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Implications of Madison's Cycling Policies for a Heterogeneous Population

Abstract

With the emerging importance of bicycling as a sustainable form of transportation, coupled with its health benefits enhancing quality of life, understanding the ways bicycle policy is being addressed by cities is crucial to its healthy growth. The City of Madison, Wisconsin adopted the Mayor's Platinum Bicycling Committee's Report, "Making Madison the Best Place in the Country to Bicycle" in 2008. The report laid out a number of specific goals with the intent of increasing Madison's bike mode share. This report provided a tangible benchmark from which to assess the city's strategies to meet this goal. Interviews with local activists and a survey of existing riders provided data from a number of perspectives in order to help us analyze the cities bike policies. Four key themes emerged during our assessment - infrastructure, education, safety and community support. Our research has found that Madison has accommodated bicycles in the built environment, but in order to make it the best city in the country a paradigm shift will need to happen changing the way bicycle polices are composed, but also redefining the relationship between Madison's bike community and the larger community as a whole.

(Keywords: Madison, Bicycle, education, safety, infrastructure, community support)

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1. Introduction

The city of Madison, Wisconsin persists as one of the most prominent cities for bicycling in the United States. The importance of this status continues to emerge as the United States attempts to address the issues of sustainable transportation as well as public health issues such as obesity, and improving environmental quality. Bicycling has been championed as a solution to these and other problems that have been creeping to forefront of public policy in the country. City governments have directed their focus to keystone bicycling cities across the globe for ideas on how to implement changes at home. However, American car culture and auto-dependency has presented a barrier to adopting successful international models due to its affect upon city planning and resource allocation. Madison is often revered as one of the best examples of a bicycle-friendly city within the United States due to its efforts to reorganize its city structure away from this fossil fuel dependent system

In recent years the Madison city government has made a concerted effort to capitalize on this reputation, pouring resources into the expansion and improvement of the city's bicycle infrastructure, programs, events and industry in order to continue its reign near the top. In 2008 Madison's Common Council adopted a report entitled "Making Madison the Best Place in the Country to Bicycle" produced by then Mayor Dave Cieslewicz's Platinum Bicycling Committee hereby referred to as the Platinum Report. The report outlined further plans to improve the city for bicycling. Three years later we can see many of its plans implemented on the streets of Madison. However, the relationship between writing the Platinum Report increasing the proportion of bicyclers is far from direct. In order for the Madison to continue its growth in bicycle use, its policy makers must adopt policies that address the unique conditions that have shaped its current bike culture. Our project goal is to critically analyze and evaluate the city of

Madison's Platinum Report on the implementation of their goals to promote bicycling. Our research led us to organize the goals into four prominent themes: infrastructure, education, safety, and community support, to better understand what elements of the Platinum Report have been well addressed, and which still need improvement. Through our research we have found that Madison has done the easy parts to propagate bicycling, but in order to make it the best city in the country a substantial shift will need to happen. This will require not only changing the way bicycle polices are composed, but also changing the dynamics between the relationship of Madison's bicycle community and the larger community.

2. Literature Review

Bicycling is an inherently geographic activity. Its ability to transport people across the landscape in a unique way marks it as a subject of interest in a vast array of geographic literature (Krizek & Stonebraker 2010; McCarthy 2011; Moudon et. al 2005, Pucher et. al. 1997, 2007, 2010, 2011; Walljasper 2008). The subset of the literature we focused our research on attempts to study the ways in which conditions for bicycling can be improved in the built environment, ultimately attempting to determine their effect on increasing the bicycle mode share (a contested term used to quantify the percentage of residents using bicycles for transportation). This is a growing field of interest, fueled by the search for ways to transition into a transportation system less dependent on fossil fuels. Since there is no prescription for a high bicycle mode share, some articles examine the impacts of specific bicycling infrastructure or programs. These studies attempt to more directly assess the consequences of a particular feature using a variety of methods, the most common being surveys or GIS data. More of our research focused on articles which examine cities which have cultivated high levels of bicycle mode share. This case study

approach attempts to synthesize the social, built and natural environmental factors that interact to form the particular conditions present in each location. Evaluating data of these two types is especially pertinent to our study, as Madison is attempting to pit itself against other US cities as the best city for bicycling in the country. This process inevitably includes attempts to draw from the successes of European bicycle havens; cities like Copenhagen and Amsterdam, whose populations have adopted bicycling as a common form of transportation with bicycle mode shares more than tripling those of Madison. Understanding the success of various bicycle facilities and bicycle-friendly cities is only the first step to applying the lessons to Madison.

While this type of knowledge may seem mobile enough for its results to be effectively duplicated from city to city, the larger context in which it has been implemented must be considered. This presents a paradox for researchers and policy makers alike. If too many place-specific details are included in the study, the applicability may be limited. However, if the research neglects facility-specific details, the generality of the data may lose much of the importance of how the facilities actually work within the community. By dividing our research into these two categories, we were able to better evaluate the ways in which the Platinum Report attempts to understand, plan for, and ultimately implement policies and infrastructure to increase the share of bicycling in Madison.

2.1 Specific Impact Approach

When delving into the literature surrounding the impacts of public policy and infrastructure on bicycling, one category of research addressed specific examples of policy and infrastructure which could be analyzed in depth. However, it became apparent that these studies often failed to draw comprehensive conclusions. In those cases when the authors were able to draw useful conclusions, the results were not easily applicable to Madison. These studies often

involved heavily quantitative data, relying on surveys and GIS as evidence for their claims. Without further investigations into the findings, these reports can only offer a cursory explanation that does not address the core of the issues examined.

A prime example of this type of approach is an article examining factors that influence bicycling patterns in King County, Washington. The study utilized a method which combines surveys and GIS data to determine whether respondents' choice to bicycle was influenced by supportive bicycle infrastructure (Mouden et al 2005: 259). There was, however, some correlation between the choice to bicycle and the proximity of respondents to trails. Results like these require more explanation and contextualization if they are to be implemented in Madison's plan.

A second article that illustrates a different factor using this same approach is an article focused on the interaction between utilitarian bicyclists and drivers in Charleston, South Carolina. According to the study, this relationship was more important to bikers than the physical infrastructure on the roads to their feelings of safety while cycling. Through a series of interviews, the participants found an insider/outsider framework present in the relationship. The bicyclists were made to feel like outsiders, whose use of the road was bizarre and unacceptable. (McCarthy 2011: 1450). Although specific aspects are important phenomenon to consider in understanding certain policy, it is also relevant to consider each specific place and why such a strong relationship exists here and not in other locations.

Bicycles share the road with motorists, but can typically maintain the maneuverability of pedestrians, and thus play a complex role in the transportation network. Bicyclists perceive the urban environment differently than the other, more established identities on the road. One solution is to provide road space for all forms of transportation (cars, buses, bicycles and

pedestrians) through the implementation of "Complete Streets" (Forsyth and Krizek 2011: 532) which can be retroactively established (and have been established) on many (of Madison's) existing thoroughfares. "Complete Streets" offer equal and safe access to all users of the road including pedestrians, private automobiles, public transportation, and bicycles. Most successful bicycle cities give priority to bikers in the city core; therefore the existing transportation network needs to be considered. In some situations, this involves giving priority over the motorists of a city. In an attempt to incorporate more "Complete Streets" in Minneapolis, Minnesota, four lane roads were reduced to only three in order to make space for bicycle and pedestrian facilities (Walljasper 2008: 22). An undertaking such as this is a monumental decision which effectively changes the transportation habits of every player involved. However, as stated by Forsyth and Krizek, there is not a significant amount of research exploring how the built environment is perceived by a bicyclist. In a way, this makes every new implementation worth research and analysis to determine its effectiveness; in accordance with the abductive research methods (Gomez and Jones).

2.2 Case Study Approach

The general goal of the case studies is to evaluate a broad range of current bicycling trends, working to understand the complex relationship between the social, built, and natural environmental factors that interact to form the particular conditions of a location. Each of the articles intentionally picked cities to compare important factors such as climate, topography, governmental policy initiatives, city density, popular modes of transportation, large visibility events, safety, education, and history. The case studies provide many examples of how these factors can be integrated cohesively into existing networks and highlight which of the

aforementioned factors will have stronger impacts when one considers the existing culture and geography of the city.

