A Social and Political Geography of Bicycle Transport in Madison, WI

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Abstract: The state capital and university town of Madison, Wisconsin is home to a thriving bicycle culture. The existing landscape of bicycle infrastructure in Madison is the result of a network of feedback loops involving people, historical events, city policies, and processes. This paper is the culmination of a look into the impetus of Madison's bicycle culture and infrastructure. Surveys, interviews, mapping, photo analysis, and other research methods illuminated specific incidents and general paradigm shifts that are leading Madison in its mission to become a top-rate bicycling city. Engineering infrastructure for bicycle use creates a framework that allows social pro-bicycling groups to enact policies that aim to increase bicycle ridership.

Introduction

Madison, Wisconsin currently has a reputation as a bicycle-friendly city with a prolific cycling culture, an image that many have worked very hard to build and maintain. In our project, we seek to find how people, events, policies and infrastructure have influenced Madison's bicycle landscape over the lifetime of the city. We will focus on isolating which elements have been the most influential in the movement, development, and construction behind Madison's bicycle culture.

Our data sources include interviews with sources close to Madison's bicycle culture and its history, a collection of data from historical maps, archival sources, data comparisons with other major bicycling cities and a survey created by our group. The interviews include Madison's former mayor, Dave Cieslewicz, several prominent pro-bicycle advocates, Robbie Webber and Michael Barrett and a former Wisconsin Department of Transportation engineer Michael Rewey. These primary sources are rich with details about Madison's history with bikes and how the city was able to create a considerable bicycle culture. Our archival sources help to bolster the assertions made by our interviewees, while data comparisons with other cities helps to clarify Madison's place amongst the country's best bicycling cities. In order to collect information about local ridership, we interviewed bicycle path users at random. We also photographed the city's infrastructure to further the readers' understanding of Madison's bicycle culture.

Madison's history with bicycles is complex with no singular reason responsible for its current culture. Rather, the city has been able to create this culture through the culmination of several factors. A number of people, events, policies and processes have coalesced to create Madison's current bicycle landscape. In doing so, the City of Madison has created a feedback

loop, where infrastructure developments, cycling culture, and ridership have built off one another to instill Madison with a highly developed bicycle landscape.

Literature Review

Richard Schein describes cultural landscape as a material record of our activity. All cultural landscapes can be traced back to their creation, and by looking at the history of a particular landscape we can attempt to understand the significance of its meaning in relation to the places and people it affects. Because cultural landscapes are affected by both variations in time and space we can gather information on them through various methods. The cultural landscape which the bicycle has created is profound and well-documented. It changed the physical landscape as well as the lives of people who use them all around the world. However, Schein states that all cultural landscapes are local and exist somewhere particular. Our mission is to identify the origins and progression of cultural landscape the bicycle has created in Madison (Schein 2010, 222-226).

Biking in Madison is a priority for some people, but what has caused this spirited culture to grow and develop? Our review will look into Madison's bicycle culture by first discussing the history of bicycling in general, followed by the developments that have affected the current state of urban biking. We then will focus on Madison's bicycle infrastructure in the way it relates to infrastructure in other cities. We conclude with an analysis of humanist aspects and the way those aspects attach people to bicycle culture.

History

'The Bicycle Boom,' a chapter in David Herlihy's *Bicycle: The History*, focuses on how the safety era spurred a boom in bicycle production, sales, and ridership in the 1890s. It supported evidence for these claims with manuscripts of interviews with bicycle producers, political comics, and historical photographs and advertisements. Invented in 1885, the 'rover cycle' gained popularity due to its improved safety over the then-common 'high mount' bicycle. The gains in safety were due to the rovers design being lower to the ground and having two wheels of the same size. The rover cycle touted innovations such as chain-driven propulsion and pneumatic tires (Herlihy 2004, 252). This also gave the bicycle an impressive mechanical advantage over the high mount as it was able to outrace a trotting horse (Herlihy 2004, 254). The rover cycle design increased the practical appeal of bicycles, which led to an increase in demand. The resulting wave of relatively affordable bicycles opened up previously neglected demographic groups to the bicycle craze, including women, minorities, and the working class. This lead to societal concerns that bicycles would lead cyclists to skip church or cause female cyclists to abandon their household responsibilities. In all actuality, some conservative fears were not unreasonably held. Bicycles did indeed act as a social liberator, increasing mobility for women and underprivileged citizens (Herlihy 2004, 266-272).

Herlihy was able to support the concept that the major driver in the bicycle boom was the development of safer bicycles, which increased ridership and furthered the rights of new riders. However, he did not mention other factors that may have been in play at the time which could have led to increased rights. Madison is generally a liberal city, and based on findings from the Herlihy text, the cycling culture may be viewed not only as a result of this but also as a catalyst for American liberalism.

In his 1974 publication *DeLong's Guide to the Bicycle*, Fred DeLong offers a valuable resource for bicycle societies and organizations. A few of these organizations, such as the League of American Wheelmen, had been established earlier while others were popping up during this age of the comeback of the bicycle (DeLong 1974, 267). The author compiled this with supplementary information from periodical sources. Some of the organizations still exist today, such as The League of American Wheelmen (currently under the name The League of American Bicyclists). The knowledge and overview of these associations allows us to find some of the main groups that have influenced the growth of Madison's bicycle infrastructure and continues to offer insight on the groups that influence its future (DeLong 1974, 267-269).

Urban Planning Issues and Path Design

As the costs of motorized transportation rise and as public awareness of the externalities associated with high-emission vehicles grows, there is an international push for sustainable transportation policy. In the context of environmental movements of the past decades, certain countries, many in Western Europe, developed comprehensive national plans that had the power to radically alter the status quo of area transportation. One example, the National Environmental Policy Plan of the Netherlands in 1990-1994, marked out a hierarchy of initiatives the government should use to direct the country to a sustainable future. The plan's second most important initiative is to reduce car use, which places federal authority in the position of increasing bicycle use (Kroon 1997, 161-172).

The Dutch have developed a culture of bicycle use that could serve as a model for most countries looking to develop their bicycle infrastructure. Plans and pieces of legislation (such as the Dutch Bicycle Master Plan 1990-1996 or the design manual 'Sign up for the bike') provide a framework for planning for bicycle paths (Godefrooij 1997, 229; Welleman 1997, 177-178). By

no means, however, is the Netherlands alone in promoting bicycle use with carefully planned bicycle infrastructure. Many metropolitan areas in the United States are at work developing their own systems of bicycle infrastructure in an effort to ease automotive traffic, emissions, and fuel reliance (Untermann 1984, 61-62).

Several dichotomies distinguish possible pathways for bicycle transportation. Perhaps the most fundamental dichotomy is that of segregated and integrated paths. Segregated paths, those that do not exist as part of a shared lane on a road for motor vehicles, allow different benefits than integrated paths, which are part of a similarly defined road. For example, while segregated paths allow an element of safety and isolation from motor vehicle traffic, they may sacrifice efficiency and add distance between points of origin and destination (Chen et al. 2012, 1120; Jones 2012, 138). Segregated bicycle paths can be divided between their methods of segregation—either visually (i.e. painted bike lanes) or physically (i.e. a path that is either situated to the side of a road or one that does not follow a road) (Untermann 1984, 62-63; Godefrooij 1997, 229-230; Chen et al. 2012, 1120).

The Dutch design manual for bicycle path design includes three design principles that help to prescribe segregation or integration. In circumstances of consistently fast-moving motor vehicle traffic, bicycle paths should be segregated. When such segregation is impossible, motor vehicles must slow down to accommodate sharing infrastructure with bicycle traffic. Finally, speed reduction of both cars and bicycles must occur at intersections in order to accommodate comfortable integration (Godefrooij 1997, 232).

In addition to the three design principles of segregation and integration, the Dutch design manual provides a conceptual graph displaying ranges of ideal bicycle transportation

infrastructure over average motor vehicle speed and the density of motor vehicle traffic (Figure 1).

Michael Conzen, author of *The Making of the American Landscape*, posits that conditions that led to widespread American 'auto dependency' started with the invention of the automobile itself and the American dream of mobility and freedom. As societal desire to drive cars increased, their influence on the country and its policymakers led to a radical change in patterns of settlement across the country. That pattern was woven to accommodate the speed, flexibility, and design of the motorized transportation. As patterns of settlement changed, so changed the patterns of accessibility. Planners drafted new landscapes and city structures around the car and retrofitted old landscapes for roads and highways (Conzen 2010).

As the car became a mainstay in American households, city residents found it easier to relocate away from the ordeal that was innercity life. New, low density urban areas spread over vast areas reflected changes in American mindset towards privacy, which the automobile first afforded them. New urban spaces were designed without concern for pedestrian travel that was common in city cores and these new suburban settings offered little opportunities for citizens to travel by other modes of transportation. According to Dolores Hayden, author of the book *Building Suburbia,* as suburban populations began to overtake those in the urban cores of cities, businesses and other commercial activities moved with them, creating a whole new phenomena in urban development. These new suburban hotspots are known as edge nodes and are the new commercial centers of suburban America. In an edge node, the layout of the urbanized landscape and the architecture of the buildings is centered solely on the automobile and easily accessed only by car. This urban landscape phenomena is known as urban sprawl. Urban sprawl creates an

extreme disincentive to bicycle riders because long-distance bicycle infrastructure is costly to maintain and does not typically facilitate safe, efficient use of bicycles.

The History of Bicycle Infrastructure in Madison, WI

The focus of our project is on the creation of Madison's bicycle culture and the major factors driving its growth. This portion of our final project will likely revolve around the information gathered through our interviews with local bike enthusiasts and policy makers. Regardless of this, there are several crucial sources that are available to our group, which help explain the groundwork that has led to Madison's current culture.

A historical description of Wisconsin's bicycle history, provided by the Wisconsin Department of Transportation, claims that Madison's bicycle roots stretch back into the 1960's and 1970's, which developed out of the need to combat the energy crises of the time period. Starting in 1975, the department created a guideline to building bike paths in urban areas (Wisconsin Department of Transportation). Following these guidelines, the City of Madison published the *Long Range Bikeway Program - A Summary Report of Proposed Policies & Facility Plans*. This document laid out the future of Madison's bicycle paths and policies.

With the *Long Range Bikeway Program*, the city laid out its plan for Madison's paths with a full map (Madison Department of Transportation 1975, 26-27), description of path types (MDoT 1975, 10) and estimates of the cost (MDot 1975, 27). This source, which incorporates maps and relies heavily on spatial science, discusses Madison's bicycle plan as it may develop over a long period of time.

Shortly after the publication of the *Long Range Bikeway Program*, Madison's Department of Transportation published a second article about the future of bicycles in the city. In it, author Thomas Walsh argues that while downtown Madison has the highest concentrat of

bikes, more rides actually occur outside of this area (Walsh 1975, 13). His document includes a few maps and data pertaining to the region, usually data that was missed in the *Long Range Bikeway Program* guideline (Walsh 1975, 7-9). By analyzing through the spatial science paradigm for his research, Walsh is able to identify the areas which should receive the most development moving forward. While this source will not be as relevant as the long range plan, it is beneficial in that when combined with the long range plan, it helps create a more complete image of Madison's initial plans to develop the city's paths and culture.

City Comparisons and Case Studies

To gain a better understanding of the demographics of bicycle owners and users in the United States, the authors of *Factors Associated with Bicycle Ownership and Use: A Study of Six Small U.S. Cities* adopt the conceptual framework used in the field of public health. This framework uses three distinguished factors, which ultimately contribute to the choice to use bicycles by the U.S. populace. Those factors are individual, social-environmental and physical-environmental (Buehler, Handy, and Xing 2010, 969).

Individual factors include attitudes, preferences and beliefs, in addition to self-confidence in the ability to engage in a behavior, in this case the use of a bicycle. Social-environmental factors focus on the societal norms of the community as a whole and the collective behaviors of its residents. Lastly, from a cycling perspective, transportation infrastructure and land use patterns would constitute the physical-environmental factors. It is the authors' hypothesis that these three factors directly determine a person's decision to use a bike. Individual factors determine motivation to bike, while the social and physical environment factors affect quality of bicycling conditions and may either enable and encourage bicycle use, or alternatively, prevent and discourage it (Buehler, Handy, and Xing 2010, 969).

The correlation between the three factors can be seen as cyclical in nature. Physical-environmental factors, like a robust bicycling infrastructure or the lack thereof, affects the practicality of cycling for an individual and inevitably, their choice to ride. From there either the increase or decrease in use by individuals leads to response by the community to invest in or shutter plans for the cycling infrastructure, which can create a supportive or unfriendly social environment for cyclists with in a community (Buehler, Handy, and Xing 2010, 969).

To study the three factors determining bicycle ownership and use, the authors sample six case study cities in the U.S. that differ in respect to physical and social environments but have relatively high rates of bicycle use when compared to the nation as a whole. Using Davis, California as a starting point for the study, the authors compare it with three cities in its vicinity. The other two cities were similar to Davis in population, social demographics and topography. These two cities also share levels of cycling. (Buehler, Handy, and Xing 2010, 972).

Davis was the logical starting point for the authors of *Factors Associated with Bicycle Ownership and Use: A Study of Six Small U.S. Cities* because it has been long known as the nation's most bicycle friendly city as also discussed in the article *Fifty Years of Bicycle Policy in Davis, California.* Davis has a history, dating back to the 1960's of support for bicycle facilities backed by the city officials and University of California-Davis faculty and students. Since then, Davis residents continue to maintain the highest bicycle ratio per capita at 14.4 percent, the highest bike-to-work commute mode share, and highest proportion of bike lanes on city streets. In 2005 it became the first city in the nation to receive a platinum rating by the League of American Bicyclists. (Buehler, Handy 2008, 52). The demographics and urban layout of Davis also influence the city's robust cycling culture and infrastructure. It is a small city, unaffected by issues of urban sprawl which makes cycling appealing as a leisure activity and mode of

transportation. Davis also has the distinction of being a thriving university town with a young, active populous, the main proportion of bicycle users in the country.

Other cities in the United States have had relative success in terms of cycling use and supporting infrastructure. According to the author of *Bring Your Own Bicycle: America's Top 5 Bike-Friendly Cities*, Portland, Oregon, the nation's largest city to receive a platinum rating by the League of American Bicyclists, is a dense urban area with high levels of community support for cycling. The city has passed multiple initiatives to create over three hundred miles of on-street and dedicated bicycle paths to date. In 2010, Portland city officials passed a twenty year, 613 million dollar initiative to double bikeway mileage and attempt to make cycling account for twenty-five percent of all travel. Another city to make the list in the article is Boulder, Colorado. Boulder is the third city in the country to receive platinum status and has a transportation infrastructure heavily reliant on bicycles (O'Driscoll 2011, 40). Like Davis, Boulder, Colorado is a small university town with a populous and city officials that support the culture of cycling. Its relatively flat topography makes riding easy for all age groups. University towns like Eugene, Oregon and Tucson, Arizona are also fitting cities to compare with Madison. Perhaps due to similar representations of demographics, there is strong support for cycling by their respective universities' staff and students and by city officials.

A study using primary data collected from 608 randomly sampled citizens of King County, Washington intended to find out who is biking and the relationship between perceived and actual built environmental conditions associated with cycling (Moudon 2005, 248). This research from King County is also relevant to our research as we wish to evaluate the development of Madison's bicycle infrastructure and its initial phase one plan. We can look at their strategies in developing the plan and review it based on data and findings from this King

County study. It will also help us to make better sense of Madison's plan and the decisions made behind it. The King County study found that cycling is most common in people who are young adults, male, use public transportation, and are in good physical health (Moudon 2005, 257).

Are people in Madison healthy because they bike? Or do people in Madison bike because they are already living a healthy lifestyle. The study found that both perceived and built environmental conditions may raise the likelihood of cycling (Moudon 2005, 257). It combined this survey data with object parcel-level GIS measures of land use and infrastructure data. They also found that other previously researched factors such as, proximity to parks, are statistically insignificant in their analysis. Although, we do not plan on doing a GIS analysis we still can use these findings to make sense of the decisions made behind the placement of bike lanes. It will also help us to identify lanes that may have been put in more out of convenience for construction rather than actual practicality at that location. Overall, the study will be helpful in helping us identify decisions that were made in Madison that have transformed it into its current landscape form.

It is important to understand the relationship between the landscape and people's personal choices. In a study on cyclists' mode preferences, Nebiyou Tilahun found that people are willing to travel up to twenty minutes in order to switch from an unmarked on-road facility with side parking to an off-road bicycle trail. survey of individual preferences for various cycling environments (Tilahun 2007, 298). It looked at trade-offs between higher travel time with better accommodating facilities against lower travel time with better facilities. This was to understand the value attached to different bike infrastructure attributes. The facilities the study considered are off-road facilities, in-traffic facilities with a bike lane and no on-street parking, in-traffic facilities with a bike lane and on-street parking, in-traffic facilities with no bike-lane or on-street

parking, and in-traffic facilities with no bike lane but with a parking lane. These preferences are important to understand when evaluating the Madison phase one plan. It will also offer valuable insight into why some bikeways are more popular than others. Lastly, the data can be used to assist us in evaluating our own surveys.

Personal choices can affect how the landscape is used and how changing landscape and policy can influence personal choice. The article, *Short-run and Long-run Policies for Increasing Bicycle Transportation for Daily Commuter Trips* analyzed two policies to promote bicycling using data analysis from the Philadelphia metropolitan area. They found that short-run 'pro-bike' policies could be developed by gearing to make bicycling safer and more convenient. Then they also found that a policy aimed at reducing the convenience of automobile commuting, 'anti-auto' could be implemented in the long-run (Noland 1995, 73). A possible landscape quality that could affect personal choice is that of safety. The study found that fifty percent of the total sample surveyed reported that they considered bicycle commuting 'too dangerous' and over sixty percent said there was 'too much car traffic.' The analysis still found that perception of risk did not significantly affect cyclists decision to commute via bicycle (Noland 1995, 74).

