



# CITY OF CAPITOLA BICYCLE TRANSPORTATION PLAN



Adopted  
February 10, 2011

## TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION .....	1
SECTION 1.1 PURPOSE OF THE PLAN .....	1
SECTION 1.2 HISTORY OF BICYCLES.....	2
SECTION 1.3 BENEFITS OF BICYCLE TRANSPORTATION .....	3
SECTION 1.4 SETTING .....	4
SECTION 1.5 PLANNING PROCESS .....	5
SECTION 1.6 PLAN ORGANIZATION .....	6
SECTION 1.7 BTA COMPLIANCE .....	6
CHAPTER 2 GOALS AND OBJECTIVES .....	7
SECTION 2.1 CITY OF CAPITOLA PLANNING DOCUMENTS .....	7
SECTION 2.2 SANTA CRUZ COUNTY REGIONAL TRANSPORTATION PLAN.....	8
SECTION 2.3 GOALS AND OBJECTIVES .....	10
CHAPTER 3 EXISTING CONDITIONS.....	14
SECTION 3.1 EXISTING BICYCLE FACILITIES .....	14
SECTION 3.2 EXISTING LAND USE.....	17
CHAPTER 4 NEEDS ANALYSIS.....	19
SECTION 4.1 TRIP GENERATORS .....	19
SECTION 4.2 COMMUTE PATTERNS AND COMMUTER NEEDS.....	20
SECTION 4.3 COLLISION ANALYSIS .....	22
CHAPTER 5 BICYCLE PLAN PROJECTS.....	25
SECTION 5.1 PROPOSED BIKEWAYS .....	25
SECTION 5.2 BIKEWAYS AND ROAD MAINTENANCE .....	26
SECTION 5.3 BICYCLE PARKING AND SUPPORT FACILITIES .....	27
SECTION 5.4 BICYCLE DETECTORS AND COUNTERS .....	28
SECTION 5.5 TRANSIT AND INTERMODAL FACILITIES .....	31
SECTION 5.6 SAFE ROUTES PLANNING AND RESEARCH.....	32

SECTION 5.7 MONTEREY BAY SANCTUARY SCENIC TRAIL .....	34
CHAPTER 6 BICYCLE SAFETY AND EDUCATION PROGRAMS.....	36
SECTION 6.1 ORGANIZATIONS AND EDUCATION AND SAFETY PROGRAMS.....	36
CHAPTER 7 FUNDING SOURCES .....	38
SECTION 7.1 FEDERAL FUNDING SOURCES .....	38
SECTION 7.2 STATE FUNDING SOURCES.....	38
SECTION 7.3 LOCAL FUNDING SOURCES .....	38
WORKS CITED .....	39
APPENDICES.....	A1
APPENDIX A-1   LAND USE MAP .....	A1
APPENDIX A-2   BICYCLE FACILITIES MAP .....	A2
APPENDIX B   PAST EXPENDITURES AND FUTURE COSTS .....	B1
APPENDIX C   BICYCLE TRANSPORTATION PLAN CHECKLIST .....	C1
APPENDIX D   2011 PROPOSED PROJECTS LIST .....	D1
APPENDIX E  FUNDING MATRIX .....	E1
APPENDIX F   GUIDELINES FOR CONSTRUCTION AREAS.....	F1

## CHAPTER 1|INTRODUCTION

The City of Capitola Bicycle Transportation Plan (BTP) assesses commuter needs, identifies funding sources and directs the future development of bicycle facilities in the City. It also seeks to carry out the Five Es used by the League of American Bicyclists to identify and rank Bicycle Friendly Communities. The five Es are Evaluation, Engineering, Education, Encouragement and Enforcement. Listed below are questions that define each category.

Evaluation	•How well does a community evaluate its own bikeway network and systematically plan to improve it?
Engineering	•Is the physical bicycle infrastructure well connected, accessible , safe and well maintained?
Education	•Are cycling educational programs available to bicyclists and motorists of all ages?
Encouragement	•Does the community support and promote bicycling through special events, clubs and recreational programs and facilities?
Enforcement	•Do well enforced laws exist which improve bicycle safety?

Communities which support bicycling through the simultaneous achievement of the 5 Es are considered to be Bicycle Friendly Communities. The goals and objectives of the Capitola Bicycle Transportation Plan were created with the 5 Es in mind in order to realize the vision of a pro-bicycle city. The Capitola Bicycle Transportation Plan was created as a result of community input, and reflects the needs of bicycle commuters in the City of Capitola and the greater region. By meeting the 5 Es criteria and engaging members of the community, the implementation of the Capitola Bicycle Transportation Plan will result in a safer, more convenient, and more pleasurable place to bicycle.

### SECTION 1.1 PURPOSE OF THE PLAN

The Capitola Bicycle Transportation Plan sets goals and objectives for the purpose of increasing the safety and convenience of bicycle commuting in the area. The BTP is an update of the 2005 City of Capitola Bicycle Transportation Plan. It includes or expands upon the goals and objectives put forth in 2005 to improve network connectivity, address dangerous or hazardous areas, and increase education and bicycle resources. In addition to remaining consistent with major City planning documents, the 2011 Bicycle Transportation Plan implements the policies and programs of the Circulation Element of the General Plan. The BTP is intended to aid City of Capitola planners and engineers in prioritizing bicycle improvement projects with the goal of increasing bicycle commuting, recreation, tourism and safety.

As traffic congestion, air pollution, obesity, and energy costs have become more serious problems, bicycling has become a practical alternative mode of transportation. Comprehensive planning efforts will help the bicycle reach its full potential as a viable transportation mode for commuting and shopping as well as for recreation. The Bicycle Transportation Plan defines goals, objectives, policies, and implementation programs involved in the planning, design, and construction of an integrated system of regional bicycle facilities. The BTP defines a network of bikeways, with an emphasis on commuter routes, which coordinate with and compliment other routes in Santa Cruz County.



## SECTION 1.2 HISTORY OF BICYCLES

The bicycle was originally developed as a transportation vehicle and gained prominence 100 years ago as a sporty alternative to the horse drawn carriage. With the emergence of the motor vehicle, however, the situation quickly changed. Unlike in Europe, where automobiles took decades to supersede cycling, American cyclists never had the chance to coexist with the automobile community. As a result, when the exchange of transportation modes occurred, bicycles experienced a rapid drop in status from high-class fashion to mere child's toy. No merging of these two modes was made. From there the bicycle's popularity fluctuated with the relative availability of cars and fuel costs, and was considered at best a working class mode of transportation.

Cycling began its great comeback after the postwar urban sprawl. More and more young people turned to bicycles as their only transportation to and from the suburbs and this, in turn, encouraged the development of more suitable bicycles. Then other groups began catching on: open road lovers, fitness enthusiasts and recreational riders. Enrollment in cycling clubs grew rapidly, and new and inexperienced members brought with them their childhood-taught "fear of motor vehicles." This viewpoint placed cyclists and motorists in competition with each other instead of encouraging cooperation and mutual respect. This viewpoint, predominant at the time, led to the bicycle path trend of the 1970's. Bicycle paths created at that time physically separated the two types of vehicles so that there could be no competition. They also reinforced the "fear of motor vehicles" viewpoint by keeping cyclists off the road. Experience with separated bicycle paths proved that they alone could not meet the needs of bicyclists. Firstly, bicyclists will not use poorly designed bicycle paths, due to inconveniences and safety problems. Well designed separated paths function well for some trip purposes and poorly for others. When riding for recreational purposes or commuting to only one destination, separated paths can be useful to bicyclists. The issue of access arises

when a trip destination is off of the bicycle path and can only be reached by a street network shared by motorized vehicles. The two apparent solutions to the issue of access are to create separated bicycle paths that run throughout the city, or encourage motorists, cyclists and pedestrians to share the road.

Today the cycling trend is to "share the road." This viewpoint promotes the integration of motorists and cyclists by improving existing roadway systems to accommodate bicycles. Bicyclists then share the roadway along with general motor vehicle traffic. Not only does this conserve funds, but it also unites the two groups under one set of rules of the road for better cooperation and safer operation. Unfortunately, "share the road" signs have not been entirely successful as automobile drivers sometimes take "share the road" to mean that bicycles should not take the lane and slow down motorized vehicle traffic. To reflect State law which states that bicycles have a rightful place on the road the City of Capitola has installed several "Bicycles may use full lane" signs on streets lacking bicycle facilities.



### SECTION 1.3 BENEFITS OF BICYCLE TRANSPORTATION

Bicycle riding not only improves physical health through exercise, and the environment by offsetting green house gas emissions, but it requires less expensive operational and infrastructure maintenance than driving an automobile. Investment in bicycle infrastructure has also proven to benefit local economies by attracting environmental and bicycle tourism (Flusche, 2009). It is difficult to realize the daily cost of driving an automobile, as not all costs are direct such as a bus fare, and many costs are subsidized or hidden. In order to help people quantify the financial and environmental impacts of driving, the Santa Cruz Regional Transportation Commission created an online interactive tool which calculates the "True Cost of Driving" (<http://www.commutesolutions.org/calc.htm>). The tool counts direct costs such as fuel, maintenance, insurance and parking in cents per mile. What is unique about the calculator is that it also includes indirect costs which are often overlooked such as infrastructure improvements and maintenance, air and water pollution, land use impacts, noise and congestion costs. By inputting the number of miles driven annually, the calculator can tally the costs and assign a dollar value to the amount of driving an individual does in a year. According to Commute Solutions.org, the true cost of driving is \$1.36/mile. Therefore, a person who drives 5 miles to and from work each day spends approximately \$3,000 each year. Most people drive to places other than work, which means that \$3,000 per year is a low estimate, and for many the total cost of driving will exceed this amount.

Increasing the bicycle mode share and improving bicycle facilities can also reduce automobile congestion. Bicyclists will often choose different routes than automobiles, and physically take up less space on the road which reduces the traffic load on major arterial streets. Bicycles also take up less space than an automobile when parked, which frees up land for other uses.



Approximately 8 to 10 bicycles can fit in the space of one car parked on the street. A standard curb parking space is 8 feet by 22 ft or 176 ft<sup>2</sup>. If businesses could meet a portion of their parking requirements by providing bicycle facilities instead of car parking, it could potentially free up a substantial amount of land for uses other than parking in the future. Bicycles also increase the accessibility of public transit which reduces congestion by transporting more occupants than a car. Congestion caused by parents driving their children to school can be reduced by encouraging children to walk or ride their bicycles.

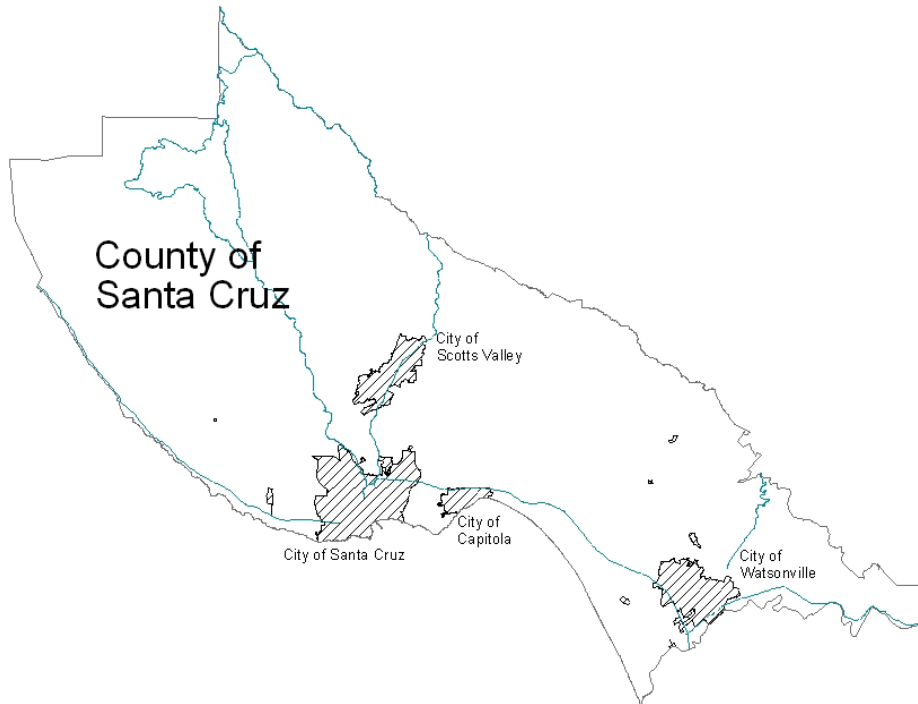
Another benefit of bicycling is that it increases the mobility and independence of non-drivers such as youth under age 16, low income groups who cannot afford automobiles, and the elderly and disabled. In Capitola approximately 16% of the population is younger than 16 years old and 14% is over the age of 65. There is no specific age at which a driver's license is revoked, so there are individuals who are legally allowed to drive past the age of 65. However, there are 8 million people in America over the age of 60 who no longer have a driver's license (Gotschi, 2008). As the Baby Boom population ages, it is expected that the number of senior citizens living in Capitola will increase, creating a demand for alternative transportation modes. For some, loss of balance or diminished capacity for physical activity becomes a limiting factor in regards to their mobility. Tricycles and electric bicycles mitigate such problems, and make it easier for those with disabilities or health issues to get around safely. The County of Santa Cruz offered an electric bicycle subsidy program which has been discontinued. However, there are several retailers in Santa Cruz County that offer electric bicycles at affordable prices. Electric bicycles are helpful to some, although unnecessary for many individuals, as bicycles are the most efficient means of human powered transportation (Wilson, 1973).

## SECTION 1.4 SETTING

The City of Capitola is a small city of 10,015 people located on the Monterey Bay Coast in Santa Cruz County (Figure 1-1). With an area of two square miles, the compact nature of the city, mild weather, and mostly flat terrain make Capitola an ideal place for bicycling. The City is connected by a network of bikeways to the City of Santa Cruz, a "Silver" Bicycle Friendly Community (League of American Bicyclists) and other parts of the county. The historic Capitola Village is a popular tourist destination over the summer months, and its narrow streets encourage bicycling and walking.

The Union Pacific railroad runs through the southern portion of the city along the Monterey Bay National Marine Sanctuary. The Union Pacific railroad is currently being purchased by the SCCRTC although as of February, 2011 escrow has not closed. Freight service will continue on the rail line. The possibility of constructing bicycle and pedestrian facilities alongside the railroad tracks will be considered as part of the planning effort for the transportation network. Such facilities would provide access to major commercial areas, beaches and parks within Capitola.

