

A Social and Spatial Analysis of Madison's Bicycling Community

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Abstract:

For many cities across the United States biking is not just a leisurely activity; it is a means of transportation, exercise, and an important staple that helps form a sense of identity and community. This study looks at Madison, Wisconsin's bicycle community and examines how infrastructure influences the overall bikeability and social structure of the city. While infrastructure is an important underlying factor in determining the safety and effectiveness of a city, this study also analyzes how infrastructure can impact gender divides, racial composition, and safety concerns. All of these factors play into the accessibility and management of a bicycle community.

Our research consisted of survey data from cyclists at the Wisconsin Bike Federation and cyclists on and off campus, as well as interviews with two UW students and Dave Cieslewicz, executive director at the Wisconsin Bike Federation and former Mayor of Madison. By examining survey and interview data, graphs based on demographics and networking were created, confirming that Madison, Wisconsin has great rating as a bike-friendly community and is considered one of the better cities for biking in the United States. In particular, our engineering of streets and bike paths/routes helps push Madison, Wisconsin ahead of the curve.

1. Introduction

In recent years, there has been an increase in reasons for bicycling as a method of transportation. By using a bicycle as a method of transportation, one can reduce their carbon footprint. Bicycling is a sustainable method of transportation and rider numbers continue to increase. Besides bicycling being better for the environment (Gotschi & Mills, 2008), it can be a solution for public health issues, such as obesity, which continues to be a rising problem in the United States (Ogden, 2010). Bicycling promotes a healthy lifestyle and encourages a way to actively commute (de Hartog, 2010). As climate change and health issues continue to grow, the bicycle provides one possible solution to these complicated problems.

Wisconsin began incorporating a bicycle-friendly design into the city's transportation infrastructure in the 1950's with funding from the federal Rails-to-Trails program. Wisconsin has a deep relationship with bicycles that dates back into the 19th century, way before bikes were popular across the rest of the country. Many of Wisconsin's early residents used the bike as a solution for getting from point A to point B. But it soon evolved into something much greater than just a mode of transportation. Biking used to be something for people with 'elite' status but has changed over time as it has become a much more affordable mode of transportation. The City of Madison, Wisconsin is known for being a bike friendly community, ranking number four in the United States in 2014 in USA Today's 10 Best series. This is demonstrated by the counter stations, which show over 2.9 million users in different parts of Madison in less than a year.

As Madison continues to work on infrastructure improvements each year, the addition of lights and new paths continue to alter the community of people who bike in the city. This paper will look at

the Madison bicycle infrastructure to determine how infrastructure affects who bikes where in Madison. We also looked at age, gender, race, and reasons for biking to discover any patterns, similarities, or divides in the Madison biking community. By conducting surveys and interviews of Madison bicyclists, we gathered information about people's reasons for bicycling and investigated how they chose their routes to and from their destination.

2. Literature Review:

The literature we focused on led us to four key themes: bicycle network and infrastructure, bicycle safety, a gender divide in bicyclists, and the benefits of bicycling. We focused on these aspects in our research, investigating how Madison and its bicyclers acknowledge each of these themes. By dividing our research into these four categories, we were better able to understand what aspects of bicycling in Madison we should address.

2.1 Network & Bike Lanes and Paths

Madison has a total of 295 miles of paths, routes, and streets with marked, wide lanes specifically designed to be accessed by bikers for a safe and convenient ride (Madison Bike Map, 2015). Many of these paths and routes also connect different neighborhoods and areas within in the city and outside of the city. But Madison's connectivity through bike paths and routes, and this large amount of infrastructure, may be a reason for increased ridership. One study in New Orleans showed that the place of a 1 bike lane increased ridership on the road, but also in other areas of the neighborhood (Parker, 2013). In Beijing, Zhao (2013) found that a 1 % increase in exclusive bike lanes corresponded to a 0.19 % increase in the probability of choosing to bicycle, and Nelson and Allen found that each additional mile of bikeway per 100,000 residents was associated with a 0.069–0.075 % increase in commuters using bicycles across 18 US cities. Although sheer quantity of bike lanes are important,

having a diversity of bike types is also important for increased ridership. Dill found each additional mile of facility per square mile of city area to be associated with a one percentage point increase in bike commuting. Yet, the connectivity of a path may be hindered by only a few dangerous intersections. The analysis by Mekuria of low stress networks demonstrates the importance of connectivity, and found that even a path that is comprised of almost all off-street bike paths, but requires crossing major streets at a few hostile intersections still makes that path inaccessible to some. Wilkinson et al recommended a network of bike lanes, separated paths, and bike boulevards, or quiet local streets helped to encourage new riders parallel to major roadways help to create low stress routes and increase ridership.

Throughout Madison, there are a host of different path types available to the community. Implementation that Madison has made in recent years is the addition of a cycle track (green lane) on University Avenue near campus, Off-street bike paths such as the SW Commuter Path, and lanes on many major roads are only a few examples of Madison's different bike infrastructure. One of the reasons people tend to use bike paths is because they feel a sense of security that leads to safer biking. Bikers want to be separated from other motor traffic (Lusk, Furth 2011). Bringing this down to a personal level, this is a lived-experience that many have shared. They know the danger of integrating bicycling traffic with other motor traffic and would prefer to have their own separate space. In places where bikes paths and routes cannot be built there are marked lanes and widened lanes to help further separate bicycle and motor traffic.

As Madison looks to increase its use of different path types, it must look at the safety that this path type provides. One example of a controversial path was the cycle track on University, a cycle track is a bike lane that is physically separated from the rest of traffic and meant exclusively for bikes (Lusk, Furth 2011). This bike lane is different from others in the city because of its orientation to traffic; it

runs completely opposite to the traffic flow of University Avenue. Not many cities in the United States have implemented these newer designs of bike lanes due to safety concerns. The main reason for this is because many cities across North America believe that the use of cycle tracks are correlated with an increase in biker injury rates. The American Association of State Highway and Transportation Officials (AASHTO) has come to the conclusion that bikers are safest when they treat and view themselves as operators of vehicles. This is a valid viewpoint but it doesn't address integration of bicyclists and motor traffic and how it can lead to injury. To test the safety of cycle tracks, a study was conducted in Montreal, Canada to see if cycle tracks were truly associated with higher injury rates among cyclists. The study found that there were 28% less accidents reported on cycle tracks than on reference streets and that there are 2.5 times as many cyclists using cycle tracks than there were using roads. (Lusk & Furth 2011) This study also concluded that people were willing to go out of their way to use this safer bike path.