In contrast, the study found that the most significant landscape factor affecting a person's decision to commute was the accessibility of the route from their home to their work via bicycle. 'Accessibility' in this context refers to the ease of effort and amount of time of a trip takes. Accessibility, then, can be in an illuminating metric in the comparison of traveling in different modes, such as by car or by walking (Noland 1995, 78). The Philadelphia survey found that infrastructure improvements that increased the convenience of bicycle transportation, compared with long-run policies that discourage automobile commuting, increased bicycle ridership overall. The paper advocates short-run policies that added and improved bicycle lanes to the

infrastructure. Long-run policies the study advocates include strategies such as building on-street bicycle lanes to replace parking or timing traffic signals to reflect the average speeds of bicycles rather than automobiles. This would result in slower automobile traffic, which would create a safer environment for bicyclists (Noland 1995, 79). We can use these recommended strategies to study Madison's infrastructure to understand why some commuters decide to travel by bicycles rather than automobiles.

Relationship Between Time and Space with Concern to Madison's Bicycle Paths

Yi-Fu Tuan presents that place is a static concept within time. However, place can be representative of a goal, such as an employee who wishes to rise to a higher position at their place of employment. That goal is a place they wish to attain (Tuan 1977, 179). He argues that places can be numerous things. A place can be a point along the path of someone's travels or can be a region, though a place such as this may lack a visible boundary (Tuan 1977, 182). His second theme in the chapter discusses the amount of time it may take one to get to know a place, and that acquiring the feel of a place takes time (Tuan 1977, 183). He also explained how a place changes over time, giving as an example that Chinese civilization has had numerous cities that once grew quickly but no longer exist. European cities built primarily of stone have evolved also, some of which stand today as testaments to their labor-intensive construction (Tuan 1977, 190-93). He also explained however that sometimes cultures are quick to forget their history, such as early Americans wishing to deny their European legacy (Tuan 1977, 195).

Tuan eloquently presented his ideas in a humanistic and philosophical manner. He presented many of his examples by telling the story of a single person and how the concept would relate to them. He did not however leave out the macro levels of human existence and took time to construct the idea of place around civilizations as well.

This relationship may be used to contextualize our research question. To some, Madison is not only a physical place but an ideal of a bicycling city. We can also use the concept of 'knowing' a place. The government and people of Madison earned the city a reputation as a great cycling city. We can address knowing Madison in a way to examine some key questions. How long did it take to achieve this reputation? How was this "feel" of Madison acquired? What natural and artificial rhythms interact to create Madison the place and Madison the bicycle haven?

Methods

Mapping

We received shapefiles from the city of Madison and the UW-Maps library for the creation of our maps. This allowed us to create maps that served a dual purpose in our research. First, the maps allowed us to dig into the data and analyze it. Something is special about building a map that allows a deeper understanding of your collected data. Building the maps forced us to stare at its data for hours rather than minutes, and required us to understand how various layers of data interacted with one another.

Also, the maps are used in our paper as a visual reference. They have the ability to both locate a place for the reader and point out specific interactions or ideas that we are identifying in our paper. For example, Map 1 is used to help the reader locate the bicycle infrastructure within Madison and understand its interaction. The focus of the map is on the downtown and near downtown area as this was the emphasized region of our research. Map 2 is used to help the

reader locate the Allied neighborhood and understand the geographic constraints placed on the neighborhood.

Photography

We took a large collection of photographs to highlight various features of Madison's bicycle Landscape. Twenty of these photographs have been included in the report. The photographs are intended to have three major purposes for our research. First, they gave us a chance for participatory observation. Second, the photographs give us a visual reference for themes and concepts we encounter in our other forms of research, and lastly they are included in our paper to give the reader a visual aid for ideas that we introduce.

While biking around Madison taking photographs, we were able to immerse ourselves into the landscape. We gained valuable first hand experiences of how it feels to bike through Madison. This allowed us to evaluate how the various components of the landscape interacted. We were able to decide whether various bikeway construction types worked as they were designed at specific location. In addition, we observed how these bikeways affected the environment and how people responded to this.

Our photographs have been important tools in analyzing our findings from other research forms. They have been a particularly vital supplement to our interviews. A great example is image 3 which is an intersection referred to by former Mayor Dave Cieslewicz. In the interview, he explains how this intersection is a great example of a surface solution to a traffic problem with bicycles. We used image 3 to both evaluate and understand his claim. We have also used the photographs to understand some of the themes that we have encountered. We have been able to evaluate these themes in our photographs through comparisons. An example would be how space is separating motorists and cyclists in varying infrastructures.

Lastly, the photographs are vital visual aids to any reader of this paper. They will offer an important visual to concepts and specific ideas that we analyze in this paper. Many of the photographs will be referenced along with an explanation can be found in the figures listing.

Interviews

Our group interviewed a variety of bicycle enthusiasts to enhance our understanding of Madison's bicycle culture and its growth. These interviews brought us in contact with everyone from local advocates to former city officials. Our interviews, in the order they were conducted in, included Dave Cieslewicz, Robbie Webber, Michael Barrett and Michael Rewey.

Cieslewicz is Madison's former two-term mayor from 2003 to 2011, who implemented the Platinum Bicycle Committee, an attempt to make Madison a top-tier bicycling city. Webber is a transportation analysts and former city council member. Barrett is a local bicycle advocate and outspoken critic of Madison's current bicycle policy. Lastly, Rewey worked for the Wisconsin Department of Transportation as a chief planning engineer, he was also a member of the Madison Platinum Bicycle Committee.

Each interview provided a unique perspective into Madison's bicycle culture and the various elements that have influenced it. Those who were city officials were able to highlight individuals and policies that have shaped the landscape, while the advocates and analysts detailed cultural elements of importance for Madison. When comprised together, the interviews create a holistic image of Madison's bicycle culture and its foundation.

Surveys

In order to tap the knowledge and opinions of Madison's bicyclists, we took to the streets to give surveys to riders waiting at stoplights. We sought to find out more about who was using the bike paths, how often they biked, and how these people felt about issues pertaining to safety

on Madison's bicycle paths. On the morning of November 9, we split up into groups of two and set up survey locations at the intersection of University Avenue and N. Park Street and at the intersection of Monroe Street, Regent Street, and the Southwest Commuter Path. We chose to set up at stoplights to better communicate with bicyclists. We collected 40 surveys between the two survey locations.

After identifying demographics based on sex and age, our survey participants clued us into their biking habits with answers about the frequency at which they biked and during which seasons. We also asked riders about their participation in any of Madison's pro-bicycling event. Our final three questions asked participants to rank their feeling of safety when biking in Madison, the specific elements of pro-bike infrastructure (i.e. painted lanes, bike symbols on streets, etc.) that they felt increased their safety, and what influenced their route preference.

Previous Research

To understand Madison's cycling culture it was necessary to research the history of cycling in general. The obvious starting point would be the invention of the bicycle and then working through the important design changes it underwent. These changes have allowed the bicycle to become the popular instrument of recreation and transport it is today. David Herlihy's *Bicycle: The History* had a helpful chapter called 'The Bicycle Boom,' which detailed accounts of the bicycle's demand growth. This growth was stimulated through improvements in safety and efficiency. Author Fred Delong's publication *DeLong's Guide to the Bicycle*, described the rise of bicycling organizations such as the League of American Wheelmen that further pushed cycling growth. While bicycling advocacy groups and innovations in bicycle design furthered its viability as a transportation mode, several factors hindered it in the United States. Previous research we used cited American interest and subsequent dependence on motor vehicles as a

major hindrance on cycling development, which is evident in the layout of many cities in the United States. Urban planning focusing on the car has yielded sprawling cities that have not only made bicycling inconvenient but at times, dangerous.

We then looked for literature on the history of bicycling in Madison. We found that Madison's cycling culture first emerged shortly after the energy crisis of the 1970's largely as a response to that crisis. City and county leaders drafted a plan to build Madison's bicycle infrastructure. The *Long Range Bikeway Program - A Summary Report of Proposed Policies & Facility Plans*, has been an important resource for us throughout this project as it is the framework for Madison's bicycling program.

City Comparisons

To undertake intensive research on the development of Madison's bicycle culture Andrew Herod and Kathleen Park explain that examining multiple sample observations are necessary to identify patterns of phenomena. While the authors explain that taking an extensive approach to data collection rarely yields little more than general trends we found that researching bicycle culture in other cities helped to identify common, but important facets of the development such as the positive feedback loop of bicycling and the five E's of infrastructure planning. (Herod, Parker 2012, 67)

After reviewing the history of bicycling and its roots in Madison, we found it helpful to compare Madison's bicycle development with that of other cities in the United States and countries in Europe. After learning about Madison's aspirations to earn a "Platinum" rating from the League of American Bicyclists, we decided it would be most beneficial to look at the other platinum cities, which would enable us to identify common themes in bicycle development. Those cities are: Boulder, Colorado, Davis, California and Portland, Oregon.

Article *Fifty Years of Bicycle Policy in Davis, California,* gave us an overview of Davis' long standing history as America's most bicycle friendly city. Portland, the nation's largest platinum city has passed multiple initiatives to create its expansive bicycling network as outlined in *Bring Your Own Bicycle: America's Top 5 Bike-Friendly Cities.* Though it's not one of our comparison cities, the article *Cycling and the built environment, a US perspective* discussed the relationship between perceived and built environments in Seattle, Washington, another large bicycle friendly city. Internationally we looked to countries in Europe, many of which have bicycles ingrained in the overall culture. European countries often have bicycle usage that far exceeds that of the United States. The Netherlands is renowned for its extensive bicycle infrastructure systems, which is discussed in the *Dutch Bicycle Master Plan 1990-1996*.

Results

Interview Analysis

Perhaps the most rewarding section of our project was the interviews with intellectuals in the community. These interviews provided invaluable insight into the creation of Madison's bicycle culture. Every interview was notably different than the last, as each interviewees' opinion and perspective varied based on their involvement in the bicycle community. Although the topics differed from person to person, several themes recurred throughout the interviews. Amongst these themes was the idea of the five E's of bicycling and the question of whether or not geographic determination played an important role in Madison's bicycle infrastructure and culture.

When asked what influences Madison bicycle culture the most, all of our interviewees discussed the five E's of bicycle policy. These subcategories of bicycle policy, as our interviews suggest, are the main elements that cities can focus on to improve biking. While each person has their own concept of the E's, such as what should be included and how many E's there are, the standard five E's are: Engineering, Education, Encouragement, Enforcement and Evaluation. Engineering, which is essentially infrastructure, was highlighted by Dave Cieslewicz as easily the most important of these categories. He stated, "We will have to do all of them but the most important, I'd say about eighty percent, is in engineering" (Cieslewicz, 23 October 2012). Robbie Webber echoed this sentiment, adding that "Engineering is the most important of the E's, but enforcement is rising as police forces start to embrace the bicycle and bicycle culture." While infrastructure was identified as the most important of the E's by a few of our interviewees, Webber noted:

> "Creating bicycle culture is a balance; it's a system. It has to be all strategies--I can't pick one." (Webber, 04 December 2012)

Education is the next E, which is the distribution of information through classrooms and information pamphlets. Education attempts to teach others about how to ride bicycles safely on multi-use paths, while also teaching motorists how to work with cyclists ("Bicycle Friendly Community: What are the 5 E's?" 2012).

The next E of bicycle policy is, encouragement, which concentrates on promoting biking as a better alternative than driving. Examples of encouragement in Madison include Ride the Drive and the proliferation of Trek's B-Cycle program (Map 1). Enforcement, according to

Webber, was of rising importance amongst bicycle policy. It calls for the implementation of laws, which police forces can use to control the relationship between pedestrians, bicyclists and motorists.The final E is Evaluation, or planning, which calls for the community to judge the city's current system, including the number of both cyclists and injuries, as well as the adequacy of its programs ("Bicycle Friendly Community: What are the 5 E's?" 2012).

Another E was suggested by Michael Barrett, who called for "Environment, in the sense that cities are more beautiful without cars, which will cause more people to want to be out biking and enjoying their surroundings." (Barrett, 06 December 2012). Nevertheless, the current five E's of bicycling were recognized by our interviewees as the most important strategy for the creation and future of Madison's bicycle culture. Although, engineering was recognized as the most important, each serves a particular role, such that the loss of one would greatly hurt the whole.

The geographic location of Madison was another topic that occurred in most interviews. Was Madison, based on its physical geography, more or less likely to have a bicycle culture. Environmental Determinism, as described in *Researcher's Methods in Geography*, judges the environmental influences, especially the climate, and how they influence human behavior. (Gomez and Jones 2010, 29). When asked about whether Madison's location was helpful or hurtful, most said it had a negligible or negative effect on the city's bicycle culture. Michael Rewey argues:

> "The layout of the isthmus area hurt the grid system, but helped bike paths (Map 1,3,4). Grid systems are generally the best for biking, because bicyclists are able to choose the most preferable routes to them instead of having to use certain roads

without flexibility." (Rewey, 11 December 2012)

With the city condensed between two lakes, one could argue that the added congestion would be helpful in getting people on bicycles and out of cars, but Barrett noted, "Lakes don't mean that downtowns have to stay constricted, just look at New Orleans." (Barrett, 06 December 2012) He later argues that it is cheap enough to fill in land, and that the lakes did not constrain the city and force more bike paths. (Barrett, 06 December 2012)

Another aspect of Madison's environmental determinism is the weather. Some of our interviewees discussed the ease of biking in the winter. Webber believes:

> "There's a lot of biking done in the midwest year-round. People say it's hard to bike in winter, but once you get used to not driving, you find other ways to get around." (Webber, 04 December 2012)

However it is difficult to ignore the effect of Madison's winter on it's bicycle culture. It was taken under consideration when the city first planned its bicycle paths, especially with Madison's sharp decline in ridership during the winter (Figure 2). This is because the city of Madison has a significantly greater number of days below 32 degrees Fahrenheit than most of the country's other major bicycling cities (Table 1). When considering that Madison's physical geography hurt its grid system and limits the number of quality days to ride, it is clear that Madison is negatively influenced by its location.

Owing to its poor location, Madison had to create its own bicycle culture. Several of our interviewees noted that Larry Nelson was instrumental in the foundation to Madison's biking

culture. Nelson, who was Madison's head traffic engineer for at least two decades, found a way to fund the city's initial bike lanes. Barrett states:

> "He was a big highway guy, but he wanted to get the crazies to bike to free up the roads for suburban commuters. However, to his credit, he realized a loophole which could pay for the bike paths. Much of our roads are federally subsidized, because when applying for federal money, Larry always put bicycle infrastructure first. He realized that he would still get the money for his highways, but when a city put bicycles first, they were almost always guaranteed to receive federal funds. This signaled to the Feds that Madison was serious about biking." (Barrett, 06 December 2012)

Along with Barrett, Rewey highlights the importance of Larry Nelson as a forerunner for Madison's bicycle culture (Rewey, 11 December 2012). In conjunction with Nelson, the City of Madison also benefitted from a few conscious decisions. One of which came from then Mayor Paul Soglin's fight to keep state and city jobs in the downtown (Barrett, 06 December 2012), the other was the University's decision to limit parking (Cieslewicz, 23 October 2012). These decisions helped make Madison more congested, which in turn has made driving harder and biking easier. This, along with Nelson's actions, helped initially fuel Madison's bicycle culture. Starting in 1971, the City of Madison decided to get serious about its bicycle culture with the *The Long Range Bikeway Program.*

The Birth of Madison's Bicycle Infrastructure

The Long Range Bikeway Program for the city of Madison was approved in 1971 and adopted by the Common Council in August of 1973 (City of Madison Transportation Department 1975, xx). This program was later presented in June of 1975. The document lays out the short term and long term goals of Madison's newly adopted resolution. The program looks to update what the city's current plan, which was prepared at a time when the bicycle had not yet achieved popularity. It describes its broad goal as, "To increase the role of the bicycle as a major mode of transportation and vehicle for recreation, by providing safe, convenient, and pleasant biking facilities serving all major employment, recreation, and education centers in the Madison area" (City of Madison Transportation Department 1975, 4). A major outcome of this report was the adoption of a study analysis for the planning process. This analysis process can be found in the Figures appendix as Figure 3. This process resulted in twelve main conclusions. They are:

1. A significant number of Madison area residents consider themselves bicycle users.
2. The study portrayed an interest in bicycle facilities by both bikers and non-bikers.
3. The study indicated that adult interest in bicycling is quite strong.
4. Bikers indicated a willingness to go at least six blocks out of their way to take advantage of a safe bikeway.
5. Field counts from other studies indicate that bicycles are used year-round.
6. Bikes are used most during hours of darkness.
7. Most bikeway facilities should be located on existing streets.
8. Study findings indicate that as much as seventy-five percent of weekday bicycle trips

are for purposes other than recreation and that cyclist prefer direct routes especially for these trips.

9. The single most active center of bicycle activity is the university campus.

10. Parking facilities are essential to bicycle security and should be required as a part of all new development.

11. There are three possible sources of funding for bicycle facilities.

a. Local funds

b. private grants or loans

c. funds through grants from county, state, and federal programs

12. The major physical constraints to bicycle use appear to be weather and traffic hazards.

(Source: City of Madison Transportation Department 1975, 5-9)

The plan also laid out design criteria and definitions of bike path types. A visual depiction of these classifications can be found as Figure 4. These types are:

Class I: A completely separated right-of-way designated for the exclusive use of bicycles. Bike paths fall under this classification.

Class II: A restricted right-of-way designated for the exclusive or semi-exclusive use of bicycles. Motor vehicle parking and cross-flow may be allowed for this type of classification. Bike Lanes fall under this category.

Class III: A shared right-of-way designated by signs and stencils on the pavement. Mixed traffic routes are type three bikeways.

(Source: City of Madison Transportation Department 1975, 9-10)

The city also developed a guideline for the construction of these various classes based on motor

vehicle speed and traffic volumes, similar to what other cities such as Davis, California and European cities have done. It was developed with the help of Davis, California and can be found as Figure 5. The creation of this program was essential to the birth of what is now Madison's highly developed and complex network of bicycle facilities. Two maps of the initial plan can be found in our figures as Map 3 and Map 4.