**Figure 1-1 Map of Santa Cruz County**



## SECTION 1.5 PLANNING PROCESS

The 2011 Capitola Bicycle Transportation Plan is the result of community input and staff recommendations. A public meeting was held before the Capitola Planning Commission on August 5, 2010 to receive comments and suggestions from members of the public. The plan was written in coordination with the public works department in order to insure the efficiency and cost-effectiveness of bicycle facility improvement projects. The Santa Cruz County Regional Transportation Commission's Bicycle Advisory Committee reviewed the draft BTP in October to confirm the plan was consistent with the Regional Transportation Plan and State Highway Code Section 891.2. In February 2011, the Capitola City Council adopted the Bicycle Transportation Plan and Notice of Exemption by resolution. The Capitola Bicycle Transportation Plan was approved by the Santa Cruz County Regional Transportation Commission in February 2011.



## SECTION 1.6 PLAN ORGANIZATION

The Plan is organized in the following chapters:

CHAPTER 1	Introduction
CHAPTER 2	Goals, Policies and Objectives
CHAPTER 3	Existing Conditions
CHAPTER 4	Needs Analysis
CHAPTER 5	Bicycle Plan Projects
CHAPTER 6	Bicycle Safety and Education Programs
CHAPTER 7	Funding Sources

## SECTION 1.7 BTA COMPLIANCE

The Bicycle Transportation Account (BTA) was created to implement the California Bicycle Transportation Act, Streets and Highway Code Sections 890-894 (1994). BTA money may be used for infrastructure projects aimed at improving bicycle commuting and safety. Only projects which are listed and described in the local Bicycle Transportation Plan are eligible to receive BTA funding. The Capitola Bicycle Transportation Plan is consistent with the criteria stated in the California Streets and Highways Code section 891.2 listed in Appendix C: Bicycle Transportation Plan Checklist. Therefore, the projects listed within the Bicycle Transportation Plan are eligible for BTA funding.

## CHAPTER 2 GOALS AND OBJECTIVES

This chapter introduces the goals and objectives of the 2011 Capitola Bicycle Transportation Plan, and discusses the consistency of the Plan with other City and Regional planning documents. Bicycling currently falls into four general use categories: commuting/utility, recreational, touring, and racing. The goals and objectives of the Capitola Bicycle Transportation Plan focus primarily on improving bicycle facilities and programs for commuters. Commuting/utility riders are those who regularly travel to and from a specific destination, usually as quickly and directly as possible, for very practical purposes, such as to purchase or transport goods and services or to travel to and from work, school, or events. Many people commute by bicycle for environmental or economic reasons, exercise and for the pleasure of riding.

Recreational cyclists include those who take day-long local excursions and are generally riding for pleasure or fitness. The Pacific Coast Bicycle Route, a California designated facility promoted by CT and the Adventure Cycling Association traverses through the City of Capitola and facilitates tourist activities. Off-road mountain bicycling is a very popular recreational activity. Touring, on the other hand, extends over longer periods of time. Touring requires more planning since the destination and routes are important factors. Racing is a specialized sport and race courses may use public roadways with appropriate public agency approval and permits.

To accommodate all cycling types, route systems should be accessible and frequent enough to be within a few blocks of all residents. They should be understandable and have adequate signs and graphics to make clear where routes are, and where they are going. Route systems should be safe, visible, relatively flat, and have adequate lane width. In addition, it is important to keep in mind that excessive motor vehicle traffic volume and speed make bicycling less safe and less fun. There is a need to design transportation systems that provide more balance between modes, a more efficient use of energy in the movement of people, and a more harmonious interaction between transportation and the environment. The goals and objectives of this plan address the aforementioned needs and seek to improve the bicycle infrastructure in Capitola for commuters and other cycling enthusiasts.

### SECTION 2.1 CITY OF CAPITOLA PLANNING DOCUMENTS

The City of Capitola General Plan Circulation Element includes objectives, policies and programs to develop a safe and efficient bikeway system. The Element supports the improvement and expansion of bikeways and bicycle facilities (Policies 30, 31, 32, 33 and 34). The preparation and implementation of a Bicycle Plan facilitates achieving these objectives by developing an action plan that can be used as part of the County, regional, and statewide funding and grant programs. The Bicycle Plan is in support of the following City of Capitola General Plan Circulation Element Policies and Programs:

Policy 30	<ul style="list-style-type: none"> <li>•Support the development of the bikeway system as planned.</li> </ul>
Policy 31	<ul style="list-style-type: none"> <li>•Make every effort to provide for bicycles along all arterials and minor arterials. The desired objective is a Class II bikeway.</li> </ul>
Policy 33	<ul style="list-style-type: none"> <li>•Require bicycle parking or storage facilities at new private and public developments where appropriate.</li> </ul>
Policy 34	<ul style="list-style-type: none"> <li>•Bicycle facilities are not recommended on collector streets unless traffic volumes are close to the limits of collector street standards and/or bicycle traffic is estimated to be high or related to school or park access.</li> </ul>

## SECTION 2.2 SANTA CRUZ COUNTY REGIONAL TRANSPORTATION PLAN

The Santa Cruz County Regional Transportation Plan (RTP) was adopted by the Santa Cruz County Regional Transportation Commission in June 2010. The 2010 RTP contained only minor changes to the 2005 RTP, thus many of the goals and objectives from 2005 have been continued in the 2010 plan. Similarly to the Capitola Bicycle Transportation Plan, the 2010 Regional Transportation Plan (RTP) also seeks to increase bicycle travel, reduce conflicts between bicycles and other modes of travel and increase the potential of combining bicycle travel with other modes of transportation. The RTP seeks to develop bikeway systems, including bicycle lanes, which provide for safe bicycle travel. The Bicycle Plan is consistent with RTP bicycle planning policies that seek to update bikeway plans and implement projects to close gaps in the bikeway network and provide safe and convenient bicycling facilities (Figure 2-1).

**Figure 2-1: List of Consistent Policies**

**2010 Santa Cruz County Regional Transportation Plan Policies**

- 1.4.1** Encourage signal standardization and signal timing improvements, with respect for pedestrian mobility and bicycle access, and discourage unwarranted stops on streets.
- 1.5.4** Retain and/or enhance existing sidewalks, bikeways and bus turnouts in road improvement projects incorporating “Complete Streets” concepts.
- 1.6.2** Reduce bicycle and pedestrian collisions by reducing the potential for conflicts between bicycles and autos and between pedestrians and autos.
- 1.6.3** Minimize adverse impacts on bicyclists and pedestrians during construction and maintenance activities by prompt repair, sweeping, and avoiding longitudinal seams on all road edges and curb areas including bicycle lanes and by following current best practices.
- 1.6.4** Encourage law enforcement agencies to take a more active role in the enforcement of laws governing the operation of bicycles and of motorists who are at fault in bicycle-motor vehicle accidents.
- 1.6.5** Encourage driver instruction about sharing the road with bicycles and encourage bicyclists to attend safety education programs; support continuation of bicycle traffic school for bicyclist offenders.
- 1.6.9** Improve bicyclists’ safety by eliminating impediments along all streets and bikeways, including but not limited to conducting regular street and pathway sweeping, bike lane repainting, trimming vegetation, and implementing traffic signal detection of bicycles.
- 2.1.1** Consider the needs of the non-motorized traveler in all programming, planning, maintenance, construction, operations, and project development activities and products. Whenever feasible, the incorporation of pedestrian, bicycle, and transit facilities should be incorporated in all capital projects.
- 2.7** Increase percentage of work trips done by bicycle to five percent of all trips and 20 percent of all work trips by 2035; do so by prioritizing bikeway projects based on: 1) increased safety or access; 2) complete gaps in the regional bicycle network; 3) high-demand, high-density areas and commute routes; 4) along popular recreational routes. Develop a program to measure and monitor growth rates.
- 2.7.1** Construct and mark bikeways on roads and bridges consistent with state standards.
- 2.7.2** Locate bikeways as bicycle lanes on roads unless a more direct bike path can be provided.
- 2.7.3** Maintain adequate outside travel lane width (14 feet) when no bicycle lane can be accommodated.
- 2.7.4** Support promotion and transportation safety programs to encourage safe and frequent use of alternative transportation modes.
- 2.7.5** Ensure that the public is informed about safe bicycling routes and options.
- 2.7.6** Support programs which deter bicycle thefts.
- 2.7.7** Facilitate cooperation among adjacent jurisdictions, both in-county and with adjacent counties, to install continuous bikeways and bike routes; Support programs to increase access to bicycles such as bike-sharing; discounts for bikes, helmets and other accessories; free bikes; inexpensive bike loans or rentals.
- 2.8.1** Provide bicycle racks and/or lockers that are consistent with best practice design guidelines at park and ride lots, transit centers and bus stops; bicycles on transit and pedestrian connections to transit; and potential inter-connections with future uses of the rail line within Santa Cruz County.
- 3.4.2** Encourage showers/lockers in new commercial and industrial development.
- 3.4.3** Encourage new recreation/visitor-serving development to include transit and bicycle improvements.
- 3.4.4** Provide alternative transportation information as well as adequate and secure bicycle parking at special
- 3.4.6** Limit the number of driveways in new commercial developments to reduce auto/bike conflicts.
- 3.7.2** Encourage safe routes to schools by providing improved bicycle and pedestrian facilities, improved transit service traffic-calming measures, and bicycle rider training programs for students.

## SECTION 2.3 GOALS AND OBJECTIVES

The Capitola Bicycle Transportation Plan identifies goals and objectives which seek to improve bicycle transportation in the City. The goals and objectives serve to guide bicycle transportation projects and programs from 2011 to 2016.

### GOALS

- 1 / *Improve bicycle circulation, connectivity and access*
- 2 / Increase bicycle ridership and replace motor vehicle trips with bicycle trips. Achieve a city-wide goal of 5% of all trips and 20% of work trips made by bicycle by 2020.
- 3 / *Improve bicycle safety*
- 4 / *Design a city-wide multi-modal transportation system that accommodates bicycles*
- 5 / *Maintain new and existing bicycle infrastructure*

#### GOAL 1 *Improve bicycle circulation, connectivity and access*

- Objective 1.1|** Construct and mark bicycle routes in conformance with the County-wide Bicycle Route Signage Program and state standards, as outlined in the Manual of Uniform Traffic Control Devices (MUTCD) and the California Supplement.
- Objective 1.2|** Locate bikeways as bicycle lanes adjacent to the main traveled way unless a more direct and useful separated bicycle path can be provided. Where bicycle lanes are not possible due to right-of-way restrictions, etc., include a wide curb lane, or shared lane pavement marking
- Objective 1.3|** Coordinate with other jurisdictions to adopt a system of bikeways that complements the County system.
- Objective 1.4|** Coordinate the planning, design and construction of bikeway facilities with all implementing agencies.
- Objective 1.5|** Install in all existing and proposed signalized intersections inductive loop sensors or video sensors (devices to trigger traffic signal phasing) that are positioned to detect bicycles, and are appropriately stenciled.

- Objective 1.6|** Design regional bicycle routes to connect residential areas with major activity centers (employment, educational, civic, etc.) by including bikeway network development as part of the Capital Improvements Program to prioritize construction or retrofits for completion of specific routes.
- Objective 1.7|** Build all bridges with enough width to safely accommodate bicycle travel. Comply with or exceed the Caltrans standard requirement of a 4-foot (1.2m) minimum bicycle lane, or a 5-foot lane if a gutter is present.
- Objective 1.8|** Where possible exceed the minimum lane width for Class II bicycle lanes to allow more bicycle traffic and separation from parked cars and automobile traffic.
- Objective 1.9|** Improve the flow of bicycle traffic through the Capitola Village.

---

*GOAL 2 Increase bicycle ridership and replace motor vehicle trips with bicycle trips. Achieve a city-wide goal of 5% of all trips and 20% of work trips made by bicycle by 2020.*

- Objective 2.1|** Require that event sponsors provide safe bicycle access and secure bicycle parking at special events
- Objective 2.2|** Encourage employers to offer incentives to employees who ride a bicycle instead of driving a car to work.
- Objective 2.3|** Encourage the provision of bicycle racks, showers, lockers, and other storage facilities at destinations, where practical and economically feasible, when reviewing discretionary permits for major activity centers and new developments.
- Objective 2.4|** Plan a bikeway network to integrate with other modes of transportation (train or transit stations and Park and Ride lots, etc.) in order to encourage and support the use of bicycling and reduce the use of motor vehicles.
- Objective 2.5|** Provide convenient, secure bicycle parking at private and public facilities and commercial districts through parking ordinance requirements.
- Objective 2.6|** Provide bicycle parking stands (facilities) at all primary public access points and at appropriate neighborhood access points.
- Objective 2.7|** Identify several street parking spaces located in front of commercial and retail stores to be converted into bicycle parking.
- Objective 2.8|** Increase modal split of Capitola employee commuter trips to 25% of all trips made by bicycle, transit, walking or carpool by 2020.
- Objective 2.9|** Replace Capitola vehicle fleet trips with bicycle trips when feasible.
- Objective 2.10|** Work with New Brighton Middle School and local Bicycle advocacy groups to establish a year-round incentive and tracking program for students to encourage active transportation.

---

### *GOAL 3 Improve bicycle safety*

- Objective 3.1** Support bicycle rider safety training programs for elementary and middle school students.
- Objective 3.2** Encourage establishments that teach driver education to include lessons on sharing the road and the rights and responsibilities of bicyclists according to the California Vehicle Code.
- Objective 3.3** Continue to support stable funding for local bicycle safety and education programs.
- Objective 3.4** Require that contractors and utility companies doing roadside work maintain the road edge in the best possible condition during construction and adhere to the “Guidelines to Protect the Safety of Bicyclists, Pedestrians, and Disabled Travelers during Road Construction” in Appendix F.
- Objective 3.5** When feasible, avoid lengthwise concrete seams in bicycle lanes and require prompt repair (including pavement) and restriping of bicycle lanes before the project is considered complete.
- Objective 3.6** Limit on-street parking on arterial and collector streets, encourage parking alternatives, pursue off-street parking development as methods to provide Class II bicycle lanes and do not eliminate joint bicycle lanes/parallel shoulder parking unless the new bicycle lanes are effectively as wide or wider.
- Objective 3.7** Limit the number of driveways when planning new commercial and multiple-family residential developments in order to reduce automobile-bicycle conflicts.
- Objective 3.8** Maintain adequate outside travel lane width (14 feet) when no bicycle lane can be accommodated.
- Objective 3.9** Encourage bicyclists to take the lane on Class III bikeways by exceeding the minimum standard distance sharrows shall be placed from the curb as defined in the Manual of Uniform Traffic Control Devices (MUTCD) Section 9C.07.
- Objective 3.10** Encourage car parking arrangements which increase the visibility of pedestrians and bicyclists. Consider reverse angled parking.
- Objective 3.11** Remove bottle dots from streets during scheduled road maintenance.