The central claim of this theme is that no individual factor can explain the bicycling culture in any certain place. Sometimes natural factors in some areas, such as the hot and dry climate, flat topography, and density of Davis, California (Pucher 1999: 6.7), are completely contradicted by places like Seattle, Washington, which has a cool, rainy climate, hilly topography, and a much more spread out built environment. The authors who researched in this style emphasize the importance of uniqueness, and searched for factors that give the city a unique identity that the bike community could grow around. This approach fits into a post-structuralist theoretical framework by acknowledging this uniqueness and also the importance of power structures in shaping the public's perceived identity (Gomez 2010: 19). A factor that all of the articles shared was the importance of utilitarian bicycling, which is biking with a purpose other than recreation. There is a strong correlation between bicycling prominence in cities where the bike mode share is relatively high; however, the factors that create a high degree of utilitarian bicycling vary from city to city (Bonham 2010; 1). Throughout the articles, the most important factors leading to utilitarian bicycling are: policy initiative of the local government, safety and education of youth in public schools, interconnectedness with city infrastructure, bicycling accommodations, and bicyclists' acceptance by drivers. Often a positive result of the previous list is the demotion of the reliance upon cars in the city center (Pucher 2010: 63-65). By treating each city as an individual, rather than prescribing a uniform solution, it is possible to bring out the essence of the cities' identity. Having the bicycling culture address the needs and desires of each cities' specific citizens is the common thread between all cities with keystone, marketable bike cultures (Krizek 2010: 163).

These articles are structured in a practical manner. The author presents a city and analyzes what is perceived as positive and negative about that specific place's bicycling culture. Once the author has highlighted the many positive and negative aspects of a certain place he moves onto another place and repeats the process. Through this juxtaposition, light is shed upon the various relationships that exist, and many possible solutions become apparent as cities struggle through very similar problems (Winters 2011; 1). This research design process is known as abduction, and is a never ending guess where the problem continues to unfold as more research is conducted and more information is learned (Gomez 2010: 37). However, in the North American Bicycling Renaissance article the author uses an inductive bottom-up approach because in his conclusion he creates a list of factors that should be considered in America, and explains why these factors are the only things to consider when working to create a successful bicycling culture. The weakness of case-studies is that they make the assumption that the cities are comparable, because this approach already argues the sensitivity of individual cities. This theme also largely ignores the complex financial differentiations between cities, which makes each of their abilities to implement policy very different.

The strengths of case studies is the compare and contrast method between cities. The cities that were chosen in all circumstances represented a range in climates, topography, density, geography and culture. In the European Bicycling, the cities differed in historic bicycle culture, density, accommodation for cars, degree of policy initiative, and education in public schools of children (Buehler 2007: 2). In the Australian comparison article, the differences were largely focused on policy, and topography of the two cities (Pucher 2010: 2). Articles depicting case studies provided a high degree of both qualitative and quantitative analysis. The quantitative data showed direct proof of factors that changed in the city over time, such as bike mode share,

demographics of bike use, travel distance, and direct infrastructure improvements and additions. In the Australian comparison article there was a high degree of information from the government transportation bureau. The qualitative data was largely taken from professional interviews. In the European bicycling article many policy makers of cities were interviewed so specific information was provided such as goals and visions of cities, as well as specific problems that the city planners struggled with while attempting to grow the bicycle culture (Buehler 2007: 6). The qualitative data was an important part of the research of this theme because it was a way to talk to the expert and help to understand the relationship between a utopian theory and the reality of instituting a policy. It was a strength to use the abductive reasoning style, because more and more cities could be compared which allowed for more relationship understanding, and more ideas of factors for comparisons. The strongest aspect to this theme is the acknowledgment that fitting bicycling into the city's existing culture is more important than fitting different cities to a preexisting and repeatable structure of bicycling culture (Pucher 1999: 6.2). The European bicycling article was successful to use the European bicycle culture as a measuring stick. The author's made sure to include a German city in order to allow for an accurate comparison to America because both places have degree of complexity within individual bike features. For example public transportation varies widely from city to city and with this case study approach it is easy to overlook the details of public transportation which can give a false representation of what is possible. It is also broad to the degree that it does not assess the feasibility of implementing many of the policies that they prescribe for cities, and does not mention any of the struggles that have come up while trying to implement innovative policy ideas. The authors create a phantom definition of what factors like "transportation" mean and begin to make assumptions, before they attempt to correctly define transportation themselves. Although it was

successful to use Europe as a model, the authors largely over estimated the degree to which policy implementation is repeatable from country to country. They fail to acknowledge the difficulty American politics have to avoid special interest influence, and transportation an extremely wealthy industry in America. This theme also under estimates the cultural boundaries and differences, by assuming after a few changes in policy Americans will be biking everywhere like the Dutch. Some of the most important aspects, which the articles included within this theme underestimate, are the importance of urban planning, mixed uses, and designed density in promoting bicycle use. These factors are very difficult and time consuming for our cities to implement retroactively and may significantly limit the degree to which American cities can model themselves after the Europeans. This theme also failed to provide any type of timetable for any of these policies to be applied, provided no economic information to compare and contrast from city to city, and did not consider the public support of these projects when being implemented, putting the feasibility of this method into question.

3. Research Methods

Not surprisingly, the efforts put forth by the city of Madison to promote bicycling are not recognized uniformly by the city's population. With such a varied group of players involved, it is difficult to comprehend the multitude of views and opinions which relate to the subject. Pedestrians, cyclists, and motorists all have issues with the system which are distinctly different from the others.

One additional complication is that at any moment, one who is considered a member of one group now can easily be considered a member of another group later. For example,

everyone is a pedestrian at some point of the day. This ever-changing dynamic creates a complex mixture of opinions spread throughout the population.

By triangulating the surveys, interviews, and participatory observation we were able to form a more comprehensive view of the current and historical aspects of bicycling culture in Madison.

3.1 Survey Process

Since the entire population of Madison over the age of 16 can easily be considered a motorist, pedestrian, bicyclist, etc., it is difficult to designate the target population of our surveys as the entire population of the city. It is common knowledge that "[if] you intend to use your survey results to make general statements about a population, then you will need to construct a random sample in which each member of the population has an equal chance of being included within the survey," (Gomez and Jones 2010: 196). It was not logistically feasible for the members of this group to give every member of the city an equal chance to participate. As a result the target population was specified. We sought out both UW-Madison students and bike shop workers because they would be familiar with the policies/infrastructure of bicycling in the city. It was assumed that students would be less knowledgeable and experienced with biking in Madison, but they are a significant portion of the population that must be accounted for. Each year a new flock of students arrives, and they can be expected to act similarly upon arrival. Bike shop workers, conversely, are assumed to be very learned, and will represent those bicyclists whose own personal goals may be reflected in the Platinum Report. These two samples were not only chosen because of their relative experience, but also because of the following reasons: low survey response rate, volunteer bias, and convenience of participants.

According to Gomez and Jones, mail in surveys typically receive a low response rate (Gomez 2010, 197). This led us to believe that respondents are not typically willing to respond to a survey, even when it is convenient for them. Those uninterested in a topic are usually not as willing to participate in surveys related to the topic. Those people are also not expected to be as knowledgeable about the issue, and are therefore considered to be a less valuable resource. As stated before, any member of the city is potentially a bicyclist, so hopefully the issue of a volunteer bias is not as drastic as initially feared. The most effective way to find respondents was to seek them out at various places throughout the city. Madison is already a popular bicycling city, and so they are a convenient group to confront and ask for their opinions.

As stated before, one target population was students, so a large portion of our student surveys were distributed to members of our class, Geography 565, and other acquaintances of our group. In addition, we canvased State Street, a thouroughfare running across downtown restricted to pedestrian, bicycle and bus use and asked random bikers at bike racks to participate. This was rather successful because we were seeking out respondents, rather than passively waiting for them. Our group also targeted bicycle store employees because they would be familiar with Madison as a bicycling city. Stores were very convenient because the workers were willing to take a number of surveys, and distribute them to their employees before we returned to collect them. Regardless of the process, the goal of finding participants was not a daunting task. Many of Madison's residents have experience biking, and therefore have an opinion to be considered, but we sought out two distinct samples.

The major objective of this survey was to examine how bicyclists experience the on-going process of making Madison the most bicycle-friendly city in America. The Platinum Report is not a well-known document among the general population or even among bicyclists;

our survey respondents are more likely to have noticed changes in the built environment, rather than have an existing knowledge of such a bureaucratic report. For this reason, our survey questions (Appendix B) addressed some of the specific goals of the report, and asked respondents to rate the success of various elements concerning bicycling in Madison. A five-point Likert scale was provided for respondents to do so. Data of this nature attempts to quantify a qualitative opinion.

The data was organized using a shared spreadsheet in which the basic functions (sum, median, mode, and average) were used to visualize simple patterns. The survey responses were not always complete, so it was difficult to perform a formal statistical analysis. By observing the patterns of responses and their correlation with our interviews we could theoretically verify the progress of the Platinum Report's goals.