The significance of this infrastructure plan is that it paved the way for Madison's current and future plans. It focused its attention on the downtown area but also put forth plans and strategies to radiate the infrastructure outward. It also led to the development of safer and progressive bicycle lanes which grew along with increased ridership.

Social Mobility Impacts of Bicycle Infrastructure Development

The bicycle has a history of social liberalism. After its invention and mass production there was fear about its potential power. The ruling class feared that women would be having too much fun biking around to take care of their kids, leaving the man at home helpless. Or that the "sinful cyclist" will be too busy riding to attend church on Sunday morning. The true meaning of this fear was that bicycles were giving mobility to women, minorities, and the lower class (Herlihy 2005). The popularity of bicycling by women spurred the abandonment of restrictive Victorian dresses that women had previously been required to wear in public. Women started wearing less restrictive and more bike appropriate clothing (Portland Transportation History 2012). Still today the bicycle offers mobility to those unable to afford a car.

Currently in Madison twelve percent of people do not own or have access to a vehicle, many of them being minorities (Barrett, 06 December 2012). Cars and parking are very expensive, It's much cheaper to bike (Webber, 04 December 2012). These problems are exacerbated for the poor and segregated. Barrett expands on this saying:

> "The current infrastructure is discriminating towards those who can afford cars by stretching distances. This creates injustice, it works almost as the new Jim Crow Laws by excluding those who cannot afford a car." (Barrett, 06 December 2012)

Because of this biking, which is a much cheaper form of transportation, is an obvious choice for some trips. Bicycling has an important place as an alternative to driving. "It's perfect for distances of one to five miles, which may be too far to walk, but don't need to be made by bus" (Webber, 04 December 2012). An attempt to help increase mobility to citizens in the Allied neighborhood was made in the 1990s. Verona Road and allied drive were isolated, there was a proposal to connect it to Williamson street with a tunnel. According to Barrett:

> "People freaked out crying about crime and such, its the same as the Southwest Bike Path, people are worried about the reduction in property values. However, Madison has fought and produced a counter weight to NIMBYism, which is health, fun, and social justice." (Barrett, 06 December 2012)

In the case of the Allied neighborhood, the bicycle tunnel under Verona Road and the overpasses built over the Beltline break through the harsh and abrupt geographical barrier of these two major roads (Map 2). The path connects an underprivileged neighborhood (the third least-white in Madison according to the 2010 Census) to the rest of the city and onward to affluent neighborhoods such as the CBD and Williamson Street. Additionally, on the bike path people are able to interact with each other (Barrett, 06 December 2012). It is much more than

just a breakthrough in physical barriers but also a breakthrough in social and economic barriers.

Barrett also identified a few key links on the East Side. According to him the bike path to Goodwin and the overpass over East Washington have helped connect different neighborhoods and have allowed the movement of those in poverty (Barrett, 06 December 2012).

Logic Framework: Bicycling Positive Feedback Loop

While the five E's is a model used to increase ridership in a landscape, the Bicycling Positive Feedback loop is a framework we developed to understand the interaction of three major actors in the development of a bicycle landscape. We found that the three most important factors that can lead to this landscape are ridership, a cycling culture, and infrastructure development. A visual representation of this can be found as Figure 6.

Infrastructure Development

Infrastructure development gives people choices and the key is to make biking the rational choice. Cieslewicz argues that, fifty-six percent of bikers do so because it is the easiest way to travel for them (Cieslewicz, 23 October 2012). Madison only has 230,000 people, but has many of the issues of bigger cities because of the constraint caused by Lake Mendota and Lake Monona. Webber states:

> "We have to deal with traffic congestion. I think one of the reasons people bike is that bicycling is a logical thing to do. Students have been biking forever, and when there are only a few hundred parking spots on a campus with over 40,000 students, it's logical to use alternate modes of transportation." (Webber, 04 December 2012)

Additionally, only twenty-five percent of bicycle commuters are women and many of them don't ride because they don't feel safe, especially with their kids (Cieslewicz, 23 October 2012). According to Cieslewicz, "Once people feel safe and comfy the ridership will continue to rise" (Cieslewicz, 23 October 2012). Webber also agrees saying, "ridership swells in safe infrastructure" (Webber, 04 December 2012). From this we can see that increasing infrastructure development will increase ridership.

In Madison, many policies have changed since the beginning of Madison's implementation of bicycle paths. Now when the city builds or rebuilds major arterials and connectors, they automatically put bike paths in the plan (Webber, 04 December 2012). Infrastructure can also have other very important effects on culture. According to Webber:

> "Transportation is often really important for social equality. Driving is expensive. If a person needs access to a car in order to eat, repair their house, or send their kids to a good school, how can they manage if they cannot afford a car? This is not sustainable economically, environmentally, socially, or healthwise. Bikes can help mediate this problem" (Webber, 04 December 2012).

Due to this, transportation and cycling infrastructure becomes a greater economic and social need. Increases in bicycle infrastructure and access to transportation will not only lead to a growth in cycling culture but will also create a culture of social mobility and environmentalism.

Ridership

Increased ridership results in cyclists being safer. Drivers become more aware of those on a bicycle and therefore will have more empathy towards bikers. They will begin to treat

bicyclists and cars equally and the result will be less accidents (Cieslewicz, 23 October 2012). Additionally according to Webber:

> "When your friends or people around you bike, biking is more attractive for you. When there are bike racks around (Image 18), biking will seem more regular and people will feel more normal when they do it. The more bicyclists there are on the streets, the better accustomed cars are to sharing the roads with them. This makes a big impact on the safety of biking. In the last decade, biking in Portland, OR has become five times more common. During this time, the rate of crashes also significantly fell." (Webber, 04 December 2012)

This leads us to believe that as safety increases, the more likely people are to ride their bicycles. As was stated earlier, we know that many people, especially women do not bike because of safety concerns. This was supported by our survey results, where women on average reported feeling less safe on Madison's bicycle paths (Table 2). As soon as safety improves, ridership increases.

The increase in ridership that results from this creates a cycling culture in which many citizens participate and add cycling to their daily lives. Geographer Yi-Fu Tuan explains that the quality and intensity of an experience matter to the attachment to a place (1977, 179-198). The more bicyclists there are riding, the safer it will become. As safety improves, so does the quality of the experience. This has helped Madison's bicycle culture by increasing riders' attachment to the city's bicycle culture, which is alignment with Tuan's theory.

Increased ridership also greatly influences infrastructure development. The design of Madison's infrastructure is changing, largely owing to this increased ridership. On many roads eight to ten feet of bike lanes are no longer wide enough to accommodate the growing number of bikers (Image 5, 8, and 9 show varying lane sizes). There also are more bike racks (Image 18) and drivers are becoming more accustomed to bicycles (Webber, 04 December 2012)(Image 6, 8, and 17). From this Madison's infrastructure is being changed to match ridership by expanding bicycle lanes size and increasing the number of bike racks available to cyclists. As the infrastructure improves, ridership should continue to rise, helping to fuel Madison's bicycle culture.

Culture

Webber believes that bicycling has an important place by offering alternatives to driving, considering that most cities are built for cars. She argues that it's important for cities to develop a culture of embracing alternatives (Webber, 04 December 2012). This embracement of alternatives is an example of bicycling culture. It normalizes multiple forms of transportation into a city with bicycling being one of those forms (Image 17). Specifically, in Madison, it's very normalized to bike. People are used to seeing other people bike, which according to Webber is a part of an important feedback loop (Webber, 04 December 2012).

Culture can also exist in other forms. For example, outreach such as pamphlets, PSAs, and courses for law enforcement on how to deal with bikers all contribute to a cycling culture (Webber, 04 December 2012). They influence how cyclists relate with their city, how law enforcement and drivers react to cyclists, and how active cyclists are in their city (Image 8, 10, and 17). If cycling is encouraged, a city will be more likely to have a positive cycling culture where bicyclists have a good relationship with other transportation methods. When you have

this, cyclists will be able to lobby for bicycling infrastructure because they face less opposition from motorists.

Madison itself has a 40-year-old history of bicycle support through infrastructure. Many policies have changed since the beginning of Madison's implementation of bicycle paths. It is now standard that when the city builds or rebuilds major arterials and connectors, they automatically put bike paths in the plan (Webber, 04 December 2012). The city is committed to bicycle paths on old railways and greenways, and they are trying to make biking more intuitive and natural, just like they always have for driving (Webber, 04 December 2012). As the infrastructure begins to grow, the more likely people are to ride their bikes. With the growing number of cyclists, bicycling culture begins to grow stronger and more popular. As it becomes more popular, it begins to have control over politics. Early in his lobbying history, Barrett states he:

> "Began going to the commissions to annoy them to make sure biking was considered. Politicians then began blocking or ignoring commission reports. We then started presenting candidates with questionnaires to see if they were friendly to cycling. Slowly we got a core of pro-bicyclists on the city council. In 2003, there was a candidate for mayor, who came out of 1,000 Friends of Wisconsin, which was very bicycle friendly. The bicycle community came out in force to get him elected. With the support of the bicycle community, Dave Cieslewicz won the election. The thirty-third ward gave him the biggest lead of any ward in the city. Bicycles stretched for two blocks at his victory party, it became known as the "Election of the Cyclists". Dave forced transit engineers to retrofit streets with

> bicycle paths and did a few things which were very good for bicycling in Madison...While he instituted the automatic building of bike lanes on renovated streets, I did not agree with him on the paving budget. He allowed for giant roads and intersections on the outskirts of the city. With this he alienated his supporters." (Barrett, 06 December 2012)

Another belief of Barrett is that he rejects the notion that Madison bicycle culture is due solely to being a university town (Barrett, 06 December 2012). He says that this has helped but many schools do not have a bicycle culture at all. He believes that two things that helped Madison, they are: the city is a very environmentally conscious town and the state capital is close to the university and the interconnection that occurs because of this have helped. People who go from the university to the state government has created this level of interconnection with the city. Many graduates go straight into state government and in doing so maintain their student lifestyle of biking (Barrett, 06 December 2012). From this we can see other important factors that help to define a bicycle culture. First, Environmentalism that is associated with the liberalism supplied by bicycling (Herlihy 2004) and second, a young workforce that is able to seamlessly transition from university life to working life without a drastic change in lifestyle. As Madison's culture continues to grow, it has become politically relevant, which helps add funding for infrastructure and encouragement, which in turns helps the city's culture grow even more.

Summary of the Bicycle Positive Feedback Loop

The bicycle feedback loop has three major factors; infrastructure development, ridership, and cycling culture. All of these factors are related and affect each other. Furthermore this relationship is a positive and the loop can go either direction. Infrastructure development for

instance often leads to increased ridership but it can also culture by modifying who has access to mobility and how they do so. Ridership is able to influence culture by normalizing cycling, changing the interaction between cyclists and motorists, and increasing the political force behind cycling in an environment. Increased ridership also leads to changes in infrastructure development. Just as with roads and cars, when more people ride their bicycles it creates stresses on the infrastructure and leads to changes in infrastructure design as well as its expansion. Bicycling culture leads to increased ridership by people being aware that others are cycling. People see others biking and realize that they themselves can do the same. Bicycling culture is also extremely effective at increasing infrastructure development. It does this by mobilizing a strong pro-bicycle lobbying force. Once again refer to Figure 6 to view the visual representation.

City Comparisons (Development of culture and infrastructure)

The five E's and the positive feedback loop of bicycling help to explain the emergence of bicycling culture and infrastructure development in each of our comparison cities. The earliest accounts of a city with a distinct bicycle culture come out of Davis, California back in the 1960's. Davis, a small university town in the Sacramento Valley, has long valued bicycling. The University of California-Davis faculty and students were early pioneers of the city's pro-bicycling image (Buehler, Handy 2008, 52). Eager to please the city's largest employer, main source of revenue, and student population, Davis politicians drafted plans to incorporate cycling within its pre-existing infrastructure. Notably, Davis was the first city in the country to have a bike lane on a city street (Buehler 2007, 7). As bicycling increased in popularity within the city, more bike lanes and paths were added to meet demand. In turn, increased mileage of bicycle paths bolstered ridership, and now Davis boasts over one hundred miles of bike lanes and paths (Bowen 2012). The city also has the highest per capita bicycle ownership ratio, the highest bike

commuter mode share, around fourteen percent, and the highest proportion of bike lanes on city streets in the country (Buehler, Handy 2008, 52). In 2005 the American League of Bicyclist rated Davis a platinum bicycle friendly city, which made the city the first in the country to earn platinum status (Bowen B 2012). The League of American Bicyclists rates cities on their ability to implement the five E's of transportation planning. Executing each of the five E's is important to building a successful bicycling culture (League of American Bicyclists 2012) . After evaluating citizen interest and the need for cycling, planners set out to build infrastructure to accommodate it. Education on and enforcement of safe and courteous biking behavior ensures community support for the developing culture which is extremely important considering America's car-centric mentality. Once the infrastructure is in place and support from the community is gained the culture begins to grow. Boulder, Colorado, another platinum bicycle city's culture began in similar fashion. Like Davis, Boulder has a large university with active faculty and students that pushed for the city to offer a comprehensive and safe cycling infrastructure. Today the city has over 300 miles of bike paths and has been particularly successful in keeping bicyclists and motorized traffic segregated by using bridges and tunnels to cross busy streets a testament to the engineering facet of the five E's (City of Boulder 2012).

Perhaps the most fascinating example of successful bicycling culture emerging from the use of the five E's and the positive feedback loop is that of Portland, Oregon. In 2008, Portland became the second city to receive platinum status and has the unique distinction of being the largest bicycling friendly city in the United States with a population of nearly 600,000 (US Census 2010). Similar to other pro-cycling cities in the country Portland can trace its cycling culture to the late 1960's and 70's. Portland citizens, were alarmed at how car-centric the city had become. In response, students and faculty at Portland State University founded the PSU

bicycle lobby. The lobbyist group, realizing the potential for bicycling as a legitimate, alternate mode of transportation pushed for legislation that would create bike lanes on major streets and bridges near places of education, and commerce. Additionally, the legislation called for space to be made available for bicycle parking as well as integrating bicycles on public transportation systems. As the city began building new infrastructure and retrofitting existing streets for use by bikes the cycling culture flourished. It was estimated that in the mid 1970's there were over 180,000 bicycles in Portland. City and state leaders responded to the popularity of bicycling in Portland by passing the 'Bike Bill' which mandated the city spend at least one percent of its federal transportation aid on bicycling infrastructure (Johnson, S.). Portland has been extremely successful in creating an expansive network of bike lanes and paths throughout the city. Currently the city has over 350 miles of bicycle infrastructure and just signed a twenty-year initiative to double bikeway mileage and make bicycling account for twenty-five percent of all travel in the city (Portland Bureau of Transportation 2012). The project has garnered recognition as being the most ambitious bicycle infrastructure project in America (Rose 2010, 1)

With the energy crisis of the 1970's looming in the minds of government leaders and citizens alike there was a need to wean the country off motorized transportation burning fossil fuels. Madison, like other progressive cities in the country, began to look to bicycles to solve the problem. Using the University of Wisconsin-Madison as a starting point for changes in urban layout, planners built new additions for the university to accommodate bicycles as a primary mode of transportation and create a disincentive to drive. This spurred the use of bicycles around campus which made up a sizable portion of the downtown population. Along with the disincentive to drive around the university, the relative density of downtown Madison, its proximity to the university, and its bike-favoring populace promoted further bicycle use.

However, Madison's bicycle infrastructure and culture as a whole was only concentrated in the downtown (isthmus) region of the city. City residents in the periphery could not access the downtown by bicycle in a safe or convenient manner. As stated above, this changed when the city drafted *The Long Range Bikeway Program*. The program paved the way for bicycle infrastructure construction in other parts of the city and allowed for ease of travel. It also provided a framework for advances in safety features we are accustomed to today, such as painted lanes and boxes, on-street paths and symbols, bike-specific traffic signals and bike boulevards, many of which are documented in the following section. For further data analysis and comparisons between platinum cities and Madison, see our figures section.

Photography Analysis

The photography of Madison's bicycle infrastructure that exists in an appendix to this paper is evocative of many principles of bicycle policy and culture in action. In this section we focus on analyzing pictures of several intersections in the downtown area. Though these pictures were chosen arbitrarily and are all inherently biased by perspective, we feel each picture has the power to illuminate in topics of culture, functionality, and safety. Each photograph referenced here and many more are printed in the appendices.

1. Martin Luther King Jr. Boulevard and East Main Street

The photograph was taken at dusk on Friday the 9th of November 2012. It looks to the south on the Capitol Square with Martin Luther King Jr. Boulevard to the left and the Capitol to the right (out of frame). The image features one design of a bicycle lane in Madison. The cyclist is situated in the middle of the bicycle lane that is shared with busses and other vehicles that intend to make a right hand turn. The bicycle lane is designated for bicycles by using paint on the street and overhead signs, although this is not visible in this photograph. To the right of the

cyclist is the lane designed for automobile travel. To the left of the bicycle lane is the lane reserved for parked vehicles and bus stops. All traffic flows one-way and counter clockwise around the capitol.

How space is appropriated both by objects within the landscape and by the landscape itself the provide clues to social norms and to the priorities of individuals. The position that the cyclist has taken in the lane gives evidence that the cyclist is probably an experienced cyclist who values their personal safety. The bicycle rider is positioned near the center of the lane. This is important as it increases the cyclist's visibility to other vehicles and also discourages these vehicles from unsafely overtaking the cyclist. Furthermore, the cyclist has a light installed on their bicycle showing that they understand the dangers of riding during dark hours and the importance of staying visible for safety. The space that the bus gives the cyclist is also important. The bus is situated well behind the bicycle giving it a safe distance if an instant of panic were to occur. This offers insight into the bus driver's concerns. The bus driver probably is concerned with the bicyclist's safety as well as following their desire to follow the normal traffic rules.