---

### *GOAL 4 Design a city-wide multi-modal transportation system that accommodates bicycles*

- Objective 4.1** Encourage other modes of transportation (buses, trains, etc.) to plan for, and provide space for carrying recreational and commuting bicyclists on public



transportation systems. Include secure bicycle parking facilities with development of transit shelters incorporating Santa Cruz County Transit District design approval.

- Objective 4.2** Include bicycle access in all fixed guideway planning and design.
- Objective 4.3 Make provisions for bicycle commuter facilities in any and all future planning documents regarding the Capitola Mall and Transit Station.
- Objective 4.5** Require new recreation and visitor-serving developments in the Coastal Zone to support alternative transportation to the beaches and other tourist destinations.
- Objective 4.6** Ensure that all major corridors provide a choice of transportation modes and are designed with multi-modal amenities such as bus stops, turnouts and shelters, and bicycle lanes and sidewalks.

---

#### *GOAL 5 Maintain new and existing bicycle infrastructure*

- Objective 5.1** Ensure that bicycle facilities remain in a usable condition through regular maintenance and sweeping.
- Objective 5.2** Retain all existing bikeways along with roadway improvement projects.
- Objective 5.3** Secure a portion of local and State funding for bikeway maintenance.
- Objective 5.4** Maintain bicycle parking facilities.

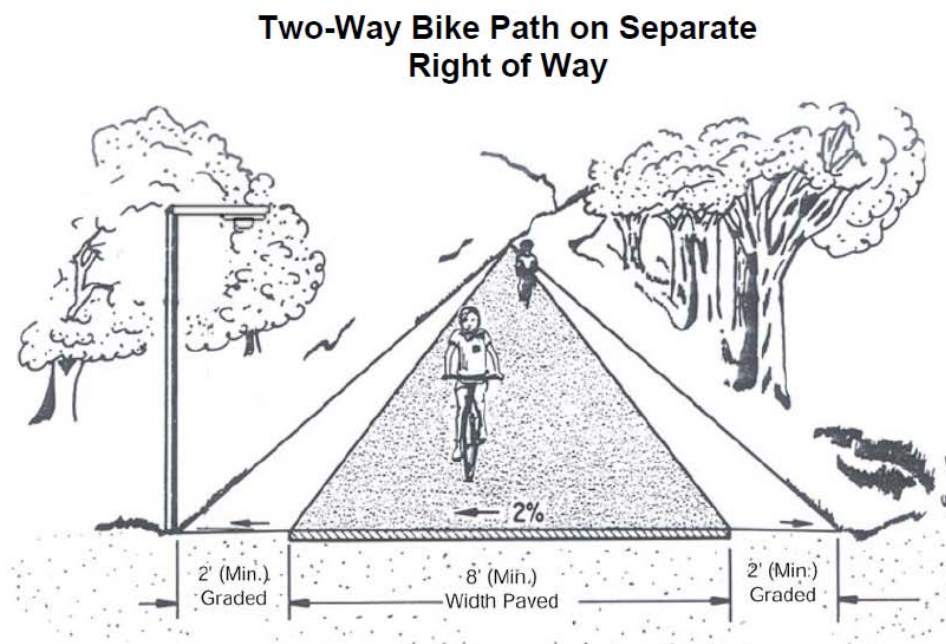
## CHAPTER 3|EXISTING CONDITIONS

### SECTION 3.1 EXISTING BICYCLE FACILITIES

The California Department of Transportation recognizes three types of bikeways, Class I, Class II and Class III. The City of Capitola bicycle network is composed of a combination of all three. Each Class of bikeway is distinguishable by its structural design and location in relation to the road. Descriptions of Class I, Class II and Class II bikeways are as follows:

**Class I Bikeway (Bicycle Path)** is typically grade-separated from motor vehicles, providing two-way bicycle and pedestrian travel on a single wide path. Bicycle paths work best in areas with few crossings (i.e., along edges, such as river fronts). Where bicycle paths do cross motor vehicle routes, extreme care must be taken to make the crossing for bicyclists as safe as possible. Caltrans minimum width is 8 feet or 2.4 meter (4 feet {or 1.2 meters} each way, with a stripe down the center), with a 2 foot or 0.6 meters graded shoulder on each side. A Class I bicycle path is conceptually illustrated in Figure 3-1. The bicycle/pedestrian bridge over Soquel Creek between Wharf Rd and Peery Park is currently the only Class I bicycle path in Capitola.

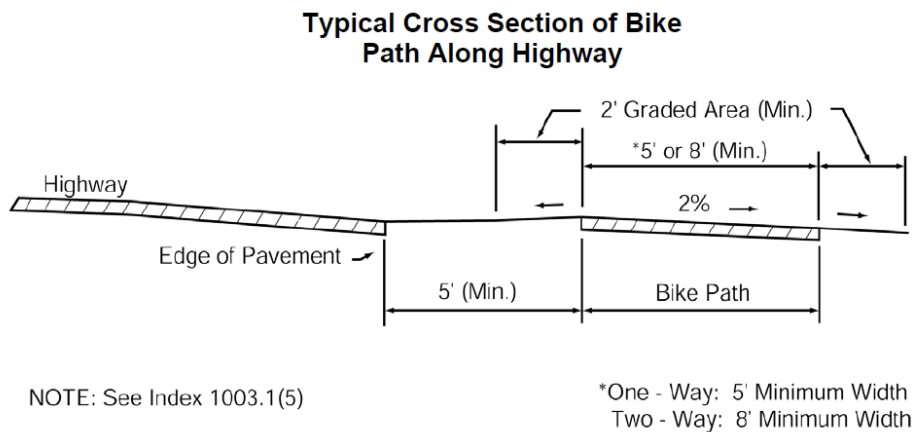
**Figure 3-1: Class I Bikeway**



Note: For sign clearances, see MUTCD, Figure 9B-1.

(Caltrans, 2009)

**Figure 3-2: Class I Bikeway Section**



(Caltrans, 2009)

**Class II Bikeways (Bicycle lanes)** are striped lanes on roadways that are marked by signage, pavement striping, and/or stencils (Figure 3-3). The Caltrans minimum recommended width against a curb is 5 feet or 1.5 meters. Where parallel auto parking occurs against a curb, Caltrans recommends a minimum of 12 feet or 3.6 meters from curb to lane stripe, producing a bicycle lane width of approximately 4 feet or 1.2 meters, but only one foot when a car door is open. Where practical, a wider and safer lane width is suggested, however, with a total width of 13 feet or 4 meters for auto parking and bicycle lane space combined. This will accommodate bicycle trailers as well as opening doors. Class II bicycle lanes are located on arterial streets and major collector streets in accordance with the City of Capitola General Plan.

**Figure 3-3: Class II bikeway (41<sup>st</sup> Avenue)**



**Class III Bikeways (Bicycle Routes)** are shared with motorized vehicle traffic and are characterized by signs that help guide bicyclists on recommended routes to certain locations. They are used on streets where auto traffic volume and speed do not warrant other facilities. Signing streets as bicycle routes does not necessarily make streets any safer for bicyclists to use. The purpose is mainly to guide bicyclists on recommended routes. The minimum auto/bicycle lane width when adjacent to the curb should be 14 feet or 4.2 meters. Where a shared lane is present adjacent to parallel auto parking, the lane width (including parking lane) may be 18 feet or 5.4 meters greater.

A Bicycle Boulevard is an enhanced route for cross-town bicycle travel (traffic signals or 4-way stops at all arterial crossings are essential), which also prevents or discourages motor vehicles from also using the street as a thoroughfare. Successful bicycle boulevards have low volumes of auto traffic and slow auto speeds, and therefore do not require striped bicycle lanes. The primary way to prevent the street from being used as an auto thoroughfare (which the recommended traffic controls at arterial crossings would otherwise encourage) is to use "traffic-calming" devices to slow down traffic. Traffic-calming devices include speed humps, bulbouts, mid-street islands with trees or foliage, and narrow traffic lanes.

The City of Capitola has several narrow arterials and major collector streets that require the use of shared lane pavement markings, aka "sharrows". Sharrows are used to indicate to bicyclists and motorists the appropriate footprint for bicycle travel away from the dangerous open or opening doors of cars parked on the street (Figure 3-4).

**Figure 3-4: Sharrow**



The City of Capitola currently has approximately 14.41 miles of Class II paths and 0.17 miles of Class I paths (Table 3-1). By the end of 2011, there will be an additional 0.23 miles of Class II paths and 0.72 miles of Class III paths for a total of 15.53 bikeway miles (Appendix A-2, Capitola Bicycle Facilities Map).

**Table 3-1: Santa Cruz County Bikeway Miles 2009**

	Bi-directional		Centerline		
Jurisdiction	Miles	Type	Miles	Type	TOTAL
Capitola	14.41	Class II	0.17	Class I	14.58
Santa Cruz	47.90	Class II	9.42	Class I	57.32
Scotts Valley	15.26	Class II	1.00	Class I	16.26
Watsonville	18.10	Class II	9.10	Class I	27.20
Unincorporated	91.73	Class II	4.13	Class I	95.86

UCSC	2.07	Class II	1.30	Class I	3.37
<b>Santa Cruz County Total</b>	<b>189.47</b>	<b>Class II</b>	<b>25.12</b>	<b>Class I</b>	<b>214.59</b>
<b>Source:</b> (Santa Cruz County Regional Transportation Commission, 2009)					

A comprehensive bikeway map of Santa Cruz County is produced by the Santa Cruz County Regional Transportation Commission and provided to the community free of charge. The map provides a detailed look at existing bicycle lanes and paths within the City of Capitola and throughout Santa Cruz County, informational items on bicycling tips and laws, and local bicycle resources.

There are several Class II paths in the City which are scheduled for maintenance in 2010-2011. The arterials and major connectors which require bicycle lane repair or maintenance are:

- 41<sup>st</sup> Avenue
- Brommer Street
- Gross Road
- Park Avenue
- Bay Avenue
- Monterey Avenue
- Wharf Road

**Figure 3-5 Brommer Street**



## SECTION 3.2 EXISTING LAND USE

Land use and housing density are directly related to transportation systems. Certain transportation modes such as train or light rail depend on medium to high density populations in order to be successful. Conversely, low-density development is dependent upon the automobile. Bicycle transportation can be successful in both high-density downtown areas as well as low-density suburban development, provided that adequate infrastructure exist.

It is important that bikeways and bicycle paths connect residential neighborhoods to commercial and entertainment areas and employment zones. The City of Capitola is split roughly down the center by Soquel Creek. The dominant land use to the east of Soquel Creek

is single-family residential neighborhoods with several moderately sized commercial areas near the creek. The majority of commercial land lies to the west of the creek and includes the Capitola Mall, a regional shopping center. Residential zones are connected to commercial zones primarily by Class II and Class III bikeways, however, the Class I bikeway also connects the two sides of the City. The City of Capitola Zoning Map can be found in Appendix A-1 for a detailed illustration of land use patterns in the City.

## CHAPTER 4|NEEDS ANALYSIS

The need for bicycle transportation does not exist solely on the local level, but on the State and National level as well. This chapter will discuss the issues that can be addressed through increased bicycle travel, current local bicycle commuter trends and statistics, and commuter needs.

Perhaps the greatest issue which is applicable on the local, State and National levels, is a heavy dependence on fossil fuels for transportation, energy and agriculture amongst other things. Not only does the burning of fossil fuels pollute the environment, but its limited accessibility and national supply can leave consumers vulnerable to fluctuating prices. Because housing development and land use have centered on the automobile over the past 50 years, an increase in gas prices can have a significant financial impact on commuters. This is evidenced by the fact that in many households in the U.S., transportation is the second greatest household expense after housing. Gas prices and driving are inversely related; when gas prices are low more people drive. Conversely, in 2008 the price of gas increased to \$4 per gallon and the total Vehicle Miles Travelled (VMT) in the United States decreased by 57.8 billion miles from 2007 (Flusche, 2009). Although high gas prices can be devastating especially to low income working families or those who commute great distances by car, they can also be an opportunity for change. When fuel is expensive and fewer people drive, alternative modes of transportation should be promoted and improved to increase and sustain ridership.

In response to the problems caused by the burning of fossil fuels, the State of California passed Senate Bill 375: Redesigning Communities to Reduce Greenhouse Gasses. The bill requires that local jurisdictions plan for alternative modes of transportation and stop urban sprawl amongst other strategies to reduce harmful emissions. Although SB 375 is aimed at reducing emissions and not necessarily reducing fossil fuel consumption, the two are intrinsically connected, and therefore the latter may also be addressed in the implementation of the bill. Bicycling as a mode of transportation is not only greenhouse gas emission-free, but it allows more freedom in time of travel than public transit, and allows for travel of greater distances than walking. The bicycle has built in incentives and is widely applicable, as it is an inexpensive alternative to the automobile that is viable in low-density or high-density neighborhoods alike. Because of this, increasing bicycle ridership through programs and small infrastructure improvements is a relatively quick and affordable way for local jurisdictions to reduce greenhouse gas emissions.

### SECTION 4.1 TRIP GENERATORS

Trip generators are popular destinations that are regularly frequented. They include popular parks and public buildings, beaches, regional shopping centers, schools and tourist attractions. Because these places attract more people, they are good candidates for public transit service and alternative modes of transportation. Alternately, traffic congestion, large parking lots and the presence of many cars can detract from the charm, attractiveness or accessibility of a place.

