EVALUATING BICYCLE FRIENDLINESS

A CREATIVE PROJECT

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MASTER OF URBAN AND REGIONAL PLANNING

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The League of American Bicyclists (LAB) offers communities the ability to be recognized as being friendly to people riding bicycles through their Bicycle Friendly America (BFA) and Bicycle Friendly Community (BFC) programs. In order to answer what “bicycle friendly” means the LAB (2015, bikeleague.org/bfa) explains that, “A bicycle-friendly place makes bicycling safe, comfortable, and convenient for people of all ages and abilities.” Bicycle friendliness involves, at the very least, policies, culture, and facilities that make a bicycle a realistic transportation option. The LAB offers an evaluation that is able to be consistent across the country. The LAB designates states, businesses, universities and communities as being bicycle friendly. Being a BFC is useful to economic development as a talent attractor and retainer. The ability of a city to show employers that their employees can safely ride their bicycles to work, shopping, dining, entertainment, libraries, recreation, and schools goes a long way in recruiting top industries and top employees.

The key outcomes of a BFC according to the LAB, as seen in Appendix C, are increased ridership, lower rates of crashes, and lower rates of fatalities. These outcomes, especially lower rates of crashes and lower rates of fatalities, are unquestionably positive for any community. The goal of planning is to protect the health, safety, morals, and welfare of the community. Lowering incidents of crashes and fatalities plays an important role in making that a reality. Providing a range of transportation options is critical to making a community work for people with different incomes and lifestyles. Increased ridership and safety as a priority helps make bicycle commuting a legitimate choice for transportation to a wider range of people.
The BFC metric should ensure that transportation planners and those working in economic development understand the value of the BFC designation. It is also important to evaluate the BFC metric so that BFC designation is as useful at addressing the interests of transportation and economic development as possible.
**Literature Review**

Municipal governments everywhere want their cities or towns to be the best place in the area to live. Many things factor into what makes a place a good one to live. Some places are a great place to live because of the cost of living being low, others, because of a litany of shops and restaurants nearby; still others are the best place for their residents because of quality schools or parks. The goal of planners is to help a community to achieve its economic and societal goals. Two of the goals most communities have are to improve the local economy and to make the area socially or culturally interesting, both of which broaden the tax base upon which government runs.

One tool that many cities have used to actualize these goals is an increase in active transportation friendly policies and infrastructure. The most obvious parts of infrastructure that have been utilized for these purposes are bicycle lanes and paths. The importance of knowing what works for encouraging bicycle transportation to the profession of planning is that transportation planners can determine how to best use their funding for greatest benefit.

**Infrastructure**

Dill and Carr from Portland State University wrote “Bicycle Commuting and Facilities in Major U.S. Cities: If You Build Them, Commuters Will Use Them – Another Look” (2003). This paper found that bicycle commuters would, in fact, use bicycle lanes if they were built. In order to ensure that results were not skewed the data they used from the census omitted college towns where there are typically more cyclists (p. 1).

“Bicycling for Transportation and Health: The Role of Infrastructure” carried out by Dill (2009) was a step forward from her previous work because she recruited a
convenience sample from survey respondents to affix Global Positioning System (GPS) transmitters to their bicycles in order to track their use of the transportation network including streets with and without bicycle facilities. The use of GPS technology to track riders yielded information which is representative of how transportation cyclists actually ride, not just their perception of how they ride. A cyclist who responds in a survey that he or she does not prefer streets with bicycle facilities may be found, in practice, to tend to use streets with bicycle facilities due to some aspect that the cyclist had not thought of. An interesting note about the findings that Dill found was that in her study half of trips were on streets with bicycle facilities while the transportation network in Portland only has bicycle facilities on 8% of streets (p. 98).

Pucher, Buehler, Merom, and Bauman (2009) analyzed the report from the National Household Travel Surveys in 2001 and 2009 in “Walking and Cycling in the United States, 2001–2009: Evidence From the National Household Travel Surveys”. They found that to increase transportation cycling there was a need not only for additional bicycle infrastructure but also for increased traffic education and strict enforcement (p. 316).

Akar and Clifton found in “Influence of Individual Perceptions and Bicycle Infrastructure on Decision to Bike” (2010) that active transportation including bicycle commuting is more likely to be chosen when flexibility of departure times is a high priority for an individual commuter (p. 165).

Buehler and Pucher explain in “Cycling to work in 90 large American cities: new evidence on the role of bike paths and lanes” (2011) that by use of statistical methods it was possible to establish a stronger link between bicycle facilities and transportation
cycling than between local climate or access to public transit and cycling. Safety, lower auto ownership, density, higher petrol prices, and more students were also linked to greater use of the bicycle for transportation.

According to Garrard in “Promoting transportation cycling for women: The role of bicycle infrastructure” (2008, p. 55) men are significantly more likely to cycle for transportation than are women. She points to the longstanding research of Byrnes (1999) that indicates that women are more risk averse than men. In her observations, Garrard found nearly 80% of transportation cyclists were men which follows with the inherent risks associated with cycling in a country where bicycles make up only a small part of the mode share such as Australia, where her research was done, or the United States. Most interestingly, in her study there was a significant preference among women for off road cycling infrastructure but no preference between on road bicycle lanes vs no bicycle facilities on roads (p. 57).