When it comes to designing transportation systems that integrate both motor traffic and bicycles, Europe tends to have the most infrastructurally connected cities. In a study done in Canada, researchers looked at what makes cities more "bikeable" than others and found a few noteworthy things. This study found that more compact land-use patterns allowed for shorter commute distances for bicycles, making travel less hard (Pucher, Buehler 2006). They also found that increased infrastructure and parking for cars reduced the utility of bike lanes. Along with this (Handy & Xing) conducted a survey that found bicycle commuters are to be highly sensitive to distance, and that direct routes with less detours were very important. Rietveld and Daniel did a study on the quality of infrastructure in 103 cities in The Netherlands. They found the number of stops and hindrances per

kilometer on any given trip were both negatively associated with bicycle use. Land-use patterns such as increased density, and a longer history of bike infrastructure combined with vehicle infrastructure along with policies that reinforced new connected bike infrastructure make Europe a stand out region for bicycling. One important thing to notice is how Lusk & Furth report and the Handy & Xing report end in completely different conclusions. This highlights the context dependence of bicycle infrastructure, and that what works for a certain city may not work for another.

The American Association of State Highway and Transportation describes bicycle network planning as a process involving comprehensive qualitative and quantitative assessment of existing conditions, needs, and feasibility. No single facility type serves all roadway contexts and user needs. The different styles of bike lanes, paths, and routes to accommodate how different people use bike resources (American Association of State Highway and Transportation Officials 2012). The infrastructure and networking of transportation routes in cities often dictates how biking communities develop. Having good paths and routes sometimes isn't good enough when it comes to defining what makes a city a good place for biking. There are other factors that matter when it comes to defining a good place to bike, like the inclusion of bike-sharing programs and proper integration of bike paths and routes in regards to safety, not availability of paths and roads.

2.2 Safety

Much of the road infrastructure in North America has been built with the Automobile in mind, and bicyclers usually have to share those roads. This creates a safety hazard for bikes as they have no protection against automobiles. Even as cyclists' crash rates are being lowered, cyclists are still 70

times more likely to get into a collision than automobiles (Reynolds, 2009). This creates the need for an analysis of the infrastructure that leads to collisions and injuries of bikers.

A lot of studies have focused on path use, and which paths are safest. One study found that bike most accidents occurred on sidewalks, then bike paths, then roads (Aultman-Hall & Kaltenecker, 1999). Further analyzing bike path types another study found that mixed use bike paths tended to have a higher crash rate than singular use bike paths (Moritz, 1998). Bike lanes on roads were safest in areas with less traffic around cyclists. As mentioned earlier bicyclists prefer paths where they have greater isolation from other road users, and studies have shown that mixed-use roads and sidewalks do not provide adequate enough safety to most peoples.

Specific infrastructures also affect the safety of cyclists. Bikes have weaker lights, and wheels that are more susceptible to cracks in the pavement. Simple measures such as having well-lit roads, and paved areas significantly reduced collisions in cyclist. Marking bike lanes also led to fewer collisions on roads. Roundabouts tended to cause greater injuries than intersections, and even after adding bike lanes to roundabouts they still yielded higher injuries. Although adding bike signals and lanes to more infrastructures can lower collision rates, having a larger population of bikers also reduces likelihood of incidence. The safety in numbers principle states that having bikes more visible will lower the chance of “looked-but-didn’t-see” accidents by normalizing bikers on the road and making drivers more aware of their presence (Reynolds, 2009). The lack of safety in bike infrastructure is a major barrier for increased bicycling, and this barrier is even greater for female bikers.

2.3 Gender Divide

Many studies show that there is a gender divide in the U.S. biking community. In 2009, the US Department of Transportation found that women made only 24 percent of bike trips in the US (2010). It is widely acknowledged that countries with low rates of cycling have significantly lower rates of women who cycle. However, Bonham and Wilson discovered that even countries with high levels of bicycling see a gender divide in bicycling. One factor they explored could be due to the lack of segregated cycling infrastructure combined with women's greater aversion to risk. The key limitations to cycling for women they found were lack of safety, threats of violence, danger, and risk. As a result, women typically avoided heavily trafficked roads. The *Women Return to Cycling* project, found that women in the study created their routes through a combination of quality and directness. Many used main roads and most who used secondary roads or residential streets felt confident they could manage traffic on main roads if necessary. Another factor they explored is that women would commute to work if their career and domestic responsibilities, such as having children in the household, didn't limit their cycling opportunities (Bonham, Wilson 2011).

There are many benefits for women to perform physical activities outside, such as bicycling. However, one major challenge for women is the "geography of fear." Gaarder and Wesley found that women adapt various strategies to help them cope with their perceptions of fear. Their study found women take precautions such as avoiding isolated trails, not going at night, and taking a cell phone when performing an outdoor activity (Gaarder, Wesley 2004). Women are often used as a proxy for the quality of infrastructure, and using this knowledge we hope to we hope to find if there is a gender divide in Madison and identify if there is a connection to Madison's bike infrastructure.