One benefit to bicycling is that often times it is possible to park much closer to the desired destination than with other modes of transportation. In order to encourage individuals to choose to ride a bicycle instead of drive, it is important to have ample and secure bicycle parking at popular destinations. The most popular trip destinations in the City of Capitola, in no particular order are as follows:



Capitola Beach  
Capitola Village  
Capitola Mall  
New Brighton Beach State Park  
Jade Street Community Center  
Capitola Library  
New Brighton Middle School  
Capitola Mall  
Brown Ranch Marketplace  
Kings Plaza  
City Hall

## SECTION 4.2 COMMUTE PATTERNS AND COMMUTER NEEDS

It is important to analyze commute patterns when addressing climate change and pollution, as the majority of commuter trips are taken by automobile and 45% of greenhouse gas emissions in Santa Cruz County are attributed to transportation. The modal split is a useful indicator as to whether or not a transportation network adequately accommodates multiple modes of transportation. In the case of commuting, the modal split is the percentage of employees that travel by each mode of transportation to and from work. An uneven modal split may indicate a transportation system that favors one mode of transportation over others. The modal split for City of Capitola employees commuting to work in 2008 was:

- 63% drove alone
- 5% used a bicycle, public transit, carpooled or walked
- 32% split their commuting methods between driving alone and carpooling

The overwhelming percentage of automobile trips made by City employees suggests that the transportation system in the City of Capitola and surrounding areas favors the automobile. This theory is strengthened by the fact that the majority of employees live within 5 miles of the workplace, a distance that is within the range of alternative modes of transportation such as bicycling, walking and transit. The result of an automobile-dominant mode split is poor air quality, traffic congestion and a large portion of land devoted to parking. City employee commute trips accounted for 8% of the overall emissions due to City government operations, or 66 metric tonnes of CO<sub>2</sub> (AMBAG, 2009). In order to reduce greenhouse gas emissions, the City will lead by example and strive for a modal split for commute trips of:

- 43% drive alone
- 25% use a bicycle, public transit, carpool or walk
- 32% split their commuting methods between driving alone and carpooling

This goal will be achieved if the above modal split is accomplished by 2020. In order to increase bicycle ridership the City will offer incentives to those who do not drive to work. Some incentives may include monetary compensation, bicycle commuter facilities, discounted transit passes, zero interest bicycle loans and emergency ride home services. The City will also analyze vehicle fleet trips, which account for 35% of greenhouse gas emissions due to government operations. Bicycles will be added to the City fleet, and when feasible, fleet vehicle trips will be replaced with bicycle trips.

**Table 4-1: City of Capitola Commuter Mode Split**

	Commuters	Percent of Total
<b>Car, Truck or Van</b>		
Drove Alone	4394	80.5%
Carpooled	517	9.5%
<b>Alternative Transportation</b>		
Walk	298	5.5%
Bicycle	92	1.7%
Bus	74	1.4%
Other means	57	1.0%
Motorcycle	25	0.4%
<b>TOTAL</b>	<b>5457</b>	<b>100%</b>
<b>Source: (U.S. Census, 2000)</b>		

In 2000, only 92, or 1.7% of all commuters who lived in Capitola rode their bicycles as their main mode of transportation to work (Table 4-1). In terms of alternative transportation to the automobile, walking was the most popular with 242 people, followed by bicycling, and the third most popular mode was the bus with 74 riders. These figures are most likely lower than actual ridership, as the U.S. Census only counts the primary mode of transportation to work. According to this method of counting, an individual who primarily drives alone to work but rides a bicycle once or twice a week would only be counted for “drove alone”. Additionally, if an individual rides a bicycle to the bus or transit, transit will be counted for the trip. In order to obtain more accurate bicycle commuter data, the City will install bicycle sensors on several popular bicycle commuter routes and conduct bicycle counts (Appendix D: Proposed Projects List). Bicycle commuters typically ride at 10 miles per hour, which is often more time efficient than driving a car for distances of 3 miles or less, especially during peak hours of travel (League of American Bicyclists, 2000-2010). Yet an overwhelming number of workers “drove-alone” even though 50% of workers commuted less than 20 minutes away. The uneven mode split suggests that there are factors other than distance which deter people from commuting on bicycle. The most common barriers to bicycle commuting are concerns about safety, hygiene, distance and the ability to run errands after work or reach family quickly in an emergency ([michianabiketowork.org](http://michianabiketowork.org); Voiland, 2008). Local jurisdictions are working to break down these barriers by offering incentives and programs such as Ecology Action’s Sustainable Transportation Employer Membership which offers bicycle loans, discounted transit passes and an “Emergency Ride Home Service”.

**Table 4-2: Travel time to Work**

Travel Time to Work	City of Capitola	% of Commuters
<b>Less than 15 minutes</b>	1,787	32.7%
<b>15 to 29 minutes</b>	1,691	31%
<b>30 to 44 minutes</b>	501	9.2%
<b>45 to 59 minutes</b>	762	14%
<b>60 minutes or more</b>	716	13.1%
<b>Total</b>	5,457	100%
<b>Source: US Census 2000. Summary File 3, QT-P23: Journey to Work.</b>		

In 2000, roughly one third of all commuters in Capitola had a less than 15 minute trip to work, which suggests that the distance travelled was likely less than 9 miles if driving at 35 mph, 2.5 miles if bicycling, or 1.25 miles if walking briskly (Table 4-2). All of these trips are achievable on a bicycle in less than one hour. By breaking down barriers to bicycle commuting especially to those who live within 9 miles of work, the City of Capitola will strive to achieve 5% of total trips and 20% of commuter trips by bicycle by the year 2020.

### SECTION 4.3 COLLISION ANALYSIS

According to the California Highway Design Manual, car/bicycle collisions are most likely to happen at an intersection (Highway Design Manual, 2006). This is the case in Capitola, Nearly 60% of bicycle collisions from 2005 to 2009 occurred at an intersection. Fortunately, there have been no fatalities as a result of collisions involving bicycles in the City of Capitola, however there have been 26 injuries from 2005 to 2008 (Table 4-3: Bicyclists Injured and Killed 2000-2008). The majority of collisions involving a bicycle have occurred at the following intersections:

41st Avenue x Gross Rd (3)
41st Avenue x Brommer Street (3)
Bay Avenue x Capitola Avenue (2)
Bay Avenue x Highway 1 (2)
Monterey Avenue x Bay Avenue (2)
Park Avenue x McGregor Drive (2)
41st Avenue x Capitola Road (1)
Capitola Road x 38th Avenue (1)
Capitola Road x 42nd Avenue (1)
Clares Street x 42nd Avenue (1)
41st Avenue x Jade St (1)

Several collisions involving bicycles have occurred along 41<sup>st</sup> Avenue which is known to have high volumes of automobile traffic throughout the day due to the regional shopping center and access to Highway 1. Future City plans will specifically address bicycle infrastructure surrounding the Capitola Mall and the 41<sup>st</sup> Avenue corridor. Restriping and bicycle infrastructure improvements along 41<sup>st</sup> Avenue have been scheduled for 2010-2011.

Collisions between bicycles and cars are not always the fault of the car. In fact in approximately half of the accidents involving cars and bicyclists in Capitola from 2005-2009, the bicyclist was at fault usually because they were riding on the sidewalk which is illegal in Capitola. Riding on the sidewalk is hazardous for bicyclists and pedestrians. Bicyclists travel at higher speeds than pedestrians, thus leaving less time for each party to react if a conflict emerges, and increasing the likelihood of a collision. Drivers backing out of driveways will also not expect to see a bicyclist riding on the sidewalk, and have less time to react due to the travel speed of the bicyclist. In order to prevent such collisions in the future, the City will concentrate on bicycle education, enforcement and improvement of bicycle infrastructure so that bicyclists feel comfortable riding on the street rather than on the sidewalk.

**Table 4-3: Bicyclist Injuries and Fatalities for Santa Cruz County**

<b>Bicyclists Injured and Killed 2000 - 2008</b>									
<b>Injured</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Capitola	11	8	10	11	20	7	5	6	8
Santa Cruz	60	59	58	77	63	71	82	64	91
Scotts Valley	2	4	4	4	6	2	0	14	4
Watsonville	17	22	20	7	17	12	13	3	16
Unincorporated	65	58	61	67	56	59	54	63	70
<b>S.C. County Total</b>	<b>155</b>	<b>151</b>	<b>153</b>	<b>166</b>	<b>162</b>	<b>151</b>	<b>154</b>	<b>150</b>	<b>189</b>
<b>Killed</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Capitola	0	0	0	0	0	0	0	0	0
Santa Cruz	1	0	0	1	0	0	0	1	2
Scotts Valley	0	0	0	0	0	0	0	0	0
Watsonville	0	1	0	0	0	0	0	0	0
Unincorporated	0	1	0	0	0	1	1	1	0
<b>S.C. County Total</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>

(Bicyclist Injuries and Fatalities for Santa Cruz County, 2008)

The Community Traffic Safety Coalition compiles data from the Statewide Integrated Traffic Records System (SWITRS) each year regarding bicyclist injury and death rates. SWITRS collects fatal and non-fatal traffic accident data from CHP areas and police departments across California. The Santa Cruz County Bicycle Injuries and Fatalities 2000-2008 data, put out by the Community Traffic Safety Coalition, can be found in Table 4.3. The data from these reports is used to inform local jurisdictions within the county of collisions involving bicyclists, so that appropriate measures can be taken to improve safety.

## CHAPTER 5|BICYCLE PLAN PROJECTS

The City of Capitola seeks to provide bikeways for commuting and connections that will provide greater access between residential, employment, and educational centers. The development of new bikeways is prioritized by the criteria listed below in the following order:

1. High density, high demand areas and school routes
2. Low density areas where cyclist's safety is a concern (neighborhoods)
3. Recreational routes in low density, low demand areas

Critical needs that are met with each project also are identified in the Proposed Project List (Appendix D) to enable planners and decision-makers to prioritize funds as they become available.

The Planning and Design Chapter of the Caltrans Highway Design Manual provides specific detail on design speeds, signing, striping, and other related bikeway design issues as does the U.S. Manual on Uniform Traffic Control Devices for streets and highways (MUTCD).

The high priority bicycle plan projects include the completion of bicycle lanes on existing streets, on-street bicycle safety improvements and studies, a bicycle safety and education program for students, and the installation of bicycle detector loops or video sensors at signalized intersections and replacement of antiquated or ineffective infrastructure. These projects have the clear benefit of providing greater convenience and safety for bicyclists. Other projects that improve bicycle facilities and encourage cycling include bicycle lane maintenance, parking facilities, and inter-modal connections, as well as studies to address unsafe areas for bicyclists. Proposed bicycle projects are described in this chapter; existing bicycle safety and education programs are discussed in Chapter 6. The implementation of the proposed bicycle projects is expected to achieve 10% of work trips and 2.5% of all trips taken by bicycle by 2016. This will keep the City of Capitola on track to reach the goal of 20% of work trips and 5% of all trips taken by bicycle by the year 2020.

### SECTION 5.1 PROPOSED BIKEWAYS

#### **Bicycle Path (Class I)**

Class I bicycle paths can be useful to bicyclists for commute or recreational purposes. Because bicycle paths are separated from motor vehicle traffic and have few intersections, they are safer than Class II or Class III bikeways. If designed and situated appropriately, Class I bikeways can be a safe and convenient route for inexperienced or young bicyclists. A bicycle path can also create opportunities for individuals to experience the natural features of their community in a unique way. The current Class I bikeway in Capitola allows bicyclists to enjoy Soquel Creek and the historic Rispin Mansion site. If the path was extended north to Soquel Elementary School alongside Soquel Creek, it would create a safe alternative to the Bay Avenue Highway 1 intersection for children riding to and from school, and allow all cyclists the opportunity to enjoy the flora and fauna in the riparian area. A study will be conducted to determine the feasibility of extending the path north along Soquel Creek toward Highway 1 (Appendix D: Proposed Project List).

### **Bicycle lanes (Class II)**

A 0.23 mile Class II bicycle lane will be installed on 38<sup>th</sup> Avenue between Capitola Road and Brommer Street in 2011 (Appendix A-2: Bicycle Facilities Map).

### **Bicycle Routes (Class III)**

In addition to re-stenciling existing sharrows, the City plans to add sharrow markers on Clares Street near the Brown Ranch Shopping Center, and on Wharf Rd between Clares Street and Grace Street (Appendix A-2: Bicycle Facilities Map). The City will also identify future bicycle and pedestrian improvements in the General Plan update and specific plans for the area.

For a comprehensive list of proposed bikeways refer to Appendix D: Proposed Project List and the Capitola Bicycle Facilities Map in Appendix A-2.

## **SECTION 5.2 BIKEWAYS AND ROAD MAINTENANCE**

California Vehicle Code requires bicyclists to ride in a bicycle lane if provided. Bicyclists are permitted to ride outside of the bicycle lane if there is an obstruction or unsafe conditions. If not maintained, Class II paths can collect debris and crack making them unfit for the use of bicyclists. The City of Capitola and the Regional Transportation Commission have recognized that to facilitate bicycling, bikeways must be maintained. Traditionally, two types of projects have continued to be funded. Maintenance funds go primarily to sweeping bicycle lanes according to a set schedule, restriping faded lane markings, patching potholes, and cutting overhanging vegetation.

The City plans to use maintenance funds to eliminate root intrusion on Park Avenue and restripe numerous Class II and Class III bikeways over the next five years (See Appendix D: Proposed Projects). "Conflict bikeway" funds go to spot improvements to bring existing bikeways up to current standards. Such maintenance and improvements are important for the right edges of all streets, as bicycle travel is not limited to those roads with bicycle lanes.

Construction activities typically occur in the portion of the road where cyclists travel, so it is important that such activities maintain a safe environment for bicyclists. Through the encroachment permit process, the City of Capitola will work with contractors and utility companies to insure that roadway standards are maintained during and after construction projects are completed. To this end, the City supports and upholds the recommended guidelines for construction areas put forth by the Santa Cruz County Community Traffic Safety Coalition (Appendix F).

Maintaining the integrity of bikeways during construction is an appropriate use of conflict bikeway funds. Such funds can also be used to remove hazardous fixed objects, which include features of existing infrastructure. The Class II bike lane northbound on Wharf Road, north of the Capitola library is narrow and confined further by cone barriers. The cones were placed on the left side of the bike lane to protect bicyclists from motorists. In reality, the cones create an unnecessary hazard for bicyclists, and confine them to a narrow lane. The



City will remove the cones and widen the bike lane if feasible. The City will also remove bottle dots from the southern portion of Wharf Road (Appendix D: Proposed Projects).