Baker (2009) pointed out in “How to get more bicyclists on the road: To boost urban bicycling, figure out what women want” that the difference between male and female bicycle commuting rates is more pronounced in the US than in European countries. This also follows with Garrad’s findings as mentioned above. She estimates that in the US men outnumber women by at least 2:1 as transportation cyclists. Baker quotes Garrard saying, “If you want to know if an urban environment supports cycling, you can forget about all the detailed ‘bikeability indexes’—just measure the proportion of cyclists who are female.” Any measure of bikeability that only looks at infrastructure rather than the demographics of ridership is insufficient to truly diagnose the health of bicycle transportation in a community.
“Women and Cycling” by Garrard, Handy, and Dill, a chapter from City Cycling, a book edited by Pucher and Buehler, suggests that when infrastructural improvements and cycling-friendly conditions exist in a community women receive a great deal of benefit. When children are more able to ride a bicycle to school or to a friend’s house women are relieved of some of their car trips that are for the service of someone else (p. 213). Garrard says that, “at first glance,” there is evidence that women, by virtue of their additional household responsibilities in low cycling countries, have their ability to cycle constrained (p. 221).

**Economics**

Drennen found in her “Economic Effects of Traffic Calming on Urban Small Businesses” (2003) that traffic calming and bicycle facilities made a 20% rise in property values when traffic speeds are slowed by 5-10 mph (p. 9). Two-thirds of the participating small business owners in the study felt that bicycle lanes on their street have benefited their business (p.1). Increased property values and increased visits and sales for local business are good for any community.

TNO Quality of Life published a report authored by Hendrikson, “Reduced sickness absence in regular commuter cyclists can save employers 27 million euros” (2009) which found that commuter cyclists take fewer sick days annually than those who do not commute by bicycle (p. 1). This is of benefit to employers because their staff are more dependable and it costs them less time finding replacements or having staff work overtime.

Biking and Walking that the addition of bicycle facilities would increase the commercial activity in Toronto (p. 10).

Litman finds in “Evaluating Active Transport Benefits and Costs” (2014) that typically the economic impact of transportation cycling is thought of in terms of societal impact that exchanging an automobile trip for a bicycle trip saves $1.92/mi (p. 21).

Lessons from the Literature

As noted above, the literature broadly suggests that most cyclists would rather have some sort of bicycle facilities, in particular separated paths and/or lanes with some barrier between cyclist and car traffic. There is also evidence that women are an important demographic for understanding bicycle friendliness of a community and that they, in particular, have a strong desire for bicycle infrastructure.

The studies on infrastructure mostly center on a survey of participants who identify as cyclists and then narrow the respondents into groups of recreational cyclists and commuter cyclists. Some studies will add a layer of depth beyond these based on frequency and/or distance of the respondent's regular commute.
Planning Background

1. Economics and Health

Bicycle infrastructure and bike culture can have a positive influence on the businesses adjacent to such infrastructure. Drennen has found this to be the case in San Francisco. A study referenced by Drennen indicates that lower speed limits and infrastructure that calms traffic can boost property values by 18-20% (Economic Effects of Traffic Calming on Urban Small Business, 2003, p. 9).

Bicycle tourism brings great amounts of revenue to communities. Not just in sales of bicycles and bicycle-specific clothing, but also in visits to local stores, travel expenses, lodging, restaurant, and even grocery sales according to Flusche, (2012 p. 2). It should be noted that bicycle commuters might be less inclined than recreational cyclists to purchase bicycle specific gear depending on the availability of showers or locker rooms at or near their employment, the climate, and topology. Cyclists save money over automobile commuters. This allows cyclists to spend their money in other ways, they can save their employers money on health insurance by having fewer claims per year, and can reduce parking expenses because one parking spot for an automobile can be sufficient to put up to 16 bicycles in a bicycle corral (People Street L.A., 2014).

The Netherlands Organization for Applied Scientific Research (TNO) Quality of Life (2009, p. 1) reports that regular commuter cyclists have fewer absences due to illness than those who do not cycle to work. This decline in absences due to illness was found even despite being exposed to more external environmental factors than
automobile commuters and transit commuters. The benefits of moderate exercise have become common knowledge. Active transportation elevates the heart rate. A cyclist who rides at an average speed of 11.5 mph, a modest speed, will ride nearly 19 minutes each way on a three and a half mile commute. This will easily get a cyclist above the recommended 30 minutes of elevated heart rate per day. This distance is not great but bicycle advocates such as CommuteBybike.com suggest that for trips of less than two miles, it is easy to shift modes from automobile to bicycle (2009, http://www.commutebybike.com/2008/01/03/clif-bars-2-mile-challenge/). At the same speed a two-mile trip will elevate the heart rate for nearly ten and a half minutes. Walking or taking a recreational ride can make up the remainder of the 30-minute recommendation. In a city 78 square miles in size, and assuming a fairly regular shape, that means that from the farthest points in the city to downtown a ride would almost never be longer than five miles which would take 26 minutes. That is nearly the whole recommended 30 minutes of exercise a day.