2.4 Benefits of Bicycling

When delving into the literature surrounding the benefits of bicycling, three main categories of benefits presented themselves: environmental benefits, health benefits, and social benefits. The benefits of bicycling are well known, however the percentage of individuals who bicycle remain relatively low in the United States. The most notable benefits of bicycling are the environmental benefits. Greenhouse gas emissions are a key factor concerning global warming, a growing concern around the world (EPA 2015). Carbon dioxide (CO₂) is the primary greenhouse gas emitted through human activities and driving a car is one of leading outputs of CO₂. In order to protect our environment, a reduction in CO₂ emissions is important. There are many ways to reduce CO₂ emissions, riding a bike instead of driving a car is a great start to reduce one's carbon footprint. A key article examines how bicycling is a sustainable method of transportation. Bicycling is almost ubiquitously presented as something that is cheap, easy, convenient, improves fitness, and helps to reduce carbon emissions and road congestion, (Cupples, Ridley 2008). National and local governments, environmentalists, and cycling groups promote bicycling as such. If 20 percent of commuters biked to work in Madison, we could avoid 16,687 tons of CO₂ emissions (Grabow et. al 2010). This reduction could play a role in lowering greenhouse gas emissions, resulting in public health benefits for Wisconsin residents. Our research hopes to uncover how many people in Madison are biking and understand what limits commuters from bicycling to work. We will investigate what it would take to get 20 percent of commuters to bike to work rather than drive, whether it be improved infrastructure, safety, or bicycling education in the Madison community.

The health benefits of bicycling should not go unnoticed. There are many health benefits associated with actively commuting. American adults and children have decreased walking and biking activities by a third since the late 1970s, a factor that has been linked to the rise of obesity (Green, Klein 2011). Regular, daily physical activity can help reduce obesity. Active transportation has been mentioned as one way to address the American obesity epidemic. Green and Klein presented a case study on the Columbus Healthy Places program in Columbus Ohio to understand how the Columbus Public Health Department formally promoted active transportation in numerous aspects of community design (Green, Klein 2011). The Columbus Healthy Places program (CHP) aims to teach the community to voluntarily use community design that incorporates active transportation infrastructure and to change the built environment. CHP will change the community design to make walking and bicycling safer, increasing opportunities for physical activity. Green and Klein found that out of the 70 rezoning applications, 64% adopted CHP recommendations for active transportation features by incorporating bike racks, connections to the existing sidewalk and properties, and wider sidewalks. Programs emphasizing community design are an underused option to promote actively commuting. As for Madison, no similar program currently exists. We will look into current policies to see whether community design strives to incorporate active transportation infrastructure and in which ways the built environment of Madison can continue to improve active transportation infrastructure. An important article by Jennifer Dill demonstrates that bicycling for transportation can be used by adults to meet the recommendations for daily physical activity. A supportive environment appears necessary to encourage bicycling for everyday travel, allowing more adults to achieve active living goals (Dill 2008). Out of 166 participants, a large majority (59%) were able to meet the recommended 150

minutes of activity per week through bicycling and nearly all of this bicycling was for utilitarian purposes (Dill 2008). Regular bicyclists are able to achieve healthy levels of physical activity through daily travel. Our research will uncover data regarding reasons for bicycling to identify if people are aware of the health benefits associated with bicycling and whether or not that is their sole purpose for bicycling.

Along with the environmental and health benefits of bicycling, there are social benefits as well. While only 10% of the world's population can afford a car, an estimated 80% of people can afford a bike (Queensland Government 2014). Conveniently, bicycling provides an easy way to travel independently, offering increased mobility for those who may not be able to afford or drive a car. This simple and easy method of transportation provides a way to communicate, either by biking in groups or biking to visit a friend or relative. Bicycling allows you to build a sense of community, exploring places you can't get to by car, as well as meet other community members. Bicyclists have formed many groups based on their passion and interest for bicycling. These groups may be for socializing, exercising, or promoting bicycle advocacy. We will gather data on people's reasons for bicycling to examine if people are aware of the social benefits bicycling has to offer and if their reasons for bicycling are primarily for social reasons, health reasons, and/or environmental reasons.

3. Methods

Our research project's site is Madison, Wisconsin. We focused on downtown Madison and the University of Wisconsin Madison campus. We incorporated our results into a documentary film. This is a better method to capture people's attention about our analysis.

3.1 Survey

We created a survey on demographics, reasons for biking, and infrastructure preferences to hand out to bicyclists on popular Madison's bike paths and streets. We gave surveys out to bicyclists on the Monona Bay Bike Path, Badger State Trail, and State Street. We wanted to get a wide variety of bicyclists, so we gave out our surveys in areas with high bicyclist traffic. This was a 2-page survey that required only a few minutes to fill out

We also gave an online survey via Qualtrics that was emailed to Wisconsin Bike Fed's members on their email list. The members live all over Wisconsin, so as a result we put an extra question, "Where do you live?" to discard the surveys that were not from Madison, WI. The online survey via Qualtrics was also sent to the Office of Sustainability's newsletter. The majority of recipients of Office of Sustainability's newsletter are UW Madison students.

3.2 Interviews

Based on our research question we wanted to know how infrastructure and policy are affecting who is biking where in Madison and their motives. Based on this we interviewed Dave Cieslewicz the Executive Director of the Wisconsin Bike Federation. The Bike Federation is a non-profit organization that promotes and advocates for bike friendly policies in the state of Wisconsin. As a group we constructed a question set that aimed to learn where bike infrastructure and policy has been lacking in the greater Madison area. We also hoped to learn about how programs that work to encourage biking influence the Madison bike community. We also questioned how non-profits, such as the Bike Federation help to determine where bike paths are created and the process that goes into these government and NGO interactions.

We also interviewed two cyclists to understand the perceptions of an average bicycle user. We conducted interviews with a male and a female to gauge different perceptions on safety and how gender affects their thoughts on the quality of Madison's bike infrastructure. From these interviews we were able to see more in-depth how a regular bike user interacts with the infrastructure around them. We also hoped to discover specific interactions that a person may have on the bike path that prevent or encourage bike accessibility.

For our formal interviews, we scheduled roughly an hour for which we have to finish the whole process. These interviews were conducted between October and November in 2015. We gave ourselves about 10-15 minutes before the beginning of the interview to talk to the interviewee about ourselves and the goal of this project. This served to ease the anxieties of someone being filmed as well as demonstrated the role that we as researchers and film editors are played in this interaction. We began each interview by asking the interviewees about themselves and what they do. These questions worked to ease the interviewee into more difficult questions. This allowed them to warm up to the camera and ourselves which created better film interview quality.

