

A STUDY OF BICYCLE COMMUTING IN MINNEAPOLIS:  
HOW MUCH DO BICYCLE-ORIENTED PATHS INCREASE RIDERSHIP AND  
WHAT CAN BE DONE TO FURTHER USE?

by

EMMA PACHUTA

A THESIS

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“A Study of Bicycle Commuting in Minneapolis: How Much do Bicycle-Oriented Paths Increase Ridership and What Can be Done to Further Use?” a thesis prepared by Emma R. Pachuta in partial fulfillment of the requirements for the Master of Community and Regional Planning degree in the Department of Planning, Public Policy and Management. This thesis has been approved and accepted by:

\_\_\_\_\_  
Dr. Jean Stockard, Chair of the Committee

\_\_\_\_\_  
Date June 1, 2010

Committee in Charge: Dr. Jean Stockard  
Dr. Marc Schlossberg, AICP  
Lisa Peterson-Bender, AICP

Accepted by:

\_\_\_\_\_  
Dean of the Graduate School

An Abstract of the Thesis of  
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Title: A STUDY OF BICYCLE COMMUTING IN MINNEAPOLIS: HOW MUCH DO  
BICYCLE-ORIENTED PATHS INCREASE RIDERSHIP AND WHAT CAN BE  
DONE TO FURTHER USE?

Approved: \_\_\_\_\_  
Dr. Jean Stockard

Car use has become the dominant form of transportation, contributing to the health, environmental, and sprawl issues our nation is facing. Alternative modes of transport within urban environments are viable options in alleviating many of these problems.

This thesis looks the habits and trends of bicyclists along the Midtown Greenway, a bicycle/pedestrian pathway that runs through Minneapolis, Minnesota and questions whether implementing non-auto throughways has encouraged bicyclists to bike further and to more destinations since its completion in 2006. The methods used to gather data were in-person five-minute surveys given to bicyclists, and analysis of existing data provided by non-profit organizations.

Results included mapping each surveyed trip to see taken routes as well as qualitative and quantitative answers. Answers varied, but overall, it seemed that both commuting and leisure riders have increased their trips and distance within Minneapolis since completion of the path, advocating for off-street routes within the city.

## CURRICULUM VITAE

NAME OF AUTHOR: Emma R. Pachuta  
PLACE OF BIRTH: Milwaukee, Wisconsin  
DATE OF BIRTH: November 3, 1984

## GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

University of Oregon, Eugene, OR  
University of Minnesota, Minneapolis, MN  
Denmark International School, Copenhagen, DK

## DEGREES AWARDED:

Master of Community and Regional Planning, 2010, University of Oregon  
Bachelor of Science in Architecture, 2006, University of Minnesota

## AREAS OF SPECIAL INTEREST:

Urban Design  
Transportation

## GRADUATE RESEARCH FELLOWSHIPS:

InfoGraphics Lab, Geography Department, University of Oregon  
October 2008 – June 2009

## PROFESSIONAL EXPERIENCE:

City of Eugene, Eugene, Oregon  
January 2010 – March 2010

Twin Cities Streets for People, Minneapolis, Minnesota  
June 2009 – September 2009

Lunning Wende Associates, Inc. St. Paul, Minnesota  
August 2006 – September 2008

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## TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION .....	1
Definitions.....	3
Research Questions.....	4
Overview of Thesis .....	4
II. LITERATURE REVIEW .....	5
III. METHODOLOGY .....	9
Sample and Procedure .....	9
Survey Sample.....	9
Data Collection Procedures .....	10
Measures .....	13
Analysis .....	13
IV. RESULTS .....	15
Characteristics of Respondents .....	15
Research Question One: Types of Trips .....	16
Research Question Two: Factors Affecting Greenway Use .....	17
Research Question Three: How Far Out of Their Way People Will Go to Use the Greenway .....	19
Other Important Finds.....	25
V. RECOMMENDATIONS .....	26
Summary of Findings and Implications of the Research.....	26
Adjacent Neighborhoods Use the Greenway for Utilitarian Trips .....	26
The Greenway Shortens Riders' Trips.....	27
Will People Travel Out of Their Way to Use a Direct and Fast Route? ...	28
Suggestions for Future Research .....	29

Chapter	Page
Implications for Policy and Planning . . . . .	29
Increase Signage . . . . .	30
Upgrade Existing Bicycle Infrastructure . . . . .	30
Add “Safer” Infrastructure on Arterials in Minneapolis . . . . .	31
Create a Comprehensive Plan . . . . .	32
APPENDICES . . . . .	34
A. MAPS OF EXISTING AND PROPOSED GREENWAYS . . . . .	34
B. INFORMATION ABOUT THE MIDTOWN GREENWAY . . . . .	36
C. SURVEY QUESTIONS . . . . .	39
D. ADDITIONAL SURVEY MAPS . . . . .	40
BIBLIOGRAPHY . . . . .	42



## LIST OF FIGURES

Figure	Page
1-1. PARK(ing) Day. . . . .	1
1-2. Critical Mass, Minneapolis . . . . .	1
1-3. Martin Olav Sabo Bridge . . . . .	2
1-4. Artwork along the Greenway. . . . .	3
2-1. Transportation Survey . . . . .	5
2-2. Minneapolis Skyline: LRT & Bike Lanes. . . . .	5
2-3. Martin Olav Sabo Bridge . . . . .	6
2-4. Commercial along Greenway. . . . .	8
2-5. Greenway Pedestrian Entry . . . . .	8
3-1. Neighborhood Income Level . . . . .	10
3-2. Poster Example. . . . .	11
5-1. Soo Line Community Garden off of Greenway . . . . .	26
5-2. The Midtown Greenway . . . . .	27
5-3. The Midtown Greenway . . . . .	28
5-4. The Midtown Greenway . . . . .	29
5-5. The Midtown Greenway . . . . .	29
5-6. Park Avenue Bicycle Lane . . . . .	30
5-7. First Avenue Bicycle Buffer Attempt . . . . .	31
5-8. Successful Buffer Lane, Portland OR . . . . .	31
5-9. Cycle Track in Utrecht . . . . .	32
5-10. Cycle Track Proposal, Eugene OR . . . . .	32
5-11. Is Minneapolis Ready for a Cycle Track . . . . .	32
A-1. Train on 29th Street Corridor. . . . .	36
A-2. Number of Crimes by Neighborhood Adjacent to Greenway in July . . . . .	37

## LIST OF MAPS

Map	Page
2-1. Entry Ramps and Nodes Near Greenway . . . . .	8
3-1. Commercial Nodes Around Surveyed Area . . . . .	10
3-2. Neighborhoods Adjacent to the Greenway . . . . .	10
3-3. Administered Survey Locations . . . . .	11
4-1. "On the way" Trip . . . . .	20
4-2. "½ mile out of way" trip . . . . .	21
4-3. "1 mile out of way" trip . . . . .	22
4-4. "2 miles out of way" trip . . . . .	23
4-5. "2+ miles out of way" trip . . . . .	24
4-6. Suggested Streets for Adding Bicycle Amenities . . . . .	25
A-1. City of Minneapolis Bikeways . . . . .	34
A-2. Twin Cities Greenways Minneapolis Concept Routes . . . . .	35
A-3. Phases of Greenway Completion . . . . .	36
A-4. Locations Where Bikers Encounter Car Traffic . . . . .	36
A-5. New Amenities/Development into Greenway . . . . .	38
A-6. Mapped Route . . . . .	40
A-7. Mapped Route . . . . .	40
A-8. Mapped Route . . . . .	40
A-9. Mapped Route . . . . .	40
A-10. Mapped Route . . . . .	41
A-11. Mapped Route . . . . .	41
A-12. Mapped Route . . . . .	41
A-13. Mapped Route . . . . .	41
A-14. Mapped Route . . . . .	41
A-15. Mapped Route . . . . .	41

## LIST OF TABLES

Table	Page
3-2. Survey Administration .....	11
4-1. Respondent Characteristics .....	15
4-2. Surveyed Seasonal Biking Percentages .....	16
4-3. Types of Trips Respondents Make Along the Greenway.....	17
4-4. How far Respondents will Bike for Each Type of Trip .....	17
4-5. Greenway Respondent Answers .....	18
4-6. Deterrents from Using the Greenway More.....	18
4-7. How Far people will travel to use the Greenway .....	19
4-8. Mapped Route Percentages .....	19

## CHAPTER I

### INTRODUCTION

The automobile has become the main form of personal transportation in America. This includes urban environments, where development is considerably more compact and other modes of transit are offered. Beginning with Ford's ability to create a personal car that was affordable for the every day American (Wolf, 1996), today's vicious cycle of automobile dependency and sprawled development patterns often offer Americans no alternative other than driving to their destinations. However, a shift seems to be taking place in this country. In a recent survey, sixty-six percent of the American people said that they "would like more transportation options so they have the freedom to choose how to get where they need to go" (Transportation for America, 2010). People are ready to break this overwhelming cycle, so healthier, easier, and cheaper modes of transit need to be offered.

Movements have started nationwide to get people out of their cars and help to advocate for the right to other transit options. Events like Critical Mass and PARK(ing) Day are modern social and political movements created to highlight the dominance of the car culture and reclaim the streets for the people and the environment (Figures 1-1 & 1-2). These modern movements are intended to create awareness that cars should not dominate streets; they should be



**Figure 1-1** *PARK(ing) Day. Solutions Twin Cities, 2009*



**Figure 1-2** *Critical Mass in Minneapolis. Webster, 2008*

embraced as a multi-modal space. They are popular nationally and internationally, including Minneapolis, Minnesota, the focus of this study.

In 2010, Minneapolis was declared the “Number One Biking City in America,” by Bicycle Magazine. City Council Member Cam Gordon wrote:

“According to Bicycling Magazine, Minneapolis is the nation’s best city for bicyclists. They specifically called out the hardiness of those cyclists...who brave our sub-zero winter, our 128 miles of on- and off-street bicycle facilities, our abundance of bike parking and lockers, and our vibrant cycling culture” (Gordon, 2010).