Jennifer Dill has written on the effects of bicycle infrastructure on bicycling as transportation. She points out that the majority of cycling by adults in the United States is recreational rather than for transportation. This distinction is important because in other western countries such as Germany, Denmark, and the Netherlands most adults who ride bicycles do so for transportation (2009 p. 96). In Dill’s study, using a convenience sample of regular cyclists in Portland, OR, she found that the median trip length among participants was just under three miles at two and eight tenths of a mile. The average speed for all trips was 10.8 mph. This makes the average length of time for a single trip in her study 15.5 minutes. In the Dill study the average number of one-way
trips was one and six tenths per day (p. 100). This means that the typical rider in the Dill study got 24.8 minutes of exercise just from riding daily. It also means that, at least some, daily commuters utilized multiple modes of transportation.

Two interesting things come up in her results. Only a small amount, five percent, of trips in the study, were for exercise and the median trip length for work was three and eight tenths miles, a full mile more than the median trip for the study. These work trips yield just over 26 minutes of exercise one-way and around 41.5 minutes daily using the one and six tenths trips per day figure. Commuting home from work usually follows commuting to work. This would give the average round trip for a commuter almost an hour, 56 minutes, of exercise daily (p. 100).

In the Dill study the question of what these shorter trips were for, if not for exercise or work, may be of particular importance for seeing where the economic benefits of cycling come from. It should not be a surprise that a full third of trips in the study had “home” as the destination, work accounted for another 25% of trips, and as noted above exercise for five percent of trips. That leaves 37% of trips for some other reason. Social and recreational trips account for 13%, personal business for eight percent, shopping for seven percent, and dining for three percent of trips. These are the sectors which will be most impacted by good bicycle connectivity.

The study, Valuing Bicycling's Economic and Health Impacts in Wisconsin, carried out by Grabow, Hahn, and Whited, illustrates the economic impact of direct, indirect, and induced expenditure as being nearly $533 million (2010. p. 7). Add to that the health care savings from active transportation of $319.5 million (p. 12) and the economic impact of cycling is $852.5 million in Wisconsin alone. In Iowa a similar study
was done and found $731,146 in direct and indirect economic impact from cycling (Bowels, 2011. p. 18). The Michigan Department of Transportation found that bicycling accounts for as much as $668 million in economic impact (2011, l.2).

The above economic and health impacts can only be achieved if municipalities make wise use of infrastructural improvements.

2. Infrastructure

Infrastructure is a key element of a BFC and of getting people, especially women due to risk aversion as Garrard found (2008 p. 58) and data collected by Dill, (2009 p. 97), as found by Baker, (2009), riding bicycles for both recreation and transportation. The different forms of infrastructure improvements needed to increase bicycle ridership include the following:

Share the Road or Bike Route signs: probably the simplest form of bicycle facility. These are simply signs in standard colors, typically pole mounted, adjacent to streets with symbols of bicycles and the words “SHARE THE ROAD" or “BIKE ROUTE”. These signs help to make bicycling safer because they remind motorists that there may be people on bicycles on the road and to look out for cyclists.

Shared Lane Marking: the next simplest form of bicycle facility is the Shared Lane Marking, often called a “Sharrow" due to its design with two chevrons pointing the direction of travel above an image of a bicycle indicating that the lane is to be shared. These markings go inside of a traffic lane to indicate that bicycles are likely to be in the lane and approximate physical space where bicycles are likely to be in the lane. Such markings are most appropriate when the Right-of-Way is too narrow to allow for bicycle
Bicycle Lanes: a bicycle lane is a common form of bicycle facility that indicates that the lane is for the exclusive use of bicycles. It typically consists of a white paint stripe between the cyclists lane of traffic and automobile travel lanes. If the lane is the outermost lane on a street an outer paint stripe is usually omitted. When parking, a turn lane, or a paved shoulder exists a paint stripe is usually placed on the outside of the bicycle lane as well. They can be marked with symbols or words and include arrows to
indicate the direction of travel. (Figure 2.)

Buffered Bicycle Lane: A buffered bicycle lane is similar to a bicycle lane except that bollards, curbs, planters, plastic pylons, or paint striping add a physical, protective
barrier between bicycle facility and automobile traffic. (Figure 3.)

FIGURE 3: BUFFERED BICYCLE LANE. NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS, 2014.

Cycle Track: a cycle track is perhaps the most complete facility for bicycle use as it can be one–way or two–way and it can be at grade or raised. These facilities, especially raised cycle tracks, offer separation from automobile traffic and are designed for the unique needs of bicycle traffic. Cycle tracks are often 8-12' wide. They also include buffering between automotive and bicycle traffic. This limits the locations in which they can be utilized because it does require a wider right of way than some other facilities. Some examples include pavers and pervious surfaces to assist with traction
during rain as well as storm water management. (Figure 4.)

![Figure 4: Cycle Track](image)

**FIGURE 4: CYCLE TRACK. NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS, 2014.**

Bike Box: a section of the right of way where a bicycle lane expands and moves to the front of traffic at a signalized intersection. The purpose of such facilities is to put cyclists in front of motorists and make cyclists more visible for safety. The bike box is typically striped with white and the words “BIKE BOX” and/or the image of a bicycle in white. The preferred color for the bike box in the United States is green although there
are examples where other colors such as red have been used. (Figure 5.)

**FIGURE 5: BIKE BOX. NATIONAL ASSOCIATION OF CITY TRANSPORTATION OFFICIALS, 2014.**

Bicycle Boulevard: a method of street configuration that allows bicycles to flow readily through an area while slowing and minimizing motorized traffic and using traffic calming devices. The basic rule for a bicycle boulevard is that motorized traffic should have to turn off from the boulevard every four blocks or so. Bicycle boulevards typically have street trees both as a calming device and as a way to keep the hot sun off of
cyclists. (Figure 6.)

