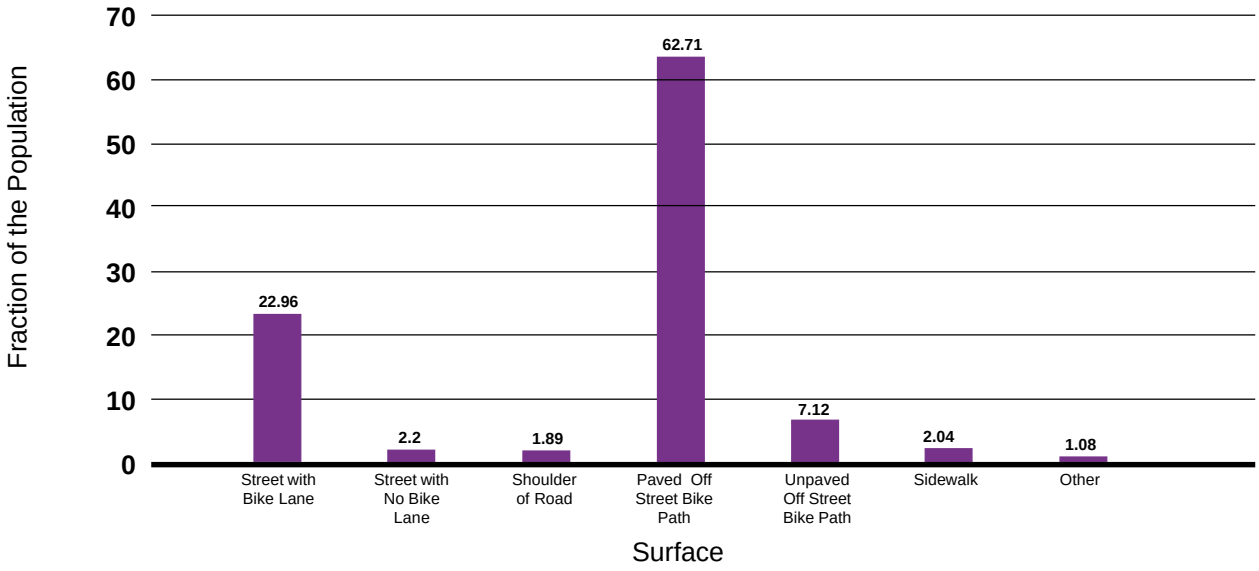
Preferred Surfaces for Bicycling

When asked about the riding surfaces they most preferred, bicyclists in Colorado left no doubt: paved off-street bicycle paths. Especially for transportation purposes, survey respondents overwhelmingly preferred this surface. Nearly two-thirds (63 percent) of Colorado bicyclists prefer to ride on an off-street bike path when they are riding to work, school or for a utility trip. Twenty-three percent prefer riding on the street with a bike lane. An unpaved off-street bike path was the choice of 7 percent of bike riders, and only a few indicated that they preferred to ride on a street with no bike lane, the shoulder of a road or a sidewalk.

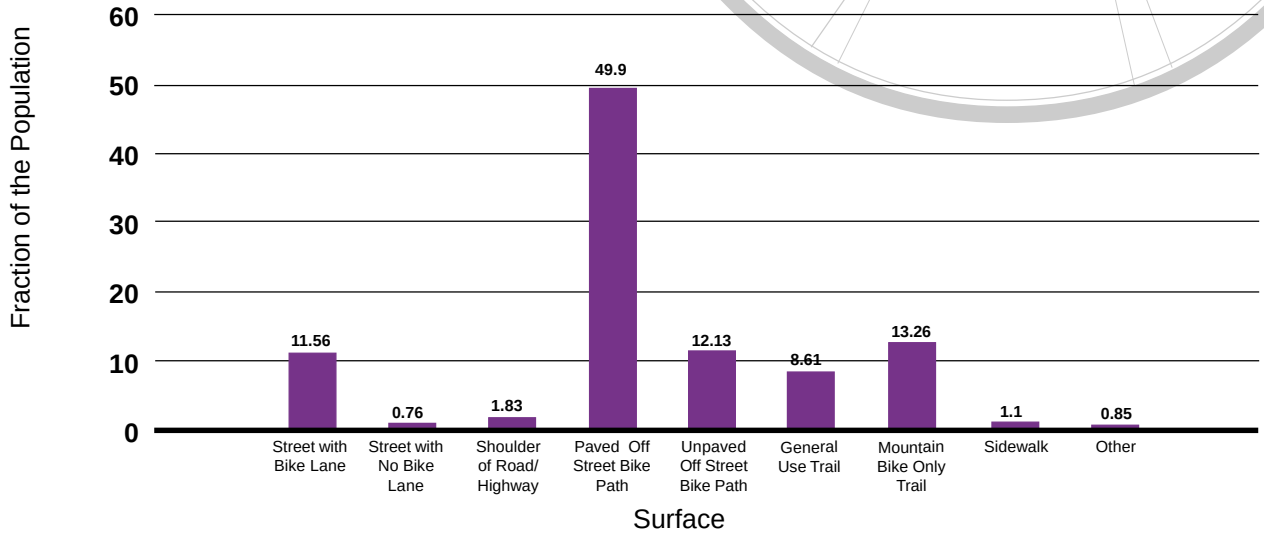
Figure 10
Prefered Surface for Work, School or Utility Trip



