6. Benefits

6.1. Why Bicycling is Important

Bicycling is important to Bakersfield's future due to its potential to address the interrelated challenges of traffic, air quality, creating a sense of community, and public health. Non-motorized transportation infrastructure can also provide economic benefits to the community. By becoming a more bicycle-friendly city, Bakersfield can affect all of these elements and can collectively influence the existing and future quality of life.

Fostering conditions where bicycling is accepted and encouraged increases a community's livability from a number of different criteria that are often difficult to measure, but nevertheless important. In areas where people ride a bicycle, there are more opportunities for chance meetings than where people generally travel by vehicle. People bicycling are also more likely to talk and interact on a more human level. More activity at a slower rate also provides more "eyes on the street", or the effect of people looking out for one another. All of these quality of life benefits can enhance Bakersfield's sense of place.

This chapter outlines estimated future bicycling activity and the benefits of bicycling including traffic, economic, air quality and health benefits.

6.2. Future Usage and Benefits

Alta has developed a Caltrans approved bicycle model that estimates bicycle network usage and benefits associated with increased bicycling. Table 6-1 quantifies the estimated reduction in vehicle miles traveled in Bakersfield following implementation of the bikeway network, as well as an increase of bicycle mode share from 1.35 percent to 2.6 percent.

6.2.1 Traffic Benefits

Each time residents in Bakersfield choose to bicycle for utilitarian purposes, automobile trips are removed from the road. As Bakersfield's downtown, other retail and employment districts become more inviting to bicycles, more work, school, shopping, and recreational trips will be made on bicycle. Cumulatively, this pattern may reduce traffic in some areas and, subsequently, improve air quality.

Table 6-1 presents estimated future bicycling trips that would result from implementation of this plan. As estimated, bicycle mode share would increase to 2.6 percent - from 5,564 existing trips to 11,195 with the built-out bikeway network.

Table 6-1: Projected Year 2030 Bicycling Demand

Data		Source and Assumptions
Future Commute Statistics		
Future study area population	433,253	CA Department of Finance State and County Population Projections applied to 2007-2011 American Community Survey, B01003 5-Year Estimates
Future employed population	175,497	CA Department of Finance State and County Population Projections applied to 2007-2011 American Community Survey, B08301 5-Year Estimates
Future bike-to-work mode share	0.7%	Assumes the number of bicycle to work commuters will double after full bikeway network buildout (based on 2007-2011 American Community Survey, B08301 5-Year Estimates)
Future number of bike-to-work commuters	1,299	Future employed persons multiplied by bike-to-work mode share
Future work-at-home mode share	3.5%	Assumes the number of work-at-home employees will increase by 25% (based on 2007-2011 American Community Survey, B08301 5-Year Estimates)
Future number of work-at-home bike commuters	612	Assumes 10% of population working at home makes at least one daily bicycle trip
Future transit-to-work mode share	1.5%	Assumes the number of transit-to-work commuters will increase by 25% (based on 2007-2011 American Community Survey, B08301 5-Year Estimates)
Future transit bicycle commuters	642	Employed persons multiplied by transit mode share. Assumes 25% of transit riders access transit by bicycle
Future school children, ages 6-14 (grades K-8)	15,830	CA Department of Finance State and County Population Projections applied to 2007-2011 American Community Survey, B01003 5-Year Estimates
Future school children bicycling mode share	4.0%	Assumes school children bicycling mode share will double (based on National Safe Routes to School surveys, 2003)
Future school children bike commuters	633	School children population multiplied by children bike mode share
Future number of college students in study area	48,238	CA Department of Finance State and County Population Projections applied to 2007-2011 American Community Survey, B01003 5-Year Estimates
Future estimated college bicycling mode share	5.0%	National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995 [Review of bicycle commute share in seven university communities (5%), adjusted to consider site-specific topographic constraints (1%)]
Future college bike commuters	2,412	College population multiplied by college bike mode share
Future total number of bike commuters	5,598	Total of bike-to-work, transit, school, college and utilitarian bicycle commuters (Does not include recreation)
Total daily bicycling trips	11,195	Total bicycle commuters x 2 (for round trips)
Estimated Adjusted Mode Share	2.6%	Estimated bicycle commuters divided by population
Future Vehicle Trips and Miles Reduction		
Reduced Vehicle Trips per Weekday	3,491	Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children
Reduced Vehicle Trips per Year	911,184	Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)
Reduced Vehicle Miles per Weekday	25,580	Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren
Reduced Vehicle Miles per Year	6,676,326	Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)

6.2.2 Economic Benefits

An inviting bicycle network and supportive programs have potential to improve the following economic factors:

- Studies suggest that home prices near trails are higher than home prices farther away from trails.[1]
- Bicycle and pedestrian facilities can lead to increased spending. A 1991 National Park Service study found that long rural trails generated more revenue per person than shorter urban trails. The study estimated average expenditures of rail-trail users at $1.90 per person to $14.88 per person.[2]
- A high-quality bicycling environment can bring bicycle-related businesses to the region. Portland, Oregon's bicycle industry was worth approximately $90 million in 2008,[3] and a study of the economic impact of bicycling in Wisconsin found that manufacturing contributes $426 million and retail sales and service contribute up to $100 million.[4]

While data are not available to quantitatively estimate the economic impacts of constructing a high-quality network in Bakersfield, this Plan's implementation may contribute to increased property values, tourism, retail sales and bicycle-related businesses.

