

Spring 5-17-2013

## **Cycling in the Crescent City: An exploration of the spatial variation in bicycle commuting in New Orleans**

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Cycling in the Crescent City:  
An exploration of the spatial variation in bicycle commuting in New Orleans

A thesis

Submitted to the graduate faculty of the  
University of New Orleans  
in partial fulfillment of the  
requirements for the degree of

Master in Urban and Regional Planning

by

Emilie Bahr

B.A., University of Texas at Austin, 2002

May, 2013

## Acknowledgements

Many thanks to my thesis advisor, John Renne, and to committee members Kate Lowe and Jim Amdal. Their guidance was indispensable in helping me to shape and refine this project, and I consider them friends as well as teachers. Thanks also to my dad, who taught me to think big and connect the dots, and to my mom, who taught me the value of leaning in to difficulty. I am forever grateful for Beaux, the best cycling partner anyone could ask for, whose patience, encouragement and agility in every type of terrain continue to amaze me. Finally, thanks to New Orleans' existing and future cyclists, for inspiring this research.

## Table of Contents

List of Tables .....	iv
List of Figures .....	v
Abstract .....	vi
Epigraph .....	1
Chapter I. Don't forget your u-lock.....	1
Thesis statement .....	2
Research questions .....	2
Contents and procedure.....	2
Description of study area .....	3
Chapter II: Gearing up: A review of the current state of cycling in the United States and New Orleans, and a survey of the literature .....	5
Conceptual framework.....	7
New Orleans' (intermittent) bike boom.....	9
Literature review .....	13
Chapter III: Who do I call if my bike breaks down? Analyzing a citywide survey on cycling attitudes, motivations and obstacles.....	24
Purpose and methodology .....	24
Socio-demographic characteristics of survey participants .....	25
Results and discussion.....	27
Chapter IV: A tale of two neighborhoods: Case study analysis .....	48
History of Bywater and Navarre .....	50
Commuting patterns .....	51
Socio-economic characteristics .....	53
Physical development patterns.....	55
What residents say about bicycling for transportation .....	65
Ease of travel to the CBD.....	73
Chapter V: Congestion and contagion: Conclusions and policy implications.....	79
Bibliography .....	90
Appendices.....	84
Appendix A. UNO Institutional Review Board exemption notice .....	84
Appendix B. American Community Survey journey-to-work questions .....	85
Appendix C. Survey instrument.....	86
Appendix D. Select survey results .....	94
Appendix E. Nola Vie article on Cycling in the Crescent City project.....	98
Appendix F. Maps .....	100
Figure 28. Violent crime in Bywater and Navarre.....	100
Figure 29. Jobs per square mile by commercial cluster, 2008 .....	100
Figure 30. New Orleans street rail system, 1904.....	101
Figure 31. New Orleans bikeways.....	102
Vita .....	112

## List of Tables

Table 1: Select socio-demographic characteristics of New Orleans and the U.S. ....	4
Table 2: Bicycle commuting in New Orleans, 2000-2011 .....	11
Table 3: Select characteristics of survey participants and city residents .....	27
Table 4: Select socio-demographic characteristics of bike commuters and all survey takers .....	37
Table 5: Comparing select socio-demographic characteristics of “interested but concerned” with those of all survey takers .....	43
Table 6: How residents 16 and older get to work, 2006-2010 .....	55
Table 7: A comparison of select features of Bywater and Navarre, 2006-2010 .....	64

## List of Figures

Figure 1. Bicycle mode share for all trips, U.S., Germany, Denmark and the Netherlands .....	6
Figure 2. Top 12 large U.S. cities for bicycle commuting.....	7
Figure 3. Bike commute rates in New Orleans by census tract, 2006-2010.....	9
Figure 4. The census tract with the highest bike commute rate in New Orleans .....	12
Figure 5. Image of Harmony Oaks.....	12
Figure 6. Where survey takers lived .....	25
Figure 7. Neighborhoods with the highest levels of survey response.....	26
Figure 8. Factors survey takers cited as motivating bicycling for transportation .....	29
Figure 9. Factors survey takers cited as preventing bicycling for transportation .....	31
Figure 10. Factors survey takers indicated would increase their willingness to bicycle for transportation .....	33
Figure 12. Factors that prevent surveyed bicycle commuters from bicycling for transportation .....	39
Figure 13. Factors bicycle commuters surveyed indicated would increase their willingness to bicycle for transportation .....	41
Figure 14. Motivations for bicycling for transportation among “interested but concerned” survey takers .....	44
Figure 15. Factors preventing “interested but concerned” survey takers from bicycling for transportation .....	45
Figure 16. Factors that would increase willingness to bicycle for transportation among “interested but concerned” survey takers .....	46
Figure 17. Map showing locations of Navarre and Bywater neighborhoods .....	50
Figure 18. Photo of a typical Bywater Creole cottage .....	56
Figure 19. Photo of a Bywater home .....	57
Figure 20. Photo of bicycles parked outside a Bywater café.....	58
Figure 21. Photo of bicycles at the 2012 Mirliton Festival .....	59
Figure 22. Photo of the Navarre streetscape.....	60
Figure 23. Photo of a Navarre café .....	61
Figure 25. Bywater to CBD route map .....	75
Figure 26. Navarre to CBD route map.....	77
Figure 27. Photo of bicycle advocacy graffiti.....	83
Figure 28. Map of violent crime in Bywater and Navarre .....	100
Figure 29. Map of jobs per square mile by commercial cluster, 2008 .....	100
Figure 30. Map of New Orleans’ street rail system, 1904 .....	101
Figure 31. Map of New Orleans bikeways .....	102

## Abstract

This thesis examines the spatial variation in bicycle commuting across New Orleans. It identifies where in the city bicycle commuting is most and least prevalent. It also explores factors that are promoting and discouraging utilitarian bicycling. A review of existing literature on variables found to influence transportation bicycling is conducted, and a survey is disseminated to residents across the city to determine some of the motivations for and obstacles to transportation bicycling locally. Additionally, case studies are compiled pertaining to two neighborhoods falling on opposite ends of the bike-commute spectrum. These include analysis of socio-economic and demographic data; an evaluation of the built environment using maps and field observation; and interviews to assess residents' attitudes about and experiences with transportation bicycling. In the end, this thesis should be helpful in pinpointing variables influencing bicycle commute rates and in determining the types of policies and investments that may be most effective in encouraging more bicycling in New Orleans and across the country.

Bicycle commuting, utilitarian bicycling, New Orleans, active transportation

## Epigraph

“When I was growing up, if you saw an adult on a bike, you either thought they stole the bike, or they were from some far-off corner of the planet like California. Now, it’s almost like there are more adults on bikes than kids

-New Orleans comedian Jodi Borello (Borello, 2012)

## Chapter I. Don’t forget your u-lock

It is a spring evening in New Orleans, one teetering on the brink of summer when there is still a coolness to the air, and an impromptu party is underway beneath the boughs of the oak trees that line the neutral ground of Esplanade Avenue. Steps away from the bars and music venues starting to come alive for the evening along Frenchmen Street in the Marigny, a crowd is taking shape around a smoking barbecue pit pulled from a nearby apartment. It is an eclectic-looking group whose constituents range in age from their mid-20s to mid-30s. There are teachers, doctors, lawyers, artists and graduate students represented, and while their interests and professions are as diverse as their hometowns, their preferred mode of transportation - if the growing mass of metal lining the periphery of this party serves as any indication - is not. Half, if not more, of the celebrants have arrived by bicycle.

Bicyclists can be found pedaling the Marigny and Bywater neighborhoods just about any time of day or night lately. They weave past colorful Creole cottages that line streets with names like Piety and Desire and roll down the bike lane that stretches along 3 miles of St. Claude Avenue, the city’s first when it was striped in 2008 (RayK, 2008). Bicycles fill out racks at bars and restaurants where they are provided, and are tethered to trees and street signs where they are not. More than a few are plastered in beads and baubles in homage to New Orleans’ parading tradition. Others creak beneath the weight of impressively-balanced lawn equipment being hauled between job sites, or carry riders with backpacks or briefcases slung across their torsos. These riverside districts have for some time honed reputations as the heart of New Orleans’ bohemian culture. Now, they are developing another (related, perhaps) distinction as one of the most bicycle-friendly sections of the city. Bike-commute data compiled by the U.S. Census Bureau’s American Community Survey (ACS) confirms what anecdotal evidence has for some time suggested: that these neighborhoods are home to some of the highest rates of utilitarian cycling in New Orleans (ACS, 2006-2010a).

Much has been made of the “bicycle renaissance” afoot in this country (Pucher, Buehler & Seinen, 2011), and New Orleans, usually a reliably eccentric counterpoint to national trends (see, for example, Woodward, 2011, and Pope, 2008) is for once keeping pace where bicycling is concerned. New Orleanians bike to work at a rate roughly three times the national average, according to the five-year ACS estimate released in 2010, which found that about 1.8 percent of city residents used their bikes to get to work (ACS, 2006-2010a). That rate is easily the highest in the state and represents a 53 percent increase over year 2000 figures. It makes New Orleans 12<sup>th</sup> in the country among cities with populations of 250,000 or more for commuting to work by



bike and sets the Crescent City apart as a southern leader in active transportation in a region notoriously lagging in that regard (League of American Bicyclists, 2011; Pucher et al., 2011a).

Because information related to bicycling for all purposes is elusive, ACS journey-to-work data arguably provides the best approximation of bicycling activity by city. Although work-commute trips are estimated to represent only 20 to 30 percent of a person's overall travel behavior (Dill & Voros, 2007), Barnes and Krizek (2005) have found that areas with higher percentages of bicycle commuting tend to have higher percentages of cycling for all purposes.

Bicycle commuting is not catching on across the city uniformly, however. ACS estimates show that in the Bywater and Marigny neighborhoods, for example, the share of residents commuting by bike runs between 7 and 15 percent. These rates are higher than what is found citywide in Portland, whose estimated bike-commuter rate of just more than 6 percent is the nation's highest for large cities (League of American Bicyclists, 2011). Yet in other parts of New Orleans, bicycle commuting is almost non-existent (ACS, 2006-2010a).

### **Thesis statement**

This mixed-methods analysis examines the spatial variation in bicycle-commuting rates across New Orleans to explore why people are bicycling for transportation and, perhaps more importantly, why they are not. It aims to: 1). Investigate and describe where the most and least bike-commute activity is happening; 2). Explore some of the variables influencing bicycle commuting rates; and 3). Offer some insight into the types of policies and interventions that appear to be making an impact. Ideally, these findings will provide valuable information for New Orleans as it aims to promote bicycling and for other cities interested in expanding their bicycling ranks.

### **Research questions**

**This project will be oriented around one overarching question: What's behind the spatial variation in bicycle commuting in New Orleans?**

**To get at this larger question, it will aim to answer the following sub-questions:**

- 1. What parts of New Orleans have the highest and lowest rates of bicycle commuting?**
- 2. What are some of the factors encouraging and discouraging cycling locally?**
  - a. What does the literature reveal about factors that influence rates of bicycling for transportation?**
  - b. What do city residents say?**
  - c. What do neighborhoods say?**

### **Contents and procedure**

The next chapter briefly reviews the state of utilitarian bicycling (as opposed to bicycling for recreation or some other purpose) nationally and explains the theoretical framework for this project. It also explores some of the changes taking shape recently with regard to bicycle-related investment and interest in New Orleans, and introduces one of the foundations of this thesis: a review of Census-tract-level ACS journey-to-work data for Orleans Parish. These data

are mapped and analyzed to gauge which city census tracts are experiencing the highest and lowest rates of bicycle commuting. A review of relevant literature on the factors that influence bicycling for transportation rounds out chapter two. This section, which emphasizes articles published since 2000, examines how utilitarian bicycling levels are affected by variables including infrastructure, climate, socio-demographic factors, and the shape of the built environment. Chapter three consists of an analysis of a survey of city residents on factors discouraging and encouraging utilitarian cycling. Chapter four turns to case studies centering on Bywater and Navarre, two New Orleans neighborhoods that fall on opposite ends of the bike-commute spectrum. In-depth information is gathered about these areas through: 1) a review of relevant statistics compiled by the U.S. Census Bureau; 2) interviews with residents; 3) a review of bike-infrastructure, zoning maps and related resources; 4) and field observations conducted by bicycling from the center of each neighborhood to the center of the Central Business District to gauge the ease of commuting by bike. By way of conclusion, chapter five returns to fundamental questions about what seems to be promoting and discouraging utilitarian cycling in New Orleans and offers recommendations for policies that could help to expand the city's commuter bicycling ranks.

### **Description of the study area**

Amid dramatic population flux in the city since Hurricane Katrina in 2005, debate persists about how many people live in New Orleans (Fussell, Sastry & VanLandingham, 2010). The 2010 decennial census pegged New Orleans' population at 343,829 (U.S. Census Bureau, 2010a). As of the agency's 2011 population estimate, that figure was revised upward to 360,740 (U.S. Census Bureau, 2013).

One statistic not contested is that New Orleans is a relatively poor city. The median household income in New Orleans is estimated at \$36,721 in 2011 inflation-adjusted dollars, almost 29 percent less than the national median household income of \$51,484 (ACS, 2007-2011a). Lower earnings are partially offset by a lower cost of living in New Orleans relative to the national average for urban areas (Lopez, 2012). Still, an estimated 29 percent of city residents live below the poverty line, almost double the 16 percent of Americans who fall into this category (ACS, 2007-2011b). Possibly related to low earnings is a higher-than-average share of carless households in New Orleans. At roughly 19 percent, the share of households without automobiles is more than double the national figure (ACS, 2007-2011d).

Despite a decline in African American residents after Katrina, New Orleans remains a predominately black city (U.S. Census Bureau, 2000a; U.S. Census Bureau, 2010d). The city is roughly 60 percent black and 33 percent white, compared to a national population that is 13 percent black and 72 percent white. Asians comprise about 3 percent of New Orleans' population, while those claiming "some other race" make up 2 percent and those claiming two or more races represent 1.7 percent. Just more than 5 percent of city residents of any race claim Hispanic or Latino heritage, compared with 16 percent of the national population.

**Table 1. Select socio-demographic characteristics of New Orleans and the United States**

	<b>Population</b>	<b>Percent car-free households</b>	<b>Percent white (including those who identify as Hispanic but not including Asians, those claiming “some other race” or those of two or more races)</b>	<b>Median household income</b>	<b>Percent below poverty line</b>
<b>New Orleans</b>	343,829	19 percent	33 percent	\$36,721	29 percent
<b>U.S.</b>	308,745,538	9 percent	72 percent	\$51,484	16 percent

Source: U.S. Census Bureau, 2010 Census, American Community Survey, 2009-2011, B19013, American Community Survey, 2011, S1701, American Community Survey 2009-2011, B08201

## **Chapter II. Gearing up: A review of the current state of cycling and a survey of the literature**

Research Questions:

- 1. What parts of New Orleans have the highest and lowest rates of bicycle commuting?**
- 2. What are some of the factors encouraging and discouraging cycling locally?**
  - a. What does the literature reveal about factors that influence rates of bicycling for transportation?**
  - b. What do city residents say?
  - c. What do neighborhoods say?

### **Futurama achieved: The state of utilitarian cycling nationally**

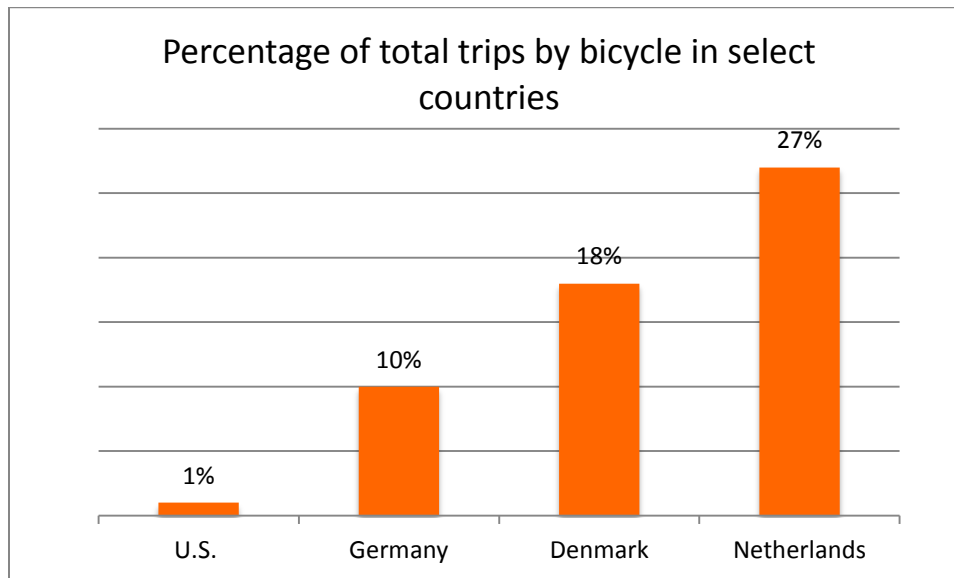
The car has long been and unquestionably remains king in America. At the start of this century, the U.S. boasted the highest rate of automobile ownership of any other country, and the vast majority of trips, even among the poor, were made by personal automobile (Pucher & Renne, 2003). The share of people who get around by bicycle hovers around 1 percent, far shy of the bicycle mode share found in some other industrialized countries (Reynolds, Harris, Teschke, Cipton & Winters, 2009). Yet anecdotal and, increasingly, empirical evidence suggest that while bicycling remains a largely fringe mode of transportation across most of the country, it has been on the rise over the past two decades. The trend is especially pronounced in certain large urban areas where it appears investment in a range of policies to promote cycling is having meaningful impact (Pucher, Buehler & Seinen, 2011).

The National Personal Transportation Survey (NPTS), conducted by the Federal Highway Administration in 1969, 1977, 1983, 1990 and 1995, and its successor, the National Household Travel Survey (NHTS), conducted in 2001 and 2009, provide the only national source of trip data for all purposes (Pucher & Renne, 2003). The NPTS reported a slight increase over its duration in bicycle mode share. Whereas the bicycle was used for 0.7 percent of all trips in 1977, by 1995, bicycle share for all trips stood at about 0.9 percent (Pucher, Buehler, Merom, & Bauman, 2011). An analysis of the NHTS found that this figure held steady between 1995 and 2001 and ticked up by a tenth of a percent between 2001 and 2009 to 1 percent. More striking was the change in purpose of bicycling trips over that time. The share of bike trips made for utilitarian purposes grew by 8 percent between 2001 and 2009 to represent just more than half (51 percent) of all bike trips (Pucher et al., 2011b).

The U.S. Census Bureau has tracked how many Americans bicycle to work since 1980. The agency reported the number of bike commuters held flat for two decades, from 1980 to 2000, while the bike share of work commuters dipped slightly from 0.5 percent to 0.4 percent (Pucher & Buehler, 2011b). Yet more recently, a turnaround seems to be underway. The U.S. Census Bureau reported the number of daily bike commuters in 2009 nearly doubled those counted by the 2000 Census, from 488,000 in 2000 to 766,000 by 2009 (Pucher & Buehler, 2011b). The ACS also uncovered a slight increase in the bike commute mode share, which grew from 0.4 percent

to 0.6 percent (Pucher & Buehler, 2011a). Still, as of the 2006-2010 ACS, the share of Americans biking to work hovered below 1 percent (Pucher et al., 2011b).

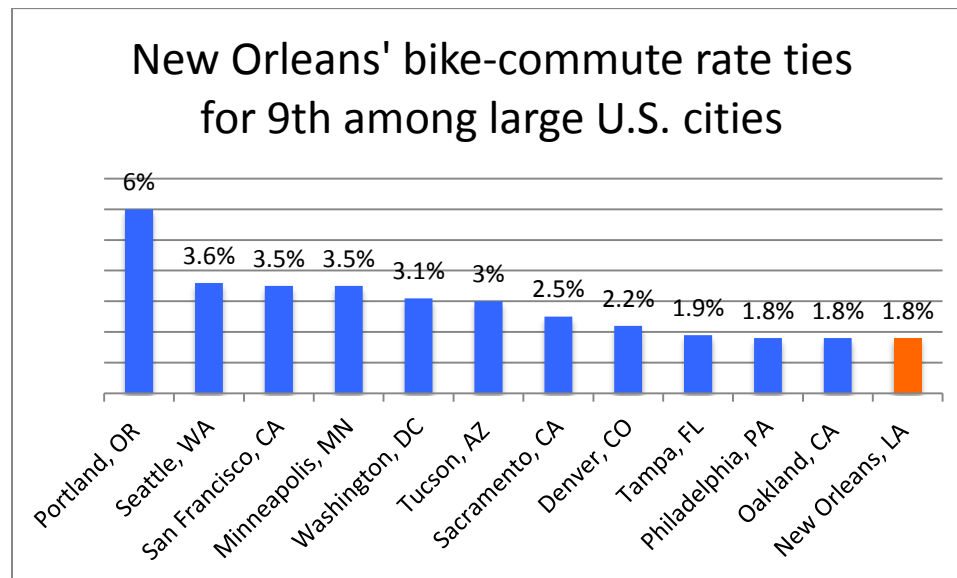
**Figure 1. Bicycle mode share for all trips in the U.S., Germany, Denmark and the Netherlands**



Adapted from Pucher & Buehler, 2008

The microscopic bicycle mode share found in the United States is not universal among industrialized nations. Whereas Americans make an estimated 1 percent of all trips by bike, in the Netherlands the bicycle share of all trips in the early part of last decade stood at roughly 27 percent (see Figure 1). For Denmark and Germany, the rates were about 18 percent and 10 percent, respectively (Pucher & Buehler, 2008). But the paltry U.S. statistic masks a far more substantial rate of utilitarian cycling taking shape in a number of cities across this country, and in particular in some large metro areas (see Figure 2), many of which have invested significantly in new infrastructure in recent years (Maciag, 2012). Pucher et al. (2011a) conclude in one analysis of active transportation trends that “cycling growth has been concentrated in a few regions and in the gentrifying central neighborhoods of a few metropolitan areas” while “(c)ycling levels in the South and in the suburbs ... remain extremely low” (p. S313).

**Figure 2: Top 12 large U.S. cities for bike commuting**



Source: League of American Bicyclists; ACS 2006-2010, Table B08301

### **Conceptual framework**

There are two predominate conceptual models used to explain travel-related behavior. These are ecological and utility-maximizing theories (Krizek, Handy & Forsyth, 2009; Emond, Tang & Handy, 2009). Each framework provides useful insights and they are characterized by substantial areas of overlap.

Health-behavior researchers tend to favor ecological models, which stress the role of the physical and cultural environments on individuals' behavior (Krizek et al., 2009b; Sallis & Owen, 1997). These models consider "how environments affect behavior and how environments and behavior affect each other" (Sallis & Owen, 1997, p. 404):

Ecological models of health behavior posit that behaviors are influenced by intrapersonal, social and cultural, and physical environment variables; posit that these variables are likely to interact; and describe multiple levels of social and cultural and physical environment variables as relevant for understanding and changing health behaviors.

There are a variety of ecological models, but all hold that an individual's choices, in this case, decisions about whether to bicycle for transportation or to opt for some other mode, are influenced to a large degree by the opportunities available to them by virtue of their environment. Providing bicycling infrastructure in the form of new bike paths, public bicycles available for checkout, showers and bike parking facilities at workplaces, maps outlining

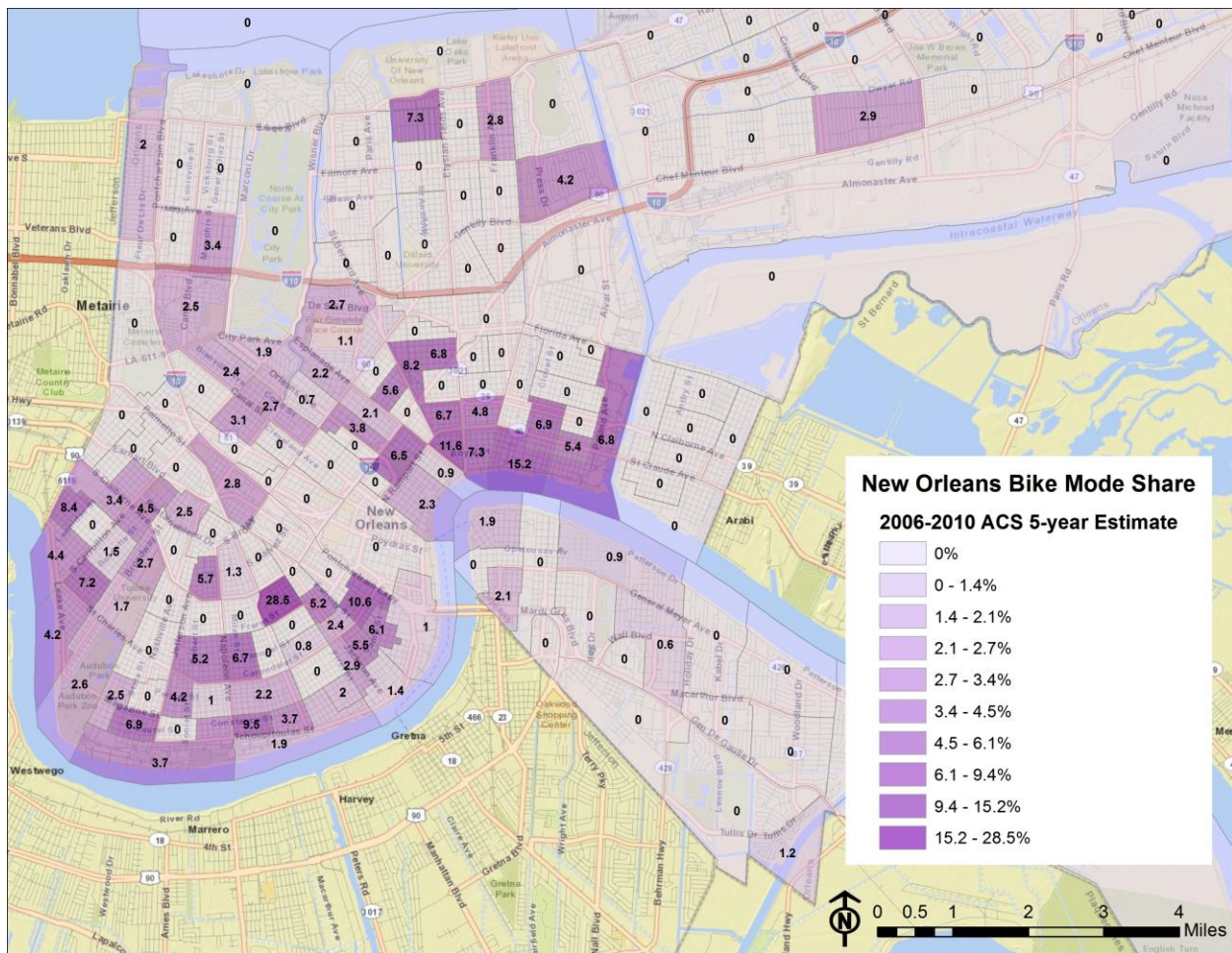
desirable bike routes and other accommodations, in order to promote and support cycling, are all strategies that comport with the ecological framework. These strategies comprise the bulk of bicycle advocates' efforts across the country over the past two decades, and more recently in New Orleans, and existing research suggests that they have generally been successful in boosting rates of cycling.

The psychologist Rudolph Moos pointed to the importance of other physical characteristics of the environment, such as weather and geography, as relevant to health behavior (Sallis & Owen, 1997). Moos further emphasizes the role of other environmental factors that influence health-related behavior, including the socio-demographic and cultural characteristics found in a particular environment, and the perceived supportiveness found in a social group for a given behavior (Sallis & Owen, 1997). Studies suggest that there are likely significant social forces at work in shaping an individual's willingness to bicycle for transportation. Research points to variables such as proximity to other cyclists, gender, and country of origin as important in influencing mode choice.

The alternative framework, traditionally favored by travel-behavior researchers and rooted in economic tradition, considers behavior to be primarily a function of utility-maximization. As applied to mode choice, it assumes that individuals are likely to base their transportation choices primarily on the associated costs of alternatives, in terms of money and time (Krizek et al., 2009b; Emond et al., 2009; Heinen et al., 2010). This theory holds that the easier it is to use a certain mode to get from point A to point B, that is, the fewer resources that are required in terms of time, money or effort to take a trip using a particular mode, the more desirable that mode will be.

Research lends some support to the importance of economic considerations in affecting mode choice. Rietveld and Daniel (2004), for example, found in their analysis of inter-city variation in bike commuting in the Netherlands that travel time and monetary costs associated with various mode choices were significant factors in an individual's willingness to bicycle for transportation. The researchers observed that the number of bicycle trips rose where bicycling presented a faster alternative to driving and that increasing the capacity for direct routes and reducing the number of stops required made bicycling a more attractive mode. Additionally, they found that increasing the cost of automobile parking resulted in higher rates of bicycle use. They concluded that by making bicycle use less costly in terms of time and money and increasing costs associated with driving, substantial gains in utilitarian cycling could be realized.

**Figure 3. Bike-commute rates by New Orleans census tract, 2006-2010**



Source: American Community Survey, 5-year estimates, 2006-2010, Table B08301. Map created by Peter Bennett

### **New Orleans' (intermittent) bike boom**

Based on the conceptual models already described and the literature review that comprises the latter part of this chapter, this project is rooted in the idea that bicycle commuting is a complex behavior, and that the relatively high and upward-trending rate of cycling to work in New Orleans, along with substantial variation in bicycle commuting across the city, likely stems from a diverse set of variables. Mounting concern for the environmental and economic implications of fossil fuel-based transportation; the city's flat terrain and relatively compact development pattern; an influx of new residents in the aftermath of Hurricane Katrina (Lopez, 2012), many of them hailing from locales with strong cycling traditions; and the substantial population of low-income residents who lack access to personal automobiles are all contributing to New Orleans' higher-than-average bike-commute rate (Bruno, 2011; Cohen, 2011; Dequine, 2010; and Fields, 2011).



So, too, is the dramatic expansion of bicycle-friendly policies, programs and infrastructure since Katrina (Fields, 2011). As of June 2012, New Orleans boasted more than 50 miles of bikeways, including bike lanes, shared lanes and shared-use trails, compared with fewer than five miles worth in 2005 (Dan Jatres, personal communication, June 7, 2012), and further expansion was planned (Hinson, 2013) thanks in large part to “complete streets” legislation adopted by the City Council in 2011 (Cohen, 2011). This policy requires that accommodations for all users – including bicyclists, pedestrians and transit riders – be considered in designing city street projects.