3.2 Interview Process

In addition to surveying the members of Madison's biking community, it is also of the utmost importance to be in contact with those more directly involved with the planning and direction of the city's cycling programs. The surveying process is effective as far as obtaining comparable answers between differing demographics and mapping out the relevant data. However, they are somewhat limited in scope as they do not allow for adaptation and personal interaction. Interviews fulfill this role as a good portion of information is obtained from spur of the moment questions and subsequent answers. A good interview is designed to be a stimulating conversation intended to provoke further sources of information. With this knowledge in mind, it is be important to follow some general guidelines when seeking and conducting interviews.

Unlike a survey, interviews must be planned out ahead of time and conducting them on the street or in the middle of an event would be impractical. Instead, a quieter venue should be

chosen ahead of time and the interview's format should be made clear, including the subject matter, any issues of confidentiality, and an estimated time so that the interviewee does not have their time infringed upon. "[...] Because the choice of location can impact conversations, *where* and *when* interviews and focus groups take place is an important consideration. For example, if you interview housewives in their homes in the evening, what you will be told about the division of labor in the household might be quite different from what you would learn talking to these subjects [...] when their husbands are at work (Gomez 2010; 201)." The ideal place in which to conduct an interview would be an office-style setting in which privacy is assured. The goal is for both parties to be comfortable in the meeting place established without pressure to censor or alter responses due to present company. A set of questions has been drawn out to serve as a backbone to the dynamic nature of the interview. It is imperative that these are worded clearly and in an open-ended manner to stimulate conversation in an intended direction. Compound questions are difficult to answer and allow for omission of important information. They should not make the subject feel as though their views are being attacked but the "why" should be handled in a manner that denotes interest in the material being discussed as this will lead to a better discourse between the target and conductor of the interview. The more naturally conversational the interview is, the easier it will be to direct transitions from topic to topic and prevent the subject from straying too far from the topic. Follow up questions show that the interviewer is both attentive and interested, encouraging the participant to be more open to fully answering questions. This will also make the subject easier to observe as far as his/her reaction to certain questions or any particular excitement noted during an answer. These provide weight to the quotes and represent what is really important to the interviewee and therefore the research

project as a whole. Appendix B contains the list of interview questions (and follow-up questions) that we asked in each interview.

As mentioned before, the primary targets for this portion of first party research were mostly leaders of bike movements within Madison or bikers with a significant presence in the Madison area from whom we hoped "[...] to learn how certain practices, experiences, knowledges or institutions work - or at least, how your participants [talked] about these things working (Gomez 2010; 199)." The interviewing process therefore gains its importance from the fluidity of discourse allowed by its more conversational structure as opposed to the rigidity of the survey. While it would be impractical to apply such a method to a large group of people, the importance of the generally better informed participants allows for obtaining more specialized and detailed about events and policies. For this project this will be especially crucial in the evaluation of the application of Madison's policies and programs meant to enhance the city's status as a center for bicycling and earn it platinum status to attract a larger bicycling demographic in the future.

4. Results

The information that we collected reveals the multidimensional nature of the Madison's bicycling success. Throughout these sections on infrastructure, education, safety, and community our interviewees and survey respondents shed light on to what has been successful and what still needs more attention.

4.1 Infrastructure

Our three interviewees each had differing opinions on how well the Platinum report supports the bicycling community through its creation of infrastructure. Scott Simonsen, a

bicycle courier for Jimmy John's, was pleased with the downtown Madison grid pattern, and says that it is the best bicycling environment he has ever ridden in (Simonsen, 2011). He claims that it provides numerous routes to any destination, allowing the biker to pick the most desired streets to ride on. The grid layout also makes it very difficult to get lost because major streets provide continuous landmarks in which the biker will eventually run into. Mike Barrett, Sustainable Planning Advocate, also elaborated on the importance of the grid in his interview, and made it very evident that he believed the grid system is the most fundamentally important element in order to increase the city's 'bike-ability'. He explained how most of Madison built before the 1960's was done so in a consistent grid design. However, for a period of time after the 1960's, the city planners and developers implemented a series of winding cul-de-sacs and subdivisions that interrupted the intuitive flow of the grid system. Barrett explained how in this flawed era of urban planning, the streets rarely intersect each other, and create hazards for bicyclists (Barrett, 2011). Although they were designed to lighten through-traffic and make neighborhoods quieter, the cul-de-sac design principle traps residents from easily walking or biking long distances. Because the streets do not line up like a simple grid, the user is often faced with no options except to bike along busy roads and turn across traffic in order to reach the next through street into the next subdivision. This dangerous feat deters many residents from choosing to bike and also makes parents uneasy about letting their children bike without supervision (Barrett, 2011). This is an important issue according to Barrett because children need to start bicycling at a young age so they can grow to become confident bikers. If children see the value of bicycling as a mode of transportation, they will continue throughout their lives, creating a balance in the transportation network. The grid design of downtown Madison is orderly for all transportation users.

Webber critiqued the infrastructure changes suggested in the Platinum Report saying that they are a bit vague and provide nothing tied to a specific location. However, for something really significant to happen there needs to be more explicit planning and there needs to be lists of specific changes they wish to make. Webber commented on Madison's geography as a key factor allowing bicycling to flourish. She strongly emphasized the fact that Madison's downtown operates like a large city, despite being squeezed into a small space on the Isthmus. She noted how the two densely populated areas of the city, downtown and the UW campus, are very close to each other which makes automobile transportation tough (Webber 2011). However, this congestion strengthens the opportunity for bikers because it eliminates many problems such as parking, traffic congestion, space, money, and directness of a route. With so many people existing in such a small space, the city's working density feels higher than its living density, further strengthening the opportunity for bikes. She believes the city does a good job retrofitting bike lanes when repaving roads. She agrees with Barrett on the fact that it's much easier to perform this retrofitting on the old part of the city that is built as a grid, and harder in cul-de-sac style neighborhoods. Webber believes that the city has done the easy part of the implementing infrastructure adaptations, but we are now faced with the more difficult task of making connections where there previously were none. She explained how it is hard to create connections after a place has been built and norms have been accepted. She gave us an example issue of a bike path being built near a house, commenting on how 'no one wants to tolerate the construction of adding a new bike path near their house, especially because some believe it will bring a constant influx of unwanted people into their personal space. However, many homeowners near bike paths often benefit from their location, and use its proximity as a selling point for the home,' (Webber, 2011).

Simonsen and many of our survey respondents were very complimentary of the bicycle connectivity throughout the city. Many of them raved about the "Capital City Trail" and also commented on its aesthetic beauty in response to question 17 of our survey (Appendix B). He also talked about how there are bike trails that meet in Madison, and run across the entire state. However, he did highlight conflict points, saying that overall Madison could have a higher percentage of "Complete Streets" with a bike lane or boulevard for safer bicycling. Specifically, he talked about the bus lane on University Avenue being a dangerous place to bike because the biker is confined to a bike lane between traffic and the bus lane. This anecdote is an understandable fear, but it actually conflicts with some of our survey data. Simonsen also ranted about how State Street is surprisingly hazardous and unorganized. State Street is a pedestrian mall located in the heart of the Madison downtown area, linking the UW campus to the capitol building. It is closed to personal automobiles, and is known for being a crowded economic and social core for the city. Scott told us how biking on State Street during a normal busy day is dangerous as pedestrians hop off the curb without looking. He recalled one instance when a girl was standing with a group of friends and happened to step one foot off the curb as he was biking to make a delivery. They collided and both were tossed to the ground. He admits that he now rides slower and more cautiously, but says that he still has many uncertain moments. As a result, he would like to see more order in one of the most important transportation bicycling corridors in the city, State Street (Simonsen 2011).

Webber also outlined some other conflict points in the city, highlighting the places in town where there are not many bicycle accommodations, and hence not many bikers. She described an example area like this over by West Towne Mall where the roads are multiple lanes, the speed limit is higher, and people are less conditioned to see bikers in that neighborhood

(Webber 2011). This type of environment is hard to navigate for the biker, and they are forced to take risks because the infrastructure was not built with bikers in mind. This causes a negative feedback because if bikers do not feel comfortable, they may make a mistake, and motorists could conclude that bicycling is too dangerous and is not meant for the road. She stated that "more butts on bikes" creates a safer environment for bikers and drivers alike because it familiarizes everyone with alternative modes of transportation.

Webber, Barrett, and Simonsen were all complimentary of the new bike boxes that the city has implemented directly from the platinum report at conflict-prone intersections. Simonsen explains how he not only feels very safe, but feels as if he has his own spot on the road which demands him respect from the other modes of transportation. He explained how the boxes make him feel more important on the road and noticed how motorists are beginning to give him more attention. Many of our respondents felt similarly, with most modes of transportation scoring highly in terms of bicyclists' respect (Appendix E). The only one which scored lowly was mopeds as they demonstrated a lack of awareness. Barrett also elaborated on the topic of respect during his interview by explaining that bike boxes are a great "marketing technique" that raises awareness of bicyclists and legitimizes their place in the transportation network. 'By designating space specific space for bikers, the city actively legitimizes the presence of bicycles on the roads (Webber 2011).' Although Webber supports bike boxes, she noticed that many drivers and bikers are still unfamiliar with them, and she thinks that people need to be taught how to use this new road feature in order to be most effective (Webber 2011). When Barrett was asked if he thought the city should continue spending money and space to create more bike boxes he responded positively and recalled how more "Complete Streets" would also be a major improvement to the bike environment. "Complete Streets" would help address a need to make new, uncomfortable

bikers begin to feel more confident. The goal of this would be to ultimately increase bicycle mode share and create a space for bicycles amongst the other transportation options on the road (Barrett 2011).