FIGURE 6: BICYCLE BOULEVARD. TUCSON, AZ ACCESSED APRIL, 2014
Bicycle Corral: A bicycle corral is a form of bicycle rack where cyclists may park their bicycles. Corrals often replace a parallel parking space for an automobile because up to 16 bicycles can be accommodated in a way that allows proper locking technique and lowers the risk of damage occurring to the bicycles. Some corrals have physical barriers, either parking blocks and bollards or a rail surrounding the corral, in order to better protect the parked bicycles and cyclists and to prevent cars from being parked in the corral. (Figure 7.)

FIGURE 7: BICYCLE CORRAL, PORTLAND, OR. BARBARA J. ANDERSEN, 2009
Evaluation of the Bicycle Friendly Community Metric

The Bicycle Friendly Community Metric is rooted in the Five E’s of the LAB BFA program. They are Engineering, Education, Encouragement, Enforcement, and Evaluation & Planning (2015, http://bikeleague.org/content/5-es). It would be easy for a metric to look at one or a few of these elements of bicycle friendliness and not address all of these elements. The case for bicycle friendliness cannot be made sufficiently if any of these elements are omitted.

Engineering includes infrastructure and realistic connectivity to all destinations within the community, even if transit connection is necessary for that connectivity. Education focuses on instructing the public of best practices in bicycling along with traffic. Encouragement asks about the advocacy groups for the community. Enforcement looks to the strengths of policy and how well law enforcement can respond to the needs of road users to protect cyclists. Evaluation & Planning asks about the data-gathering necessary for good policy to be suggested.

Strengths

Since bicycle infrastructure alone is not enough to ensure bicycle friendliness it is appropriate that the section of the metric addressing infrastructure is called Engineering. This section includes infrastructure as well as connectivity to public transportation. The need for connectivity to the transit network is demonstrated above by the Dill study indicating that some bicycle commuters may ride one way (p. 100) some of those bicycle commuters likely take transit for part of their commute. This is an aspect of bicycle friendliness that would be easy to overlook.
Within the Education section are public outreach, adult bicycling classes, and percentage of primary and secondary schools offering bicycle education. These programs are important for making cycling safer and more common because if children and adults are given good education about riding for transportation there will be more confidence about the role of cyclists on the streets, even among drivers who never ride bicycles. The Center for Cycling Education puts on driver education courses to help professional drivers know the rights and responsibilities of cyclists on the road in order to become safer drivers (2015, http://thecce.org/workshops/driver-training/)

Encouragement is strongest in including Bike Month and Bike to Work events, advisory committees, and advocacy groups. It is important to have events like Bike to Work Week because a well-publicized Bike to Work Week will invite the whole community to give cycling a try as well as alerting motorists that there will be more people riding bicycles that week. Other events that invite people to ride through the city, even if they are only on weekends when traffic is less, give people more confidence in riding. In a recent update on what the BFC specialist for the LAB, Steve Clark, has learned from spending time in designated BFCs Clark, (2015) recalled part of his experience working in Colorado as a Bicycle Coordinator. He says, “I needed the advocates to be bolder than me to allow for incremental change to occur. In a nutshell: their job was to make me look moderate”(p. 37).

Enforcement includes police and bicycle advocacy having the ability to communicate as well as laws and ordinances that are friendly to bicycling in the community. Local governments may have outdated bicycle ordinances, one example of a city with an outdated bicycle ordinance, until spring of 2015 was Muncie, Indiana. It is
important to have the advocacy groups work with police, planning departments, engineering departments, and any other appropriate offices in the local government to update ordinances governing bicycle use and enforcement in the community. In Muncie the new ordinance instituted a three-foot passing rule in order to help increase the safety of cycling in the city (Roysdon, 2015). The previous ordinance dated back 50 or so years.

Evaluation and Planning looks at the number of bicycle program staff per population and the existence and use of a bicycle plan. While it is possible to become a BFC without having full time dedicated bicycle staff with the local government it is still useful to look at the number of staff that work with bicycling full time, be it multimodal transportation, complete streets, or a full time bicycle-specific position. The existence and implementation of a bicycle plan also indicate something about the seriousness of the community regarding bicycling.

A further strength of the BFC metric includes the format of submission. The application gives the applying body the ability to describe with text some specifics when check boxes are insufficient allows a clearer image of what the community programs are doing with regard to their work to be more bicycle friendly. The application’s inclusion of explanatory boxes to elaborate is a helpful element because some “no” answers can be explained to illustrate that a category is not important for a specific location because of some other factor and some “yes” answers may require more information to explain the extent of how important this element is to the consideration of the community as bicycle friendly.
The greatest strength of the BFC metric is that five people, none of whom are affiliated with the petitioning body, address the evaluation rubric. If members of the petitioning body are the only ones evaluating the application there is a risk of being overly generous. When people from the area, from across the nation, and from LAB evaluate each petition that risk diminishes significantly. The use of five reviewers is helpful in ensuring that errors and bias are avoided, much like in statistical sampling.

**Weaknesses**

One weakness of the BFC metric is that each section appears to be weighted equally. This allows communities that are weak on some elements to be considered equal with communities that are stronger on more important elements and weaker on less important ones. A scale of evaluation that allows for different weighting of elements not being present is a problem for evaluation of bicycle friendliness.