These bike-friendly investments seem to be having an impact. Six months after the city’s first bike lane was installed there in 2008, a Tulane University study found that average daily bicycle ridership along St. Claude Avenue was up 57 percent from baseline figures recorded a year earlier (Parker, Gustat & Rice, 2011). More recently, the Pedestrian Bicycle Resource Initiative, a partnership of the Merritt C. Becker Jr. University of New Orleans Transportation Institute and the Regional Planning Commission, tracked bicycle ridership at 16 sites across the city and found an overall increase in observed ridership of 54 percent from 2010 to 2012, with the most significant gains recorded at locations that had seen considerable investment in bicycle infrastructure (Tolford, 2012). Observation points near marked bicycle facilities experienced an average increase in estimated daily bike traffic of 89 percent (Tolford, 2012).

New Orleans’ gains in bicycle-related amenities and ridership are attracting national attention. The League of American Bicyclists awarded the city its bronze-level Bicycle Friendly Community designation in 2011 (Williams). The National Complete Streets Coalition in August 2012 declared the city’s bike- and pedestrian-friendly streets policy a “model for the nation” (Eggler, 2012). And in May 2012, *Bicycling* magazine named New Orleans one of the top 50 most bike-friendly U.S. cities with populations of 95,000 or more (“America’s top 50,” 2012). The city’s No. 43 ranking fell well below those of top-rated Portland, Minneapolis and Boulder, but its inclusion at all was noteworthy. New Orleans had never before appeared on the list in the decades that the magazine has produced its rankings.

Since 2000, (see Table 2) the rate of bicycle commuting in New Orleans has risen almost 60 percent, from 1.19 percent as of the 2000 Census (U.S. Census Bureau, 2000b) to 1.9 percent according to the five-year ACS estimate released in 2011 (ACS 2007-2011c). Census tract-level analysis of bicycle-commute behavior included elsewhere in this paper relies upon five-year (2006-2010) ACS estimates, which were the most current available as of the start of this project and peg the bike-commute share at 1.8 percent. It is important to note the unprecedented population flux that has accompanied the intervening years as a result of Hurricane Katrina in 2005 that may have affected the rising bike commute rate and the city’s expanding bicycle-commuter ranks. Additionally, the U.S. Census Bureau tracks the journey to work through the American Community Survey, which bases its findings on a sample of the population. For this reason, the agency includes margin of error estimates with the data. These margin of error estimates, which are substantial relative to the total number of bicycle commuters, are based upon a 90 percent confidence level, which indicates the likelihood that the difference between the population value and the sample estimate is less than or equal to the margin of error.

**Table 2: Bicycle commuting in New Orleans, 2000-2011**

Year	Total bicycle commuters	Margin of error (+/-)	Total commuters	Percent bicycle commuters
2007-2011	2,609	366	136,341	1.9 percent
2006-2010	2,256	314	124,500	1.8 percent
2005-2009	1,972	334	133,163	1.5 percent
2000	2,187	N/A	183,675	1.19 percent

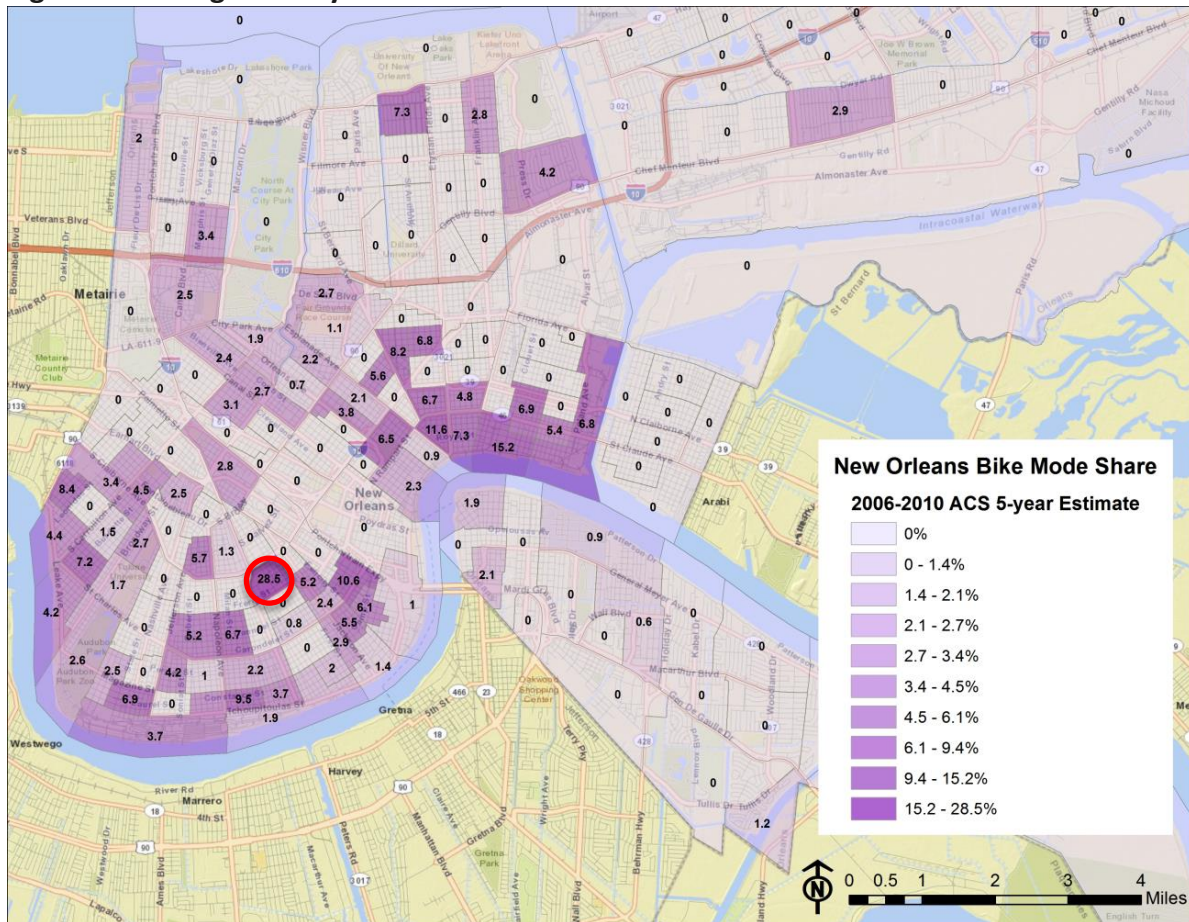
Source: U.S. Census Bureau, American Community Survey five-year estimates for 2009, 2010 and 2011. Table B08301. 2000 data from Census 2000, Table QT-2P3, Summary File 3. Total commuters tally does not include those who worked from home.

In examining ACS journey-to-work data on a census-tract level (Figure 2), it is apparent that residents of certain sections of the city are hopping on their bikes at a much greater frequency than others. Generally, the highest rates of bike-commuting activity are concentrated in older neighborhoods along the river, in Mid City, adjacent to City Park and Bayou St. John, and also in areas of Gentilly close to Dillard University, Southern University-New Orleans and the University of New Orleans.

By contrast, ACS data show bicycle commuting is virtually non-existent across much of the post-World War II landscape of the city, including in the lake-adjacent neighborhoods, in New Orleans East and on the West Bank, though in addition to those already mentioned in Gentilly, there are exceptions in each of those areas. In the census tracts that coincide with the Lakeview, Navarre and West End neighborhoods near Lake Pontchartrain, the historic Algiers Point section of the West Bank and the Read Boulevard West neighborhood of eastern New Orleans, for example, the ACS reports rates of bicycle commuting that are higher than the citywide average.

Moreover, while the downtown neighborhoods stretching along the river from the Bywater to the French Quarter are home to some of the highest concentrations of bike-commuting, the pocket of the city with the highest rate of bike commuting is in Central City, an area more readily associated with high rates of poverty and crime (Elliot, 2012; Morris, 2012). In this small section, which overlaps with the site of the former C.J. Peete public housing complex now redeveloped as the mixed-income Harmony Oaks neighborhood, it is estimated that more than 28 percent of commuters get to work by bike (ACS, 2006-2010a).

**Figure 4. The highest bicycle-commute rate in New Orleans**



The section of New Orleans with the highest rate of bicycle commuting, circled in red above, corresponds with the site of a former public housing project now occupied by the mixed-income Harmony Oaks neighborhood.

**Figure 5. Harmony Oaks apartments**



Harmony Oaks. Image courtesy nola.com

Those census tracts reported by the ACS as having no bicycle commuters are not necessarily devoid of any bicycling activity. Although the ACS provides an important approximation of cycling behavior, it is far from a perfect measure. As already noted, ACS figures are based on an estimate. In New Orleans, the five-year ACS estimate for 2006-2010, upon which the census tract analysis in Figure 2 relied, was based on a sample of 18,091 residents (ACS, 2006-2010b). Furthermore, the survey accounts only for work-commute trips, a fraction of a person's overall transportation behavior. These ACS data exclude the unemployed, those who work at home, those who are retired and those younger than 16. Finally, as representatives of the League of American Bicyclists and other observers point out, the very phrasing of survey questions could result in an incomplete picture of transportation behavior (Snyder, 2011). Respondents are asked only how they *typically* got to work in the previous week (see ACS journey-to-work questions in appendix B). They are also directed to record the mode used with the greatest frequency or for the greatest distance, leaving open the possibility that transportation mode choices made in the previous week were not representative of transportation behavior throughout the rest of the year, or that bicycling and other travel mode choices might otherwise be undercounted. If a respondent biked to work two days in the previous week and drove the other three, for example, only her driving would be counted. Despite these shortcomings, the ACS is a valuable tool that is widely used in assessing differences in cycling rates across the country. Its journey-to-work data serve as the only source of comparable travel-behavior information for all U.S. cities (Buehler & Pucher, 2011).

What, then, accounts for the rather large disparities in bicycle commuting across New Orleans? Why is it that some parts of this city seem to be teeming with bicyclists with rates of bike commuting that rival those of some of the most bike-friendly places in the country while others more closely resemble bicycle-phobic places like Dallas, where an estimated 0.2 percent of the population gets around by bike? (ACS, 2006-2010a). This question is the focus of the balance of this paper, beginning with a survey of the literature.

## **Literature review**

This section highlights key pieces of academic research related to factors that encourage, and in some cases, deter, utilitarian cycling. This effort does not reflect a comprehensive review of all the literature on this topic, which is voluminous. Rather, the overview provided here identifies recurring themes in the literature, along with factors that seem especially germane to the New Orleans experience, such as the role of crime and weather. For the sake of brevity and applicability, this section emphasizes research published in 2000 and beyond. The literature review is organized along three classes of variables, according to the scheme developed by Dill and Voros (2007): built and natural environment, perceptions and demographics.

## **Objective environmental factors**

### **The importance of bikeways and other infrastructure**

Bicycle-traffic counts in New Orleans have generally found higher levels of cycling in areas that are equipped with bike lanes and paths as compared with those areas that lack these facilities (Parker et al., 2011; Fields, 2011; Tolford, 2012). This is consistent with most of the research on

the role of bikeways that shows a positive relationship between bikeway supply and bicycle ridership (Buehler & Pucher, 2012; Krizek, Barnes, & Thompson, 2009; Nelson & Allen, 1997).

One of the largest and most recent studies to-date on the subject confirmed that those cities with a greater supply of bikeways tend to have higher bike-commuting rates. Buehler and Pucher (2012) measured the relationship between the scope of bikeway networks and cycling levels (as determined through ACS bicycle-commute data) in 90 of the country's largest cities. Controlling for a range of other factors that could influence cycling rates, including gas prices, climate and land use, the researchers found a significant positive relationship between the presence of bike paths and bike lanes and levels of bicycle commuting in cities. Importantly, their analysis did not account for shared lanes intended for use by both bicyclists and automobiles, which constitute a substantial share of New Orleans' bikeways.

Although their findings are consistent with the idea that bikeways could encourage more cycling, the researchers emphasize that their analysis does not prove that building more bikeways *causes* more biking. "Cycling levels and the extent of the bikeway network almost certainly affect each other, so that causation is probably in both directions," they write (Buehler & Pucher, 2012, p. 424). Bikeways may spur new ridership, but they may also be constructed in response to high levels of demand.

Despite the preponderance of research showing a positive correlation between bikeway presence and cycling levels, not all studies show a conclusive link between the two variables. Dill and Voros (2007), in an analysis of a 2005 telephone survey of randomly-selected adults living in the Portland area, found no relationship between the bikeway mileage located within a quarter mile of respondents' homes and respondents' self-reported tendency to be regular cyclists. The researchers concede this finding conflicts with those of much of the extant literature, and reason that it may be explained by the particular manner in which the variables were defined in the study or by a lack of connectivity of Portland-area bike lanes and paths. Interestingly, Dill & Voros (2007) also found that respondents who perceived the bike lanes and paths in their neighborhoods to be accessible and well-connected to desirable destinations were more likely to be regular and utilitarian cyclists. Furthermore, an inadequate supply of bike lanes and bike trails was among the top three factors cited by survey respondents as obstacles to utilitarian cycling. The most commonly cited (and potentially-related) reason was too much vehicular traffic.

There is evidence that the type of facility offered could make a difference in willingness to bicycle. Abraham, McMillan, Brownlee and Hunt (2002) found through an analysis of a stated-preference survey of downtown Calgary cyclists that respondents preferred bicycling on separated bike facilities and on low-traffic residential streets. Dill and McNeil (2012), in another survey of Portland-area adults, found that the type of bicycle facility is of particular importance to those most concerned about safety. In areas of high vehicular traffic, these respondents were significantly more comfortable riding on a separated facility than on a standard bike lane striped on roads shared with motor vehicles. Hunt and Abraham (2007) found through a stated-preference survey of existing utilitarian cyclists in Edmonton, Alberta, Canada that cyclists were

willing to travel longer distances where bike paths and lanes were available. Cyclists, unsurprisingly, also appear to prefer smooth cycling surfaces and continuous bicycle facilities (Stinton & Bhat, 2003; Parkin & Wardman, 2008).

End-of-trip accommodations, such as bicycle parking, showers and lockers, may also influence mode choice (Stinson & Bhat, 2003; Hunt & Abraham, 2007; Buehler, Hamre, Sorenklar & Goger, 2011; Akar & Clifton, 2009). Hunt and Abraham (2007) found through a stated-preference survey of utilitarian cyclists in Calgary, Alberta, Canada that both secure bicycle parking and showers were important, but that secure bike parking was especially important in influencing a person's willingness to bicycle to work-related destinations.

### **Weather and climate**

It would seem reasonable that the infamous heat and humidity and substantial rainfall that characterize life in a subtropical climate could dampen interest in bicycle commuting in New Orleans. Pucher et al. (2011) posit that high summer temperatures, a factor that policy interventions can do little to mitigate, could be one of the reasons that southern cities have been slower to embrace utilitarian bicycling. "Unless showers are provided," they reason, "arriving sweaty at the workplace can be a problem" (Pucher et al., 2011, p. 454).

A number of studies have found a correlation between weather and bicycling activity, with rain, cold and heat deterring cycling, though findings on the subject are sometimes conflicting. A study conducted in Vienna, Austria, found weather to be a statistically significant predictor of bicycling behavior for both recreational cyclists and bike commuters (Brandenburg, Matzarakis & Arnberger, 2007). Researchers conducted a regression analysis of data collected through intercept surveys, video monitoring and weather stations and found that temperature was a more important determinant of bike commuting than was rain. They also found that commuter cyclists were less sensitive to weather than were recreational cyclists.

Nankervis (1999) studied the effect of short-term weather and longer-term climate patterns on the willingness of college students in Melbourne, Australia to bicycle to campus. He found that bike commuting (as measured by the number of bicycles parked on three Melbourne university campuses) was highest in the summer and autumn, declined in winter and experienced a resurgence in spring. He additionally found that wind, rain and temperature all had statistically significant (though only weak to moderate) correlations with cyclist levels, with riders particularly sensitive to extremes of heat and cold.

Buehler and Pucher (2012), on the other hand, determined that the number of extremely hot or cold days were *not* especially strong predictors of bike-commuting levels. They also argue that the idea that weather stands as an insurmountable barrier to bicycling is challenged by the fact that the Mid West and Pacific Northwest are home to some of the strongest U.S. bicycle commuting rates, despite the bone-chilling or interminably rainy winter conditions that characterize those parts of the country.

Heinen et al. (2010) in a survey of the literature on utilitarian cycling, find that the most important weather-related factor is rain. The researchers also point out that a decline in cycling levels in winter could be related to fewer hours of daylight. Gatersleben & Appleton (2007) identified darkness as dampening interest in bike commuting among a group of infrequent commuter cyclists in the English county of Surrey.

### **Urban form and land use**

Cervero and Kockelman (1997) famously developed the shorthand “The Three Ds” to summarize what they labeled the core determinants of travel behavior relating to the built environment: density, diversity and design. Numerous studies since have confirmed the role of urban form and land use in influencing bicycling. Specifically, they have tended to conclude that more compact, densely-populated areas with high levels of connectivity, a mix of residential and commercial uses and other pedestrian-friendly design elements are associated with more bicycling (Cervero & Duncan, 2003; Saelens, Sallis & Frank, 2003; Buehler & Pucher, 2012; Cao, Mokhtarian & Handy, 2007; Buehler, Hamre, Sonenklar & Goger, 2011).

Shorter trip distances, often made possible by more mixed-use development patterns, are also positively associated with willingness to bicycle (Heinen et al., 2010; Rietveld & Daniel, 2004). Additionally, there may be some gender disparity when it comes to acceptable cycling trip distance. Heinen et al. (2010) point to studies showing that women bicycle shorter distances to work than do men.

As Rietveld & Daniel (2004) observe, even in the Netherlands, which boasts one of the highest rates of non-motorized transportation in the world and where 33 percent of all trips up to 7.5 kilometers are made by bicycle, the bicycling rate falls off substantially in low-density areas. The highest rates of bicycling in the Netherlands are found in medium-density areas, the authors point out, speculating that higher-density areas tend to require less cycling because of public transit and accessible destinations within easy walking distance.

The apparent link between land use patterns and higher or lower rates of active transportation has led some to question whether it is the shape of the built environment that is influential or whether people are simply moving to certain places in search of particular transportation options. This latter phenomenon is known as self selection. This issue is an important one that raises questions about the ability of design and policy interventions to influence transportation behavior.

Cao, Mokhtarian and Handy (2007), in a study of recently-relocated Northern California residents, determined that the influence of built environment variables, such as distance to daily needs like restaurants and grocery stores and the attractiveness of surroundings, exerted as substantial -- and in some cases more substantial -- influence over travel behavior than did socio-demographic factors such as gender, age and household income. Although they found that some lived in bicycling- and walking-friendly places on account of lifestyle preferences for those characteristics, the researchers also found a statistically-significant relationship between



changes in residents' built environment and their transportation behavior, and in particular their tendency to drive or to walk to destinations.

Naturally-occurring features of the urban environment have also been found to play an important role in cycling patterns. Relatively flat terrain is generally found to be more conducive to utilitarian cycling (Cervero & Duncan, 2003; Stinson & Bhat, 2003).

## **Subjective environmental variables**

### **Attitudes and culture**

Variables relating to the social acceptability of bicycle use are arguably key to explaining variation in bicycle commuting, but are not as well-represented in the literature. Thanks to their largely subjective nature and the fact that they rely entirely on self-reporting of attitudes in a potentially-sensitive arena, these factors are inherently difficult to define and calibrate.

Dill and Voros (2007) offer some evidence of the peer influence over cycling behavior. They found that people living in neighborhoods in which they frequently encountered cyclists and who lived or worked with regular cyclists expressed greater interest than those who did not in bicycling.

In another survey of Portland-area adults, Dill & McNeil (2012) found that "social support" (p. 19) may play an important role in influencing mode choice, especially among those who are interested in cycling but concerned about safety and other implications of bicycling for transportation. Those in this group who reported that they did not bicycle were less likely to live or work with people who did so or to "see people who look like them cycling on city streets" (p. 19).

Gatersleben and Appleton (2007) come to a similar conclusion in their study of a group of infrequent cyclists in the United Kingdom. "(M)any of those who have never contemplated cycling believe they would feel strange on a bicycle and that others would perceive it as strange," they write (p. 309). They further found that study participants who had never considered bicycle commuting perceived more barriers to the practice than did those who had considered or engaged in bicycling to work.

Research also suggests that possessing "altruistic and ecological beliefs" (Heinen et al., 2010, p. 72) is positively associated with cycling. Dill & Voros (2007) found that being concerned about air pollution and aware of the environmental benefits of cycling tended to be associated with greater interest in utilitarian cycling. Unsurprisingly, perhaps, so were a dislike of driving and enjoyment of bicycling (Dill & Voros, 2007).

## **Demographic variables**

### **Gender**

There is little disagreement in the literature that there exists in this country a substantial and persistent disparity between the sexes when it comes to willingness to bicycle (Moudon et al.,



2005; NHTSA, 2003; Akar & Clifton, 2009; Dill & McNeil, 2012) Men make a staggering 76 percent of all bicycle trips in the U.S. (Pucher & Buehler, 2008), a phenomenon that is not universal among developed nations. In countries such as Germany and Denmark, women make nearly as many trips by bike as do men; in the Netherlands, women make 55 percent of all bicycle trips (Pucher & Buehler, 2008). These three countries have been among the most successful in promoting bicycle-based transportation and boast high and growing rates of bicycling among all segments of society (Pucher & Buehler, 2008).

Dill and Voros (2007) found in a survey of Portland-area adults that men were not only more likely than women to be regular cyclists, but that men were also more interested than women in increasing their levels of cycling.

One reason offered as an explanation for the American gender disparity in bicycling is higher risk-aversion among women. (Pucher et al. 2011; Baker, 2009; Emond, Tang & Handy, 2009; Garrard, Rose & Lo, 2008). Countries such as the U.S. and Australia have heavily favored automobiles in policy and infrastructure design, making bicycling a more daunting activity, especially for less experienced riders (Emond et al., 2009). Garrard et al. (2008) found that female riders prefer off-road paths as opposed to unmodified roads and roads striped with bike lanes, concluding that female riders desire maximum separation from vehicular traffic possible. The researchers also point to previous research showing that Australian women were more likely than men to cite concerns about traffic and bad drivers as deterrents to cycling.

Safety concerns aside, differences in trip purpose may also influence the imbalance in bicycling between the sexes. Emond et al. (2009) point to research finding that women made more trips for “household and family support activities” (p. 17) than men. Bicycling may be a less convenient or viable option for these trips, which often involve the transportation of goods and passengers, including children.

There is some evidence that having children is negatively associated with opting for non-motorized modes of transportation. In a study based on data from the Scottish Household Survey, Ryley (2006) studied the relationship between life stage and mode choice among residents of Edinburgh, Scotland. He found that households with children were the most likely among the population to own bicycles but not use them for transportation. He also cites research showing that having a child increases a household’s likelihood of car ownership, a factor found to be negatively associated with cycling.

### **Age**

Research is fairly consistent in finding that bicycling declines with age in this country. Pucher and Buehler (2008) point to U.S. Department of Transportation data showing that the share of trips made by bike drops from 3.2 percent among children ages 5 to 15 to just 0.4 percent of trips among those 40 years of age and older. The 2002 National Survey of Pedestrian and Bicyclist Attitudes and Behaviors, which surveyed respondents 16 and older, similarly observed that bicycling declined fairly consistently with age. Whereas 39.1 percent of respondents ages 16 to 24 reported having ridden a bicycle at least once for any purpose in the preceding 30 days

in the summer of 2002, just 8.6 percent of those 65 and older responded likewise (NHTSA, 2003).

Dill and Voros (2007) found that those under 55 were most likely to be regular and utilitarian bicyclists and to wish to increase their levels of bicycling. Although health and physical ability declines with age, many in more bicycle-oriented countries continue to bicycle for transportation well beyond the age of accepted frailty in the U.S. For example, 7 percent of all trips made by Germans 75 and older are on bike, while Dutch who have crossed the septuagenarian threshold make an impressive 25 percent of all trips by bike (Pucher & Renne, 2003).

Several studies indicate that college students are among the population most likely to bicycle, (Dill & Carr, 2003; Pucher et al., 2011). As Nankervis (1999) observes, students tend to have more flexibility as compared with the general working population when it comes to time, dress and other elements of appearance. They often have access to facilities through the campus recreation center for showering and changing and even locking their belongings. College campuses also tend to have bike parking. Furthermore, college students' higher cycling rates are likely tied to youth, relative health and a tendency to have lower rate of access to automobiles (Nankervis, 1999). Nankervis (1999) also notes that college students tend to not have to commute during the height of the cold or hot seasons thanks to the academic calendar.

### **Income**

There appears to be little variation among income groups in terms of bicycling in this country. The American poor, it seems, bicycle at roughly the same rate as their wealthier counterparts (Pucher & Buehler, 2008; Pucher & Buehler, 2012). The 2009 National Household Transportation Survey found only a slightly higher bicycle mode share for all purposes existed among Americans who fell into the lowest income quartile (1.3 percent) compared with the top two income quartiles, where bicycle mode shares stand at 1 percent to 1.1 percent (Pucher et al., 2011).

Pucher et al. (2011) point to various other analyses of income and cycling levels and conclude that there does seem to be some variation in trip purpose according to income. "(I)t seems likely that low-income persons cycle mainly for work trips and other utilitarian purposes, while high-income persons may cycle more for recreation and exercise" (Pucher et al., 2011, p. 455).

Noting some contradiction in the literature about the effects of income on ridership, Heinen et al. (2010) conclude that higher income might improve one's ability to acquire a bicycle. Yet higher earnings also makes car ownership more affordable, which in turn could mean less bicycling.

There also may be a link between employment status and willingness to bicycle. Ryley (2006) found that students and those categorized as being between jobs and part-time workers without children were more likely to walk or bike.

### **Automobile ownership**

Although income doesn't seem to exert a major influence on bicycle mode share, car ownership does. "Income is the primary determinant of auto ownership, which, in turn, is the main determinant of modal choice," Pucher and Renne (2003) write in an analysis of 2001 NHTS data (p. 55), pointing to survey data showing that automobile ownership rises with household income. In households that did not own a car, the rate of bicycling for all trips as of the 2001 NHTS stood at 2.4 percent. That figure dipped substantially for households with even one car, which made 0.7 percent of trips by bicycle (Pucher & Renne, 2003). "The availability of cars appears to present an almost irresistible temptation to drive instead of walking or cycling, even for short trips," the researchers conclude (Pucher & Renne, 2003, p. 58).

Pucher et al. (2011) argue that car ownership has become increasingly important in determining bicycling mode share in recent years. They point to NHTS data showing that bike mode share in 2001 and 2009 was "more than twice as high for households without cars as for households with three or more cars" and that bike mode share increased the most among households that owned one car or no cars (Pucher et al., 2011, p. 455).

Conversely, Moudon et al. (2005) found in a 2002 telephone survey of Seattle-area adults that cyclists were more likely than non-cyclists to own one or more cars. But this finding may reflect in part the definition of cyclist used. For the purposes of this study, cyclists were defined as those who bicycled at least once per week for recreation, exercise or to get places.

### **Race and ethnicity**

The automobile is the dominant mode of transportation among all racial and ethnic groups (Pucher & Renne, 2003), yet non-Hispanic whites account for the vast majority of all bicycle trips in the United States (Pucher et al., 2011). In an analysis of NHTS data, Pucher et al. (2011) found that non-Hispanic whites accounted for 77 percent of all bike trips in this country. However, looking at change from 2001 to 2009 data, they found that bicycling rates are increasing most rapidly among African Americans, Asian Americans and Hispanics (Pucher et al., 2011).

The 2002 National Survey of Pedestrian and Bicyclist Attitudes and Behaviors, which interviewed members of the driving-age public in the summer of that year, found that 29.4 percent of those who had ridden a bicycle at least once for any purpose in the preceding 30 days leading up to the survey were Hispanic, while 27.8 percent classified themselves as non-Hispanic white, 22.5 as non-Hispanic black, and 25.4 percent as non-Hispanic "other" (NHTSA, 2003).

There appears to be some variation in trip purpose among different racial and ethnic groups. In an analysis of 2001 NHTS data, Pucher and Renne (2003) noted that whites were most likely to bicycle for recreation, while Hispanics most often were bicycling to get to work (Pucher & Renne, 2003). The researchers posited that differences in trip purposes likely reflected income disparities between racial and ethnic minorities and whites (Pucher & Renne, 2003).

Research additionally shows a substantial difference in travel behavior among immigrants to the United States as compared with native-born residents. Smart (2010) finds that immigrants, especially those who have lived in the U.S. for fewer than ten years, are more likely than natives to get around by carpool, transit and bicycling and walking.

## **Safety**

### **Crashes**

Absent the bodily protection provided by automobiles, cyclists are more vulnerable to serious injury in crashes than are motor vehicle drivers (Reynolds, Harris, Teschke, Cipton & Winters, 2009; Jacobsen, 2003). There is evidence that the risk of injury associated with cycling stands as a significant obstacle to increasing the cycling ranks in this country (Heinen et al., 2010).

The U.S. rate of cyclist injury is substantially higher than that of many European countries that boast much higher rates of bicycling (Reynolds et al., 2009). One analysis found a two- to three-times higher risk of fatality among U.S. cyclists as compared with cyclists in Holland and Germany and an eight-to-30-times higher risk of injury (Reynolds et al., 2009).

A growing body of evidence suggests that injury risk may decline as cycling rates rise; that there is, as the axiom goes, safety in numbers. This phenomenon may be linked to increased awareness among drivers in cities with lots of cyclists on the roads, and to stronger political clout in communities with high cycling rates that improves the likelihood of achieving cycling-related policy and infrastructure gains (Reynolds et al., 2009).

In their review of 23 international studies on bicycle infrastructure and safety, Reynolds et al. (2009) found that much of the research suggests bike lanes and routes substantially reduce the risk of injury as compared with roadways without bike-specific accommodations. Also important to improving safety for cyclists were well-paved bikeways and good nighttime lighting.