National data indicate that 1% of the population commutes by bike (National Household Travel Survey, 2009), while 4.3% of Minneapolis residents are commuting by bike (Van Denburg, 2010). Figure 1-3 shows a bicyclist in Minneapolis.

As of 2009, the City of Minneapolis had 84 miles of off-street bicycle paths and only 44 miles of on-street bike lanes (2010). A recent study suggests that off-street paths do not help to increase the number of people bicycling in the Twin Cities, while on-street paths do increase ridership (Krizek, 2006). Minneapolis has a unique off-street network that connects to on- and off-street paths throughout and around the metropolitan area (See Appendix for The Bicycle Map of Minneapolis). Perhaps responding to this study, in the upcoming year, Minneapolis will have 35 miles of newly marked on-street bicycle paths and only 3 miles of newly constructed off-street paths, doubling the amount of streets that will be marked for bicyclists (City of Minneapolis, 2010).

The Midtown Greenway, which is the focus of this study, has 29 entry ramps onto the path through South Minneapolis. Even though it is only 5.5 miles in length, planners believe that it could be useful to bicycling commuters searching for a more direct path to their destination, rather than simply an aesthetic ride. In other words, it is possible that the



**Figure 1-3** *Martin Olav Sabo Bridge, Kallusky 2010*

Greenway generates greater destination bicycling than most off-street paths. It creates, as one Minneapolis biker put it in an in-person interview, “an inter-urban bicycle highway” offering cyclists the means to commute quickly. Like most on-street paths, it offers proximity to other bicycle facilities and retail. The specific location of this path could, like on-street paths, be helping to increase ridership in Minneapolis (See Figure 1-4).

This thesis analyzes the bicycling habits and trends that exist along the Midtown Greenway—an urban bike path completed in 2006 that runs east to west through the city of Minneapolis, Minnesota—and attempts to shed light on whether or not the implementation of the Greenway has increased bicycling for personal trips. This thesis also examines riders’ opinions of the path and whether its attributes encourage bicyclists to use it.

This research is important because, to date, studies have supported the addition of on-street bicycle infrastructure as the way to increase bicycle ridership, but insist that off-street paths do not have the same effect. If off-street paths, like most on-street paths, are located in an environment with high connectivity and proximity to retail, have the ability to increase ridership, they should not be deterred within specific contexts.



**Figure 1-4** *Artwork along the Greenway, Kallusky 2010*

### *Definitions*

Greenway – A non-automobile designated urban pathway that runs through a city, usually with multiple exits along its trail that connect to regular streets. Many Greenways are designed with separate paths for both pedestrian and cyclists and try to have little interaction with auto-dominated streets.

The Twin Cities – The cities of Minneapolis and St. Paul, Minnesota are known as the “Twin Cities,” since they are many times grouped together in statistics and facts due to their close proximity of each other (approximately 10 miles apart).

Active Transportation - Mobility options powered by an individual, most often referring to walking or biking, but can be any mode that fits into the definition (ie skating, rollerblading).

### *Research Questions*

In an attempt to learn more about how and why bicyclists use the Midtown Greenway, three research questions were asked:

- 1.) *What types of trips are people using the Greenway for?*
- 2.) *Is there anything that stops people from using the Greenway more frequently?*
- 3.) *How far out of their way are people bicycling to use the Greenway and are they biking to further destinations because of it?*

### *Overview of Thesis*

Chapter 2 includes a brief review of literature related to bicycling infrastructure and the Midtown Greenway. Chapter 3 describes the methods used in this project, Chapter 4 presents the results related to each of the research questions, and Chapter 5 summarizes the findings and discusses possible further implications.

## CHAPTER II

### LITERATURE REVIEW

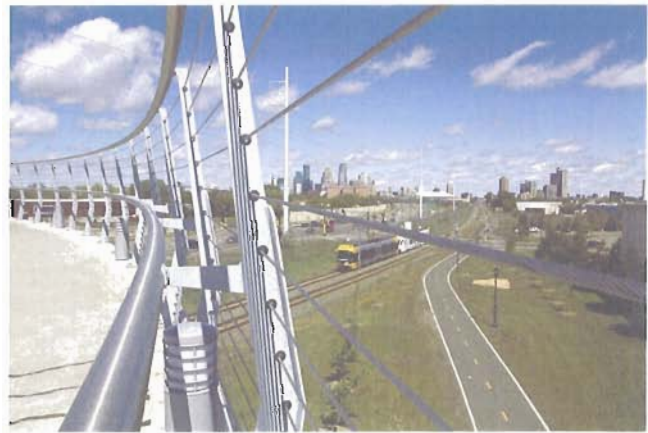
Polls suggest that Americans have begun to change how they think about personal transportation. The Future of Transportation National Survey revealed that 59% of the population thinks “we need to improve public transportation, including trains and buses, to make it easier to walk and bike to reduce traffic congestion”, compared to 38% who think “we need to build more roads and expand existing roads to help reduce traffic congestion” (Figure 2-1, Transportation for America, 2010). The National Household Travel Survey found that biking and walking made up 11.9% of the trips made in this country in 2009, a 25% increase since 2001 (9.5%).

Only 8% of people who did not ride public transit said that they “simply prefer to drive.” Figure 2-2 shows a view of different transportation options in Minneapolis. The majority says they drive because other transit options

are not readily offered. In an interview on National Public Radio, Ray LaHood, Secretary of Transportation and an advocate for other modes of transit explained that:



**Figure 2-1** *Transportation Survey. Transportation for America, 2010*



**Figure 2-2** *Minneapolis Skyline: LRT & Bike Lanes. Kallusky, 2010*



“90% of people who don’t have access to public transit have been forced into their car...Our commitment now at DoT (Department of Transportation) is to create opportunities for alternatives to congestion...we know that 90% of people will not be biking, but that opportunity and that option and that alternative, we think, is something that people want.”

Not only has public transit become increasingly important, so has increasing bicycle and pedestrian safety and amenities nationwide (USDOT, 2008).

Bicycle infrastructure has become a new priority for transportation departments nationwide. Gabe Kline, Director of Transportation in Washington D.C. has stated that there is a direct correlation between bike lanes and bike share-usage rises with the addition of bike amenities. “When you make the mode hassle-free and inexpensive, [the people] will use it” (NPR, 2010). Over 40% of Americans’ daily trips are less than 2 miles (National Household Travel Survey, 2010). These trips do not have to be made by a personal automobile. These trips are close enough that with the right built infrastructure, it is possible to get more people to walking and biking to their destinations (See Figure 2-3).

Urban environments are especially viable options for creating walkable and bikable environments. A study in Portland, Oregon found that bicycle use increases with a connected built environment (Dill, 2006). The same study also discovered that people have a strong preference to use bicycle infrastructure if it is available. Half of the study’s surveyed



**Figure 2-3** *Martin Olav Sabo Bridge.*  
*Kallusky, 2010*

trips were on bicycle infrastructure (lanes, paths, or boulevards) even though they made up only 8% of the available network. The author concluded that: “a supportive environment... appears necessary to encourage bicycling for everyday travel” (Dill, 2006). A second Oregon study revealed that street connectivity and shorter distances contribute to utilitarian bike trips (Dill & Voros, 2006). Barriers in the study included “too much traffic” and “lack of bike trails and lanes.” These studies in Portland, Oregon reinforce that improving street structure

is crucial to get people out of their cars. If streets are connected and safe for all modes of transportation, active transport among residents will rise.

Similar results were found in a study of biking in Minneapolis. For instance, Barnes, Thompson & Krizek compared ridership before and after the implementation of bicycle infrastructure and concluded that the new infrastructure “significantly impacted the level of bicycle commuting” (2006, 3). Like Dill’s study, riders were found to choose streets with bicycle infrastructure over streets without infrastructure when it was offered. It also increased the amount of people who were willing to bicycle in the city.

Another study in Minneapolis and St. Paul, conducted in 2006, found that riders prefer bicycle lanes on existing streets rather than off-street bicycle trails (Krizek). It found that people are willing to add 16.3 minutes to their commute to use an on-street lane, but will add only 5.2 minutes of travel time for an off-street path (Krizek, 2006). Similarly, a study done by the MN DoT found that off-street trails, though valuable as leisure and exercise tools, did not increase bicycle commuting in the Twin Cities (Douma and Cleaveland, 2008). Both of these studies conclude that off-street paths are less desirable than on-street paths, and contribute less to bicycle commuting within Minneapolis and Saint Paul.

Off-street paths are normally considered recreational facilities, especially since most of them are in public parks (Active Living Research, 2010). Given this location, there is less emphasis on direct routes and most likely less connections to outside amenities. Johnson and Krizek suggest that proximity to retail is a significant predictor of choosing active modes and transport (2006). Their study focuses especially on bicycling traffic for commuting and concludes that: “on-street bicycle facilities trump off-street trails for commuters” (2006, 320).

In general, existing research suggests that people will bicycle more if there are sufficient amenities with direct paths in close proximity to their residence. It also concludes that on-street paths are preferred over off-street paths for commuting, and that the provision of off-street paths have not helped increase bicycle commuting within the Twin Cities. The Midtown Greenway was not included in any of the studies.



☆ Entry Ramp Location

**Map 2-1** *Entry Ramps and Nodes Near Greenway*

The Midtown Greenway is unique as an off-street trail. With 24 entry ramps onto the path through South Minneapolis, this 5.5 mile path offers a much greater chance for bicyclists to find a more direct path to their destination (shown in Map 2-1) and commercial nodes located in close proximity with the path. In other words, rather than just offering an aesthetic ride as paths through parks might, the Greenway is designed to provide easy access for commuters (Figures 2-4, 2-5). The Greenway connects to both main off- and on-street bicycle paths that run around and through the city (See Appendix A for the Bicycle Map of Minneapolis). This creates a potentially different use than most off-street paths, including the potential to decrease commute time rather than increasing it, offering the ability to get to a destination without coming into contact with cars or dangerous intersections. It offers cyclists the means to bicycle quickly West/East through South Minneapolis (See Appendix B for description of the Greenway and its design).