3.3 Analysis

We analyzed our data using Qualtrics, Microsoft Excel, and JMP. We found distributions for race, income, gender and age. We also averaged out the average rankings provided by respondents for questions about preference to path type, importance of different factors in choosing a certain path, reasons for bicycling, and ranking of bicycle network and safety as a whole. We organized the qualitative responses of different safety concerns into different categories to discover different themes

that were present in the data. Answers that didn't fit into a category or that were unable to be interpreted were not used.

3.4 Filming

We conducted an interviews with three Madison citizens at three different locations which required different film techniques to fully capture the situation and story we hoped to present. We used a simple one camera qualitative interview. We also used Go-Pro cameras to give the film viewers the feel of riding a bike down the roads and paths. This created a unique perspective that allowed viewers to get the sense that they were biking down the roads and paths themselves as they were discussed.

Bibliography:

American Association of State Highway and Transportation Officials: Guide for the Development of Bicycle Facilities, 4th edn. American Association of State Highway and Transportation Officials, Washington, DC.
https://bookstore.transportation.org/collection_detail.aspx?ID=116 (2012). Accessed 15 Feb 2014

Aultman-Hall, L., and M.G.Kaltenecker. 1999. Toronto Bicycle Commuter Safety Rates. *Accident Analysis & Prevention* 31, no. 6:675–86. (Last accessed 26 October 2015).

"Best U.S. Cycling Town Winners: 2014 10Best Readers' Choice Travel Awards." 2014. 10Best. *USA Today*.
<http://www.10best.com/awards/travel/best-u-s-cycling-town/> (Last accessed 26 October 2015).

Bonham, J. and A. Wilson. 2012. Women Cycling Through the Life Course: An Australian Case Study. In *Transport and Sustainability: Cycling and Sustainability*, ed. J. Parkin, 59-81. Emerald Insight. (Last accessed 26 October 26, 2015).

City of Madison. Bike Map. 2015. Madison: City of Madison. www.cityofmadison.com (Last accessed 26 October 2015).

Cupples, J. and E. Ridley. 2008. Towards a Heterogeneous Environmental Responsibility: Sustainability and Cycling Fundamentalism. *Area* 40(2) June:254-264. <http://www.jstor.org/stable/40346120> (Last accessed 25 October 2015).

"Cycling Benefits." 2014. Department of Transportation and Main Roads. *Queensland Government*.
<http://www.tmr.qld.gov.au/Travel-and-transport/Cycling/Benefits.aspx> (Last accessed 26 October 2015).

de Hartog, J. J., Boogaard, H., Nijland, H., & Hoek, G.. (2010). Do the Health Benefits of Cycling Outweigh the Risks?. *Environmental Health Perspectives*, 118(8), 1109–1116. Retrieved from <http://www.jstor.org/stable/27822995>

Dill, J. 2009. Bicycling for Transportation and Health: The Role of Infrastructure. *Journal of Public Health Policy* 30 (S1) (Last accessed 26 October 2015).

Grabow, M., M. Hahn, M. Whited. 2010. Valuing Bicycling's Economic and Health Impacts in Wisconsin. *Rails to Trails Conservancy*. <https://www.railstotrails.org/resourcehandler.ashx?id=4579> (Last accessed 26 October 2015).

Green, C. G., and E. G. Klein. 2011. Promoting Active Transportation as a Partnership Between Urban Planning and Public Health: The Columbus Healthy Places Program. *Public Health Reports* 126 May/June:41-49.
<http://www.jstor.org/stable/41639264> (Last accessed 25 October 2015).

Gotschi, T., & Mills, K. (2008). *Active transportation for America: The case for increased federal investment in bicycling and walking*. Washington, DC: Rails-to-Trails Conservancy.

Handy, S.L., Xing, Y.: Factors correlated with bicycle commuting: a study in six small US cities. *Int. J. Sustain. Transp.* 5(2), 91–110 (2011). doi:10.1080/15568310903514789

Lusk, A. C., P.G. Furth, P. Morency, L.F. Miranda-Moreno, W. C. Willett, and J.T. Dennerlein. 2011. Risk of Injury for Bicycling on Cycle Tracks Versus in the Street. *Injury Prevention*.
<http://injuryprevention.bmj.com/content/early/2011/02/02/ip.2010.028696.full.pdf> (Last accessed 26 October 2015).

Mekuria, M.C., Furth, P.G., Nixon, H.: Low-Stress Bicycling and Network Connectivity. Technical Report. Mineta Transportation Institute, San Jose (2012)

Moritz, W. 1998. Adult Bicyclists in the United States: Characteristics and Riding Experience in 1996. *Transportation Research Record: Journal of the Transportation Research Board* 1636 (January 1): 1–7. (Last accessed 26 October 2015).

Nelson, A., Allen, D.: If you build them, commuters will use them: association between bicycle facilities and bicycle commuting. *Transp. Res. Rec.* 1528, 79–83 (1997). doi:10.3141/1578-10

"Overview of Greenhouse Gases." 2015. Carbon Dioxide Emissions. *Environmental Protection Agency*. <http://www3.epa.gov/climatechange/ghgemissions/gases/co2.html> (Last accessed 26 October 2015).

Parker, K. M., Rice, J., Gustat, J., Ruley, J., Spriggs, A., & Johnson, C. (2013). Effect of bike lane infrastructure improvements on ridership in one New Orleans neighborhood. *Annals of behavioral medicine*, 45(1), 101-107.

Pucher, J., J. Dill, and S. Handy. 2010. Infrastructure, Programs, and Policies to Increase Bicycling: An International Review. *Preventive Medicine* 50. (Last accessed 26 October 2015).

Rietveld, P., Daniel, V.: Determinants of bicycle use: do municipal policies matter? *Transp. Res. A* 38(7), 531–550 (2004). doi:10.1016/j.tra.2004.05.003

Reynolds, C. C., et al. 2009. The impact of transportation infrastructure on bicycling injuries and crashes: a review of the literature. *Environmental Health* 8.1: 47. (Last accessed 26 October 2015).