Respondents were also asked about the surface they preferred when riding for recreation and exercise, and the results are slightly different from the surfaces that they preferred for commuting purposes. Although the most popular surface was again paved off-street bike paths, other surfaces were viewed more favorably when riding for recreation. Half of the bicyclists indicated that they preferred paved bike paths. Thirteen percent preferred riding on a mountain bike trail, 12 percent preferred an unpaved off-

street bike path and 12 percent most enjoyed riding on a street with a bike lane. A general use trail was preferred by 9 percent of the respondents. Less than 2 percent each indicated that they preferred to ride for recreational purposes on a street, road shoulder or sidewalk.

Figure 11
Preferred Surface for Recreation or Exercise Trip



Satisfaction with Bicycling

Respondents who bicycle in Colorado were asked to rate their satisfaction with 15 different aspects of their bicycling experiences in the state. These aspects include the courtesy of others, bicycle parking, and the physical condition of the surfaces on which they ride. They were to indicate their satisfaction on a scale from one to five, with five representing "very satisfied" and one representing "not satisfied". The features that generated the highest frequency of negative responses were: the courtesy of motorists, debris on the roads, conditions at road intersections and the condition and width of road shoulders. Over 60 percent were dissatisfied (either very or somewhat dissatisfied) with the width of road shoulders. Above, few people reported a preference for riding

on the shoulder of a road, but those who ride on road shoulders are clearly not satisfied with either their width or condition. Only 2 percent indicated they were very satisfied with the condition of road shoulder surfaces, while 19 percent indicated that they were very unsatisfied.

Table 2. Satisfaction with Aspects of Bicycling in Colorado

	Percent Very Satisfied	Percent Somewhat Satisfied	Percent Somewhat Unsatisfied	Percent Not Satisfied
Bicycle Parking at Work	12%	9%	7%	11%
Bicycle Parking at School	8%	8%	4%	4%
Bicycle Parking at Other Locations	3%	9%	22%	13%
Courtesy of Motorists	1%	7%	28%	28%
Courtesy of Other Cyclists	12%	12%	12%	5%
Courtesy of Walkers, Runners and Skaters	7%	7%	12%	6%
Crossings at Road Intersections	2%	2%	25%	13%
Railroad Crossings	5%	15%	11%	7%
Debris on Roads/Paths	4%	19%	22%	13%
Speed Bumps and Drainage Grates on Roads	3%	15%	19%	10%
Road Surface Conditions	3%	18%	22%	10%
Bike Path Surface Conditions	12%	37%	9%	3%
Road Shoulder Surface Conditions	2%	7%	33%	19%
Road Shoulder Widths	1%	6%	33%	29%
Signs/Travel Markers	4%	19%	18%	11%

Preferences Regarding Bicycle-Related Public Expenditures

Respondents from Colorado households were asked if they would like to see improvements in conditions to encourage bicycling as a means of transportation. An overwhelming majority (79 percent) indicated that they would like to see such expenditures. Respondents then indicated their preferred funding method(s). Respondents could select from among the options presented in Table

3, and could select as many sources as they liked. Twelve percent did not indicate any preference. Clearly, the use of new taxes is not an attractive funding source. Only 6 percent indicated that they would like to use this funding option. The majority of survey respondents preferred to reallocate funds from other transportation projects. There was some support for using fees for trails and path use and bicycle registration and licensing revenue.