This thesis examines the bicycling habits of those who use the Midtown Greenway, examining 1) the types of trips for which people use the Greenway, 2) factors that stop people from using the path more frequently, and 3) how far out of their way people will go to use the Greenway. The next chapter describes the methods used in the study.



**Figure 2-4** *Commercial Along Greenway.*  
Kallusky, 2010



**Figure 2-5** *Greenway Pedestrian Entry.*  
Kallusky, 2010

## CHAPTER III

### METHODOLOGY

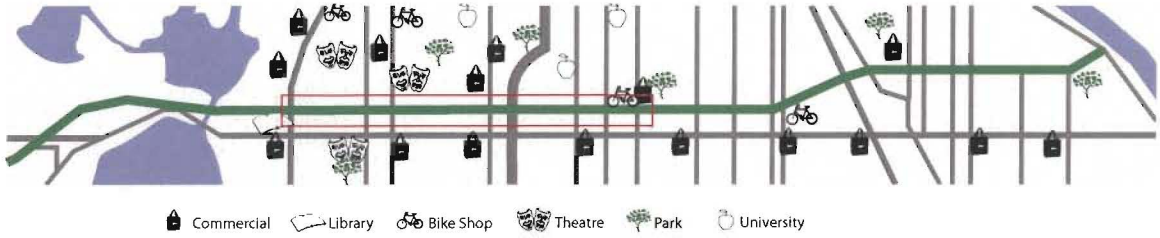
The literature in the previous chapter suggests that bicyclists will travel out of their way to feel safer and to use bicycle infrastructure. Studies also concluded that off-street paths are less valuable to commuters and do not necessarily increase bicycling within the city as much as on-street paths. The general assumption is that on-street paths will have better connectivity to neighboring streets and retail, while off-street paths are many times within parks or outside of metropolitan areas.

The Midtown Greenway, an off-street path that runs through South Minneapolis and has high connectivity to neighboring streets, was the focus of this research. Through surveying bicyclists on the Greenway this thesis attempted to learn more about bicyclists' use of the path.

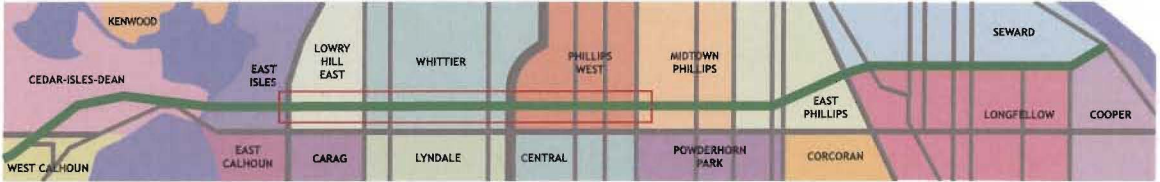
#### *Sample and Procedure*

##### *Survey Sample*

The sample included bicyclists using the Midtown Greenway between Hennepin Avenue and Chicago Avenue, an area that accounts for more than 2 miles of the path. This area was chosen due to its close proximity to several retail nodes, anticipating that people might be biking to specific destinations rather than bicycling for exercise or leisure. Map 3-1 maps the types of amenities offered near the surveyed area. The neighborhoods along the



Map 3-1 Commercial Nodes Around Surveyed Area



Map 3-2 Neighborhoods Adjacent to the Greenway

Greenway have a range of income levels, the higher income neighborhoods at either end of the path (See Map 3-2, Figure 3-1). It was important to ensure that respondents would be more likely to be able to afford to drive but had chosen to bicycle, and most neighborhoods along the path have a high enough income to be able to be in that bracket.



Figure 3-1 Neighborhood Income Level, 2009

Only those over eighteen were surveyed. Walkers and rollerbladers were also excluded from the sample. Mapped results (Chapter 4) focused on people who bicycled as a mode of transportation (commuting and running errands) rather than for leisure or exercise. However, anyone who stopped was administered the survey regardless of their reason for using the Greenway.

Data Collection Procedures

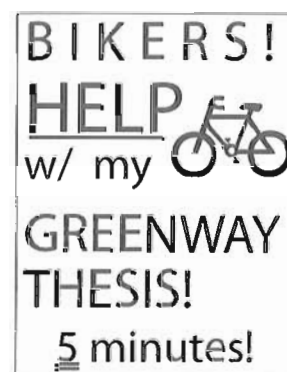
Research procedures were approved by the University of Oregon’s Institutional Review Board for the Protection of Human Subjects on July 10, 2009, and research began in late July. Respondents were surveyed during what were deemed “normal commute hours”

SURVEY INFORMATION			
Date	Day	Time	Number of people interviewed
26-Aug-09	Wednesday	8:30-11:00am	14
27-Aug-09	Thursday	4:00-6:30pm	26
31-Aug-09	Monday	7:00-9:30am	14

**Table 3-2** *Survey Administration*

(morning and early evening). The specific days were chosen based on weather conditions. It was assumed that people would be more willing to stop and more people would use the path if the weather was pleasant, so only nicer days were chosen.

A large 3x5 poster that read: *Bikers! Help With my Greenway Thesis! 5 Minutes!* was held up on the side of the Greenway to entice bicyclists to stop and take the short survey (Figure 3-1). Map 3-6 shows the locations that surveys were administered. In general, bicyclists seemed very receptive to stop and answer the 5-minute survey. Interviews ran anywhere from 3 minutes (people that were commuting and in a rush) to about 25 minutes (people that were very passionate about the topic). A tape recorder was not used because the survey responses were short enough to document during the interview. Surveys were taken during two morning time slots and one afternoon time slot. The afternoon time slot obtained twice as many respondents as the morning time slots. The Greenway seemed to have a higher traffic volume of bicyclists in the afternoon than the morning (See Table 3-2).



**Figure 3-2** *Poster Example*



**Map 3-3** *Administered Survey Locations*

Survey information was gathered by filling out a separate questionnaire for each person who stopped. Ultimately, 58 completed surveys were obtained within the 7½ hours spent standing on the side of the bicycle path. It is unclear whether the survey participants are representative of the entire commuting population that travelled during the times of the interviews. There may be some biases that explain who chose to stop and participate and those who did not.

Possible limitations and biases included the *age of participants*. The modal age of respondents was 65, most likely due to the fact that retired persons have more time to speak to someone giving a survey. However, because the majority of the respondents over 65 who stopped were leisure riders and leisure riders were not included in the mapping analysis, this segment of the sample will have little effect on the analysis of commuter routes. The *type of participants* may have affected results because some commuters may not have had time to stop, even for a short survey. As a result, respondents who did stop may have had more time than others, perhaps introducing an unknown bias. Similarly, those already involved in the bicycle advocacy community may have been more likely to stop, while people who do not frequently use the Greenway may have been less likely to talk about their biking habits. In an attempt to stop as many bicyclists as possible with a short survey limited the types of questions asked and quantitative answers received.

Another limitation in my study included the fact that research was only obtained within one week of the year. Ninety-four percent of respondents said they biked for three seasons, so

surveying over a longer period of time could get a better representation of the types of trips that people are taking.

### *Measures*

The survey questions were grouped into three sections:

1. *General Information*, which included obtaining the subject's age, gender, how often and during which seasons they bike during, and also where they were coming from and going to during that specific bike ride.
2. *Greenway Use*, which covered how long (days, months, years) they had been riding on the Greenway, how frequently and for what purposes they use it for, and how far they are willing to travel.
3. *Benefits and Improvements*, which asked what encouraged or discouraged the subject's use of the Greenway, as well as what could be done within Minneapolis to make the city more bicycle-friendly (Survey Questions listed in Chapter 4).

### *Analysis*

Respondents' answers were recorded into a machine readable form and were then organized to answer each of the research questions. The first research question asked what are the types of trips that people are using the Greenway to make? Questions from the survey that answered this question included:

- *How many times per week do you use the Greenway, on average, and what is the length of each trip:*

*for commuting to work? \_\_\_\_\_ times per week \_\_\_\_\_ miles*

*for running errands? \_\_\_\_\_ times per week \_\_\_\_\_ miles*

*for purely exercise or leisure? \_\_\_\_\_ times per week \_\_\_\_\_ miles*

The second research question asked if bicyclists were choosing the Greenway over city streets, and if there was anything preventing them from using the Greenway more frequently. Questions from the survey that addressed this issue included:



- *Has the Greenway shortened travel time for you?*
- *If yes, has that affected the distance that you are willing to bike and the types of trips you are willing to take? Can you give a good example of this?*
- *Do you see any benefits to using city streets instead of the greenway?*
- *Can you think of any aspects about the Greenway that decrease your using it?*

The third research question asked how far out of their way are people bicycling to use the Greenway and are they biking to further destinations because of it? Questions in the survey that answered this research question included:

- *Where are you coming from today (closest intersection)?*
- *And where are you going (closest intersection)?*
- *Is the Greenway out of your way to get to this specific destination? If yes, what are your reasons for choosing the Greenway?*
- *If you travel out of your way to use the Greenway, how many blocks or miles do you go out of your way?*

In addition, information provided was used to produce maps to assess how far out of their way respondents had bicycled to use the Greenway on that specific trip. Routes were mapped with knowledge of the beginning point and end destination of each respondent, the location that the respondent was surveyed at, where the entry ramps for the Greenway were located, and the bicycle paths/routes throughout the city. With this knowledge, educated assumptions were made as to the exact streets/paths taken by the respondents. The websites Google Maps and Cyclopath were used to discover the most direct bicycle routes and the mileage of each trip. Analysis of these maps equate to possible conclusions as to why the bicyclist may have avoided certain areas/neighborhoods/streets in Minneapolis.

Chapter 4 presents the results of the data analysis.

## CHAPTER IV

### RESULTS

The first section of this chapter describes the characteristics of the respondents, and the remaining sections of the chapter address each of the research questions, examining factors that influence the frequency with which they use the Greenway, the types of trips for which they use the Greenway, and the extent to which they will go out of their way to use it.

