived bicycle commuters to have a high level of fitness and autonomy.

Some people want to offer you a ride home but why, when I can do it myself.

You have sort of a moral superiority. Like when you tell people you do it, there's this social stigma that people automatically think I'm hardcore and really in shape. You have a good feeling about self-sufficiency (Subject 11k).

Four bicycle commuters who were also parents, and one other who worked with high school-aged children, specifically mentioned the benefit of setting an example to their own children, families, children at school, and fellow coworkers. These individuals explained that being a bicycle commuter is a good opportunity to show others that they are choosing to live their lives differently.

My wife and I wanted to expose our children to a different way of doing things sometimes. So we bicycle commuted, and we took some memorable family vacations with all camping gear on bikes and had a lot of fun. Now my daughter and her husband and her family are all avid bikers and don't have a car at all.

They do all grocery shopping and everything by bike (Subject 6f).

Although some bicycle commuters did not specifically mention setting an example they did mention the benefit of subscribing to an alternative lifestyle. Cars were perceived to be a symbol of the consumptive culture of the United States, and by not participating in this trend, bicycle commuters felt they were exposing others to a different ideology. "I'm just sick of how the city and our society revolves around cars. Everything could be totally different if we were willing" (Subject 2b).

Still, other commuters felt the benefit of being a part of a social community as well as benefiting the local economy.

It's supporting a local economy of local bikeshops... You begin to identify with it and associate yourself with it, with this whole community of bicycle commuters.

People you pass on a rainy day and give a knowing glance to. It makes you who are (Subject 10j).

Research does not currently exist on this idea of social community aspects regarding bicycle commuters, and this is an area which a more in-depth study should examine.

Overall, bicycle commuters noted a broad range of motives and benefits in choosing to bicycle commute. Some of these motives and benefits included convenience, saving money, saving gas, and recreation and enjoyment of bicycle commuting. The physical fitness and health benefits as well as environmental concern were the most oft-cited motive and benefit to bicycle commuting. Bicycle commuters thought their decision may expose and positively influence family and peers to also choose bicycle commuting. These social and cultural benefits as well as those involving economic and recreational benefits should be explored further in a more in-depth study.

#### Findings Regarding Constraints and Needs

During the interviews, there were more keywords associated with needs mentioned than any other topic of motives, benefits, constraints, and needs. Bicycle commuters expressed new ideas and facilities that would be helpful for them as commuters and that may even encourage others to bicycle commute. The discussion revealed seven emergent themes with four referred to as constraints, one referred to as a need, and two referred to as both constraints and needs. As previous research suggested, traffic and

weather as well as lack of facilities are major constraints for bicycle commuters (“CFLRI Research Report,” 2003; Dill & Voros, 2007; Nankervis, 1999). Table 6 shows all seven constraints and needs and the frequency of which they were mentioned during discussion.

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Table 6.

Frequency of Constraints/Needs Mentioned During Discussion

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Theme	Frequency
Facilities (or lackof)	64
Weather, Clothing, and Gear	61
Street – Specific and Road Conditions	58
Traffic and Fear of Drivers	52
Need for City Action	32
Time and Distance	17
Mental/Cultural/Social	13

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#### *Traffic and Fear of Drivers*

Bicycle commuters generally did not feel that many constraints existed when it came to their daily commute. Interviewees enjoyed bicycle commuting so much that it was challenging for them to find things that were difficult about it. During the interview, they were asked to think back to their first few months in becoming a bicycle commuter and about friends and family and what their perceived constraints may have been. As expected, traffic was the number one most mentioned constraint. “It’s true that I feel very small and very vulnerable in traffic and I am very aware” (Subject 7g). Bicycle commuters often described similar feelings to those above. Traffic was described as

“intimidating” (Subject 17r), and that it was really their only “safety concern” (Subject 16q).

A related constraint, fear of drivers, was another frequently mentioned topic. Similar to the CFLRI Research Report (2003), bicycle commuters described they felt a lack of respect from car drivers. “I think that the barriers can be the miscommunication between drivers and cyclists, me being afraid of cars at the same time” (Subject 12m). When talking about this issue, bicycle commuters revealed that while they had a fear of drivers and worried about getting hit by a car, only two interviewees actually stated that they had in fact been hit by a car. This fact reveals that traffic may only be a perceived constraint rather than an actual constraint. Bicycle commuters felt that although they were small in comparison to the other street users, they also felt more aware, could see the patterns of traffic moving around them, and therefore, could anticipate drivers and traffic.

#### *Weather, Clothing, and Gear*

Comparable to cyclists surveyed by Nankervis (1999), bicycle commuters found weather conditions like rain and temperature to be difficult situations to navigate and often prevented them from cycling on these days. Most bicycle commuters did not mind being wet during rain as long as conditions were still safe. Determining one’s safety during the weather conditions was usually the deciding factor for bicycle commuters; if safety could be compromised, bicycle commuters chose another method of transportation for the day, most frequently this was walking. Other commuters found that extreme hot or cold temperatures made bicycle commuting difficult. This varied depending upon the preference of the individual. Some bicycle commuters had a high heat tolerance and

could cycle on extremely hot days during summer without coming into work covered in perspiration. Others were more tolerant to cold weather and were more prone to bicycle during snow, ice, and cold temperatures. Many commuters had a limit that below 15 degrees Fahrenheit, they would not cycle, although one commuter did not commute below 40 degrees Fahrenheit.

For me, rain is a big issue to get over. I need to get a fender, usually I can just wear a good rain jacket and ride anyway and I can ride in cold weather, but I don't like to ride my bike under about 15 degrees. It's warmer to just walk (Subject 1b).

An issue related to weather involves barriers of proper clothing and gear to which the cyclist above alluded. Most bicycle commuters held jobs where dress codes were not especially formal or strict. This made it easier for the commuters to bike in their work clothes. However, there were a small percentage of bicycle commuters who did need to wear more formal clothes for work which prevented them from bicycling when weather was particularly wet. Bicycle commuters were asked if they had family, friends, or coworkers who did not bicycle commute and why. Many commuters explained that a formal clothing dress code is often a reason for not bicycle commuting. Proper gear was also a barrier for commuters. Bicycle commuters discussed that in order to be most comfortable for their commute, they felt they needed to invest in specialized equipment for the activity. The main barrier in acquiring this equipment is the expense of such gear. Bicycle commuters discussed the costliness of expenses like a comfortable bicycle for daily riding, panniers for carrying bulky items, and special gear for winter or rainy

weather like snow bicycle tires or fenders to reduce splattering from wet roads. They suspected these may be barriers to non-bicycle commuters.

### *Time and Distance*

While many of the bicycle commuters mentioned how much quicker and convenient it was for them to bicycle to work than drive, it was mentioned that time and distance can be a constraint for utilitarian trips outside commuting like going to dinner or shopping. Bicycle commuters also discussed that their families, friends, and coworkers may also face a barrier in choosing to bicycle commute because of the distance they live from work or the time constraints they may be under due to strict departure and arrival times to and from work. This is the same as the cyclists Nankervis (1999) surveyed who felt it was hard to abide by firm arrival and departure times for work. The cyclists from this study noted that this barrier was also due to secondary barriers like the amount of daylight, especially during winter months, as well as busier traffic times.

“It’s not the time it takes to commute particularly, as much as it is the amount of time to figure out your route and prepare for your day” (Subject 2b). Bicycle commuters generally agreed they spent more time than car drivers in preparing for their workday because weather could impact what clothing or gear would be necessary. Planning efficient routes is also time-consuming because most bicycle commuters preferred to take more in-direct routes where there was less vehicle traffic as well as less pedestrian traffic. “Sometimes it’s the oblivious pedestrians with their iPods than cars that are more dangerous and you have to watch out for” (Subject 5e). This reiterates again that distance was a constraint for some bicycle commuters because prioritizing safety by taking less-heavily used streets often created a longer, less direct, and more time-consuming route.