Table 3. Preferred Funding Sources for Improvement of Bicycling Conditions

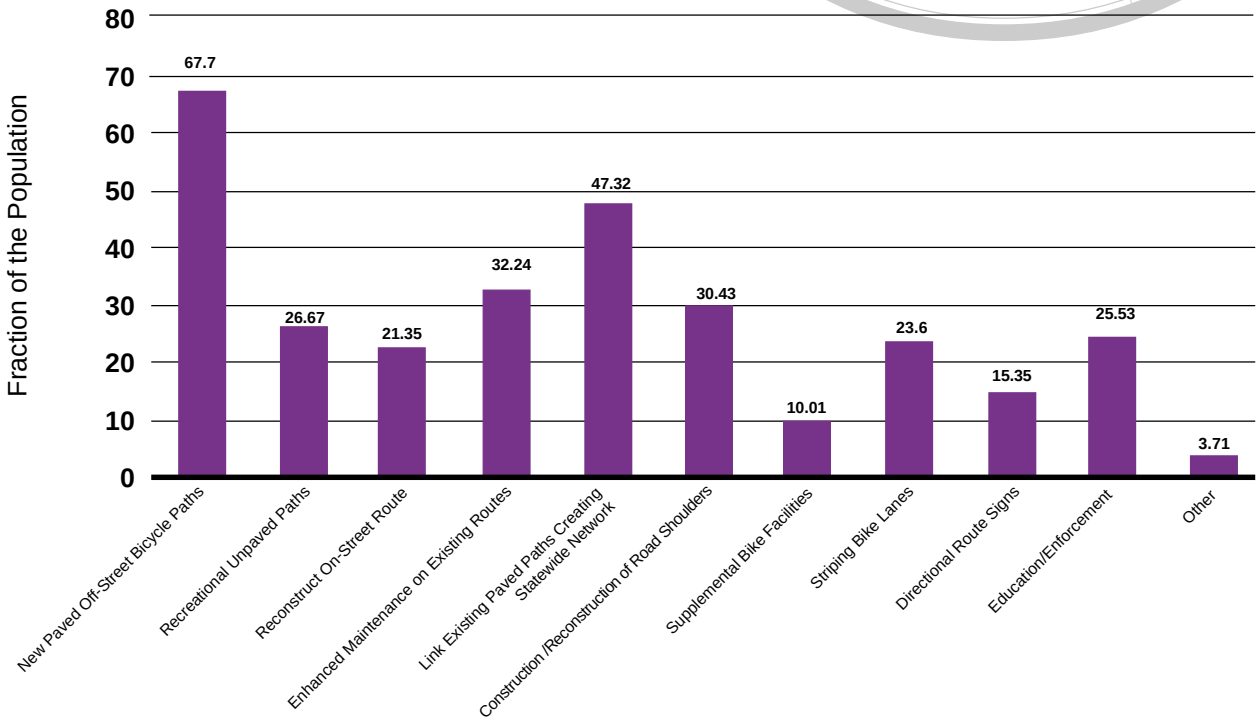
Funding Source	Percent of Households
New Tax	6.2%
User Fees for Trails and Paths	20.9%
Bicycle Registration and Licensing Fees	35.5%
Reallocating Funds from Other Transportation Projects	51.3%

Note: Percentages sum to more than 100% since respondents can select more than one funding source.

Respondents who bicycle in Colorado were also asked about how they would allocate $100 among various uses to improve their experiences when bicycling to work or for a utility trip. The questions listed ten possible uses for the money. Figure 12 below illustrates the projects that were most frequently mentioned by survey respondents. (It should be noted that the question did not ask if they would like to see any money spent on improving bicycling, but rather, if $100 were to be spent, where they would like to see the improvements.) Not surprisingly, given the fact that most bicycle riders indicated that they preferred riding on paved off-street bike paths, the most popular expenditure was to create new paved off-street bicycle paths. Just over two-thirds of the bike riders (68 percent) would choose to allocate some money for this use. The second most frequently mentioned project was to link existing paved paths. Forty-seven percent of respondents also chose this project. Other projects receiving support include spending to create recreational unpaved

paths, to better maintain existing routes and t[illegible]nstruct and imp[illegible]e road shoulde[illegible]. Bicyclists were less enthusiastic regarding expenditures on [illegible]ducation and enforcement, constructing on-street routes, and striping bike lanes. Supplemental b[illegible]e facilities and improving signs were mentioned by the fewest riders.