Jacobsen (2003) found that in places where more walking and bicycling occurs, the rate of motorist collisions with walkers and cyclists declines. He proposes this non-linear relationship is largely related to changes in motorist behavior where higher rates of cycling and walking are found. He further suggests that drivers in such places are more likely to be occasional cyclists and walkers themselves and are thereby more sensitive to the needs of non-motorists. He concludes that policies aimed at increasing active transportation could improve the safety of walkers and cyclists. Buehler et al. (2011) note that causation here is likely bilateral. Places with better cyclist safety records may have an easier time of attracting new cyclists, and higher levels of cyclists make cycling safer. Furthermore, those places with high levels of cycling are likely to have more expansive and sophisticated cycling infrastructure.

## **Crime**

In a city like New Orleans where the murder rate makes national headlines and violent crime is a fact of life for many, it would seem reasonable that the threat of crime, whether real or perceived, would serve as a deterrent to bicycling. Relatively little attention has been paid in

the literature to the role of crime in influencing mode choice, however.

One of the few recent studies on this topic was conducted by Ferrell, Mathur and Mendoza (2008). The researchers analyzed crime and travel survey data from the San Francisco Bay area to gauge the effects of neighborhood crime on mode share. Their findings offer some support for the hypothesis that higher rates of crime are associated with lower rates of non-motorized transportation. Notably, however, they also found that higher crime rates were significantly and positively associated with walking for non-work trips in San Francisco. They concluded that this finding may be the result of self-selection bias – that many living in San Francisco did so because they valued getting around by means other than driving. It is also possible that those living in high-crime areas are lower income and have fewer transportation options available to them.

Gomez, Johnson, Selva and Sallis (2004) studied 7<sup>th</sup> graders living in an urban barrio in San Antonio, Texas and found that levels of violent crime in the children's neighborhoods and a sense that their neighborhoods were dangerous were significantly and inversely related to levels of outdoor physical activity for female study participants, but not for male participants.

### **Key findings**

This survey of the literature highlighted important pieces of research related to variables that seem to affect bicycling rates.

In summary:

- Most of the literature suggests that bikeway availability is positively and significantly associated with levels of cycling, though it is likely that causation runs in both directions. There is also evidence that the type and shape of facilities and end-of-trip accommodations such as showers and secure bike parking exert important influence over a person's willingness to bicycle.
- Research generally suggests that factors related to the built environment influence people's likelihood to bicycle, with more compact, mixed-use, bicycle and pedestrian-friendly development patterns tending to be associated with higher levels of cycling. The topography of an area may also be a significant factor, with flat terrain more conducive to cycling.
- Several studies suggest weather and climate patterns exert substantial influence over bicycling behavior, though some of the literature point to some certain weather-related factors being more important than others. Some research suggests that rain, wind and extreme temperatures are statistically significant predictors of cycling, while rain may be the most important weather-related factor. There is also evidence that commuter cyclists are less influenced by weather conditions than are recreational cyclists.
- It makes intuitive sense that perceptions about the social acceptability of cycling would carry significant sway in an individuals' willingness to bicycle, though related factors are inherently difficult to measure and isolate. The literature does suggest that social norms exert important influence over cycling interest, with those who live and work among regular cyclists more likely to be willing to consider the practice than those who do not.
- Far fewer women than men bicycle for transportation in this country, a result generally

attributed to higher risk aversion among women than men and the fact that women tend to be tasked with taking care of household and family-related duties that may make cycling less convenient.

- Age appears to be an important predictor of cycling in this country. Generally, cycling levels are negatively associated with age.
- Research has found little variation by income in bicycling.
- Car ownership appears to play an important role in a person's willingness to bicycle for transportation. Most of the research suggests that utilitarian cycling drops off substantially in households that have access to even one automobile. Moudon et al. (2005) offer a somewhat contradictory finding in a study that found cyclists are more likely than non-cyclists to own cars. But this study was designed to gauge all types of bicycling, not just bicycling for transportation, and the results may be influenced by recreation and exercise-related cycling.
- National surveys suggest that non-Hispanic whites make the vast majority of bicycle trips in this country, but that cycling is increasing most rapidly among members of racial and ethnic minority groups. There is also evidence that immigrants are more likely than those born in this country to opt for alternative modes of transportation including bicycling.
- There is evidence that the risk of cyclist injury through collisions or crashes is a deterrent to bicycling in this country. Research also suggests that places with higher rates of cycling tend to have fewer cyclist crashes and injuries.
- The literature is light on research on the role of crime and mode choice, though there is some evidence that higher levels of crime may provide an obstacle to non-motorized modes of transportation.

### **Chapter III. Who do I call if my bike breaks down? Analyzing a citywide survey on cycling attitudes, motivations and obstacles.**

Research Questions:

1. What parts of New Orleans have the highest and lowest rates of bicycle commuting?
- 2. What are some of the factors encouraging and discouraging cycling locally?**
  - a. What does the literature reveal about factors that influence rates of bicycling for transportation?
  - b. What do city residents say?**
  - c. What do neighborhoods say?

#### **Purpose and methodology**

A survey designed to gauge commuting behavior and attitudes and the various factors influencing respondents' bicycling habits was conducted online using the survey software Qualtrics. A web-based survey method was chosen for cost-savings, environmental reasons and to promote ease of use and analysis. These benefits are balanced against the downsides of a web-survey, most notably, that the survey is skewed toward Internet users.

Several iterations of the survey were produced and pilot surveys conducted in developing the final survey instrument, which consisted of 26 questions and required around 10 minutes to complete. A brief introduction at the start of the survey advised of its purpose and that the instrument was restricted to New Orleans residents 18 and older. A copy of the survey instrument and detailed results can be found in appendices C and D.

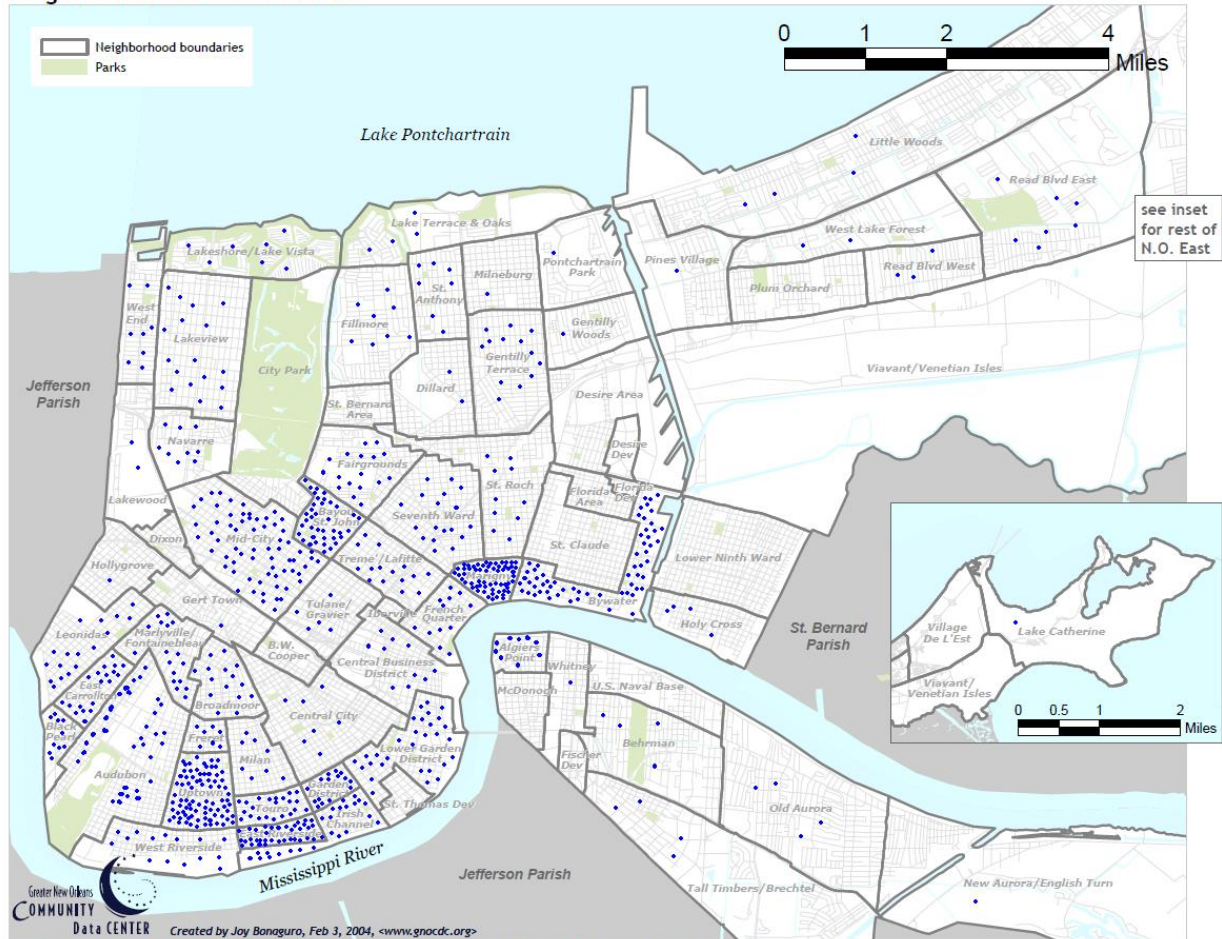
Survey results were collected between Oct. 17, 2012 and January 7, 2013. The author disseminated the survey with the help of neighborhood, nonprofit and faith-based organizations; by emailing the survey link to local colleges and universities; through social media; and other channels. Additionally, an article on the project appeared on the website nolavie.com on Dec. 2, 2012. A copy of the article can be found in appendix E.

## Socio-demographic characteristics of survey participants

A total of 949 surveys were started and 807 completed, for an 85 percent completion rate. Respondents claimed residency in 56 of 68 neighborhoods provided survey takers as options (see Figure 4). A majority of New Orleans neighborhoods are represented, though survey takers were concentrated in certain areas. Figure 5 highlights the 11 neighborhoods with the highest frequencies of survey participation.

**Figure 6. Where survey takers lived**

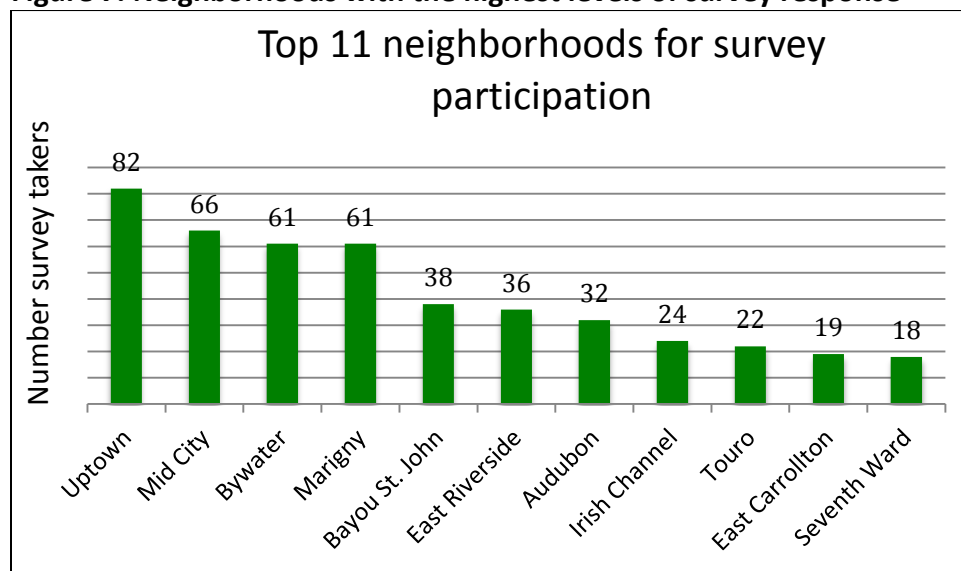
Neighborhoods in Orleans Parish



Dots are randomly distributed within each neighborhood and do not pinpoint any one address.



**Figure 7. Neighborhoods with the highest levels of survey response**



A majority of survey takers were white, working women who typically drove to work, had access to a car and possessed at least a bachelor's degree. The ages of survey takers ranged from 18 to 88, with a median age of 36, roughly on par with the citywide median age (U.S. Census Bureau, 2010b). As shown in Table 3, the sample represented by survey takers was much whiter than the city at large. It was also characterized by larger proportions of women and households with cars. And although most survey takers typically got to work by driving, the sample contained a much higher rate of regular bike commuters than does the city's population. The sample is also relatively well-educated. Of the 811 respondents who provided information on their academic backgrounds, 88 percent had attained at least a bachelor's degree. Citywide, just 18.3 percent of residents 25 and older have a bachelor's degree (ACS, 2006-2010f). Income for this group ran the spectrum, from less than \$15,000 to more than \$100,000. Because respondents were asked to provide an income range instead of an exact figure, it is tough to compare income for the group against the citywide median income of \$36,721 (ACS, 2006-2010c). Still, the sample appears to be a relatively affluent group. The largest income group (accounting for 24 percent of the 773 respondents who answered a question about income) comprised households earning \$100,000 or more. The second largest group (accounting for 20 percent of respondents) came from households earning \$50,000 to \$74,999.

### **Commuting habits**

Of 811 respondents who answered the question about employment status, seventy-two percent traveled to work. Of the remaining 28 percent, 7 percent said they worked for pay inside the home, 2 percent said they were looking for work, 2 percent described themselves as home makers or stay-at-home parents, 7 percent said they were students (though in a separate question, 24 percent of 897 respondents said they traveled to school, suggesting that a number of survey takers worked and went to school), and 6 percent said they were retired. Another 5 percent claimed some "other" employment situation. Among those who commuted to work

and who provided distance traveled between home and work, the range was 0.2 to 55 miles, with a median distance of 4.3 miles.<sup>12</sup>

### **Bicycle access**

Also notable is that 88 percent (of 919 respondents who answered this question) own or have access to a bicycle. Less than 6 percent (of 814 respondents) claimed health problems that prevented them from riding a bicycle.

**Table 3. Select characteristics of survey participants and city residents**

	Percent female	Median age	Percent bike commuters	Percent white <sup>3</sup>	Percent carless households
<b>Survey takers</b>	58 percent <sup>4</sup>	36 <sup>5</sup>	23 percent <sup>6</sup>	87 percent <sup>7</sup>	9 percent <sup>8</sup>
<b>New Orleans</b>	51.6 percent <sup>9</sup>	35	1.8 <sup>10</sup>	33 percent	19 percent <sup>11</sup>

## **Results and discussion**

### **Current utilitarian cycling behavior and interest**

Because this survey was not distributed randomly, it is subject to self-selection bias, and likely favors those interested in bicycling. It is not surprising, then, that this sample is dominated by people accustomed to bicycling with some level of frequency, whether for recreation or transportation. More than half (57 percent of 905 respondents) said they had bicycled on the streets of New Orleans for any purpose including recreation within two weeks. Just under half (47 percent) said they had done so within the week. Less than a quarter (19 percent) said they couldn't remember the last time they rode a bike or that they had never ridden a bicycle in New Orleans.

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<sup>1</sup> Eight hundred fifty nine respondents answered a question about distance to work. Of the 177 that provided an actual distance, the range was 0.2 to 55 miles, with a median distance of 4.3 miles to work. Respondents were asked to write NA if they did not work or if they did not travel to work. Seven hundred ninety three respondents entered NA and another four entered 0. Given that just 28 percent of respondents indicated in a separate question that they did not travel to work, some of those who wrote NA may have done so to indicate that they did not know the distance to work.

<sup>2</sup> Not including Asians, those who claim some other race or those of two or more races

<sup>3</sup> Of the 810 respondents who provided their gender

<sup>4</sup> Of the 805 respondents who provided their age

<sup>5</sup> Of the 905 respondents who answered a question about typical commute mode

<sup>6</sup> Of the 809 respondents who answered a question about race

<sup>7</sup> Of the 907 respondents who answered a question about access to a vehicle

<sup>9</sup> Census 2010b

<sup>10</sup> ACS 2006-2010a

<sup>11</sup> ACS 2006-2010d

As already noted, the survey sample contains a relatively high concentration of regular bicycle commuters. Almost a quarter of those surveyed said they typically got to work by bike, and 43 percent (of 877 who responded to the question) said they used a bike to get to work or school with any frequency (whether “occasionally,” “frequently,” or “almost always”). Roughly 57 percent (of 877 respondents) indicated that they never used a bike to get to work, though this figure could be inflated by respondents who are unemployed, retired or who do not travel to work.

A higher proportion of survey takers reported using bicycles to get to places other than to work. Sixty-seven percent (of 893 respondents) said they bicycled for transportation purposes such as running errands and visiting friends. Thirty percent (of 893) said they did so either “frequently” or “almost always.” Thirty-three percent (of 893) said they never bicycled for non-work transportation.

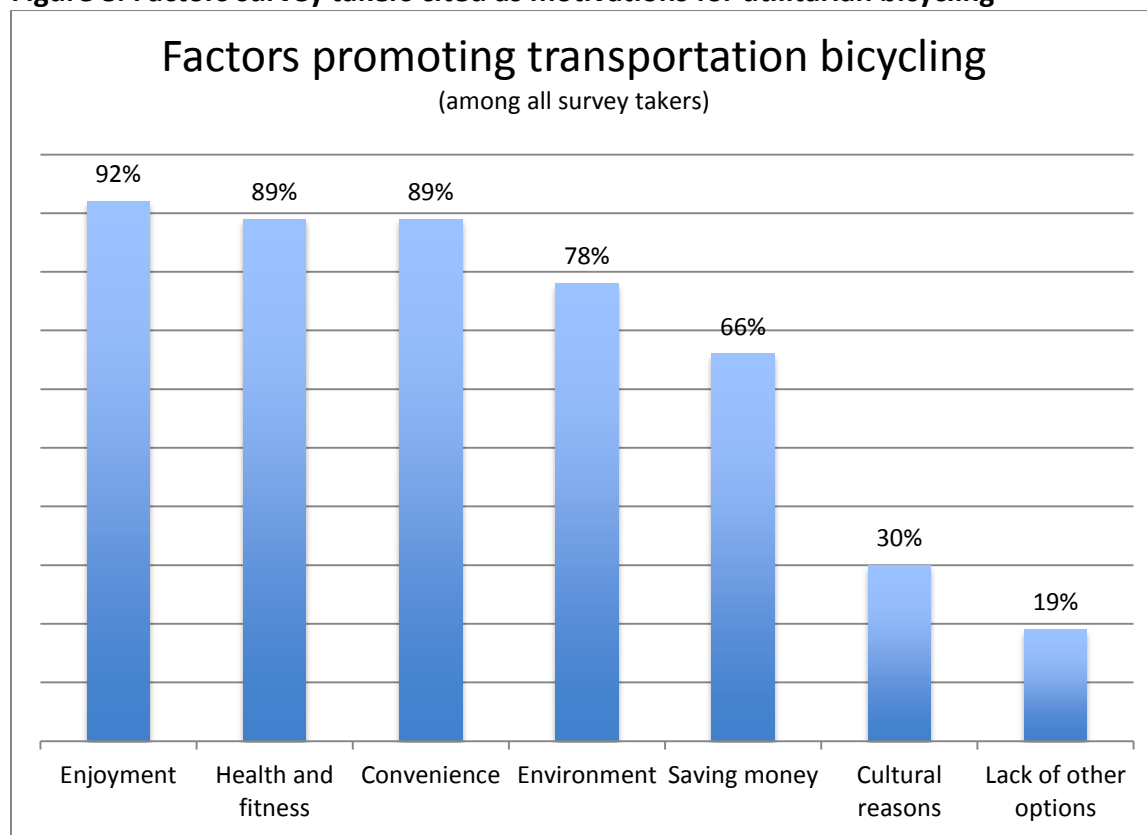
Interest in utilitarian cycling among survey respondents was stronger than practice. Of 900 respondents who answered a question about interest in traveling to work or school by bicycle, 56 percent indicated that they would like to bicycle to these destinations either “frequently” or “almost always.” Three-quarters said they would like to do so with any frequency (“occasionally,” “frequently,” or “almost always”). Only 14 percent said they would not like to travel by bicycle to work or school with any frequency. Eleven percent said they did not travel to work or school.

Interest in utilitarian cycling for purposes other than traveling to work was even more pronounced. Ninety-six percent (of 897 survey takers) said they would like to use a bike to get places other than to work or school with any frequency. Sixty-nine percent said they would like to do so either “frequently” or “almost always.” A meager 4 percent expressed no interest in using a bicycle for this purpose.

### **Why do survey respondents bicycle for transportation?**

Respondents who indicated that they currently bicycle for transportation with any frequency were directed to a multi-part question that asked them to rate the importance of a list of factors in encouraging their bicycling behavior. Survey takers were asked to indicate whether each was “not at all important/not applicable,” “neither important nor unimportant,” “important,” or “very important.” Factors rated either “important” or “very important” are summarized in Figure 8. A detailed table showing the number of respondents who answered this question can be found in appendix D.

**Figure 8. Factors survey takers cited as motivations for utilitarian bicycling**



Based on the proportion of survey takers who rated it either “important” or “very important,” enjoyment was the most commonly-cited motivating factor. Bicycling “feels good, it makes me happy, I see more and feel more connected to my lovely neighborhood,” wrote one survey-taker in space provided for adding influences not explicitly named in the survey. “It’s just FUN!!!!” wrote another.

Health and fitness and convenience were also cited by the vast majority of survey takers as “important” or “very important.” Some wrote that they bicycled because it led to improved mental health. As one survey taker wrote: “My head is clearer when I arrive at work or home.”

Numerous respondents elaborated on the various convenience-related considerations that encouraged them to bicycle. Several explained that bicycling allowed them to avoid traffic and parking hassles, that it was in some cases faster than driving, and that it provided an alternative to the city’s sometimes-unreliable public transit system.

Environmental reasons, such as concern about carbon emissions generated by driving, were cited by 78 percent of survey takers as an “important” or “very important” factor that motivated bicycling. Economic considerations were also “important” or “very important” for more than half (66 percent) of the survey takers. Some wrote in the space provided for comments that they couldn’t afford a car or the associated maintenance and insurance costs.

One person indicated, perhaps in jest, that he or she bicycled to avoid traffic cameras that ticket drivers for violating traffic rules.

Close to a third of respondents indicated that cultural influences, such as knowing lots of people who bicycle, were motivating factors in their own decision to bicycle for transportation. A number of people wrote that their bicycling behavior served in part as a political statement. “Piss off a Republican: ride a bike,” advised one survey taker. Others revealed less adversarial intentions, saying they bicycled to raise more awareness of bicyclists among city drivers and to encourage others to take up the practice.

Other social motivations figured strongly in written responses. Several survey takers suggested that bicycling promoted community engagement, allowed for interacting with neighbors and meeting new people, and for spending quality time outside with friends and family.

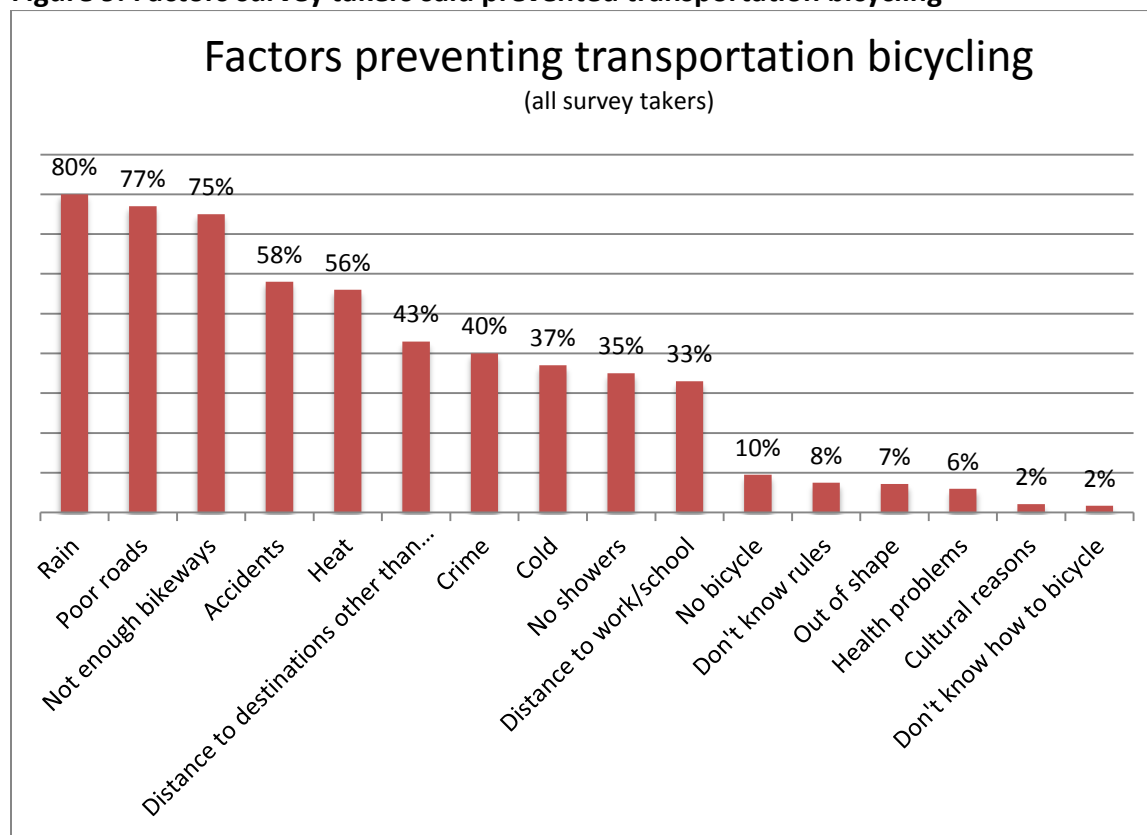
One of the most common write-in factors was avoiding drinking and driving, a consideration mentioned by 21 survey takers. “I would never overindulge and bike, but it is nice even after just going for a beer,” one wrote. “Less likely to get a DUI on a bike,” said another. And while safety from crime is a concern of many bicyclists, one survey taker wrote that he or she bicycled to *avoid* crime. Bicycling, the respondent said, is “safer than walking, especially at night.”

Much has been made of the effect that the addition of bikeways has on encouraging bicycling. Although the presence of bikeways was not included in the list of motivating factors provided to survey takers, one respondent wrote that the addition of new bike lanes, paths and shared lanes throughout the city had “greatly” increased his or her use of the bicycle as a mode of transportation.

### **What are the barriers to utilitarian bicycling?**

All respondents, including regular utilitarian cyclists and those who never ride a bike, were asked to rate the importance of a list of factors in *preventing* them from bicycling for transportation. Figure 9 summarizes the results. A detailed table showing the number of respondents participating in this question can be found in appendix D.

**Figure 9. Factors survey takers said prevented transportation bicycling**



Rain was the most commonly-cited impediment to utilitarian cycling among survey respondents. Heat, another inescapable characteristic of life in New Orleans for much of the year, was also cited by more than half (56 percent) of survey takers. Providing showers at destinations would seem to be one way of addressing problems associated with the hot, sticky weather, yet just more than a third of respondents indicated that the absence of showers at destinations was a major impediment to bicycling. One survey taker wrote that she worried about wrinkling her work attire en route on a bike. Another listed “helmet hair” as a deterrent.

Safety concerns appear to be a substantial barrier to cycling among survey respondents, 58 percent of whom indicated that the threat of accidents affected their willingness to bicycle for transportation. Fear of city drivers was a common theme among those who wrote in additional constraints. “I don’t want to be victimized by motorists who hate cyclists because they take up too much space and go too slow,” said one. Several also mentioned drunk drivers as a source of concern. Others pointed to specific sites that they felt uncomfortable navigating by bike, such as “the underpass of I-10” where “there’s no shoulder and it can be really scary to get through.”

Likely related to the safety issue are substantial concerns among the survey sample about the state of the city’s cycling infrastructure. Poor roads and insufficient bikeways were among the top impediments cited by respondents. “The bike paths that do exist don’t necessarily go where I want,” wrote one survey taker. Forty percent of respondents also listed fear of crime as a

significant deterrent, and a few listed specific crime-related concerns. These included poorly-lit streets, schedules that require traveling late at night, and “no route to and from work that doesn’t involve sketchy neighborhoods.”

Distance to destinations was rated as a major deterrent to bicycling by a substantial proportion of respondents, yet fewer than half (43 percent) indicated that distance to work or school was a pressing concern (either “important” or “very important”). Even fewer (35 percent) cited distance to destinations other than work or school as a significant (“important” or “very important”) obstacle. Some indicated that they didn’t have the time required to get places by bike. Others said that because their neighborhoods didn’t provide the types of amenities they needed, they were required to make trips far outside their neighborhoods for which bicycling was untenable. “Real urban shopping in Gentilly is not possible,” wrote one survey taker. Said another, “I live in Algiers and have only a few good places to bike to.”

Although cited infrequently by this sample, it is worth noting the proportion of respondents who indicated that a limited understanding of bicycling rules (7.5 percent) or not knowing how to ride a bike (1.7 percent) were “important” or “very important” to preventing them from bicycling for transportation. “Riding a bike is scary because I’m not good at it,” wrote one survey taker. Another respondent expressed hesitation about managing basic bicycle repairs, asking: “Who do I call if my bike breaks down on the road?” Given that this sample is dominated by people who bicycle at least occasionally on city streets, it seems likely that a random sample of city residents would result in a higher proportion of people impeded by a lack of cycling and bike-maintenance know-how.

A small percentage of survey takers also cited cultural barriers as obstacles to bicycling. One wrote that having friends who preferred to get places by driving instead of bicycling served as a deterrent. Wrote another, “I don’t want to fall into the stereotype of a white person on a bike.”