#### *Characteristics of Respondents*

The average person who stopped was a forty-three year-old male, who was currently employed at a “9 – 5” job. (See Table 4-1.) Few said that they biked to save money. This response conforms to one of the goals of the sample selection process noted in Chapter 3: to include people who chose to bicycle even when they could afford to drive. Reasons that they gave to bicycle included health, the environment, and social trips.

In total, there were 58 people who responded on 54 surveys. (Three surveys had respondents’ answers grouped together because they were biking together and their answers were generally the same; such as where they were heading and the types of trips for which they used the Greenway). The majority of people who stopped were male, reflecting the results of other bicycle surveys done in Minneapolis (Hennepin County-Trail User Survey 2008, Hennepin County-Trail User Survey 2009). Respondents’ ages ranged from 20 up to 76.

<b>RESPONDENT CHARACTERISTICS</b>	
<b>Age</b>	
Mean	<b>43</b>
Median	<b>40</b>
Mode	<b>65</b>
<b>Gender</b>	
Female	<b>26%</b>
Male	<b>74%</b>

**Table 4-1** *Respondent Characteristics*

There were approximately equal numbers of people who began using the Greenway as soon as it was built (Phase 1 was completed in 2000), people who began riding it within the last few years, and people who began using it as recently as two weeks before they answered the survey. This suggests that the Greenway is maintaining its popularity and has a steady flow of new bicyclists that begin using it every year. Previous number counts on the Greenway suggest that it continues to build in popularity (Hennepin County-Trail User Survey, 2008).

**Table 4-2** *Surveyed Seasonal Biking Percentages*

<b>SEASONAL BIKING</b>	<b>Winter</b>	<b>Spring</b>	<b>Summer</b>	<b>Fall</b>
<b>Yes</b>	23	51	54	52
<b>No</b>	31	3	0	2
<b>Bicycles during specified season</b>	<b>43%</b>	<b>94%</b>	<b>100%</b>	<b>96%</b>

Of the 58 respondents, almost half (43%) said they bicycled in Minneapolis all year, even during the coldest days of the winter (See Table 4-2). Many of them stated that the Greenway allowed them to reach their destination faster in the winter than a car would, since the bicycle paths are plowed before city streets. The rest of the respondents stated that they were seasonal bikers, excluding the winter months.

#### *Research Question One: Types of Trips*

The first research questions asked what types of trips people use the Greenway for, asking how many times they use the Greenway each week and the length of each trip for commuting, running errands, and for exercise or leisure.

Half of the respondents surveyed use the Greenway for commuting at least once a week (Table 4-3). Of that half, over three-fourths of respondents ride more than five miles per trip. Over half of the bicyclists surveyed also report using the Greenway to run an errand at least once a week, and almost three-quarters of respondents reported using the Greenway for exercise at least once a week.

TYPES OF TRIPS	Commute trips per week		Running errand trips per week		Exercise trips per week	
0 trips	27	50%	24	44%	14	26%
1 - 3 trips	7	13%	17	32%	18	33%
3 - 5 trips	10	18%	6	11%	7	13%
5 - 7 trips	7	13%	3	6%	11	21%
7+ trips	3	6%	4	7%	4	7%
Total Responses	54		54		54	
Percentage of Users	50%		56%		74%	

**Table 4-3** *Types of Trips Respondents Make Along the Greenway*

The most common response to how far Greenway commuters bicycle was 5 – 10 miles; a total of 67% of trips were less than 10 miles (Table 4-4). The common response for how many bicyclists travel to run an errand was 1 – 5 miles, while 84% of errand trips were under 10 miles. Unlike the shorter trips for commuting and errand running, the majority of cyclists (53%) who exercise on the Greenway bicycle more than 15 miles per trip.

TRIP MILES BIKED	Commute miles per trip		Errand miles per trip		Exercise miles per trip	
1 - 5 miles	6	22%	17	57%	3	8%
5 - 10 miles	12	45%	8	27%	9	23%
10 - 15 miles	6	22%	3	10%	5	13%
15+ miles	3	11%	2	7%	21	53%
Total responses	27		30		40	

**Table 4-4** *How Far Respondents Will Bike for Each Type of Trip*

#### *Research Question Two: Factors Affecting Greenway Use*

The second research question asked if bicyclists were choosing the Greenway over city streets, if it had shortened their travel time, affected the distance they were willing to travel or types of trips they would take, and asked them to list their benefits of the Greenway and aspects that might decrease their use of the path.

Of the 48 responses (ix responses were not applicable because they only bicycled leisurely on the Greenway and never had a destination during use), 28 bicyclists reported that

GREENWAY TRAVEL	Has the Greenway shortened travel time for you?		Has it affected the distance you are willing to bike?		Do you see any benefits to biking on city streets rather than the greenway?	
	Responses	Percent	Responses	Percent	Responses	Percent
Yes	28	58%	21	51%	25	46%
No	9	19%	9	23%	29	54%
Not Sure	11	23%	9	23%	11	0%
Total Respondents	48		39		54	

**Table 4-5** *Greenway Respondent Answers*

the Greenway had shortened travel time for them, and twenty (out of 38) respondents said that it had affected the distance that they were willing to travel through Minneapolis (See Table 4-5).

Fifty-four percent of users said they did not see a benefit to using city streets over the Greenway (Table 4-6). It should be noted that leisure riders were grouped into this question, and so there could be more of a bias towards off-street paths for that reason. Reasons to use

GREENWAY USE	Is there anything that decreases your using the	
Yes	39	72%
No	13	24%
Not Sure	2	4%
Total Respondents	54	
<b>Contributing Attributes that decreases use</b>		
Lack of Safety	17	44%
Congestion	5	13%
Direction (E - W)	9	23%
Bike Etiquette	3	8%
Other	5	13%
Total Respondents	39	

**Table 4-6** *Deterrents From Using Greenway More*

The top reasons that deterred people from using the Greenway more frequently were safety and direction (Table 4-6). Comments regarding safety emphasized that night time riding is dangerous for solo riders, causing many to avoid its use past a certain level of darkness. Respondents noted that there is inadequate lighting, creating shadows under certain bridges. Comments regarding direction suggested that the Greenway is very good for getting around

the Greenway over city streets included: fewer car fumes, it was safer and faster during the day, they did not have to deal with rush hour traffic, and it was more aesthetically pleasing. Of the 46% who saw benefits to using city streets over the Greenway, reasons included: streets can be more direct, they are safer at night, there are short cuts on city streets, and there is more excitement and adventure.

South Minneapolis, but there are few North to South connections that connect the Greenway to Downtown Minneapolis. Some people said it should continue into Saint Paul.

*Research Question Three: How Far Out of Their Way Will People Go to Use the Greenway?*

The third research question asked how far out of their way people will go to use the greenway and was addressed by asking about this issue and by mapping the route that they most likely took.

OUT OF WAY TRAVEL	Miles willing to travel out of way to get to Greenway	
0 miles	13	25%
0 - 1 miles	10	19%
1 - 2 miles	12	23%
2 - 3 miles	5	9%
3 - 4 miles	2	4%
>4 miles	4	8%
Total Responses	53	

**Table 4-7** *How Far People Will Travel to Use Greenway*

total, 28 of the respondents had a “specific destination” or just “destination”. The other 26 were exercising and did not have a specific destination.

Mapping was used to assess how far out of the way people were traveling to use the Greenway on that specific trip, and also what part of the Twin Cities they were traveling to. Out of the 28 respondents, 16 of the trips did not go out of their way to use the Greenway (Table 4-8). Twelve respondents’ (43% of people) trips were at least a few blocks out of the way of the Greenway.

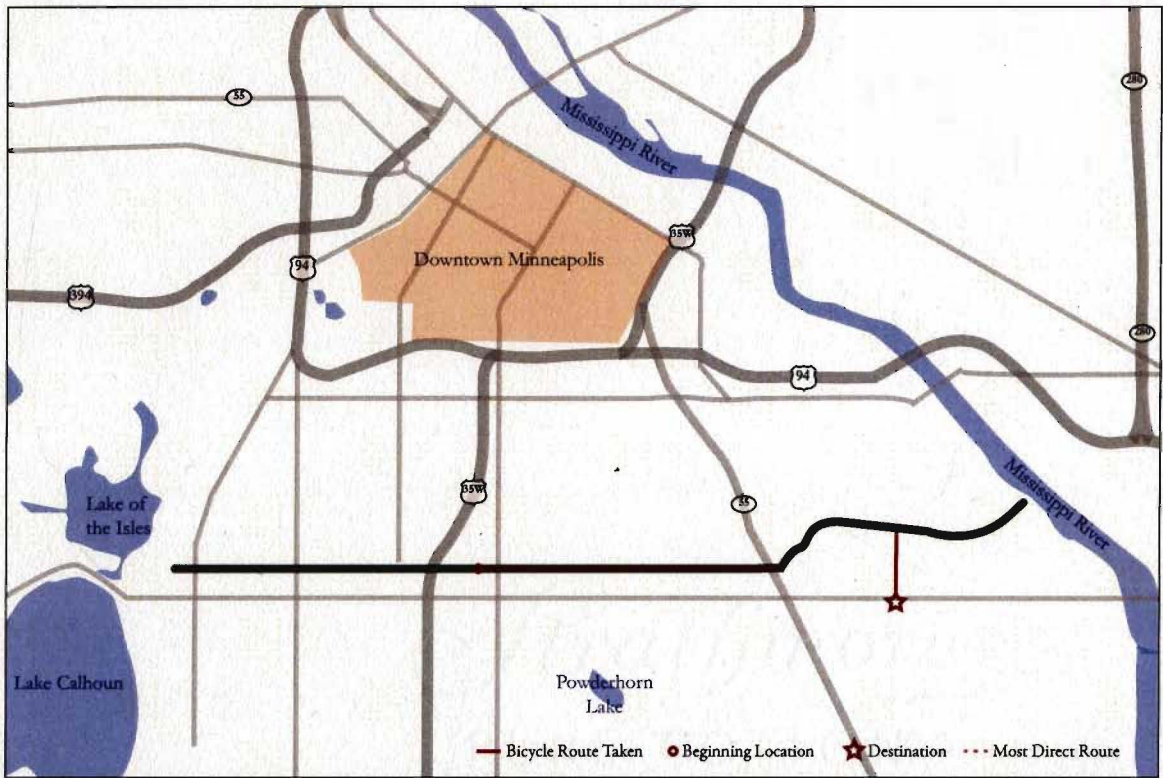
Greenway Mapped Routes		
Greenway on the way of trip	16	57%
Traveled less than 6 blocks out of the way	2	7%
Traveled up to a mile out of the way	4	14%
Traveled up to 2 miles out of the way	3	11%
Traveled more than 2 miles out of the way	3	11%
Total Respondents	28	