Figure 12
Public Bicycling Expenditure Preference



The Determinants of Bicycling

The household survey asks respondents to indicate the degree to which a variety of factors affect their decision to ride to work, school or for a utility trip. For each factor, the individual may indicate that it is not a factor, is a minor factor, is a major factor, or prevents them from bicycling

altogether. We use the responses to these questions to investigate the impact these factors have on the likelihood and amount of bicycling.

An investigation of the determinants of bicycling for work, school and utility trips reveals that concerns with traffic safety, the lack of off-street bike paths and lack of shower and dressing facilities at the destination influence the propensity to bicycle to work. Concern about traffic safety is the only significant factor that impacts the decision to bicycle to school; and road hazards (e.g., potholes and gravel) and lack of off-street bike paths are the factors that influence the decision to use a bicycle for utility trips.

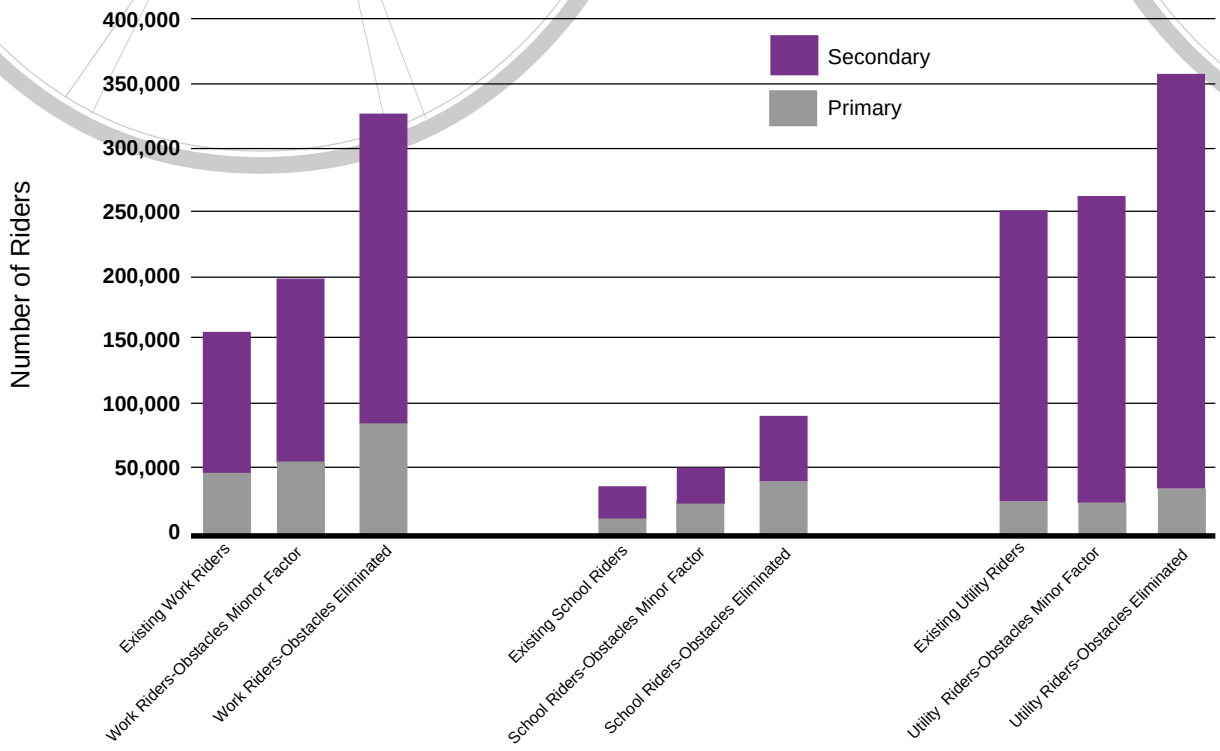
It is estimated that in Colorado there are 155,000 individuals who use a bicycle as their primary or secondary method of transportation to work. There are 41,500 students who use a bicycle for school trips as their primary or secondary method, and 241,000 individuals who bicycle for utility trips. The monthly number of miles bicycled by these riders are 5.6 million miles for work trips, 1.5 million miles for school trips, and 5.4 million miles for utility trips, generating a total of 12.5 million miles per month.