We can also infer cultural context from this image. How space is appropriated offers clues into the priorities of a culture. In the case of infrastructure, more space for a particular infrastructure type hints towards a greater reliance on that particular mode of transportation. In this scene bicycles, public transport, and personal vehicles all share the road together. Therefore, in this scene all three forms of transport are closely valued and relied upon. That may be a wild assumption to make, but even so, it provides evidence that all form of transportation are valued by some people. In the case that we cannot quantify this value, we can still deduce valuable information from the photo. In proper bicycle lane construction roads with higher speeds require the most separation between cars and bicycles and roads with the lowest speeds require the least

amount of separation. A high speed and high volume road such as University, bicycles get their own lane in the direction of traffic. Then going against traffic bicycles have their own lane that is physically separated with the road by a curb. On the other end of the spectrum is an artillery road like Lake Street where the road has been turned into a bicycle boulevard meaning that bicycles are allowed to take the entire lane. From these two extremes we can see that the image features a street that falls somewhere in the middle of the spectrum as there is a degree of both separation and sharing of the road between bicycles and personal vehicles.

From this image we conclude that the individual rider and bus driver in this image are experienced and concerned for safety. We also found that in this particular landscape public transportation, bicycles, and personal vehicles are all given similar value. And lastly, the appropriation of space in the image also hints at the infrastructure needs of the particular landscape.

2. Monroe Street, Regent Street, and the Southwest Commuter Path

There's a lot going on at the intersection of Madison's Regent Street and Monroe Street. Situated near the southwestern corner of the University of Wisconsin campus and adjacent to Camp Randall Stadium, the intersection is a busy one on account of its motor vehicle traffic alone. The two thoroughfares meet at an acute angle bisected by the Southwest Commuter Path. The commuter path complicates the route by making it a six-way intersection. Indeed, one could make a case that in this specific geographic context the Southwest Commuter Path exhibits both the best and worst qualities of a path that maximizes accessibility (i.e. proximity to origins and destinations) by bringing the path's users directly to the busy intersection. This photograph, which group member Steven Krueger captured on a Friday afternoon in early November, shows

the intersection in action and with an emphasis on the commuter path's crossing route across the streets.

This photograph depicts the intersection of Regent Street and Monroe Street as dominated by commercial and private motor vehicles. The picture captures the point of view of a bicyclist looking across the intersection to the continuation of the Southwest Commuter Path, which for the readers' reference exists between the set of green-lit traffic signals and the set of red-lit traffic signals. Given the time (12:46 PM on Friday, 9 November 2012) and location of the photograph, this could be the view of a student biking home after a morning class, a mother carrying her daughter on a bike ride to purchase groceries at Trader Joe's, or many other potential path users acting in a variety of scenarios (which may involve walking, skateboarding, running, etc. rather than bicycling).

Perhaps the most important note one could make about the landscape this photograph depicts is that the intersection of Monroe Street and Regent Street did not look the same way several years ago. Rephotography might highlight the stark difference between the landscape of the intersection in 2008 and 2012 by drawing the reader's attention to the bicycle-guiding mechanisms the City of Madison implemented in revamping the intersection in a recent construction project. The project was the first of its kind in Madison. Professionals developed a 'surface treatment' plan (i.e. one that used low-cost, effective modifications rather than a bridge/tunnel) for the busy intersection involving bicycle path crossing lights and visually prioritized bicycle crossing paths painted a vibrant green.

This photo represents the changing cultural stance towards transportation. As bicycles become more prevalent as an alternative mode of transportation, more money is being spent improving their infrastructure. This is implied by the photo as painted lanes, bicycle

crossing signs and especially bicycle traffic lights are currently very unordinary. However, the photo could be showing a glimpse of the future as this style may become more common, as the city continues to spend more of its budget promoting and protecting bicyclists. With these painted lines and lights, drivers are also more likely to be aware of bicyclists, as all the drivers in this photo are behind the painted bike lanes. This will make riding safer, which could help boost the number of riders and further increase spending on bicycle infrastructure.

Several social norms are present in this photo as well. The bicycle stoplights play off a social norm, as people already understand the three-colored light system. Another social aspect that is present is the dominance of vehicles over bicycles. While it may seem obvious that cars should dictate the paths of other forms of transportation, this is a societal norm portrayed in the photograph. Bicycles must accommodate the pathing of vehicles, which allows for the continued domination of cars over bicycles.

The visual hierarchy and perspective of this photograph visually follows the path's crossing through its diversions across one street at a time in order to make its way back to the established off-road route on the other side. Though the boundaries of the photograph frame the intersection itself fairly tightly, context for the physical intersection seeps into the story. HotelRED, a 'boutique hotel' serving a transient populace that probably adds extremely low numbers of bicyclists but a sizable number of cars to the thoroughfares in the picture, occupies the upper left margin of the photograph. Donald Lispki's *Nail's Tails*, a landmark in itself on the Camp Randall grounds, stands in the background to the left of a red-lit bike traffic signal. A poetic observer might note the significance of this metaphor—the events at Camp Randall Stadium are arguably some of the biggest sources of concentrated motor vehicle traffic in the entire city.

Indeed, all signs point to motor-vehicle dominance at the intersection of Monroe Street and Regent Street. Though this image captures the fruit of a pro-bicyclist local administration, the innovative design is still a product of its car-centric environment. The massive amount of motor vehicle traffic in and associated with this intersection (and both Madison as a city and America as a country) dwarves the growing-yet-small percentage of citizens who use bicycles for transportation. Considering this new infrastructure, however, it is clear that the city is investing in its bicycle culture and attempting to strengthen its options for alternative modes of transportation.

3. State Street

The first picture is taken on State Street, a major cycling thoroughfare. In 1974 the city proposed turning the street, then a conventional four-lane road into a pedestrian mall open only to municipal vehicles, delivery vehicles and bicycles. Since that time bicyclists have used the street extensively as a safe, car-free route to travel through downtown. The picture I selected captures the essence of State Street and how the people of the city use it. Looking down towards the capitol we can see three cyclists biking up the street and a lone police vehicle. Apartments and storefronts and many pedestrians flank the street on either side. As the lighting would suggest, its relatively early in the day, which helps explain the quietness of the street scene. Images like the one on State Street are great for promoting the city's friendly stance on cycling. It gives riders a sense of importance in an otherwise car-centric society that we live in. We can think of State Street as one of the poster children for bicycling in the city.

4. Bike Path and Park Street

Taken from above, we see a biker riding down a bike lane on car-laden Park Street. This picture gives the viewer a sense of just how important cycling is to the community as a

transportation option. As an important mode of transportation, safety of riders is essential and as we see, this bicycle lane creates a wide buffer between the cyclist and passing motorists which is important considering the amount of vehicle traffic and the speed at which they travel. However, the second image on Park Street is arguably more important. While many would agree that a thoroughfare like State Street is an integral part of Madison's cycling experience because of its safety features and location near the Capitol Square, businesses, residences and the entrance to the university it is not practical to have streets like it throughout the city.

The image on Park Street shows that cycling can be done in a safe and efficient manner throughout the city along side vehicles. Park Street is a major transportation artery for many modes of transportation. In terms of vehicles, it's a part of US Highway 151, a multi-state highway that transects the city. For cyclists, the street is an important route for students getting to and from the university, as well as commuters that use the street to get downtown to work after coming off many of the off-street paths like the Southwest Commuter Path we have a photo example of.

5. Southwest Commuter Path near Spooner Street

Looking straight down the path near Spooner Street the photographer captures another important form of cycling infrastructure. While nearly devoid of traffic given the time of day the photo was taken, this path is known as a major route for commuters coming from the west side of the city to downtown. We have a path dedicated solely to cyclists and walking which makes it the safest way to travel by bicycling.

Survey Analysis

To gain insight into the thoughts of cyclists using the bicycling infrastructure around Madison we split up into two groups to survey riders. One group stayed downtown near campus

(Image 5) while the second group surveyed riders along the Southwest Commuter Path near Monroe and Regent Street (Image 3). In all, our group surveyed forty riders.

Of our forty riders we surveyed, twenty-three were in the 18-23 age demographic. This group used bicycles the most frequently with twenty of those respondents riding five to seven days a week. However, only three of the riders in that demographic used their bikes year around, most likely because they are using them for school purposes only. Five of our riders were in the 24-29 age demographic and all used their bikes five to seven days a week, while three of them used their bikes year around. Just two of our riders were in the 30-39 age group and both used five to seven days a week all year. Our lone respondent in the 40-49 age group also used their bike five to seven days a week all year. Eight of our respondents were in the 50+ age demographic. Seven of them were surveyed along the Southwest Commuter Path, evidence that this demographic may be using their bicycles to get to and from work.

Sixteen of the forty riders identified as female, while twenty-three identified as male. This proportion puts women at forty-one percent of the reporting group, a notably high percentage considering how male-dominated ridership can be in other areas (Image 10). The interviewees we met with shared varying feelings about the male domination of bike riding, but Webber may have been the most passionate in asserting her views that Madison had a very good percentage of female bikers (Webber, 04 December 2012). Her estimation was that while ridership in many bike-positive cities was skewed toward seventy-five percent men and twenty-five percent women, Madison has something closer to forty percent women and sixty percent men (Webber, 04 December 2012). The survey was admittedly subject to selection bias, but it is encouraging to see that forty-one percent of the survey participants were female (Figure 7).

Of the twenty-three participants in the 18-23 age group, eleven were female. We chose this age group to try to measure college students' use of bike infrastructure. The split between genders at the college-aged level was forty-eight percent females to fifty-two percent males, which reflects the notion that at the college-aged level there is less of a source of gender divide.

Our questions about transportation infrastructure were geared toward aspects of the cycling infrastructure that made riders feel safe. Painted lanes came in as the number one infrastructure improvement to make riders feel safer (Image 8). Second was painted bike symbols on on-street paths (Image 4). Off-street paths were third on the safe infrastructure list (Image 1), which is surprising considering that these paths separate cyclists from motorists completely. Fourth were bike boulevards (Image 13) and one respondent said adding lights to paths would make them feel safer (Figure 8). We then asked our respondents how safe they feel biking around Madison, on a scale of one to five, one being not safe at all, five being very safe. Twenty-two, or fifty-five percent of our respondents answered four on our scale. Eight riders answered five, six riders answered three and four riders answered two on our scale (Figure 9). What was most surprising was the difference between male riders versus female riders. Males noted that they felt, on the whole, safer than females on the city's bicycle paths (Figure 10).

Lastly, when asked what influences bicycle route preference the number one answer was safety followed by accessibility and travel time. One respondent said they chose routes based on landscape appearance and sense of calm, which reinforces early ideas about the importance of environment in bicycle promotion. Overall our group has gathered useful information from bike users round the Madison area. In order to understand what has made the cycling culture in Madison develop and grow we need to better understand what riders find important when they choose to ride. Safety is very important for ridership growth, and by identifying which

infrastructure pieces make riders feel the most safe, bicycle culture can push for more of them and continue to grow. For further data analysis see our figures section.

Conclusion

Our findings indicate that Madison's current bike friendly reputation and prolific cycling culture has no singular source. The city has worked hard to build and maintain this image. We were able to identify how people, events, policies, and infrastructures have influenced Madison's bicycle landscape and culture. We have isolated many elements which have been most influential in the movement, its development, and the construction behind it.

Madison has made a conscious effort to expand and improve its infrastructure, starting with its *Long Range Master Plan-Bike Route System* approved in 1971. Our interviews with Dave Cieslewicz, Robbie Webber, Michael Barrett and Michael Rewey highlighted the aspects of Madison's bicycle culture which have made it successful. The four major components are people, events, policies and processes. A number of people have influenced Madison's bicycle culture, including those we interviewed, along with a few mayors, engineers, advocates and many of Madison's citizens. While the 1973 oil crisis was certainly an important event, so are the annual gatherings such as Ride the Drive and Bike to Work Week. Over the years, a number of policies have influenced the culture, but none have been as important as Larry Nelson's push to get large swaths of federal funding for Madison's bicycle infrastructure. Lastly, the positive feedback loop, which is an amalgamation of the previous reasons cooperating with one another, has continued to grow. As more bikers get on the roads, the safer the routes become. As roads become safer, more citizens get on their bikes, which adds strength to the culture. As the culture

grows, the city adds to the infrastructure and the roads become safer, which prompts more people to use them for bicycling. Eventually, the bicycle culture became ingrained in Madison's popular culture and grew to have a large amount of political power. When considering what tenets are most crucial to the growth of Madison's bicycle culture, our group believes that no one is more important than the next--rather, they rely and build off each other. Owing to the strength of each section of the bicycle impulse, Madison's bicycle culture has grown and will continue to grow into one of the country's best urban environments for bicycling.

Future Research

If our group had more time and resources to complete this project, there are several changes that we could implement in order to make our paper more comprehensive. We would conduct a more vast survey of existing literature in our review. We would conduct more surveys with larger numbers of respondents, and we would seek to remove biases by altering our methodology. Perhaps the section of research that could see the most beneficial effects of additional time and resources would be our interviews. The interviews were effective and illuminating in a way that surveys or literature review could not compete with. Each interviewee we met with suggested a few other people we could potentially interview.

Figures

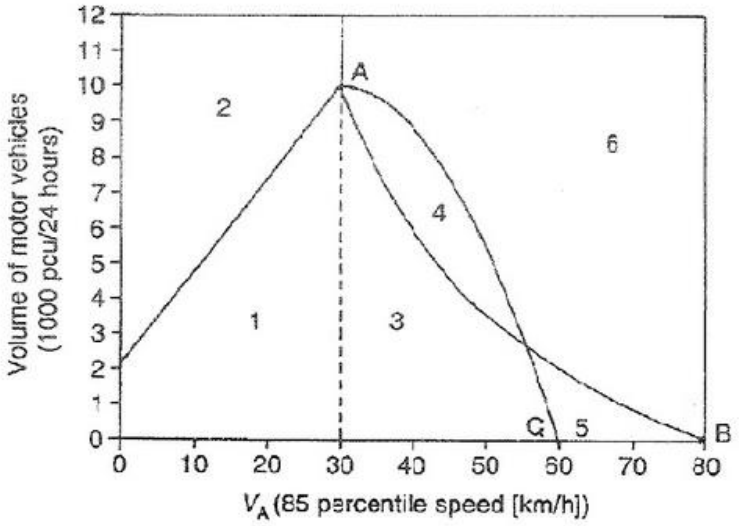


Figure 1: Source: (Godefrooij 1997

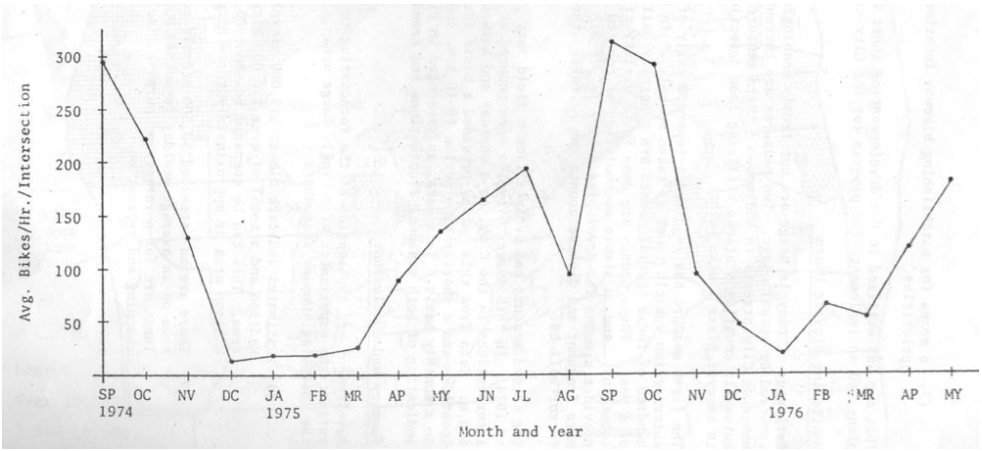


Figure 2: Source: Walsh, Thomas. *Forecasting Urban Area Bicycle Demand at the Neighborhood Level*. Madison, WI: Department of Transportation, 1976.