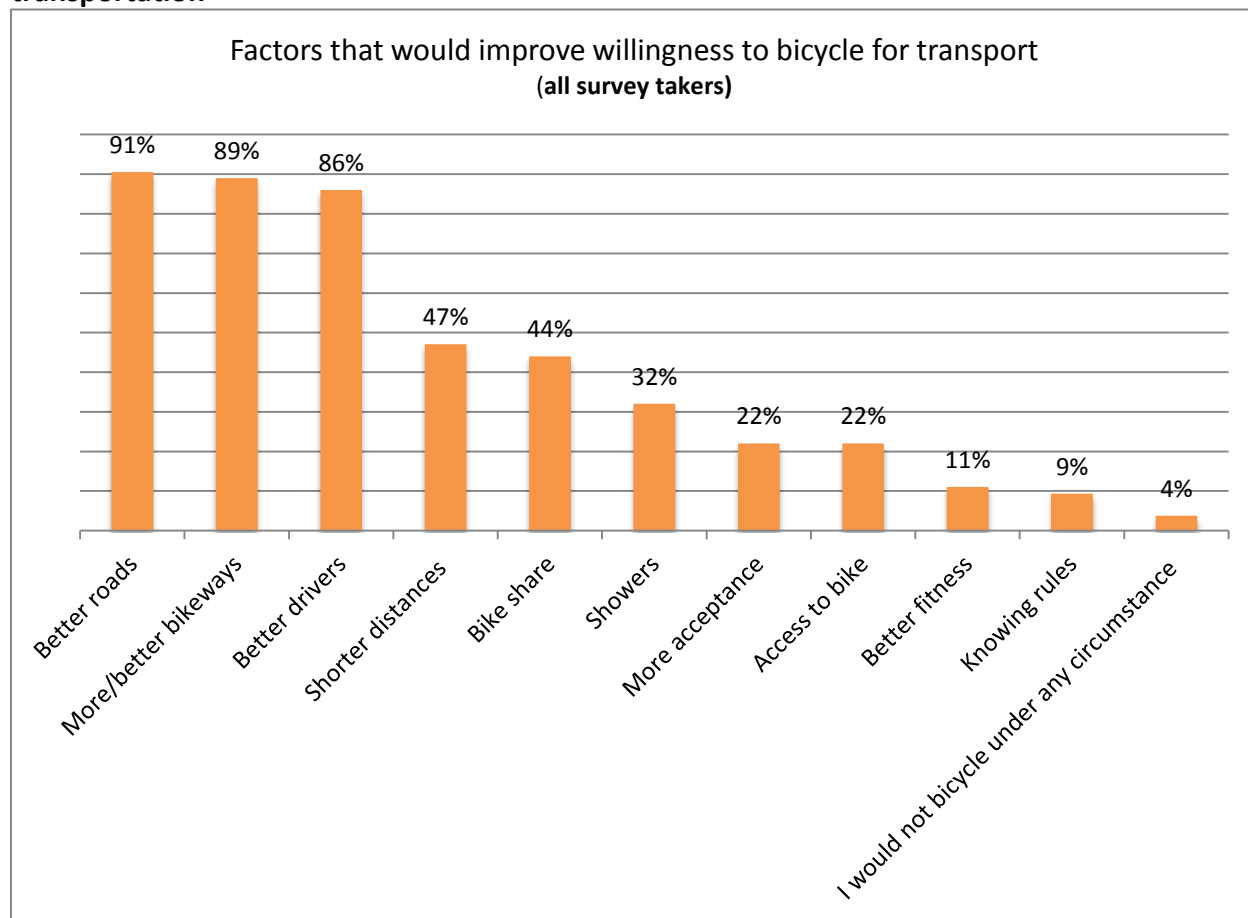
Several factors appeared as recurring themes in the space provided for comments and therefore merit mentioning:

- Children: A number of respondents said bicycling was infeasible thanks to safety, time and related concerns involved transporting young children to and from school and other activities.
- Cargo capacity: Several mentioned capacity constraints related to transporting everything from groceries to dogs to work tools. “I need a whole lot of stuff with me for the day (multiple school books, work out bag, coffee mug, lunch, water bottle, extra sweatshirt for air conditioning),” one wrote. “This is problematic without a car trunk at my disposal.”
- Secure bicycle parking: Several cited as deterrents to bicycling insufficient or inadequately-secured bicycle parking, the hassles of finding a place to lock up and concern about bike theft.

### What would make survey respondents more likely to bicycle for transportation?

All survey takers were asked to rate the importance of a list of factors in making them *more likely* to get places by bicycle. Respondents were also given the option to indicate that they would not bicycle for transportation under any circumstance. Figure 10 provides a summary of the responses. A detailed summary of responses can be found in appendix xxx.

**Figure 10. Factors survey takers indicated would increase their willingness to bicycle for transportation**



Overwhelmingly, survey takers suggested that they would be willing to bicycle for transportation given the right set of circumstances. Just nine respondents said that they would not bicycle under any condition.

The two factors respondents most frequently named as positively affect their bicycling behavior related to improved city infrastructure. The vast majority of survey takers indicated that smoother roads (rated "important" or "very important" by 90.5 percent of survey takers) and more or better bikeways (rated "important" or "very important" by 89 percent) would encourage them to bicycle more.



Numerous written comments indicated a preference for dedicated bicycle facilities, as opposed to the shared lane markings commonly installed on New Orleans streets. One suggested that bikeways should be configured in the manner preferred by many European (and now some American) cities in which the bicycle lane is placed between the sidewalk and a row of parked cars to better protect cyclists from crashes with moving vehicular traffic. Another said more attention needed to be paid to “hotspots,” such as bridges and interstates that require more specialized infrastructure to make crossing more feasible and less dangerous.

Most (86 percent) also said improved driver behavior was key. Several suggested that the city undertake a public safety campaign aimed at improving driver awareness of bicyclists’ legal rights to the road and said that better enforcement of traffic laws was needed. A few said they would be more likely to bicycle if fellow cyclists better adhered to bicycling rules.

Close to half of survey takers (47 percent) said shorter distances to destinations would make them more likely to bicycle to get places, while around a third said showers at those destinations would provide an important incentive. Forty-four percent cited a bike share program that would allow them to check out bikes from kiosks set up around the city as an important enticement. “As a West Bank resident, I wish I could ride a bike around the city without having to ride all the way to the ferry or bring my bike in my car across the river,” wrote one respondent. Twenty-two percent said access to a bike would serve as an important motivator to bicycle. Some wrote that they could not afford the type of bicycle that they would wish to ride for transportation.

Just under a quarter of participants also indicated that more acceptance of bicycling among their friends, coworkers or employer would improve their willingness to bicycle. “Acceptance of an attorney in clothing suitable for riding a bike,” wrote one. Another suggested that employers offer financial perks to encourage employees to bicycle.

It worth noting the frequency with which respondents mentioned concerns specific to parenthood – the need to shuttle around children – as negatively affecting their willingness to bicycle for transportation. Although survey takers were not directed to assess the role that children played in influencing their transportation behavior, numerous survey-takers independently listed related considerations, signaling that the needs specific to transporting children is an important concern among some living in these neighborhoods. As one survey-taker wrote:

In my and many cases, it is not feasible for many reasons to bike with the kids to school and then to work. So while I would like to ride more, I just can’t because I am taking kids to/from school and extra curricular activities. So without better public transportation and good neighborhood schools this won’t change.

Another parent wrote that “closer schools” would serve as an important motivator to bicycle, one of several who listed having to drive children across town to school and other activities as a

barrier to biking to work. One parent said she felt unsafe bicycling with her young daughter in tow in New Orleans, but noted that in other cultures, children's safety on bicycles is a non-issue. "I just came back from Amsterdam and they don't wear helmets, kids sit on random crates," she wrote. "None of it, by appearance, seems safe, but it felt so much safer than in New Orleans because everyone was on their bike, and there were designated places for people to ride."

Several other considerations were repeatedly mentioned in the space provided for comments:

- Crime: Several said reduced crime rates and better lighting would make them less leery of bicycling, especially at night.
- Bike parking: More -- and more secure -- bicycle parking was a factor cited numerous times, along with a corresponding concern about bicycle theft.
- Cargo capacity: One survey taker wrote that she would be more likely to bicycle "If I had a bike that could hold both puppy and child."
- Linkages with other modes: Some respondents said making better connectivity between bicycling and public transit would make utilitarian cycling more feasible. One noted that streetcars, unlike city buses, are not equipped to carry bicycles.
- More public convenience facilities: Some said bike maintenance kiosks equipped with bike pumps and other tools, and public lockers and more water fountains would encourage them to bicycle more.

### **The most and least willing cyclists**

Regular utilitarian cyclists represent an uncommon breed in the United States. They are a group that tends to comprise some of the most-motivated cyclists and one undeterred by various conditions that might dissuade the less dedicated. They also represent a constituency that is arguably among the best-equipped for the practice, possessing the physical ability, access to gear and cycling know-how that enables them to regularly engage in the practice. Yet even as these characteristics may set them apart from the general public, those who frequently use their bicycles as a mode of transportation are a valuable barometer of the ease and barriers to transportation cycling. After all, they are the ones routinely navigating city streets and traffic on bicycle.

Those curious about utilitarian cycling but reluctant for various reasons to take up the practice represent a much larger constituency than do regular bike commuters (Dill & McNeill, 2012). In terms of increasing a city's cycling ranks, this group's perceptions are arguably more important than those of the dedicated and are immensely valuable in terms of shaping policies that might convince more people to take up utilitarian cycling.

Portland bike coordinator Roger Geller developed a typology of utilitarian cyclists in his city that has been adopted by other bicycling advocates and researchers (Dill & McNeill, 2012). Based on their interest, ability and comfort with transportation cycling, Geller grouped would-be bicyclists into four categories. These were: 1) Strong and fearless: that minority group willing to ride no matter the conditions; 2) Enthused and confident: those who may ride regularly for

transportation and who are comfortable riding in traffic but who tend to prefer bike-specific accommodations such as bike lanes; 3) Interested but concerned: referring to people who are curious about bicycling and who may even ride on occasion but who are fearful of or otherwise prevented from routinely engaging in the practice; and 4) No way, no how: those unwilling or unable to bicycle for transportation under any circumstance.

Survey responses suggest that each of these typologies is represented in this study sample. As the aim of this project is to explore reasons why people are bicycling for transportation in New Orleans and also why they are not, this section briefly considers the characteristics and attitudes specific to bicycle commuters surveyed, and also those of respondents who express interest in bike commuting but who typically get to work by other means. In keeping with Geller's typology, survey takers who regularly got to work by bike are categorized as "enthused and confident." Those who said they were interested in commuting but who typically got to work by some other means are deemed "interested but concerned."

### **Enthused and confident**

Two-hundred twelve survey takers (22 percent of all who started the survey) indicated that they primarily got to work by bicycle. Of this number, almost three-quarters (72 percent) owned or had access to cars. Exactly half of the bike commuters who provided their gender were female. Of those who provided their age, the range was 20 to 80, with a median age of 30. The vast majority (90 percent) of bike commuters who provided information on race described themselves as white. The second largest group (5 percent) claimed some "other" race, and 2 percent each described themselves as black and Asian Indian. Roughly 9 percent (of 197 who responded to this question) additionally claimed Hispanic or Latino origin. Bike commuters represented every household income category listed, from less than \$15,000 to more than \$100,000. Among those who provided income information, 18 percent reported annual household income of less than \$15,000, 13 percent reported household income of \$100,000 or more, and 37 percent said their household income was greater than \$50,000. About 86 percent reported having at least a bachelor's degree.

Table 8 offers a comparison of socio-demographic characteristics of bike commuters surveyed and the general sample of respondents. Relative to the general survey sample, the bike commuter sample was proportionally more male, contained a larger percentage of households earning less than \$15,000, and was also younger and whiter, with a higher percentage of carless households and a slightly lower rate of bachelor's degree holders. The bike commuter sample also included a slightly higher proportion of students than the overall survey sample. Additionally, the median distance traveled to work among bike commuters was almost two miles less than for the general sample.

**Table 4. Socio-demographic characteristics of bike commuters and all survey takers**

	<b>Surveyed bike commuters</b>	<b>All survey takers</b>
<b>Percent female</b>	50 percent <sup>12</sup>	58 percent
<b>Median age</b>	30 <sup>13</sup>	36
<b>Percent white<sup>14</sup></b>	90 percent <sup>15</sup>	87 percent
<b>Percent carless households</b>	28 percent	19 percent
<b>Percent bachelor's degrees</b>	86 percent <sup>16</sup>	88 percent
<b>Percent income less than \$15,000</b>	18 percent <sup>17</sup>	11 percent
<b>Percent current students<sup>18</sup></b>	25 percent <sup>19</sup>	24 percent <sup>20</sup>
<b>Median distance to work</b>	2.5 miles <sup>21</sup>	4.3 miles

Bike commuters surveyed came from 33 of the 68 New Orleans neighborhoods provided survey takers as options. The largest number of bike commuters surveyed lived in Bywater, a neighborhood described in some detail as part of the case study that comprises the next chapter.

#### **Current utilitarian bicycling behavior and interest among bike commuters**

Roughly 72 percent of surveyed bike commuters also reported using their bicycles for other transportation purposes – such as visiting friends, shopping or other errands -- either “almost always” or “frequently.” Less than 3 percent said they never use their bicycles for purposes other than commuting. About a quarter of the bike commuters said they also attended school. Among current students, 88 percent primarily travel to school by bike, 8 percent drive or carpool and 4 percent use public transit.

These cyclists are generally enthusiastic about their chosen mode. Of the 210 who answered the question, 95 percent said they wanted to get to work or school by bicycle “almost always.” Seventy-percent (of 210) said that they would like to travel to places other than work or school by bicycle “almost always.” Another 26 percent said they wanted to do so “frequently” and 4 percent said they wanted to bicycle to these places “occasionally.”

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<sup>12</sup> Of 196 bike commuters who provided gender

<sup>13</sup> Calculated based on 196 bike commuters who provided age

<sup>14</sup> Not including Asians, those who claim two or more races or who selected “other”

<sup>15</sup> Based on 197 bike commuters who provided race

<sup>16</sup> Based on 197 respondents who answered a question about education

<sup>17</sup> Based on 195 respondents who provided household income information

<sup>18</sup> Based on response to the question “How do you most often get to school?”

<sup>19</sup> Based on 211 bike commuters who answered the question “How do you most often get to school?”

<sup>20</sup> Based on 897 respondents who answered the question “How do you most often get to school?”

<sup>21</sup> Calculated based on 200 bike commuters who provided distance to work

Two hundred bike commuters provided distance traveled to work. Responses ranged from less than a mile to 10 miles, with a median distance of 2.5 miles. Two people reported that they worked from home, suggesting some confusion with the question, while another said distance to work varied.

### **Why do bike commuters bicycle for transportation?**

As was true for survey respondents more generally, convenience, enjoyment and health and fitness were the top-rated motivators among bike commuters surveyed, as determined by the number of respondents who indicated these factors were either “important” or “very important” in their decision to bicycle. Relative to the general sample, a larger proportion of bike commuters surveyed cited financial reasons, environmental stewardship, cultural pressures and enjoyment as “important” or “very important” to their mode choice (see table x appendix x). Fewer said they were motivated by health and fitness considerations. Additionally, a higher proportion of bike commuters indicated that they bicycle because they have no other option.

### **What prevents bicycle commuters from bicycling for transportation?**

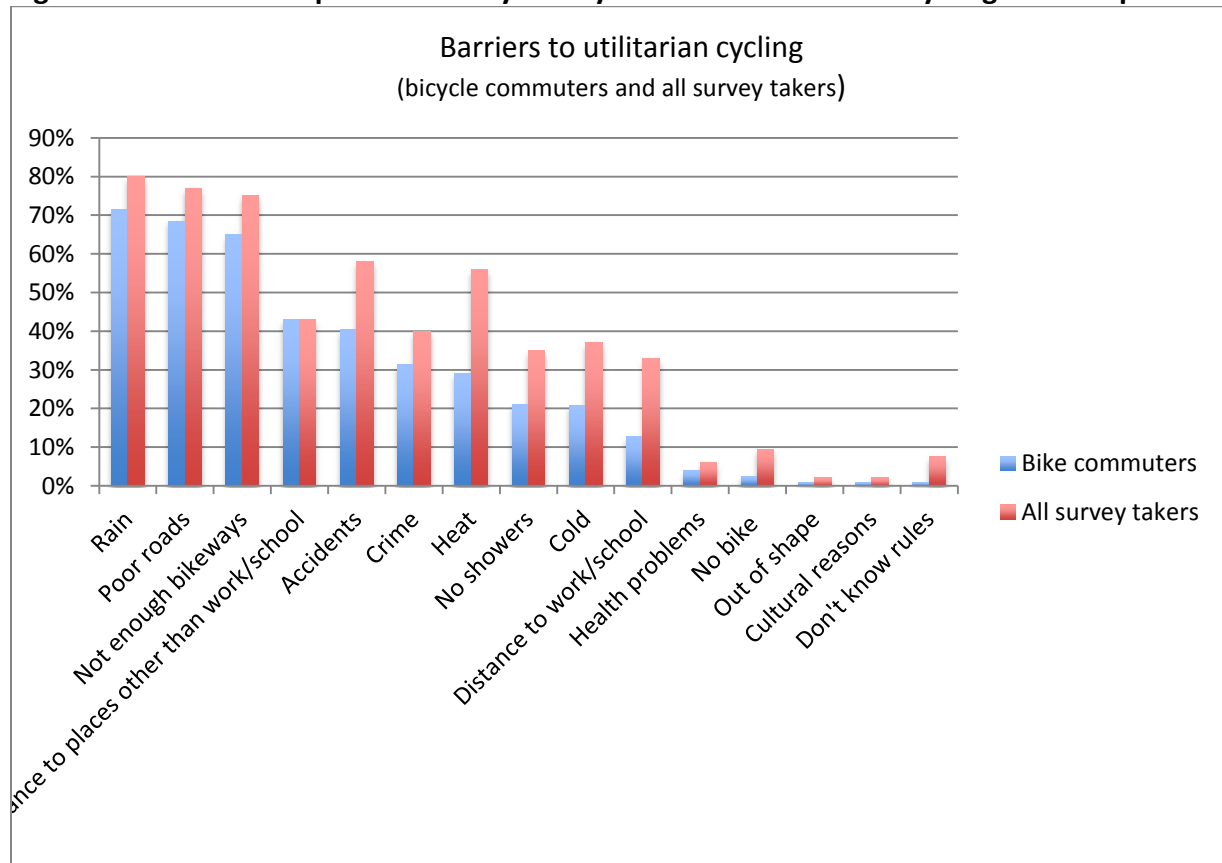
As with the general survey sample, the bike commuter sample indicated that rain, poor roads and too few bikeways were among the most important impediments to bicycling for transportation (see figure xxx) A detailed summary of these findings can be found in appendix ww.

One bike commuter said that the existing bike path network doesn’t always go where he or she needs to go. Another said that it wasn’t just the potholed roads that created problems, but also the debris – from broken glass to Mardi Gras beads -- littering many city streets. Yet, as compared with all survey takers, a smaller proportion of bike commuters considered most of the factors provided as important barriers. The exception was distance to destinations other than work or school. Bike commuters and survey takers generally agreed in equal proportions (43 percent) that this factor was an important barrier to utilitarian cycling.

The absence of secure bike parking was another common concern of the bike commuter sample, mentioned numerous times in space provided for additional comments. Another appearing with frequency was limited cargo capacity that respondents said made hauling groceries and other bulky items difficult. Several also cited poorly-lit streets as a barrier to riding at night, both for crime reasons and because it made it difficult to avoid potholes.

Cultural pressures that tend to preference driving over bicycling also registered as important considerations for some of these dedicated cyclists. One wrote that the absence of other cyclists on city streets served as a deterrent. “Having to get to an important event where sweating would be a problem,” said another. A third wrote that wanting to go places with friends who were unwilling or unable to bicycle often meant opting for another mode.

**Figure 12. Factors that prevent surveyed bicycle commuters from bicycling for transportation**



### **What would make bike commuters more likely to bicycle for transportation?**

As was the case for the survey sample generally, bike commuters listed better roads, better bikeways and better drivers as the top three factors likely to improve their willingness to bicycle for transportation (as determined by the percentage rating these factors “important” or “very important”). Figure 13 below summarizes the findings and a more detailed summary can be found in appendix D. In written comments, several offered specific suggestions for improvements. One bike commuter said the city needed more bike paths totally separated from automobile traffic and running through the city instead of meandering along its periphery. “Dedicated bike routes so I could bike with friends to destinations” safely, wrote another.

Compared with the general survey, a smaller proportion of bike commuters said they would be encouraged to ride more if showers were provided at their destinations. This may suggest that these commuters already benefit from showers at their workplaces. It could also be that they are less concerned about arriving sweaty to their jobs. Similarly, fewer said that better drivers would increase their willingness to bicycle. This may relate to the fact that these survey respondents are committed cyclists who are accustomed to dealing with bad drivers and other existing conditions.

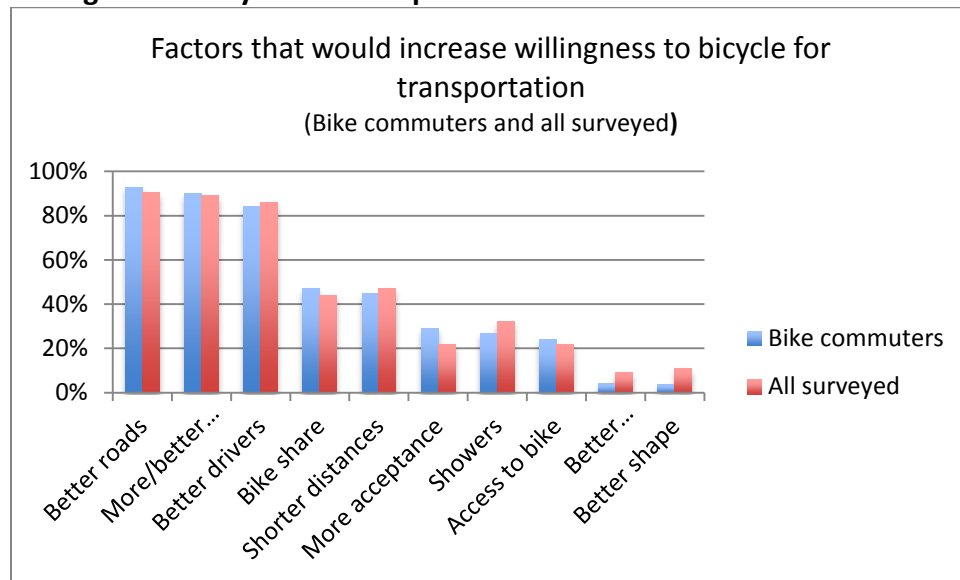
A slightly larger proportion of bike commuters suggested that having access to a bike would positively influence their bicycling behavior. This is somewhat curious, considering that everyone in this sample claimed to have a bike. This may reflect a relatively high interest in this sample in bicycling for a portion of trips for which some other mode has also been used. After all, a higher proportion of bike commuters indicated that bike share would serve as an important inducement to utilitarian cycling (though this result may also reflect more familiarity among bicycle commuters with the bike share concept). Finally, one of the biggest percentage point differences observed between the two groups related to cultural influences. Twenty-nine percent of bike commuters said they would be more likely to bicycle for transportation if friends, coworkers or employers showed more acceptance for the practice, compared with just 22 percent of all surveyed. One might expect that those who regularly get around by bike would be those least concerned about others' opinions of cycling. Perhaps this finding points to a degree of social stigma related to bicycling for transportation of which non-cyclists are less aware.

As with previous questions, the need for better bicycle parking was a dominant theme in the space provided for additional comments. Others indicated that not just more – but also more secure -- places to lock up their bikes would have a positive effect on their cycling. There is “no safe place to park expensive bicycles,” one wrote. “They get stolen even if they’re locked. Sometimes parts get stolen. You’ll come out from doing an errand and your \$100 leather saddle is gone.”

While most did not indicate that fear of accidents was a strong deterrent, 87 percent thought that improved driver behavior would be a positive motivator to increase their cycling activity. “My biggest concern with biking in New Orleans is safety--many drivers disregard or are aggressive toward cyclists,” one respondent wrote. And although most did not express concern about the length of their journeys to work, more than half indicated that shorter distances to other destinations would make them more likely to make those trips by bike.

Finally, one survey taker wrote that “relaxed road rules for bicyclists” would have a positive impact. “Auto rules don’t always make sense for bicyclists and as a result bad press arises, which gives bicyclists a bad rap, thus discouraging bicycling,” he wrote.

**Figure 13. Factors bicycle commuters indicated would increase their willingness to bicycle for transportation**



### **The interested but concerned**

To get a sense of bicycling-related attitudes and behavior among survey respondents interested in bike commuting but who do not typically get to work by bicycle, survey results were filtered to select for respondents who: 1) traveled to work, 2) did not primarily bicycle to get there, and 3) indicated that they would like to commute to work by bike with any frequency. This process yielded 198 survey takers.

### **Socio-demographic characteristics of the “interested but concerned”**

This group is characterized by roughly the same proportion of white respondents as the general survey sample, based on the 197 in this sample who provided information on race (see table 15). It is proportionally more female and slightly younger than the survey sample at large. Of the 192 respondents who provided their age, the range was 21 to 73, with a median age of 34. It is more educated by a couple of percentage points, with 90 percent of respondents claiming at least a bachelor’s degree. It also includes a smaller proportion of students (17 percent, based on 196 survey takers who responded to this question) and appears to be more affluent. Just 4 percent of the 193 respondents who provided income information reported household incomes of less than \$15,000. The largest household income category among this subset (reported by 31 percent of 193 respondents) is \$100,000 or more, while 68 percent reported household incomes of more than \$50,000. Additionally, the rate of carless households is markedly smaller than for the general survey sample -- just 1 percent of the 197 who answered this question. Most (87 percent) also own or have access to a bike.

Respondents in this group lived in 43 New Orleans neighborhoods and traveled anywhere from less than a mile to 80 miles to get to work, based on the 192 survey takers who provided



distance traveled to work. The median distance to work was 5 miles, less than a mile more than the median distance to work for all survey takers.

### **Current transportation behavior and utilitarian bicycling interest**

Most respondents in this sample (92 percent) typically drove themselves to work, while 4 percent walked, 2 percent used public transit, 2 percent carpooled and 2 percent used some other means. Although none of these respondents bicycled to work, more than half (53 percent) used bicycles for other transportation purposes with any frequency. Close to 10 percent reported using their bicycle to get places other than to work or school with regularity (either “frequently” or “almost always”). Of the 196 who answered a question about the most recent time they had ridden a bicycle on the streets of New Orleans, 25 percent said they had ridden a bicycle within the week for any purpose. Less than a quarter (19 percent) indicated that they had never ridden a bicycle in New Orleans or couldn’t remember the last time they had done so. The largest group of respondents (29 percent) said they had last ridden a bike within 6 months of taking the survey.

These respondents were selected because they showed some interest in bicycle commuting. Their responses to a question about how often they would like to bike to work sheds some light on the extent of that interest. Most (54 percent) said they would ideally like to bike to work “occasionally,” while just less than half (46 percent) said they would like to bicycle to work either “frequently” (21 percent) or “almost always” (25 percent).

More common were those who expressed interest in bicycling to get places other than work or school with regularity. Sixty-one percent said they wished to use their bikes to run errands, meet friends or for other transportation purposes either “frequently” (38 percent) or “almost always” (23 percent), substantially more than the 10 percent who said they currently do so regularly. Just 1 percent indicated they had no interest in bicycling for these purposes.

**Table 5. Comparing select characteristics of “interested but concerned” with those of all survey takers**

	<b>Interested but concerned</b>	<b>All survey takers</b>
<b>Percent female</b>	64 percent	58 percent
<b>Median age</b>	34	36
<b>Percent white</b> <sup>22</sup>	85 percent	87 percent
<b>Percent carless households</b>	1 percent	19 percent
<b>Percent bachelor’s degrees</b>	90 percent	88 percent
<b>Percent income less than \$15,000</b>	4 percent	11 percent
<b>Percent current students</b> <sup>23</sup>	17 percent	24 percent <sup>24</sup>
<b>Median distance to work</b>	5 miles	4.3 miles

### **Why do the “interested but concerned” bicycle for transportation?**

Respondents who indicated that they currently bike to get places with any frequency were directed to a question that asked them to rate the importance of various factors in motivating them to do so. One hundred eleven survey takers who do not currently bicycle to work but use their bicycles with any frequency for transportation purposes and who are interested in bike commuting participated in this question.

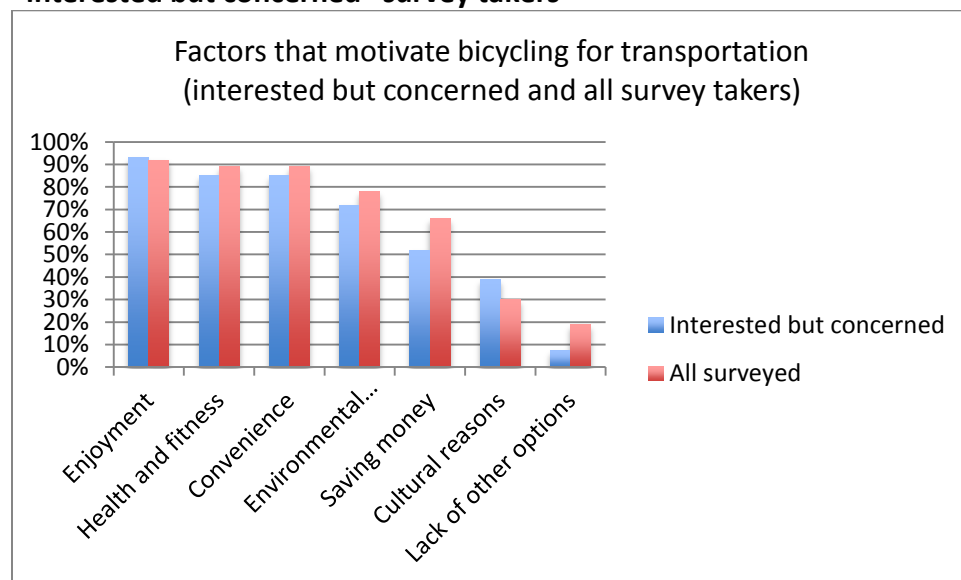
As with survey takers generally, those falling into the “interested but concerned” category found enjoyment, health and fitness and convenience reasons among the most compelling factors encouraging them to bicycle for transportation (see figure 14 below. A more detailed summary can be found in appendix D). However, while this group was slightly more likely to cite enjoyment as an inducement, as compared with the general survey sample, it was slightly less motivated by several other factors, including financial considerations, environmental concern and a lack of transportation alternatives. Incidentally, this group was more likely to indicate that cultural pressures, such as knowing lots of other people who bicycle, exerted a positive influence on their bicycling behavior.