*Mental Constraints and Cultural/Social Constraints*

Frequently, bicycle commuters would refer to constraints as a mental block. Usually these were also related to the aforementioned constraints like weather, gear, or distance. “There’s a mental barrier. I can talk myself out of anything. It’s raining and I’ve ridden a million times in the rain, but it’s hard to get on the bike some days” (Subject 7g). Similar statements revealed that weather was a mental barrier when there was a consistent weather pattern for a longer period of time like several hours or days of rain. Similar statements revealed bicycle commuters felt constraints in “not having the right gear or I could have a better bike” (Subject 10j), yet when they really thought about the question during the interview, they felt that these were not actual constraints but perceived constraints. Still, other bicycle commuters felt distance or topography was a mental constraint where in one instance, they might have bicycled all day for utilitarian purposes totaling ten miles, but the next day, felt a destination only two miles was too far or that the terrain was difficult. Again, when sincerely thinking about the question during the interview, they explained that it was not the actual distance, but more so the perception of distance.

Bicycle commuters also explained that fellow family or friends who did not bicycle commute had a mental misconception of what bicycle commuting is like. “People don’t realize it’s a fairly easy threshold to get over” (Subject 20u), and “mentally, it’s intimidating and they aren’t confident that they can physically do it” (Subject 13n). Self-esteem and self-autonomy could be barriers to non-bicycle commuters.

Cultural or social constraints were also discussed as a barrier of non-cycle commuters to becoming bicycle commuters. “I know they rely on a car because that’s what they’ve always done, this is America” (Subject 2b), and “it’s convenient to have cars” (Subject 20u). “I think people just don’t think about it. They are so used to driving places, but I think they just don’t realize the benefits of it” (Subject 17r). As Dittmar (2002) explained, there were 297,048,193 licensed motor vehicles in the United States in 1998, a number that has probably increased exponentially since. With so many cars and car driving being the norm in transportation, a number of subjects suggested that many citizens have not stopped to ask themselves why not try something different.

#### *Facilities for Bicycle Commuters*

Of total motives, benefits, constraints, and needs discussed, facilities were the number one most mentioned topic with 64 instances. Study participants mentioned needs that could be met by the city and the Indiana University campus involving facilities, road conditions, and specific problem streets and intersections. Bicycle commuters were able to come up with dozens of ideas for facilities in order to make bicycle commuting more convenient for those already commuting, and that would, perhaps, encourage non-bicycle commuters to start commuting. Most frequently mentioned for facilities was more bike parking, perhaps covered parking, and more bike lanes. Regarding the City of Bloomington, bicycle commuters would like to see more bike routes in the downtown areas and popular businesses.

Most places in the downtown area have bike racks referred to as staples, where a single 3-inch wide strip of metal is bent in a “U” shape. Bicycle commuters felt that while these racks are easy to maintain, they only hold one bicycle, perhaps two. While

there are several, bicycle commuters did not feel there was adequate supply. Appendix H contains a bicycle map depicting bicycle rack locations. Students, faculty, and staff at Indiana University requested more bike racks for the school's campus. Several times it was suggested that bicycle lockers could be provided on the campus for faculty to rent in place of a parking permit reserving a car parking space.

Bike lanes were also a frequently mentioned need of bicycle commuters. Some commuters mentioned the existing bike lanes on streets in Bloomington many times seemed like a token gesture for bicycle commuters.

To be honest, the bike lanes are kind of useless, they do a good job of at least providing a visual symbol to motorists that say 'Hey, bikers might be on this road,' but otherwise, they don't seem to do much else. They stop and start in random places and you might be on one that just ends and then you're caught where you don't want to be (Subject 14o).

The above statement reveals how many commuters felt about bike lanes. Regardless, more commuters preferred on-street facilities to multi-use trails similar to the cyclists surveyed by Nankervis (1999). While the Bloomington bicycle commuters liked the comfort of multi-use trails, often these trails become crowded with pedestrian traffic and almost seem more unsafe than the street. Also, commuters preferred on-street bike lanes because they are traveling to a specific location on a particular street. Many subjects commented that off-street trails are not as convenient as bicycling on the street.

With that, bicycle commuters felt that most of their needs were met with routes going north and south primarily using Washington and Lincoln streets, however, no bicycle commuters felt that lanes were adequate moving east and west. Likewise,

commuters felt there was inadequate connectivity to new subdivisions, making it difficult to bicycle commute from newer developments. “My impression of Bloomington is that new development of houses is taking place further from work places so the sprawl doesn’t allow for easy bicycle commuting” (Subject 15p). Dill and Voros (2007) reported the same findings where street connectivity was valuable and necessary to bicycle commuters. In addition, bicycle commuters wanted to feel more protected in the bike lanes by adding a buffer like a curb between the bike lane and car lane.

Wider shoulders were another feature for streets that bicycle commuters would like to see added. In instances where a bike lane may not be possible, wider shoulders would be helpful in giving cyclists a safer place to ride. Some bicycle commuters revealed that they had read or heard about facilities involving car-restricted streets in some cities. Although “radical,” (Subject 2b) many bicycle commuters thought this to be a good idea for two reasons. First, it would provide a symbol to citizens that bicycle commuting is a priority in Bloomington, and second, it would allow bicycle commuters to ride conveniently and safely in the city.

Although off-street trails were not particularly favorable to bicycle commuters because of their lack of convenience, these facilities were likeable for the safety they offered from car traffic. One bicycle commuter mentioned how increased miles of off-street trails may encourage non-bicycle commuters to start commuting and then, as they gain confidence, they may start commuting more on streets (Subject 18s). Many commuters were excited about the new B-Line Rails-to-Trails project that is creating a new off-street trail near downtown Bloomington. Bicycle commuters were glad to see money being appropriated for such a project, however, many did not feel it was going to

be used frequently for bicycle commuting, rather, more people would use it for recreational cycling.

Bike route signs were discussed by bicycle commuters as a need for the City of Bloomington. Many bicycle commuters noted that the bike route signs are some of the most helpful in finding convenient, low-traffic streets. Bicycle commuters would like to see more signs placed around the city. Commuters on the Indiana University campus would also like to see bike route signs placed on campus so as to be able to avoid a sidewalk that may contain stairs as well as direct both bicycles and pedestrians toward safe routes.

Additionally, a very frequently mentioned need was shower facilities for bicycle commuters.

I think at IU, I have talked to my colleagues at work and I can quickly identify a handful of people who would use a locker room or shower facilities, at least one on the south side of campus. Some are bicycle commuters, some would be if there was a place to shower (Subject 18s).

While many of the interviewees did not have a problem regarding appearance and clothing, most felt that shower and locker room facilities could benefit those who did, in fact, have a stricter dress codes. This would be another convenient feature that may encourage non-cycle commuters to begin bicycling to work. Another important facility bicycle commuters found as a need was the availability of free air for bicycle tires in various places in the City of Bloomington. Interviewees felt that this amenity could be simply implemented and inexpensive.

### *Street-specific Needs*

Like many of the facilities needed and suggested by bicycle commuters, frequently mentioned were specific problem streets and intersections that need attention. Appendix I contains a city map highlighting the following discussed areas. Of 21 interviews, 17 mentioned West Second, West Third, and East Third/Atwater as the most problematic areas in Bloomington. “Riding on East Third Street or Atwater, the other direction, I don’t do it. That can be a little nasty. So narrow and with the curbs, you get boxed in” (Subject 4d). “West Second and Third are terrible. You have to be tough and experienced. I’m experienced and I just borrow a car to get to the shopping centers there” (Subject 11k). While some commuters mentioned they would bike to the west side of the city, most bicycle commuters did not feel that they had any access to that area. Along with the lack of access to the west, bicycle commuters explained that East Third street was difficult to navigate along with College Mall street, making shopping centers to the east also difficult to reach.