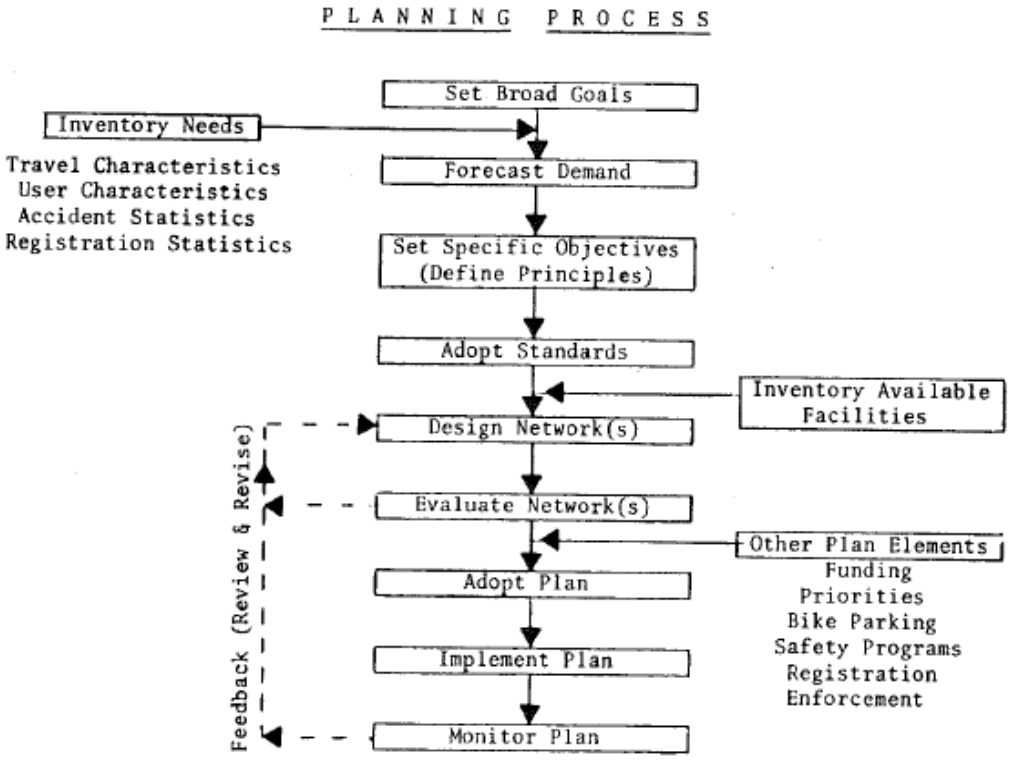
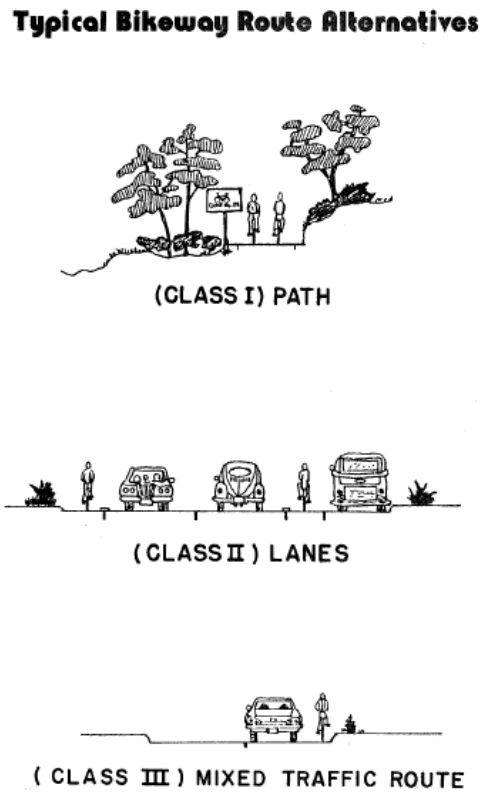
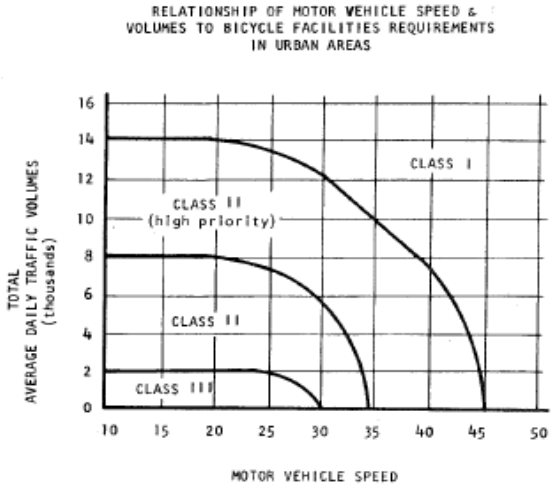


Figure 3: Source: City of Madison Transportation Department 1975





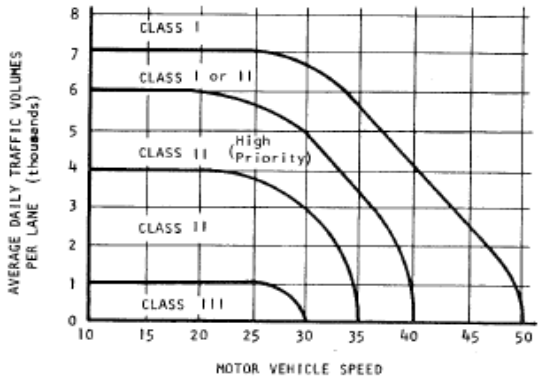


Figure 4 (above): Source: City of Madison Transportation Department 1975
Figure 5 (right): Source: City of Madison Transportation Department 1975

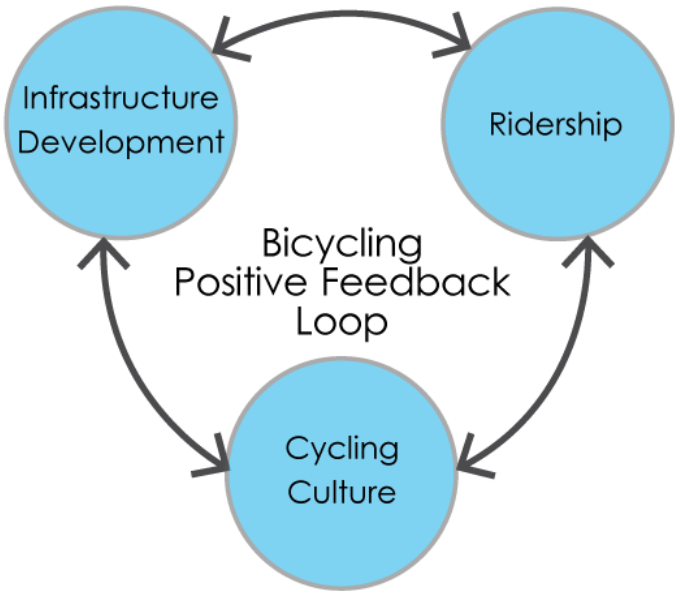


Figure 6: Source: Clementi et al.

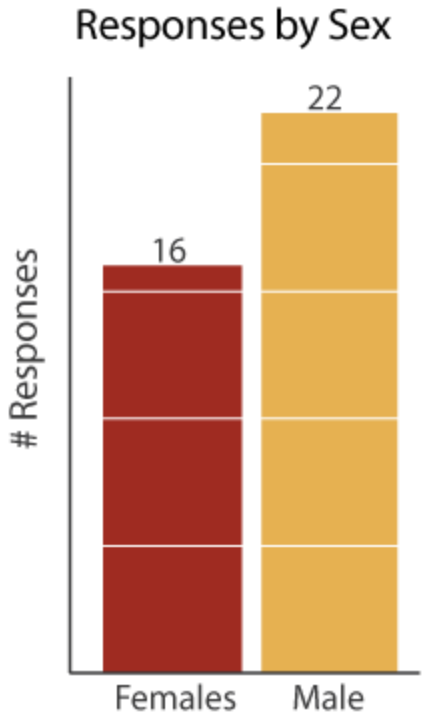


Figure 7: Source: Survey Results

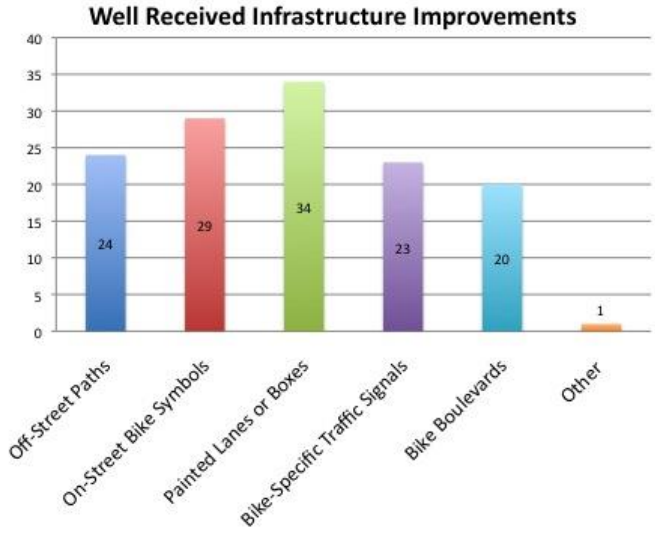


Figure 9: Source: Survey Results

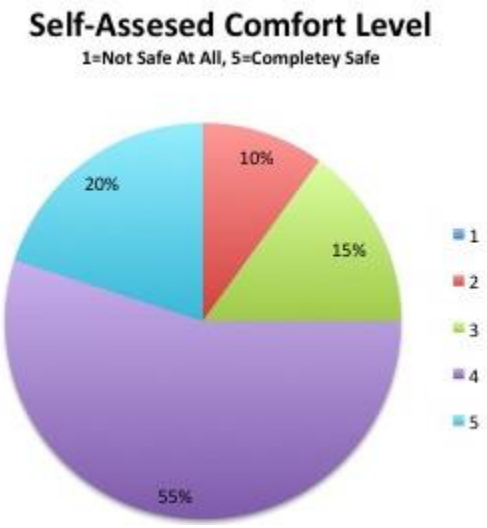


Figure 10: Source: Survey Results

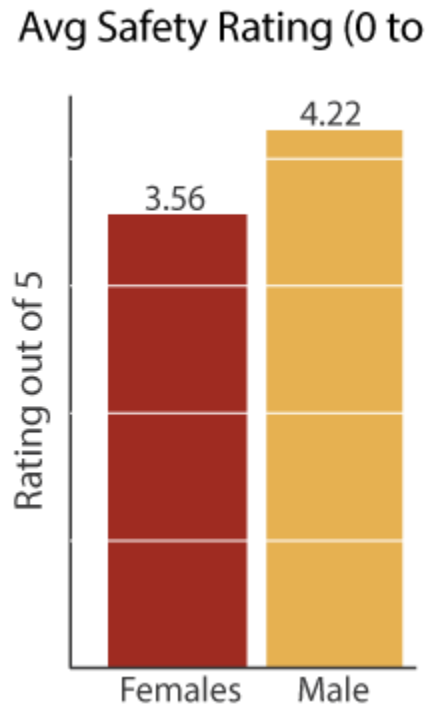


Figure 10: Source: Survey Results

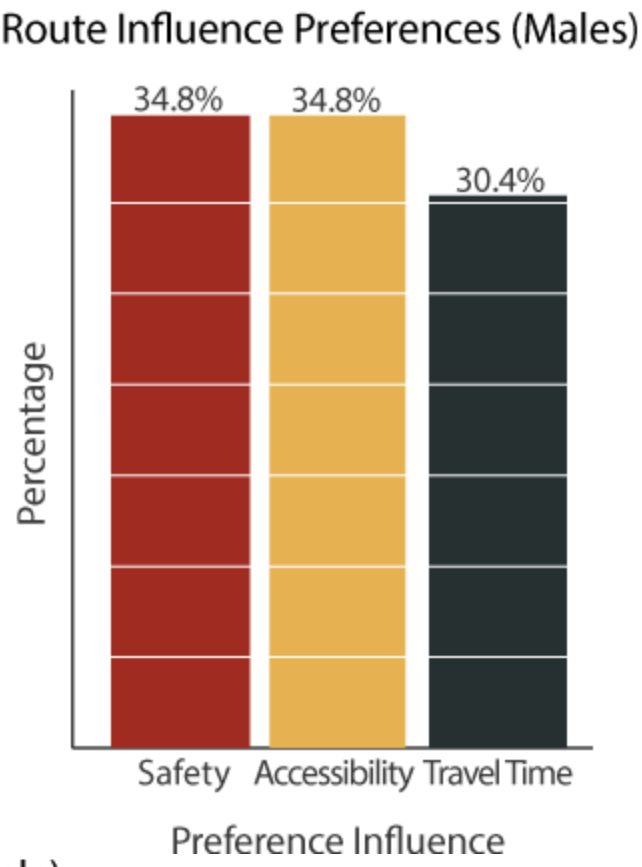


Figure 11: Source: Survey Results

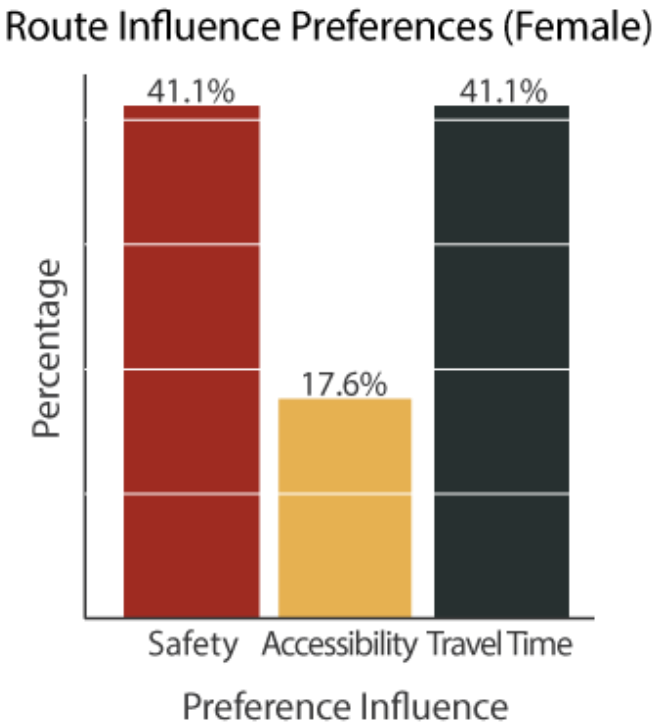


Figure 12: Source Survey Results

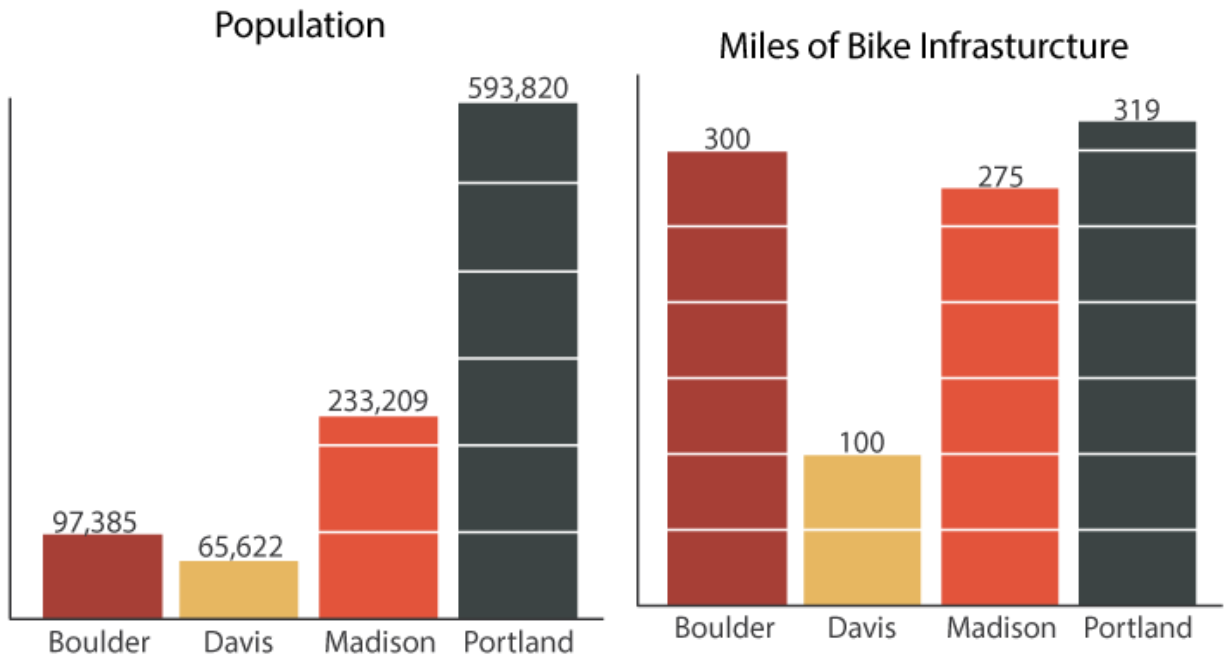


Figure 13: Source: City of Boulder, City of Davis, City of Madison and City of Portland

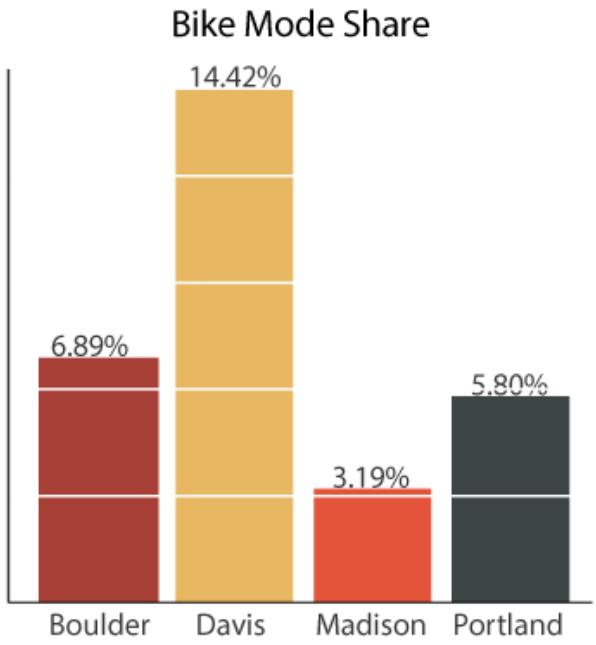


Figure 14: Source: City of Boulder, City of Davis, City of Madison and City of Portland