## SECTION 5.3 BICYCLE PARKING AND SUPPORT FACILITIES

There are several additional components to a successful bicycle network besides bicycle lanes. Facilities and amenities that support and encourage bicycling include secure and convenient bicycle parking facilities, employee shower and changing facilities, bicycle sensitive signals at intersections, and intermodal connections.

Providing convenient and secure bicycle parking is a good way to increase bicycle ridership. Several cities in California and across the Country have converted street parking spaces into permanent bicycle parking in commercial areas. Although there was an initial concern that removing a space for car parking would be detrimental to local businesses, it was soon realized to be the opposite. Ten to twelve bicycles can be parked securely in place of one car, thus the number of potential patrons of local businesses increases dramatically when spaces are converted to bicycle parking.



A common myth is that individuals who ride their bicycle to commercial areas do not spend as much money at retail stores as individuals who drive. A 2010 study conducted by San Luis Obispo Regional Rideshare, shows that drivers do not spend more money downtown than bicyclists on average. Although drivers spend more money per trip, bicyclists take more trips downtown than drivers. Bicycle parking requirements are established in the City of Capitola Zoning

Ordinance for new development. Rates vary according to the type of use. The bicycle parking standards will be updated to specify the number of bicycle racks required, where they should be located and basic design requirements. The City will consider increased bicycle parking in certain commercial or recreational areas including the conversion of parking spaces into bicycle corrals (Appendix D: Proposed Project List).

The Santa Cruz County Regional Transportation Commission also administers a program to help fund the installation of secure bicycle racks and lockers in commercial and public facility areas. Since 1993, the "Bicycle Secure" program has provided inverted u racks or subsidized bicycle lockers for agencies and businesses resulting in the installation of over 2000 new bicycle parking spaces.

The following locations in the City of Capitola have been constructed through this program:

1. Capitola Village streetscape – 12 spaces
2. Capitola Community Center – 8 spaces
3. Capitola City Hall – 6 spaces
4. Brown Ranch Marketplace, 3335 Clares Street – 10 spaces

Currently, there are few public places for changing and storing bicycle clothes and equipment. Changing areas are limited to public restrooms and or locker rooms at City Hall, Capitola Beach and New Brighton Middle School (although only used by students). To encourage commuter bicycling use, some jurisdictions have adopted ordinances, which require new employment-generating uses to provide onsite bicycle parking, lockers, and facilities for showering and changing clothes. These types of requirements for new or expanded development provide incentives for employees to use bicycling as a commuting alternative. City-wide site design requirements for worksites have not been adopted. If considered in the future, ordinances should include requirements for bicycle storage, showers, and clothes lockers to further encourage bicycle commuting.

([www.cycle2city.com.au](http://www.cycle2city.com.au))



## SECTION 5.4 BICYCLE DETECTORS AND COUNTERS

The City of Capitola has ten signalized intersections. Currently none of the intersections are equipped with sensors that can detect bicycles. As a result, a bicyclist must wait for a car to drive up to trigger the green light. Traffic signals that are triggered by inductive loop sensors or video sensors can significantly increase the convenience of bicycle commuting. Both types of sensors also encourage bicyclists to position themselves in the correct location on the road. Push-button sensors can also be useful if situated properly. Unfortunately, it is often times that case that push-button sensors are located on the sidewalk or far over to the right-hand side of the bicycle lane, which ultimately decreases the visibility of bicyclists on the road. For the strengths and weaknesses of loop detectors and video detectors see Table 5-1.

### Loop Detectors

Inductive loop detectors are commonly used to sense the presence of vehicles (including bicycles) at intersections for the purpose of triggering traffic signals. Loop detectors are installed below the surface of the road and are activated by the metal in motorized vehicles or bicycle spokes when positioned above. Although loop detectors encourage bicyclists to position themselves in the safest location on the road, they are difficult to install correctly, repair and maintain, and are unreliable. Local jurisdictions and Caltrans are moving away from the use of loop detectors to overhead traffic detectors which use Video Image Processing Systems (VIPS) to sense and control vehicle traffic (UC Davis Department of Mechanical and Aeronautical Engineering, 2007).

### Video Detectors

Given good weather conditions and proper installation and maintenance, video detectors can be more than 95% accurate (US Department of Transportation, 2006). Video detectors are often mounted on existing traffic signals or other infrastructure and can detect multiple lanes and zones. If mounted over a street, it may be necessary to close the road for maintenance however, video detectors can be mounted on the side of the roadway to avoid inconvenience. Unlike loop detectors, video cameras are subjected to weather and other environmental factors which may require more frequent maintenance. Nevertheless, video detectors tend to be more reliable and more accurate than inductive loop sensors.

Both loop detectors and video detectors are capable of sensing the presence of vehicles, triggering traffic actuated signals, counting vehicles and measuring the speed of vehicles. Unlike loop detectors, video detectors can be used for multiple lanes or detection zones. This can be useful to bicyclists who may need to position themselves outside of the bicycle lane, to make a left turn for instance. The City of Capitola will install inductive loop detectors and/or video sensors at ten signalized intersections to collect data on bicyclist trips and enable bicyclists to trigger traffic signals. The eight signalized intersections are all located within the Community Commercial zone district, at the following locations:

- 41<sup>st</sup> Avenue and Clares Street
- 41<sup>st</sup> Avenue and Capitola Mall
- 41<sup>st</sup> Avenue and Capitola Road
- 41<sup>st</sup> Avenue and Brommer Street
- Capitola Road and 38<sup>th</sup> Avenue
- Capitola Road and Clares Street
- Capitola Road and 30<sup>th</sup> Avenue
- Clares Street and Capitola Mall

**Table 5-1: Sensor Technologies, Strengths and Weaknesses**

Technology	Strengths	Weaknesses
<b>Inductive Loop</b>	<ul style="list-style-type: none"> <li>• Flexible design to satisfy large variety of applications</li> <li>• Mature, well understood technology.</li> <li>• Large Experience base.</li> <li>• Provides basic traffic parameters (e.g., volume, presence, occupancy, speed, headway, and gap).</li> <li>• Insensitive to inclement weather such as rain, fog, and snow.</li> <li>• Provides best accuracy for count data as compared with other commonly used techniques.</li> <li>• Common standard for obtaining accurate occupancy measurements</li> <li>• High frequency excitation models provide classification data</li> </ul>	<ul style="list-style-type: none"> <li>• Installation requires pavement cut.</li> <li>• Improper installation decreases pavement life</li> <li>• Installation and maintenance require lane closure.</li> <li>• Wire loops subject to stresses of traffic and temperature.</li> <li>• Multiple loops usually required to monitor a location</li> <li>• Detection accuracy may decrease when design requires detection of a large variety of vehicle classes</li> </ul>

Technology	Strengths	Weaknesses
<b>Video image processor</b>	<ul style="list-style-type: none"> <li>• Monitors multiple lanes and multiple detection zones/lane.</li> <li>• Easy to add and modify detection zones.</li> <li>• Rich array of data available.</li> <li>• Provides wide-area detection when information gathered at one camera location can be linked to another</li> </ul>	<ul style="list-style-type: none"> <li>• Installation and maintenance, including periodic lens cleaning, require lane closure when camera is mounted over roadway (lane closure may not be required when camera is mounted at side of roadway)</li> <li>• Performance affected by inclement weather such as fog, rain, and snow; vehicle shadows; vehicle projection into adjacent lanes; occlusion; day-to-night transition; vehicle/road contrast; and water, salt grime, icicles, and cobwebs on camera lens.</li> <li>• Reliable nighttime signal actuation requires street lighting.</li> <li>• Requires 30 to 50 ft camera mounting height (in a side-mounting configuration) for optimum presence detection and speed measurement.</li> <li>• Some models susceptible to camera motion caused by strong winds or vibration of camera mounting structure.</li> <li>• Generally cost effective when many detection zones within the camera field of view or specialized data are required.</li> </ul>
(US Department of Transportation, 2006)		

## SECTION 5.5 TRANSIT AND INTERMODAL FACILITIES

There is a need to design transportation systems that provide more balance between modes, a more efficient use of energy in the movement of people, and a more harmonious interaction between transportation and the environment. This can be achieved by requiring that all users be considered when planning new transportation infrastructure. For example, bicycle parking should be required along with automobile parking for new development.

Capitola is serviced by Santa Cruz Metro for regional bus transportation. Santa Cruz Metro makes an effort to be “bicycle friendly” by offering bicycle racks mounted on the front of each bus, bicycle lockers at the Metro Center in downtown Santa Cruz, and allowing folding bicycles on board the buses. By combining bicycle and bus, bicyclists are able to travel further distances without the use of an automobile.

The closest Metro Center to the Santa Cruz Metro Center is located in front of the Capitola Mall, the only regional shopping center in Santa Cruz County. The Capitola Mall stop currently offers uncovered bicycle parking, but no bicycle lockers. The location of the bus stop is not easily or safely accessible, as pedestrians and bicyclists must travel through a large parking lot with no bicycle or pedestrian facilities to get there. Future plans for the Capitola Mall Area will address the lack of bicycle and pedestrian access to the transit center and the mall and require all users be kept in mind in the design of any new development that occurs.

## SECTION 5.6 SAFE ROUTES PLANNING AND RESEARCH

### **Safe Routes to School**

Safe Routes to School is a state and federal funding program as well as a local education program. Safe Routes to School funding can be used for infrastructure improvement projects and bicycle and pedestrian facilities as well as educational programs. It is important for children to be encouraged to ride bicycles and walk to school, and be educated on bicycle and pedestrian safety from a young age. Not only will such encouragement and knowledge result in safer cyclists and pedestrians, eventually, those children will become drivers who are more conscious of bicyclists and pedestrians. It is equally important to provide safe and accessible routes and secure parking facilities for children travelling to and from school and local activity centers. The programs that have been generated and maintained by Safe Routes to School and local funds are listed in Chapter 6. The City of Capitola supports Safe Routes to School programs and projects, and is committed to work with the Soquel Unified School District, Ecology Action, the Santa Cruz County Department of Health and Safety, and other organizations with programs that meet the goals of Safe Routes to School.

### **New Brighton Middle School Active Transport Tracking Program**

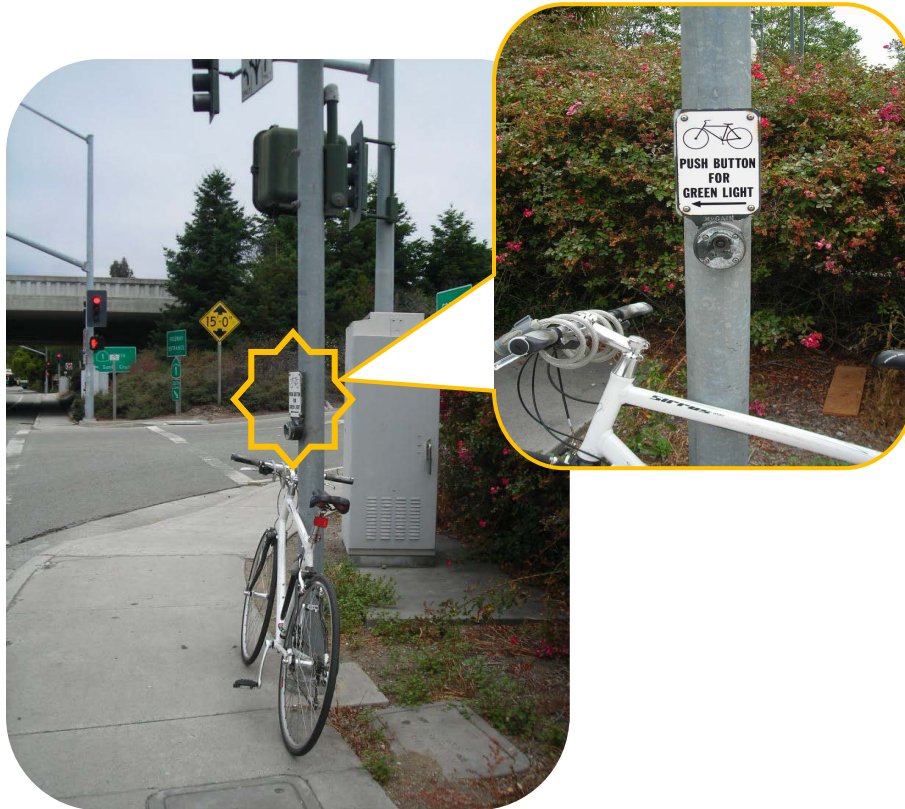
New Brighton Middle School is the only school located in the City of Capitola. Out of 676 students only about 30 students ride their bicycles to school and the majority arrives by car. The entire school participates in Bike to School day and 6<sup>th</sup> graders also participate in Bike Smart workshops. During such events New Brighton Middle School experiences high levels of participation. Unfortunately, ridership returns to low levels after the events have ended. In order to sustain increased ridership, the City of Capitola will work in cooperation with New Brighton Middle School to establish and support an on-going incentive program to encourage active transportation.

### **Porter St-Bay Ave/Highway 1 underpass study**

Bay Avenue is a four-lane arterial street in Capitola and is a major route for commuter and recreational bicyclists alike. Importantly, Bay Avenue is one of the only routes for school children who live in Capitola and attend Soquel Elementary or children who live in Soquel and attend New Brighton Middle School. Currently the intersection of Porter Street/Bay Avenue and Highway 1 is not bicycle friendly. On the northbound side of the street, motorized vehicles cut off bicyclists riding in the bicycle lane as they turn right onto the Highway 1 on-ramp. The same problem is true for southbound bicyclists on Porter Street just before the Highway 1 underpass. The intersection is equipped with push buttons which allow bicyclists to trigger the demand-actuated traffic signal, however, the push buttons are located

on the far end of the sidewalk so a bicyclists must get off of their bike to change the light (see Figure 5-1).

**Figure 5-1: Push button on Bay Avenue & Highway1**



#### **Bicycle improvements on Capitola Ave/Highway 1 overpass**

Capitola Avenue is a two-lane arterial that overpasses Highway 1. The overpass is too narrow for a Class II bikeway, and currently does not have a Class III bikeway. The overpass is in the project area for the proposed Highway 1 widening, and the development of pedestrian and bicycle facilities should be considered as conditions of the project. A study will be conducted to determine the cost and preferred design of such facilities, as well as identify short term solutions.