Another significant weakness of the BFC metric is that the educational elements are primarily for bicycle safety. If motorists are not expected to change behaviors it is hard to imagine a bicycle culture truly existing in a community. Driver education about the right of cyclists to use the road would seem a higher priority for education than bicycle safety classes.

Furthermore, the Engineering section suggests infrastructure along arterial roads. The idea makes sense because arterial roads help connect neighborhoods and businesses, but some arterial roads are not realistic candidates for most forms of bicycle infrastructure. It does appear that in practice an arterial road is considered

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1 Email to the author from Steve Clark, the Bicycle Friendly Communities specialist for the League of American Bicyclists, November 21, 2014.
sufficiently serviced by bicycle infrastructure when that infrastructure exists on adjacent parallel streets.

A shortcoming of the Evaluation section is that resort towns can be evaluated highly because the year-round population of these towns may be as little as 1,200 people but they may have a bicycle planner to serve their functional peak season population of, perhaps 30,000. This makes a community seem like it has more bicycle planners per person than is true for the functional population. Moreover, the bicycle program staff member levels listed in Appendix C may not be appropriate in some communities. Depending on density, higher or lower numbers of bicycle related staff might be required.

The Encouragement section seems to be the most problematic because some categories can add to the score of a community while not giving much benefit to those who would like to ride for transportation. The problem categories are cycling clubs and recreational facilities like bicycle parks and velodromes, oval tracks with banked surfaces on which cyclists race. These are not what most people think about when considering if a community is bicycle friendly. Recreational activities and facilities also allow a community that is lacking in infrastructure and bicycle culture to be considered bicycle friendly when they may not actually be bicycle friendly in people’s real life experience. As such, some of these things detract from the BFC metric being a useful tool for evaluation.

A general observation about the weakness of the BFC metric is that all communities are able to use the same metric and submit as one community.
area of ~2,700 square miles are evaluated using the same metric\textsuperscript{2}. It does not seem that both of these communities are structured in such a way that they are well served to be evaluated using the same metric.

\textsuperscript{2} BFC application materials provided to the author by the Clark of the LAB November 21, 2014.
Assessing the Validity of the Bicycle Friendly Metric

In order to create a more robust and accurate assessment of bicycle friendliness as a transportation option it seems important to give different weight to the indicators of bicycle friendliness so that recreation is represented but with the primary focus being on cycling as transportation. A velodrome, skate park, mountain bike trail/park, or regular club ride does not have the same benefit on transportation options or property values as a raised cycle track on an arterial road or lowered speeds on residential streets as noted above.

In order for the BFC metric to be the most useful tool available for measuring bicycle friendliness it may be necessary to have two metrics established. Bicycle friendliness means something different for a community with an emphasis on bicycle commuting or utility cycling than for a community that has an emphasis on recreational and tourism activities. These two could be applied for separately or together because it seems that at least some recreationally BFCs would also be BFC for utility and commuting and the other way around. For such communities the designation of BFC would be most appropriate. For communities that desire to focus on commuter friendliness a designation of Bicycle Commuting Friendly Community, BCFC, might be appropriate. For communities that desire to focus on recreational friendliness a designation of Recreational Bicycle Friendly Community, RBFC, might be appropriate. Certainly these two designations would have much in common. This is probably the reason that LAB has not separated the two designations. But crossover or having a lot in common does not mean that the designations should not be considered separately.
Having a mayor, or similar, who is an advocate of bicycles may go farther than having a staff member whose main responsibilities are bicycle related. According to Roysdon (2015) in Muncie, Indiana the Geographic Information Systems director and mayor are strong advocates of bicycle friendly infrastructure and policy, which led to the new bicycle ordinance for the city. Similarly, having one or more full-time bicycle planners on staff may or may not have any real impact on the allocation of funds to bicycle infrastructure or building a culture of bicycle friendliness. This highlights how some of the questions in the BFC application are less telling than others since question 10 asks about the number of government employees who are working on bicycle issues in the community.

The questions from the BFC application are all available in Appendix A. The numbers in the following sections will reference specific questions.

**Engineering**

It is important for the BFC metric to focus on the current strengths while correcting the problems caused by the weaknesses. The inclusion of connectivity, for example, in engineering should not be sacrificed in order to also include secure bicycle parking. The inclusion of American Association of State Highway Transportation Officials (AASHTO), Manual on Uniform Traffic Control Devices (MUTCD), and National Association of City Transportation Officials (NACTO) standards as the minimum goal for the infrastructural component of the Engineering section, questions 20 and 28, is a great starting point for bicycle facilities. It is impressive that the application requests information about street sweeping, snow clearance, and pothole maintenance that could
be easily overlooked by municipalities. The questions in the Engineering section of the application all seem appropriate and do not seem to lack any important information.

**Education**

The educational component of the BFC metric would be made stronger if the education sections had motorist education at the heart of it. This may be beyond the scope of a local municipality since drivers licenses are issued by states but local governments could still offer supplemental education for motorist training, even if it does not make it to the licensing exam. In the interest of the health and safety of the community this element alone would be important enough to be weighted more heavily than other elements of the metric with the possible exception of infrastructure.