Stewart, S. K., D.C. Johnson, W.P. Smith. 2011. Bringing Bike Share to a Low-Income Community: Lessons Learned Through Community Engagement, Minneapolis, Minnesota. *Centers for Disease Control and Prevention*. (Last accessed 26 October 2015).

US Department of Transportation Federal Highway Administration. 2010. *National Household Travel Survey*. <http://nhts.ornl.gov> (Last accessed 26 October 2015).

Pucher, John, and Ralph Buehler. "Sustainable Transport in Canadian Cities: Cycling Trends and Policies." *EScholarship. Berkeley Planning Journal*, 2006. Web. 07 October 2015.

"Welcome to Madison B-cycle." 2015. Home. (Last accessed 26 October 2015).

Zhao, P.: The impact of the built environment on bicycle commuting: evidence from Beijing. *Urban Stud.* (2013). doi:10.1177/0042098013494423

Link to film documentary:

<https://www.youtube.com/watch?v=BNNNoMQsyNIg>

Appendix

Survey

Madison Bicycling Survey Questions

1. What is your year of birth? _____
2. What is your sex? (circle one) M F
3. What is your race?
 - White
 - African American
 - Hispanic
 - American Indian
 - Asian
 - Pacific Islander
 - Two or more: _____
 - Other: _____
4. What is your most recent occupation? (include "student" if applicable)

5. What is your total household income?
 - Less than \$30,000
 - \$30,000-\$59,999
 - \$60,000-\$99,999
 - \$100,000 or more
6. Where general area are you currently biking to: _____ and from:
_____?
7. How often do you use a bike in the warmer months? (April-September) (Circle One)
Never Rarely Sometimes Often Most of the Time
Always
8. How often do you use a bike in the colder months? (October-March)
Never Rarely Sometimes Often Most of the Time
Always
9. Rank your reasons for bicycling (1= Most Common, 5= Least Common)
 - _____ Commute to work or school
 - _____ Run errands/Personal business
 - _____ Leisure/Recreation
 - _____ Social/Visit friends or relatives

____ Exercise

Other reasons for bicycling: _____

10. Did you bike before living in Madison? Yes or No (Circle One)

11. How long have you been bicycling in Madison? _____

12. What type of route do you prefer the most?

Off-street Bike path

Bike lane

Road

Sidewalks

13. Rate the following factors of importance to picking a bike route:

(1 = Most Important and 5 = Least Important)

____ Minimize distance

____ Avoiding roads with heavy traffic

____ Riding in a bike lane

____ Riding on a signed bike route

____ Riding on an off-street bike path

14. Rate the following characteristics of Madison's bicycling infrastructure:

1 = Excellent and 5 = Needs significant improvement

• Traffic Safety 1 2 3 4 5

• Bike Lane & Path Network 1 2 3 4 5

• Parking availability 1 2 3 4 5

• Links to public transportation 1 2 3 4 5

15. What is the average length of your typical bicycle trip? (Please Circle One Interval)

<1 Mile 1-2 Miles 2-3 Miles 3-4 Miles >4 Miles

16. How familiar are you with bicycle traffic laws?

Unsure 1 2 3 4 5 Expert

17. How often do you wear a helmet?

Do not have a helmet

Have a helmet but never

Rarely

Sometimes

Frequently

Always

18. Why do you or don't you wear a helmet?

19. Over the last 6 months have you feared your personal safety while bicycling in Madison?

Yes or No (Circle one)

If yes, explain why:

Privacy Statement

We are UW-Madison Geography Students who are researching bicycling for our senior project. The information gathered from this survey is for academic purposes only. We will not collect or otherwise obtain any personal information about you, unless you choose to provide such information to us. Upon completion, the surveys will be shredded and recycled. The results of this survey will be incorporated into a documentary that will be shown on December 15th, 2015. You are welcome to attend this public presentation of our research on December 15th 2015, in AB20 Weeks Hall on the UW campus.

Thank You!

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Interview Questions

Questions for Bike Fed Director Dave Cieslewicz

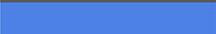
1. How did your experience biking bring you into bicycle advocacy?
2. How have you personally gotten involved in the bike culture of Madison?
3. What are the individual benefits of biking? What are the community benefits?
4. How does Bike Fed promote biking in WI and Madison?
5. What has Bike Fed done to increase bike safety? What other steps are needed to increase safety?
6. What are the main constraints to increasing bike safety? What are the main constraints to biking in general?
7. What steps are needed to increase biking in Madison?
8. What kind of patterns do you see in the populations of bikers? At what scale? In Madison specifically?
9. Many studies show that there is a gender divide in the US biking community. In 2009, the US Department of Transportation found that women made only 24 percent of bike trips in the US. Do you think there a gender divide in biking? Is the divide as pronounced in Madison as it is in other cities? Why do you think there is a gender divide? How do you think we can address this issue and change it? What are ways Bike Fed has worked to change this issue?
10. How much of a police presence would you say there is in enforcing bike regulations in Madison? Are the current levels of bicycle enforcement adequate?
11. Can you comment on the interactions between motorists, bicyclists, pedestrians, and other street users? Do you feel there is mutual respect between motorists, bicyclists, pedestrians, and other street users? If not, how could this be improved? What are the consequences of these relationships?

12. How do you think the infrastructure (eg. green boxes, dedicated bicycle lanes, etc) has affected the bicyclist population in Madison?
13. How well do the bike paths and roads provide a network for travel across Madison? What do you think are the most important routes? Most popular routes? What could be improved?
14. Are planned changes to Madison's bicycle infrastructure incremental (focused on a few components or particular places) or systemic (focused on the entire infrastructural system)? If most changes are incremental, what is the process of selecting or prioritizing some components or places over others?
15. State and federal governments seem neutral - at best - towards bicycling, only allocating a small proportion of transportation dollars to bicycle infrastructure. They also rely heavily on private or non-profit sponsored bicycle safety programs to reduce bicycle risk rather than publicly sponsoring a state-wide or national program. Why do you think this is, given the importance of bicycling in places like Madison, Davis, Boulder, and Portland?
16. What are the biggest challenges and successes Bike Fed has done for bike advocacy in Madison?