Webber acknowledged the importance of linking transportation types, supporting the idea that people should have different transportation options. This can be seen in Madison by pointing out the bike racks on city buses (Webber 2011). This allows a person to alternate between different modes of transportation, facilitating easier movement through the city. Webber's view is interesting because it does not favor one particular type of transportation over the other; it just acknowledges that each has its own strengths and weaknesses. She added that many people do not know how to use the bus bike racks and thinks they would be much more affective if the city was able to better educate the public. She noted that one benefit of supporting multiple forms of transportation is that a bicycle infrastructure projects are significantly cheaper than those pertaining to automobiles (Webber 2011). Recently in downtown they have been changing parallel parking stations for one car into bike parking for 10-15 bikers. Webber comments that by converting prime, downtown parking for one car, many more citizens can be accommodated. Webber comments that every time she passes renovations like these they are always full, hinting at the idea that maybe we should add more (Webber 2011).

Overall, a general consensus is that while Madison has made important strides in the improvement of bike infrastructure, there is still much to be accomplished. A more specific plan should be laid out to create transparency with the future plans of the Platinum report for bicyclists. The survey results, while positive towards most applications of infrastructure, also showed a concern for safety and so should become a point of emphasis for the future (Figure 2, Appendix E). Through the increase of infrastructure implementation such as bike boxes,

bicyclists will become more visible on the road, more anticipated, and more accepted as a part of the everyday road traffic within Madison.

4.2 Education

Education is one of the themes that could use the most improvement in Madison's biking culture. Currently there is too much reliance upon the citizen to actively seek out education information instead of having this information presented to them. There is an email list that has been in existence for about 20 years (Webber 2011). The email list talks about issues, schedules meetings, and has a large viewer following that includes many city officials so they can stay up to date on the contemporary bike ideas. However, the drawback to this list is that one must be a subscriber, and therefore the list fails, to reach out beyond the current bike community requiring the everyday person to be proactive about biking. This is not as effective of a technique as presenting information to the whole city (Webber 2011). The idea of presentation was addressed in survey question #11. Respondents were given the opportunity to rate their knowledge of the laws on the road. All of the measures of central tendency, illustrated in Table 3, state that most of our respondents are confident in their knowledge. However, based on our interview with Barrett, this is hard to believe because even officers - the expected experts - fail to familiarize themselves with the bicycle laws. The overconfident survey results explain that most of the bicyclists surveyed answered that they were confident in their actions on the road, and are not at all likely to seek out additional information regarding safe bicycling in Madison. This lack of education is supported by one of the avid bikers that we interviewed, Scott Simonsen, showed very little embarrassment about his run-ins with the law, and his concept of biking education may shed light onto his attitude. When asked about the quality and prominence of Madison's bike education he replied that Madison does not do a great job with educating their community

on bike laws. He feels that there is a "learn as you go" mentality, which means people are presented with dangerous situations before they are able to experience them and learn from them. This presents a very dangerous learning environment for the city, and it needs to be addressed further otherwise bicyclists will not feel responsible for their actions and not feel at fault for wrong decisions (Simonsen 2011).

Traffic accidents and police tickets are a horrible way to educate our public. Webber explains how she is part of a group of volunteers and law enforcement that go out on the streets at night and stop bikers who are driving illegally without lights. Instead of handing out tickets however, they outfit the illegal biker with a light during the stop and give them pamphlets with biking information. Although she acknowledges that this is a time and money intensive education technique, she feels it is more successful than writing a ticket and collecting the small amount of money as penalty (Webber 2011).

Survey question #13 asked for respondents to circle all of the resources (pamphlets, articles, courses/workshops, bike Madison website and street signs) that have been presented to them promoting safe bicycling. This information is summarized in Table 4. In all cases, a larger proportion of bike shop workers were familiar with educational resources. The reason for this can be explained by a lack of promotion (Barrett, Simonsen, Webber, 2011). First, pamphlets (brochures) are typically found at locations relevant to their topic, i.e. bike stores. The canvassing tactics of Madison need significant improvement, and this is a perfect example (Webber 2011). The student population bikes frequently due to its cost and convenience on the UW campus. This is a perfect group which could be targeted for safe bicycling pamphlets, yet it appears that they are not. Articles are not often read by either group, but again, this requires that one is looking in the correct place in order to find an article relevant to bicycling. Students are

probably not seeking out this information, so it is not as likely that they will ever come across it. Similarly, the bike Madison website is hardly referenced by students (even less so than pamphlets). There is much more information available online, but unless one is searching for it, the information is worthless. Workshops and courses related to bicycling is an even more extreme example of this concept because not only must one seek out the information, they must dedicate their time (and potentially money) in order to utilize them. Not surprisingly, street signs were the most frequently recognized safe bicycling resource because one is expected to read them while using the roads. Ironically, not all respondents stated they are familiar with street signs, which leads us to question two things. Either there was a misunderstanding as to what the question was asking, or bikers in Madison do not pay close attention to street signs. Regardless, it is clear that Madison's city planners should not expect its biking population to be incredibly well-informed, so appropriate actions must be taken.

There are good examples of education programs in other cities that Madison can model itself after. Portland, Oregon has an example of a great bike education program. In Portland, bike advocates break the city into sections of about 20,000 people. They then target everyone in the section by sending them lots of biking information such as trip planning help, senior assistance, events, stores, contact numbers, and maps in order to present all possible information directly to the biker making it as easy as possible for them. This education acts as encouragement, and works at a neighborhood level, influencing the neighborhood to come together through biking, and in some cases even create their own neighborhood biking social events (Webber 2011).

The education program is extremely important especially because every year there are new individuals entering the biking community and they need to be brought up to speed with the

rules, regulations, and norms. Newcomers often don't know the dangers, and have a false perception of the biking environment. Not only is this a safety issue, but teaching the bike laws to beginners could often would create a more accepting and friendly bike experience for all (Barrett 2011). "We Are All Mechanics" is a popular program known as WAAM, where bikers are taught how to perform basic bicycle maintenance such as changing flat tires, fixing gears, and replacing brakes (Barrett, Webber 2011).

Not only is it important for children and newcomers to become educated, but it is important for our law enforcement to be as educated as possible as well. The Department of Transportation has a course called "Enforcement for Bicycle Safety" and officers are not required to take this course, and judges ought to take the course as well. He cited two recent incidents in which the court found bicyclists to be in the wrong (Barrett 2011). This supports the idea that education of the law needs significant improvement, by the public and the authorities how enforce the law. Currently, Madison's education and encouragement is aimed at the employer level, and as a result, residents that do not work for a large firm will not be exposed to as much information (Webber 2011). Out of all the firms, the University of Wisconsin - Madison does a relatively good job, which could be a factor as to why so many residents who work on campus also ride their bikes to work.

Another great education idea is to offer a two-hour seminar on biking in traffic at least once a month (Webber 2011). The groups can be organized at the neighborhood scale, and by paying as a group the lessons could be cheap. There are other simple, but proven effective methods such as running a bike tip column in the newspaper, and having a larger presence at the Farmer's Market as an educational and visual boosterism resource (Webber 2011). To become the best bicycling city in the nation, Madison must improve its safety. The current problem with

the education is that potential bikers should not have to be proactive to learn about biking. They should be presented with the information first, so they are familiar with biking before they make the choice whether to bike or not (Webber 2011). No only does Madison need to educate their community on safety, but also on the overall benefits of the bicycling community as well. For example, how biking paths are a positive infrastructure item to support because they increase property value.

4.3 Safety

Our survey results show that our participants believe Madison has a medium level of safety on the roads. Safety was addressed in question #14, and the median score for Traffic Safety was 3. This shows that there is some insecurity when it comes to safety. This insecurity is very important to understand, because Webber estimated that '~2% of the biking community will bike no matter how safe, ~6% is cautious but usually willing to bike if it is not dangerous, about ~70% of people need to feel safe in order to bike consistently, and then ~10% she claimed may never bike due to a variety of personal reasons'. These statistics show how important it is to create a safe environment in order to perpetuate the bike culture, because the largest group by far (70%) needs to feel safe in order to bike. Simonsen possessed an interesting view on the safety of the Madison bike experience, which points to the fact that safety needs improvement. He described the hectic job of bicycle courier, literally exclaiming, "sometimes you just get hit (Simonsen 2011)!" This shows that many riders view the environment as hazardous, but they accept it by making themselves responsible for their own safety. Although Madison has relatively better safety than other cities, that does not mean that Madison should become complacent and not continue to strive for an even safer environment than it has now to get more people of all ages and types out on bikes. It is important to acknowledge that defensive driving

does not always necessarily work with buses, cabs, and jaywalkers being unique obstacles. These views on the safety of the bike environment show that more education is needed in order to create a safer environment.