A frequently mentioned intersection with many problems was East Tenth Street’s intersection with the bypass, State Highway 45/46. Just south of East Tenth Street is a bicycle route and path connecting the two sides of the highway. However, there is no crosswalk or system put in place for bicycle commuters or pedestrians to cross safely, but instead, “you kind of have to just dart out and weave your way through” (Subject 13n). Bicycle commuters need to have a safe way to cross this busy street.

South Walnut was the last street frequently mentioned by bicycle commuters. Bicycle lanes exist going north on College Avenue and south on North and South Walnut where it is one-way traffic. However, once the streets merge and shift to two-way traffic,

the bicycle lane ends and this creates a hazard for bicycle commuters. Bicycle commuters mentioned other streets but none were frequent enough to present accurate results. More in-depth research could be undertaken by the city to learn areas with a high saturation of need from a wider sample of commuters.

#### *Need for Action*

Apart from facilities and specific problem-causing streets, bicycle commuters expressed the needs that could be met by the City of Bloomington municipal government. Almost all of the bicycle commuters discussed road conditions. First, many commuters felt that streets could be cleaned more often so that debris potentially causing flat tires would be removed. Many commuters did note Bloomington has relatively clean streets compared to other places they may have lived. However, it was also said that most debris is swept into the bicycle lane or shoulder and commuters are forced to choose whether to ride in the street and risk being hit by a car or riding in the lane and risk a flat tire. Second, commuters faced a problem of trying to avoid potholes. Bicycle commuters felt that the city could do more to make sure street surfaces were smooth and clean.

Bicycle commuters would also like to see a reassessment of the current bicycle lanes in the city. As aforementioned, bicycle commuters felt bike lanes were inadequate in providing east and west routes and the routes were also hard to follow or inconsistent. Many interviewees expressed a need for a reanalysis of the city in order to have bike lanes on effective streets where there is low-traffic, but high street connectivity and access to high demand locations. Many bicycle commuters also discussed how their first few months of bicycle commuting were more difficult because they did not have access to or realize bicycle route maps were available. Most now have bicycle maps in

possession, however, they would like to see maps more widely advertised and distributed. This may be another method of encouraging non-cycle commuters to start bicycle commuting.

Other features bicycle commuters need from the City of Bloomington include lower speed limits and driver/cyclist education. Many bicycle commuters felt that current speed limits create a fast-paced environment. If speed limits were lowered to twenty-five miles per hour and well enforced, bicycle commuters believed they would feel safer on the streets and traffic would not feel so intimidating. Bicycle commuters also felt a lack of cycling education exists in Bloomington. Several interviewees even noted that fellow bicycle commuters do not always follow the rules of the road and many driving laws are unclear as to how they apply to cyclists. Participants also mentioned the feeling that many motorists believe bicycles should be ridden on sidewalks or other areas off the street. Education for bicyclists as well as drivers could take place during the drivers' education course required for all licensed drivers. Bicycle commuters also suggested that perhaps the City in combination with the Bloomington Bicycle Project could provide free workshops for bicycle commuters to learn the rules of the road and how and where to bike safely in Bloomington.

A much-requested need for both the City of Bloomington and Indiana University to meet was the implementation of the Bicycle Commuter Act. As previously mentioned in the review of literature, the Bicycle Commuter Act, House Resolution 1424, has written into law the provision of non-taxable fringe benefits of up to \$20.00 per month for bicycle commuters. Several interviewees were aware of this legislative action by the federal government, but had yet to see the act come to fruition. Employees of Indiana

University felt that the university should initiate this action so that other employers would follow. Bicycle commuters also felt that the City of Bloomington municipal government should take initiative in this matter and encourage local employers to begin providing these benefits to their bicycle-commuting employees.

Lastly, most bicycle commuters were aware of the existence of the Bicycle and Pedestrian Safety Commission within the City of Bloomington's municipal government. Many commuters, however, felt that this commission may not always receive attention from the City Council members or Mayor's office. "I just wish the Bike and Ped people could have more clout. We're the taxpayers and we want to make sure that commission is listened to by decision-makers" (Subject 6f). Several interviewees expressed that same sentiment and felt they needed the Bicycle and Pedestrian Safety Commission to be more frequently heard.

On the whole, bicycle commuters noted a wide range of constraints and needs in choosing to bicycle commute. Traffic, driver unfriendliness, and weather were included as major themes in the constraints for regular bicycle commuters. Other constraints were clothing, distance, and mental constraints. Bicycle commuters also described needs, largely for facilities like covered parking and an increased number of bike lanes. The commuters felt that the City of Bloomington's provision of driver and cyclist education and resources could be helpful in encouraging non-cycle commuters to begin bicycle commuting. A more in-depth study by the City of Bloomington of specific streets, bike lanes, and road conditions could make bicycle commuting more convenient.

## Summary

The 21 interviews of bicycle commuters conducted by the primary researcher help give a better understanding of bicycle commuting in the City of Bloomington. Overall, commuters were motivated to bicycle because of the added physical health and fitness benefit. They also felt they were contributing to the community by choosing a form of commuting that lessened their impact on the environment. Most commuters chose to commute because of the money saved, the convenience bicycle commuting can offer, and because it is an enjoyable activity. With regard to constraints and needs, commuters felt there was a lack of quality facilities like on-street bike lanes, off-street trails, and bike racks in the City of Bloomington. Bicycle commuters named problem areas like West Second and West Third streets where they felt unsafe due to road conditions. Additionally, commuters felt traffic is not only a constraint for themselves, but a perceived constraint of non-cycle commuters.

These findings illustrate themes with which bicycle commuters identify regarding the several benefits felt from choosing to bicycle commute and help convey a general idea of how bicycle commuting in Bloomington can be made more convenient for current commuters as well as actions that can be taken to encourage non-cycle commuters to begin bicycle commuting. In sum, this study has been valuable in beginning to understand the motives, benefits, constraints and needs of bicycle commuters in the City of Bloomington, Indiana.

## Chapter 5

## SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

**When I see an adult on a bicycle, I do not despair for the future of the human race.**

~H.G. Wells

This qualitative study gathered information regarding the motives, benefits, constraints, and motives of bicycle commuters in the City of Bloomington, Indiana. This final chapter will review what has been learned in this study and be presented through (a) summary, (b) findings, (c) implications of the study, and (d) recommendations for future study.

## Summary

The problem explored in this study was to examine motivations, constraints, needs, and benefits of residents of the City of Bloomington, Indiana, both students and non-students, who choose to commute via bicycle. Two research questions were asked regarding the emerging themes of both motives and benefits as well as constraints and needs. The study took place in the City of Bloomington, Indiana during the months of May and June 2009 through the Department of Recreation, Parks, and Tourism at Indiana University with approval from the Institutional Review Board at Indiana University.

A total of 30 individuals agreed to participate in the study, and 21 interviews were conducted by the primary investigator. The interviews lasted on average 25 minutes and took place at a mutually agreed upon location, most popularly either the interviewee's work office or Soma, a coffee shop located in downtown Bloomington. The interviews were semi-structured and consisted of five broad questions concerning habits, motives,

benefits, constraints, and needs as a bicycle commuter. A copy of the interview script can be found in Appendix G. With the exception of one, all interviews were audio-recorded so that the primary investigator could review the interviews later in order to capture what was not observed through note-taking during the interview. After interviewing, each study participant was mailed a thank-you card.