Yet, only two questions in the Education section, 40 and 44, deal with driver education as regards bicycles on the road. While this does constitute 20% of the questions, disregarding clarification and sub-questions, in the section two questions about driver education does not seem to be enough to stress the importance of this aspect of Education for a BFC. Professional drivers and individual drivers are not the same, either. Professional drivers can be required to take additional bicycle safety courses that individual drivers probably cannot. The more important class of driver in regards to safety of cyclists is the individual driver. Asking question 40 about motorists and cyclists sharing the road safely is weak service to the motorist education that is critical to building a culture of bicycle friendliness.

**Encouragement**

The encouragement section should focus on the elements that have the greatest impact on culture. Bike to Work and Bike Month events, questions 47 and 48, along with
the work of advocacy groups make a significant impact on day-to-day culture leading to a cultural shift in favor of cyclists. The cycling clubs are helpful for getting groups of recreational and serious sport riders to come together for causes, charity rides, and fitness, but they do not have the same impact on bicycle culture as do bicycle advocacy groups. Trails, bike parks, and velodromes that are not a means of connectivity but recreation are a great indicator of recreational activities for cyclists. They do not indicate a culture that understands the needs of utility cyclists. These could be considered as a bonus to the needs of cyclists in the city but should not be treated as on par with advocacy, infrastructure, or laws that protect cyclists.

Question 51, addressing the cycling clubs, is only somewhat useful to the typical commuter or utility cyclist. These clubs tend to be recreational, focused on off-road activities like mountain biking, are competitive, or are racing clubs who ride many miles at high speeds in specialty gear. In the interest of better urban planning this question is unnecessary. In the interest of tourism this question is more useful.

Question 53a, on skate parks and their openness to bicycles, is an odd question from a planning perspective. While it may encourage trick riding on fairly specific types of bicycles, BMX, freestyle, and variations thereof, the emphasis on building a culture of bicycle friendliness is not helped by this. Rather, a subculture is given a pace. This is not bad in and of itself, but these facilities are usually in parks and if they are visible from a street they are far enough away as to not have a real impact on the awareness of motorists to cyclists on the road.

Questions 56 and 57 run the risk of giving bias in favor of communities that already have a relationship with the LAB. These questions make sense because they
ask about places that are already considered bicycle friendly but it seems important that these questions in no way be the tipping point between a place being considered a BFC or not a BFC.

Questions 58 and 59, on the other hand, are strong and important questions, which do indicate more about bicycle friendliness. Youth programs focusing on cycling in one way or another will help those youth who experience such programs to understand the role of bicycles in transportation and on the streets as well as the rights and responsibilities of cyclists so that when the youths become drivers they will understand these things more. Question 59, likewise, looks to providing information to the community about what routes and streets are considered bicycle friendly through maps, either as a GIS layer that is available to the public or in print.

Enforcement

Many ordinances regarding the rights and responsibilities of cyclists are outdated and therefore are unenforced (Roysdon, 2015). Others are updated but remain unenforced. It is a good sign that the BFC metric starts the question of enforcement with the interaction of police with the local cycling community and what the police are taught about cyclists and traffic laws, questions 61 and 62. This section also hopes to see a lot of exchange of information between the police and the engineering and planning departments, question 66.

Without cooperation between the police, engineering, and planning departments it would be difficult to understand what the circumstances are that cause motorists to collide with cyclists. When this data can be gathered by planning and engineering over
several years it can begin to show trends. Once trends are identified the appropriate departments can find solutions.

**Evaluation and Planning**

The Evaluation and Planning section involves how planners go about deciding the direction to go regarding bicycle friendliness and how progress to meet those goals is measured. The questions address bicycle and pedestrian planning, counts and surveys, and crash data. These elements are used for evaluation so that planning can be done to reach the goals set by the community and to draw attention to the shortcomings of current practices, if there are any.

Questions 71 and 72 address bicycle plans for the community as well as mountain bike plans allowing connectivity so that such facilities are not kept away from the community but are integrated. This starts to make mountain bike facilities feel like part of a comprehensive bicycle network instead of a fully separated system. This makes recreational facilities more apt to be part of what makes a community bicycle friendly.

Commuting to work and commuting distance are addressed by questions 77 and 78. The answers to these questions can be turned into information about health by looking at average speeds and how much daily exercise that means for each cyclist. This data can help a community promote itself as a healthy place to live and thereby recruit better employers and employees to live and work there.

Bicycle level of service (BLOS), question 80, and economic impact studies of bicycling, questions 82, are important planning questions. These questions, as discussed above, are related to one another. Transportation options and greater
economic vitality are good practice in planning. These questions should not, however, be weighted so highly as to offset other things because it is possible to have good BLOS and a positive economic impact from cycling even without actually completing the studies.

*Final Overview*

In the final overview the community has the opportunity to explain more about what they see as strengths and weaknesses of that community being considered for designation as a BFC as well as opportunities for new projects and awareness of community needs having completed the application.
Lessons Learned

The BFC metric is a great tool for many communities to measure bicycle friendliness. There are some deficiencies, but by and large this tool does a good job of evaluating bicycle friendliness. The major deficiencies are the inclusion of topics that are supplemental to building a safe place for cyclists on the road. For example mountain bike park facilities and velodromes, and an overemphasis on having other LAB designated bicycle friendly aspects to the community, universities and businesses. One of the greatest strengths of this metric is in the desire to ensure that underserved populations are addressed sufficiently in terms of access to bicycle friendly facilities, policies, and offerings in the community. As a tool for planners, then, it is worth looking at the questions in the application and applying those questions even if BFC status is not a priority for the community.