**Table 4-8** *Mapped Route Percentages*

One-quarter of respondents said they were not willing to travel out of their way to use the Greenway (See Table 4-7). Other responses varied anywhere from “a couple of blocks” up to “about 10 miles”. Respondents were asked what their destination was on the day they answered the survey, and where they were coming from. In

Greenway Mapped Routes		
<b>Greenway on the way of trip</b>	<b>16</b>	<b>57%</b>
Traveled less than 6 blocks out of the way	2	7%
Traveled up to a mile out of the way	4	14%
Traveled up to 2 miles out of the way	3	11%
Traveled more than 2 miles out of the way	3	11%
Total Respondents	28	

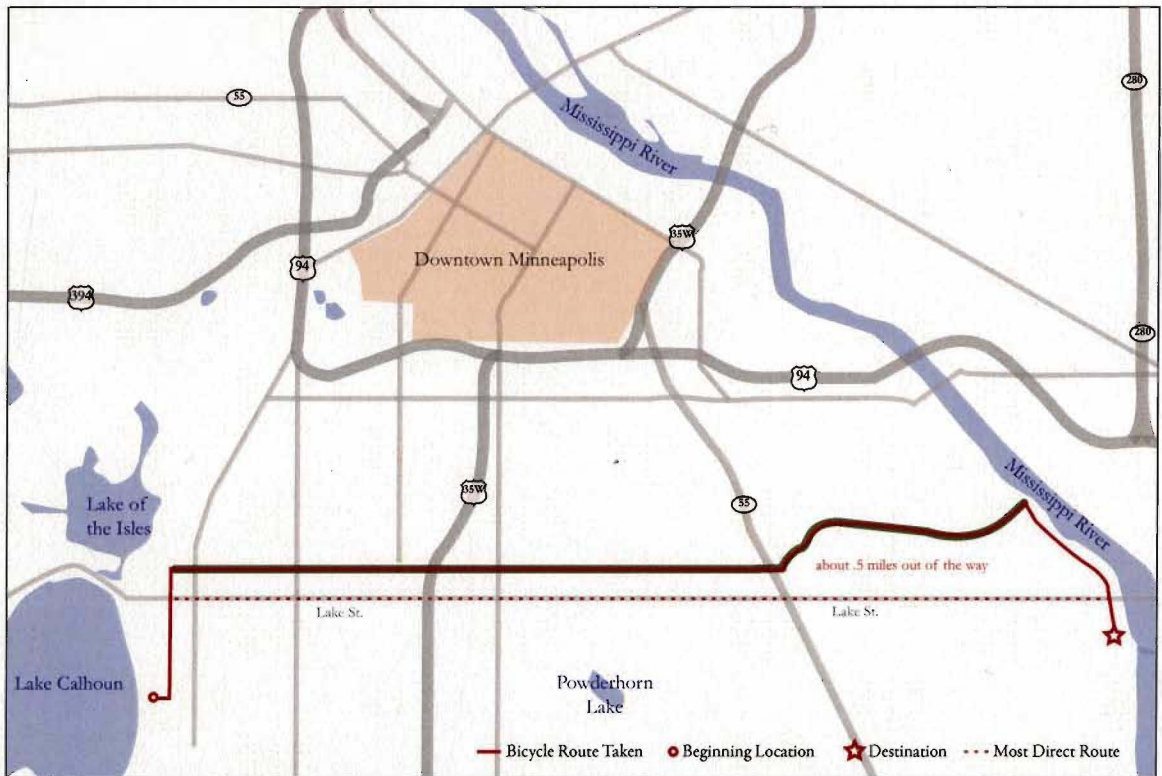
Map 4-1 "On the Way" Trip



Map 4-1 shows an example of the one of the sixteen routes bicycled where the Greenway was "on the way" to their destination. There was no bicycle path/lane/road that was more direct for this specific trip, so the Greenway is the obvious choice.

Greenway Mapped Routes		
Greenway on the way of trip	16	57%
<b>Traveled less than 1/2 mile out of the way</b>	<b>2</b>	<b>7%</b>
Traveled up to a mile out of the way	4	14%
Traveled up to 2 miles out of the way	3	11%
Traveled more than 2 miles out of the way	3	11%
Total Respondents	28	

Map 4-2 "1/2 Mile Out of Way" Trip

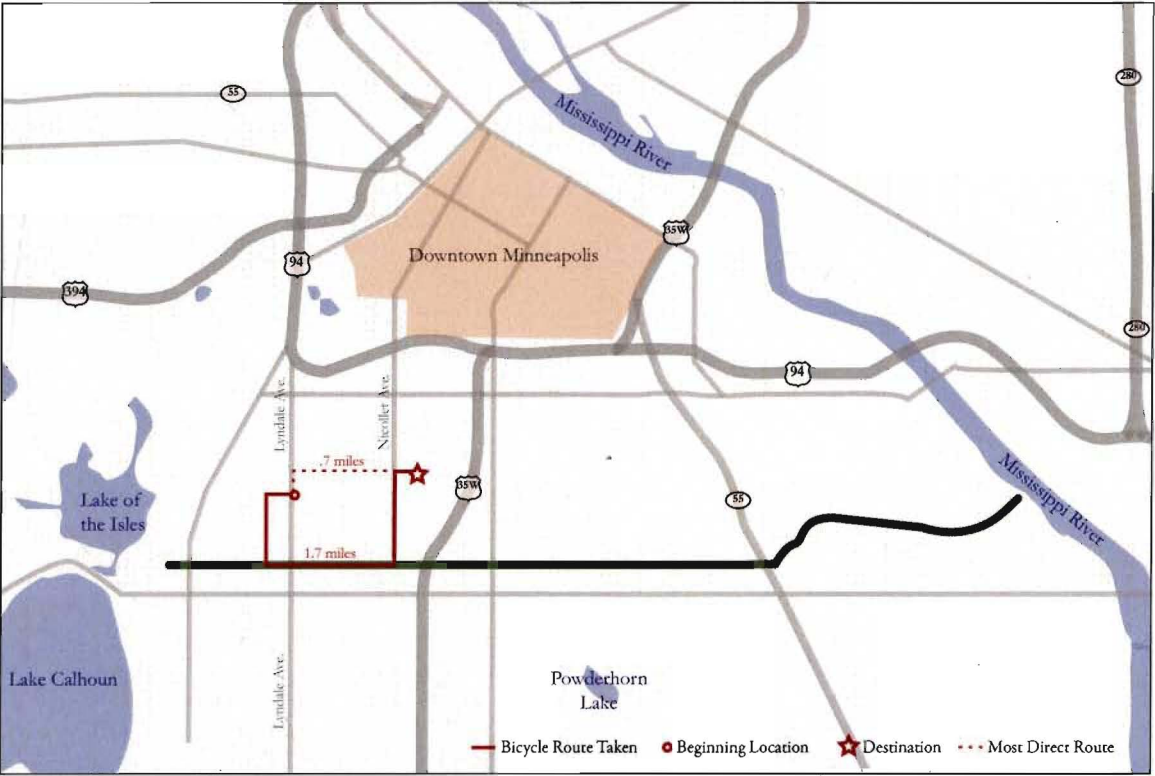


Map 4-2 shows a route where the bicyclist traveled about 1/2 mile out of their way to use the Greenway. The more direct route would have taken Lake Street, shown by the dotted line on the map. Lake Street is a minor arterial without any bicycle facilities. This rider potentially chose to ride out of their way to be able to use a route with bicycle infrastructure.



Greenway Mapped Routes		
Greenway on the way of trip	16	57%
Traveled less than 1/2 mile out of the way	2	7%
<b>Traveled up to a mile out of the way</b>	<b>4</b>	<b>14%</b>
Traveled up to 2 miles out of the way	3	11%
Traveled more than 2 miles out of the way	3	11%
Total Respondents	28	