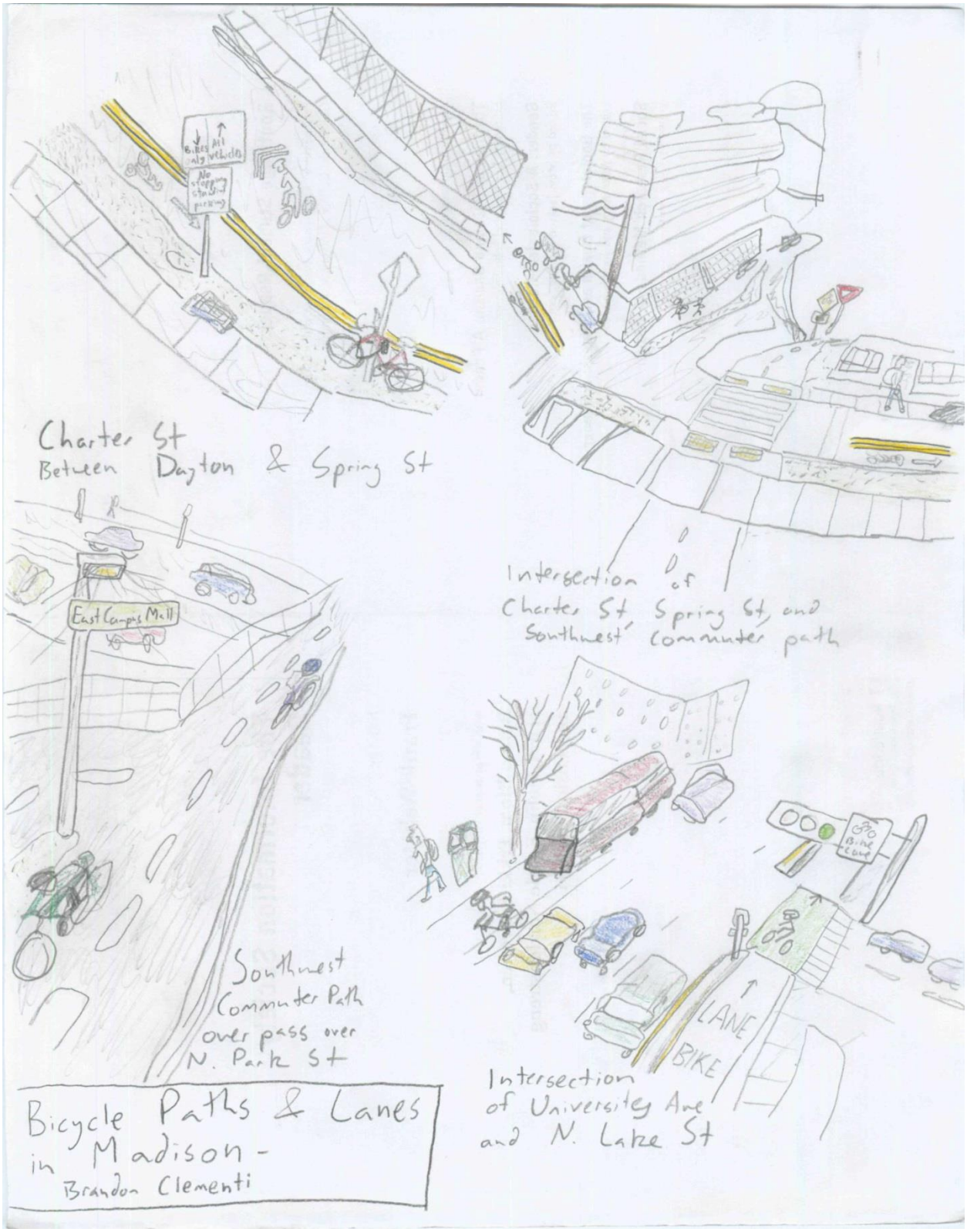
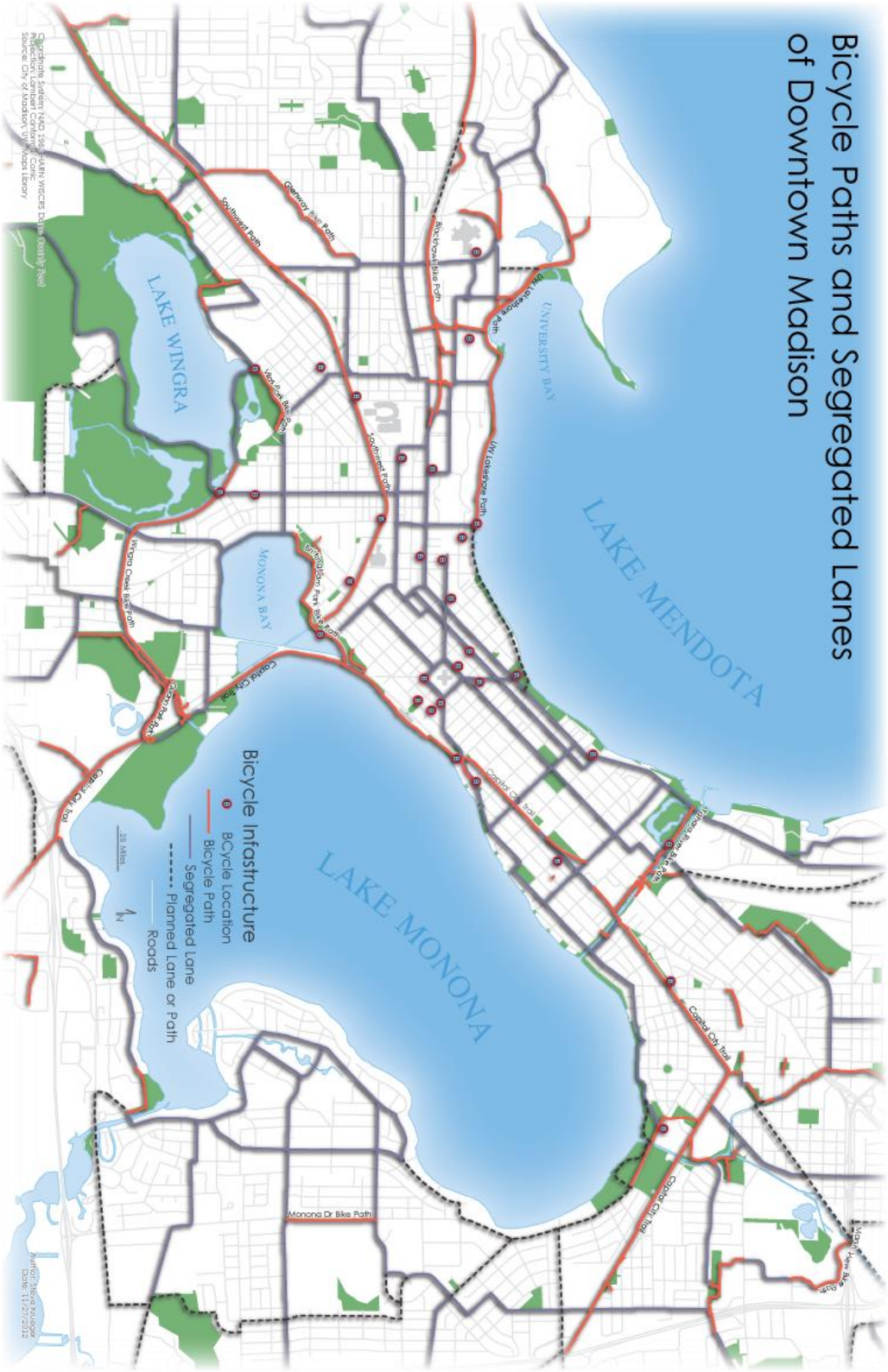


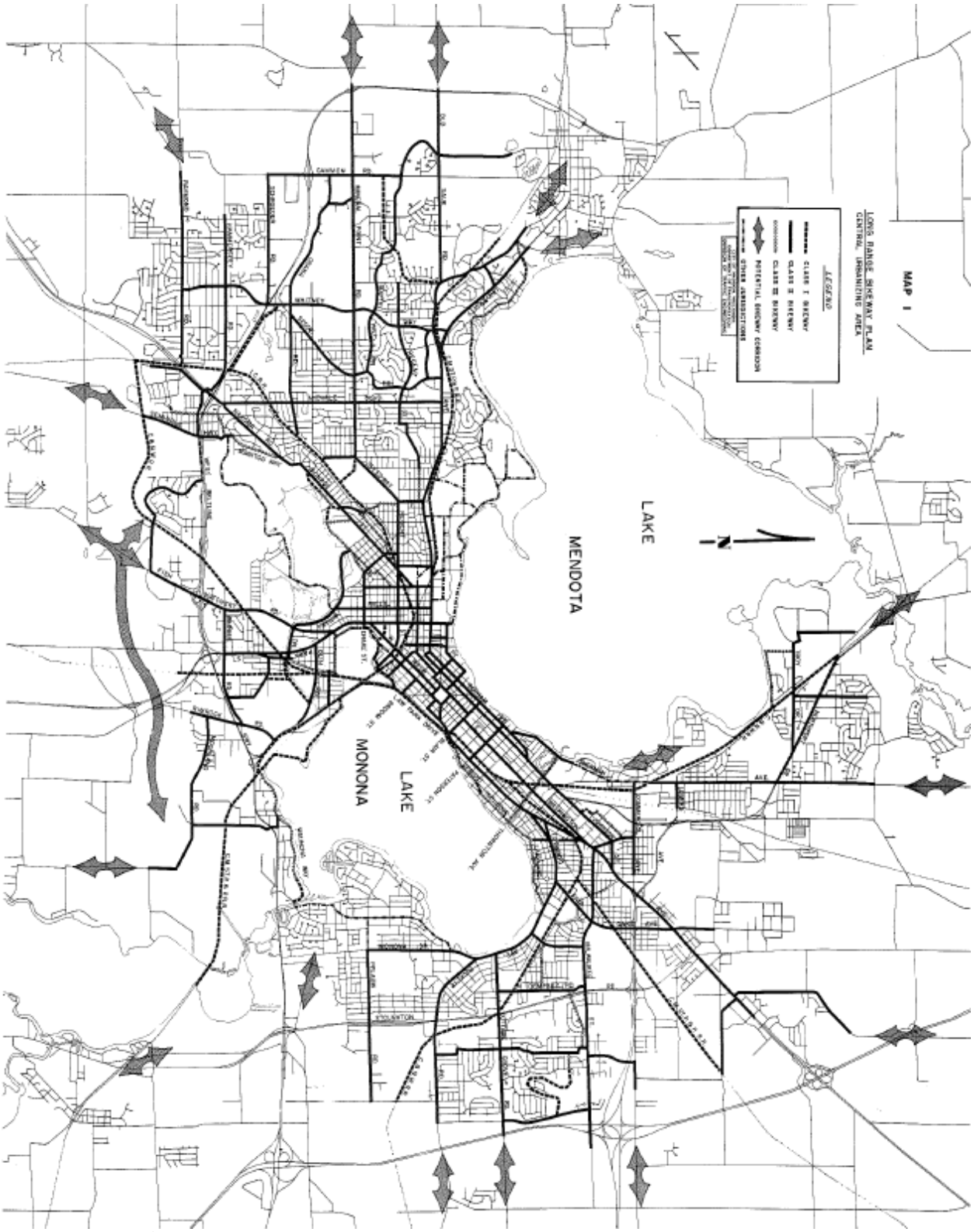
Figure 15: Created by Brandon Clementi

Maps

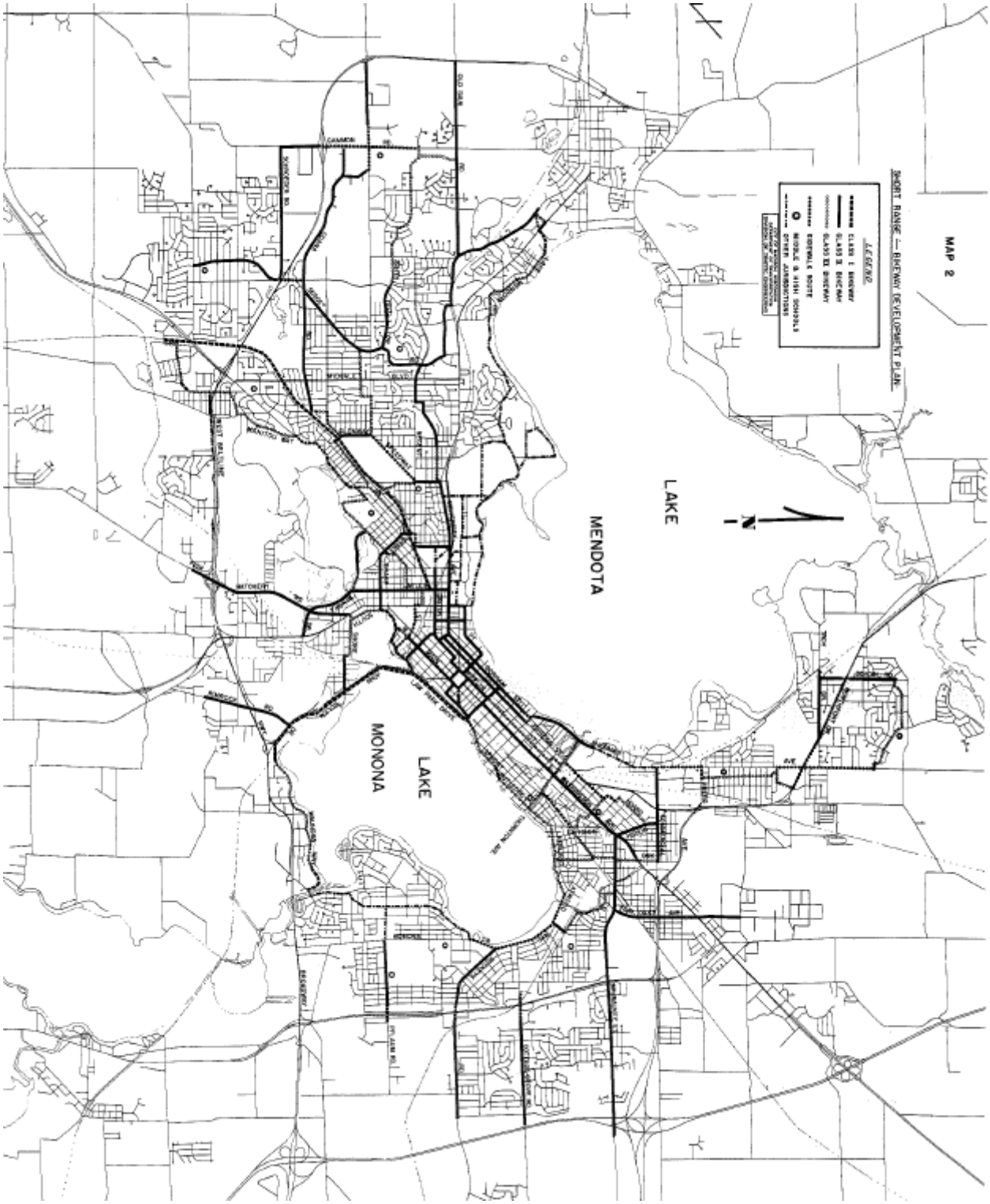


Map 1: Created by Steve Krueger Nov. 2012, Sources: City of Madison and UW-Maps Library

Map 2: Created by Steve Krueger Nov 2012,
Sources: City of Madison and UW-Maps Library



Map 3: Source: City of Madison Transportation Department, 1975



Map 4: Source: City of Madison Transportation Department 1975

Tables

Table 4. Case study cities: climate summary, 1961–1990 averages

City	Days per year with measurable rainfall	Days per year with min. temp. < 0°C	Months per year with min. avg. temp. < 0°C	Snowfall per year (cm)
New York	121	79	3	72
San Francisco	68	0	0	0
Boston	127	98	4	106
Toronto	108	not avail.	4	135
Seattle	150	19	0	17
Madison	120	161	5	112
Davis [a]	58	17	0	0

a Sacramento metropolitan area

Sources: Canadian Meteorological Centre, Environment Canada (1998); US National Oceanographic and Atmospheric Administration (1998).

Table 1: Source: Pucher et al. 1999

Design Radii

Design Speed mph	Design Radius feet
10	15
15	35
20	70
25	90
30	125

Table 2

Design Stopping Sight Distances for Bicycles

Design Speed mph	Stopping Sight Distances for Downhill Gradients of: 0% feet	5% feet	10% feet	15% feet
10	50	50	60	70
15	85	90	100	130
20	130	140	160	200
25	175	200	230	300
30	230	260	310	400

Table 3

Bikeway Surface Widths*

Number of Lanes	Minimum Width feet	Desirable Width feet
1	3.5	4.0
2	7.0	8.0

Adjustments to Basic Bikeway Widths

Condition	Additional Width, feet Minimum	Desirable
Raised curb on one side	0.5	1.0
Raised curb on both sides	1.0	2.0
Parked cars adjacent	2.0	2.0

*Surface widths do not include gutter section.

Table 2: Source: City of Madison Transportation Dept. 1975

Images

Image 1 (Steven Krueger, 11/ 2012) shows a typical span of a Madison bike path (Class I). This image shows a span of the Southwest Commuter path that passes under Spooner Street. It is important to note the attempts at the path to not only be functional but also to be aesthetically pleasing as seen by the style of the bridge.

Image 2 (Steven Krueger, 11/2012) shows an example of a bike lane (class II). This image was taken on the intersection of the SW Commuter path and Dayton Street. A bike lane is a designated lane of a road restricted to bicycle use. It seperates cyclists and motorists by a painted line, raised divider, or curb. This lane is separated by a painted line and is situated between a parking and driving lane.

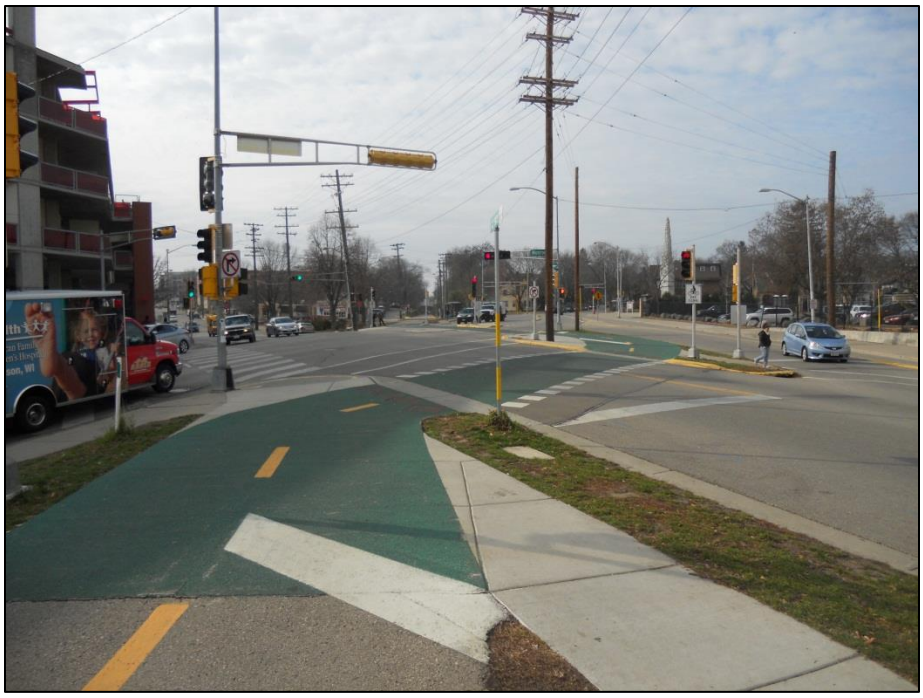


Image 3 (Steven Krueger, 11/ 2012) is another example of a bike path (class I). Here the SW Commuter path intersects with Regent St. and Monroe St. The path features bike specific traffic lights to allow for safer passage through the intersection. The light works much like a walk signal giving bicycles and parallel vehicle traffic a green light at the same time but does not allow bicycle crossing at the same time as perpendicular traffic. The green pavement and white blocks further enforce the separation of the bicycle path from the roadway.