<sup>22</sup> Not including Asians, those who claim two or more races or who selected “other”

<sup>23</sup> Based on response to the question “How do you most often get to school?”

<sup>24</sup> Based on 897 respondents who answered the question “How do you most often get to school?”

**Figure 14. Motivations to bicycle for transportation among “interested but concerned” survey takers**



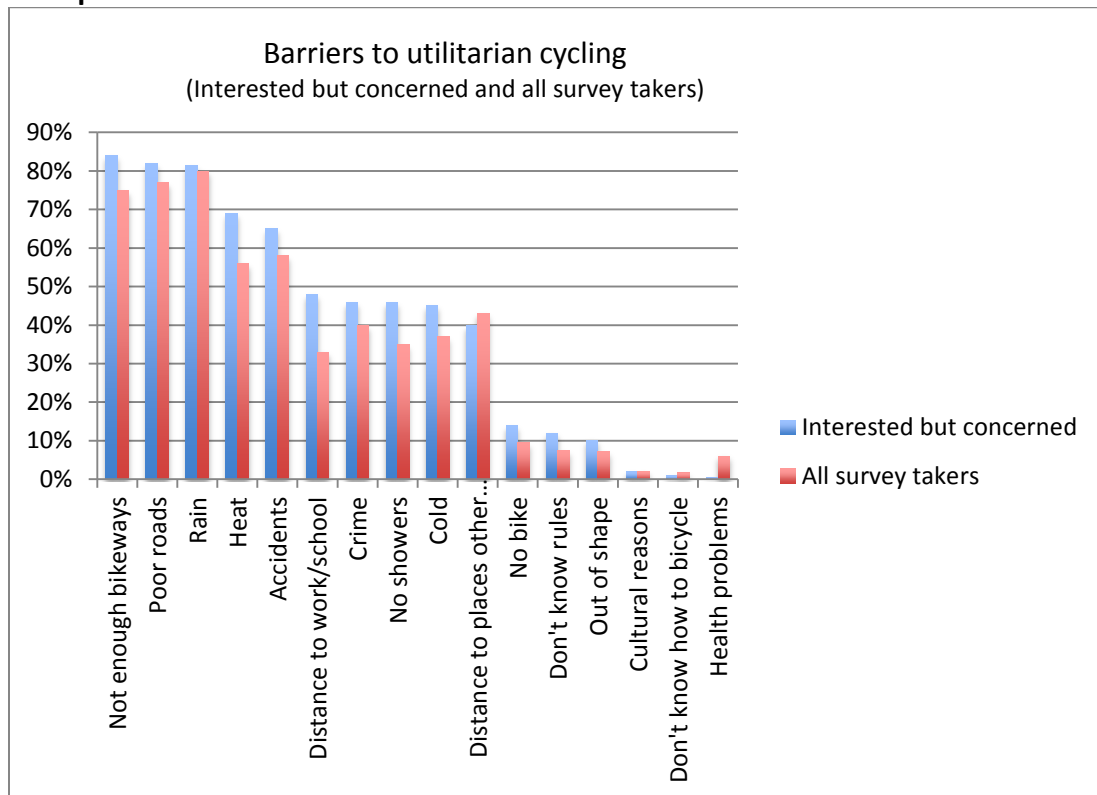
#### **What prevents utilitarian cycling among those “interested but concerned”?**

As with the larger sample, members of this survey subset rated insufficient or infrastructure in the form of too few bikeways and rough roads as the most important deterrents to utilitarian cycling (see appendix D for more detailed information). Survey takers in this group, however, tended to find each of the factors listed more substantial obstacles than did survey takers more generally. An exception relates to distance to destinations other than work or school.

Proportionally, this sample group considered this factor a less substantial obstacle relative to the general survey sample. The group also was less likely to report that health problems, lack of access to a bicycle and cultural reasons such as not knowing anyone else who bicycles served as impediments.

A number of respondents from this sample wrote in additional concerns. Frequently, these related to transporting children and cargo on a bicycle. Some said they needed to have a car at the office to make work-related trips. One said not having important safety gear like bike lights and helmets was a deterrent.

**Figure 15. Factors that prevent “interested but concerned” from bicycling for transportation**



### What would make “interested but concerned” more likely to bicycle for transportation?

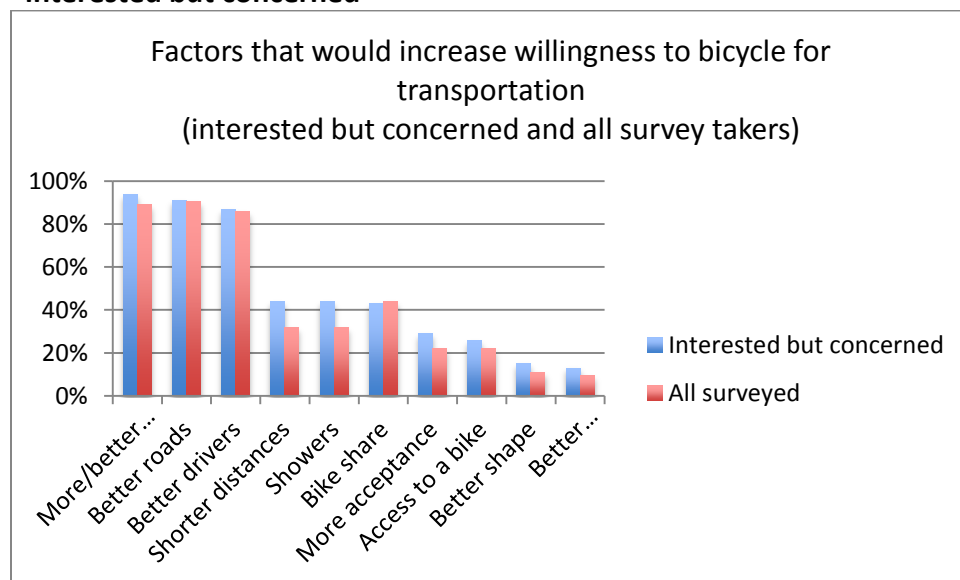
As was the case in with impediments to utilitarian cycling, “interested but concerned” survey takers were proportionately more likely than the general sample to emphasize the role of infrastructure in the form of smoother roads and better bikeways as enticements to the practice (See appendix D for more information). One written response left in the comments section was typical of this group, which tended to stress the need for more a sophisticated, connected and expansive bikeway system:

The bike lane network is too piecemeal. One second, you’re riding in a designated lane, the next you’re sharing a lane on a major thoroughfare during rush hour. Since I have a car, I find myself saying I’d rather not risk injury and end up driving everywhere.

This sample of more tentative cyclists also generally considered end-of-trip amenities such as showers a more important inducement than did the larger group of survey takers. “If there was a shower at my office, I would definitely bike to work at least occasionally,” one survey taker wrote.

Similarly, they were more apt to indicate that a better understanding of bicycling etiquette and more acceptance for bicycling among friends, coworkers and employers would make them more likely to engage in the practice. They were less likely than the general sample, however, to cite a citywide bike share program as a substantial enticement.

**Figure 16. Factors that would increase willingness to bicycle for transportation among the “interested but concerned”**



### Comparing regular bicycle commuters and those “interested but concerned”

In roughly equal proportions, both “enthused and confident” and “interested but concerned” survey takers cite the need for more or better bikeways and for smoothing out the city’s infamously cratered streets. They also agree on the need for more driver awareness and respect for cyclists, a factor bicycling novitiates consider important in a slightly higher proportion. Interestingly, equal proportions of the survey sample subsets said that they would be more likely to bicycle for transportation if this were better accepted in their social circles, suggesting that a certain stigma associated with bicycling could be causing people to opt for other modes.

Among the notable differences, members of the more tentative group were more likely to say that they would bicycle if the distances to get places were shorter. This finding may relate to actual disparities in distance required to reach important destinations among the two sample groups, or it could simply be the result of differences in perception. The median distance traveled to work was 2.5 miles for the bike commuter group, half that of the “interested but concerned” sample. But it could also be related to a disparity in physical fitness. Whereas just 3.7 percent of the bike commuter group said they would be more likely to bicycle if they were in better shape, 15 percent of the “interested but concerned” group suggested that this factor was an important consideration.

A small, but noteworthy proportion of the interested but concerned group (13 percent) indicated that they would be more apt to bicycle if they were more confident in their

understanding of the rules governing utilitarian cycling, such as how bikes should navigate streets shared with motor vehicles. Far fewer (4 percent) of surveyed bike commuters shared this concern. Finally, a substantially higher proportion (44 percent) of the “interested but concerned” group indicated that showers at the end of a trip would make them more likely to bicycle, compared with just 27 percent of the bike commuter group who considered this an important factor.

### **Key findings**

Most of the people who responded to this survey bicycle because they simply enjoy the practice. Convenience is also a major motivator, allowing cyclists to avoid parking hassles, traffic and a sometimes-unreliable public-transit system. A majority also cite environmental considerations, saving money and health and fitness benefits as incentives, and close to one-third of respondents point to cultural factors, such as knowing other bicyclists, as influencing their behavior.

Weather, particularly rain and heat, and safety were among the most significant obstacles to bicycling among this group. Many cite concerns related to poor infrastructure and a potentially-associated fear of crashes, which were ranked by survey takers as more important deterrents to bicycling than distances to destinations.

Regular bicycle commuters surveyed share many of the concerns of the general sample, pointing to poor roads and too few bikeways as disincentives to cycling. Members of this subset note a need for better-maintaining existing roads and paths to facilitate bicycling, the need for more – and more secure – bicycle parking, and cite distance to certain destinations as dampening cycling behavior (a factor that could potentially be mitigated by better connectivity of the bikeway network). Additionally, these frequent cyclists overwhelmingly cite safety concerns related to driver behavior and emphasized the need for bicycle facilities that offer more safety from automobile traffic. Separated facilities could also help to improve the speed of travel by bike and help to improve the likelihood of their friends joining in.

Those “interested but concerned” about bicycling similarly find the health, convenience and enjoyment offered by the practice enticing, but are more apt than the general survey sample and the regular bike commuter sample to cite inadequate existing infrastructure as a deterrent. Their responses suggest they would be more swayed in favor of the practice than the general survey sample and bicycle commuter sample if they had access to more and better-connected bikeways that offer greater protection from vehicular traffic. They were also more likely to stress the importance of end-of-trip accommodations, such as showers and lockers at the workplace. Finally, they were more apt to cite as factors preventing them from transportation cycling a lack of cycling know-how, whether this related to how to ride a bicycle, basic bicycle maintenance skills, or understanding the rules of riding on city streets.

## Chapter IV. A tale of two neighborhoods: Case study analysis

Research Questions:

1. What parts of New Orleans are experiencing the highest and lowest rates of bicycle commuting?
- 2. What are some of the factors encouraging and discouraging cycling locally?**
  - a. What does the literature reveal about factors that influence rates of bicycling for transportation?
  - b. What do city residents say?
  - c. What do neighborhoods say?**

A more detailed analysis of two distinct New Orleans neighborhoods provides a useful framework for exploring the variation in utilitarian cycling across the city. The Bywater and Navarre neighborhoods were chosen in significant part because they fall on opposite ends of the bike-commute spectrum. According to ACS data, an estimated 7 to 11 percent<sup>25</sup> of Bywater residents get to work by bicycle, while the rate of bicycle commuting in Navarre stands at around 2.5 percent (ACS, 2006-2010a). Both neighborhoods are characterized by bicycle commuting rates that are higher than the citywide average, yet neither reflects the highest or lowest rates of bicycle commuting in the city.

Bywater and Navarre are also representative of two different types of New Orleans neighborhoods from the perspective of the built environment. Bywater is one of the city's oldest neighborhoods, comprising part of the city's historic urban core. Its relative compactness and fine-grained land use pattern in which commercial and residential activities coexist reflect its pre-automobile origins and orientation around pedestrians and streetcars. Navarre, on the other hand, developed much more recently. One of four neighborhoods that comprise the city's Lakeview district, Navarre was built in a manner more typical of post war, auto-oriented development. It is dominated by single-family homes set back from the street and boasts abundant off-street parking and easy highway access. Little commercial activity exists within

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<sup>25</sup> For the purposes of this study, Bywater is defined as census tract 11, a territory that does not account for the full geographic scope of the neighborhood as recognized by the City Planning Commission. Of particular interest, the census tract's westernmost closest to the Mississippi River is Congress Street, half a mile downriver from Press Street, which most residents recognized as the boundary between the Marigny and Bywater. For this reason, the Greater New Orleans Community Data Center (GNOCDC) defines Bywater as encompassing census tracts 11 and 12. This latter tract, however, includes a portion of the Marigny neighborhood. By this method, GNOCDC found in its analysis of 2006-2010 ACS data that Bywater's rate of bicycle commuting stood at 10.8 percent (GNOCDC, n.d.). The bicycle commuting range provided here reflects the smaller and larger territories.

neighborhood bounds, though the neighborhood is home to notable institutions including Delgado Community College, the Greenwood Cemetery and the studios of public television affiliate WYES.

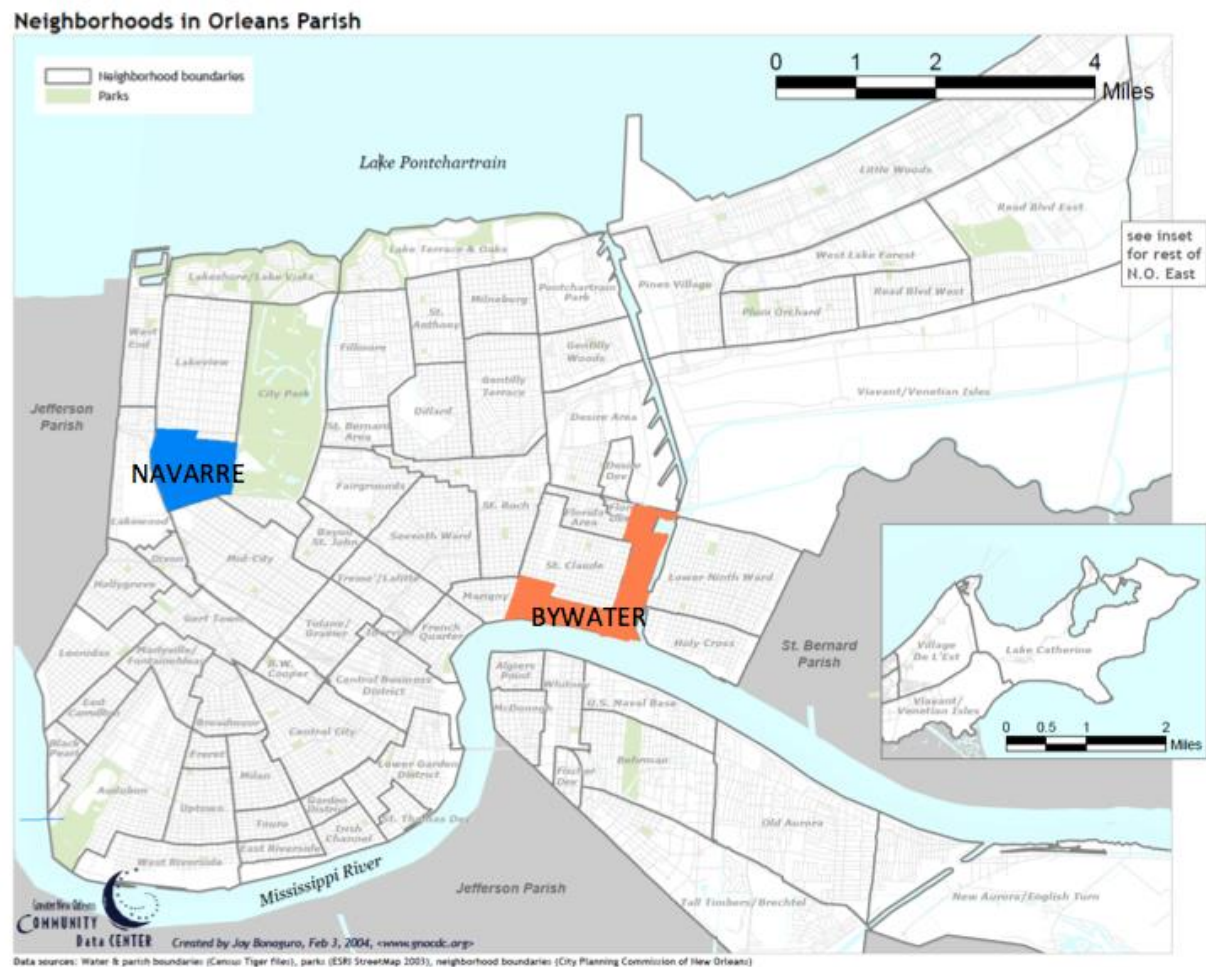
The overarching theme of this research is that bicycle commuting is a complex behavior not readily attributable to any one factor or even one set of factors in isolation. Nevertheless, intuition and empirical research suggest that the shape of the physical environment of a place plays an important role in promoting or discouraging utilitarian bicycling. The differing geographies of the two case study neighborhoods presented here offer insight into the effects of the built environment on bicycle commuting in this city, as well as some of the other influences that may be contributing to the geographic disparities in transportation cycling.

Demographic, land use and attitudinal characteristics of each neighborhood are described and compared in some detail below. These features are gleaned from census data, zoning maps, interviews with residents, systematic observation of on-the-ground conditions, a survey conducted by the author and other sources. Additionally, a hypothetical bicycle route from the center of each neighborhood to the center of the Central Business District is mapped, bicycled and described in an effort to assess the relative ease of bicycle commuting from each of the neighborhoods.

This case study aims to uncover information about who is bicycling in these neighborhoods, who is not, and some of the major incentives and obstacles to bicycle for transportation in these areas and across New Orleans.



**Figure 17. Map showing locations of Navarre and Bywater neighborhoods**



## History

### Bywater

Bywater lies about a mile downriver from the French Quarter, between the Marigny and Lower 9<sup>th</sup> Ward neighborhoods (see figure 17). It is a horseshoe-shaped territory stretching along the Mississippi River between Franklin Avenue and the Industrial Canal, and north to south between Florida Avenue and the river. The neighborhood's current moniker, acquired in the 1940s, was inspired by its watery southern and eastern boundaries, the Mississippi River and the Industrial Canal, which was constructed in the 1920s. The sign staked in the neutral ground near the intersection of St. Claude Avenue and Press Street announcing arrival to the neighborhood pegs its founding to 1807, though the area was the site of urban activity well before that year (HDLC, 2011).

### Navarre

Navarre is located at the southwestern edge of City Park. The neighborhood is bounded by I-10 to the west, I-160 and Florida Avenue to the north, Orleans Avenue to the east and City Park

Avenue to the south. It is one of four neighborhoods that comprise the Lakeview section of New Orleans, development of which began in the early- to mid-20<sup>th</sup> century.

### **Commuting patterns**

#### **Bicycle commuting**

As already noted, the bicycle-commute patterns of the two neighborhoods are markedly different. An estimated 2.5 percent of Navarre residents use the bicycle as their primary means of getting to work (ACS 2006-2010a). This rate is higher than the citywide bike commute rate, but it stands well below the 6.8 percent of Bywater residents who get to work by bike.

#### **Automobile commuting**

As is true across New Orleans, driving is by far the most common means of getting to work for residents of Bywater and Navarre. Yet whereas 66 percent of Bywater residents rely on the automobile as their primary mode of commuting, 90 percent of Navarre workers drive themselves to the workplace (ACS 2006-2010a).

Looking more carefully at the breakdown of driving commuter data offers other another point of contrast. ACS estimates indicate that less than half of Bywater residents 16 and older drove alone to work, substantially less than the 68 percent of city residents who drove alone. By comparison, more than 83 percent of Navarre residents drove alone (ACS 2006-2010a). In each case, the balance of automobile commuting is accounted for by carpooling, which occurred in Bywater at a rate higher than the citywide average and more than double that found in Navarre.

The lower rate of single-occupancy vehicle commuting in Bywater is unsurprising in light of lower rates of automobile ownership in the neighborhood, described below. But higher rates of carpooling may also reflect differing attitudes and priorities among residents of the two neighborhoods that could help to explain their disproportionate interest in bicycle commuting.

#### **Commute by transit**

Also notable is the relatively high rate of Bywater residents who rely on transit to get to jobs (ACS 2006-2010a). Bywater's transit mode share is more than double the citywide rate and stands in striking contrast to Navarre, where virtually no one commutes by transit. It is not simply that Navarre residents are cut off from transit access. Rather, the neighborhood benefits from six transit lines, including two Jefferson Parish bus lines that terminate in the neighborhood, and the Canal streetcar, which terminates at the neighborhood's edge. Bywater, on the other hand, is served by four bus lines. Again, the higher rate of transit commuting in Bywater is probably linked to lower rates of car ownership, but differing attitudes about alternative modes may also be in play.

#### **Walk commuting**

The rate of commuting by walking provides another worthwhile point of comparison. Navarre's rate of walk commuting is nearly identical to the citywide rate of 5.3 percent, despite

substantially higher rates of car ownership found in the neighborhood as compared with the city (ACS 2006-2010a).

Equally surprising is the absence of walk commuting reported by the ACS in Bywater. This may have something to do with the neighborhood boundaries used in this study, which cut out the portion of the neighborhood closest to the French Quarter and Central Business District that are home to the largest concentration of jobs in the city. The GNOCDC analysis estimates that 4.1 percent of Bywater residents walk to work (GNOCDC, n.d.), yet this figure is still lower than the Navarre walk mode share and the citywide rate of walk commuting. Given the relatively low rates of car ownership and automobile commuting in Bywater, it is possible that higher rates of bicycle and transit commuting could be offsetting walk commuting in the neighborhood.

Navarre's walk-commute rate, meantime, suggests that conditions are at least moderately suitable to walking and that there are at some employment opportunities to be found in close proximity of the neighborhood. As Southworth (2005) notes, some of the factors that make a place amenable to walking also make it well-suited to bicycling. Navarre's walk-commute rate further suggests that there is a substantial contingent of the population for whom active transportation represents a feasible alternative.

It is also important to note that Navarre residents are not necessarily walking to work because they don't have other options. Of those who commute by bicycle, all come from households with at least one vehicle available (ACS 2006-2010d). More than 10 percent of walk commuters live in two-vehicle households.

**Table 6. How residents 16 and older got to work, 2006-2010**

Mode	Bywater	Navarre	New Orleans
Drive alone	49.7 percent	83.1 percent	68 percent
Carpool	16.6 percent	7.3 percent	12.6 percent
Transit	17 percent	0 percent	6.9 percent
Walk	0 percent	5.2 percent	5.3 percent
Bicycle	6.8 percent	2.5 percent	1.8 percent
Work at home	7.2 percent	0 percent	3.3 percent

Source: American Community Survey, 2006-2010, Table B08301

### **Commute time**

ACS data on commute time provides some sense of the distance traveled by residents of both neighborhoods to get to work, and could offer some clue as to the viability of active transportation modes in each neighborhood. Notably, almost 93 percent of Navarre residents have commute times of less than 30 minutes, substantially more than the 64 percent of Bywater residents who claim such a short commute (ACS 2006-20100). This could indicate that more Navarre residents live closer to their jobs than do Bywater residents or that transportation infrastructure better facilitates rapid commutes from the neighborhood to job centers. It could also account for higher rates of bicycle and transit commuting in Bywater, as these modes can require more time than driving. Still, the apparent proximity of Navarre

residents to jobs suggested by these data could help to explain why higher rates of walking are found in Navarre as compared with Bywater. It could also help to explain higher rates of bicycling in Navarre as compared with some other Lakeview locales. Finally, it suggests that bicycling might be feasible, at least from a distance perspective, for a larger contingent of neighborhood residents than presently opts for this mode.

### **Socioeconomic characteristics**

#### **Wealth and poverty**

New Orleans is a notoriously poor city in which 29 percent of city residents are estimated to live below the federal poverty line. At 16 percent and 18 percent, respectively, the rates of residents living below the poverty line in Navarre and Bywater are substantially lower than they are for the city as a whole (ACS 2006-2010h).

Other wealth indicators suggest that Navarre is an affluent community relative both to Bywater and the city more broadly. Navarre's median household income of \$44,691 is more than 50 percent higher than Bywater's median household income of \$26,699 and 20 percent higher than the citywide median household income of \$36,721 (ACS 2006-2010c). Housing is also more expensive in Navarre than it is in Bywater. The median value of an owner-occupied home in Navarre is estimated at \$232,300 (ACS 2006-2010i), about 38 percent higher than Bywater's estimated median housing value of \$158,400 and 23 percent higher than the citywide median value of \$184,100. Even so, Navarre has a higher proportion of homeowners than does Bywater, though housing is majority renter-occupied in both neighborhoods, as it is in the city (ACS 2006-2010k). Median gross rent in Navarre is estimated at \$958, about 14 percent higher than Bywater's median gross rent of \$831 and 6 percent higher than the citywide figure of \$899 (ACS 2006-2010l).

Although the literature shows some contradiction on the influence of income where bicycle commuting is concerned, some research suggests the poorest Americans may be somewhat more likely to bicycle for transportation (Pucher et al., 2011). Higher income also makes it easier to afford the cost of owning and maintaining a car, and the availability of even one car in a household seems to substantially reduce the likelihood of opting for other modes (Pucher & Renne, 2003).

As already noted, Bywater residents own far fewer cars on average than do their Navarre counterparts. Just more than 18 percent of Bywater households are carless, roughly on par with the citywide estimate of 19 percent, but substantially higher than the 2.1 percent of Navarre households estimated to have no cars (ACS 2006-2010d). Moreover, nearly half of all Navarre households have two or more cars, compared with less than a quarter of all Bywater households for which this is the case.

Given the income disparity between the two neighborhoods and the differences in household vehicle access, it is possible the higher rate of bicycle commuting in Bywater is driven in part by necessity.

### Household composition

Bywater is also characterized by a higher rate of single-person households relative to Navarre. Nearly half of all Bywater residents live alone, compared with 37 percent of Navarre residents who fall into that category (Census 2010c). This difference owes in part to a higher frequency of families with children living in Navarre, a factor that the literature and primary research conducted as part of this study indicates may affect residents' willingness to bicycle for transportation (Riley, 2006). In Navarre, 18.2 percent of households comprise families living with their own children under 18 years old. This is true of 13.5 percent of Bywater households (U.S. Census, 2010e).

### Age

Bicycling in this country tends to be dominated by younger people and to decline precipitously with age. One study found that the practice drops off dramatically after age 55 (Dill & Voros, 2007). The age structure of Navarre doesn't present any obvious obstacle to bicycle commuting. The median age of residents in Navarre is 33 years, five years younger than the median age in Bywater (U.S. Census, 2010e).

### Gender

The gender composition of the two neighborhoods is virtually identical and is not in itself explanation for the disparities in bicycle commute rates. Males make the vast majority of all bicycle trips in this country. They also comprise 68 percent of the regular bicycle commuters in New Orleans (ACS 2006-2010e). Yet while males hold a slight majority in Bywater and Navarre (U.S. Census, 2010b), most of the bicycle commuters in Bywater are female (ACS, 2006-2010e). By contrast, virtually all of the bicycle commuters in Navarre are male. This female advantage in Bywater's bicycle commuting ranks may have something to do with employment patterns. More women in the neighborhood commute to work than men, according to ACS estimates of the share of workers 16 and older (ACS 2006-2010f). The opposite holds true in Navarre.

### Race

National research has found that most of the bicycle trips made in this country are made by white men (Pucher et al., 2011). Bywater and Navarre are both whiter than the city at large, though Navarre is far less racially diverse than Bywater. More than 88 percent of Navarre residents described themselves as white in the 2010 Census, compared with 44 percent of Bywater residents and 33 percent of all New Orleanians (Census 2010b).

### Education

Using bachelor's degrees as an indicator, Navarre has a more educated population than Bywater and than the city as a whole. Just more than a quarter of residents 25 or older are estimated to have at least a bachelor's degree in Navarre, compared with about 18 percent for New Orleans and 15 percent for Bywater (ACS 2006-2010f). Although the literature review included in chapter two did not explicitly address any link between education and commute mode, there is a positive correlation between education and income, and the median income in Navarre is higher than it is in Bywater. In light of lower educational attainment and income, it is probable that Bywater residents hold fewer white-collar office jobs than do Navarre residents.

They may also face less stringent workplace dress and schedule requirements that can complicate bicycle commuting.

#### College students

There is some evidence that college students are more likely than those in the workforce to bicycle for transportation (see, for example, Dill & Carr, 2003). Yet Navarre, which is home to Delgado Community College, has a higher share of residents enrolled in college than does Bywater (ACS 2006-2010j).

#### Crime

Some studies also suggest that crime may have a dampening effect on active modes of transportation (see, for example, Ferrell, Mathur & Mendoza, 2008). Judging from a year's worth of violent crimes mapped using the city's crime-mapping system, Bywater is by far more prone to incidents such as muggings, rapes, homicides, robberies and assaults than is Navarre (maps showing violent crimes in each neighborhood for a recent 12-month period can be found in appendix F). However, in a city with a well-publicized crime problem, it is important to consider the broader crime picture. Even if riders don't perceive a serious threat in their own neighborhood, they may be less inclined to travel to work by bike if they have to travel through an area they perceive of as more crime-prone to get there.

#### Physical development patterns

Navarre and Bywater were chosen as case studies for this project in large part because they epitomize two strikingly different development typologies found in New Orleans. It is likely that these distinct physical patterns have some influence over mode choice in each neighborhood (see, for example, Heinen et al., 2010).

#### Bywater

As one of the city's oldest neighborhoods, Bywater's built environment is fairly typical of that found across much of the city's historic urban core. It is a landscape dominated by Creole cottages, shotguns and corner stores, most of them situated directly on the sidewalks, which are plentiful and well-connected and typically located directly adjacent to the street. Bywater developed before the arrival of the automobile and the shape of the neighborhood reflects this fact. There is scant off-street parking to be found in the neighborhood, which grew around the streetcar system that eventually crisscrossed the district, connecting residents with the French Quarter and other streetcar suburbs further upriver (see map of the New Orleans streetcar system in 1904 in appendix F) The streetcars that once served Bywater were dismantled decades ago, but the streets retain a distinct grid pattern with relatively short blocks common of areas built before the automobile. The neighborhood is dotted with small businesses, former and contemporary manufacturing facilities, and even a couple of antebellum plantation homes, reflecting the mix of residential, agriculture and industrial activity that characterized the district in its earliest days (HDL, 2011). Although some newer structures can be found in the neighborhood, many of Bywater's buildings were constructed more than a century ago. ACS data on housing age hint at the age of the neighborhood. The largest share of residential units in Bywater (42.4 percent) was constructed in 1939 or earlier (ACS 2006-2010k). These data do

not distinguish among structures built before that year, but much of the neighborhood's architecture dates to the 19<sup>th</sup> century (HDL, 2011).