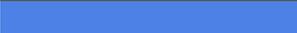
Questions for a female or male UW Student bicyclist

1. How have you personally gotten involved in the bike culture of Madison?
2. How often do you bike? Why do you bike? How did you get started biking?
3. What benefits do you receive from biking?
4. What seasons of the year do you bike?
5. Do you feel safe most of the time biking? Why or why not?
6. Where do you feel safest/ least safe?
7. Do you wear a helmet? Why or why not?
8. What is your biggest concern when biking? What is your biggest challenge?
9. What routes do you prefer? Why?
10. How well do the bike paths and roads provide a network for travel across Madison? What do you think are the most important routes? Most popular routes? What could be improved?
11. Do you feel there is mutual respect between motorists, bicyclists, pedestrians, and other street users? If not, how could this be improved? What are the consequences of these relationships?
12. Do you see patterns in the populations of bikers in Madison?

Sex Ratio: Madison

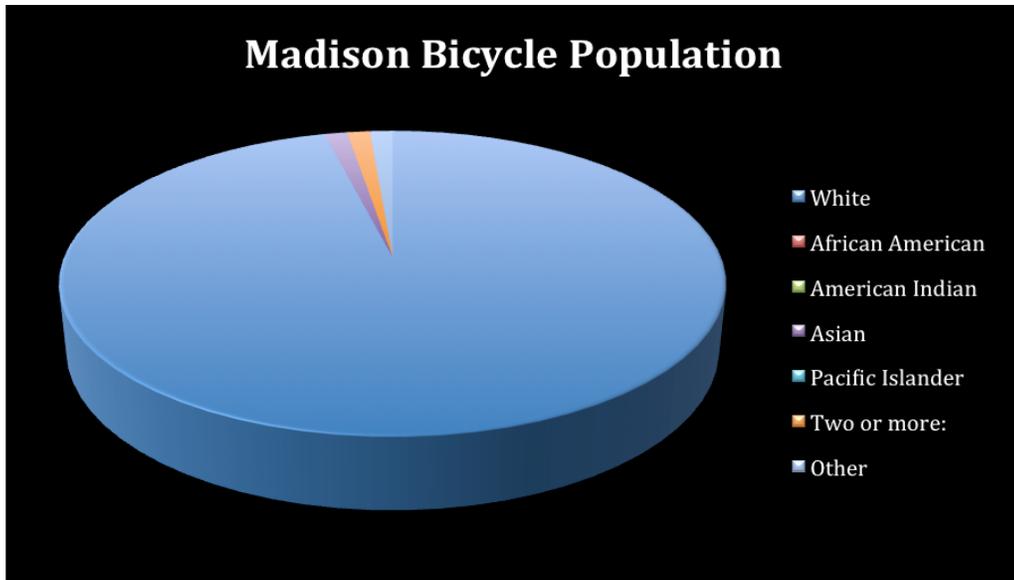
#	Answer		Response	%
1	Male		38	46%
2	Female		45	54%
	Total		83	100%

Sex Ratio: Wisconsin

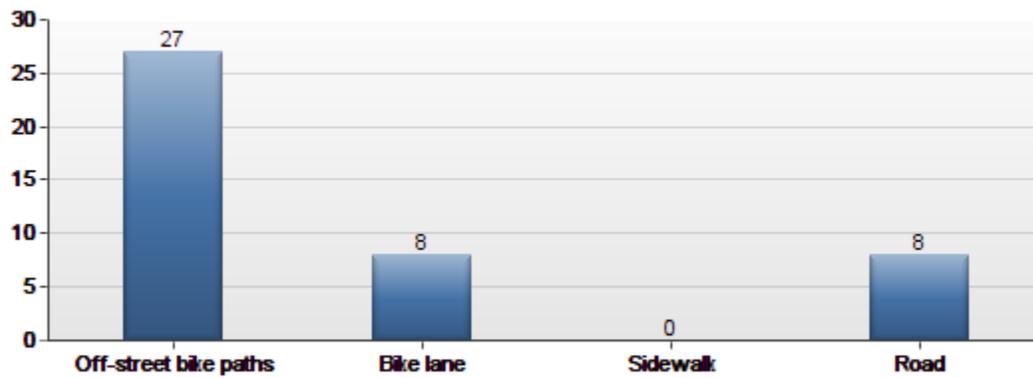
#	Answer		Response	%
1	Male		156	63%
2	Female		91	37%
	Total		247	100%

Total Household Income

#	Answer		Response	%
1	Less than \$30,000		22	10%
2	\$30,000-\$59,999		49	21%
3	\$60,000-\$99,999		63	27%
4	\$100,000 or more		97	42%
	Total		231	100%

