7. Benefits of Bicycling

7.1. Why Bicycling is Important

Bicycling is important to San Mateo'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, San Mateo 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 San Mateo's sense of place.

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

7.2. Future Usage and Benefits

Alta has developed a Caltrans approved bicycle model that estimates bicycle network usage and benefits associated with increased bicycling. **Table 7-1** quantifies the estimated reduction in vehicle miles traveled in San Mateo following implementation of the bikeway network, as well as an increase of bicycle mode share from 1.35 percent to 5.39 percent.

7.2.1. Traffic Benefits

As identified in the General Plan, heavy traffic conditions characterize most arterials and the two highways in San Mateo. In the downtown area, local streets experience continued congestion at several intersections. Each time residents in San Mateo choose to bicycle for utilitarian purposes, automobile trips are removed from the road. As San Mateo'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. Assuming 73 percent of these bicycle trips replace vehicular trips; buildout of the Bikeways Master Plan would result in approximately 29,615 fewer vehicle miles driven per weekday or 7.7 million fewer vehicle miles per year.

Table 7-1: San Mateo Estimated Future (Year 2030) Bicycle Trips and Benefits

Data		Source and Assumptions
Future Commute Statistics		
Future study area population	119,800	2030 General Plan (based on ABAG 2007 projections)
Future employed population	48,512	Based on 2030 General Plan number of employed residents (Assumes 4.7% (2010 data) of employed residents work at home)
Future bike-to-work mode share	10%	Assumes 5% of work commuters bicycle to work after full bikeway network buildout
Future number of bike-to-work commuters	4,851	Assumes the mode share will increase with implementation of the increase bikeway network
Future work-at-home mode share	4.7%	2008 US Census American Community Survey
Future number of work-at-home bike commuters	113	Assumes 10% of population working at home makes at least one daily bicycle trip
Estimated number of people who use Caltrain and SamTrans	5,391	Applies 2008 US Census American Community Survey ratio of Estimated number of people who use Caltrain and SamTrans to San Mateo Population (4.5%) to 2030 San Mateo Population
Future transit-to-work mode share	18.0%	Assumes 18% of transit users access by bike (based on 2009 Caltrain Ridership Counts)
Future transit bicycle commuters	970	Assumes 18% of transit users access by bike (based on 2009 Caltrain Ridership Counts)
Future school children, ages 6-14 (grades K-8)	9,225	Applies 2008 US Census American Community Survey ratio of School Children Grades K-8 to San Mateo Population (7.7%) to 2030 San Mateo Population
Future school children bicycling mode share	5.0%	Assumes 5% will bicycle to school with implementation of the Safe Routes to School toolkit
Future school children bike commuters	461	School children population * children bike mode share
Future number of college students in study area	6,469	Applies 2008 US Census American Community Survey ratio of College Students to San Mateo Population (5.4%) to 2030 San Mateo Population
Future estimated college bicycling mode share	1.0%	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	65	College population * college bike mode share
Future total number of bike commuters	6,461	Total of bike-to-work, transit, school, college and utilitarian bicycle commuters (Does not include recreation)
Total daily bicycling trips	12,922	Total bicycle commuters x 2 (for round trips)
Estimated Adjusted Mode Share	5.39%	Estimated bicycle commuters divided by population
Future Vehicle Trips and Miles Reduction		
Reduced Vehicle Trips per Weekday	3,916	Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children
Reduced Vehicle Trips per Year	1,022,014	Reduced number of weekday vehicle trips multiplied by 261 (weekdays in a year)
Reduced Vehicle Miles per Weekday	29,615	Assumes average round trip travel length of 8 miles for adults/college students and 1 mile for schoolchildren
Reduced Vehicle Miles per Year	7,729,495	Reduced number of weekday vehicle miles multiplied by 261 (weekdays in a year)
Future Air Quality Benefits		
Reduced PM10 (tons/weekday)	545	Daily mileage reduction multiplied by 0.0184 tons per reduced mile
Reduced NOX (tons/weekday)	14,772	Daily mileage reduction multiplied by 0.4988 tons per reduced mile
Reduced ROG (tons/weekday)	2,150	Daily mileage reduction multiplied by 0.0726 tons per reduced mile
Reduced C02 (pounds/weekday)	6,570,071	Yearly mileage reduction multiplied by 0.85 pounds per reduced mile
Reduced PM10 (tons/year)	142,223	Yearly mileage reduction multiplied by 0.0184 tons per reduced mile
Reduced NOX (tons/year)	3,855,472	Yearly mileage reduction multiplied by 0.4988 tons per reduced mile
Reduced ROG (tons/year)	561,161	Yearly mileage reduction multiplied by 0.0726 tons per reduced mile
Reduced C02 (pounds/year)	6,570,071	Yearly mileage reduction multiplied by 0.85 pounds per reduced mile