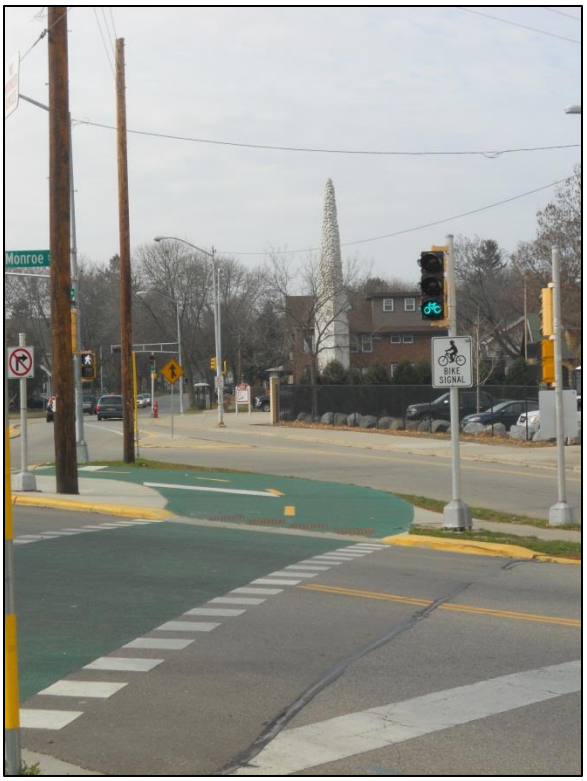


Image 4 (Steven Krueger, 11/2012) shows the working of the bicycle specific traffic light. Notice the synchronization of the light with the walk signal and the parallel traffic which has a green light one block up.

Image 5 (Steven Krueger, 11/2012) is the bicycle path (class I) traveling east down University Ave. The path travels against traffic and is separated by a raced divider. Notice the green path going through the intersection to reinforce separation of the lane from traffic.

Image 6 (Steven Krueger, 11/2012) features the bicycle path (class I) running west on University Ave. The path has three lanes of traffic to its right and a dual purpose lane designated for busses and right turns to its right.

Image 7 (Steven Krueger, 11/2012) is an example of a combination green lane and bike box on street with a designated bike lane (Class II). Here bicycles stop in front of traffic in the designated green area. This creates a clear area designated for bicycles separated from the rest of traffic. It also allows for safer left turns for bicycles.

Image 8 (Steven Krueger, 11/2012) features a bike lane (class II) along a high volume street (Park Street). The lane is separated only by a painted line.

Image 9 (Steven Krueger, 11/2012) features both a bike lane (class II) and a mixed traffic route (class III). The bike lane travels against traffic and is separated by a yellow line. The route with traffic is designated by a bicyclist and two white arrows. This signals that cyclists are allowed to take the lane and share the road with traffic. Notice the distance this symbol is given from parked vehicles to avoid door hits.

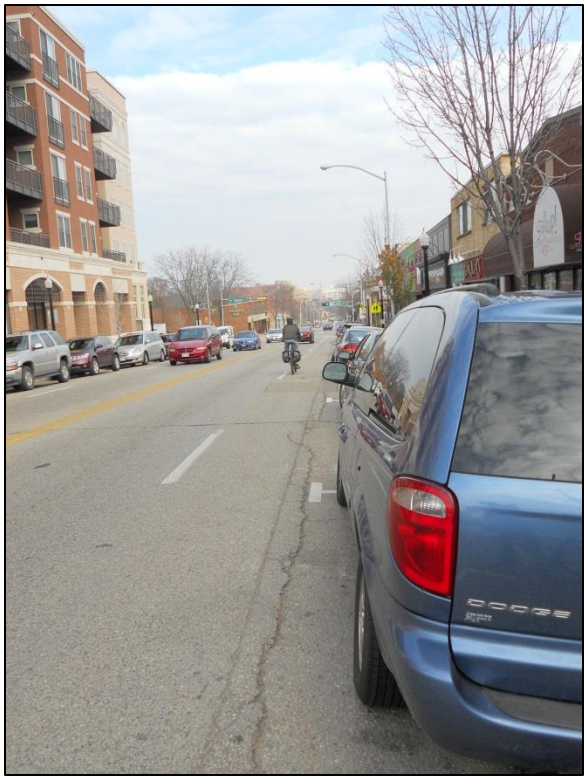


Image 10 (Steven Krueger, 11/2012) is another example of a mixed traffic route (class III). The cyclist shares the lane with running traffic during rush hour and parked traffic during off peak traffic times. Notice the distance the cyclist gives parked cars to avoid being hit by a door. This lane type has the drawback of leaving the cyclist exposed to short and possibly dangerous passing distances from passing motorists.

Image 11 (Steven Krueger, 11/2012) shows a sign illustrating the ban on cyclists riding on the sidewalk along Monroe Street. Bicycles are not allowed to be ridden on sidewalks that directly run along buildings. Cyclists can ride on sidewalks that are separated with buildings by green space such as along parts of Mineral Point Road.

Image 12 (Steven Krueger, 11/2012) presents a common problem with bike lanes designated with painted lines (class II). A motorist has illegally parked in the lane restricting bicycle traffic and potentially putting bicycle riders at risk while attempting to overtake.

Image 13 (Steven Krueger, 11/2012) is an example of a bicycle boulevard. This span of Lake Street was recently designated as a bicycle boulevard. A bike way of this type gives preference to cyclists and encourages them to use the full lane.

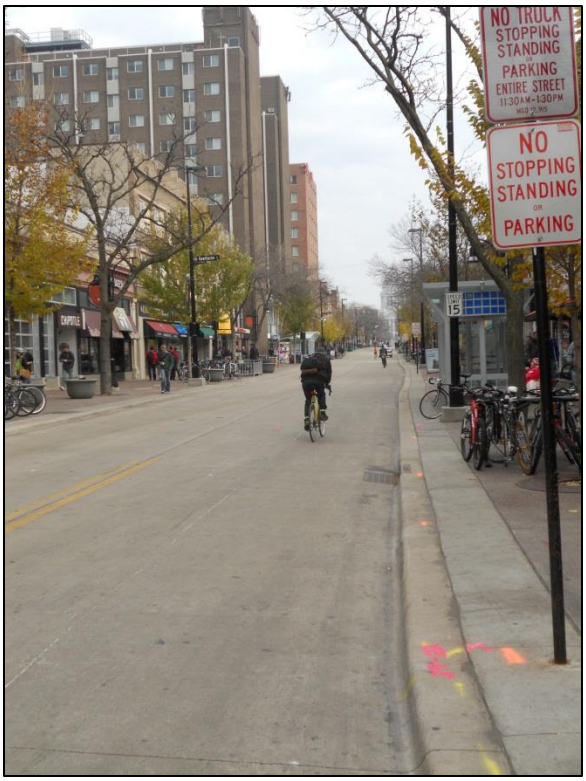


Image 14 (Steven Krueger, 11/2012): State Street is a unique situation in that the street is restricted to bicycles, busses, delivery drivers, taxis, and emergency response vehicles. This creates a street primarily used by bicycles, busses, and emergency response vehicles.

Image 15 (Steven Krueger, 11/2012) shows a cyclist going through a green light along State Street. Notice the bicycle box in front the cyclist is not painted green but is clearly designated by a white silhouette of a bicycle rider.

Image 16 (Steven Krueger, 11/2012) is a photograph of the bicycle lane along the capitol square. The square features two outside lanes of parked vehicles, one lane of traffic, and one lane designated for bicycles, busses, and right turns. Lanes are marked by white diamonds and overhead signs. A common problem experienced by cyclists here is vehicles prematurely merging into the bicycle lane for right hand turns and vehicles entirely ignoring the lane being designated for bicycles. This could be a result of poor representation of the lane for priority use of cyclists.

Image 17 (Steven Krueger, 11/2012) displays this lane in action. The cyclist is centered in the bicycle lane with vehicles to their left and a bus behind them.

Image 18 (Steven Krueger, 11/2012) is an example of a non-bikeway improvement the city has made to its infrastructure. As with drivers, cyclists, highly value parking opportunities. Increasing the availability of bicycle parking increases the ridership to an area.

Image 19 (Steven Krueger, 11/2012): Campus Mall is designated for both foot and bike traffic.

Image 20 (Steven Krueger, 11/2012): Another improvement to the Madison's infrastructure has been the implementation of the B-Cycle program. The program encourages the use of bicycles for commuting and short trips less than 30 minutes.

Appendices

Dave Cieslewicz Interview Transcript

Q1) When did you become a bicycle enthusiast?

I became an enthusiast in high school, after college in 1977 a couple of buddies and I went on a bicycle tour. Took the Amtrak to Lacrosse and we biked back in 5 or 6 days to Milwaukee.

Q2) Why is it important "for Madison to become the best city in the country for bicycling"?

It goes beyond biking, in a new economy it can create jobs anywhere. It makes the City of Madison competitive with others places such as Boston and Portland. It is part of the matrices for new business. Madison needs to be attractive to entrepreneurs.

Q3) What are the most effective strategies for creating a bicycle culture in Madison?

The most effective strategy is attempting to enrich the bicycling community with all of the 5 E's (Engineering (Infrastructure); Education; Encouragement; Enforcement; Evaluation (Planning). We will have to do all of them but the most important, I'd say about 80%, is in engineering. When you look at bicycle commuting only 25% are women, many don't ride because they don't feel safe especially with kids. The goal moving forward for Madison should be about $50 million over the next 5 years. Think about what bicyclists do for the community, everyone on a bike is not taking up space or parking, nor are they polluting. Currently madison has about 6-10% of our daily commuters using bicycles, the goal is by 2020 to have 20%. If we can get to that number it will benefit not only the city but also the motorists.

Q4)
Prelude: Most bicycle commuters in Madison are white, middle-aged, male professionals. Yet, in northern Europe, bicycling seems to be a broader cultural trait rather than one associated with a certain demographic.
Question: How do you explain this difference?

That is a good question, you are absolutely right. Ridership is about 95% male and 99% white. I spoke at a bicycle conference in April, in a room of around 500 people, there were probably about 20 females and maybe 3 African-Americans. This comes from the business perspective, where they have a blind spot towards women, blacks and hispanics. It is definitely a cultural trait, businesses cater to higher income males to sell their new bicycles. In Europe this does not seem to be the case as women riding in dresses is actually very common.

Q5) What recommendations from the Platinum Bicycling Committee Report has Madison successfully implemented?

I can't entirely remember all the recommendations in the report, I believe we made over 100. The inspiration for the report came after I toured bicycle facilities in Europe, we modeled the report after some of the things we saw. The first major success was the the implementation of the bike boxes. Although that did not come without some form of controversy. The original color was red, as opposed to the AASHTO standard green now. Nevertheless, it was called by some a "socialist plan to get people out of their cars." Still it has done a wonderful job defining cyclist space. The boxes aren't anti-car, they are pro-choice, providing more freedom and options for citizens. The best thing Madison can do moving forward is to raise parking rates or underbuild parking. In the 1970's, the university made a conscious decision to discourage driving and underbuild ramps. This helps with the two part strategy of making it easier to bike and more difficult to drive, where eventually biking wins because it is just easier. The first part, making biking easier, is not difficult you just need more money, however making driving harder is politically very difficult. When driving becomes more difficult, you hear it from everyone, even the liberals. We can't rely on idealism, the most rational policy would be a $1/gallon carbon tax on gasoline because gas prices greatly affect European biking. Only 7% of people in the United States bike because it is environmentally friendly, while 56% of bicyclists in the United States bike because it is the most practical mode of transportation

Q6) What are Madison's failures with respect to implementing the Platinum Bicycling Committee Report?

Mayor Soglin is doing a good job, he has not reversed on any of the policies we put in place. He has his limitation however, discouraging driving is politically very difficult.

Q7) What improvements would you suggest for the City of Madison moving forward with regards to bicycle policy?

With the City of Madison, I would suggest a continued investment in engineering. Once people feel safe and comfy the ridership will continue to rise. Infrastructure is about 80% of the game.

Q8) Where are the priority areas for developing bicycle infrastructure in Madison? - commercial vs/ res, high income vs low, areas of low bus service

While I would say there has been a slight priority towards higher income neighborhoods, I don't believe it has been very serious. Many of the major bicycle paths were not conscious choices, the southwest bicycle path just follows an old rail line that opened up. There has been a conscious effort to expand to less affluent areas recently though. Some projects include connecting a bridge to the downtown over the Beltline and the bicycle overpass on East Washington.

Q9) Prelude: There have been conflicts between bicyclists and other Madison residents over issues of path lighting, segregated lanes, path expansion (eg The Blackhawk path extension through Shorewood Hills), and other issues.

What are some potential challenges Madison could see in developing bicycle infrastructure?

Its a cultural issue. It is everywhere, even in Canada, biking is just not a hot button issue. A major problem is the image of bicyclists. The image is one of microbikers, young fit guys on expensive bikes who come off looking elitist and arrogant. This draws a negative reaction from the cultural conservatives who get the image of a cyclist not following the rules. We need to change the image of a bicyclist to a 35 year-old women with a kid and groceries. We need understanding on both sides, education for everyone about safety, as well as task forces to stop cyclists and issue warnings, similar to speed traps. In terms of working with other municipalities, most were pretty cooperative. Middleton was especially about it, like on Monona Drive, where there were lots of cyclists on the sidewalks but now there is a bike lane. Communities have rapidly been coming on board. In terms of sidewalks, we need to fix pinch points (an example of this is Monroe and Regent). When going against traffic it can be very dangerous. Monroe and Regent was a cheap and effective solution. Overpasses are expensive and not effective, because no one wants to walk up to cross, it is better to find a surface solution.

As for the funding, the first George Bush added enhancements to the Federal Highway Act, which allowed states to spend as they wished, and Wisconsin spent very little on bicycling, we were actually one of the worst. The bill is reauthorized every three years, and last year biking got slammed. The biggest problem is funding at both the state and federal level. Most of the funding comes from the gas tax and from property tax inside the city. However, with the recession in combination with more fuel efficient vehicles, there is less money coming in from the gas tax. The infrastructure is deteriorating and the Road Builders Association is a stronger lobbying group than the cyclists lobby. There is still a commissionary recommendation for $10 million a year for cycling in Madison, with a potential total of $20 million if the federal government matches it.

Q10) What changes that you have seen in Madison bicycling since you became a bicycle enthusiast?
-on a personal level - give us a timeline?

Perhaps the biggest change has been the debate over helmets. The current belief is that there is safety in numbers. As more people prefer to ride when helmets are not required, this means they are actually safer because drivers will be more aware and therefore will have more empathy towards bikers. They will begin to treat bikes and cars equally and there will be less accidents.

Q11) Is there anything you would like us to include in our report or that you would see as vital to know?

Not really there are only two big issues to focus on, engineering and culture. Improve those and the whole scene will improve.

Robbie Webber Interview Transcript

Q1) Tell us a little bit about yourself:

-Do you view yourself as a bicycle enthusiast? If so, why and how did you become one?

I think 'bicycle advocate' is a better term for me. I've been biking everywhere since I was a kid. Growing up, it was always the logical thing to do. When you are growing up, it's your freedom before you can drive. In high school I discovered the difficulty of parking, so I biked through high school as well. On the North Shore of Chicago, I lived in a trolley car suburb that was developed around a commuter rail before World War II. It was less than a mile to the train and about a mile to middle school and high school. I biked through college here at the UW during my undergrad years because the campus doesn't lend itself to driving or parking. After graduation, I bought a house before I bought a car. Cars and parking are expensive. It's much cheaper to bike.

-How does your current job relate to bicycling or bicycle policy making?

-What positions have you held in the past that related to bicycle use?

I worked through the Bicycle Federation for nine years. I was elected to the city council, where I acted as the 'bike and transportation geek' for six years. I currently work in the Social Sciences building for the Center on Wisconsin Strategy (COWS), where I work on making policy recommendations for a group of nineteen Department of Transportation (DOT) heads on transportation issues.

Q2) How important is it for Madison to excel in its bicycling infrastructure and policy?

I believe it's very important! Cities with good alternatives to driving will fare well in the future. There are many benefits to multimodal transportation. Bicycling has an important place within alternatives to driving. It's perfect for distances of 1-5 miles--distances that might be too far to walk, but don't need to be made by bus. Most cities are built for cars, but it's important for cities to develop a culture of embracing alternatives.

Trek's B-Cycle is a for-profit system just as taxis are, and they are a great example of filling a niche. It works well in Madison, and might be even more important in other cities. Take Washington, D.C. for example--people can take the Metro rail into the heart of the city, and then once they arrive there they can rent a bicycle to get around during their time downtown.

Q3) How does Madison's bicycle culture interact with or relate to other the bicycling culture of cities across the country and world?