For those who bicycle to work, the satisfaction with the availability of bicycle parking is the only important factor that determines the frequency of bicycling. The satisfaction with the courtesy of other bicyclists, the availability of bike paths and signs and markers impact the frequency of utility trips.

Figure 13 displays the information on the number of current riders in each category (work, school and utility trips) by whether bicycling is their primary or secondary method of transportation. The middle bars in each category represent the number of bicyclists one would observe if the factors that matter in bicycling decisions were reduced to being a "minor factor" in each commute category. For example, if traffic safety concerns, the availability of bike paths and shower facilities were only a minor concern for workers, this would increase the number of individuals who bicycle

to work to 191,000 individuals. If these obstacles were eliminated entirely, the number of individuals who bicycle to work would go up to 319,000.

Figure 13
Number of New Riders



The reduction of the traffic safety concerns to a "minor factor" would increase the number of students who bicycle to school by 7,700 to 49,200 students. Elimination of traffic safety concerns entirely would increase the number of students who bicycle to work to 84,500.

The reduction in road hazards and the lack of off-street bike paths increases the number of individuals who bicycle for utility trips to 248,000. The elimination of these obstacles increases this number to 352,000.

Figure 14
Monthly Miles Commuted by Current and New Bicyclists Due to Factors Becoming "Not a Factor" and Satisfaction Raised to 4 on Five Point Scale

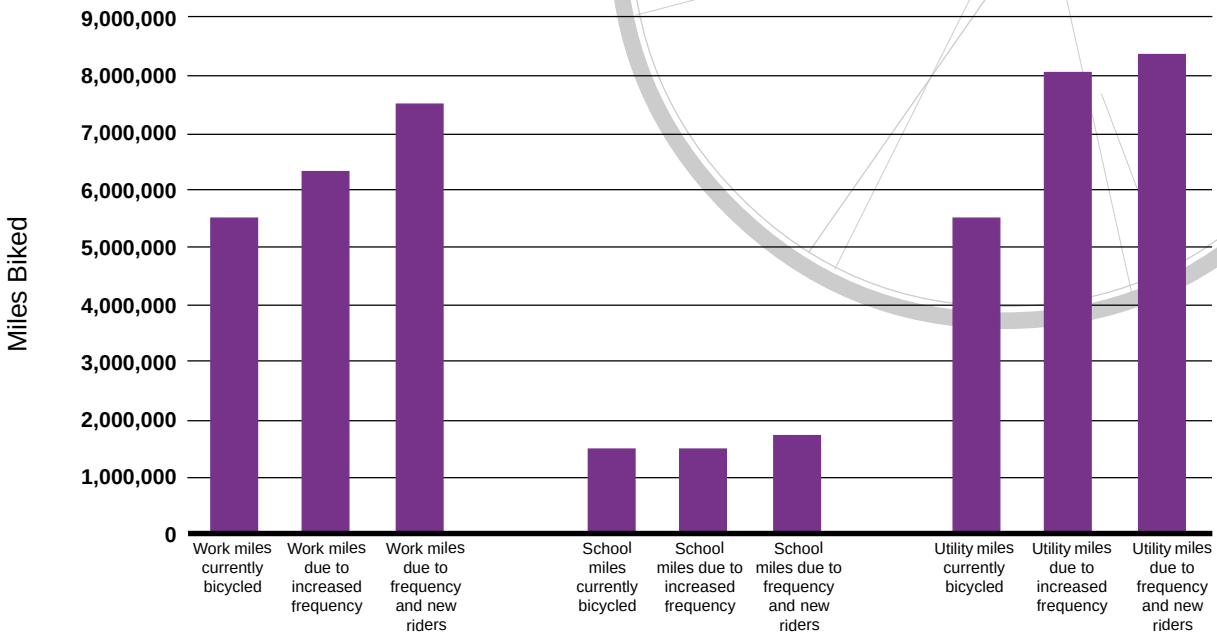


Figure 14 displays the number of miles bicycled per month for each category (work, school or utility trip), along with the number of miles that would be observed due to increased frequency of riding by current users, as well as the miles that would be observed due to increased frequency and the entrance of new riders following a change in bicycling environment.