6.2.3 Air Quality Benefits

Increased bicycle commute trips would have the additional benefit of improving air quality levels over levels projected without improvements to the bicycle network. Analysis conducted for this Plan found that implementation of the bicycle network could result in approximately 11,195 daily commute and utilitarian bicycle trips. The corresponding reduction in vehicle miles driven would reduce air pollution emissions. Measuring environmental improvements by reduction in greenhouse gases allow easy measurement and tracking of real benefits.

Table 6-2: Projected Year 2030 Bicycling Air Quality Impact

Data		Source and Assumptions
Future Air Quality Benefits		
Reduced Hydrocarbons (pounds/weekday)	77	Daily mileage reduction multiplied by 1.36 grams per reduced mile
Reduced PM10 (pounds/weekday)	0.3	Daily mileage reduction multiplied by 0.0052 grams per reduced mile
Reduced PM2.5 (pounds/weekday)	0.3	Daily mileage reduction multiplied by 0.0049 grams per reduced mile
Reduced NOX (pounds/weekday)	54	Daily mileage reduction multiplied by 0.95 grams per reduced mile
Reduced CO (pounds/weekday)	699	Daily mileage reduction multiplied by 12.4 grams per reduced mile
Reduced C02 (pounds/weekday)	20,809	Yearly mileage reduction multiplied by 369 grams per reduced mile
Reduced Hydrocarbons (pounds/year)	20,018	Yearly mileage reduction multiplied by 1.36 grams per reduced mile
Reduced PM10 (pounds/year)	77	Yearly mileage reduction multiplied by 0.0052 grams per reduced mile
Reduced PM2.5 (pounds/year)	72	Yearly mileage reduction multiplied by 0.0049 grams per reduced mile
Reduced NOX (pounds/year)	13,983	Yearly mileage reduction multiplied by 0.95 grams per reduced mile
Reduced CO (pounds/year)	182,513	Yearly mileage reduction multiplied by 12.4 grams per reduced mile
Reduced C02 (pounds/year)	5,431,229	Yearly mileage reduction multiplied by 369 grams per reduced mile
Emissions rates from EPA report 420-F-05-022 "Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks." 2005.)		

[1] Racca, D., & Dhanju, A. (2006). Property Value/Desirability Effects of Bike Paths Adjacent to Residential Areas. Delaware Center for Transportation.
[2] Center for International Public Management, Inc. for the Florida Dept. of Environmental Protection, Office of Greenways and Trails. (1998). Thinking Green: A Guide to the Benefits and Costs of Greenways and Trails.
[3] Alta Planning+Design. (2009). The Value of the Bicycle-Related Industry in Portland.
[4] Wisconsin Department of Transportation. The Economic Impact of Bicycling in Wisconsin.

6.2.4 Health Benefits

Bicycling can improve public health through increased physical activity. In recent years public health professionals and urban planners have become increasingly aware that the impacts of vehicles on public health extend far beyond asthma and other respiratory conditions caused by air pollution. Dependency on vehicles has decreased physical activity, which in turn is linked to cardiovascular disease, stroke, hypertension, Type-2 diabetes and osteoporosis. In comparison to European countries and Canada (Figure 6-1[5]), the U.S. has a higher rate of obesity and lower rate of walking, bicycling, and public transportation use. Improving non-motorized facilities may help alleviate these disorders and reduce obesity.

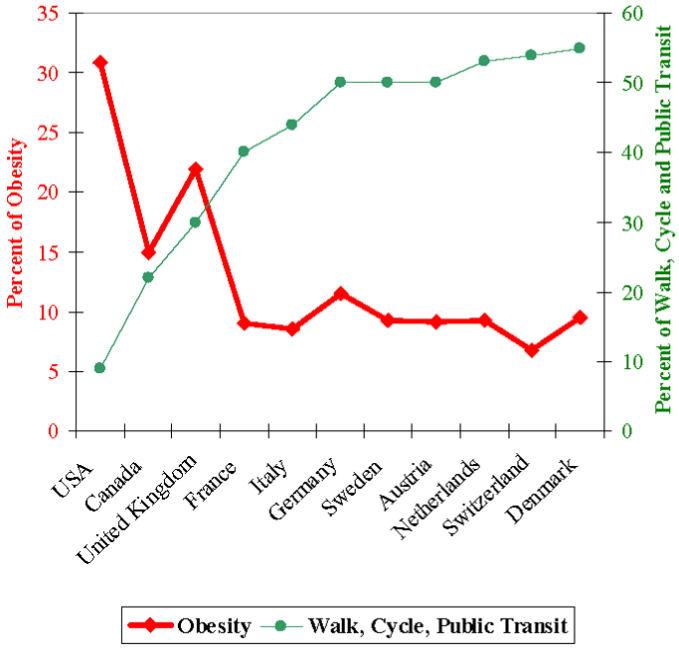

Figure 6-1: Transportation and Obesity Rates

The Centers for Disease Control recommend that all healthy adults aged 18 to 65 need moderate-intensity physical activity at least three days each week. Community design, including bicycle facilities, influences the ability of Bakersfield residents to attain these levels of exercise through daily activities such as commuting to work, school or for recreation.

[5] Pucher, J., & Dijkstra, L. (September 2003). Promoting Safe Walking and Cycling to Improve Public Health. American Journal of Public Health.