**Figure 18. Typical Bywater Creole cottage**



Parking in Bywater is mostly on the street. Photo taken by author.

**Figure 19. Bywater home**



Bicycling offers a more convenient (and fashionable) option for some Bywater residents. Photo by author.

Most of Bywater was constructed along the natural levee of the Mississippi River in the days before pumping systems allowed for urbanization of low-lying swampland. As a result, the neighborhood was spared significant flooding from Hurricane Katrina. However, like many inner city areas, Bywater suffered from decades of disinvestment, during which time the neighborhood garnered a reputation as an undesirable crime- and poverty-stricken place. In recent history, Bywater has experienced a turnaround catalyzed by artists and creative types who found deals in the peeling but charming historic neighborhood just downriver from the French Quarter and Marigny. Although high rates of violent criminal activity remain a concern of neighborhood residents, few doubt Bywater's ongoing revival.

Commercial investment has followed new residents. Cafes, art galleries, music stores, thrift shops and at least one high-end apartment development have moved into long-vacant storefronts and manufacturing facilities in recent years, taking advantage of the growing interest in the neighborhood, relatively low rents and zoning that allows for more development-type flexibility compared with much of the city (Dall, 2012). Some of the new businesses are setting up shop along St. Claude Avenue, the once hardscrabble commercial corridor that stretches between the Marigny, Bywater and into the Lower 9<sup>th</sup> Ward. But St. Claude is not the only center of renewed commercial activity, signs of which can be found scattered throughout the neighborhood.

As of the writing of this document, the city did not have available an existing land use map of the city (Paul Cramer, Dec. 5, 2012, personal communication) and research for this project did not include a comprehensive land use study. But an informal survey of land use conditions and a review of zoning regulations for each of the neighborhoods suggest a much more heterogeneous development pattern in Bywater as compared with its more suburban counterpart. Much of Bywater is zoned for two-family residential use, but there are pockets of commercial zoning interspersed throughout the neighborhood. And while industrial uses are concentrated at the neighborhood's periphery, along the Industrial Canal and the river, there are even areas where light industrial activities are allowed deeper inside the neighborhood.

The more varied land use composition of Bywater is reflected in its reputation as a neighborhood that lends itself relatively well to active modes of transportation. The website [walkscore.com](http://walkscore.com), for example, gives Bywater a "very walkable" rating of 75 out of 100, a score based upon the number of activities and errands that can be undertaken on foot.



**Figure 20. Bywater café**



A bicycle rack nearing capacity outside a Bywater café.  
Photo taken by author.

### Bikeways

The presence of bikeways has been found to positively influence bicycling behavior (Buehler & Pucher, 2012). As employment oftentimes requires traveling beyond a neighborhood's boundaries, a person's willingness to bicycle to work is undoubtedly influenced by factors beyond the neighborhood itself. Still, the presence of bicycle infrastructure in a neighborhood may at once reflect something about the culture of the neighborhood and help to encourage more cycling.

Bywater was one of the first neighborhoods in the city to receive dedicated on-street bicycle infrastructure. The first bicycle lane in the city was striped along a 3-mile stretch of St. Claude Avenue running between Elysian Fields in the Marigny through Bywater and the Lower 9<sup>th</sup> Ward, in 2008.

In addition to the bike lane, a shared lane is marked along Chartres Street in the neighborhood, reminding drivers to "share the road." Meantime, Bywater's narrow, low-speed interior streets and high rate of cycling makes the entirety of the neighborhood relatively well-suited to bicycling, notwithstanding cratered streets in parts that make for rough riding. For this reason, the bicycle advocacy organization Bike Easy designates all of the neighborhood and the adjacent Marigny and French Quarter "bicycle friendly areas," noting the slower-traffic streets

and high numbers of cyclists that characterize these places (see bicycle infrastructure map in appendix F).

**Figure 21. 2012 Mirliton Festival**



Bicycle corrals set up outside Bywater's Mirliton Festival November 3, 2012.  
Photo taken by author.

### Navarre

More than 100 years separate Bywater and Navarre, development of which began in the 20<sup>th</sup> century and was largely completed by 1949 (GNOCDC, 2002). More than half of Navarre's housing stock was constructed between 1950 and 2004 (ACS 2006-2010k).

The New Orleans Land Company began draining the long uninhabitable swampy territory between City Park and the Jefferson Parish line that would become Lakeview in 1905. The first subdivision located in present-day Navarre opened in 1912 as Homedale (GNOCDC, 2002). The district's newer Park Place Subdivision, completed in 1947, was promoted as an exclusive neighborhood of single-family homes of the sort growing in popularity at the time across the United States. Multi-family development, including the duplexes that were so commonplace across much of the old city, was expressly prohibited (GNOCDC, 2002). Construction of the West End and Spanish Fort streetcar lines added to the neighborhood's appeal by connecting these farther-flung suburbs to the city center (LCIA, n.d.).

Navarre contains numerous elements common of suburban America. It is largely residential, with homes set back from the street. While many of these residences are smaller and more modest than those found in other sections of Lakeview, the lots in Navarre are larger than those found in older parts of the city, and off-street parking is in abundant supply.

Zoning rules prohibit much in the way of commercial activity within the neighborhood. Commercial uses are concentrated along Canal Boulevard, which runs through the center of the neighborhood, and along Harrison Avenue, a commercial corridor just under a mile north of Navarre's northernmost edge.

**Figure 22. Typical Navarre streetscape**



Navarre is dominated by single-family homes set back from the street and abundant off-street parking. Photo taken by author.



**Figure 23. Navarre café**



Café Navarre is one of the only restaurants located in the Navarre neighborhood.  
Photo taken by author.

### **Transportation infrastructure**

The westernmost and northernmost edges of Navarre are defined by major high-speed automobile infrastructure in the form of interstates 10 and 610 that facilitate driving from and to the neighborhood. Several Navarre residents interviewed noted the ease of getting from their neighborhood to various points around the city by car. Despite a higher rate of walk-commuters than found Bywater, the website [walkscore.com](https://www.walkscore.com) ranks Navarre much less walkable than Bywater, with a score of 51. The neighborhood ranks 41 among 71 neighborhoods city rated for walkability (Walk Score, n.d. b).

### **Bikeways**

There are no dedicated bikeways located within Navarre's boundaries, though several nearby bicycle facilities help to connect the area with other parts of the city (see bicycle infrastructure map in appendix F). The neighborhood is also situated directly adjacent to City Park, home to various multi-use trails and share-the-road reminders, and it is close to Lakeshore Drive, a popular lakefront recreational cycling corridor that does not currently include any dedicated bikeways. Although experience and interviews suggest that City Park and the lakefront are commonly used by recreational cyclists, they could also be used by utilitarian cyclists to cut to connect to parts of the city lying to the east and west of Navarre.

**Table 7. A comparison of select features of Bywater and Navarre, 2006-2010**

<b>Household characteristics</b>	<b>Bywater</b>	<b>Navarre</b>	<b>Percent difference</b>
Median household income	\$26,699	\$44,691	50 percent
Percent single-person households	47 percent	37 percent	24 percent
Median housing value	\$158,400	\$232,300	38 percent
Median gross rent	\$831	\$958	14 percent
Percent owner-occupied housing	37 percent	46 percent	22 percent
<i>Resident attributes</i>			
Median age	38	33	14 percent
Percent female residents	48.6 percent	48.4 percent	0.4 percent
Percent residents who are white	44 percent	88 percent	67 percent
Percent adults 25+ who are college educated	15 percent	25 percent	50 percent
Percent residents living below poverty line	18 percent	16 percent	12 percent
<i>Transportation attributes</i>			
Percent bike commuters	7 percent	2.5 percent	95 percent
Percent walk commuters	0 percent	5.2 percent	200 percent
Percent transit commuters	17 percent	0 percent	200 percent
No. transit lines serving area	4	6	40 percent
Percent households without cars	18.4 percent	2.1 percent	159 percent
Percent residents who drive to work	66 percent	90 percent	31 percent
Percent workers with commute times 30 minutes or less	85 percent	97.7 percent	14 percent
Designated bikeway mileage	2 miles*	0	200 percent
<i>Housing attributes</i>			
Percent housing that is single-family detached <sup>26</sup>	40.5 percent	58.4 percent	36 percent
Percent housing units built 1939 or earlier	42.4 percent	21.7 percent	64.5 percent

\* Tally based on miles between Congress Street and Poland Avenue. If including larger territory defined by GNO CDC as stretching to Franklin Avenue, the total mileage is approximately 4.32 miles. Mileage includes travel capacity in both directions and both dedicated bike lanes and marked shared-lane routes.

<sup>26</sup> ACS 2006-2010k

### **What residents say about bicycling**

To dig deeper into what might be influencing bicycling-related behavior in Bywater and Navarre, a series of interviews were conducted with volunteers from each of the neighborhoods. Interview subjects were identified with the help of neighborhood organization leaders and other contacts. The only criteria applied to candidates was that they be at least 18 years of age and live in either Bywater or Navarre. The interviews were conducted in person, by phone and, in two cases where it was unfeasible to use other methods, through email. Eight interviews were conducted in total, with four residents from each of the neighborhoods. The subjects ranged from bicycling enthusiasts who get almost everywhere by bike to people who don't even own a bicycle.

Interviews were semi-structured and generally lasted 20 minutes. Questions related to subjects' background, lifestyle and experience with bicycling. Interviewees were asked about vehicle and bicycle ownership, work and leisure habits, household composition and what attracted them to their neighborhood. They were also asked to remember the last time they road a bicycle, the purpose of the trip and route choice. Other questions related to the ease of traveling in their neighborhood and around the city by various means, including bicycles, walking and cars, and to the factors most important to them in preventing and encouraging utilitarian cycling.

Geller's cyclist typology (Dill & McNeill, 2012) is again applied here to organize interviewees into three categories according to their bicycling behavior and interest. The "enthused and confident" are those who ride regularly for transportation and who are comfortable riding in traffic but prefer specific bicycle accommodations. The "interested but concerned" are those who are curious about utilitarian bicycling and who may enjoy bicycling for recreation, but infrequently ride for transportation purposes. Finally, "no way, no how" refers to those impeded from bicycling for transportation by some physical inability or complete lack of interest. Although the typologies provide a useful organizational mechanism, none of them is a perfect match for the interview subjects, several of whom possess characteristics belonging to more than one category.

### **Navarre**

Four people (Emma, Tal, Tanya, and Sam<sup>27</sup>) living in Navarre took part in interviews conducted by phone in November and December 2012. All in the group are white (Tal describes herself as half-white, half-Asian) and, with the exception of Sam, female. All work outside the home. Three are married with children, while Tal is single and lives with a roommate. Participants ranged in age from 28 to 48, and had completed anywhere from some college to graduate degrees. All were from New Orleans or moved to the city at least ten years ago, though all had lived in Navarre for less than a decade. Three of the four owned bicycles and cars and got most places by driving. Tal is the exception. She did not own a car and frequently used her bicycle for transportation.

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<sup>27</sup> Names have been changed

**No way, no how**

Emma, 32, is from Alabama originally, and has little experience bicycling for any purpose other than the occasional recreational trip. “Growing up, we were not a family that biked and you couldn’t get where you needed to go with a bike in the town that I was from,” she said.

Emma moved to New Orleans in 2002 to pursue a masters’ degree in social work. She moved to Navarre from Uptown with her now-husband several months before Hurricane Katrina. Emma was attracted to her neighborhood by the centrality of the area that makes getting to different places across the city relatively easy and by the fact that it fronted City Park and seemed like a quiet neighborhood of young professionals that would offer a safe place to raise a family. The couple was displaced by the storm for two years and moved back to the neighborhood in November 2007.

Today, Emma works full-time as a nurse at a Jefferson Parish hospital and is the mother of a two-year-old. Although her husband, who also works full-time, helps out around the house and with their son, Emma says she handles the bulk of the household and child-rearing responsibilities. Unlike her husband, who owns a bicycle that he uses mostly for recreation (but occasionally for getting to nearby events like Jazz Fest), Emma does not own a bike. She’s interested in getting one, in part to teach her son the benefits of an active lifestyle, but is doubtful she would ever use a bicycle for anything but recreation.

The distance to her job is too far to realistically commute by bike, she said. And there aren’t many places she could think of nearby that would be feasible to reach by bike for other purposes. Then there is the fact that she is often transporting her son and taking care of errands that would be tough to handle by bike. “I’ve got the kid and the groceries and the dog and everybody else” to tend to, she said. For Emma, driving is second nature. “I kind of drive everywhere,” she said. “To be completely honest, I’m so used to jumping in the car and going” that she doesn’t give any thought to alternatives. This behavior is at least partially related to how easy it is to drive in and from her neighborhood, thanks to its proximity to I-610 and I-10. With the exception of a few times a year when people converge on the area for festivals and events, parking is also readily available, thanks to an abundance of driveways and other off-street facilities, she said.

Although she notices many more cyclists in New Orleans than when she first arrived in the city, she is unlikely to follow their lead. Safety, for herself and for her child, is her number one concern. “Personally, I’m scared for the bikers,” she said. “Drivers are kind of aggressive. Even if I lived in a place where all kinds of things were close by, I don’t see myself biking to do those things,” Emma said.

### **Enthusied and confident**

Tal, 28, moved to New Orleans ten years ago from her home state of Missouri. Three years ago, she moved to Navarre from the West Bank of the city, attracted by her new neighborhood's subdued, residential feel. "There's not a lot of commercial activity around," she said. Most stores and businesses are "about a mile away, so I have easy access but I don't live right in the midst of it." Even so, Tal appreciates that there are "a few places in the area" that she can easily reach by foot or by bike. "I'm also very, very close to the highway and to public transportation," she said.

It was while she was living in her former neighborhood that Tal first started bicycling for transportation after the city impounded her car for failure to pay parking tickets. Today, she gets around mostly by bike, walking or transit. She no longer owns a car and lives in Navarre with a roommate who also counts a bicycle as her primary vehicle.

Tal, who has some college under her belt, worked two jobs at the time of this interview: one with a local environmental advocacy organization and another seasonal position at a local discount retailer. She gets to work mostly by walking. Both of her jobs, she said, are easily reachable by foot.

She uses her bike most often to get to the grocery store or to the Harrison Avenue commercial strip about a mile away. She mostly rides in the street and doesn't depend too heavily on any dedicated bike infrastructure. "In this particular area, there aren't really off-street routes, though I will cut through City Park if I need to go anywhere around Bayou St. John," she said. "Other than that, I pretty much go straight down the street."

One of Tal's biggest complaints with the existing conditions for cyclists is the debris she finds strewn across many city roads. "I literally have to get a new tube for my bike once a month," she said. In terms of concerns specific to her neighborhood, she describes the intersection of Canal Blvd. and City Park Avenue as an especially hairy spot to maneuver. "It's difficult enough for a car to get through," she said. "For a bike or pedestrian, it's almost impossible."

Safety is generally a concern, and Tal said she would like to see more bicycling infrastructure. But perhaps equally as important, she said, is better enforcement of laws protecting cyclists. She's never had a serious crash, though she has had some close calls in which cars have nearly hit her on her bike.

Otherwise, she feels fairly comfortable navigating the city by bike. "I try to avoid riding down Broad Street, just because it's not the greatest-looking neighborhood, and also along Esplanade, because it's a crappy place for bikes," she said. But most places are easy to reach by bicycle from her neighborhood. "The French Quarter is really easy," she said. "It's just a straight shot down Canal Street."



Tal describes her choice to bicycle for transportation as rooted in both practical and ideological considerations. She especially appreciates the health, economic and environmental benefits of cycling. And she said she has a fair amount of company in her neighborhood. "I wouldn't say as many (people bicycle in Navarre) as in the French Quarter or Marigny," but it is not unusual to see bicyclists in Navarre. She also is not alone at her workplace. A number of her co-workers at the environmental organization where she works also walk or bike to the office, she said.

### **Interested but concerned**

Tanya, 37, is originally from Massachusetts but moved to New Orleans 15 years ago after graduating from college in Connecticut. She moved to the neighborhood most recently of all the interview subjects, having only lived in Navarre for a year and a half. She moved to the neighborhood from Uptown New Orleans with her husband and young son, now two years old.

Tanya owns a bicycle and a car, though she mostly uses her car to get around, including for the 12-minute driving commute to her university job Uptown. The last time she had ridden a bicycle was a couple months before our interview, when she went for a five-mile ride in City Park with the aim of getting some exercise. Although she has never attempted the trip between her Navarre home and her job, she used to bicycle to work "all the time." That was before she had her son and when she lived Uptown, closer to work and in an area she considered better-suited to cycling for transportation.

"From where I am now, I would not bike to work," she said "Basically, there's just too many tricky traffic areas."

To get to work, Tanya takes Carrollton Avenue to St. Charles Avenue. She wouldn't feel comfortable biking the same route, which is characterized by heavy, fast-paced vehicular traffic and feels especially dangerous for non-motorized users at the point where it crosses under the interstate. She also hasn't considered alternative routes, such as the Jefferson Davis path that connects Mid City with Uptown that is reachable by bike from City Park or Orleans avenues.

Tanya doesn't notice many utilitarian cyclists in her new neighborhood. "You'll see people bicycling in City Park," she said. "And my next door neighborhood bikes. So some people do. But mostly, it's a lot of families. It's a lot of people with kids" who aren't inclined toward bicycling for transportation.

Tanya hasn't done much bicycling for transportation since moving to her new home, though she did bike to Jazz Fest in 2012, pulling her son behind her. She found the ride refreshingly simple and convenient, cutting through City Park and then onto Esplanade Avenue to reach the fairgrounds. Then came the last day of the festival. "I was coming back on Esplanade and I had my son in a bike trailer behind me and there was an asshole in a pickup truck who was apparently angry that I was taking up space on the road," she said. "He accelerated and came within two inches of my two-year-old. It sucked, because other than that, the whole biking to Jazz Fest experience was really nice."

The experience served to reinforce Tanya's poor opinion of city drivers, a major factor in preventing her from bicycling more frequently. Crime is also of concern.

She is heartened to see more bicycling infrastructure cropping up around the city. "Hopefully, with that will come more awareness of people on bikes," she said. Yet more bikeways are not likely to serve as a major incentive to get her back on a bike, at least for now. "It's my current lifestyle and kid" that are shaping her transportation behavior these days. "Also, I've just kind of gotten used to doing stuff by car. You just get out of the habit of getting out the bike."

Sam, 48, moved to Navarre with his wife and son, now 10, in 2006 after the family lost its home along the 17<sup>th</sup> Street Canal in another section of Lakeview to Hurricane Katrina. He and his wife decided to move to the neighborhood because it felt like a stable community, and because its proximity to City Park made it easier to give up the sprawling back yard they loved at their old home. Convenience was another factor. "You can get very quickly from here by car to most parts of the city with the access we have to the interstate," Sam said.

Sam is an avid recreational cyclist who rides a bicycle as often as four times a week for exercise, using both the street and dedicated bike lanes and paths. He often rides through City Park, along the Lakefront and among the streets in and around his neighborhood. Sam considers his neighborhood to be relatively bicycle-friendly and he finds bicycling to the French Quarter especially efficient. "It's not too bad traffic wise and once you get into the Quarter it's pretty easy to get around," he said. That said, while he would love it if his son could bike to school two miles away, he wouldn't think of letting him, given the dearth of protected bicycling infrastructure and lack of respect for bikes among drivers.

Although he bicycled to work regularly for a job he had several years ago, Sam now works in sales and says it is not feasible to commute by bike because of the traveling required throughout the day. Apart from the occasional bike trip to festivals and other special events, he doesn't do much in the way of bicycling for transportation, in part because of limited cargo capacity on his mountain bike that makes errands like going to the grocery store difficult. However, he says he would like to do more utilitarian cycling. Sam's wife also drives to work. She is not a likely candidate for bike commuting, Sam said, thanks to the climate. "You need to have shower facilities at work," he said. His wife's office does not.

Sam thinks more could be done to encourage bicycling in the area and to protect cyclists. Case in point: he thinks the shared-lane markings on some roads near his neighborhood have little positive effect in terms of either increased safety or driver awareness, which Sam views as the primary obstacle to utilitarian cycling. "A lot of motorists don't tend to treat bikers like other commuters," he said. "They don't give you the same respect." He thinks some sort of public awareness campaign targeted at drivers is in order.

## **Bywater**

As in Navarre, four people living in Bywater (Brian, Laurie, Donna and Pete<sup>28</sup>) were interviewed. Two interviews were conducted in person and two through email in January 2013. The group is evenly split between men and women. All participants are white and live alone. They range in age from 36 to 61, and have completed anywhere from some college to graduate degrees. Only one is from New Orleans originally but three have lived in the city at least ten years. The fourth moved here seven years ago. All own bicycles and automobiles. One gets around primarily by bicycle and walking.

## **No way, no how**

Brian, 53, moved to Bywater seven years ago from Ft. Lauderdale, Florida. He owns a bicycle, but rarely uses it. When he does, it is mostly to avoid the traffic of the French Quarter during high-traffic events like Mardi Gras or French Quarter Fest.

He chose Bywater for its “interesting, diverse” population, and for the opportunity to buy a “wonderful historic home at an affordable price” in an “up-and-coming neighborhood.” He was also attracted by its proximity to the French Quarter, though he rarely ventures into that part of town. At the time of our interview, he hadn’t ridden his bike in at least three months.

Brian has never commuted to work by bike. He is a realtor, a job that involves driving “all over town” with clients. Bicycling, he said, would be “impractical.”

Since he moved to the neighborhood, Brian has noticed a major shift in how people get around. “When I moved to Bywater, it was not as bike-friendly as it is now,” he said. Today, he said, the area is teeming with cyclists.

But Brian is not tempted to significantly alter his transportation habits. He lists distance to various destinations and concern about accidents as the primary deterrents to utilitarian cycling outside of his work commute. Crime is also a concern, but not as significant a concern as accidents.

## **Interested but concerned**

Laurie, 61, has lived in Bywater “on and off” for 15 years. She moved away after Hurricane Katrina, to Arlington, Virginia, and moved back in November 2007. She loves bicycling, though she hasn’t done much of anything active for the past few months thanks to a sciatic nerve problem that made even walking painful. When she bikes, she does so mostly for exercise.

“I’ve ridden all over the city on my bike,” she said. “I prefer to ride on a bike path. I love the one on the North Shore,” she said, referring to the 31-mile Tammany Trace, the multi-use path used by cyclists, runners and walkers and off-limits to automobiles developed along a former railroad right-of-way. “But down here, I ride on the street.”

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<sup>28</sup> Names have been changed

She's noticed lots of other people riding in her neighborhood, many of whom, she said, depend on their bicycles for transportation. And she is thinking about doing more utilitarian bicycling. Laurie usually drives to her job in human resources with the public library system, "but when the weather is nice, I plan to ride more this year, now that I'm not in pain anymore," she said. "The biggest things preventing me from biking are my hip problem and the weather. I think it would only take encouragement for me to ride more often."

Donna, 36, is a writer and yoga instructor who recently gave up her full-time middle school teaching job to head back to school to study architecture. She admits she is intrigued by the idea of bicycling for transportation, yet she has never attempted to bike to her job or to school Uptown. She rattles off a list of reasons to justify her reluctance. There's the distance ("it's a 30 minute drive from Bywater to Tulane"), her fear of crashes ("there's so much traffic"), not wanting to show up sweaty ("the weather's not good for it") and her unconventional schedule ("I come home at ungodly hours and I don't feel like biking as a woman is that safe"). Yet she uses her bicycle to get around her neighborhood with some frequency. She describes her bicycle usage as "recreational transportation."

"I'll ride to go to breakfast or to get a snowball, to get to the Quarter or to hear music in Lafayette Square," she said. Still, Donna usually drives her car to get places, especially if she's leaving her neighborhood, as she often does, even for social reasons.

Donna moved to Bywater just over a year ago from Bayou St. John. Most of her friends live elsewhere in the city. On the occasions that friends come to visit in Donna's part of town, they usually walk to get places, or, if the trip is not readily walkable, drive.

"I feel like if I had more friends in the neighborhood, I would bike to people's houses and I would bike to go out more," Donna said. "I know a lot of people bike to go out because it's better than drinking and driving and one of the benefits of living in Bywater is that you can bike to bars, but I'm not necessarily drinking in the neighborhood."

Her comfort level with bicycling declines precipitously the farther outside of Bywater she travels. She isn't very confident navigating automobile traffic on a bike. "I'm more likely to bike when I'm with friends who are comfortable biking," she said. "And I don't have many girlfriends who bike."

Part of her concern relates to the fact that "there aren't many well-marked, safe bicycle lanes," Donna said. "I've looked up the bicycle routes and realized how few actual bike lanes there are. This map had all these other quote-unquote bike routes that are not actual lanes at all. I need a really clearly marked bike lane that says, 'You are safe doing this here.'"

Donna is a native New Orleanian who has lived in a number of other places, including, briefly, a stint in Japan, where she taught English. "In Japan, we did everything on bicycle," she said. "I would walk or bike everywhere. And it felt so much more normal."

Since she moved to her new home, she has started to feel self-conscious about her primary mode of transportation. “Sometimes down here I feel like I live in Berkeley or Brooklyn,” she said. “I’m a yoga teacher. I’m enlightened. I want to help the world. But it makes me feel like an asshole, living in the Bywater and driving,” she said.

Peer pressure aside, Donna appreciates the environmental and cost-saving benefits of bicycling, and the pleasure she gets from it. “Some of my best days in the Bywater have been by myself, tooling around and going to a cafe or to get a snowball and locking up my bike instead of parking my car,” she said. “Anytime I do bike I absolutely love it.”

She thinks the city needs more high-visibility, protected bicycle infrastructure and a public awareness campaign to emphasize the rights of riders. “You know the Strut Safely campaign that’s going on (in which the satirical dance troupe the 610 Stompers remind drivers to yield to pedestrians)?” she asked. “Why not capitalize on another noteworthy New Orleans cultural group? Put the Mardi Gras Indians on bicycles.”

She said she would be much more likely to bicycle routinely (and beyond the boundaries of her neighborhood) if she knew that it was a faster option, or at least didn’t require too much more time, and if it was relatively easy and safe. Meantime, Donna admits that much of her behavior is simply rooted in habit.

“I never owned a dog until I was in my 20s, and then I owned a dog, and I was like, ‘This is great,’” she said. “I’ve never been a bike commuter, but maybe if I started, just by practicing it and trying it, maybe I would love it.”

### **Enthused and confident**

Pete, 45, moved to Bywater three months before our interview, but has been working in the neighborhood for years. He is a woodworker and renovations specialist who previously lived in the Irish Channel. He is currently working on the very house he’s living in, so he doesn’t commute for his job, though he commuted by bike for about a year recently. “I had a house I was working on and gas prices were going up. It was a good way to get exercise and save money,” he explained.

Now, he mostly gets where he needs to go in the neighborhood by foot. Things are closer-by than they were in the Irish Channel, where he mainly got around by bicycle, he says. Plus, he feels safer walking in Bywater at night than he did where he lived before thanks to more 24-hour activity that gives him a greater sense of security. He still uses his bike regularly to get around town, at a minimum of once a week.

Pete is a Detroit native who moved to New Orleans in the 1990s after living in Seattle and San Francisco. He grew accustomed to bicycling for transportation in those cities, and finds New Orleans relatively well-suited to the mode. “It’s a strange city where you can probably get somewhere as fast or faster on a bike, without any parking problems,” he said. “And I’m so much more relaxed when I go across town on a bike than when I drive.”

The most obvious obstacles Pete finds to bicycling in New Orleans are the rain (“but even that’s not that big a deal”), the heat (“For my work it doesn’t really matter, but it’s gotta matter for a lot of people who get to work and they’re all sweaty”), “crazy” drivers and poor infrastructure, especially too few bikeways and pot hole-riddled roads. But some of these things are getting better, he said. Roads are being repaired and bike lanes added. And even drivers seem to be getting more accustomed to cyclists. Pete was biking Uptown at night recently and was yelled at by a driver, who was not telling him to get out of the road, as he expected, but that he needed a bike light.

Perhaps the biggest challenge to cycling in New Orleans, as Pete sees it, has nothing to do with the reality on the ground but people’s perceptions of it. “I think even though the city’s not spread out, in our mind,” he said, “it’s bigger than it is.”

### **Ease of travel by bicycle to the CBD**

To get a sense of the relative ease of and difficulties associated with bicycle commuting from each neighborhood, I conducted field observations that involved bicycling with a research assistant from the centers of Navarre and Bywater to the intersection of Girod and Carondelet streets in the Central Business District. Although neighborhood residents undoubtedly travel to places other than the CBD for work, this district contains one of the highest concentrations of jobs in the metro region and therefore offers a useful barometer of the viability of bicycle commuting from each neighborhood (see appendix F for a map of jobs clusters).

Routes were chosen for a combination of directness and available bike facilities. In both cases, alternative routes could have been taken. Travel speed, distance, direction and time were tracked using the cell phone application BikeBrain. This information was subsequently uploaded to Google Maps. The Bywater to CBD route was ridden on the afternoon of Saturday, Dec. 8, 2012. The Navarre to CBD route was ridden on the afternoon of Sunday, Dec. 9, 2012. Traffic patterns may differ substantially during the week day. The weather during both mapping periods was cool and sunny.

### **Bywater to CBD**

The route from the Bywater began at Urquhart Street and Poland Avenue, on the north side of St. Claude Avenue. This is an area that has not seen the same level of reinvestment as much of the rest of the neighborhood. Overgrown lots, abandoned buildings and a panhandler appealing to motorists for change were among the visible signs of poverty on the day of our ride. Traveling down Poland felt a little treacherous. Even on a weekend, there was heavy auto traffic coming down the avenue, some of it channeled off the Claiborne Avenue Bridge over the Industrial Canal.