#### **Bicycle improvements on 41<sup>st</sup> Avenue and Highway 1 overpass and Gross Road intersection**

41<sup>st</sup> Avenue is a major 6-lane arterial street that runs through the major commercial/retail portion of the City of Capitola. The Capitola Mall, a regional shopping center is located on 41<sup>st</sup> Avenue as well as two other large shopping centers. These popular destinations generate



traffic congestion which in turn leads to unsafe conditions for cyclists. The intersection at Gross Road is difficult for bicyclists to maneuver due to congestion, right-turning traffic and low visibility of cyclists and pedestrians.

### **Bay Avenue-Capitola Ave Roundabout study**

Bay Avenue and Capitola Avenue are both 4-lane arterials which meet at a four-way stop. Due to the size and angles of the streets, it is sometimes difficult for drivers and cyclists to tell which vehicle has the right-of-way when crossing the intersection. One solution to this problem that the City of Capitola is considering is to transform the intersection into a roundabout. No engineering studies have been conducted thus far however, when a study is conducted special attention will be paid to the safety of bicyclists in the design.

### **Future planning efforts (Mall area, Esplanade parking design)**

The City of Capitola General Plan update process will begin in 2010 and incorporate the principles of sustainability into all goals, policies and programs therein. Specific areas may be focused on as a part of the update such as the 41<sup>st</sup> Avenue corridor and the Capitola Village. The promotion of sustainable transportation will be a key consideration in the future development of these areas and throughout the entire city.

## **SECTION 5.7 MONTEREY BAY SANCTUARY SCENIC TRAIL**

The Santa Cruz County Regional Transportation Commission (SCCRTC) has programmed \$6.8 million to date to develop the Monterey Bay Sanctuary Scenic Trail (MBSST) Network. The multi-use trail is envisioned to be a recreational, interpretive and transportation facility for bicyclists and pedestrians that will span the county's coastline. Previous projects such as the Rail Trail and the Coastal Trail Network have been consolidated into the MBSST Network project as they all share the goal of developing new accessible bicycle and pedestrian trail facilities on or near the coast. Once the RTC completes purchase of the Santa Cruz Branch rail line, the rail right of way will be evaluated through a Master Planning process for the possibility of accommodating such a trail adjacent to the active rail line. The 32 mile rail right of way spans the length of most of the county, is often very near the coast, and offers a perfect gradient for an accessible bicycle and pedestrian facility. The City of Capitola will coordinate with the trail efforts listed above to ensure an effective and efficient bicycle facilities system.



The Santa Cruz County Regional Transportation Commission is currently evaluating options for implementing passenger rail service from the City of Santa Cruz to Davenport. In planning for the Monterey Bay Sanctuary Scenic Trail Network and potential commuter rail service, consideration should be given to provision of the following bicycle facilities:

- Bicycle parking at rail/transit parking lots/stops
- Provision for allowing bicycles on trains; and parallel bicycle routes within the right-of-way
- Establishment of bicycle paths along railroad right of way
- Bicycle and pedestrian access from multi-user trail to important destinations within the City



Figure 5-2 MBSST rendering at Monterey Avenue and Park Avenue

## CHAPTER 6|BICYCLE SAFETY AND EDUCATION PROGRAMS

The City of Capitola has an abundance of safety and education programs, as well as advocacy groups, at its disposal. Bicyclists need to know the vehicle laws and they also need to develop good cycling skills, so that they can coexist safely with motorists. Motorists need to know that cyclists have a legal right to the roadways and they need to learn coexistence strategies, as well. Education programs can provide motorists with valuable information they need and bicyclists with on-bicycle training. The safety benefits of helmets and other protective measures also need to be stressed. The bicycle education and safety programs and resources are listed in the following sections of this chapter.

### SECTION 6.1 ORGANIZATIONS AND EDUCATION AND SAFETY PROGRAMS

Bicycle education is a critical piece of bicyclist safety. Programs that teach individuals the importance of safety equipment and bicycle maintenance, as well as road etiquette and bicyclist rights and responsibilities, save lives every year. There are several education and safety programs available to bicyclists in Capitola. In addition to educating bicyclists, it is also important to reach out to automobile drivers who may not be familiar with the legal rights of bicycles on the road. The California Department of Transportation currently does not require bicycle education as a part of the permitting and licensing of automobile drivers, so it is up to local organizations and government to inform the public. The following organizations offer bicycle safety training, education and bicycle support to Capitola residents:

**Santa Cruz County Regional Transportation Commission** - Plans for, funds, and supports numerous bicycle projects. A SCCRTC Transportation Planner serves part-time as a Bicycle Coordinator and staff person for the Bicycle Advisory Committee; handles bicycle hazard reporting (of potential or existing hazards on roadways or bikeways), applications for Bikes Secure, providing bicycle parking at private lots, vanpools and other locations (<http://www.sccrtc.org/>). The SCCRTC also produces the Santa Cruz County Bikeways Map which is distributed free to the public.

*Commute Solutions* - A rideshare program that provides callers with commute information, such as carpool and vanpool matching, transit schedules, bicycle commuter brochures, bikeway maps, and route suggestions, amongst other resources (<http://www.commutesolutions.org/>).

*Bicycle Advisory Committee* – advises the Santa Cruz County Regional Transportation Commission (SCCRTC) on bicycle planning and policy related issues. The Committee provides technical review of proposed bicycle projects and funding applications as well as theft prevention, bicycle parking programs, education and safety, and other bicycling related issues (<http://www.sccrtc.org/ros-bike.html>).

**Ecology Action** – a non-profit environmental consultancy that offers bicycle education and safety programs, technical support, and incentive programs to encourage active transportation.

Ecology Action works closely with local jurisdictions, schools and businesses, and is an active presence in the community (<http://www.ecoact.org/Programs/Transportation/index.htm>).

*Bike to Work/School Program* - Offers two County-wide Bike to Work/School Day events per year as well as the Spring Bike Week. These events are fun, inclusive, and educational, and encourage, support, and promote more people to bicycle for transportation.

*Bike Smart* – A Safe Routes to School program run by the Transportation Division of Ecology Action, a local non-profit organization. Bicycle safety training is done in the classroom and outside where youth of all ages participate in “Bicycle Rodeo” obstacle courses.

*Cabrillo College Go Green (Partnered with Ecology Action)* – Offers up to \$500 no-interest loan to purchase a bicycle for commuting to and from school and/or work. The College also hosts a bicycle co-op and offers bicycle lockers and secure bicycle parking.

**Community Traffic Safety Coalition** - a public safety organization representing over 30 community and government organizations, funded by a grant from the State Office of Traffic Safety. Some of its activities include: "Share the Road" with bicyclist signs, low-cost helmet distribution, outreach and education of enforcement agencies, Latino Community outreach, night-riding education (<http://www.sctrafficsafety.org/>).

*Ride n' Stride Bicycle and Pedestrian Safety Program* – Teaches elementary school children to safely ride their bicycles and walk. The program covers traffic and safety laws including helmet use and proper street crossing.

*Bicycle Traffic School* – A program aimed to hold bicyclists who receive traffic violations responsible for illegal behavior and educate them so the behavior is not repeated. Bicycle traffic safety classes are offered to individuals who receive traffic violation tickets in lieu of paying the fine.

**People Power** - a grass-roots advocacy group that monitors and advocates for positive bicycle associated issues (<http://peoplepowersc.org/>).

## CHAPTER 7|FUNDING SOURCES

There are a variety of funding sources on the Federal, State and local levels available for bicycle facilities and programs. As the opportunity arises the City of Capitola Public Works Department will apply for such funding. A detailed list of current funding options is included in Appendix E of this Plan. Adoption of this Bicycle Plan by the Capitola City Council will enable the City of Capitola to apply for Bicycle Transportation Account (BTA) funding offered by the State of California.

### SECTION 7.1 FEDERAL FUNDING SOURCES

- Safe Routes to School Program (SRTS)
- Section 402 – State and Community Highway Safety Program
- Federal Lands Highway Funds
- Recreational Trails Program
- Federal Highway American Recovery and Reinvestment Act (ARRA)
- Transportation Enhancement (TEA)

### SECTION 7.2 STATE FUNDING SOURCES

State funding sources:

- Bicycle Transportation Account (BTA)
- Wildlife Conservation Board Public Access Program
- California Conservation Corps
- California Safe Routes to School (SR2S)
- State Transportation Improvement Program (STIP)
- Environmental Enhancement and Mitigation (EEM)

### SECTION 7.3 LOCAL FUNDING SOURCES

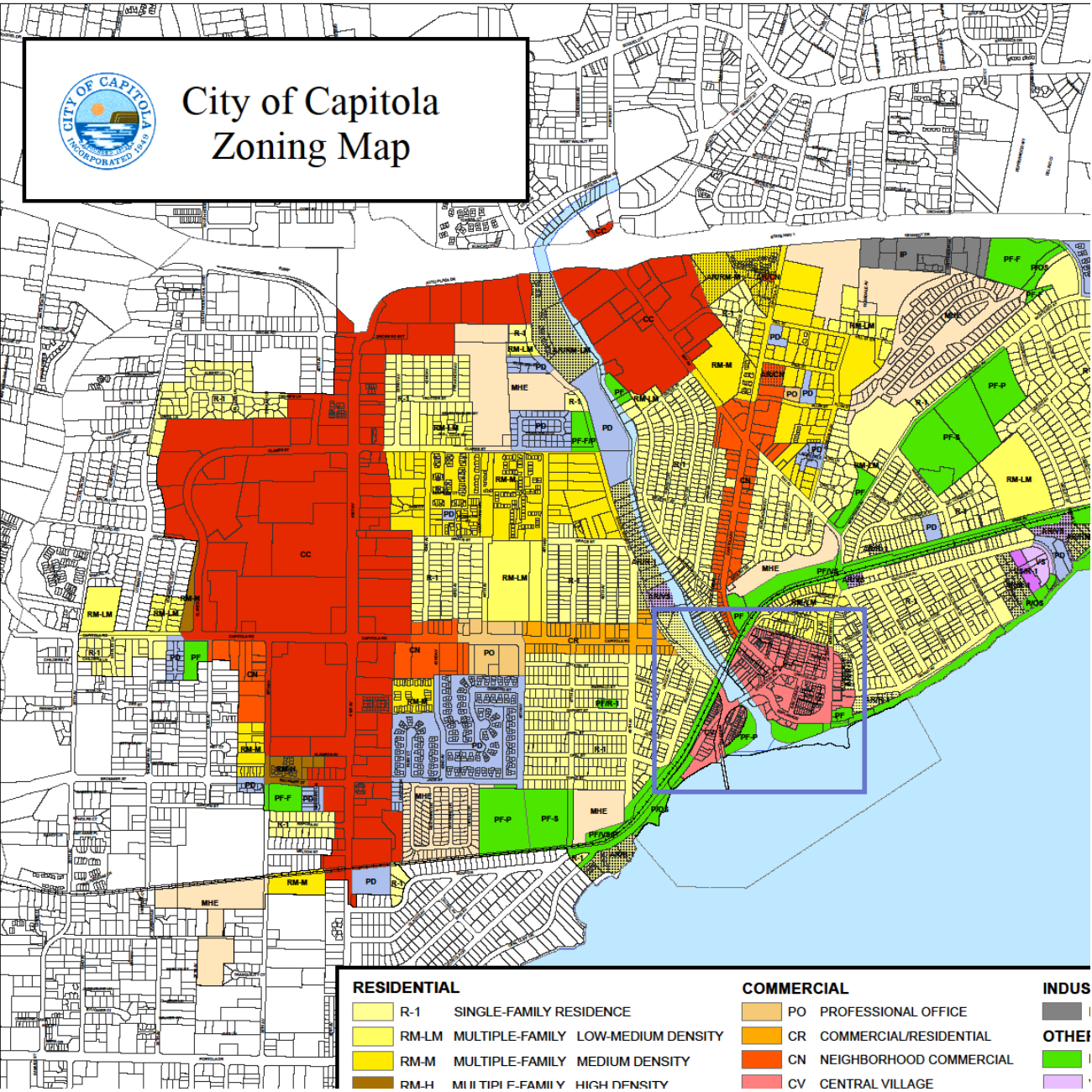
Local funding sources:

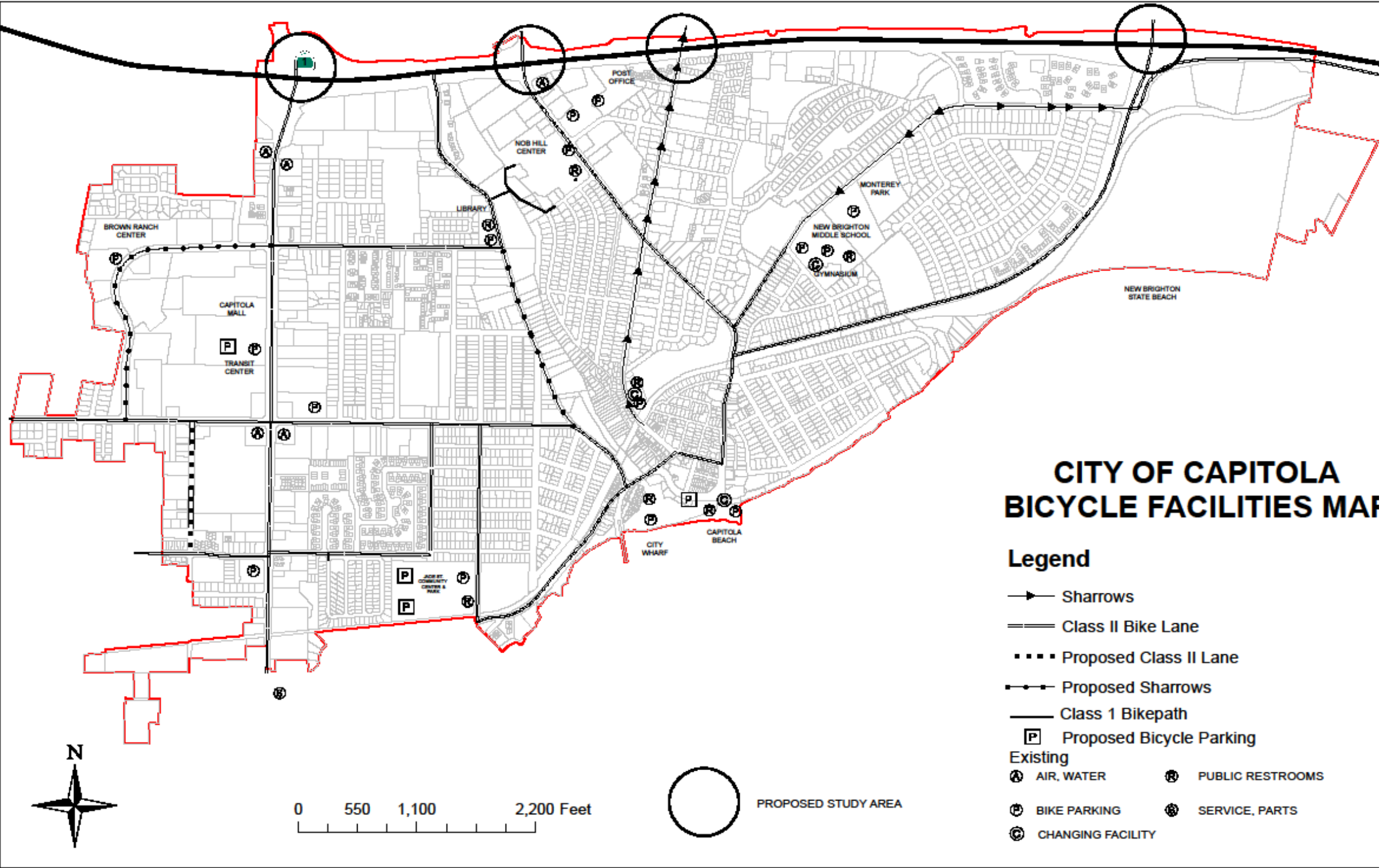
- Transportation Development Act (TDA)
- Vehicle Registration Surcharge Fee (AB 2766)
- City Sales Tax