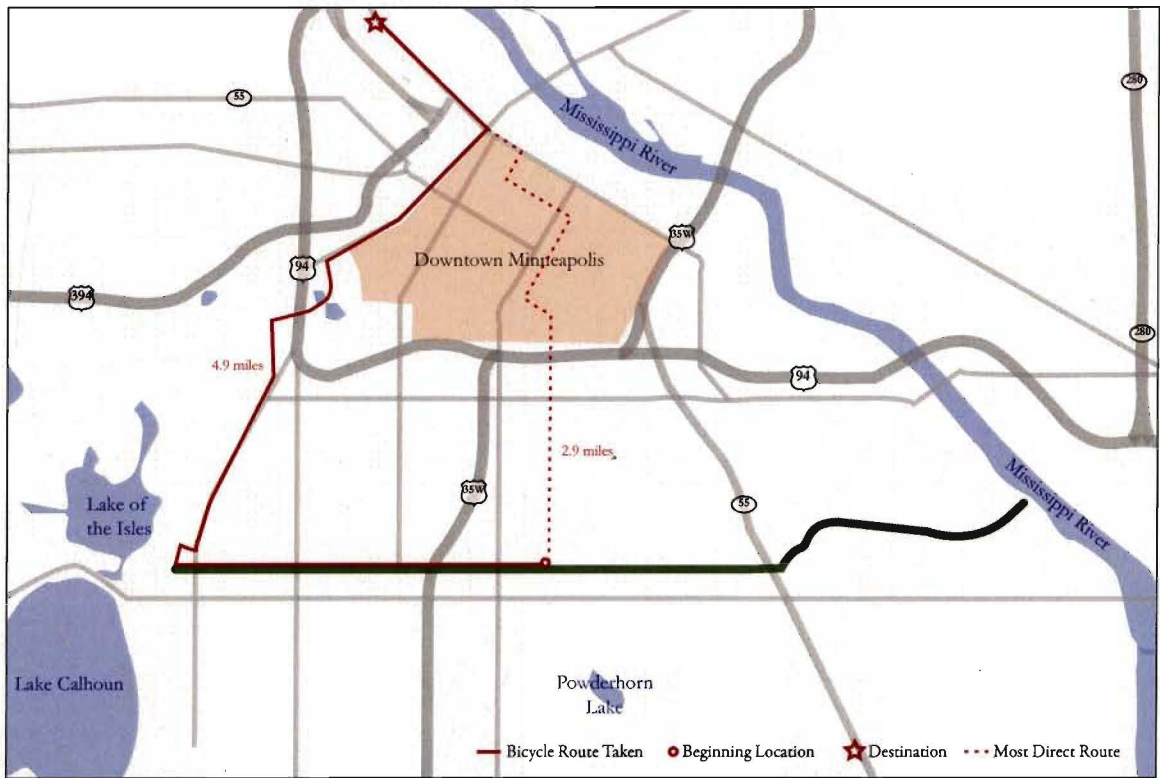
Map 4-3 "1 Mile Out of Way" Trip



Map 4-3 shows a trip where the bicyclist was willing to travel 1 mile out of their way to their destination. It seems that the bicyclist may have tried to avoid crossing Lyndale Avenue and Nicollet Avenue, both four-lane arterials that run north and south through Minneapolis.

Greenway Mapped Routes		
Greenway on the way of trip	16	57%
Traveled less than 1/2 mile out of the way	2	7%
Traveled up to a mile out of the way	4	14%
<b>Traveled up to 2 miles out of the way</b>	<b>3</b>	<b>11%</b>
Traveled more than 2 miles out of the way	3	11%
Total Respondents	28	

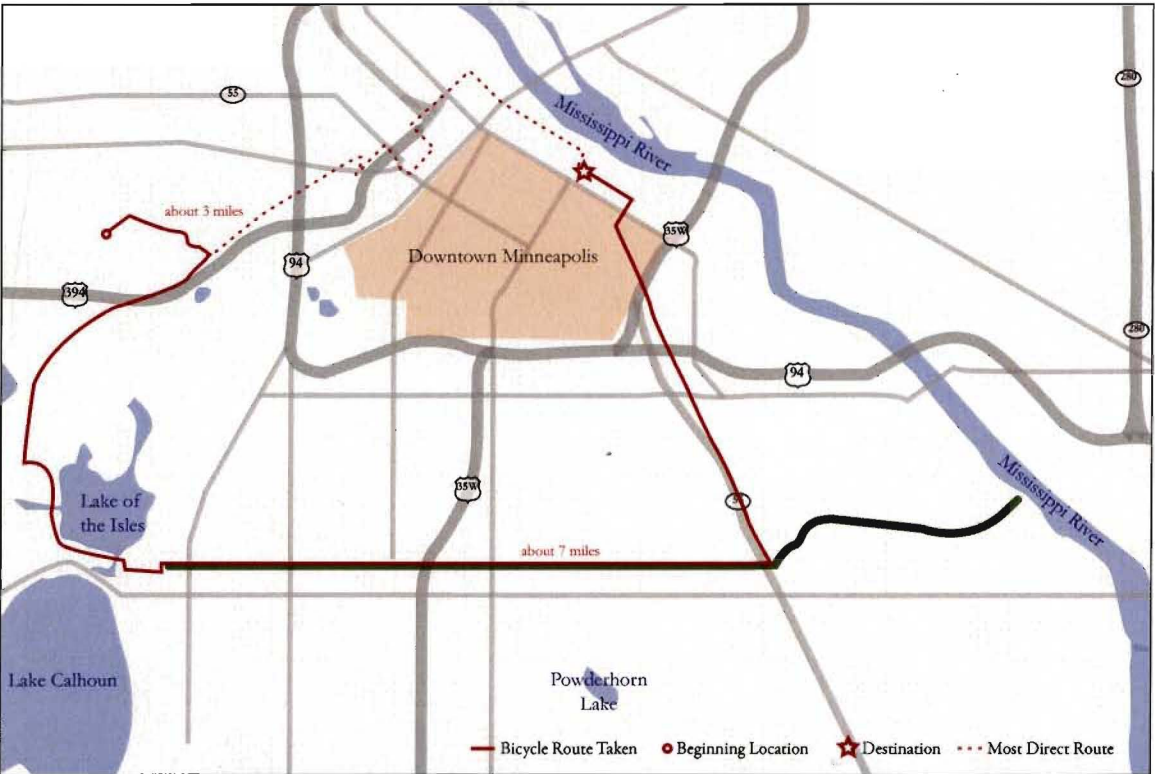
Map 4-4 "2 Miles Out of Way" Trip



Map 4-4 shows a route that was taken that where the bicyclist travels about 2 miles out of their way to reach their destination. For this specific trip, the most direct route would have been through Downtown Minneapolis. Perhaps the bicyclist chose to avoid the downtown traffic and take the off-street trails instead.

Greenway Mapped Routes		
Greenway on the way of trip	16	57%
Traveled less than 1/2 mile out of the way	2	7%
Traveled up to a mile out of the way	4	14%
Traveled up to 2 miles out of the way	3	11%
<b>Traveled more than 2 miles out of the way</b>	<b>3</b>	<b>11%</b>
Total Respondents	28	

Map 4-5 “2+ Miles Out of Way” Trip



Map 4-5 shows a trip where the bicyclist adds on an extra 4 miles to their trip to use the Greenway. This specific trip does not seem to have any barriers that biking on the Greenway would avoid. It’s possible that this bicyclist wanted to travel a further distance because they simply enjoy bicycling and wanted to increase their travel on an off-street path before they reached their destination.

### *Other Important Finds*

Eighty-seven percent of respondents said that more could be done in Minneapolis to increase their ridership. The majority of people suggested increasing on- and off-street bicycle lanes. Similar to that, comments included: “policy change for more roads to have bicycle priority,” “separate paths for bikes,” and “slow down traffic next to bicycle lanes.” The comment “more north-to-south bicycle connections” also came up frequently. Figure 4-6 shows that streets that were suggested by respondents to add bicycle amenities on to create more direct routes within the city for bicyclists.



**Map 4-6** *Suggested Streets for Adding Bicycle Amenities*

Education and Awareness were the second top issues that people gave input on. Many bicyclists commented that there was too little education for both bicyclists and drivers. More signage for bicyclists and for drivers that alerts them to bicyclists could create a better dynamic between the two types of transportation modes.

Chapter 5 summarizes the results of this study, discusses future research needs, and possible uses of this information for future policy and planning.

## CHAPTER V

### RECOMMENDATIONS

This thesis examined bike travel on the Greenway in Minneapolis, Minnesota (Figure 5-1) and addressed three questions: What types of trips are bicyclists making, are there factors that discourage people from using the Greenway more frequently, and how far out of their way will people travel to use this off-street path. Short in-person surveys and maps of riders' routes were used to answer these questions, seeking to understand the extent to which off-street paths in urban environments may encourage a change in transportation mode.



**Figure 5-1** *Soo Line Community Garden off of Greenway. Kallhskey, 2010*

This chapter first summarizes the results of the research and relates the findings to earlier work. It then briefly discusses possible other directions for research and then provide recommendations for the further development of bicycle infrastructure in Minneapolis.

#### *Summary of Findings and Implications of the Research*

Results presented in earlier chapters indicate that a substantial number of bicyclists use the Greenway for utilitarian trips, that the Greenway can shorten their trips, and that some will go out of their way to use the Greenway.

#### *Adjacent Neighborhoods Use the Greenway for Utilitarian Trips*

Though a large number of people who use the Greenway for leisure, my results indicate that the Greenway is most certainly used for commuting through the Twin Cities,

The Hennepin County Trail Survey reported that 24% of bicyclists use the off-street trails for commuting, 19% for running errands, and 82% use the trails for exercise (2009). In contrast, my survey of Greenway riders found that fifty-six percent of respondents reported using the Greenway to commute and 50% reported running an errand on it at least once a week.

It is possible that the Greenway is used differently than the bulk of other off-street trails around the city because of its location, especially its proximity to retail outlets and the numerous access points (Figure 5-2). The majority of people that used the Greenway for “errands” traveled less than 5 miles, and the majority of people that used the path for commute trips traveled less than 10 miles. This suggests that residents of neighboring communities use the Greenway to get to destinations in their own or adjacent neighborhoods.

#### *The Greenway Shortens Riders' Trips*

My results also suggest that the Greenway has shortened travel time for the majority of respondents. Though Krizek's study suggests that people were willing to bike 5.2 minutes out of their way to use an off-street path in Minneapolis (2006), 58% of respondents to my survey stated that the Greenway actually shortened their travel time. Several respondents also stated that they are willing to bike further because of the Greenway. This may indicate a change in transportation mode choice for some residents in Minneapolis since the construction of the Greenway path or that the choice to use a path depends upon its location.

“Safety” and “Direction” were the top two reasons that people reported not using the Greenway more. Interestingly, two interviewees were involved in bicycle organizations that have started patrolling at night to increase safety, and signage along the Greenway suggests that certain problematic areas are now under video surveillance. It should also be noted



**Figure 5-2** *The Midtown Greenway.*  
Kallusky, 2010

that the Midtown Greenway Coalition and the City of Minneapolis are currently looking into the plausibility of continuing the Greenway across the river into Saint Paul (Midtown Greenway Coalition, 2010). An interview with a board member from Twin Cities Greenways, a new advocacy group, confirms that a new north-to-south greenway connection through Minneapolis is being considered and a pilot project will soon be under way (See Appendix page 35 for a concept map of the proposed North/South greenway). If Safety and Direction are no longer problematic for riders, there may also be an influx of ridership in the future (Figure 5-3).