In order to analyze the qualitative information, a process of transcribing and coding was implemented. Each interview was carefully transcribed and coded when any theme revealed itself. A total of six themes emerged regarding motives and benefits, and coincidentally, a total of seven themes emerged regarding constraints and needs. The primary investigator also analyzed any quantitative data regarding demographics and commuting habits using simple frequency counts.

The data from each interview was analyzed soon after the interview was completed, in most cases 48 hours or less, in order to code the data most accurately. This strategy was recommended by Henderson (1991) and Denzin and Lincoln (2000). The primary investigator kept interviewing until the data became repetitive, or saturated. New themes continuously emerged throughout the first eight interviews. After 17 interviews, the primary investigator realized new themes and different keywords were no longer being mentioned. Four more interviews were conducted to confirm, and after coding and analysis of the final four interviews, the primary investigator concluded saturation had been met, and interviewing could cease (Henderson, 1991).

### Findings

Bicycle commuters were motivated for a variety of reasons, the most frequent being improvement to health and general enjoyment of bicycling. Study participants also

mentioned their motive to commute because of its convenience relating to time saved and accessible parking. Several participants also chose to bicycle commute because they did not own motor vehicles. Many benefits were found such as a personal higher level of physical fitness as well as the benefit to the greater environment. Because vehicle maintenance and fuel can be costly, bicycle commuters enjoyed the benefit of saving money and conserving non-renewable resources. Additionally, bicycle commuters found that they set a positive example for their children, families, friends, and coworkers.

Although bicycle commuters discussed several needs they would like to see met, they were happy with their decision to bicycle commute and felt benefits outweighed constraints and needs. Still, regular commuters felt that weather could be an actual barrier to commuting as well as a mental constraint when weather was more extreme like consistent days of rain or heavy snow, ice, and severely hot or cold temperatures. Bicycle commuters also felt traffic and fear of drivers were major constraints to themselves and the routes they could choose. The study participants mentioned these two issues may also be barriers preventing others from becoming bicycle commuters. Other constraints discussed were distance or the amount of time it might take to travel by bicycle for utilitarian trips. In addition, strict dress codes and departure/arrival times to and from work were barriers to bicycle commuters. Expensive bicycles and accessory gear also can be constraints to bicycle commuters.

Bicycle commuters in Bloomington expressed several needs such as more and/or covered bike parking on the Indiana University campus and other locations throughout the city. Almost all bicycle commuters would like to see more bike lanes and bike route signs. The commuters felt adequate routes traveling east and west were necessary. More

specifically, bicycle commuters need safer alternatives to East Third and Atwater streets along with West Second and West Third streets. Although not as frequently requested, commuters would like to see more convenient off-street facilities. Driver and cyclist education is an idea that would be effective in helping both motorists and bicyclists feel safer on the road. The information revealed in these findings was heavily saturated and usually mentioned by at least half of bicycle commuters interviewed.

The information gathered from the quantitative data regarding demographics and habits shows the longevity of bicycle commuters. Once begun, most commuters seemed to have stayed a bicycle commuter until circumstances or perhaps physical ability changed. Most bicycle commuters found it was also easy to bike for all of their trips including shopping and running errands. The bicycle commuters were usually young to middle-aged professionals biking about 20 minutes per day, five days per week. Significantly more males were bicycle commuters than females. This may be related to the female role in the nuclear family of taking children to school and other activities.

### Implications

The goal of this exploratory study was to investigate a sample of bicycle commuters and give insight to this population through their motives, benefits, constraints and needs. The study participants were all very excited and willing to take part in this study because of their vested interest in the bicycle commuting community of Bloomington. Several participants specifically mentioned their gratitude to the primary investigator for listening to bicycle commuters, evaluating their benefits and needs, and contributing the information to the City of Bloomington, making the participants feel like their requests as citizens were being heard.

Because of the shortage of research existing on bicycling and bicycle commuting, this study contributes directly to the body of knowledge, providing perspectives of the bicycle commuter in order to further bicycling research and advocacy. The information researched should be taken seriously because as Brown (2007) also found, the benefits to creating communities allowing for more physical activity and active living like walking and bicycling can help in preventing child and adult obesity, reduce health costs for the community, and generally help people live healthier, happier lives (deJong, 2009). Communities that provide facilities for active lifestyles, secondarily benefit the environment by conserving energy and reducing pollution (“CFLRI Research Report,” 2003; Maia, 2007).

This study has the potential to actually impact the community life and decision-making of the City of Bloomington. The primary investigator contacted members of the City of Bloomington government, specifically of the Bike and Pedestrian Safety Commission, in order to inform them of the study and incur as to whether they would be interested in reviewing the findings. City of Bloomington decision-makers should use this study to make bicycle commuting in Bloomington more feasible. With regard to the motives and benefits, a marketing campaign could be created to advertise the benefits to bicycle commuting. Many of the bicycle commuters suggested that non-cycle commuters probably do not bicycle commute because they simply have not ever thought about it. If free literature were made available to citizens, perhaps more people would consider choosing bicycling as their method to commute. Less car use and more bicycle use on city streets would help keep streets in better condition for longer periods of time, decreasing a cost to the City.

Along with literature, the City could use this study to create free bicycle riding workshops teaching citizens how to safely share the road with cars, dispel myths about traffic and accidents and clothing and gear, and learn better routes for commuting throughout the city. These workshops would help in teaching consistent rules and regulations to cyclists so that all cyclists are behaving similarly in traffic. Bicycle shops could also be involved and volunteer time to workshops in which they could teach basic maintenance, in turn, giving cyclists more confidence.

Many of the same ideas were repeated enough times by such a large number of participants, therefore the researcher believed these give reason for change within the city. Enough responses were given regarding the dangerous conditions of West Second, West Third, and East Third and Atwater to validate change in these roads, and the city government should seriously evaluate the situation. Enough responses were also given regarding a need for more east and west routes to warrant a reanalysis by the City of all bicycle lanes, on- or off-street facilities.

However, the results of the study may not be extensive enough to necessitate immediate change, but should still call for future change. Using the findings from this study, the City of Bloomington would be able to create a more widespread bicycle commuting survey that could reach a larger sample of the Bloomington population. As the review of literature revealed, the Bloomington City Council has already begun to increase emphasis on bicycle commuting facilities as well as other forms of alternative transportation through their implementation of the Greenways Systems Plan. Interviewing the more regular users of these facilities has given insight as to how well-utilized these features are and as to whether they are valuable and effective in meeting

cyclists needs. The members of the Bike and Pedestrian Safety Commission are now able to use some of the findings from this study to better understand their target market and assess if the Greenways Systems Plan meets the needs of bicycle commuters. The Commission can also learn how to better accommodate current bicycle commuters and study the cyclists' barriers in order to ease constraints and attract more commuters.

Many members of the Commission may already understand bicycle commuters because they are, perhaps, a member of that population, however, this study is useful for non-commuters to better understand bicycle commuters. Therefore, this study can now be used as a resource for other community leaders and decision makers as well as the general public and advocacy organizations like the Community Bike Project.

Additionally, there interest groups within Indiana University who may find this study useful. Because many Bloomington residents are also Indiana University employees, the decision-makers at Indiana University may be able to use this study in order to better meet needs of their employees. The Indiana University Office of Sustainability was contacted and informed that this study had taken place and to inquire as to whether the staff was interested in the results, and in fact, the study has been sent to that office. The Office of Sustainability may be able to use this study as justification to make direct changes on campus. Like the City of Bloomington, perhaps literature could be created advertising the convenience of bicycle commuting to work as this was one of the most oft-cited reasons for commuters choosing to bicycle. The Indiana University employees interviewed were enthusiastic to discuss how much easier it was to bike than find parking, the money they saved in parking permits, and the quickness at which they could travel around campus for meetings or classes. Literature could also contain the

bicycle rack locations throughout campus so that it is easier for both employees and students to park bikes. Speed limits for vehicle traffic could be better regulated to make sure safety is a priority for not only cyclists, but also pedestrians. In addition, bicycle routes could be created throughout campus in order to increase safety for both cyclists and pedestrians.