## WORKS CITED

- (2008). *Bicyclist Injuries and Fatalities for Santa Cruz County*. Santa Cruz County Regional Transportation Commission.
- Bike PGH! (2007, June 12). *The Paint is to the Pavement on Liberty Ave*. Retrieved July 27, 2010, from Bike PGH: <http://bike-pgh.org/blog/2007/06/12/the-paint-is-to-the-pavement-on-liberty-ave/>
- Caltrans. (2009). *Highway Design Manual Chapter 1000: Bikeway Planning and Design*. California Department of Transportation.
- Census, U. (2000). *Summary File 3, QT-P23: Journey to Work*. US Census.
- Collaborative, A. E. (2009). *City of Capitola Local Government Operations Greenhouse Gas Emissions Inventory: 2005 Baseline Report*. AMBAG.
- Flusche, D. (2009). *The Economic Benefits of Bicycle Infrastructure Investments*. League of American Bicyclists.
- Gotschi, T. (2008). *Active Transportation for America: The case for increased Federal investment in bicycling and walking*. Rails-to-Trails Conservancy.
- (2006). *Highway Design Manual*. California Department of Transportation.
- League of American Bicyclists. (n.d.). *Bicycle Friendly Community*. Retrieved July 2010, from League of American Bicyclists:  
<http://www.bikeleague.org/programs/bicyclefriendlyamerica/communities/>
- League of American Bicyclists. (2000-2010). *Tips for Commuters*. Retrieved July 6, 2010, from League of American Bicyclists:  
<http://www.bikeleague.org/resources/better/commuters.php>
- Santa Cruz County Regional Transportation Commission. (2009). *Bikeway Miles*.
- U.S. Census. (2000). *Means of Transportation to Work for Workers 16 and Older (P30) Summary File 3*.
- UC Davis Department of Mechanical and Aeronautical Engineering. (2007). *Overhead Traffic Detector Mounting System Final Technical Report*.
- US Department of Transportation. (2006). *Traffic Detector Handbook: Third Edition. Vol 1*.
- Wilson, S. (1973). Bicycle Technology. *Scientific American*.
- [www.cycle2city.com.au](http://www.cycle2city.com.au). (n.d.). Retrieved July 27, 2010, from [www.cycle2city.com.au](http://www.cycle2city.com.au)









## APPENDIX B | PAST EXPENDITURES AND FUTURE COSTS

Completed 2005 Bicycle Plan Projects	
Project	Cost
Install bicycle lane/ sharrows use on Wharf Rd, from Clares St to Grace St.	\$2,000
Monterey Ave sharrows, Park to Capitola Avenue Southbound	\$1,000
Install sharrows, on Capitola Ave from Stockton Ave	\$5,000
Install bicycle lanes on Monterey Ave southbound bicycle	\$3,000
Restripe Class II bikeways; reposition and re-stencil sharrows on 41 <sup>st</sup> Ave, Clares St, Brommer St, Monterey Ave and Bay Ave; Stripe left hand turn pocket on Bay Ave at Center Ave	\$9,300
Stencil Sharrows on Clares Ave by Brown Ranch Shopping Center	\$1,700
<b>Total Cost of 2005 BTP Projects</b>	<b>\$22,000</b>
<b>Total Projected Cost of 2011 BTP Projects</b>	<b>\$509,000</b>

## APPENDIX C | BICYCLE TRANSPORTATION PLAN CHECKLIST

Requirement	Location
(a) The estimated number of existing bicycle commuters in the plan area and the estimated increase in the number of bicycle commuters resulting from implementation of the plan.	Chapter 4   Table 4-1   pg 21
(b) A map and description of existing and proposed land use and settlement patterns which shall include, but not be limited to, locations of residential neighborhoods, schools, shopping centers, public buildings, and major employment centers.	Appendix A-1   pgs 18-20
(c) A map and description of existing and proposed bikeways.	Appendix A-2   pgs 14-17, 25-35
(d) A map and description of existing and proposed end-of-trip bicycle parking facilities. These shall include, but not be limited to, parking at schools, shopping centers, public buildings, and major employment centers.	Appendix A-2   pgs 27-28
(e) A map and description of existing and proposed bicycle transport and parking facilities for connections with and use of other transportation modes. These shall include, but not be limited to, parking facilities at transit stops, rail and transit terminals, ferry docks and landings, park and ride lots, and provisions for transporting bicyclists and bicycles on transit or rail vehicles or ferry vessels.	Appendix A-2   pg 31
(f) A map and description of existing and proposed facilities for changing and storing clothes and equipment. These shall include, but not be limited to, locker, restroom, and shower facilities near bicycle parking facilities.	Appendix A-2   pg 28
(g) A description of bicycle safety and education programs conducted in the area included within the plan, efforts by the law enforcement agency having primary traffic law enforcement responsibility in the area to enforce provisions of the Vehicle Code pertaining to bicycle operation, and the resulting effect on accidents involving bicyclists.	Chapter 6   pg 26-27
(h) A description of the extent of citizen and community involvement in development of the plan, including, but not limited to, letters of support.	Chapter 1   pg 5
(i) A description of how the bicycle transportation plan has been coordinated and is consistent with other local or regional transportation, air quality, or energy conservation plans, including, but not limited to, programs that provide incentives for bicycle commuting.	Chapter 2   pg 7-8
(j) A description of the projects proposed in the plan and a listing of their priorities for implementation.	Appendix D
(k) A description of past expenditures for bicycle facilities and future financial needs for projects that improve safety and convenience for bicycle commuters in the plan area.	Appendix B

## APPENDIX D | 2011 PROPOSED PROJECTS LIST

Project	Priority	Existing Conditions	Goal(s) Achieved	Projected Cost	Potential Funding
<b>1) Monterey Bay Sanctuary Scenic Trail Network</b>	H	Existing Railroad Right-of-way; Existing Coastal Route	<b>Goal 1</b> - Circulation, Connectivity and Access <b>Goal 2</b> - Increase Ridership	N/A	RTC/BTA/Local/ STIP/TEA/Coastal Conservancy/Federal appropriations
<b>2) Install inductive loop sensors or video sensor at signalized intersections to detect bicycles</b>	H	Existing model of wire loop actuated signals work for cars but not bicycles	<b>Goal 2</b> - Increase Ridership	\$380,000	BTA/Local
<b>3) Install bicycle sensors in several locations around the City to collect ridership data or develop and implement a bicycle count program</b>	H	Limited Capitola-specific bicycle ridership data	<b>Goal 1</b> - Circulation, Connectivity and Access		BTA/Local
<b>4) Safe Routes to School planning; work with New Brighton Middle School to establish a year-round bike to school incentive and tracking program</b>	H	Limited safe routes to New Brighton Middle School	<b>Goal 1</b> – Circulation, Connectivity and Access <b>Goal 2</b> – Increase Ridership <b>Goal 3</b> - Safety	\$40,000	SR2S (State)
<b>5) Conduct a feasibility study for the extension of the Class I bikeway from Soquel Elementary to Perry Park</b>	H	Limited safe routes to Soquel Elementary and New Brighton Middle School. Only 0.17 miles of Class I bikeway in the City of Capitola	<b>Goal 1</b> - Circulation, Connectivity and Access <b>Goal 2</b> - Increase Ridership	\$15,000 to \$20,000	SR2S, Local
<b>6) Porter-Bay underpass study</b>	H	Current bicycle infrastructure makes bicyclists vulnerable to right-hook turns; route used by students	<b>Goal 3</b> - Safety	\$15,000 to \$20,000	Local

Project	Priority	Existing Conditions	Goal(s) Achieved	Projected Cost	Potential Funding
<b>7) Conduct a study to further improve the bicycle route on Clares St around Brown Ranch Shopping Center</b>	H	Lacking bicycle infrastructure, narrow right of way; Sharrows stenciled in 2010	<b>Goal 1</b> - Circulation, Connectivity and Access	\$15,000 to \$20,000; \$1700	BTA/Local
<b>8) Eliminate root intrusion on Park Avenue; resurface, repave and restripe</b>	H	Tree roots raise pavement creating a hazard for cyclists	<b>Goal 5</b> - Maintenance	\$3,000 to \$4,000	BTA/Local
<b>9) Add bicycle racks along the Esplanade and near the stage; create bicycle corrals for short term and long-term bicycle parking; consider space for a loading zone for bicycle-based businesses</b>	H	Lack of secure bicycle parking	<b>Goal 2</b> - Increase Ridership	\$5,000 - \$10,000	BTA/Local
<b>10) Install racks at Jade Street Park</b>	H	Lack of secure bicycle parking	<b>Goal 2</b> – Increase Ridership	\$500/rack	BTA/Local
<b>11) Install bike lockers at the Capitola Mall Transit Station</b>	H	Lack of secure bicycle parking	<b>Goal 4</b> - Multi-modal	\$3,000	BTA/Local
<b>12) Participate in the County-wide Bicycle Route Signage Program</b>	H	Lack of way-finding signage on popular bicycle routes	<b>Goal 1</b> - Circulation, Connectivity and Access	\$200/sign	RTC/Local
<b>13) Update Bicycle Parking ordinance; create a bicycle facilities ordinance</b>	H	Existing development standards for bicycle parking are out of date	<b>Goal 1</b> - Circulation, Connectivity and Access <b>Goal 2</b> - Increase Ridership		Local
<b>14) Bicycle improvements on Capitola Ave/HWY 1 overpass; short-term solutions and consideration in future plans</b>	H	Lacking bicycle infrastructure, unsafe conditions for bicyclists	<b>Goal 3</b> - Safety		Local/BTA/Caltrans

Project	Priority	Existing Conditions	Goal(s) Achieved	Projected Cost	Potential Funding
<b>15) Conduct study to make bicycle infrastructure improvements on 41<sup>st</sup> Ave and HWY 1 Overpass and Gross Rd intersection</b>	H	Unsafe route and intersection for bicyclists	<b>Goal 3</b> - Safety		Local/BTA/Caltrans
<b>16) Bicycle design and safety component of Bay Ave-Capitola Ave Roundabout study</b>	H	Busy 4-way stop intersection	<b>Goal 1</b> - Circulation, Connectivity and Access <b>Goal 3</b> - Safety	\$5,000	BTA/Local
<b>17) Install warning signs where bicycle bridge path exits on to Wharf Rd. Install signage to distinguish between the two bridge paths.</b>	M	Lack of signage notifying autos that bicycles are exiting onto roadway	<b>Goal 3</b> - Safety	\$200/sign?	Local
<b>18) Include plans to develop a bicycle commuter facilities at the Capitola Mall Transit Station in the General Plan Update/future area plans</b>	M	Insufficient commuter facilities for Capitola Mall employees and transit riders	<b>Goal 4</b> - Multi-modal		Local
<b>19) Create plans to improve parking design along the Esplanade</b>	M	Existing parking results in low visibility for drivers which is hazardous for bicyclists and pedestrians	<b>Goal 3</b> - Safety	\$15,000 - \$20,000	Local
<b>20) Work with senior centers to create a program that promotes senior bicycle ridership</b>	M	Seniors have limited transportation options, and many are afraid to ride bicycles even if they are physically able	<b>Goal 2</b> - Increase Ridership		Local
<b>21) Work with Capitola Chamber of Commerce and hotels to create a bicycle rental program</b>	L	Limited transportation options for tourists	<b>Goal 2</b> - Increase Ridership		Local

# APPENDIX E| FUNDING MATRIX

Grant Source	Due Date	Administering Agency	Annual Total	% Match Required	Eligible Applicants	Comments
FEDERAL SOURCES						
Congestion Mitigation and Air Quality Improvement (CMAQ)		SCTA/MTCA				Funds may be used for bicycle facilities and programs. Website: <a href="http://www.mtc.ca.gov/funding/STPCMAQ">www.mtc.ca.gov/funding/STPCMAQ</a>
Transportation, Community and System Preservation Program (TCSP)		FHWA				Focuses on improving the efficiency and accessibility of the transportation system through planning and implementation.  ( <a href="http://www.fhwa.dot.gov/tcsp/pi_tcsp.htm">www.fhwa.dot.gov/tcsp/pi_tcsp.htm</a> )
Highway Safety Improvement Program		Caltrans		10%		The HSIP provides funding for bicycle safety improvement projects. ( <a href="http://www.dot.ca.gov/hq/localprograms/hsip.htm">www.dot.ca.gov/hq/localprograms/hsip.htm</a> )