Over the past 20 years the relationship between all modes of transportation has strengthend, and that this is a result of people expecting and accepting bicyclists in their daily travels. There is an idea of "safety in numbers", where more biker on the road create a safer environment for everyone (Barrett 2011). When bikers ride legally, motorists are more likely to see them and less likely to hit them (Webber 2011). For example, if a bicyclist rides in the middle of the street instead of the gutter along the curb they become more prominent in the road system avoiding many potential disasters such as parked cars and pedestrians. Many of the problems on the streets today between bicyclists and motorists are caused by poor decision making, which Barrett coined as "deliberate jackassery (Barrett 2011)."

The city has a new initiative to put on-duty police officers on bicycles on the road. This policy will give law enforcement a new perspective, and propagates the visual aspect of bicycles being a form of bicycle boosterism. Simonsen supports the presence on the road and thinks that it is an important factor to create a friendlier environment on the roads. Simonsen willingly admitted to a story of when he failed to yield at a stop sign and was pulled over. He was presented with the option to take a class or lose the points on his driver's license. Simonsen rarely drives a car and the traffic safety class was significantly more expensive than the ticket. He opted for the demerit points and kept biking as a bicycle courier to pay for the ticket. Despite Simonsen's prior enforcement experiences with the law, he views it as a necessary component in order to perpetuate a pleasant environment on the streets; however, there is always room for improvement (Simonsen 2011).

Another conclusion from our survey is that many bikers are uneducated about safe biking in Madison in general. This strongly correlates with the comments made by Webber and Barrett because it appears information must be proactively sought out by the individual, instead it must be presented directly to all residents.

Bike shop workers are least familiar with this resource as well, probably because they are already so involved in the bicycling community. Another interesting point is the story mentioned earlier about Simonsen. He had the opportunity to take a class after being ticketed on his bicycle, but he chose not to. All of this information supports the fact that many bikers learn by doing (Simonsen 2011). The city has already implemented many infrastructure developments to encourage bicycling, but if it wants to be the best city, it must educate the users as well.

4.4 Community Support

Ultimately, the Platinum Report is meant to "get more butts on bikes" (Webber 2011), because in order to be the best bicycling city in the country, the community needs to be dedicated. Although Webber acknowledged that 'writing the report organized the thoughts of those in charge and acted as a form of boosterism' (Webber 2011), it is still the responsibility of the citizenry to ultimately fulfill the goals of the Platinum Report. Of the goals listed in the report (Appendix A), the second, third, fourth, fifth, seventh, and tenth goals are all related to a strong, involved community. For this reason, it is very important to explore the aspects of raising community support.

The most salient issue is the respect felt amongst road users. It is common knowledge that bikers in Madison do not abide by the laws of the road which treat them most similarly to an automobile. Due to their relative maneuverability, bikes can be ridden in a variety of situations.

This leads to 'conflict among different modes of transportation as they compete for the same space,' (Webber 2011). The versatility of bicycles often allows them to win out in such battles and this creates tension on the road. When asked about the relationship between motorists, bicyclists, and pedestrians, Simonsen admitted with a smile, "we pretty much hate each other" (2011). This is an unfortunate result because the Platinum Report states that mutual respect is more appropriate for the best bicycling city in America.

In order to investigate the equality of respect, Question #16 of our survey (Appendix B), addressed the topic directly. The question allowed for respondents to rank road users on the same Likert scale as the other questions, from 1 to 5. A specific standardization scheme was developed for question's data, and that is explained in Appendix E. Based on the median values of each sample, we were able to conclude that mutual respect does not exist. This information is summarized in Figure 1 (Appendix F). Our survey declared that bus drivers were the most respected road user; other bikers followed them; motorists and pedestrians were both ranked average to below average; and moped riders were clearly the most disrespected among our sample. Some interesting conclusions can be drawn from these results.

Bus drivers are probably so highly regarded because they are conditioned to anticipating bike-intense areas as mentioned in Section 5.1 Infrastructure. Other bikers ranked highly, but it is important to consider the potential volunteer bias due to our sample demographic. Motorists and pedestrians shared similar, average rankings, perhaps due to our respondents' personal experience as both. And lastly, moped riders were labeled the most frustrating, probably due to their unique capabilities on the road. This short list of hypotheses hardly represents the multitude of factors which determine whether mutual respect is present on the road, so the simplest conclusion is that respect can always be improved.

Ideally, all transportation types would abide by all the rules of the road at all times, 'because no one motorist, biker, or pedestrian thinks the laws they are break are the important laws' (Webber 2011). This leads to the deterioration of respect amongst road users. Her solution was to 'emphasize education of the traffic laws' (Webber 2011), and this can be done in many ways. For example, bicycle safety could be taught intensively to elementary school children or tested more intensively in driver's education. But in order for these decisions to be made, the community must be in strong support of bicycling.

One factor, which reflects Madison's community support, is the B-Cycle program. This innovative resource, supported by Trek Bicycling Company, 'puts a bicycle in the possession of nearly every Madison or visitor,' (Simonsen 2011). This communicates the idea to the public that Madison is a bike friendly city. This is an example of a "public-private partnership" which is described in the 7th goal of the Platinum Report (Appendix A).

What is so intriguing about community support is the variety of methods that can be used to promote bicycling as a social norm. When we asked Simonsen (2011) what infrastructure was lacking in Madison, he responded "a velodrome". A velodrome is a banked bicycle race track that is made gives riders the ability to reach speeds unsafe anywhere else. This would be an expensive endeavor, but implementing elements that promote bicycling as visually, spatially, and financially important is a very fundamental factor in order to demand more attention and respect in the future. Although a velodrome may not be the most direct investment to expand the bicycle community, it represents a potential "public-private partnership" (Platinum Report 2008: 2) whose importance is undervalued by the person looking for instant impacts.

The most obvious form of community support is community sponsored events, like Ride the Drive event, which limits John Nolan Drive exclusively to the use of bicyclists. Barrett

(2011) stated that ‘opportunities like this show what the world would be like if bikes ruled the road’. It sparks the imagination of the bikers, and allows them to all gather in once place and interact. This is also provides the opportunity for uncomfortable bikers to learn in a controlled environment.

Some less well-known events are the Full Moon Bike Ride and the Urban Warrior Alley Cat which was organized by Scott Simonsen. The Full Moon Bike Ride is unique because a large group of people ride through the city together and effectively block car traffic. This is a very strong method to raise bicycling awareness because it impacts many road users if they ever encounter it because it is such an obvious, visual display of bike support.

The Urban Warrior Alley Cat is a less popular event, involves a group of bicyclists travelling to various locations in the city and performing tasks in a high intensity scavenger hunt. One’s participation in the even required an intimate knowledge of the city and its bike-friendly routes. Some local businesses sponsored the race held this autumn, which acted as a simple way to raise publicity for these bicycle-supportive businesses.

Lastly, Simonsen also described Madison’s bike polo club and he exclaimed “the world of biking is so vast, and there are so many types of bikes and people who bike” (Simonsen 2011). There are many ways in which one can ride a bike, but they all have access to the road. This implies that any active support of the bicycling community is necessary for the best bicycling city in the country.

The last example of community support is “Bike to Work Week” which was explained to us by Webber (2011). She described it as the catalyst ‘which urges individuals to stop procrastinating and participate with their co-workers. Bikers are not just members of a fringe culture, anyone can do it,’ (Webber 2011). For this reason community support is not limited to

just existing bicyclists. All members of the community need to at least recognize biking as one of the many transportation types.

A powerful measurement for determining the bike-friendliness of a city is bicycle mode share, the percent of trips that the city makes via bicycle. This information was sought after by survey question #7, but it became clear is an incredibly difficult question to answer. Our interviews alluded to this issue because they explained how Bicycle Mode Share is measured by the US Census. When the census is distributed in March, one question asks something to the effect of, 'what was your primary mode of transportation to work in the past couple months?' (Barrett & Webber, 2011). Our survey encountered a different problem because it is difficult for a person to correctly estimate the number of trips they make via bicycle because the definition of a trip is easily misunderstood. A good level of bicycle mode share would be 10%, or put another way, 10% of all the total trips made by the population would be by bicycle. This number is difficult to compare with the data we collected because our surveys targeted bikers rather than the entire population of Madison. The averages of our sub-samples are far greater than 10% and when interpreting the compiled survey data, the results are probably not accurate. The results of this survey question are displayed in Table 2 (Appendix F). These data show such a varied range of responses and it is our belief that most people simply estimate this value poorly, leading to unhelpful results.