In some areas, this study may not present enough evidence to warrant immediate change, and in these cases, the study could be used as the basis of a simple survey used for a larger selection of employees. Many interviewees mentioned the idea of a choice between purchasing a parking permit for the year or a bicycle locker. Participants would also like to see Indiana University introduce the employee benefits put in place by the Bicycle Commuter Act, House Resolution 1424. The university could also offer other programs for bicycle commuters where students and employees might be able win free cycling gear or maintenance from local bicycle shops. On the whole, both Indiana University and the City of Bloomington can implement numerous changes and new programs throughout the city and campus in order to create an even more cycle-friendly city.

Other researchers outside the City of Bloomington could also use this study as a model for bicycle commuting research taking place in their own community. Although limited by results only being inferred for the City of Bloomington, Indiana, this study has begun to fill a gap in research by specifically seeking the motivations of those who choose to bicycle commute, the benefits they reap and their constraints and needs. Moreover, this study serves as a precursor to further research that can take place.

### Recommendations for Future Study

Like many research studies, some methods used were later found to be not as effective as anticipated and could be changed to enhance the success of a future study. These recommendations concern the data collection process and analysis.

First, with regard to data collection it was unnecessary to first email the club contact members for each organization and request club rosters. The Bloomington Bicycle Club was concerned for privacy of its members and would not release the names of club members and contact information to the primary investigator, therefore, a mass email was sent to all members requesting their participation. Because club members had such a vested interest in bicycle commuting in Bloomington, they were more than willing to participate regardless of whether the initial email was personal. Communication with study participants was generally uncomplicated and effective and interviews were easily scheduled. There was never a real need for reminder emails to be sent. Additionally, several bicycle commuters did take advantage of the flyers offered at local shops and took initiative to contact the primary investigator and schedule an interview.

The method of sampling chosen was most effective for this particular study. Because the population of bicycle commuters is relatively small and difficult to access, using nonprobability sampling was the best method. However, random sampling is the most used probability sampling, and according to Henderson and Biachelski (1995), is superior to nonprobability sampling. Had random sampling been used in this study, a more accurate representation of the population may have been selected as using volunteers for this study may have produced biased results. Initially, the researcher proposed a different process for selecting participants. The process included using a bike

tag, similar to the used flyers in Appendix E, and bike tags would be placed on a random selection of bicycles parked at bike racks through the Indiana University campus and City of Bloomington. This idea was not used because of the offense that could be taken by cyclists who do not want a bike tag unknowingly attached to their bike. Another idea for further study could include using focus groups to perhaps produce less biased results.

During the interview, a copy of the interview was set in front of the participant to serve as a reminder that the conversation should stay on topic of bicycle commuting. The researcher found it especially helpful to have an electronic copy of the interview template saved for each interviewee so that during interviews she could fill in notes under each question. This helped later when interview recordings were listened to and transcribed for further detail. Because questions were broad in nature, the interview was easy to understand. Nevertheless, the broad questions had some negative impacts as they led to wide-ranging interpretation. Often times the primary investigator had to repeat back to the participant his or her answer in order to make sure the investigator understood its relevancy. The primary investigator tried to be as flexible as possible with interview schedules; however, this often led to interviews being one after the other which in turn, led to long days due to the interviews also needing to be transcribed soon after taking place.

The primary investigator sent each interviewee a thank-you card in the form of a postcard. This was not only efficient because of the lower cost of postcards, but each postcard was printed using an electronic template saving the researcher time as well. The thank-you cards may not have been necessary since the interviews provided a setting where the interviewee could be thanked personally and gratitude could be verbally

expressed. However, it was important to the researcher that study participants know the degree to which they were appreciated.

The last recommendation involves the timing of the study. Originally, the study had been planned for late winter or early spring. Although time constraints did have some negative effects, the overall response rate may have increased during May and June because more bicycle commuters were riding regularly again after taking a break from the cold weather months. Overall, the study was implemented smoothly due to the recommendations the primary investigator received from other qualitative researchers.

This study has a role serving as a precursor to future study in this area of research. New computer software programs for qualitative research allow for more exact coding and transcribing, and could be used for the same audio-recordings and notes collected during this study (Holliday, 2007). The computer software may see new or different themes emerge with regard to the motives, benefits, constraints, and needs.

Additionally, more- in-depth studies could include a study using a control group of commuters using motor vehicles compared to a group of bicycle commuters to evaluate the quantitative differences in health benefits or expenses or carbon emissions and fossil fuel use. As noted in the findings, no research currently exists on the social community regarding bicycle commuting, and more research could be completed on this topic.

Regarding the constraints to bicycle commuters, this study cannot be exact as to whether many of these constraints discussed are perceived constraints or actual constraints and therefore, further study explore this question. Furthermore, this study only interviewed current bicycle commuters who may not have an accurate point-of-view of the barriers. Therefore, it would be beneficial to interview bicyclists who do not commute since they

have not successfully negotiated their constraints, but yet they enjoy bicycling. This might be the group that most easily can become bicycle commuters. Additionally, it would be useful to interview motorists who do not bicycle in order to determine their constraints and what incentives they might need in order to become bicycle commuters.

Another quantitative study could also gather data regarding specific preferences and needs of bicycle commuters in order to learn what facilities they desire most. Overall, continuing to research bicycle commuting locally as well as globally is contributing to the push toward active, healthier living as well as furthering the sustainability movement necessary for success in the future.

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APPENDIX A  
Club Contact Email

**(Initial email sent to club contact person)**

Bcc: Contact person from each of Bloomington Bicycle Club, Indiana University Cycling Club, and Indiana University Outdoor Adventure Trip Leaders  
Subject: Bicycle Commuting Research  
Study Number: 0903000132

Hello (name of contact person),

I am a graduate student in the Department of Recreation, Parks, and Tourism at Indiana University and completing my Master's degree by conducting a research project on bicycle commuting in the City of Bloomington. Due to your affiliation with (name of organization), I need your help in locating resources for my research.

As a contact person of (name of organization), I am requesting a roster of the members of your club with names, email addresses and/or phone numbers so that I may contact them as potential study participants. Participation in the study consists of a one-on-one interview lasting approximately 30 minutes taking place at a mutually-agreed upon location. The interview will be recorded with permission of the respondent

Participation in the study is completely voluntary. However, by obtaining this information from people who bike commute, I will be able to complete research that will help contribute to discussions centering on alternative transportation, healthy living, and making Bloomington an even more bicycle-friendly city.

If you are willing to help me with my research project, please send me a list of your club members including name, email, and phone number to the following address, 1225 N Fee Lane, C-218, Bloomington, IN 47406, or email address, [eecoe@indiana.edu](mailto:eecoe@indiana.edu).

If you have questions about this study, please contact me by phone at 979-240-8696 or by e-mail at [eecoe@indiana.edu](mailto:eecoe@indiana.edu), or you may contact the Office for the Human Subjects Committee, Indiana University, Carmichael Center L03, 530 E. Kirkwood Avenue, Bloomington, IN 47408, 812/855-3067, [iub\\_hsc@indiana.edu](mailto:iub_hsc@indiana.edu).

I hope you will participate in this study. I genuinely thank you for your assistance.