**PM10: particulate matter of 10 nanometers or less in diameter; NOX: Nitrous Oxide; ROG: Reactive Organic Gases; CO2: Carbon Dioxide*

7.2.2. Economic Benefits

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

- The majority of studies reviewed found that home prices near trails are higher than home prices farther away from trails.
- Bicycle-related tourism has been shown to bring in significant revenue to a region. Studies of bicycle tourism in Colorado, Maine and the Outer Banks Region of North Carolina estimate annual bicycle tourism revenues ranging from $19.5 million to $250.6 million.
- Bicycle and pedestrian facilities can lead to increased spending by consumers. 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 $3.02 per person to $23.63 per person.
- A high-quality bicycling environment can bring bicycle-related businesses to the region. Portland, Oregon's bicycle industry was worth approximately $90 million in 2009, and a study of the economic impact of bicycling in Colorado found that manufacturing contributes $990 million and retail sales and service contribute up to $251 million.

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

7.2.3. 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 buildout of the bicycle network in year 2030 could result in approximately 12,922 daily commute and utilitarian bicycle trips. The corresponding reduction in vehicle miles driven would reduce air pollution emissions, including particulate matter (by approximately 0.5 ton/weekday), nitrogen oxides (14.7 ton/weekday), reactive organic gases (2.5 ton/weekly), and carbon dioxide (16.5 ton/weekday). Measuring environmental improvements by reduction in greenhouse gases allow easy measurement and tracking of real benefits.

7.2.4. 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, 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.

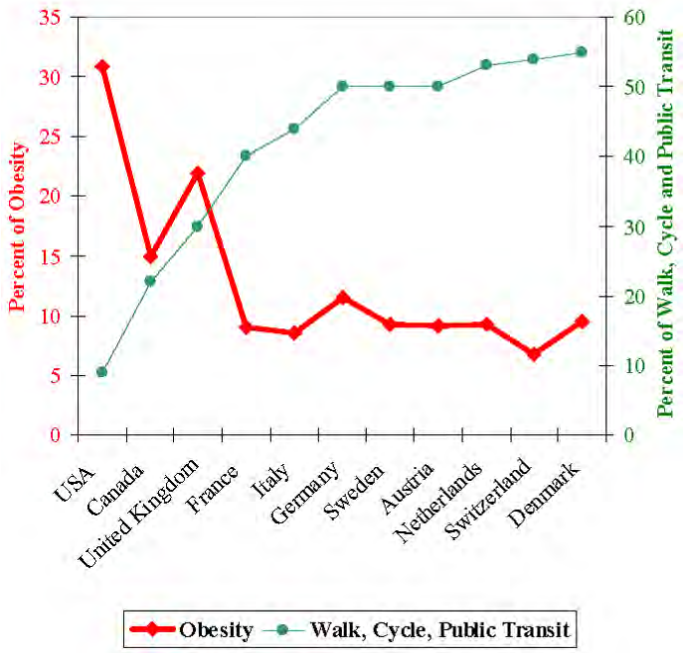

Figure 7-1: Transportation and Obesity Rates

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 San Mateo residents to attain these levels of exercise through daily activities such as commuting to work, school or for recreation. As **Figure 7-1**[7-1] shows, there may be a link between walking, bicycling, and transit use and obesity. In comparison to listed European countries and Canada, the US has a higher rate of obesity and a lower percent of walking, bicycling, and public transportation use.

[7-1] Pucher and Dijkstra, "Promoting Safe Walking and Cycling to Improve Public Health, Am Journal of Public Health, September 2003.