There are communities that would be well served by seeking and obtaining BFC designation. There are also communities that, while having a high degree of bicycle friendliness, do not need to be a designated BFC. Smaller cities and towns that are bicycle friendly by virtue of lower traffic counts, speeds, and sufficient infrastructure to allow motorists and cyclists to easily share the road. These communities may not need to receive BFC designation in order to be able to recruit and retain talent, business, and improve property values.

Limits should be imposed as to the size or number of municipalities or jurisdictions that may apply together for BFC recognition in order to strengthen the assessment. Small urban areas are substantially different than large, mainly rural, ones. It is important that these be distinguished in order to strengthen the metric.
Bibliography

Akar, G., Clifton, K.J. (2010). Influence of individual perceptions and bicycle infrastructure on decision to bike. Transportation Research Record: Journal of the Transportation Research Board. 2140, pp. 165-172.


Appendix A

The Bicycle Friendly Community Metric, Spring 2013

Community Profile
1. Type of Jurisdiction.
2. For purposes of comparison, would you describe your community as largely…
3. Climate, Average daily temperature, Average precipitation.
4. Size of community.
5. Total Population.
   a. Student population (during semester)
7. Median Household Income.
8. Age Distribution
9. Race
10. How many Government employees (including Bicycle Program Manager), expressed in full-time equivalents, work on bicycle issues in your community?
11. What percentage of the community’s Bicycle Program Manager’s time is spent on bicycling issues?
12. Do you have a Bicycle Advisory Committee?
   a. How often does it meet?
   b. How many members serve on the committee?
   c. Which of the following groups are represented or regularly attend the Bicycle Advisory Committee?
   d. Name and email of Bicycle Advisory Committee Chair.
13. List all bicycle advocacy groups in your community.
   a. List the name and email of the primary contact for the bicycle advocacy community.
   b. Do you contract with any advocacy groups for services or programs?
   c. List all advocacy groups that are working with you on this application
14. What are the primary reasons your community has invested in bicycling?
15. What was your community’s most significant achievement for bicycling in the past year?
16. What specific improvements do you have planned for bicycling in the following year?

Engineering
17. Does your community currently have any of the following policies in place? (check boxes)
   a. When was it adopted?
18. What tools are in place to ensure implementation?
19. Does your community currently have any of the following additional policies in place? (check boxes)
20. How do you ensure your engineers and planners accommodate bicyclists according to AASHTO, MUTCD, and NACTO standards?
21. Which of the following significant physical barriers to cycling exist in your community?
22. How do you ensure that there are end-of-trip facilities for bicyclists?
23. Do your standards for bike parking conform with APBP guidelines?
24. What is the total number of bike parking spaces in your community?
   a. What percentage of bike racks conform with APBP guidelines?
   b. Of the total bike parking available, please specify the percentage of bike parking spaces that are:
      i. Bike lockers
      ii. Parking spaces in bike depots
      iii. Parking spaces in bike corrals
25. Approximately what percentage of the following {omitted here} locations has bike racks or storage units?
26. Does your community have Transit service
   a. What percentage of buses are equipped with bike racks?
   b. Are bikes welcomed inside transit vehicles?
27. What is the mileage of the existing off-road bicycle network within your community?
   a. How many miles of the following {omitted here} off-road bicycle accommodations do you have? Answer all that apply (in centerline miles).
   b. What percentage of natural surface trails and singletrack are open to bicyclists?
   c. What are the exceptions?
28. What is the centerline mileage of your road network?
   a. What is the street network density of your road network? (miles of road per sq. mi. of land area)
   b. What percentage of roads has posted speeds of 25mph and lower?
   c. What percentage of the existing on-street bicycle network meets or exceeds AASHTO, MUTCD, and NACTO standards?
   d. List your existing on-road bicycle accommodations that meet or exceed AASHTO, MUTCD, and NACTO standards. Answer all that apply (in centerline miles)
      i. Conventional bike lanes, shared lane markings, contra-flow bike lanes, protected or buffered bike lanes, protected or buffered bike lanes (one way), protected or buffered bike lanes (two way), raised cycle tracks, left-side bike lanes, bike boulevards, signed bike routes
29. What other ways have you improved conditions for bicyclists?
30. What percentage of arterial streets has dedicated space for cyclists?
31. Which of the following {omitted here} broader transportation policies and programs are in place in your community?
32. What maintenance policies or programs ensure the on-street bicycle network (including shoulders) remains usable and safe?
   a. Street sweeping
   b. Snow clearance
   c. Pothole maintenance
d. Describe any other maintenance policies or programs for the on-street bicycle network (including shoulders).

33. What maintenance policies or programs ensure the off-street bicycle network remains usable and safe?
   a. Path sweeping
   b. Vegetation maintenance
   c. Snow clearance
   d. Surface repair
   e. Describe any other maintenance policies or programs for the off-street bicycle network

34. Is there a mechanism in place for cyclists to identify problem intersections or areas to traffic engineers and planners?

35. How do you accommodate cyclists at intersections in your community?

36. Describe any other amenities or infrastructure improvements that your community provides or requires that create a comfortable and attractive bicycling environment (e.g. human-scale building design guidelines, mixed-use zoning, public restrooms, etc.).