*People Travel Out of Their Way to Use a Direct and Fast Route*

Respondents commented that many bicycle routes are indirect, and there are missing connections within and around the city (See Map 4-6 in Chapter IV). Results reported in Chapter 4 indicate that several respondents went out of their way to use the Greenway. The mapped routes from Chapter 4 include possible reasons that people went out of their way to use the Greenway, such as avoidance of streets without bicycle infrastructure and congestion and providing an aesthetic ride to a destination. This finding supports several Oregon studies mentioned earlier (Dill, 2006; Dill & Voros, 2006).

In contrast, Krizek's (2006) study of Minneapolis suggested that people preferred streets to paths for commuting. Yet, this, and other studies of bicycling in Minneapolis did not include the Greenway when comparing on-street paths to off-street trails. This decision may have occurred because the authors felt that the



**Figure 5-3** *The Midtown Greenway.*  
Kallusky, 2010

Midtown Greenway was unique in its off-street attributes. My results suggest, however, that the Greenway does have attributes that attract commuters and that it should be included in future work in the city.

### *Suggestions for Future Research*

Future studies of bicycling on the Greenway and in Minneapolis should, of course, have a larger sample. There should also be an effort made to include all different types of riders and to have a statistically representative population.



**Figure 5-4** *The Midtown Greenway.* Kallusky, 2010

Current studies compare on-street paths with off-street trails in Minneapolis (The Midtown Greenway has not been included in these studies (Krizek et al, 2006)), or the Greenway is grouped in with the “trail system” around the Twin Cities metro. The fact that there is a new off-street greenway system beginning suggests that there is momentum for these types of paths and that an off-street system, within an urban context, contributes to the addition of more utilitarian trips within the bicycling community (Figure 5-4).

### *Implications for Policy and Planning*

The Greenway is a unique way to provide bicycle infrastructure within an urban environment (Figure 5-5). There is the potential to have further Greenways built in Minneapolis. There are already proposals in the works for a north-to-south connection (see Appendix), and also a proposal connecting the capital in Saint Paul to Dinkytown in Minneapolis (Twin Cities Greenways, 2010). There are unused railroad tracks that could be turned into greenway connections with enough funding and positive reaction from the people in Minneapolis. Thus, results from this research could aid those advocating for direct urban off-street paths. In addition, this research provides suggestions for other less space-consuming and less expensive ways to increase ridership within the Twin Cities.



**Figure 5-5** *The Midtown Greenway.* Kallusky, 2010



Minneapolis bicycle riders seem to value the Greenway for its directness to specific destinations, aesthetics that make for an appealing ride, and its avoidance of cars and congestion. However, it is difficult to build an off-street pathway within most urban environments, which may not have enough land for this type of direct path. This research can provide awareness to the types of amenities riders like and the attributes can help create a better bicycling city.

### *Increase Signage*

Based on responses to my survey it appears that an inexpensive way for Minneapolis to increase bicycle safety is to add better signage to existing bicycle infrastructure. The Greenway has adequate signage along the path, but very few signs lead bicyclists to the path from other parts of Minneapolis. Unless riders are familiar with the streets, there is little signage directing cyclists to the streets where bicycle amenities are offered. By increasing signage to get to existing bicycle infrastructure, it could help eliminate the need to add as much new infrastructure (which will decrease costs), increase safety for current riders, and increase the potential to get more people bicycling once they become aware of the extensive bicycle network that exists in Minneapolis.

### *Upgrade Existing Bicycle Infrastructure*

Minneapolis riders made it clear that they would like more bicycle infrastructure that gives direct routes through Minneapolis. Currently, there are bicycle lanes on some arterial roads through the city, but many cyclists say there are not enough. Figure 5-6 shows an on-street bicycle amenity on Park Avenue, an arterial that runs north-south through Minneapolis. It is a good depiction of what the majority of on-street paths look like in Minneapolis: narrow, with parking on one side and several lanes of one-way traffic on the other. There are dangers on either side of the cyclist. So what is the solution to increasing direct routes while increasing safety?



**Figure 5-6** *Park Avenue Bicycle Lane, Slotterback, 2010*

There have been unsuccessful attempts to create safer on-street bicycle routes. Examples include adding a buffered bicycle lane on First Avenue (Figure 5-7) and making Hennepin Avenue open to two-way traffic, taking out the existing bicycle lanes, and creating a bus/bike/parking lane. Both of these streets were meant to be “upgraded” for bicyclists, however, many cyclists deem these attempts as failures in increasing safety. Figure 5-7 shows a photo of First Avenue’s bicycle buffer. Because the street has poor signage, drivers are confused about where they should park, blocking the allotted bicycle path.



**Figure 5-7** *First Avenue Bicycle Buffer Attempt, Minneapolis. Slotterback, 2010*

One approach that has been successful in other cities has been to give more focus to the bicycle lane by changing its color and size, and creating better safety buffers. Figure 5-8 shows the first cycle track in Portland, Oregon that was implemented in 2009. There is a painted buffer in between the parked cars and the bike lane without any confusion of where the cars park and where the bicyclists ride. The difference



**Figure 5-8** *Successful Buffer Lane Portland, OR. Maus, 2009*

between these two photos (Figures 5-7 & 5-8) is that Minneapolis did not give up a full lane of traffic for the bicycle path, while Portland’s plan did. Minneapolis could stop condensing bicycle amenities into as compact an area as possible and give the cyclist more room. This would increase safety for both cyclist and driver, lessen confusion, and increase the visual presence of the bicyclist.

#### *Add “Safer” Infrastructure on Arterials in Minneapolis*

Many European cities have taken a buffered bike lane one step further. Figure 5-9 shows an image of a cycle track on either side of the street in Utrecht, Germany. The lane

is almost as wide as the car lane, colored and easily marked. Figure 5-10 shows a proposed cycle track in Eugene, Oregon that would allow cyclists two-way cycling and only allow cars one-way access, giving a larger portion of the road to the bicyclist. There would also be a marked buffer in between the car traffic and the bicycle traffic. If this proposal passes, it will be one of the first cycle tracks in the nation (Eugene Safe Routes to School, 2010).

Many respondents in the survey gave suggestions about adding bicycle amenities to arterials, giving cyclists direct routes to destinations. According to the implications of research obtained along the Greenway, respondents value their safety, aesthetics, and dislike car congestion, and will go out of their way to use the Greenway to obtain those attributes.

Minneapolis could add a two-way cycle track on many of the one-way arterials. This would increase mobility and safety of cyclists, while still maintaining the majority of its original design for automobile use. Highlighting bicycle traffic adds awareness to drivers, which would hopefully create a city that sees bicycles, and accepts them as a viable mode of transportation.

#### *Create a Comprehensive Plan*

Finally, Minneapolis lacks a comprehensive plan that looks at what streets have the potential to eliminate a lane of traffic for safer bicycle infrastructure. Currently, the city has a



**Figure 5-9** *Cycle Track in Utrecht.*  
*Wikipedia, 2009*



**Figure 5-10** *Cycle Track Proposal,*  
*Eugene Safe Routes to School, 2010*



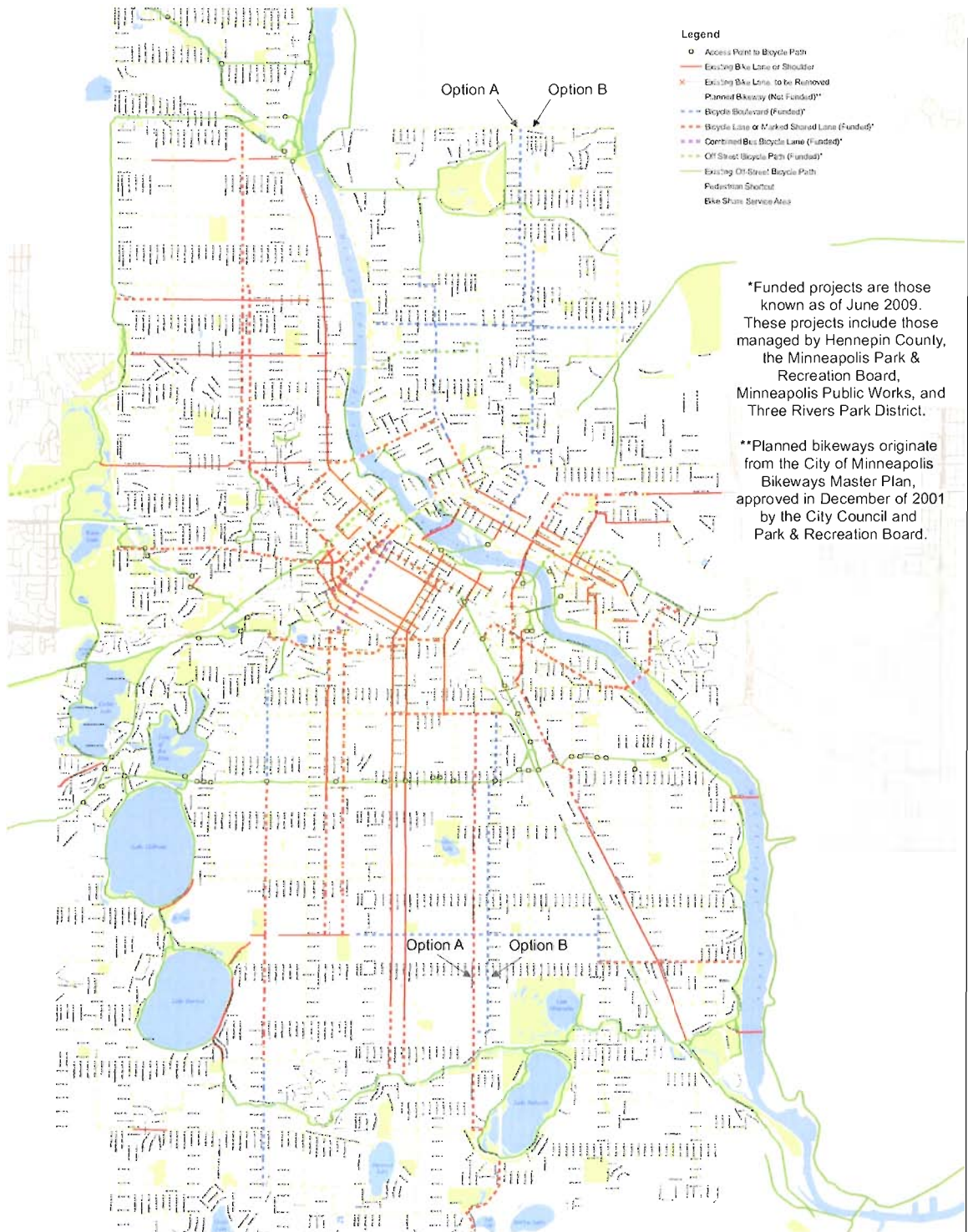
**Figure 5-11** *Is Minneapolis*  
*Ready for a Cycle Track?*

Bicycle Map that shows all on- and off-street bicycle paths, routes, and streets throughout the metro area. They are also in the process of writing a new Bicycle Master Plan that will hopefully be useful for future bicycle infrastructure projects. Many on-street projects, as previously stated, are afterthoughts, giving the cyclist a small amount of space as to not eliminate any lanes of automobile traffic.