Grant Source	Due Date	Administering Agency	Annual Total	% Match Required	Eligible Applicants	Comments
Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETY-LU)		RTPA & Caltrans	varies	11.47%	Federally certified Jurisdictions	SAFETY-LU is the major federal funding source for surface transportation funding. The majority of funds are meant for capital improvement projects, however, 10% of funds may be used for safety and education programs.
Surface Transportation Program (STP)	varies	RTPA/MPO/ Caltrans/FHWA	Approx. \$200 million to state	11%-20% non federal	Federally Certified jurisdictions	Contact RTPA. Funds can be used for a wide variety of projects. STP is exchanged every year. After exchange, money belongs to RTPA's. ( <a href="http://www.mtc.ca.gov/funding/STPCMAQ">www.mtc.ca.gov/funding/STPCMAQ</a> )

Grant Source	Due Date	Administering Agency	Annual Total	% Match Required	Eligible Applicants	Comments
Transportation Enhancements (TE)		FHWA			Municipality, County, State agency, University, Federal government, or Non-profit. Only state and federal agencies can apply for ITIP TE.	Surface transportation related bicycle infrastructure projects and education programs are eligible for funding.
Section 402 – State and Community Highway Safety Grant Program		DOT Traffic and Safety				Funding may be used for bicycle safety and education programs, educational materials and/or safety equipment (helmets).
STATE SOURCES						



Grant Source	Due Date	Administering Agency	Annual Total	% Match Required	Eligible Applicants	Comments
<p><b><i>State Transportation Improvement Program (STIP) Related Programs. The statewide four-year Capital Improvement Program adopted biennially by the California Transportation Commission, which included all major transportation projects funded by state or federal funds. These projects are submitted by the local jurisdictions through the RTPA's RTIP/STIP budget process.</i></b></p>						
Regional Share (Major Projects \$300,000 and up.)	July 1 odd years to RTPA	CTC, RTPA	varies	11.47% for transit only	RTPAs	Emphasis is on reducing traffic congestion & increasing capacity. RTPA determines projects for the region within CTC guidelines. Must be adopted into RTIP by Dec. 1 of odd # years.  (Except 12/98)
Bicycle Transportation Account (BTA)	December 1 to Caltrans District 5	Caltrans	\$7 million/yr	n/a	Cities, County	Contact Caltrans. State account designated to fund bicycle facilities. Local jurisdictions must have a Bicycle Plan approved by RTPA & State. Project requests must not exceed \$170,000.
State Highway Account (SHA)	Summer in odd # years	Caltrans, RTPA	\$360,000	n/a	Caltrans District Offices	Contact Caltrans. Must be associated with State Highway and be able to provide for enhanced safety. Funds available to districts for bicycle facilities on state right of way.

Grant Source	Due Date	Administering Agency	Annual Total	% Match Required	Eligible Applicants	Comments
Minor A/B programs	Ongoing, Approve by April, odd years	Caltrans	n/a	Approx.\$4 mil/yr to Dist. 5	Local Jurisdictions & special districts	Contact Caltrans. For projects (\$107,000-\$750,000) Minor A program; Minor B for projects up to \$107,000.
Habitat Conservation Fund Grant Program		California State Parks & Recreation	varies	50% non-state match	Local Jurisdictions & special districts	Contact CA Parks & Rec. Projects that attract people to park and wildlife areas. Fund will last until 2020. Must comply w/ CEQA, NEPA, & must demonstrate land ownership.
Environmental Enhancement and Mitigation Program (EEM)		State Resources Agency	\$10mil/yr	0%, but favored	Nonprofit agencies, local, state, and federal agencies.	Contact State Resources. Projects that enhance or mitigate existing or future transportation projects. Will be available until year 2000. \$500 K is the maximum allocation for a project. Must be above and beyond what CEQA requires for traffic-generating project. The Resources agency makes final recommendations to Caltrans.
Safe Routes to School		Caltrans	\$22 million/yr	10%, \$450k max	Local Jurisdiction	Contact Caltrans

Grant Source	Due Date	Administering Agency	Annual Total	% Match Required	Eligible Applicants	Comments
Land and Water Conservation Fund		California State Parks & Recreation	varies	50% non state	n/a	Contact Parks & Rec. States must adopt a State Comprehensive Outdoor Rec Plan. For recreational parks facilities.
Recreational Trails Program (RTP)		California State Parks				Supports the development and maintenance of recreational trails.  ( <a href="http://www.fhwa.dot.gov/environment/rectrails/index.htm">www.fhwa.dot.gov/environment/rectrails/index.htm</a> )
Coastal Conservancy		California State Coastal Conservancy				Encourages projects that will increase or improve public access to the coast, rivers and creeks. It also supplies funding for resource conservation projects. ( <a href="http://scc.ca.gov/category/grants/">scc.ca.gov/category/grants/</a> )
LOCAL SOURCES						
Transportation Development Act (TDA), Article 3	ongoing	RTPA	varies	0%	Cities, County	In Santa Cruz County, the funds are allocated annually according to formula. Local Jurisdiction proposes projects to the Bicycle Committee and the Regional Transportation Commission for final approval. Article 8 funds are used in Santa Cruz primarily for bicycle and pedestrian projects.

Grant Source	Due Date	Administering Agency	Annual Total	% Match Required	Eligible Applicants	Comments
Vehicle Registration Surcharge Fee (AB 2766)	April	MBUAPCD	Est. over \$1 million/yr district wide	0%, but preferred	Private and Public agencies	Contact MBUAPCD. For projects that contribute to the reduction of motor vehicle air pollution emissions in the MBUAPCD District (3 counties are included: Santa Cruz, San Benito, and Monterey)

### TRANSPORTATION ACRONYMS

#### for Grants Funding Information Matrix

AMBAG	Association of Monterey Bay Area Governments	A voluntary association of Santa Cruz, and Monterey Counties and the incorporated cities in the two counties. Serves as the federal MPO for transportation planning purposes. San Benito County is included in this Association with respect to transportation planning. Handles interregional issues including transportation planning, water quality, air quality conformity analyses and demographic forecasts.
CEQA	California Environmental Quality Act	Legislation which requires state and local agencies to disclose, consider and mitigate any environmental impacts associated with their projects or actions.

CTC	California Transportation Commission	A nine member board appointed by the Governor (with the Legislature's confirmation) to oversee transportation funding and project delivery. This board is responsible for review of the Regional Transportation Improvement Programs. This board approves the State Transportation Improvement Program which allocates state and federal funding.
DO	District Office	Shorthand for California Department of Transportation District Offices. The DO for the Central Coast is Caltrans District 5 located in San Luis Obispo.
FHWA	Federal Highway Administration	A branch of the US Department of Transportation. This federal agency has responsibility for review and approval of transportation projects and programs which impact the designated federal interstate system. Also oversees federal transportation planning agencies and MPO requirements.
FTA	Federal Transit Administration	A branch of the US Department of Transportation. This federal agency has responsibility for review and approval of transportation projects and programs which impact transit systems.
MBUAPCD	Monterey Bay Unified Air Pollution Control District	This regional agency holds jurisdiction over the implementation and enforcement of state and federal air quality regulations and guidelines in the three county area which includes Santa Cruz, Monterey and San Benito counties.

MPO	Metropolitan Planning Organization	This agency is designated by the Governor to administer the federally mandated transportation planning processes in metropolitan areas (over 50,000 population). AMBAG is the MPO for our region.
RTIP	Regional Transportation Improvement Program	A state mandated capital improvement program for regional transportation projects which will use federal and / or state funding sources. The Santa Cruz County Regional Transportation Commission (SCCRTC) adopts the Santa Cruz County Regional Transportation Improvement Program (RTIP) which is then forwarded to the CTC for inclusion in the final STIP. A key component of the RTIP is the selection of projects for state “regional share” funds.
RTPA	Regional Transportation Planning Agency	Local agencies designated by the State legislature to conduct state mandated regional transportation planning and programming activities. In Santa Cruz County, Santa Cruz County Regional Transportation Commission (SCCRTC) is the Regional Transportation Planning Agency. The corresponding agency in Monterey County is the Transportation Agency for Monterey County (TAMC). RTPAs often coordinate the distribution of several different state and federal funds such as STP/CMAQ, TEA, TDA & STA.
SAFE	Service Authority for Freeway Emergencies	An authority enabled by state law and established by local jurisdictions to collect a \$1 fee for the purpose of developing and maintaining a highway motorist aid system with the cellular callboy as its main component.

SCCRTC	Santa Cruz County Regional Transportation Commission	SCCRTC is the designated Regional Transportation Planning Agency (RTPA) for Santa Cruz County. It has primary responsibility for development of regional transportation policy and plans and programming of funds within the Santa Cruz County area. SCCRTC is also the congestion management agency, the regional ride share agency (Commute Solutions), and the Service Authority for Freeway Emergencies (SAFE) for Santa Cruz County.
TAMC	Transportation Agency for Monterey County	TAMC is the designated Regional Transportation Planning Agency (RTPA) for Monterey County. It has primary responsibility for development of regional transportation policy and plans and for programming of funds within the Monterey County area.
TDA	Transportation Development Act	A 1971 state law which provides for the collection of a ¼¢ sales tax dedicated for local transportation projects. Revenues are allocated on an annual basis by the Santa Cruz County Regional Transportation Commission (SCCRTC).



## COMMUNITY TRAFFIC SAFETY COALITION

### **Recommended Guidelines to Protect the Safety of Bicyclists, Pedestrians, and Disabled Travelers during Road Construction**

As stated in the California MUTCD (2003 Edition with Revisions Number 1 and 2 Incorporated, December 2007), **“The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA) Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.”**

#### **THE PROBLEM**

There are three general situations which impact bicyclists, pedestrians, and disabled travelers:

1. Work in the *bikeway*\* or *walkway* which forces bicyclists or pedestrians to compete with motor vehicles in a narrow car lane.
2. Work which is not in the *bikeway* or *walkway* but which puts equipment, debris, or warning signs in the *bikeway* or *walkway*.
3. Work which blocks the direction of travel without a clear, safe, and convenient detour for cyclists, pedestrians, or wheelchair travelers.

In addition, please be aware of these specific hazards for bicyclists, pedestrians, and disabled travelers.

---

\* For the purposes of these guidelines, “*bikeway*” will be used to refer to where bicyclists usually travel on a given road, including painted bike lanes, paved shoulders, the right side of a wide travel lane, or the center of a narrow travel lane if there is no bike lane or shoulder. “*Walkway*” will be used to refer to sidewalks, shoulders, and paths where pedestrians and wheelchairs travel.



### Hazards to Bicyclists

- Signs, equipment, or debris in the *bikeway*.
- *Bikeway* blocked without advance warning.
- Rough pavement or gravel without advance warning.
- Poor pavement transitions, especially when parallel to the line of travel (eg: metal plate edges or pavement removal/resurface areas which are not tapered).
- Inadequate time to pass through a signalized one-lane, two-way traffic control.

### Hazards to Pedestrians

- Blocked or hazardous *walkway* which is not marked in a way that is visible in advance, especially at night.
- Alternate route or detour which is not negotiable by wheelchairs, strollers, carts, etc.

### Special Hazards to Visually Impaired Pedestrians

- Blocked or hazardous *walkway* without a barrier which is solid enough to be discernible by guide dog or cane.

### Special Hazards to Wheelchair Travelers

- Signs, equipment, or debris partially blocking the *walkway*.
- Sidewalk blocked with no curb cut or ramp to exit sidewalk, or advance warning to exit at a prior curb cut.
- Rough pavement, grooves, or gravel without advance warning. Rocks of 3" diameter or greater are especially hazardous because they may cause the wheelchair to stop abruptly and eject the occupant

## **THE SOLUTION**

The California MUTCD (Section 5-01-2) includes these “fundamental principles” for bicyclists and pedestrians in construction and maintenance work zones:

1. Bicycle and pedestrian “movement should be disrupted as little as practicable”.
2. “Pedestrians and bicyclists should be provided with access and passage through, or around, the temporary traffic control zone at all times.”
3. Bicyclists and pedestrians “should be guided in a clear and positive manner while approaching and space traversing the temporary traffic control zone.”

In addition, please consider the following specific safety and access measures.

### Detours

- When construction blocks the *bikeway*, accommodations should be made for bicyclists if they are made for motor vehicles, including safe and well marked detours for cyclists when needed. In some situations when motor vehicles are detoured, a safe corridor can be left open for bicyclists. If not possible, post “End Bike Lane” and “Share the Road” (or “Merge Left”) caution signs to encourage cyclists to merge into the through lane. Rather than directing bicyclists to walk their bikes in pedestrian zones, try to provide a rideable alternative.
- If construction or signs must block the *walkway*, establish safe, well-signed detours for pedestrians which are accessible for wheelchairs, strollers, carts, etc.
- When one-lane, two-way traffic control is done by temporary traffic signals, timing should accommodate bicyclists, who will be slower than motor vehicles especially in the uphill direction. Consider push button signals for bicyclists or special bicycle loops, if practical.
- Barriers should include a portion low enough and solid enough to be easily discernible by a cane, guide dog, or child. If necessary, use flaggers to guide pedestrians.

### Signs

- Whenever possible, construction warning signs should be placed out of the *bikeway* and *walkway*, so that the sign itself is not a barrier for bicyclists for wheelchair travelers. Remove construction signs promptly when construction pauses or ends.
- Any construction or sign which blocks the *bikeway* should have sufficient sight distance, including night-time visibility, to allow cyclists time to merge safely into the car lane. Use “End Bike Lane” and “Share the Road” signs.
- Any construction or sign which blocks the *walkway* should have prior warning to allow wheelchairs time to exit the walkway at a prior curb cut.
- For all construction where the *bikeway* or *walkway* is blocked or the lane narrows, post “Share the Road” caution signs to warn motorists to slow down and watch for bicyclists and pedestrians.

### Pavement Surface

- Temporary pavement or metal plates installed during construction should have cold mix asphalt tapered at the edges for bicyclist, pedestrian and wheelchair safety. When locating metal plates, avoid placing edges in the middle of the *bikeway*. Debris in the *bikeway* or *walkway* should be cleared at the end of each workday.
- If no smooth surface is available for bicyclists, pedestrians, or wheelchairs, post signs warning “Rough Surface” or “Uneven Pavement” at the beginning of the work area. Keep signs posted at the end of the workday. Use reflective signage on barricades with flashers for night safety.
- Prior to “sign off” on projects, verify that the pavement in the *bikeway* and *walkway* is even. Overlay should be smoothed at drainage grates, manholes, and gutter pan, and after narrow trenching in the *bikeway*.