When broken down into the level of the sub-samples mentioned before, the data is a more revealing. Clearly, students' use of bicycles as a mode of transportation is less than that of bike shop workers. The data relevant to students are definitely flawed due to outliers. The mode and median show that most students do not bicycle very often; however, the average is skewed. As for bike shop workers, these results are less erratic. It is reasonable that people of this group bike

more simply because of the resources available to them. These factors give them a very distinct advantage over the majority of the population and it is possible that their estimations are not far off from the truth. This, however, is still not particularly revealing about the city of Madison as a whole because bike shop workers make up an incredibly small percentage of the city's population. As a result, definitive conclusions are best not made on this small sample of 20 people. What is obvious, is that measuring bicycle mode share is an incredibly daunting task that requires more time and data than was collected by our group.

The last and most important indicator of community support is the desire to become the best biking city in the nation. This is the goal of the Platinum Report, so Question #19 (Appendix B) address this issue by asking respondents to rate their desire for Madison to achieve this goal. By separating the data into two separate samples, some simple patterns emerged for the sake of comparison; bike shop workers would benefit from this outcome, but students may not experience much progress accomplished during their relatively brief stay on campus. UW-Madison students who have only just arrived on campus are not expected to immediately hop on a bike and learn their way around a new city, despite the downtown grid. The streets in Madison are all names, rather than numbers, so the grid is not necessarily intuitive, and the most efficient bike routes are even less obvious. To further complicate things, students are expected to spend most of their time on campus (which runs east to west), but the nearby downtown area runs northeast to southwest with even more one-ways and angled streets. Student bikers are not nearly as dedicated to the city of Madison, and may not care what happens in Madison once they graduate. Bike shop workers, on the other hand, make their livelihoods from a strong bicycling community. If Madison becomes the best bicycling city in the country, these respondents will profit as more residents introduce more money to the bicycling industry. Table 2 summarizes the

measurements of central tendency concerning the importance of being the best for both students and bike shop workers.

Based on the results of our survey, students seem relatively indifferent toward the city's goal, but bike shop workers are obviously very involved. When viewing these data as they relates to all respondents surveyed, the conclusion is understandably less extreme. Because the sample is of bikers in general, the mode reflects that most bikers do think it is extremely important that Madison becomes the best, however, the median shows that this overall desire is split between the two aforementioned groups. The average, which is more susceptible to outliers, alludes to the fact that those not involved in the bike community may not be as receptive to the idea. As stated earlier, to become the best bicycling city in the United States, the entire community must be supportive, and our research concludes even among existing bicyclists, the desire to be the best is not a shared opinion.

5. Future Research

Due to the time and resource restraints upon this project, it is readily apparent that further research would yield more intensive results. As the time frame for this project was limited to less than half a year, there were significant sacrifices that had to be made. For one, the sample population was less than 100 individuals who shared similar locales. The majority of surveys took place on State Street, the UW Campus, and in local bike shops. While these public areas are certainly accessible to all, they represent a very small area of Madison as a whole. The survey demographics were further skewed in favor of young adult student riders who were predominately male. With a sample size this small, it is hard to say whether this is actually a trend within Madison as a whole or merely a statistical anomaly. Again, the close proximity of

the streets used for surveying would possibly explain away the large percentage of student responders. Ideally, the survey would have encompassed areas of Madison further away from campus to gain a wider perspective. An older age group would be able to provide more of a comparison concerning Madison's bicycling past and the current ongoing changes in bicycling infrastructure. Some students were simply unaware of any of the changes implemented by the Platinum report whereas a long-time resident would have a larger frame of reference. There were a few instances of participants having the same strength of opinion for every issue within the survey, perhaps denoting an uninformed or indifferent opinion. Provided with a larger research period, more frequent excursions could have been made to areas outside of the heavily populated downtown area to take advantage of a different perspective. Another possibility, given the resources, would have been extending beyond face-to-face interaction to email, internet, and mail surveying in order to gain a larger and more randomized response group in a relatively shorter amount of time. Bike shops could have provided information to narrow a search for viable candidates. Had we known about the email list mentioned by Webber, we could have drastically increased our survey results.

The lack of larger scale biking events during the survey and interview period was also disappointing. This was largely due to the onset of inclement weather that accompanies fall and winter in Madison. One of the larger bicycling events of the year, Ride the Drive, was cancelled due to a blustery, stormy day which spoiled a great chance to get some feedback from a variety of bicycle advocates. This also disrupted our ability to gather visual data beyond the everyday usage of bike paths and lanes. In the future it would be nice to have visual representation of the extreme levels of bicycle advocacy which this report addresses. Regarding this missed opportunity, a trip to another city such as Milwaukee, Chicago, or even Davis, California for a

similar event might also have been a good way in which to juxtapose the bike culture between the two and evaluate what differentiates Madison in its venture to become the country's premier bicycling city. Interviews within these communities could offer an outsider's perspective on Madison's bid to become the best city in which to bike. In order to achieve that status there would need to be a mutual recognition from the city's peers and it would be an interesting study to see how far Madison's reputation extends. Even within Madison, further interviews could have contributed to a more comprehensive evaluation of the Platinum Report. Each interview provided further contacts that we would have attempted to interview as well. Simonsen also provided a plethora of social groups that we could have gotten into contact with such as Bike Polo, Fucking Bike Club (FBC), triathlons, street race teams, etc. All of the interviews conducted for this project were with Madison residents, but going beyond to the state and national levels could have really opened up some new sources of information that are not so obvious. We got names from the people that we interviewed of more possible interview candidates, but had no time to interview them. The possible candidates were mayoral aide Annie Moriks, a Madison planning engineer Mike Rewey, another planner Larry Nelson, and an alternative transportation advocate named Tim Wong.

While our project is designed to focus around the city of Madison's Platinum Report, it would have been a worthwhile diversion to perhaps explore some of the other options discussed at these various levels of bike activism. Mike Barrett's emphasis upon needing a grid for the Platinum Report to succeed in its goal of interconnectivity could have been explored via GIS data collection. Further GIS work could have been used to determine a multitude of factors regarding this such as the areas with high concentrations of bicycle use, accidents, and bike users in general. Future research in these areas could more specifically address the feasibility of an

expanded grid system in Madison versus the implementation of more bike paths. It would also be an interesting look into the city government's target areas as far as where the efforts have thus far been concentrated and whether these address the areas with the greatest impact.

So far the Platinum Report has been successful in increasing the bike mode share and providing opportunities for beginners and experts alike to experience an interconnected system for bicycle travel. An opportunity to expound upon this in the future would be ideal as further changes are made and implemented and more information is uncovered, however, given the constraints we learned much about the community's stance on the Platinum Report, and have explicit ideas for where we would take our research if more unlimited resources.

6. Conclusion

The Platinum Report presents an excellent source to discuss the ways in which the city has implemented bicycle policies. Its clearly stated goals lend themselves well to analysis. By reviewing the academic literature available, we were able to formulate an idea of how Madison should view its policies. Using case studies of other popular cities for bicycling we were able to gauge Madison's current position and competition for becoming the best city for bicycling in the country. To assess the impacts of the report and gain a better understanding of the practice of bicycling in Madison we interviewed three individuals deeply involved with the community and administered a survey to gauge the opinions of a larger population of Madison's bicyclists.

The results largely reflected trends we anticipated from our research and analysis of the Platinum Report. Madison's extensive bike trails, innovative programs and infrastructure facilities, city-wide events and other public-private partnerships have given it notoriety as a hub for those with an interest in biking, as well as an accepting atmosphere toward the practice.

However, its limited network of streets and lack of direct education currently limit the number of citizens who bike frequently and for transportation. Competition for space among road users inherently causes tension on the road, so mutual respect can always use improvement. While solutions for these problems range from nearly impossible to relatively easy, they will need to be addressed explicitly to accomplish the goals of the Platinum Report.

Further research into the possible solutions of these issues and many other aspects of bicycling in Madison would be beneficial to the community. By better understanding what specific aspects need improvement, Madison can more effectively implement changes. Increased bicycling will have many positive impacts on Madison, especially in terms of public health. Integrating bicycling into the existing transportation network is an issue that must be dealt with by the community as time progresses. If Madison is to become the best bicycling city in the country, bicycling must be acted upon and recognized by all members of the community, on all scales.