Studies could be done in Minneapolis to discover which arterials/main streets have the potential to decrease needed car lanes, allowing for safe bicycle infrastructure throughout more of Minneapolis in a relatively inexpensive and simple way to increase bicycle mobility around the Twin Cities. One could suggest that greenways and off-street paths should not be the only way a cyclist can feel truly safe, especially when city streets are many times the most direct way for all modes to reach their destination.

The Midtown Greenway was advocated for and built by citizens who believed that an old railroad corridor was better used as a bicycle throughway in an urban environment than as empty space in the city. This has led to further commercial and residential development, creating a vibrant space in an otherwise void area. There are few other cities in America that have the momentum to push the boundaries that Minneapolis can push. Minneapolis is the Number One Bicycling City in America. The bicycling culture is already here. The mentality to allow for bikable streets is already here. Progressive ideas that haven't been tried before should be promoted here. Evidence of the utilitarian use along the Greenway and recommendations of this research encourages the promotion of bicycle infrastructure, signage, and improved lanes on existing streets within Minneapolis to increase ridership and continue to be the Number One Bicycling City in America.

APPENDIX A



Map A-1 City of Minneapolis Bikeways

# Minneapolis Concept Routes



Map A-2 Twin Cities Greenways Minneapolis Concept Routes

APPENDIX B

**The Midtown Greenway**

The Midtown Greenway is an off-street bicycle path (phases were built between 2000 and 2006) that runs West–East from Chowen Avenue, (near Excelsior Boulevard) to West River Parkway and connects to the rest of Minneapolis’ trails-extensive bicycle network (Midtown Greenway Coalition, 2010). Following the 100 year-old Milwaukee Road railroad corridor, the path runs underneath most of the existing city streets, with only a few areas where automobile traffic and bicycle traffic



**Figure A-1** Train on the 29th Street Corridor. Minnesota Transportation Museum, via Midtown Green Coalition.



**Map A-3** Phases of Greenway Completion

intersect. With minimal car-bike-pedestrian interaction, the greenway offers a quick and safe way for bicyclists and pedestrians to travel east to west on the southern portion of Minneapolis, but also limits access to the ramps that have been built down into the greenway space. Since the path is constructed underneath existing streets, emergency phones and lights for night riding were necessary to secure the safety of the riders.



**Map A-4** Locations Where Bikers Encounter Car Traffic

Both the Greenway and the land it cuts through have a vibrant history, so signs along the path educate residents about the businesses and trades that previously existed.

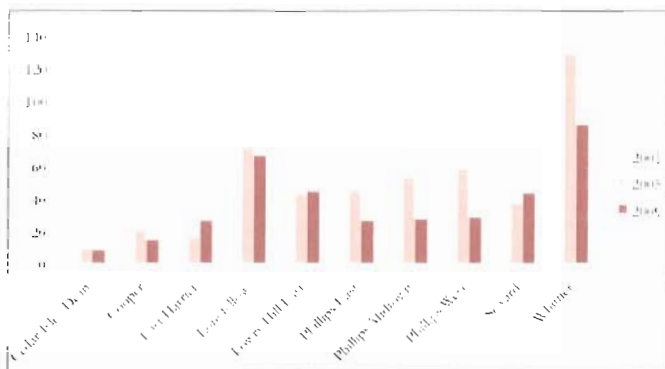
This 5.5 mile path connects up with several other off-street paths that run to other parts of Minneapolis and other parts of the entire metro. 62% of riders are from Minneapolis, so over one third of people that use the greenway bike from outside Minneapolis borders (Hennepin Off-Street Path Survey).

Since the Greenway was built along an existing railroad track and underneath over-passing streets, there are areas that become considerably narrow which could limit expansion

of a second bike lane in each direction. Currently, there are single bike lanes that run east-to-west and a single pedestrian path adjacent to it.

Since its completion, crime has dropped an astounding 50% in bordering neighborhoods (Community Census Bureau). Figure A-1 shows the crime numbers from 2000, 2005 and 2009 of the adjacent neighborhoods to the Greenway. Only East Harriet's crime rates have not dropped since 2000, but they still have a low crime rate compared to the rest of the neighborhoods. Reasons for this that relate to the Greenway could include: an influx of people passing through the neighborhoods increases supervision, the types of people that want to live near a bike path are perhaps bringing in people of higher income and are less likely to commit crime, or there is a greater sense of pride in the neighborhood.

There has also been commercial development in and along the Greenway, proving the potential for adding a new layer in the built environment. Since its completion, there have been two community gardens, a sports field, several patios of businesses and apartment complexes, and Free Wheel Bike Shop has been built down into the Greenway itself (Map A-5). Several



**Figure A-2** Number of Crimes by Neighborhood Adjacent to Greenway in July





**Map A-5** *New Amenities/Development into Greenway*

businesses and organizations have also painted murals on once-dilapidated walls of back of buildings, and even the graffiti on backs of old buildings have added to the aesthetics near the exit of Brackett Park, in the Seward Neighborhood.

The Greenway has become more popular since its inception as a bicycle path. With non-profits, advocates, and citizens taking pride in its upkeep, it is clear that Minneapolis takes pride in its off-street biking culture. By maintaining the path, increasing its safety, and continuing to allow developments to build into the space, this bike path continues to become an area of urban vibrancy for the people of the Twin Cities.

## APPENDIX C

### Survey Questions

#### General Information

Gender \_\_\_\_\_ Age \_\_\_\_\_ Race or Ethnicity \_\_\_\_\_

Which of the four seasons do you bike during? \_\_\_\_\_ winter \_\_\_\_\_ spring \_\_\_\_\_ summer \_\_\_\_\_ fall

Where are you coming from today (closest intersection)?

And where are you going (closest intersection)?

Is the Greenway out of your way to get to this specific destination? If yes, what are your reasons for choosing the Greenway?

If you travel out of your way to use the Greenway, how many blocks or miles do you go out of your way?

#### Greenway Use

When did you begin biking on the Greenway?

How many times per week do you use the Greenway, on average, and what is the length of each trip:

for commuting to work? \_\_\_\_\_ times per week \_\_\_\_\_ miles

for running errands? \_\_\_\_\_ times per week \_\_\_\_\_ miles

for purely exercise or leisure? \_\_\_\_\_ times per week \_\_\_\_\_ miles

Has the Greenway shortened travel time for you?

If yes, has that affected the distance that you are willing to bike and the types of trips you are willing to take?

Can you give a good example of this?

Do you see any benefits to using CITY STREETS over the GREENWAY?

#### Benefits and Improvements

Can you think of any aspects about the Greenway that decreases your using it?

What else could be done in Minneapolis to make you bike more and drive less?

(These last two questions were put into my survey as a favor for the Midtown Greenway Coalition in exchange for some data that they had collected about the Greenway)

Have you heard of the Midtown Greenway Coalition?

If yes, could you briefly explain to the best of your knowledge what type of work they do.

APPENDIX D



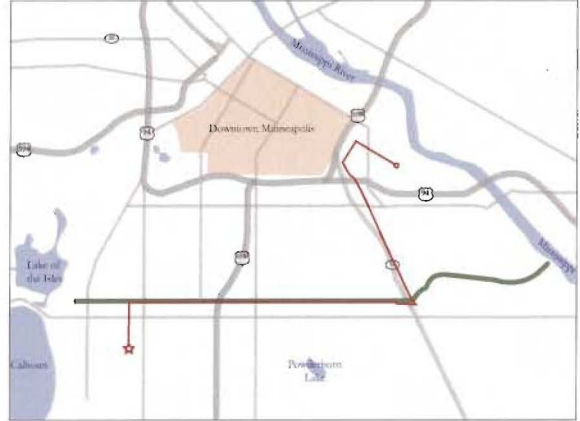
Map A-6 Mapped Route



Map A-7 Mapped Route



Map A-8 Mapped Route



Map A-9 Mapped Route



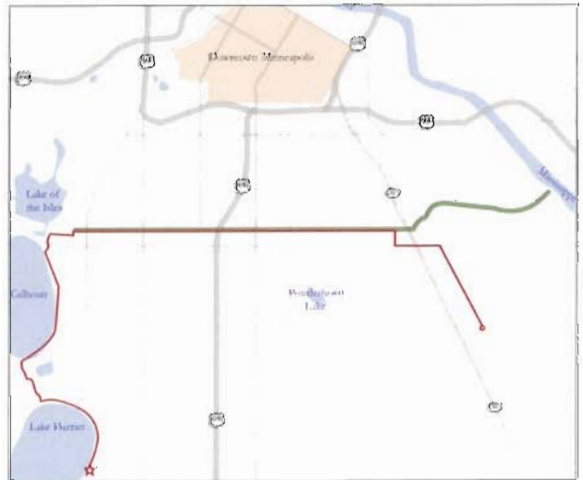
Map A-10 Mapped Route



Map A-11 Mapped Route



Map A-12 Mapped Route



Map A-13 Mapped Route



Map A-14 Mapped Route



Map A-15 Mapped Route

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