Sincerely,  
Ellen Coe  
Department of Recreation, Parks, and Tourism Studies  
School of HPER  
Indiana University

APPENDIX B  
Participant Email

**(Email sent to participants, 1<sup>st</sup> attempt)**

To: Bicycle Commuter  
Subject: Bicycle Commuting Research  
Study Number: 0903000132

Hello (name of contact person),

I am a graduate student in the Department of Recreation, Parks, and Tourism at Indiana University and completing my Master's degree by conducting a research project on bicycle commuting in the City of Bloomington. Due to your affiliation with (name of organization), I am inviting you to participate in my research study.

Participation in the study consists of a one-on-one personal interview with me to discuss your motives, benefits, constraints, and needs as a bicycle commuter. The interview would last approximately 30 minutes, and it would take place at either a mutually-agreed upon location, or your own home, according to your level of comfort. The interview would also be recorded with your permission.

Once information has been collected through the interview, any identifying information will not be revealed in the data analysis or final report. While I cannot guarantee complete confidentiality, I can assure you that your interview answers will be stated as anonymous in any study reports. Once the study is complete, your personal information will be destroyed and no record will be kept linking your interview answers to your identification.

Your participation is completely voluntary. However, your participation will be a contribution to research that will benefit alternative transportation, healthy living, and making Bloomington an even more bicycle-friendly city.

If you are willing to participate, please reply to this email ([eecoe@indiana.edu](mailto:eecoe@indiana.edu)) or give me a call at 979.240.8696.

If you feel you have not been treated according to the descriptions in this letter you may contact the Office for the Human Subjects Committee, Indiana University, Carmichael Center L03, 530 E. Kirkwood Avenue, Bloomington, IN 47408, 812/855-3067, [iub\\_hsc@indiana.edu](mailto:iub_hsc@indiana.edu).

I hope you will participate in this study. If you have any questions regarding the study, please contact me by phone at 979.240.8696 or by email at [eecoe@indiana.edu](mailto:eecoe@indiana.edu). I genuinely thank you for your assistance.

Sincerely,  
Ellen Coe  
Department of Recreation, Parks, and Tourism Studies  
School of HPER  
Indiana University

APPENDIX C

Participant Email Reminder

**(Email sent to participants, 2<sup>nd</sup> and final attempt)**

To: Bicycle Commuter  
Subject: Bicycle Commuting Research  
Study Number: 0903000132

Hello (name of contact person),

You were recently emailed with an invitation to participate in a research study on bicycle commuting in the City of Bloomington. I am a graduate student in the Department of Recreation, Parks, and Tourism at Indiana University and completing my Master's degree by conducting this research project.

Participation in the study consists of a one-on-one personal interview with me to discuss your motives, benefits, constraints, and needs as a bicycle commuter. The interview would last approximately 30 minutes and would take place at either a mutually-agreed upon location, or your own home, according to your level of comfort. The interview will be recorded with your permission.

Your participation is completely voluntary. However, your participation will be a contribution to research that will benefit alternative transportation, healthy living, and making Bloomington an even more bicycle-friendly city.

If you are willing to participate, please reply to this email or give me a call at 979.240.8696.

If you feel you have not been treated according to the descriptions in this letter you may contact the Office for the Human Subjects Committee, Indiana University, Carmichael Center L03, 530 E. Kirkwood Avenue, Bloomington, IN 47408, 812/855-3067, [iub\\_hsc@indiana.edu](mailto:iub_hsc@indiana.edu).

I hope you will participate in this study. If you have any questions, please contact me by phone at 979-240-8696 or by e-mail at [ecoe@indiana.edu](mailto:ecoe@indiana.edu).

I genuinely thank you for your assistance.

Sincerely,  
Ellen Coe  
Department of Recreation, Parks, and Tourism Studies  
School of HPER  
Indiana University

APPENDIX D

Phone Script

**(Phone script used for club members without email access)**

Hello (name of contact person),

My name is Ellen Coe and I am a graduate student in the Department of Recreation, Parks, and Tourism at Indiana University and completing my Master's research on a bicycle commuting study in the City of Bloomington. How are you today?

I am calling with an invitation to participate in a research study on bicycle commuting in the City of Bloomington.

Participation in the study consists of setting up a one-on-one interview with me in person. The interview would last approximately 30 minutes. It would take place at either a mutually-agreed upon location, or your own home, according to your level of comfort. The interview would also be audio and/or video recorded, again dependent upon your level of comfort.

I just want to make sure you know your participation is completely voluntary. However, your participation will be a contribution to research that will benefit alternative transportation, healthy living, and making Bloomington an even more bicycle-friendly city.

Would you be willing to participate? If you'd like time to think over this decision, I can call back at another time or you may call me.

(If not willing to participate):

Thank you for your time. You will not be contacted by me again with regard to this study. Have a good day.

(If willing to participate):

Thank you for your willingness to participate. I would like to schedule a time for the interview. Is there a particular day you prefer? What time of day would you prefer? Where would you like to meet for the interview?

Thank you for your time, I will see you (date and time of interview). Have a good day.

APPENDIX E

Flyer

(Flyer posted at bicycle shop locations)

# Attention Cyclists!

**Do you bicycle commute in the City of Bloomington?**

**If so, PLEASE participate in a research study!**

Contribute to discussions centering on alternative transportation, health living, and making Bloomington an even more bicycle-friendly city!

If you are willing to participate, please take this flyer. Participation will consist of a short interview.

**Please contact Ellen Coe by calling 979 – 240 – 8696 or emailing [eecoe@indiana.edu](mailto:eecoe@indiana.edu) for full details.**

APPENDIX F  
Thank-You Card

**(Thank-you card to be sent to study participants via email or physical address if known)**

Dear (study participant),

Thank you for taking the time to meet with me about bicycle commuting in the City of Bloomington. The information I gathered from the study is important to helping further bicycle-friendliness here in Bloomington. I really appreciate the interest you took in my study.

Best,  
Ellen Coe  
Primary Researcher

APPENDIX G  
Interview Script

**(Script to be used in interview process)**

## **Bicycle Commuting**

The following questions will be used as the basic interview script for interviewing bicycle commuters in the City of Bloomington. These questions will be used as the foundation, however, more probing questions will be asked dependent upon the answers of study participants.

1. Background Information
  - a. How many times do you bicycle commute to work?
  - b. How far is your commute and how long does it take?
  - c. Do you also cycle for utilitarian trips like shopping or errands?
  - d. How many weeks, months, or years have you been bicycle commuting?
  
2. Tell me about why you choose to bicycle commute over other forms of commuting.
  
3. Tell me about the different benefits you reap from your choice in bicycle commuting.
  
4. How did you decide to become a bicycle commuter?
  - a. What form of commuting did you use before choosing the bicycle?
  - b. Did you face constraints or barriers to becoming a bicycle commuter?
  - c. Can you think of any constraints your non-cycle commuter friends would tell you as their excuse to not bicycle commuting?
  
5. As a regular commuter, what do you see as the greatest need in the City of Bloomington in order for commuting to be convenient for you?
  - a. What are some the features you'd like to see the City add to existing facilities?

Are you willing to give me your personal information including address and phone number as well as demographic information?