Education

37. What percentage of schools in your jurisdiction participate in Safe Routes to School programs (or similar programs) that include bicycle education?

38. Outside of schools, how are children taught safe cycling skills?

39. Do you have a ticket diversion program?

40. What have you done in the last 18 months to educate motorists and bicyclists on sharing the road safely?

41. In your community, how often are the following classes offered annually?
   Traffic Skills 101 classes or equivalent (including classroom and on-bike instruction), Cycling Skills classes (three to four hour classroom training courses), Commuter classes (one to two hour classes), Bicycle maintenance classes or workshops.

42. Do you offer regular Smart Cycling courses for your community engineers and planners that include on-bike instruction and in-traffic cycling?

43. Has your community hosted a League Cycling Instructor seminar in the past two years?
   a. How many League Cycling Instructors are there in your community?
   b. List League Cycling Instructors that have taught at least one class during the past 12 months.

44. Which of the following groups of professional drivers have training that includes information on sharing the road with cyclists?

45. Describe any efforts your community has made to ensure your education programs reach traditionally underserved populations, particularly seniors, minorities, non-English speakers, and the disabled.

46. Describe any other education efforts in your community that promote safe cycling.

Encouragement

47. How do you promote National Bike Month/ your own dedicated Bike Month?
a. What percentage of the population participate in Bike Month events?
b. Do you actively promote Bike to Work Day or other bicycle commuting incentive programs?
c. Approximately what percentage of the community workforce do you reach on Bike to Work Day?

48. How do you promote bicycling outside of your official Bike Month?
49. List the signature cycling events that occur in your community.
   a. How does the municipality sponsor or actively support these events?
50. Does your local tourism board promote bicycling in your area?
51. Are there cycling clubs in your community?
   a. List the names of the clubs
52. How many specialty bicycle retailers (shops dedicated primarily to selling bikes and bike-related equipment) are there in your community?
   a. List their names.
53. Which of these bicycling amenities {omitted here} do you have in your communities?
   a. Is there a skate park in your community? If yes do bike shave access to the skate park?
54. Are there opportunities to rent bicycles in your community?
55. Does your community have a public bike sharing program?
   a. If yes, please provide details about the system below.
56. Do you have any current League of American Bicyclists designated Bicycle Friendly Businesses in your community?
57. Do you have any current League of American Bicyclists designated Bicycle Friendly Universities in your community?
58. Does your community have a youth recreation and/or intervention programs centered on bicycling?
59. What mapping and route finding information is available for your community, which has been updated I the last 18 months?
60. Describe any other programs or policies your community has to encourage cycling.

**Enforcement**

61. How does your police department interact with the local cycling community?
62. What kind of training is offered to police officers regarding traffic law as it applies to bicyclists?
63. What enforcement programs that target improving cyclist safety are in place?
64. What percentage of police department employees are on bikes?
65. Are any other public safety (e.g. EMS) employees on bikes?
66. Do police officers report cyclist crash data or potential hazards to traffic engineers and planners to identify sites in need of safety improvements for cyclists?
67. Which of the following {omitted here} safety services and amenities are available in your community?
68. Do you have any local ordinances that protect cyclists equitably?
69. Do your local ordinances place any restrictions on cyclists?
70. Describe any other enforcement programs or policies relating to cycling.
Evaluation and Planning

71. Does your community have a comprehensive bicycle master plan or similar section in another document?
   a. If yes, please provide details about the plan below. When was it passed or most recently updated? Is there a dedicated funding source for implementation? What percentage of the current plan has been implemented? Are you meeting annual target goals for implementation?

72. Do you have a trails master plan that addresses mountain bike access?
73. Is there formal cooperation between the mountain biking community and the community recreation and planning staff?

74. Does your community have an ongoing bicycle counting and/or survey program that allows for long-term trend analysis of cycling trips (e.g. participation in the National Bicycle and Pedestrian Documentation project)?

75. Does your community routinely conduct pre/post evaluations of bicycle-related road projects?

76. Does your community establish target goals for bicycle use?

77. What is the most current journey-to-work data from your community? Tip: Search for topic B08301 (Means of Transportation to Work) for your community on the American FactFinder website.

78. What is the average commuting distance to work for residents of your community?

79. How many cyclists have been involved in a crash in your community in the past five years involving a motor vehicle?
   a. How many cyclist fatalities have occurred in your community in the past five years involving a motor vehicle?
   b. Do you have a specific plan or program to reduce these numbers?

80. Do you measure the Bicycle Level of Service of roads and/or intersections? Describe your methodology and results.

81. Do you have community-wide trip reduction policies or programs?
   a. Does the program use individualized marketing to identify and support current and potential bike commuters in your community?

82. Have you done an economic impact study on bicycling in your community?

83. Do you have a mechanism to ensure bicycle facilities, programs and encouragement efforts are implemented in traditionally underserved neighborhoods?

84. Describe any other programs or policies that your community uses to evaluate and/or plan bicycling conditions, programs, and facilities.

Final Overview

85. What are the three primary reasons your community deserves to be designated as a Bicycle Friendly Community?

86. What are the three aspects of your community most in need of improvement in order to accommodate bicyclists?

87. Are you planning any new projects based on your completion of the Bicycle Friendly Community application?
88. Has completing this application made you more aware of what your community needs to do to be bicycle friendly?