Appendix A - Platinum Report Goals

Here is a link to the Platinum Report in its entirety:
http://www.cityofmadison.com/trafficEngineering/documents/PlatinumAdopted040808sm.pdf

- Madison will ensure a safe and well planned bicycle friendly transportation network that allows connections to all destinations. The network will include bikeways, off-street paths, on-street marked lanes and low volume/low speed local roads, adequate bike parking, and adequate links to public transit. The network will be accessible to riders of all ages, backgrounds, and abilities.
- Madison will promote a bicycling culture that supports experienced riders and brings new riders safely and comfortably into cycling.
- Madison educational institutions, businesses, health care providers, and government will actively support bicycling as a transportation choice.
- Madison will build social capital by encouraging bicycling as a social norm for all of Madison's diverse population.
- Madison will facilitate a mutual respect among drivers, bicyclists, and pedestrians by promoting knowledge, acceptance, and consistent enforcement of traffic laws.
- Madison will collaborate with surrounding municipalities, Dane County, and colleges and universities to develop complementary bicycle transportation plans and a seamless network of bikeways in the Madison area.
- Madison will take advantage of the unique resources in our area (UW-Madison and other educational institutions, bicycle industry, other businesses and nonprofit organizations) to engage in public-private partnerships to develop innovative bicycle facilities, educational programs, outreach efforts, and funding mechanisms.
- Madison's bicycle plans will be incorporated into other city plans (such as transportation plans, land use plans, neighborhood plans, the Comprehensive Plan, Climate Protection Plan, etc.) to promote bicycle use as part of a multimodal, environmentally-friendly urban transportation network designed to benefit all citizens of the Madison metropolitan area (including persons unable to walk or ride, and in cases when bicycling is not feasible).
- Madison will create an on-going mechanism for cooperation and cross fertilization on bicycling issues across city department disciplines including Traffic Engineering, Engineering, Public Works, Police, Health, Parks, Madison Metro, and Planning.
- Madison will increase its bicycle mode share (the percent of the traveling public that uses a bicycle for transportation)

Appendix B - Survey Questions

1) In what year were you born? _____ 2) What is your gender? M F

3) What is your occupation? (include "student" if applicable)_____

_____

4) About how old were you when you learned how to ride? _____

5) About how long have you bicycled in Madison? _____

6) What type of bike do you primarily ride? (ex. mountain, fixed gear, folding, recumbent, etc.)

_____

7) What percentage of your routine trips do you make via bicycle (not for recreation)? _____

8) Do you bike *year-round* or *seasonally*? (Circle One) In a few words please describe why:

_____

9) How often do you ride during peak season? (Circle One)

Daily Frequently Occasionally Rarely Never

10) Please rate your skill level. (Circle One)

Never Ridden Beginner Intermediate Experienced Expert

11) Rate your knowledge of the traffic laws concerning bicycles: Unsure 1 2 3 4 5 Expert

12) Have you, or anyone you know, ever been ticketed while riding a bicycle? Y N

If so, how many tickets in total? _____

13) Are you familiar with any of the following "safe bicycling" resources?(Circle all that apply)

Pamphlets Articles Courses/Workshops Bike Madison Website Street Signs

14) Rate the following characteristics of Madison's bicycling infrastructure:
1 = Needs Significant Improvement and 5 = Already Superb

- Traffic Safety 1 2 3 4 5
- Bike Path Network 1 2 3 4 5
- Parking availability 1 2 3 4 5
- Links to public transportation 1 2 3 4 5

15) Rate the level of support provided by each of these institutions in their efforts to promote bicycling as a transportation choice (ex. Bicycle parking, promotion of events, education,)

1 = Needs Significant Improvement, 5 = Very accommodating and n/a = unsure

- Educational Institutions 1 2 3 4 5 n/a
- Businesses 1 2 3 4 5 n/a
- Health Care Providers 1 2 3 4 5 n/a
- Government (public places) 1 2 3 4 5 n/a

16) Please rank each of these groups based on your satisfaction with their conduct on the road:

1 = Most Frustrating and 5 = Most Pleasing (You can circle the same rank more than once)

- Automobile Drivers 1 2 3 4 5
- Bus Drivers 1 2 3 4 5
- Other bicyclists 1 2 3 4 5
- Moped Riders 1 2 3 4 5
- Pedestrians 1 2 3 4 5

17) What is your favorite bicycle route/path in Madison?

_____

18) When using a bicycle for transportation (not recreation), how far would you be willing to travel from your home in Madison? (Please Circle One Interval)

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

19) How important is it to you that Madison becomes the best bicycling city in the United States?

1 = Not at all important and 5 = Extremely important 1 2 3 4 5

Privacy Statement

The information gathered from this survey is for academic purposes only. We will not collect or otherwise obtain any personal identifying information about you, unless you choose to provide such information to us. Upon completion of the analysis, the surveys will be shredded and recycled. The aggregated results of this survey will be incorporated into a report that will be available at the minds@UW website. You are welcome to attend a public presentation of our research on Tuesday evening, 13 December 2011, in 180 Science Hall on the UW campus. It is the goal of the survey to record the opinions and experiences not of the individual, but of Madison's bicycling community as a whole.

Thank You!

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Appendix C - Interview Questions

This list is not comprehensive because the conversations flowed naturally. But we did make sure to at least ask the following list of questions.

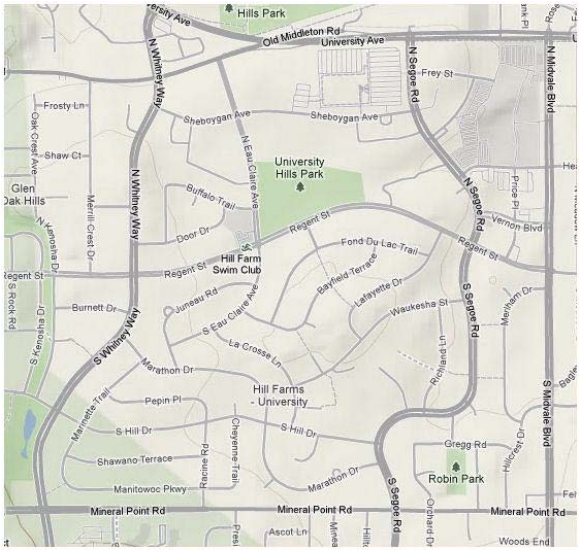
- How many years of experience do you personally have bicycling in Madison?
- How have you personally gotten involved with the bicycle culture of Madison?
- What is to be gained Madison by promoting Madison as "the best city in America to bicycle"?
    - What negative effects (if any) do you expect to result from increasing bicycle use?
- In your opinion, what has allowed Madison to develop into one of the nation's premier bicycling cities?
    - Follow up: Is this a Madison specific phenomenon or could it be replicated by other cities?
- (For Robbie and Michael especially) What is your definition of bicycle mode share?
    - Do you have any statistics on Madison's bicycling mode share?
    - Has it increased since the publication of the Platinum Report? Why or why not? Is it a significant increase?
    - What is Madison's bicycle mode share goal? What will level will make Madison the BEST city in the country?
- What do you think the city of Madison should prioritize in its effort to positively influence the bicycle mode share?
- ˜hat factor is currently limiting the use of bicycles in Madison?
- Has Madison's bike culture changed since the publication of the Platinum Committee's Report? How?
- Do you feel there is mutual respect between motorists, bicyclists, pedestrians and other street users?
    - If not, how could this be improved?
    - What are the consequences of these relationships (specific examples)?
    - How does it vary from place to place?
- How well do the bike paths/roads provide a network for travel across the city?
    - which routes are most important in your opinion?
    - which routes do you believe are most popular?
    - what could be improved?
    - Are the changes in infrastructure focused in certain areas or are they widespread throughout Madison?
- What other infrastructure changes outlined by the platinum report are most important for bicyclists? Why? (consider follow-ups from the previous question)
- How well does Madison educate its citizens on bicycle safety and etiquette? What resources are available to the public?
    - Are you aware of the Bike Madison Website? Courses/workshops? Pamphlets? Articles? Signs?
    - If you were in charge, how would you increase safety? What combination of education, law enforcement and other methods would be successful?
- How much of a police presence would you say there is in enforcing bike regulations within Madison?

    - Follow up: How would you say this differs from its presence before the release of the Platinum Report?
- Who supports the bike community and how? (ex. UW, businesses, people, stores, etc)
- How important are city sponsored events in growing the established bicycling community?

Appendix D - Examples of the Grid vs Cul-de-Sac Design

Grid

Cul-de-Sac



Appendix E - Standardization of Survey Question #16

The specific wording and layout of this question are provided in Appendix B.