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone number \_\_\_\_\_

Email \_\_\_\_\_

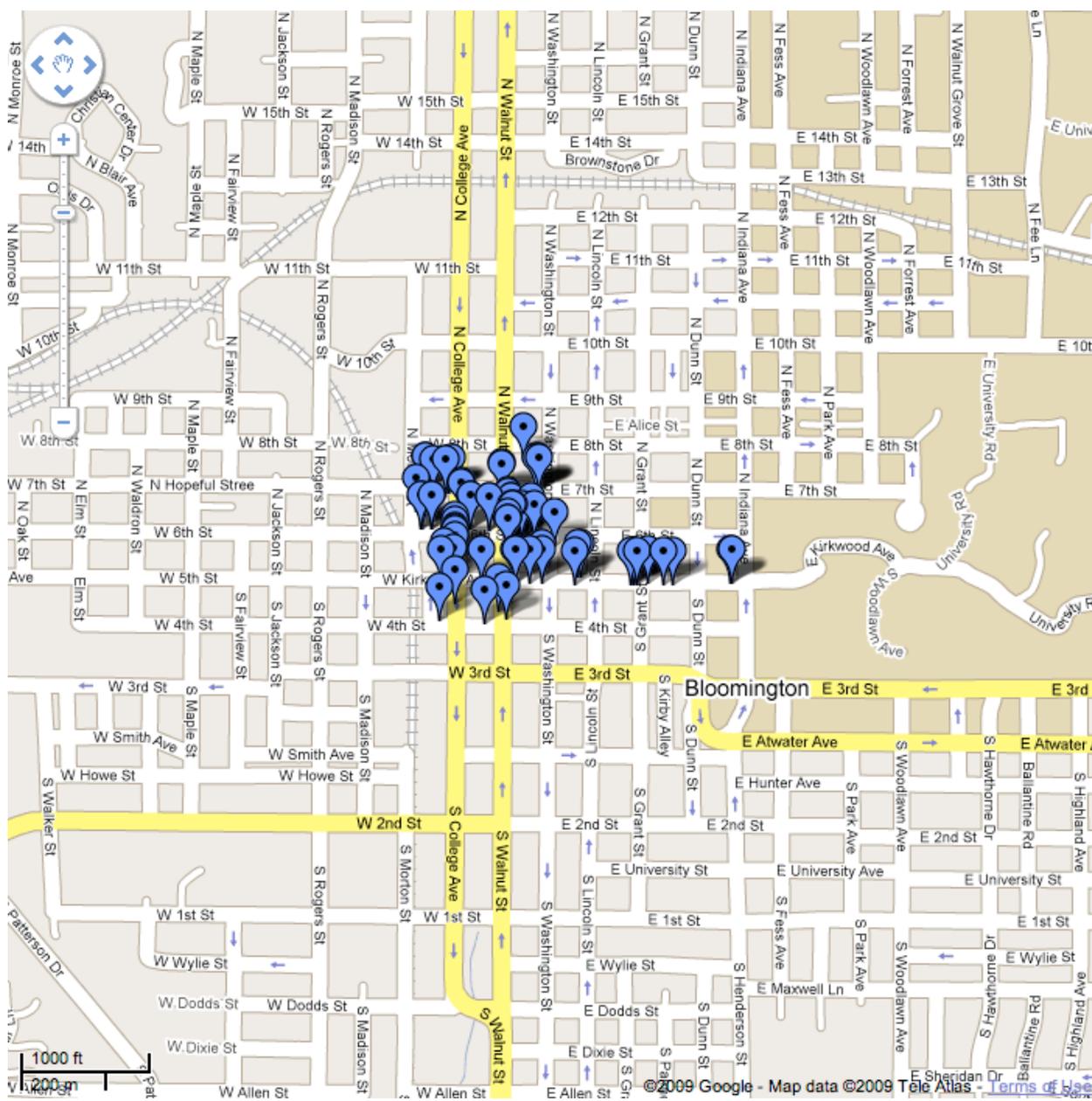
## Demographics

1. Age:
  - a. 12-17 years old
  - b. 18-24 years old
  - c. 25-32 years old
  - d. 33-45 years old
  - e. 45-55 years old
  - f. 55+ years old
  
2. Gender:
  - a. Female
  - b. Male
  
3. Total Household Income per year:
  - a. Less than \$15,000
  - b. \$15,000-\$30,000
  - c. \$30,000 - \$45,000
  - d. \$45,000- \$60,000
  - e. \$60,000 - \$80,000
  - f. \$80,000 - \$100,000
  - g. \$100,000+
  
4. Occupation:
  - a. Student
  - b. Clerical
  - c. Health Care (medical, dental, etc)
  - d. Administrative
  - e. Academic/Teacher
  - f. Managerial
  - g. General/Skilled Labor
  - h. Civil Service (Post Office, Police, etc)
  - i. Other

APPENDIX H

Bicycle Rack Locations

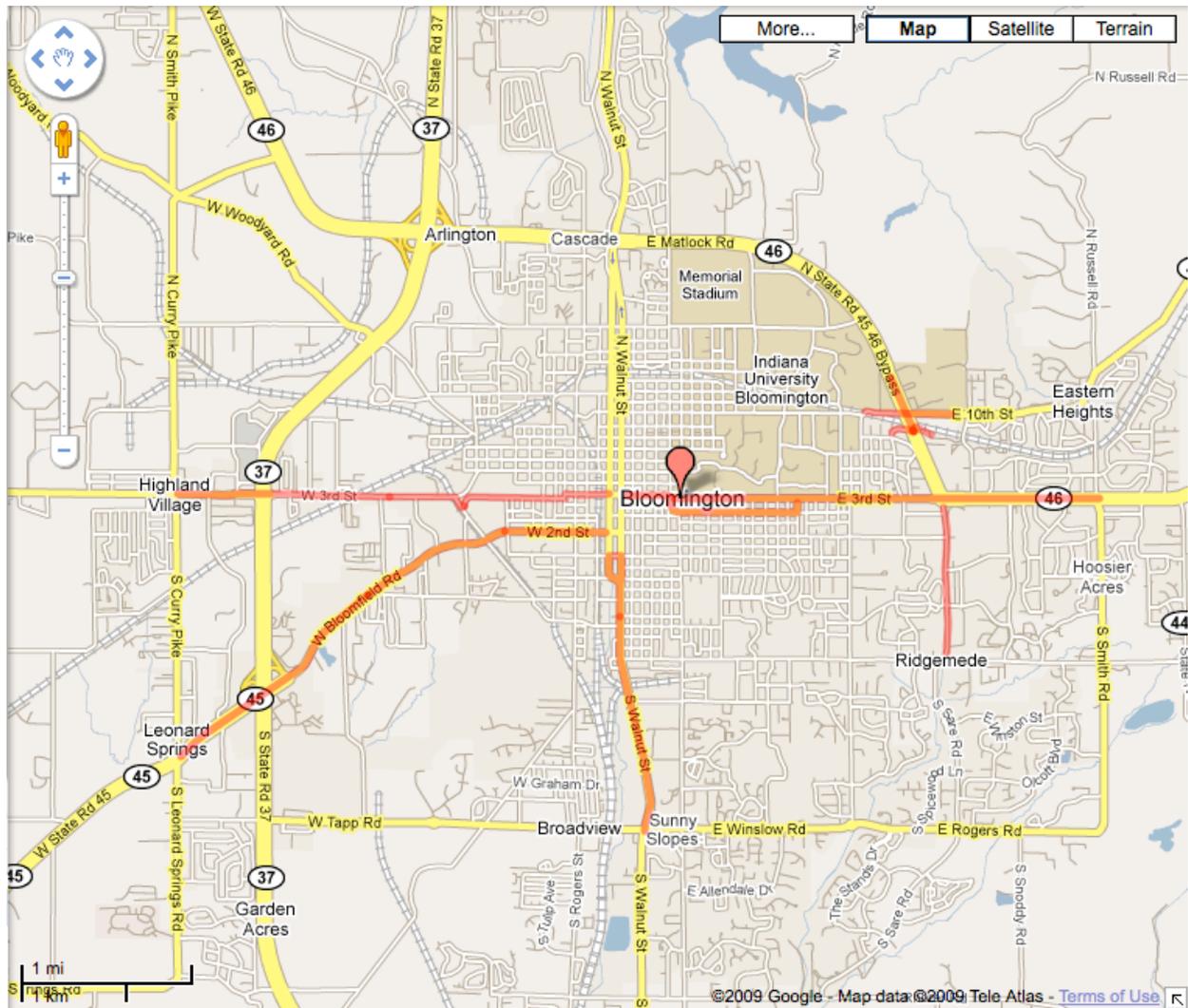
**Bicycle Rack Location Map – Pinpoints denote location of bicycle rack**



APPENDIX I

City of Bloomington Map

### City of Bloomington Map – Highlighted problem areas



APPENDIX J

Institutional Review Board Approval Documents

## Notice of Approval of Exempt Review



**INDIANA UNIVERSITY**  
OFFICE OF RESEARCH ADMINISTRATION

**To:** Ellen E. Coe  
HPER-RPTS

**From:** IUB Human Subjects Office  
Office of Research Administration – Indiana University

**Date:** March 31, 2009

**RE: EXEMPTION GRANTED – Category # 2**  
Protocol Title: Motivations of Bicycle Commuting in the City of Bloomington: A Pilot Study  
Protocol #: 0903000132  
Sponsor: N/A

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Your study named above was accepted on March 28, 2009 as meeting the criteria of exempt research as described in the Federal regulations at 45 CFR 46.101(b), paragraph 2. This approval does not replace any departmental or other approvals that may be required.