The questions used in the analysis ask respondents to indicate their satisfaction with certain factors, on a scale from 0 (very unsatisfied) to 5 (very satisfied). For example, if parking satisfaction increases to 4.0 on a scale from 0 to 5 (where the current average is 3.1 for individuals who bicycle to work), this would increase the number of miles bicycled to work by almost 12 percent to approximately 6.3 million miles per month. If the obstacles were improved such that they are only a minor concern, this would add an additional 1.3 million miles ridden by the workers who would start bicycling to work.

An improvement in the bicycling environment so that the obstacles become a minor concern, coupled with an improvement in satisfaction of various bicycling conditions to 4.0 (on a scale from 0 to 5, where the current satisfaction averages are around 3) would generate a total of 1.7 million miles bicycled to school per month, and 8 million miles for utility trips.

In the extreme scenario where all obstacles are eliminated and the satisfaction with bicycling conditions is at the maximum, the total number of monthly miles traveled for work would be 13 million miles for work trips, 3 million miles for school trips, and almost 15 million miles for utility trips. These values can be considered as the upper limits. Figure 15 summarizes the total miles traveled currently and its breakdown into work, school and utility trips, along with the miles that would be traveled if obstacles are reduced to a "minor concern" and satisfaction with bicycling conditions were raised to 4 (the middle bar). The bar on the right displays the upper-limit miles: the miles that would be traveled under the elimination of all obstacles, and all bicyclists being very satisfied with all bicycling conditions. The total miles bicycled currently are around 12 million per month. The total miles bicycled would go up to 17 million with obstacles improved to be a minor concern and satisfaction average being 4.0, and the upper limit of total miles bicycled is 31 million miles per month.

Figure 15
Total Monthly Miles Bicycled Under Various Conditions

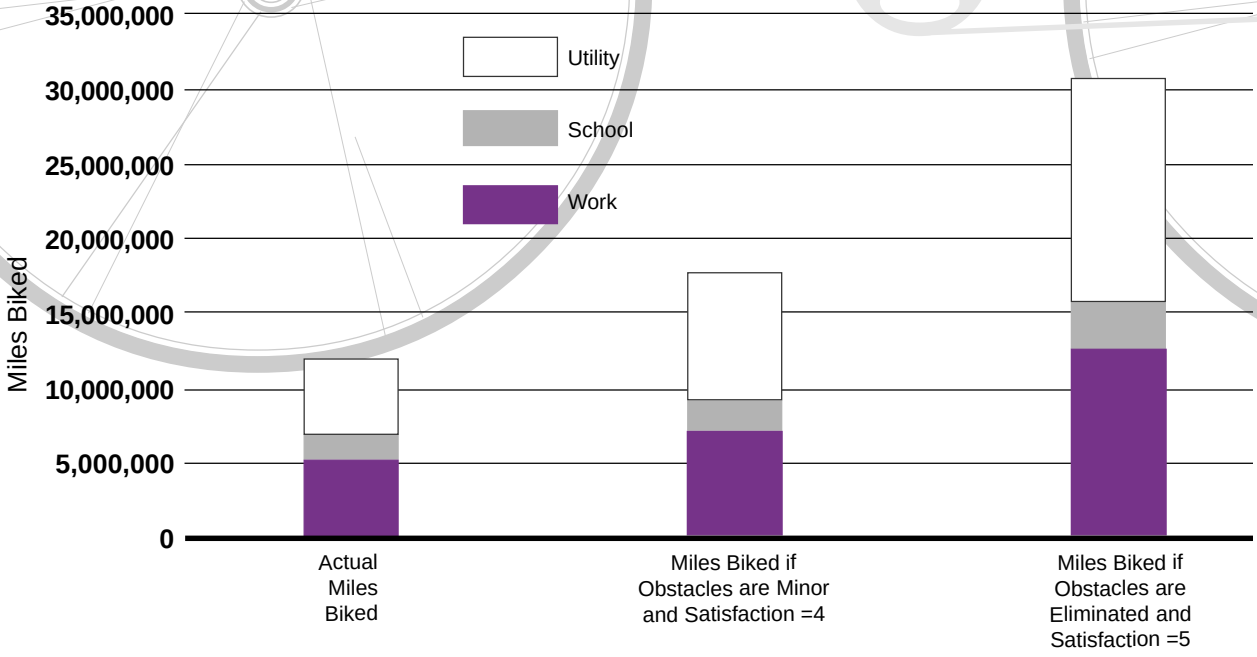


Figure 16
Statewide Bicycling Potential Without Obstacles