Turning off Poland onto St. Claude Avenue, the striped bicycle lane offered some measure of reassurance as we traveled along the heavily-trafficked state highway with cars whirring past, many of them surpassing the 35 mph speed limit. Still, the trip felt dangerous at times, especially when vehicles parked in the bike lane required us to veer into the traffic lane. Cars

pulling in and out of the parking lots that dot the corridor and bicyclists traveling in the wrong direction toward us were among the other hazards encountered. Given the lack of shade along the path, I was thankful this trip was made in one of the cooler months. Our experiment would undoubtedly have been much less comfortable in one of the summer months, with the sun beating full-force on the black asphalt pavement.

We crossed the railroad tracks at Press Street into the Marigny neighborhood to discover that a tire on my partner's bike had deflated, sliced by broken glass strewn along the bike path. The timing of the incident was fortuitous, as it occurred just blocks from the bike shop that opened a few years ago in the 2300 block of St. Claude. We ambled into the compact shop in search of a replacement tube to find the store doing a swift business on a Saturday afternoon. Virtually all of the activity was generated from customers who had bicycled to the store in search of a tune up or some piece of gear. The exception was a woman who had driven over to pick up a completed repair job: a child-sized bicycle that the customer said belonged to a 60-year-old man.

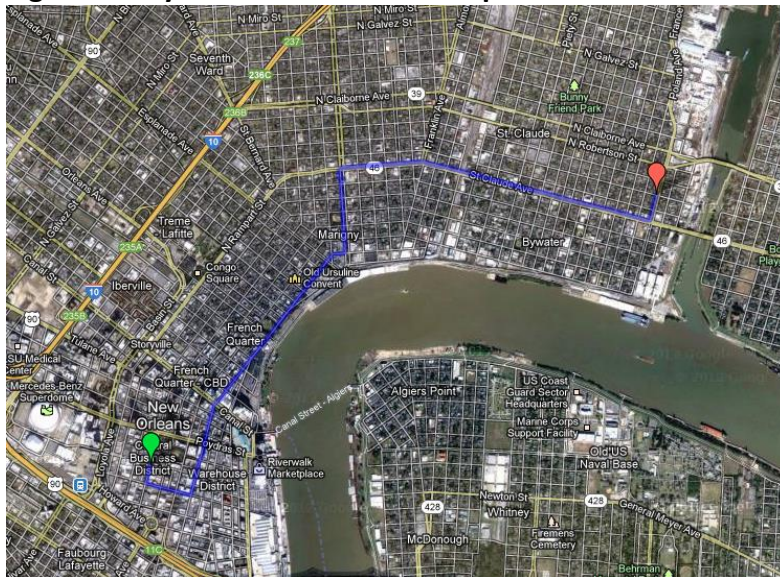
As was clear from context and conversations with various patrons, these were not recreational cyclists, but people who used their bicycles for practical purposes. Even so, aesthetics were of some concern. One of the store's customers, a black man who looked to be in his 20s, tied his tricycle up at the front and walked inside to inquire about fenders. When an employee handed a chrome set his way, the customer recoiled. "It's gotta look good, man," he told the employee, explaining that he wanted black fenders to match the body of his trike.

Among the customers waiting in line for service was a black man in his 50s who gets around primarily on a well-worn mountain bike. He was a Bywater resident, and said he sees a lot more bicycling company on the streets of his neighborhood lately. He is heartened by the trend, though he says he still doesn't always feel comfortable bicycling. He avoids the streets on weekend nights, when he fears many drivers have been drinking.

Tire repaired, we ventured back out on St. Claude, turning onto Elysian Fields Avenue then onto Decatur Street to ride through the French Quarter. Automobile traffic along the street was at a standstill, and we rode alongside the snaking cars, easily outpacing vehicular traffic but occasionally challenged by costumed cyclists riding in the wrong direction, restaurant workers pushing carts in the street to avoid crowded sidewalks and a carriage tour that almost caused a collision when it failed to signal it was turning. The chaotic scene provided sensory stimulation in droves while the slow automobile traffic and ample street life made cycling feel exciting, efficient and safe, even in the absence of dedicated bicycling infrastructure. We continued across Canal Street and into the Central Business District, turning onto Julia Street and then on Carondelet Street to reach our destination.

The trip totaled approximately four miles and took about 25 minutes, not including stops, at a leisurely average pace of 9.7 miles per hour.

**Figure 25. Bywater to CBD route map**



Source: Google Maps, created using BikeBrain

### **Navarre to CBD**

The following day, we set out to bicycle to the same spot in the CBD from the center of the Navarre neighborhood. Starting at the intersection of Navarre Avenue and Canal Boulevard, we traveled eastward down Navarre, a two-lane, mostly residential street. The street is much narrower than the four-lane St. Claude Avenue, and traffic on this day was sparse and slow-moving and mostly keeping to the 30 mile per hour speed limit. Even in the absence of any dedicated bike infrastructure, this trip was off to a far more tranquil start than the previous day's journey.

We bicycled past a few pedestrians making use of the narrow but continuous sidewalk along the avenue that is shaded in sections by trees. As we got closer to City Park, the land uses grew more varied. We passed a corner café packed with patrons, the studios of the local public television affiliate, a ballpark, some buildings associated with Delgado Community College and several multi-family residential dwellings.

We turned onto Marconi Drive and quickly turned again onto Orleans Avenue, where street markings and signs encourage motorists to share the lane with bicyclists, though no dedicated lane is provided. Upon reaching Bayou St. John and the multi-purpose Jefferson Davis Trail, we rode separated from vehicular traffic along the scenic bayou for just under a mile before turning onto Banks Street, a boulevard graced with sprawling live oak trees and large, raised homes. Before long, this picturesque New Orleans scene gave way to a scruffier set of circumstances characterized by vacant, overgrown lots and houses caving in on themselves.

We turned onto South Dorgenois Street, riding amid a series of dilapidated, industrial buildings, some of them seemingly abandoned, and crossed busy Tulane Avenue. We traveled past



parking lots used by residents of the Falstaff Apartments, bail bondsmen and the nearby courthouse, and made a couple more turns to reach Lafayette Street. We pedaled beneath an elevated stretch of Interstate 10 and briefly through an area of industrial warehouses and relatively rough, pockmarked terrain. Finally, we rode quickly beneath the Claiborne Expressway to reach a smooth and traffic-free stretch around the Superdome, and crossed Loyola Avenue to reach our destination, just under 5 miles and 27 minutes after we began.

Although to this researcher's mind, Navarre seems much farther away, our bicycle trip between the neighborhood and the CBD was only about a mile longer than the ride from Bywater. It was also a faster-moving trip. Without intentionally cycling at a higher rate, our average speed increased slightly to (a still modest) 11 miles per hour. Total travel time was only a few minutes longer than the previous day's trip. Some of the speed savings related to having avoided the French Quarter, one of the more stimulating parts of the previous day's journey but also the slowest leg of the trip.

Among the other obstacles encountered along our Navarre-to-CBD route was the elevated Claiborne Overpass, the mammoth monument to the automobile that stands between Navarre and the CBD. The area beneath the overpass is readily traversable by foot or by bike but could serve as a psychological barrier to non-motorized travelers. Furthermore, the desolate industrial stretch just before the interstate, which looked as if it could have served as the place for stashing bodies in a mobster movie, isn't the most welcoming cycling landscape.

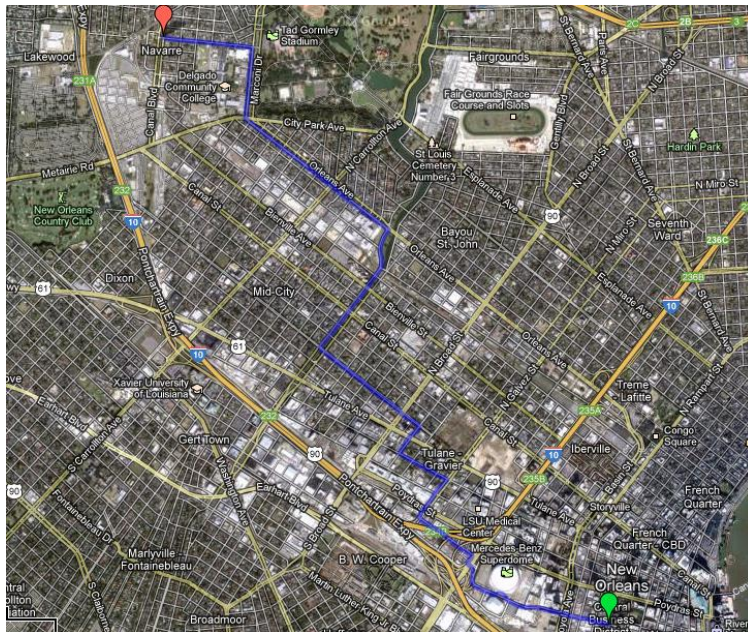
This trip also required a more circuitous route. Our journey involved approximately ten turns, roughly double those taken on our ride between Bywater and the CBD. Additionally, while we made these trips during the weekend, making them imperfect approximations of actual commuting conditions, noteworthy was the dearth of fellow cyclists encountered on the Navarre-to-CBD trip. Research suggests that people are most likely to bicycle in places where they see other people bicycling (Dill & Voros, 2007). If an area is teeming with cyclists, bicycling may be more readily perceived as a viable option. Conversely, in places where very little bicycling occurs, it may seem less feasible.

The built environment, history and culture of Navarre help to make it a far more auto-oriented neighborhood than Bywater. As compared with Bywater residents, Navarre residents own more cars, have an easier time storing their vehicles thanks to copious off-street parking, and must travel farther to reach every day needs thanks to the relative homogeneity of land uses in their almost exclusively residential neighborhood. They also live at a nexus of high-speed automobile infrastructure, with I-10 and I-610 forming two of the neighborhood's boundaries. Whereas the most direct route between Bywater and the CBD takes residents straight through the French Quarter, a neighborhood famously inhospitable to driving but relatively easy to maneuver by bicycle, Navarre residents have no need to cross the French Quarter to reach the CBD. Interstate traffic and downtown parking constraints notwithstanding, they can easily reach this jobs center by car. Given relatively high levels of access to automobiles, ease of driving (and parking), and highly-segregated land use patterns, many Navarre residents find that the incentives to drive are strong.

There was some disagreement between my travel partner and me about which of the two bicycle trips was more enjoyable. He relished the scenic views and slow-moving traffic that we encountered at the outset of our Navarre to CBD trip, while he paid little mind to the more blighted stretches that made me anxious. Ever since I was mugged a few years ago while traveling home at night on my bike in a desolate section of town, vulnerability to crime while biking has been a serious concern. Paradoxically, the heavy traffic and more frenetic conditions we encountered between Bywater and the CBD made me feel less vulnerable.

Remarkable to my mind is that there was any contest between the two trips. My assumption at the outset that the Navarre to CBD route would present glaring obstacles offering ample explanation for the substantial discrepancy in bicycle commuting between the two neighborhoods turned out to be erroneous. The experience revealed that it is not the physical environment exclusively that is tamping down utilitarian cycling in Navarre. Aforementioned concerns aside, bicycle commuting - between Navarre and the CBD at least – does not require any Herculean feat.

**Figure 26. Navarre to CBD route map**



Source: Google Maps, created using BikeBrain

**Key findings**

Substantial disparities in bicycle commuting patterns observed in Bywater and Navarre are not readily explained by the age, racial or gender composition of the two neighborhoods or the composition of each neighborhood's working populations. The higher rate of bicycle commuting in Bywater may be tied to lower income and car ownership in that neighborhood, requiring some to bicycle out of necessity. It may also relate to familial structures in each neighborhood, specifically, a higher concentration of households with children living in Navarre that could make bicycle transportation more difficult. Differences in the shape of the built environment and land uses may additionally be influencing commuting behavior. As compared with Navarre, Bywater has more bicycle-specific infrastructure, a street grid that is more conducive to non-motorized transportation, a more mixed-use environment that reduces distances required to reach many everyday needs, and far less off-street parking. But none of these findings is enough to explain the difference in commuting behavior, in this researcher's opinion. Bicycle trips made from the center of each neighborhood to the center of the city's Central Business District reveal that it is feasible to travel to work by bicycle, that the distance and time required to travel there by bicycle are not substantially greater from Navarre as compared with Bywater and that the trip is by some measures more appealing. This finding, along with evidence gleaned from interviews with neighborhood residents, suggest that differences in attitudes and social norms between the two neighborhoods may also be exerting substantial influence over commuting patterns. Self-selection may also play a role, with people moving to Bywater because they want to get around by means other than the automobile, while those living in Navarre prefer to drive most places.

## **Chapter V. Congestion and contagion: Conclusions and policy implications**

Research Questions:

- 1. What parts of New Orleans are experiencing the highest and lowest rates of bicycle commuting?**
- 2. What are some of the factors encouraging and discouraging cycling locally?**
  - a. What does the literature reveal about factors that influence rates of bicycling for transportation?**
  - b. What do city residents say?**
  - c. What do neighborhoods say?**

Despite well-publicized gains in bicycle commuting that set New Orleans apart in the car-dependent south, ACS data reveal substantial variation in bike commute rates across the city. In certain sections of New Orleans, and especially in some older areas located along the river, bike-commute rates are comparable to - and even surpass - those found in acclaimed U.S. bicycling hubs like Portland and Seattle. Meantime, across much of the city's post-World War II landscape, bike commuters are nearly as rare as a winter snowfall in this subtropical climate. And while the journey to work represents just a portion of a person's overall transportation behavior, it is an imperfect but useful proxy for utilitarian cycling more generally (Barnes & Krizek, 2005).

Existing research finds that bicycling is more prevalent where it offers time and money savings over driving (Reitveld & Daniel, 2004), and this project reinforces this idea. Convenience was a major motivator cited by New Orleans-based survey respondents and interview subjects, who indicated that bicycling was an appealing option where it allowed them to avoid parking hassles and circumvent automobile traffic and a sometimes-unreliable public transit system. Eighty-nine percent of survey respondents cited convenience as a motivating factor in their decision to bicycle for transportation. Likewise, 89 percent reported that health and fitness benefits were an important motivator, while 66 percent cited economic considerations as encouraging the practice.

Bad weather, including rain and heat, render bicycling significantly less convenient and appealing, as shown by the literature and echoed by city residents. Among those surveyed, weather-related factors – and rain in particular - rated among the most substantial barriers to bicycling. Rain was cited by 80 percent of survey respondents as a barrier, while 56 percent of respondents cited heat and 37 percent cited cold as impediments.

The literature also points to a relationship between the shape of the built environment and utilitarian bicycling behavior. There appears to be a link between bicycling and the presence of bikeways and end-of-trip facilities, for example. Similarly, a positive association has been found between utilitarian bicycling and mixed-use development patterns that can reduce the

distances required to reach important destinations and promote a more pedestrian-scale environment.

Surveys and interviews conducted as part of this project indicate that distance to destinations can serve as an important deterrent. Forty-three percent of survey takers reported that the distance to reach places other than work or school stood as a barrier to bicycling, and 33 percent said the distance to work or school made bicycling unappealing. Almost half (47 percent) of all survey takers said they would be more likely to bicycle if they didn't have to travel as far to reach their destinations. Similarly, several interview subjects said the trip to work was too far to travel by bike.

The idea that the shape of the physical environment is a significant driver of utilitarian cycling is reinforced by observations from two city neighborhoods, Bywater and Navarre. Bywater is a neighborhood with one of the highest rates of bicycle commuting in the city, and is defined by a mix of commercial and residential uses, some dedicated bicycle facilities and scant off-street parking. Even though cyclists are allowed on all city streets, dedicated infrastructure may signal to potential riders that areas equipped with bikeways are ones where cycling is accepted, safe and even encouraged. As compared with Bywater residents, Navarre residents own more cars, have an easier time storing their vehicles thanks to copious off-street parking, and tend to need to travel farther to reach every day needs thanks to the relative homogeneity of land uses in their almost exclusively residential neighborhood. They also live at a nexus of high-speed automobile infrastructure, with I-10 and I-610 forming the borders along two sides of the neighborhood. Given relatively high levels of access to automobiles, ease of driving (and parking), and highly-segregated land use patterns, many Navarre residents find that the incentives to drive instead of opting for alternative means are strong. A smaller proportion of Navarre residents opts to bicycle to work.

Potentially more important than distance are concerns about poor infrastructure. Seventy-seven percent of survey takers said poor roads prevented them from bicycling for transportation, while 75 percent said they were kept off of their bikes by inadequate or insufficient bikeways. Ninety-one percent of survey takers said better roads would make them more likely to bicycle, while 89 percent said a more expansive bikeway network or one that provided better protection from vehicles was important to enticing them to the practice. Concerns about infrastructure were especially pronounced among more tentative cyclists identified through this research. For example, 82 percent of "interested but concerned" survey takers, those who indicated some interest in bike commuting but who do not typically get to work by bicycle, reported that poor roads prevented them from bicycling, while 84 percent said insufficient or inadequate bikeways were important obstacles. Among this survey subset, 94 percent reported that an improved or more extensive bikeway system would improve their willingness to bicycle for transportation.

Possibly related to concerns about the shape of existing infrastructure is a fear of crashes, cited by 58 percent of all survey respondents as an impediment to bicycling for transportation. The

vast majority of survey takers (86 percent) also said that they would be more willing to bicycle if city drivers were more cautious around and attentive to cyclists.

Certain demographic factors seem to serve as valuable predictors of utilitarian cycling levels. The literature suggests that most cyclists in the U.S. are non-Hispanic whites. They are also overwhelmingly male. Cycling drops off substantially with age, and there is some evidence that the poor are more likely than the wealthy to bicycle for transportation, though this disparity may be largely driven by access to automobiles, a factor negatively associated with utilitarian cycling.

Lower incomes and lower rates of auto ownership in Bywater relative to Navarre lend some support for the idea that necessity born out of financial constraint may be in part the cause of higher bicycle commuting rates in Bywater. Survey takers who described themselves as regular bicycle commuters were more likely than the general survey sample to live in carless households, even as the majority owned or had access to cars. They were also more likely than the survey sample generally to claim household income of less than \$15,000.

Yet this research simultaneously offers evidence that the spatial variation in bicycle commuting is not necessarily rooted in differences in age, gender or race. For instance, Bywater's median age is higher than that of Navarre, bicycle commuters in the neighborhood are mostly female and the population is proportionally more black.

The literature shows some support for the "safety in numbers" hypothesis, which holds that places with higher rates of bicycling tend to be the safest places to ride. It also suggests that living or working in places with high rates of bicycling may encourage taking up the practice. Interviews conducted as part of this research reinforce the idea that bicycling is, as the author Malcolm Gladwell might describe it, contagious (Gladwell, 2000).

Even while this study suggests that convenience, demographic factors and the shape of the physical environment are important, it also points to an important role for cultural forces in shaping residents' transportation cycling behavior. Just as social norms are largely responsible for one Bywater resident's self-consciousness about driving through her heavily-bicycled neighborhood, so they also contribute to Navarre residents' inclination to hop in their cars to get just about everywhere. Nearly one-third of survey respondents identified cultural factors, such as knowing other bicyclists, as positively influencing their bicycling behavior. Twenty-two percent suggested that they would be more apt to consider bicycling for transportation if they felt less social stigma toward the practice. Field observations conducted as part of this research reinforce this idea, showing that it is not only feasible to bicycle from Navarre to the Central Business District, but that the ride between Navarre and this important city jobs' center is by some measures more appealing.

Although social forces may be harder to manipulate directly than the shape of the built environment, evidence from New Orleans and elsewhere suggests that the physical landscape both reflects and helps to define the culture of a place where bicycling and other transportation

behavior are concerned. By creating an environment conducive for bicycling - one with proper infrastructure, education, compatible land use policies and where driving is probably a little more difficult - it is likely that more people will be attracted to the mode, spurring others to feel more comfortable taking up the practice.

### **Policy recommendations**

This project suggests that there are more people interested in bicycling for transportation than currently do so. Even though almost three-quarters of the survey sample reported that they typically drove themselves to work, more than half (56 percent) said they would like to bicycle to work “frequently” or “almost always.” A higher proportion (69 percent) said they would like to get places other than work or school by bicycle “frequently” or “almost always,” while just 30 percent of survey respondents said they currently travel to non-work or school destinations on bicycle at this frequency. Just 4 percent of survey respondents said they would not bicycle for transportation purposes under any circumstance. If policy makers intend to improve the existing transportation cycling landscape and attract new riders to the practice, a broad and integrated web of policies and programs that involve areas that are less commonly part of bicycle-advocacy discussions is needed. To this end, several recommendations are prescribed.

### **Infrastructure**

The substantial investment in new bikeways that New Orleans has made in recent years appears to be paying off in attracting new ridership, as evidenced by growth in the city’s bike-commute ranks (ACS 2006-2010a) and recorded increases in bicycle traffic, especially at observation points in close proximity to dedicated bicycle facilities (Tolford, 2012). Yet surveys and interviews suggest that more work is needed to expand, improve the connectivity of and bolster the protection afforded by the city’s bicycle-transportation network. For example, 75 percent of survey takers said that a dearth of bikeways prevented them from bicycling for transportation. Eighty-nine percent said that more or better bikeways would make them more likely to bicycle for transportation. More direct routes and reducing stops required of cyclists could improve the convenience of bicycling by decreasing distances between points and making bicycling a faster and more attractive mode (Rietveld & Daniel, 2004). Yet the installation of bike lanes and paths has to-date followed an ad hoc approach, guided mainly by road-repair schedules created independent of any bicycle master plan. This has resulted in complaints among some users about a lack of system connectivity (Bahr, 2012).

The shape of bike infrastructure is also important, and accounts for a concern cited frequently by existing and prospective city cyclists over the course of this study. A large proportion of the city’s bikeway system comprises shared lane markings, which many believe offers inadequate protection from motor-vehicle traffic and may actually create confusion about bicyclists’ rights (Bahr, 2012). Some drivers may erroneously believe, for example, that those lanes not marked in this fashion are off-limits to bicycles. To attract new, less confident cyclists, and to encourage those already using their bikes for transportation to do so more often, the city should emphasize bike lanes and protected paths where possible to provide the maximum level of safety, real and perceived. As one Bywater woman put it, “I need a really clearly marked bike lane that says, ‘You are safe doing this here.’”

Additionally, this research suggests that more - and more sophisticated - end-of-trip facilities, from lockers and showers to secure bicycle parking, could help to make bike commuting feasible for the broader public. Thirty-five percent of survey takers said they were prevented from bicycling by a lack of shower facilities at their destination, and 32 percent said access to such facilities would make them more likely to bicycle. Although bicycle parking wasn't explicitly included in a list of factors considered by survey takers as influencing bicycling behavior, numerous respondents wrote in extra space provided that bicycle parking was an important variable.

Beyond bike-specific infrastructure, it is also important to focus on improving and maintaining city streets as a means of promoting cycling. Pockmarked streets are a source of consternation among drivers, but are a serious safety concern to bicyclists, especially those who bicycle at night. Seventy-seven percent of survey takers rated poor roads as a barrier to bicycling, a higher proportion than rated inadequate bikeways, fear of accidents and heat as obstacles. Ninety-one percent of survey takers said better roads would make them more likely to bicycle.

### **Land use**

The complete streets ordinance adopted by the city in 2011 should mean enhanced accommodations for city cyclists, but complete streets are just one part of the puzzle. Cycling advocates and policy makers should focus on what might be described as complete neighborhoods, those offering a full array of amenities that enable residents to accomplish everyday needs such as buying groceries and going out to eat - and even sending their children to school - without traveling great distances. Although distance didn't rank among the top impediments to transportation bicycling among survey respondents, 43 percent indicated that distance to work or school was a substantial barrier and roughly one-third said distance to work or school was an obstacle. Forty-seven percent of survey takers said they would be more likely to bicycle if they didn't have to travel as far to reach destinations.

This type of neighborhood is only possible through land use policies that encourage a mix of residential and commercial activities, infill development, density, and that in some cases make parking less, rather than more, convenient. Policy makers should furthermore resist pressures to raze structures and pave vacant lots in historic urban areas to make way for more parking. Related policies have been summarized in recent years under the banner Smart Growth, but whatever label they are given, they are important to creating the types of neighborhoods that encourage alternative forms of transportation and a more vibrant and safe street life.

### **Publicly-available bicycles**

Bicycle access is an obvious prerequisite to bicycle ridership. Although the vast majority of survey takers captured in this study owned or had access to bicycles, 8 percent of survey takers did not. Twenty-two percent of survey respondents said access to a bicycle would improve their willingness to bicycle for transportation. The city is currently evaluating the viability of a bike share program similar to those that have proven successful in a growing number of cities. Typically, these systems allow riders to check out bikes on a short-term basis from kiosks using



a credit card. A bike share program could go a long way toward helping to make bicycles more available and make biking more convenient, especially for commuters and tourists who may use some other means to get to the center of the city but wish to use bicycles once they arrive for shorter, inner-city trips. Increasing the number of bicyclists on the streets could help to encourage a culture that more readily embraces bicycling as a viable mode of transportation.

Although they can be gotten for a fraction of the price of a car, and require far less in the way of maintenance and upkeep, the cost of even a used bicycle may be prohibitive for the poorest city residents. A recent search for used adult bikes in New Orleans on the website Craigslist turned up a plethora of options, none of them offered for less than \$100. Bike share, with its reliance on credit, could exclude many of the city's low-income residents. It may be worth exploring a program similar to the Red Bike Project undertaken in Madison, WI, which collects donated bikes, douses them conspicuously in red paint and makes them available for check out at no cost through the city's library system.

### **Incentives**

In the same way that New Orleans and other cities have begun incentivizing the provision of fresh foods in underserved neighborhoods, incentives should be explored to entice businesses and neighborhoods to encourage cycling and other alternative forms of transportation as a means of promoting public health, environmental sustainability and fostering a culture that embraces these modes. This might mean eliminating parking requirements for businesses that set up shop in pedestrian- and bicycle-accessible locations or assisting with low- or no-interest loans to help businesses install bicycle parking and showers for employees.

### **Education**

This study also points to the need for enhanced traffic enforcement and driver education. A persistent source of frustration identified over the course of this research is a lack of awareness among drivers – including, in some cases, police officers - about bicyclists' rights to the road (Bahr, 2012). Numerous study participants suggested that a public advocacy campaign focused on cyclists' rights and driver safety is needed.

This research also identified a segment of the city population that lacks basic bicycle-riding skill, doesn't know the rules or etiquette involved in riding on city streets, or for whom basic bicycle-maintenance training could vastly improve his or her willingness to bicycle. For instance, 8 percent of survey takers said they didn't know the rules entailed with bicycling on city streets and 2 percent said they didn't know how to ride a bike. This suggests the need for more bicycle education programs to help the general public feel more confident riding and maintaining bicycles.

Finally, advocates should work to better quantify and promote the various advantages of bicycling, including those cited by survey takers in this study. The environmental merits of bicycling are well-known and were named as important motivators by a majority (78 percent) of survey takers. Yet even among those of us convinced of the calamitous effects that await the planet because of our unabated addiction to fossil fuels, the scale of the ecological problem can

seem so massive and the worst predictions far enough removed so as to allow for rationalizing away our personal transportation behavior as of little consequence. Perhaps a more effective tool for luring people to the bicycle is to frame the argument around more immediate and measurable personal benefits. Health and fitness and money savings are important examples. Americans spend billions each year on gym memberships, weight-loss products and other attempts at whittling our ever-expanding waistlines (IHRSA, 2012), and waste untold hours and gasoline stuck in rush hour traffic (Werbach, 2013). But while most appreciate intuitively that bicycling is a health-promoting activity, fewer probably realize just how much they might benefit from exchanging their cars for their bicycles, even a couple times a week. When bicycle commuting is seen as means of avoiding the gym and saving money every month, its convenience quotient increases substantially.

**Figure 27. Bicycle advocacy graffiti**



Image courtesy tubulocity.com

## Appendices

### Appendix A. Institutional Review Board exemption notice

***University Committee for the Protection  
of Human Subjects in Research  
University of New Orleans***

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*Campus Correspondence*

Principal Investigator: John Renne  
Co-Investigator: Emilie Bahr  
Date: September 27, 2012  
Protocol Title: "Cycling in the Crescent City: What's behind the varying rates of bicycle commuting in New Orleans?"  
IRB#: 07Sep12

The IRB has deemed that the research and procedures described in this protocol application are exempt from federal regulations under 45 CFR 46.101category 2, due to the fact that any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

Exempt protocols do not have an expiration date; however, if there are any changes made to this protocol that may cause it to be no longer exempt from CFR 46, the IRB requires another standard application from the investigator(s) which should provide the same information that is in this application with changes that may have changed the exempt status.

If an adverse, unforeseen event occurs (e.g., physical, social, or emotional harm), you are required to inform the IRB as soon as possible after the event.

Best wishes on your project.  
Sincerely,



Robert D. Laird, Ph.D., Chair  
UNO Committee for the Protection of Human Subjects in Research

## Appendix B. American Community Survey journey-to-work questions

### American Community Survey

#### Population: Questions on Place of Work and Journey to Work

Questions as they appear in the questionnaire.

**30 At what location did this person work LAST WEEK?** *If this person worked at more than one location, print where he or she worked most last week.*

**a. Address (Number and street name)**

*If the exact address is not known, give a description of the location such as the building name or the nearest street or intersection.*

**b. Name of city, town, or post office**

**c. Is the work location inside the limits of that city or town?**

☐ Yes

☐ No, outside the city/town limits

**d. Name of county**

**e. Name of U.S. state or foreign country**

**f. ZIP Code**

Source: ACS-1(2009)KFI

**31 How did this person usually get to work LAST WEEK?** *If this person usually used more than one method of transportation during the trip, mark (X) the box of the one used for most of the distance.*

<input type="checkbox"/> Car, truck, or van	<input type="checkbox"/> Motorcycle
<input type="checkbox"/> Bus or trolley bus	<input type="checkbox"/> Bicycle
<input type="checkbox"/> Streetcar or trolley car	<input type="checkbox"/> Walked
<input type="checkbox"/> Subway or elevated	<input type="checkbox"/> Worked at home → SKIP to question 39a
<input type="checkbox"/> Railroad	<input type="checkbox"/> Other method
<input type="checkbox"/> Ferryboat	
<input type="checkbox"/> Taxicab	

**32 How many people, including this person, usually rode to work in the car, truck, or van LAST WEEK?**

Person(s)

**33 What time did this person usually leave home to go to work LAST WEEK?**

Hour Minute

:

☐ a.m.