As the principal investigator (or faculty sponsor in the case of a student protocol) of this study, you assume the following responsibilities:

- **Changes to Study:** Any proposed changes to the research study must be reported to the IRB prior to implementation. This may be done via an e-mail or memo sent to the IRB office. Only after approval has been granted by the IRB can these changes be implemented.
- **Completion:** Although a continuing review is not required for an exempt study, you are required to notify the IRB when this project is completed. In some cases, you will receive a request for current project status from our office. If we are unsuccessful in our attempts to confirm the status of the project, we will consider the project closed. It is your responsibility to inform us of any changes to your contact information to ensure our records are kept current.

Per federal regulations, there is no requirement for the use of an informed consent document or study information sheet for exempt research, although one may be used if it is felt to be appropriate for the research being conducted. As such, the IUB IRB will no longer stamp study information sheets / informed consent documents for exempt research. Please note, however, that if a study information sheet and/or informed consent document is to be used, you may use unstamped accepted versions. **Please note that your study has been accepted with the use of a study information sheet / informed consent document.**

You should retain a copy of this letter and any associated approved study documents in your records. Please refer to the project title and number in future correspondence with our office. Please contact our office at (812) 855-3067 or by e-mail at [iub\\_hsc@indiana.edu](mailto:iub_hsc@indiana.edu) if you have questions or need further assistance.

Thank you.

## Approval of Amendment



**INDIANA UNIVERSITY**  
OFFICE OF RESEARCH ADMINISTRATION

**To:** Ellen E. Coe  
HPER-RPTS

**From:** IUB Human Subjects Office  
Office of Research Administration – Indiana University

**Date:** May 13, 2009

**RE: EXEMPTION GRANTED – AMENDMENT**  
Protocol Title: An Exploratory of Bicycle Commuting in the City of Bloomington, Indiana  
Protocol #: 0903000132  
Sponsor: N/A

An amendment to your study named above has been accepted as continuing to meet the criteria of exempt research as described in the Federal regulations at 45 CFR 46.101(b), paragraphs 2. The changes described in the amendment can now be implemented, unless any departmental or other approvals are required. **Please note that your amendment has been accepted with a revised study information sheet/ informed consent document, which you should now begin using.** As the principal investigator (or faculty sponsor in the case of a student protocol) of this study, you assume the following responsibilities:

- **Changes to Study:** Any proposed changes to the research study must be reported to the IRB prior to implementation. This may be done via an e-mail or memo sent to the IRB office. Only after approval has been granted by the IRB can these changes be implemented.
- **Completion:** Although a continuing review is not required for an exempt study, you are required to notify the IRB when this project is completed. In some cases, you will receive a request for current project status from our office. If we are unsuccessful in our attempts to confirm the status of the project, we will consider the project closed. It is your responsibility to inform us of any changes to your contact information to ensure our records are kept current.

You should retain a copy of this letter and any associated approved study documents in your records. Please refer to the project title and number in future correspondence with our office. Please contact our office at (812) 855-3067 or by e-mail at [iub\\_hsc@indiana.edu](mailto:iub_hsc@indiana.edu) if you have questions or need further assistance.

Thank you.

APPENDIX K

Study Information Sheet

**Informed consent for participants**

IRB Study #0903000132

**INDIANA UNIVERSITY BLOOMINGTON  
STUDY INFORMATION SHEET****An Exploratory of Bicycle Commuting in the City of Bloomington, Indiana**

You are invited to participate in a research study of designed to study bicycle commuting in the City of Bloomington, Indiana. You were selected as a possible subject because you have been recognized a patron of a local bicycle shop or you are affiliated with one of the following groups: Bloomington Bicycle Club, Indiana University Cycling Club, or Indiana University Outdoor Adventure Trip Leaders. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

The study is being conducted by Ellen Coe through the Indiana University Department of Recreation, Parks, and Tourism Studies. There is no funding associated with this particular study.

**STUDY PURPOSE**

The purpose of this study is to study bicycle commuting in the City of Bloomington. Specifically, this study will focus upon the motives, benefits, constraints, and needs of bicycle commuters who are community members of Bloomington.

**NUMBER OF PEOPLE TAKING PART IN THE STUDY:**

If you agree to participate, you will be one of approximately 30 subjects who will be participating in this research.

**PROCEDURES FOR THE STUDY:**

If you agree to be in the study, you will do the following things:

- Coordinate with the primary investigator to schedule a location and time for a one-on-one interview to be conducted between yourself and the primary investigator.
- Participate in a one-on-one interview with the primary investigator which last approximately thirty minutes. The interview will consist of five basic questions regarding you as a bicycle commuter. More questions may be asked to follow-up with the answers you give to the first five. During the interview, the primary investigator may be taking several notes as well as audio-recording the interview.

**BENEFITS OF TAKING PART IN THE STUDY:**

The benefits to participation may not directly affect you personally, but instead, your interview responses will contribute to discussions centering on alternative transportation, healthy living, and making Bloomington an even more bicycle-friendly city.

**ALTERNATIVES TO TAKING PART IN THE STUDY:**

Instead of being in the study, you have these options: An alternative to participating in the study is to choose not to participate.

**CONFIDENTIALITY**

Efforts will be made to keep your personal information confidential. We cannot guarantee absolute confidentiality. During data collection and analysis, each interviewer will be given a pseudonym. A master list of the pseudonyms paired with participant's actual name may be kept while data is still being collected and analyzed, however, the master list will be destroyed upon completion of the study. Any other personal information will be anonymous and may be disclosed if required by law. Your identity will be held in confidence in reports in which the study may be published as all information will be presented in aggregate results.

Organizations that may inspect and/or copy your research records for quality assurance and data analysis include groups such as the study investigator and his/her research associates, the IUB Institutional Review Board or its designees, and (as allowed by law) state or federal agencies, specifically the Office for Human Research Protections (OHRP).

**CONTACTS FOR QUESTIONS OR PROBLEMS**

For questions about the study or a research-related injury, contact the researcher Ellen Coe at 979.240.8696.

For questions about your rights as a research participant or to discuss problems, complaints or concerns about a research study, or to obtain information, or offer input, contact the IUB Human Subjects office, 530 E Kirkwood Ave, Carmichael Center, 203, Bloomington IN 47408, 812-855-3067 or by email at iub\_hsc@indiana.edu

**VOLUNTARY NATURE OF STUDY**

Taking part in this study is voluntary. You may choose not to take part or may leave the study at any time. Leaving the study will not result in any penalty or loss of benefits to which you are entitled. Your decision whether or not to participate in this study will not affect your current or future relations with the investigator(s).

**FORM DATE: May 7, 2009**