In Madison, it's very normalized to bike. People are used to seeing people bike, which is part of an important feedback loop. When your friends or people around you bike, biking

is more attractive for you. When there are bike racks around, biking will seem more regular and people will feel more normal when they do it. The more bicyclists there are on the streets, the better accustomed cars are to sharing the roads with them. This makes a big impact on the safety of biking. In the last decade, biking in Portland, OR has become five times more common. During this time, the rate of crashes also significantly fell.

In typical transportation engineering where cars are the main focus, people talk about the three E's: Engineering, [law] Enforcement, and Education. When addressing walking and bicycling, there are three more E's I think should be included: encouragement, example [do people see people they respect choosing not to drive?], and environment [is it pleasant?].

Q4) Are there cities that you look to for inspiration when considering bicycle infrastructure and culture?

Different cities provide different lessons. The field of bicycle infrastructure is changing and there is a big emphasis on experimentation. People are finding that if the most timid people will feel safe in the bike lanes, it'll make a huge difference. Ridership swells in safe infrastructure. We are learning so many tactics. Outreach, for example--there are pamphlets, PSAs and courses for law enforcement on how to deal with bikers. A lot of learning is seeing other cities' successes and failures. Cities talk amongst each other, and so do non-profits, and the health community is supportive as well. It's a public health issue. Biking can be effective for fighting depression and improving public happiness.

Q5) Can you give us an example of a policy (a favorite, perhaps?) that you worked on that benefited Madison's bicycle culture/infrastructure?

Madison has a 40-year-old history of bike support through infrastructure. During the 1973 Oil Embargo, a lot of planners had alternate modes of transportation in mind. Municipalities gain money from property taxes, and more roads means less revenue, so it's better for the city to have bicycle paths. A lot of policies have changed since the beginning of Madison's implementation of bicycle paths. Now when the city builds or rebuilds major arterials and connectors, they automatically put bike paths in the plan. The city's committed to paths on old railways and greenways, and they're trying to make biking more intuitive and natural, just like they always have for driving. Engineering is the most important of the E's, but enforcement is rising as police forces start to embrace the bicycle and bicycle culture.

Q6) What do you view as the most effective strategies for creating a popular bicycle culture in a city like Madison?

Creating bicycle culture is a balance; it's a system. Its got to be all strategies--I can't pick one.

Q7) What changes have you seen in Madison bicycling since you became a bicycle enthusiast? -on a personal level - give us a timeline?

Design is improving, in part to match increased ridership. On many roads, 8-10 feet is no longer wide enough to accommodate the growing number of bikers. There are more bike racks, which is an improvement, although now sometimes they're all full. Drivers are also becoming more accustomed to bicycles.

Q8) Prelude: Most bicycle commuters in Madison are white, middle-aged, male professionals. Yet, in northern Europe, bicycling seems to be a broader cultural trait rather than one associated with a certain demographic.
Question: How do you explain this difference?

Many people assume Madison is a biking city because it's a university town, and all the students are biking. Many people assume bikers are poor, but often bikers are middle-class people who choose to bike. In Madison, female bikers are common, although they are more uncommon in other cities. 40% of the bikers in Madison might be women, as opposed to 25% in other cities. Men are bigger risk-takers, and typically don't have to transport kids and run after-work errands. When you get large protected infrastructure, womens' ridership rises.

There are two types of stereotyped bicyclists: the spandex professionals and the poor group who has to ride. That's different in Madison--you are more likely to know someone who rides but is a professional in normal clothes [as opposed to spandex]. This is causing a paradigm shift.

Q9) The mission of COWS mentions that it "promotes high road solutions to social problems".
-Question: Do you view bicycling as part of a high road solution to social problems?

COWS is mostly not working on transportation issues, although they are in related areas, many of which address urban issues. But transportation is really important for social equality. Driving is expensive. If a person needs access to a car in order to eat, repair their house, or send their kids to a good school, how can they manage if they can't afford a car? This isn't sustainable economically, environmentally, socially, or healthwise. Bikes can help mediate this problem.

Q10) Where are the priority areas for developing bicycle infrastructure in Madison? (commercial vs residential, high income vs low, areas of low bus service, etc.)

The easiest places to bike are the pre-WW2 patterned ones with small streets, small lots, and mixed use development. Many existing rail lines have been the basis for bike paths in Madison. Those extend from the heart of Madison, though, and the further from the center of the city one goes, the more difficult it is to bike. Once out of the area of small streets, speed limits increase and destinations spread out.

It's easier to retrofit downtown, and it's harder in the suburbs, where fewer people even want to bike. Madison has done a good job, though, of taking advantage of developing bike

infrastructure when they can. As you leave the center, it's harder to take bike paths to get to where you need to go--this is why we need bike lanes on big streets.

Everyone has an idea for engineering priorities and is looking for big-picture things. We need to make roads safer for those outside cars, using striping, medians, and space. New York has gotten rid of parking and has seen success taking lanes away from cars to create space for bike lanes. If I could, I would completely redo the roads and add in the paths in the 'road diet' style. For each road, design would start at the pedestrian level. Next, bike lanes would be designed. If there was leftover room, cars would be last. If I could redo University Avenue, I would add protected bike lanes and remove a lane for cars.

Q11) Is there anything you would like us to include in our report or that you would see as vital to know?

There's a lot of sharing of ideas back and forth between cities looking to improve their bicycle infrastructure. Madison is doing really well - people come here to Madison in order to see what we're doing here. There's a lot of biking done in the midwest year-round. People say it's hard to bike in winter, but once you get used to not driving, you find other ways to get around.

Madison only has 230,000 people, but it feels like it's a bigger city because it's constrained by the downtown. We have to deal with congestion. I think one of the reasons people bike is that bicycling is a logical thing to do. Students have been biking forever, and when there are only a few hundred parking spots on a campus with over 40,000 students, it's logical to use alternate modes of transportation.

Michael Barrett Interview

Q1) Tell us a little bit about yourself:

I am quite good at irritating and pushing the buttons of the powers that be. I do it on behalf of bicycling, transit and pedestrians. The people in positions of power should aim to do the right things. It comes from this vision to see society as more just. Wars, dirty air, social exclusion are all created by giant highways. The current infrastructure is discriminating towards those who can afford cars by stretching distances. This creates injustice, it works almost as the new Jim Crow Laws by excluding those who cannot afford a car. I believe around 12% of people who live in Dane County do not own a car. From a big picture, bicycling is more than just a hobby. The longer the distances the less practical cycling is. The more compact a city is the better. Just recently there has been a marriage of bicycles and planning, it has gotten planners to think about more dense cities, which are more utilitarian.

I started in 1991, at that time bicycle policy was only about cops and helmets. Only sports cyclists and kids were really riding. Growing up in Germany with an army family, I

was fired up by the bicycle infrastructure of the country. There I had complete freedom with a bicycle. We moved back to America and lived out in the suburbs and I was stranded, there was no way to travel beyond a car. Eventually I joined the Army myself and was working in Italy. Italy was dense and therefore easy to travel around, great for both biking and walking. I came to Madison for graduate school. On the night before I was visiting there was a massive snowstorm, still the next day people were biking in snow inspite of the storm and I knew this was the place for me. Still, outside of the campus, biking was not big, it was mostly a student thing.

I began going to the commissions to annoy them to make sure biking was considered. Politicians then began blocking or ignoring commission reports. We then started presenting candidates with questionnaires to see if they were friendly to cycling. Slowly we got a core of pro-bicyclists on the city council. In 2003, there was a candidate for mayor, who came out of 1,000 Friends of Wisconsin, which was very bicycle friendly. The bicycle community came out in force to get him elected. With the support of the bicycle community, Dave Cieslewicz won the election. The 33rd ward gave him the biggest lead of any ward in the city. Bicycles stretched for 2 blocks at his victory party, it became known as the "Election of the Cyclists."

Dave forced transit engineers to retrofit streets with bicycle paths and did a few things which were very good for bicycling in Madison. However after a few years, he got scared and pulled back a little. While he instituted the automatic building of bike lanes on renovated streets, I did not agree with him on the paving budget. He allowed for giant roads and intersections on the outskirts of the city. With this he alienated his supporters.

Larry Nelson, who was the head traffic engineer in the 1950's was truly the force behind Madison's bicycle culture. He was a big highway guy but he wanted to get the crazies to bike to free up the roads for suburban commuters. However to his credit, he realized a loophole which could pay for the bike paths. Much of our roads are federally subsidized, because when applying for federal money, Larry always put bicycle infrastructure first. He realized that he would still get the money for his highways, but when a city put bicycles first, they were almost always guaranteed to receive federal funds. This signaled to the Feds that Madison was serious about biking, but highways were next in line so he got them anyway. This process of prioritizing bikes allowed Madison to get more funding than the rest of the state.

I have always pushed the 3 E's of bicycling (Engineering, Education and Enforcement). However I lobbied for a 4th E, environment, in the sense that cities are more beautiful without cars, which will cause more people to want to be out biking and enjoying their surroundings.

Q2) How important is it for Madison to excel in its bicycling infrastructure and policy?

Other reasons for promoting bicycling include clean air and the economy. Dirty airs makes the EPA mad, which causes tight regulations, which lead to the closing of factories, which has already happened in Milwaukee and Chicago. Madison is just on the edge of this pollution bubble, so every bit helps. Not having a car and using public transit helps diminish the overall air pollution.

Not having a car, I am able to have a simple but fun and great life. Informal spontaneous meetings are important for making cities work, and cycling helps promote this.

Q3) Are there cities that you look to for inspiration when considering bicycle infrastructure and culture?

I have never been to Portland, but I have read up on it a lot. The rest of the country has been an anti-inspiration. In the last five years, most cities have become more bicycle friendly, for instance, Chicago did not have a single bike lane until the 1990's.

Q4) Was Madison likely to become a bike friendly city?

Many people assume that because Madison is a university town, that this is a major reason for the bicycle culture. While this has helped, it doesn't mean anything. It's not a given that the University has helped, many schools do not have a bicycle culture at all. A couple of things have helped Madison:

1. Madison is a very environmentally conscious town

2. With the state capital being so close to the university and the interconnection that occurs because of that have helped. People who go from the university to the state government have created this level of interconnection with the city. Many graduates go straight into state government and in doing so maintain their student lifestyle of biking. Where as others who go to work, say in a business park, well they don't stand a chance, they have to start driving a car again. Soglin did help produce this in the 1970's by making an agreement to keep the state offices downtown rather than moving them out to "Sprawl Land."

Lakes don't mean that downtowns have to stay constricted, just look at New Orleans. The could have put John Nolan downtown or put a causeway across one of the lakes. However, neighborhood activists blocked the extension of John Nolan.

Q5) How would you rate Soglin's job in office?

For the longest time Paul dismissed cyclists as a hobbyist thing. Now he begrudgingly accepts bicycling as part of planning. He almost cancelled Ride the Drive this summer but businesses and advocates fought back hard. Since the 1970's so much has changed, people get their drivers licences later and later. People are waiting even longer to buy a their first car.

Q6) What do you view as the most effective strategies for creating a popular bicycle culture in a city like Madison?

The most effective strategy is to just get biking into everything as much as possible. Beyond that focus on the E's. Try and make bicycling as welcoming as possible. Try to

make bicycling a part of culture, have parties, "Bike to Work Week" is a good start. Revolution bike shop is a culture center for bike geeks such as myself.

Q7) Do you believe that bicycling instills a feeling of belonging?
-Has Madison been successful in creating this feeling?

Sort of, back in the early 1990's there were two major fights. Verona Road and Allied Drive. Verona Road was isolated, there was a proposal to connect it to Williamson street with a tunnel. People freaked out crying about crime and such, its the same as the Southwest Bike Path, people are worried about the reduction in property values. However Madison has fought and produced a counter weight to NIMBYism, which is health, fun and social justice.

Q8) Where are the priority areas for developing bicycle infrastructure in Madison? - commercial vs residential, high income vs low, areas of low bus service

There are a few key links on the East Side. The bike path to Goodwin, and the overpass over East Washington have helped connect different neighborhoods, allowing the movement of those in poverty.

Q9) Is there anything you would like us to include in our report or that you would see as vital to know?

Sure, first I enjoy how the downtown is on a grid system, this allows for easy choices. Route choices draws out pedestrians and cyclists. You can go on the big road or take the scenic route. Without this, you have one choice when going places and it is not pleasant to bike or walk. It also gives parents peace of mind knowing their kids are on these grid roads, which will allow them to make safe choices.

Another is an article I wrote for the Isthmus, discussing the budget. There is the capital budget, and the operational budget. The capital budget is used to build things, while the operational budget is used to fund public services, parks and social services. They have borrowed from the operation budget to make these major roads happen, which has to be paid back overtime. The paving budget increase occurred under Mayor "Pave". Why do we keep building road to alleviate congestion, I simply do not know.

http://www.thedailypage.com/daily/article.php?article=35022

Q1) Would you say you are a bicycle enthusiast?

Yes, I grew up a recreational biker when I was younger, my family had one car and a bike was my only regular form of transportation. I biked to elementary school but it became uncool in high school so I stopped. I became a transportation biker in 1992 and when I started there was no bicycle infrastructure on the North Side. Now the entire route has bicycle lanes, even wide curb lanes. Currently I am a full-time biker, good for 6 miles in the summer. I believe you do not learn to ride a bike until you are doing it for transit.

-What positions have you held in the past that related to bicycle use?

I was a chief planning engineer in the Wisconsin Department of Transportation since 1991. After retiring in 2005 I have worked on the Madison Platinum Bicycle committee, heading up the subcommittee on bicycle infrastructure. Also, I am on the Wisconsin Bicycle Federation board and worked on the State Street renewal project, were I pushed for more bike parking and infrastructure.
While I was working at the Wisconsin Department of Transportation, I promoted multi-modal transportation. When I started, biking was a new concept. In the city of Madison, up until 1999, the only major bike paths were on campus, and even those were retrofits. As we all know, more bikers generally equals more safety. So we forced the city to put lanes in other places, including Milwaukee street. When I went to school here, University was a two-way street and Johnson did not have street signals, it was completely unsafe for pedestrians and bikers and the students, including my wife and I, protested on Johnson street to get signals put in.

Q2) What do you view as the most effective strategies for creating a bicycle culture in Madison?

One man is especially responsible for creating a bicycle culture in Madison, that was Larry Nelson. He pushed for street crossings and bicycle paths by attempting to make it mainstream, so that politicians would recognize it as a popular policy and then would ignore particular neighbors.

Q3) Of the 5 E's of promoting bicycle use (Engineering, Education, Encouragement, Enforcement, and Evaluation (Planning)), is there one (or a combination) that has been particularly instrumental for the City of Madison's bicycle culture?

Engineering is the most important part of getting people to ride bikes in the city. In the rebuilding project of Park Street from Regent Street to West Washington Avenue, it was refit from a four-lane road to a two-lane road with bike lanes. It was a move away from the 1970s' mentality of always needing more roads. There are added opportunities of funding

for bike paths that are also part of the trade-off.

In the 1970's, there were essentially no bike lanes on roads. We started implementing bike lanes in the 1990's and we got good at it in the last decade. I promoted putting sidewalks in suburbs, which was contentious. We had to keep our plans from the townships because they would become upset about the idea of things they were not used to or didn't realize they needed. This would turn around after towns saw infrastructure being built up in neighboring towns. For instance, The DOT paid for bike lanes in Baraboo after Baraboo resisted having to pay for lanes they didn't want. Other cities contacted the DOT after this was made public to see if they could get the DOT to pay for similar lanes.

Q4) What are Madison's failures or missteps with respect to bicyclist infrastructure?

I don't think we have had missteps, but we could have done more. If you can get the city engineer to buy into biking, then you are in. If you can control the roads, that's key.

Q5) What role have Madison's roads and highways played in Madison's bicycle culture?

Roads and streets interact in a very important way with bike culture. Many bike paths were pioneered as parallels to highways. Such was the case with Highway 12. Town roads can be cyclist's haven in Wisconsin. On the outer loop around the square, in a more urban setting, bicycles are becoming an important and prioritized part of the dynamic of the road. There's a lot of thought in transportation planning about making changes to make bicycling practices more legal.

Q6) Can you give us an example of a policy (a favorite, perhaps?) that you worked on that affected Madison's bicycle culture/infrastructure?

A favorite? Not really. I just liked planning and being involved in keeping an eye on bicycle issues.

Q7) Do you feel there are priority areas for developing bicycle infrastructure in Madison? - commercial vs residential, high income vs low, areas of low bus service

A bike arterial system would be helpful. Planning would be difficult, though. Some paths in the system would be on roads, while others would be paths. This would help neighborhood planning by making areas interconnected. Denmark only has yield signs and a few stop signs - implementing this would help biking in Madison. I've been pushing for the a bill in

Wisconsin that would allow bikers to legally yield at stop signs.

Q8) Some people argue that Madison was geographically predetermined to have a successful bicycle culture, in part due to the size constrictions of the isthmus.

-Do you believe that the location of the city has helped promote its bicycle culture?

I don't think geographic predetermination has been an issue for developing Madison's downtown. The layout of the isthmus area hurt the grid system, but helped bike paths. Grid systems are generally the best for biking, because bicyclists are able to choose the most preferable routes to them instead of having to use certain roads without flexibility. The University helped the development of the engineering, but the culture had to be created as well.

Q9) Is there anything you would like us to include in our report or that you would see as vital to know?

Are highways evil? Sometimes you have to make highways better so other cars do not get off and hurt bicycle infrastructure. There's a lot of car management techniques that help bicycles. Sunken highways remove traffic from bikeways, for example, and one-lane roundabouts are good.

We've seen many changes that are improving things for bicyclists. Things that were once quirks of state laws are being fixed. Paraplegics can now legally bike using hand-pedaled bikes, and cars can now legally pass slow-moving vehicles, including bikes.

Bikers should have choices in selecting transportation just as cars do. We have to get over these mind blocks. I've been involved with the planning commission, the ped-motorist committee, and the state street redesign commission, for example. On every issue, it's important to go to meetings and speak up for issues and tell them questions that should be passed to the cities and their planners.

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