☐ p.m.

**34 How many minutes did it usually take this person to get from home to work LAST WEEK?**

Minutes

## Appendix C. Survey



### Bicycling in New Orleans

This survey asks about factors that promote and discourage bicycling in New Orleans. All residents of Orleans Parish 18 years or older are encouraged to participate, whether or not they bicycle.

The survey is anonymous. Responses will be used as part of a masters' thesis and will help to improve understanding of bicycling patterns in the city. The survey consists of 26 questions and should take around 10 minutes to complete. If you have any questions or concerns about this survey, email [nolabikesurvey@gmail.com](mailto:nolabikesurvey@gmail.com) or call Dr. Ann O'Hanlon at 504-280-3990. Thanks for your input!

**Q1 Do you own or have access to a bicycle?** Yes No

**Q2 Do you own or have access to a car?** Yes No

**Q3 When did you last ride a bicycle in New Orleans? Do not include stationary cycling.**

- ☐ Can't remember/have never ridden a bicycle in New Orleans
- ☐ Within the last six months
- ☐ Within the last month
- ☐ Within the past two weeks
- ☐ This week

**Q4 How do you most often get to work?**

- ☐ Drive myself
- ☐ Carpool/get a ride
- ☐ Bicycle
- ☐ Walk
- ☐ Public transit
- ☐ Other (please identify) \_\_\_\_\_
- ☐ Not applicable/I don't travel to work/I don't work

**Q5 How do you most often get to school?**

- ☐ Drive
- ☐ Carpool/get a ride
- ☐ Bicycle
- ☐ Walk
- ☐ Public transit
- ☐ Other (please identify) \_\_\_\_\_
- ☐ Not applicable/I don't go to school/I don't travel to school

**Q6 Ideally, how often WOULD YOU LIKE to bicycle to work or school?**

- ☐ Never
- ☐ Occasionally
- ☐ Frequently
- ☐ Almost always
- ☐ Not applicable/I do not travel to work or school

**Q7 Ideally, how often WOULD YOU LIKE to ride a bicycle to get to destinations other than to work or school (for example, to get to the store, to visit friends, etc.)?**

- ☐ Never
- ☐ Occasionally
- ☐ Frequently
- ☐ Almost always

**Q8 How often do you currently use a bicycle for the following purposes?**

	Never	Occasionally	Frequently	Almost always
Commuting to work and/or school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shopping/running errands/visiting friends, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**If you answered never to BOTH parts of Q8 (above), skip to Q10.**

**Q9 Why do you bike to get places? Indicate the degree to which each of the following factors influences your decision to bicycle. If there are significant reasons that are not listed, please write them in one of the "other" fields and select the appropriate level of importance. Do not include bicycling trips made exclusively for exercise.**

	Not at all important/not applicable	Neither important nor unimportant	Important	Very important
Lack of other options	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health and fitness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Saving money	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Convenience (for example, avoiding parking hassles)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental reasons (for example, concern about climate change)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enjoyment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cultural reasons (for example, "Many of my friends ride bikes")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (identify and rate)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other ( identify and rate)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (identify and rate)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q10 Enter the approximate distance (in miles) from your home to work. If you do not work, or you work from home, write NA. \_\_\_\_\_**

**Q11 Enter the approximate distance (in miles) from your home to school. If you do not go to school, or you are a student who takes correspondence or online classes, write NA. \_\_\_\_\_**

**Q12 What PREVENTS you from bicycling to get places? Please indicate to what degree each of the following is likely to keep you from bicycling by selecting the appropriate level of importance next to each factor. If there are factors relevant to you that are not listed, write them in one of the "other" fields and select the appropriate level of importance. Do not include bicycling trips made exclusively for exercise.**

	Not at all important/not applicable	Neither important nor unimportant	Important	Very important
I don't have access to a bicycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm worried about crime	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm worried about accidents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The heat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The cold	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The rain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not enough bike lanes or bike paths	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poor road conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No showers at destination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Distance to work or school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Distance to destinations other than work or school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't know bicycling rules	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health problems that prevent me from bicycling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I'm too out of shape	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't know how to ride a bike	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cultural reasons (for example, "I don't know anyone else who bikes")	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (identify and rate)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (identify and rate)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other ( identify and rate)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



**Q13 What would make you MORE LIKELY to bicycle to get places? Indicate the importance of each of the following by selecting the appropriate level of importance next to each factor. If there are factors relevant to you that are not listed, please write them in one of the "other" boxes and indicate the appropriate level of importance. Do not include bicycling trips made exclusively for exercise. If you would not bicycle under any circumstance, select "very important" next to the last category.**

	Not at all important/not applicable	Neither important nor unimportant	Important	Very important
Access to a bicycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More or better bike lanes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Better road conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More acceptance of bicycling among my coworkers, friends or employer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A bike-share program that lets you check out bikes at different places around the city	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If drivers were more careful around bicyclists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shorter distance to desired destinations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Showers at destinations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I better understood bicycling rules	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I was in better shape	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (identify and rate)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (identify and rate)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (identify and rate)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would not bicycle under any circumstance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q14 What is your gender?** Female Male

**Q15 What is your age?** \_\_\_\_\_

**Q16 Select the category that most closely describes your race.**

- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska native
- ☐ Asian Indian
- ☐ Chinese
- ☐ Japanese
- ☐ Korean
- ☐ Other Asian, please specify \_\_\_\_\_
- ☐ Native Hawaiian or other Pacific Islander
- ☐ Filipino
- ☐ Other race, please specify \_\_\_\_\_

**Q17 Are you of Hispanic or Latino origin?** Yes No

**Q18 Which category best describe your employment status?**

- ☐ Working for pay outside the home
- ☐ Working for pay inside the home
- ☐ Looking for work
- ☐ Homemaker or stay-at-home-parent
- ☐ Student
- ☐ Retired
- ☐ Other, please specify \_\_\_\_\_

**Q19 Please select your highest level of educational attainment**

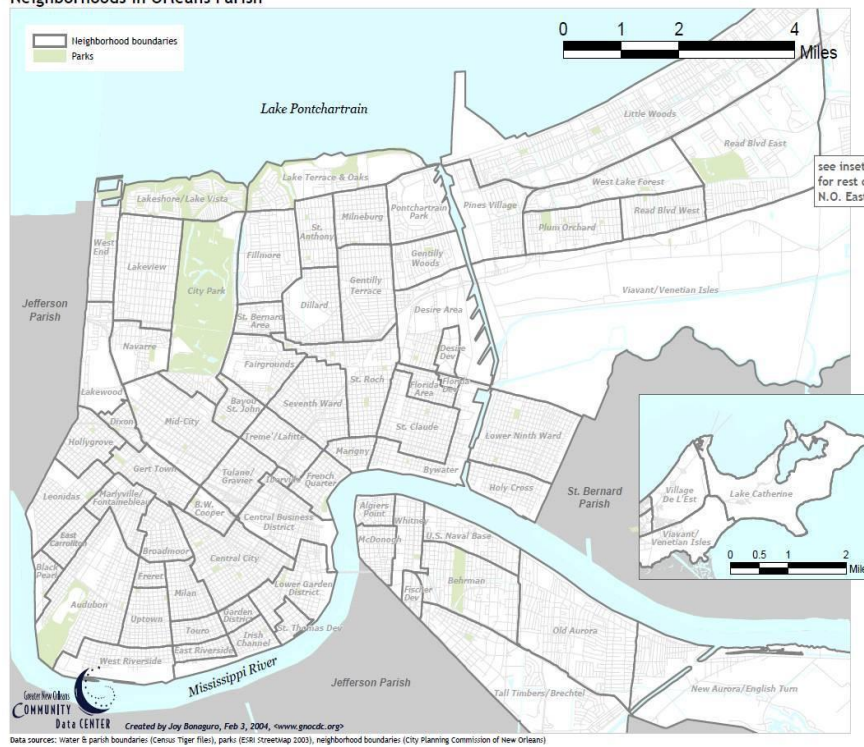
- ☐ Less than high school
- ☐ High school graduate or equivalent
- ☐ Some college
- ☐ Associate's degree
- ☐ Bachelor's degree
- ☐ Some graduate school
- ☐ Graduate or professional degree

**Q20** Please select your annual household income range

- ☐ Under \$15,000
- ☐ \$15,000 to \$24,999
- ☐ \$25,000 to \$34,999
- ☐ \$35,000 to \$49,999
- ☐ \$50,000 to \$74,999
- ☐ \$75,000 to \$99,999
- ☐ \$100,000 and up

**Q21** What neighborhood do you live in? On the map below, please circle the name of the neighborhood that most closely coincides with your New Orleans neighborhood:

Neighborhoods in Orleans Parish



**Q22 To what degree was the bike-friendliness of your neighborhood important in your decision to live there?**

- ☐ Not at all important: Bike-friendliness was not important to my decision to live here
- ☐ Somewhat important: Bike-friendliness was one of many factors I considered
- ☐ Very important: Bike-friendliness was one of the main reasons I chose to live here

**Q23 Approximately how many years have you lived in New Orleans? \_\_\_\_\_**

If you entered 10 or more years in Q23, skip to Q26.

**Q24 Where did you live immediately before moving to New Orleans? \_\_\_\_\_**

**Q25 How often did you ride a bicycle to get places in the community you lived in immediately before moving to New Orleans? Do not include bicycling trips made for exercise exclusively.**

- ☐ Never
- ☐ Occasionally
- ☐ Frequently
- ☐ Almost always

**Q26 Please use the space below to share any other thoughts you wish about what is promoting and discouraging bicycling in New Orleans.**

**If you are not currently a bicyclist, what, if anything, could convince you to try it out?**

## Appendix D. Select survey results

**Table 5. Factors that motivate utilitarian bicycling among survey respondents**

<b>Factor</b>	<b>Percentage indicating “important” or “very important”</b>	<b>Tally</b>
Enjoyment	92 percent	554/599
Health and fitness	89 percent	533/600
Convenience	89 percent	534/601
Environment	78 percent	469/601
Saving money	66 percent	397/601
Cultural reasons	30 percent	178/595
Lack of other options	19 percent	115/592

**Table 6. Factors preventing survey respondents from bicycling for transportation**

<b>Factor</b>	<b>Percentage indicating “important” or “very important”</b>	<b>Tally</b>
Rain	80 percent	658/822
Poor roads	77 percent	636/823
Not enough bikeways	75 percent	620/822
Fear of accidents	58 percent	478/822
Heat	56 percent	458/823
Distance to destinations other than work or school	43 percent	353/810
Fear of crime	40 percent	328/823
Cold	37 percent	309/823
No showers at destinations	35 percent	291/817
Distance to work or school	33 percent	264/804
Lack of access to a bike	9.5 percent	78/816
I don’t know bicycling rules	7.5 percent	61/812
I’m too out of shape	7.2 percent	59/813
Health problems that prevent me from bicycling	6 percent	48/814
Cultural reasons (for example, “I don’t know anyone else who bikes”)	2.1 percent	19/782
I don’t know how to bicycle	1.7 percent	14/815

**Table 7. Factors that would make survey respondents more likely to bicycle for transportation**

<b>Factor</b>	<b>Percentage indicating “important” or “very important”</b>	<b>Tally</b>
<b>Better road conditions</b>	90.5 percent	715/790
<b>More or better bike lanes</b>	89 percent	711/795
<b>If drivers were more careful around cyclists</b>	86 percent	679/793
<b>Shorter distances to desired destinations</b>	47 percent	370/784
<b>Bike share</b>	44 percent	345/788
<b>Showers at destinations</b>	32 percent	253/785
<b>More acceptance of bicycling among coworkers, friends or employer</b>	22 percent	176/786
<b>Access to a bicycle</b>	22 percent	172/783
<b>If I were in better shape</b>	11 percent	85/782
<b>If I better understood bicycling rules</b>	9.3 percent	73/784
<b>I would not bicycle under any circumstance</b>	3.7 percent	9/239

**Table . Factors that motivate bicycle commuters surveyed to bicycle for transportation**

<b>Factor</b>	<b>Percentage indicated “important” or “very important”</b>	<b>Tally</b>
<b>Convenience</b>	93 percent	190/205
<b>Enjoyment</b>	93 percent	190/204
<b>Health and fitness</b>	87 percent	180/206
<b>Saving money</b>	85 percent	175/205
<b>Environmental reasons</b>	83 percent	170/204
<b>Cultural reasons</b>	33 percent	68/203
<b>Lack of other options</b>	33 percent	67/202

**Table 11. Factors that prevent bike commuters from bicycling for transportation**

<b>Factor</b>	<b>Percentage indicating “important” or “very important”</b>	<b>Tally</b>
<b>Rain</b>	71.5 percent	143/200
<b>Poor roads</b>	68.5 percent	137/200
<b>Not enough bikeways</b>	65 percent	130/199
<b>Distance to destinations other than work or school</b>	43 percent	86/199
<b>Fear of accidents</b>	40.4 percent	80/198
<b>Crime</b>	31.5 percent	63/200
<b>Heat</b>	29 percent	58/200
<b>Lack of showers at destinations</b>	21 percent	42/199
<b>Cold</b>	20.7 percent	41/198
<b>Distance to work or school</b>	12.8 percent	25/195
<b>Health problems that prevent me from bicycling</b>	4 percent	8/198
<b>Lack of access to a bike</b>	2.5 percent	5/200
<b>I’m too out of shape</b>	1 percent	2/198
<b>Cultural reasons</b>	1 percent	2/192
<b>I don’t know bicycling rules</b>	1 percent	2/199

**Table 13. Factors that would increase willingness to bicycle for transportation among bike commuters surveyed**

<b>Factor</b>	<b>Percentage indicating “important” or “very important”</b>	<b>Tally</b>
<b>Better roads</b>	93 percent	180/193
<b>More or better bikeways</b>	90 percent	175/193
<b>Better drivers</b>	84 percent	163/193
<b>Bike share</b>	47 percent	90/192
<b>Shorter distances to destinations</b>	45 percent	87/192
<b>More acceptance among friends, coworkers or employer</b>	29 percent	56/192
<b>Showers at destinations</b>	27 percent	53/194
<b>Access to a bike</b>	24 percent	45/190
<b>If I better understood bicycling rules</b>	4 percent	8/192
<b>If I were in better shape</b>	3.7 percent	7/190

**Table 15. Factors that motivate the “interested but concerned” to bicycle for transportation.**

Factor	Percentage indicating “important” or “very important”	Tally
Enjoyment	93 percent	102/110
Health and fitness	85 percent	94/111
Convenience	85 percent	94/110
Environmental reasons	72 percent	80/111
Saving money	52 percent	58/111
Cultural reasons	39 percent	43/109
Lack of other options	7.2 percent	8/111

**Table 17. Factors that deter “interested but concerned” survey takers from utilitarian bicycling**

Factor	Percentage rating “important” or “very important”	Tally
Not enough bikeways	84 percent	164/195
Poor roads	82 percent	160/195
Rain	81.5 percent	159/195
Heat	69 percent	136/196
Fear of accidents	65 percent	128/196
Distance to work or school	48 percent	93/194
Crime	46 percent	90/196
No showers at destinations	46 percent	90/194
Cold	45 percent	87/195
Distance to destinations other than work or school	40 percent	77/192
Lack of access to a bike	14 percent	28/195
I don’t know bicycling rules	12 percent	23/194
I’m too out of shape	10.2 percent	20/195
Cultural reasons (such as “I don’t know anyone else who bikes”)	2 percent	4/189
I don’t know how to ride a bike	1 percent	2/195
Health problems that prevent me from bicycling	0.5 percent	1/194

**Table 19. Factors that would make “interested but concerned” survey takers more willing to bicycle for transportation**

Factor	Percentage	Tally
More or better bikeways	94 percent	183/194
Better roads	91 percent	177/194
More cautious drivers	87 percent	169/195
Shorter distances to destinations	54 percent	104/194
Showers at destinations	44 percent	84/191
Bike share	42.5 percent	83/194
More acceptance among friends, coworkers, employer	29 percent	57/194
Access to a bike	26 percent	50/194
If I were in better shape	15 percent	29/193



## Appendix E. Nolavie article on Cycling in the Crescent City project

### Cycling New Orleans: Researcher seeks to understand what keeps would-be cyclists from saddling up

*By M.T. Hinson*

Based on the results of the [Great Decatur Street Debate](#), it is apparent that public opinion about cycling and cycling infrastructure is not apparent enough – not to the Department of Public Works, anyway. Given the events of recent weeks, a survey that “asks about factors that promote and discourage bicycling in New Orleans” seems pretty well timed, no?

Enter Emilie Bahr, a graduate student concentrating in transportation at the UNO Department of Planning and Urban Studies, who has developed a survey that “will improve understanding of bicycling patterns” in New Orleans and plans to use the data collected as part of her thesis for a master’s degree in urban and regional planning.

Bahr’s personal interest in cycling/cycling infrastructure and her new-found calling to study urban planning are relatively recent, though nonetheless significant, developments in the self-described progressive environmentalist’s life.

The 32-year-old Baton Rouge native originally double majored in government and French at the University of Texas, Austin. Upon earning her degrees, however, she had already decided she would rather be a writer. So Bahr headed to Washington D.C., where she interned with the Washington Post and another publication known as the U.N. Wire.

“After about a year [in D.C.],” she said (as many often do), “I really wanted to be in New Orleans.” And, following a brief stint with a newspaper in Thibodeaux, she began writing for CityBusiness, where, she said, “I found myself gravitating toward issues related to community revitalization, transportation and public engagement post-Katrina.”

Bahr continued to cultivate her interest in “how cities work,” and, through her beat coverage at CityBusiness, she began to take note of changes occurring in New Orleans’ urban landscape. In particular, she found that many of the streets getting repaved during the post-Katrina rebuilding process were being re-striped with bike lanes. She even began to notice more, though still not many, bicycle commuters.

Her personal and professional interest in cycling was convincingly piqued, however, while attending a party in the Marigny.

“When I got down there, I noticed bikes everywhere!” she said. “And while I was at the party, I met a guy who worked for the public defender’s office who told me everyone bikes to work there.

“It was at that point that I realized something was happening.” She began to ask herself, she says, “If others are biking, why can’t I?” She also began to contemplate why some parts of the city have higher percentages of bicycle commuters than others.

That intrigue and curiosity led Bahr to pursue her newest passion as a graduate student in the UNO Department of Planning and Urban Studies. She began riding her bike between her Uptown apartment and the UNO Lakefront campus where she attends classes and conducts research.

Indeed, over the course of her studies, she has found that there is significant amount of scientific data out there that supports her observations about the local cycling community.

Perhaps the most arresting information she came across is that New Orleans is the Southeast leader and tied for number 12 in the country in cycling, with 1.8 percent of the population commuting by bicycle, according to the League of American Bicyclists’ [2000-2010 Bike Commuter Statistics for 70 Largest US Cities](#).

“Yet,” she said, “certain parts of the city such as the Marigny/Bywater or near the old [C.J. Peete] housing projects have much higher rates of bicycle commuting -- higher than even that of Portland, Oregon. Others, such as Lakeview, have almost none.”

The disparity in bicycle commuting across the metropolitan area was the fundamental motivation for her research.

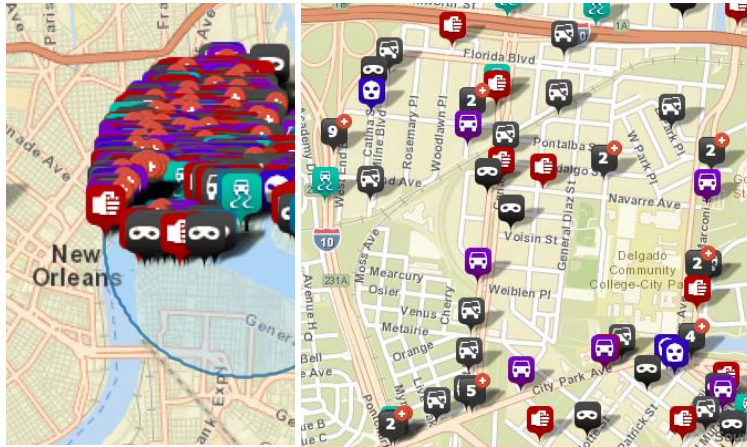
As she puts it, “My thesis is looking at the spatial variation in bike commuting across the city in an attempt to understand why certain sections of the city are characterized by booming rates of bike commuting, while in others, bike commuting is virtually non-existent. I hope that by exploring and identifying reasons why people are bicycling (and why they’re not), some insight may be gained that may be useful in making bicycling more appealing and feasible across the city.”

Bahr is interested in getting as much input as possible from non-cyclists as well as cyclists. Those who are interested can help her shed a little light on the subject of cycling and cycling infrastructure for New Orleans by taking her short and anonymous survey [here](#).

Additionally, she asks that readers willing to distribute hard copies of her survey email [nolabikesurvey@gmail.com](mailto:nolabikesurvey@gmail.com).

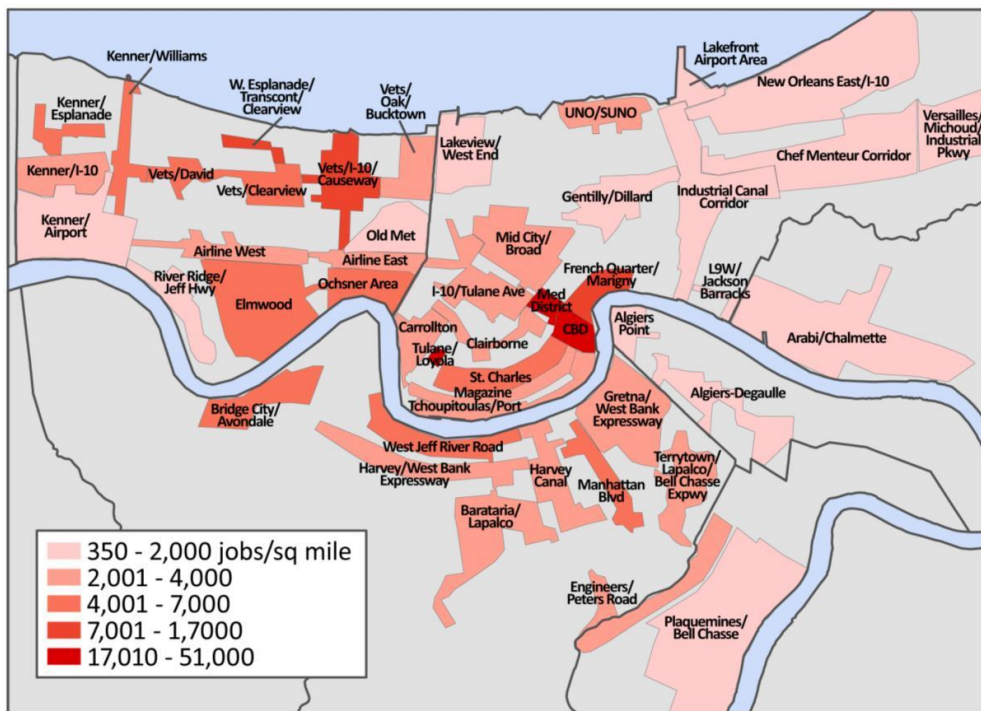
## Appendix F. Maps

**Figure 28. Violent crimes in Bywater, left, and Navarre, 11/29/11 – 11/29/12**



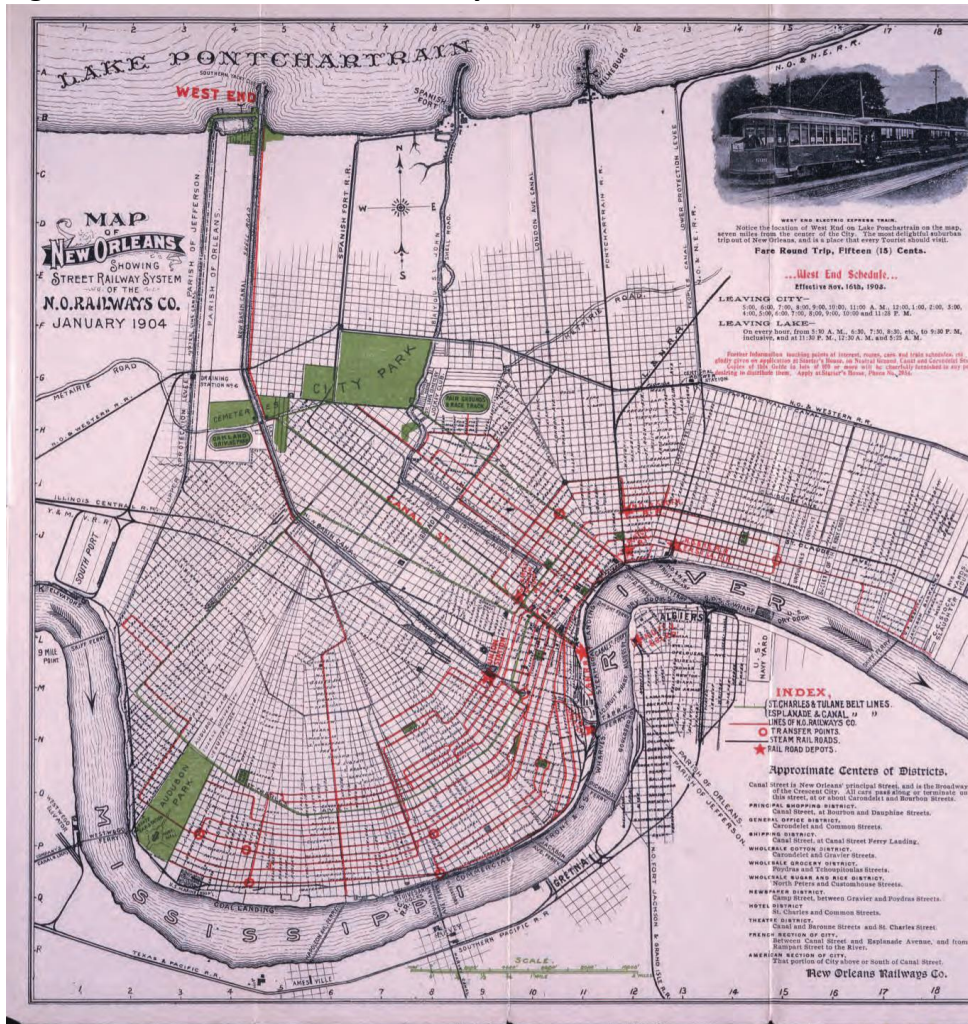
Source: [crimemapping.com/map/la/neworleans](http://crimemapping.com/map/la/neworleans)

**Figure 29. Jobs per square mile by commercial cluster, 2008**



Source: Greater New Orleans Community Data Center

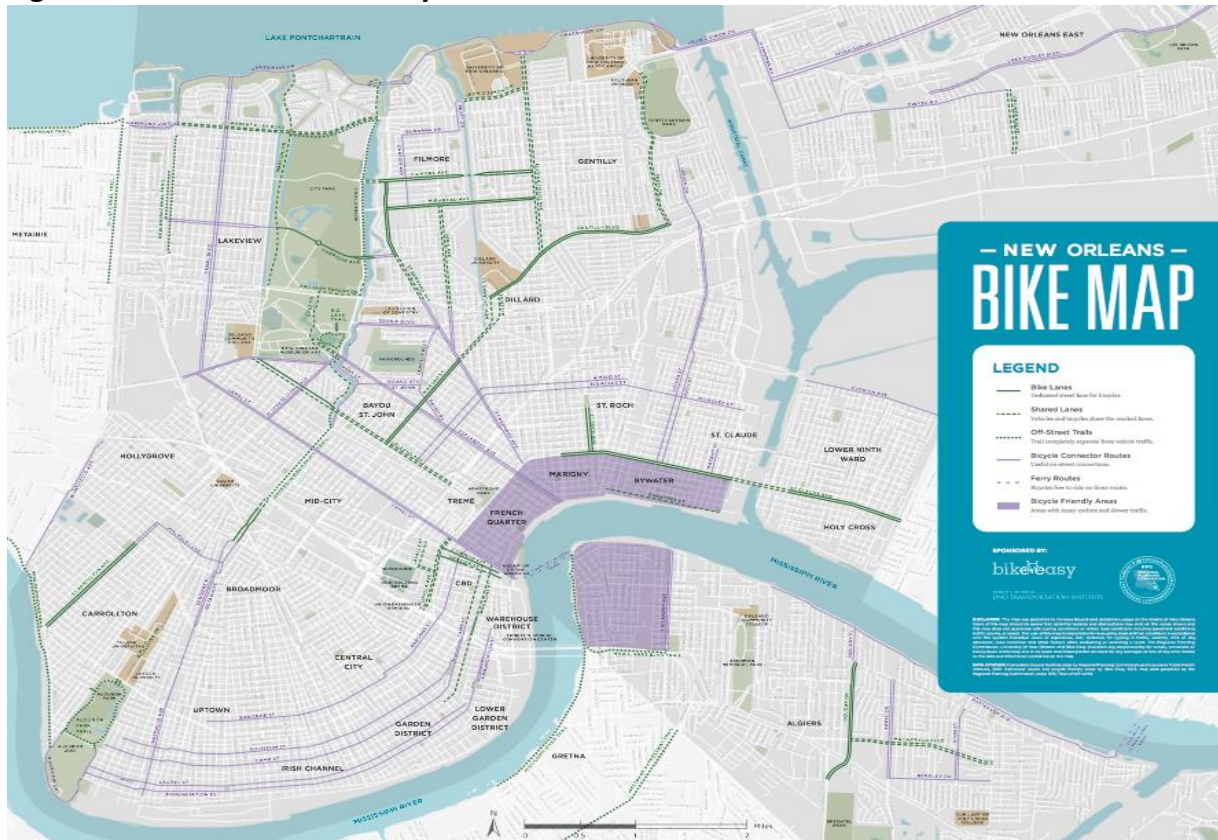
Figure 30. New Orleans street rail system, 1904



Source: Amdal, 2011



Figure 31. New Orleans bikeways



Source: Bikeeasy.org

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## Vita

The author obtained bachelor's degrees in French and government from the University of Texas in 2002 and spent several years as a journalist before enrolling in the University of New Orleans' graduate school of planning and urban studies. She credits her experience living in cities as disparate as Paris, France and Thibodaux, Louisiana, and especially post-Katrina New Orleans, with inspiring her interest in urban issues. The TV show *The Wire* also helped. She prefers to get around by bike.