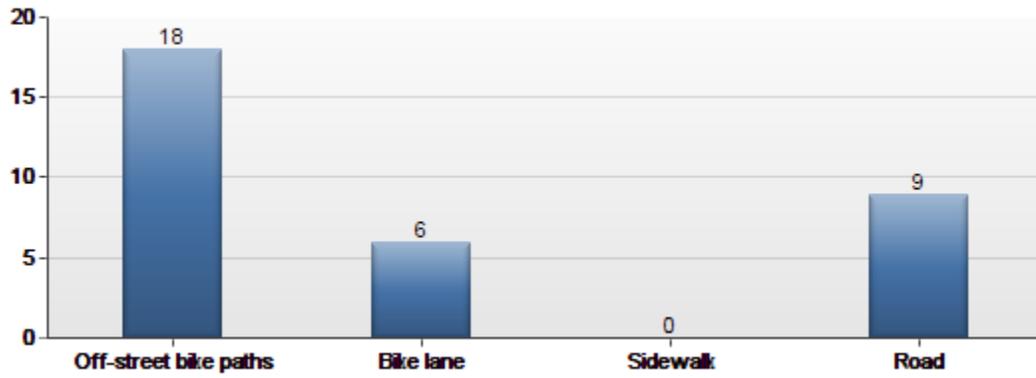


Preferred Bike path: Female



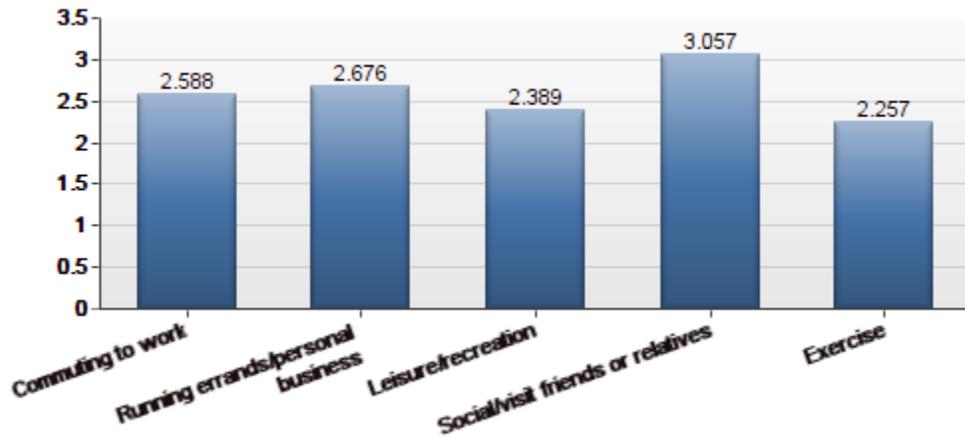
#	Answer	Response	%
1	Off-street bike paths	27	63%
2	Bike lane	8	19%
3	Sidewalk	0	0%
4	Road	8	19%
	Total	43	100%