A ranking of 1 represents a road user that is frustrating, and a ranking of 5 represents a road user that is pleasing. The question allows for respondents to circle the same answer twice if they cannot decide which is more pleasing or frustrating. In analyzing this, we standardized everyone's responses so the sum of all rankings totals 15 in an effort to show how each category of user ranks relative to each other. Ideally, each respondent would have given each of the 5 categories a different rating (1, 2, 3, 4 and 5), and the sum of 1+2+3+4+5=15. This is because we wanted to determine if mutual respect was existent and measures of central tendency would not be as accurate if standardization was not achieved. In the instances when a ranking was repeated, they were both given the same value averaged over the ranks they ought to have occupied. Consider the examples below:

Example A

Road User	Respondent Result	Standardized Result
Car Drivers	2	2
Bus Drivers	2	2
Other Bikers	4	5
Moped Riders	3	4
Pedestrians	2	2

Example B

Road User	Respondent Result	Standardized Result
Car Drivers	4	4.5
Bus Drivers	1	2
Other Bikers	4	4.5
Moped Riders	1	2
Pedestrians	1	2

In Example A, the lowest response was a 2, and there were three of them. By this logic the rankings 1, 2 and 3 were occupied by auto drivers, bus drivers, and pedestrians. Moped Riders were ranked higher than those three, so it is given a ranking of 4, and other bikers were the most pleasing (even with a ranking of 4) so they are given a ranking of 5. In Example B, car drivers and other bikers were ranked the highest, and they occupy ranks 4 and 5; as a result, those were averaged to 4.5. The remaining three were all the same, so they were averaged among ranks 1, 2 and 3; now they are all standardized at 2.

Appendix F - Survey Results: Figures and Tables

Table 1

What percentage of your routine trips do you make via bicycle (not for recreation)?

	Students	Bike Shop Workers	Everyone
Median	30%	50%	50%
Mode	0%	50%	0%
Average	43%	40%	45%

Table 2

How important is it to you that Madison becomes the best bicycling city in the US?

	Students	Bike Shop Workers	Everyone
Median	3	5	4
Mode	3	5	5
Average	3.30	4.35	3.68

Table 3

Rate your knowledge of the traffic laws concerning bicycles: 1 = Unsure, 5 = Expert

	Students	Bike Shop Workers	Everyone
Median	4	5	4
Mode	4	5	4
Average	3.37	4.55	3.78

Table 4

Are you familiar with any of the following "safe bicycling" resources?

Resource	Students	Bike Shop Workers	Everyone
Pamphlets	9	14	25
Articles	7	8	19
Courses	5	6	13
Bike Madison Website	6	9	17
Street Signs	29	16	52
Total # of Respondents	40	20	67

Figure 1
Survey Results
Median Level of Respect

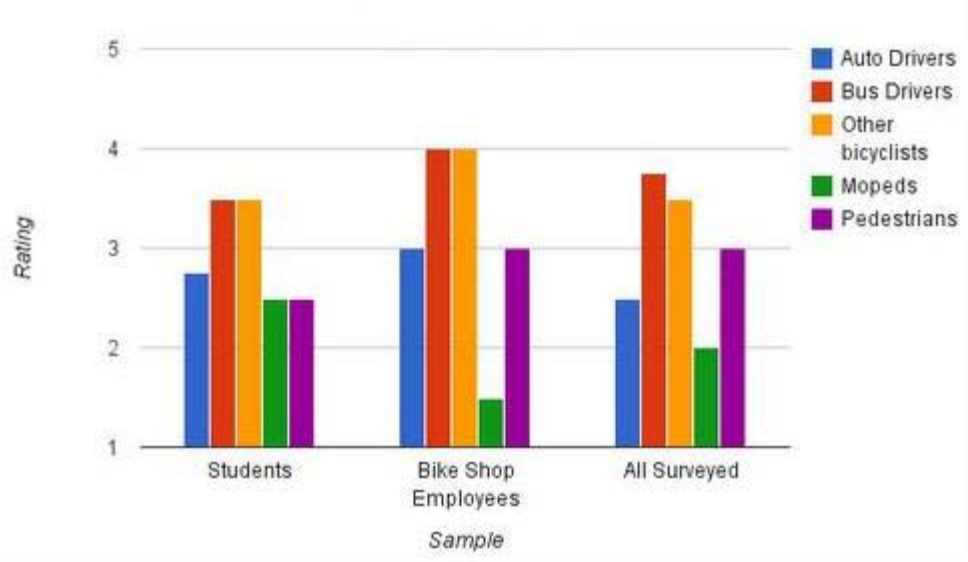
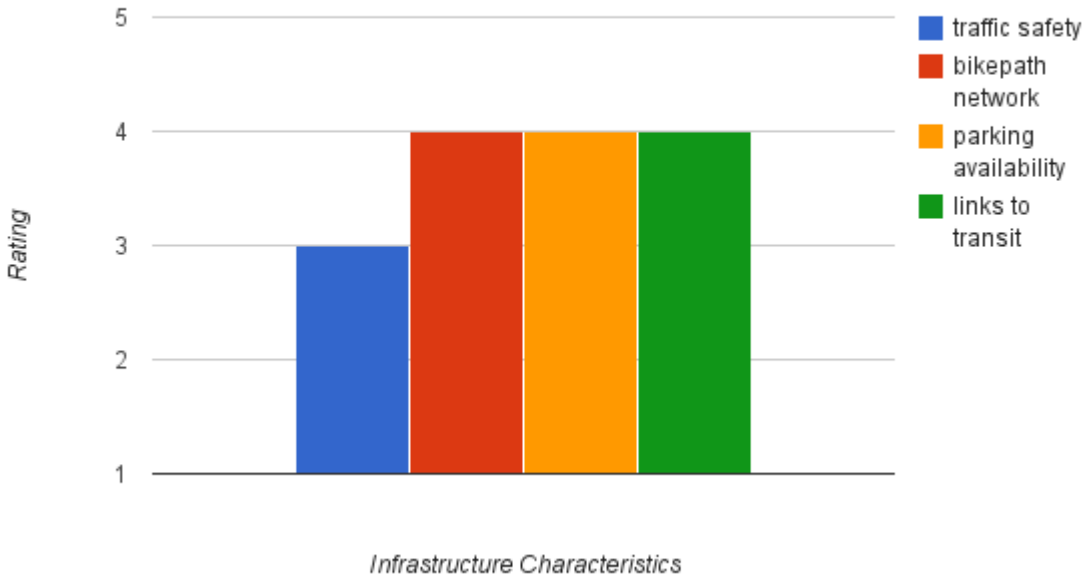


Figure 2
Survey Results
Median for Quality of Infrastructure



Works Cited

Barrett, M. Personal interview. 16 Nov. 2011.

Bonham, Jennifer, J. "Universities and the cycling culture." Transportation research. Part D, Transport and environment 15.2 (2010): 94-102. http://www.sciencedirect.com.ezproxy.library.wisc.edu/science/article/pii/S136192090900 11X

City of Madison Bike Map and Guide. Madison: Bike, 2011. Print.

Forsyth, A. , & Krizek, K. (2011). Urban design: Is there a distinctive view from the bicycle?. *Journal of Urban Design*, *16*(4), 531-549.

Krizek, K. , & Stonebraker, E. (2010). Bicycling and transit a marriage unrealized. *Transportation Research Record*, 161-167.

Madison Common Council. (2008). *Platinum Bicycling Committee Report.* City of Madison. Madison, WI: Author.

McCarthy, D. (2011). 'I'm a normal person': "An examination of how utilitarian cyclists in Charleston, South Carolina use an insider/outsider framework to make sense of risks." *Urban Studies*,*48*(7), 1439.

Moudon, A. , Lee, C. , Cheadle, A. , Collier, C. , Johnson, D. , et al. (2005). Cycling and the built environment, a us perspective. *Transportation Research: Part D*, *10*(3), 245-261.

Pucher and Buehler, 2007 J. Pucher and R. Buehler, "At the frontiers of cycling: Policy innovations in the Netherlands, Denmark, and Germany." *World Transp. Policy Pract.*, **13** 3 (2007), pp. 8–57.

Pucher, J. , Dill, J. , & Handy, S. (2010). Infrastructure, programs, and policies to increase bicycling: An international review. *Preventive Medicine*, *50*, S106-S125.

Pucher, J. , Komanoff, C. , & Schimek, P. (1999). Bicycling renaissance in north america? recent trends and alternative policies to promote bicycling. *Transportation Research Part A policy and Practice, 33*(7-8), 625-654.

Simonsen, S. Personal interview. 14 Nov. 2011.

Walljasper, J. (2008). “Brave new nonmotorized world.” *Planning, 74*(11), 20-23.

Webber, R. Personal interview. 14 Nov. 2011.

Winters, Meghan, Gavin Davidson, Kay Teschke, and Diana Kao. "Motivators and Deterrents of Bicycling: Comparing Influences on Decisions to Ride." *Transportation*, 38.1 (2011): 153-168. http://www.springerlink.com/content/ex63304355024117/

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