Preferred Bike Path: Male

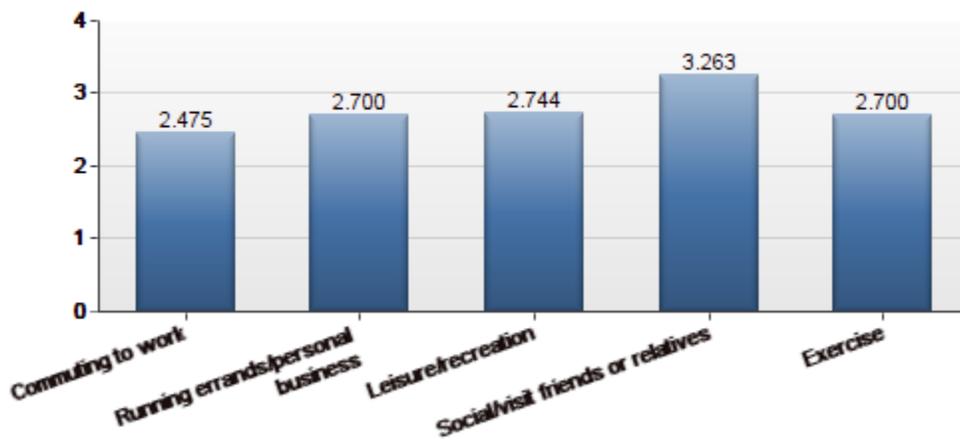


#	Answer	Response	%
1	Off-street bike paths	18	55%
2	Bike lane	6	18%
3	Sidewalk	0	0%
4	Road	9	27%
	Total	33	100%

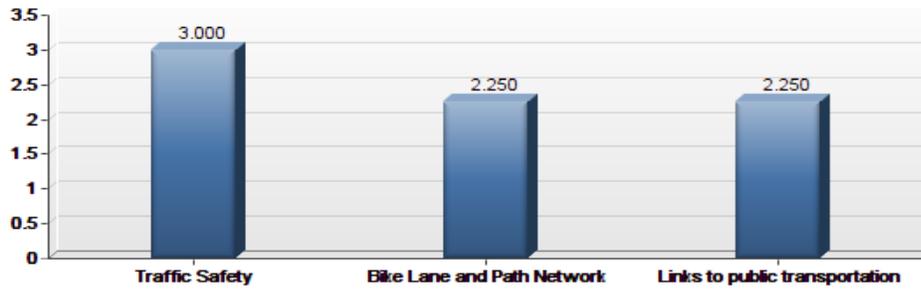
Reasons for biking female



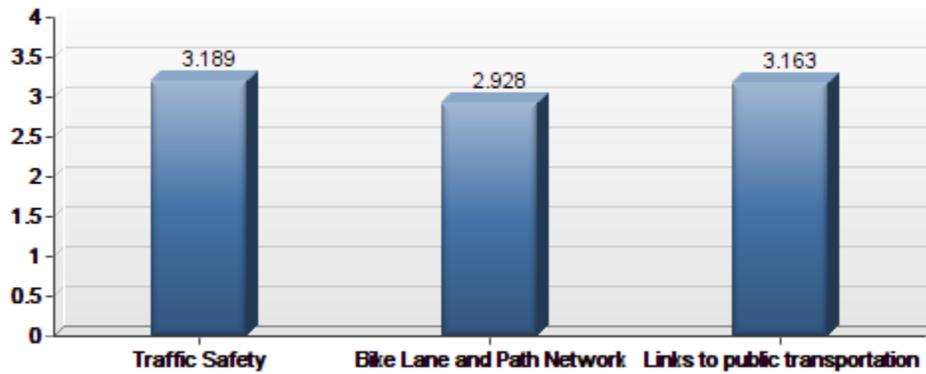
Reasons for biking male



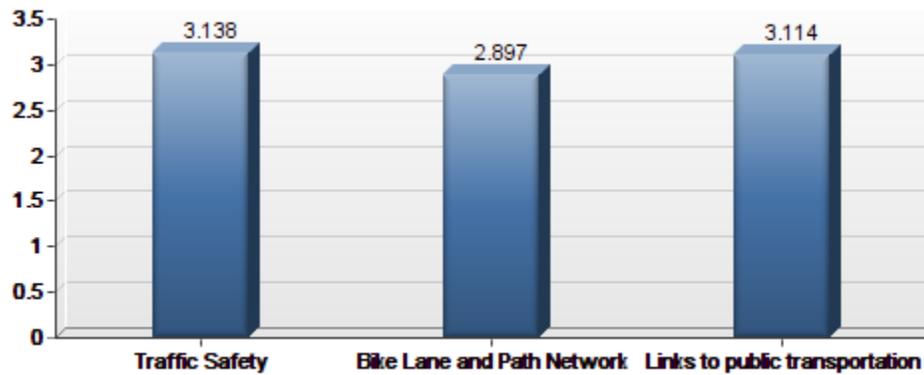
Rank of City Infrastructure: Madison



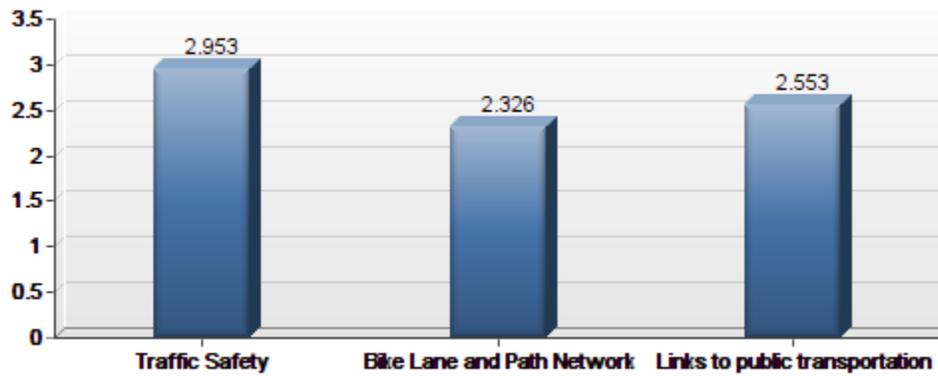
Rank of City Infrastructure: Wisconsin



Rank of city infrastructure: Wisconsin female



Rank of city infrastructure: Madison Female

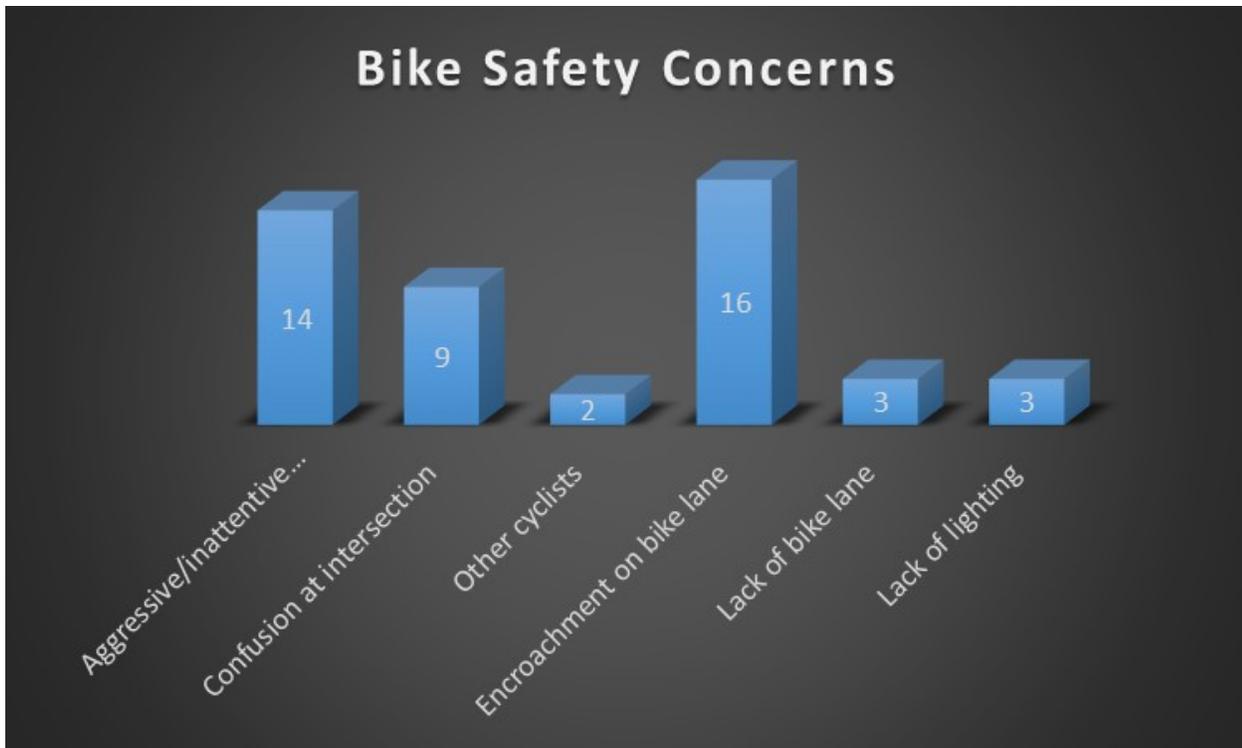


Biked before living in Madison: Female

#	Answer	Response	%
1	Yes	37	86%
2	No	6	14%
	Total	43	100%

Biked before living in Madison: Male

#	Answer	Response	%
1	Yes	30	91%
2	No	3	9%
	Total	33	100%



Distance of trip males

#	Answer	Response	%
1		1	3%
2	1-2 miles	3	9%
3	2-3 miles	4	12%
4	3-4 miles	3	9%
5	>4 miles	22	67%
	Total	33	100%

Distance of trip females

#	Answer	Response	%
1		1	2%
2	1-2 miles	12	28%
3	2-3 miles	8	19%
4	3-4 miles	2	5%
5	>4 miles	20	47%
	Total	43	100%