# Chapter 1
# INTRODUCTION

## BACKGROUND

In January 1999, the Berkeley Bicycle Plan was adopted with the goal of creating a "model bicycle-friendly city where bicycling is a safe, attractive, easy, and convenient form of transportation and recreation for people of all ages and bicycling abilities." The citywide recommended bicycle network is depicted in Figure 1. Developing a network of seven bicycle boulevards is one of the key recommendations in the Plan that will implement this ambitious goal. Bicycle boulevards are an innovative approach to developing safe and efficient bikeways for all types of cyclists in an urban environment with limited street space.

The Plan defines a bicycle boulevard as *a roadway that has been modified as needed to enhance bicyclists' safety and convenience*. Seven bicycle boulevard streets are identified in the Bicycle Plan:

| **North-South:** | **East-West:** |
|---|---|
| Ninth | Virginia |
| California/King | Channing |
| Milvia | Russell |
| Bowditch/Hillegass | |

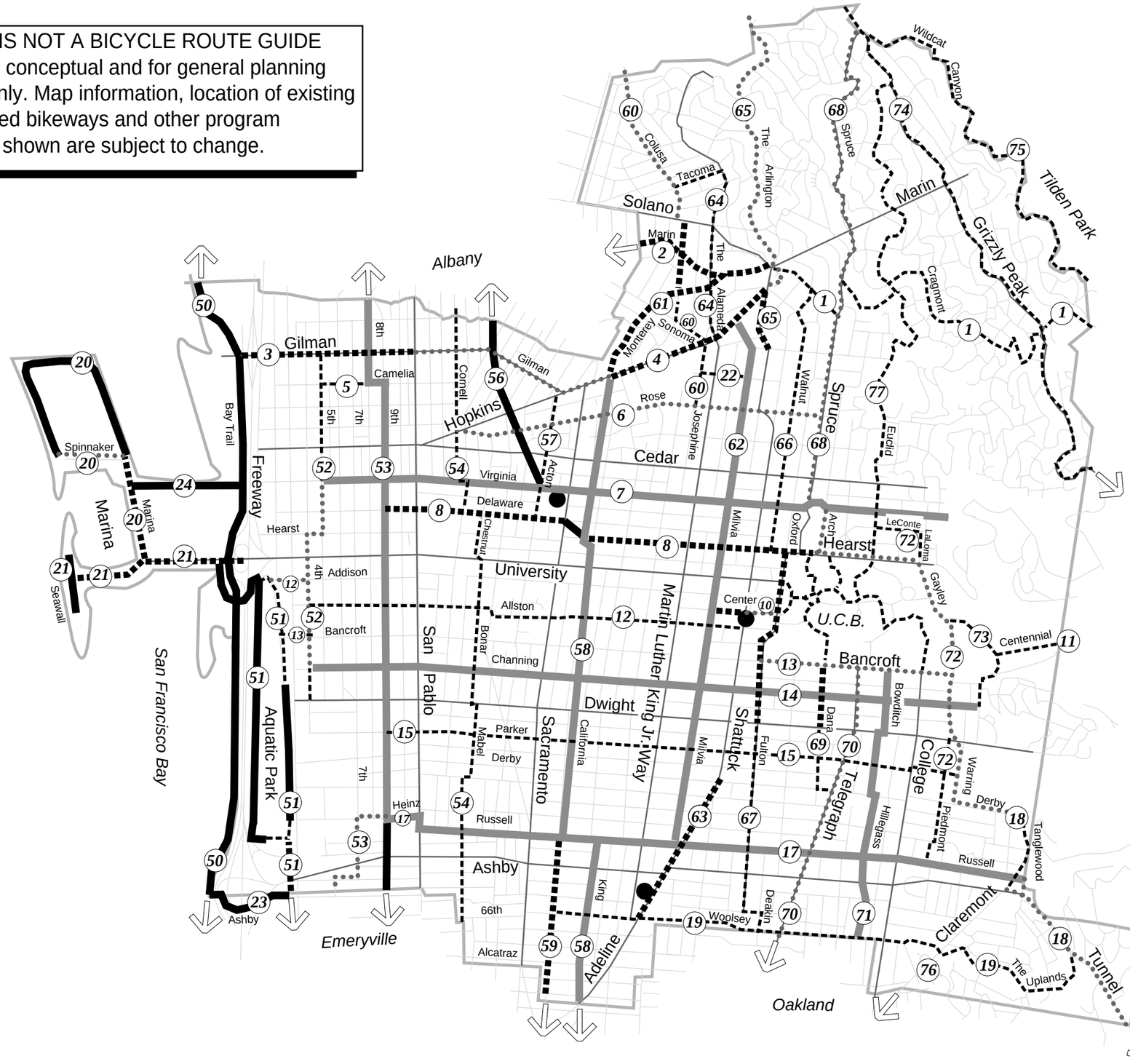
## REPORT OVERVIEW

This report represents the completion of the first phase of Bicycle Boulevard implementation: the Early Design Phase. In this phase, staff and the consultants worked with the public to develop a set of basic tools to be used on all bicycle boulevard streets. These strategies will create an easily identifiable network of bicycle boulevards. A comprehensive toolbox of site-specific strategies was also developed. The City and the neighborhoods can use this toolbox to select the strategies that respond to the specific issues along each bicycle boulevard street. The toolbox and the guidelines are contained in Chapter 4.

It is anticipated that the strategies in the toolbox may need to be modified as detailed designs for each bicycle boulevard are developed in collaboration with neighboring residents and bicyclists. New strategies may also need to be added, and some strategies in the toolbox may not be used at all. This toolbox should therefore be viewed as a guideline, not a rule, for developing bicycle boulevards.

This report also identifies the existing conditions along the bicycle boulevards, based on the consultant's field review and public input, in Chapters 2 and 3. A review of the traffic impacts of various types of

THIS MAP IS NOT A BICYCLE ROUTE GUIDE
This map is conceptual and for general planning purposes only. Map information, location of existing and proposed bikeways and other program information shown are subject to change.




# Berkeley Bicycle Plan

## Figure 1
## Recommended Bikeway Network

### Legend

- ***Paths (Class 1)*** (multi-use trail; non-motorized only)
- ***Boulevards*** (bicycle priority street)
  ***NOTE: Exact alignment of Bicycle Boulevards to be determined during the Bicycle Boulevard planning process***
- ***Lanes (Class 2)*** (striped lane for bicycles only)
- ***Class 2.5*** (upgraded bike route with targeted improvements)
- ***Routes (Class 3)*** (signed route - no special markings)
- ***Connections to Existing / Proposed Routes in other Cities***
- ***BART Station***
- ***Bikeway Network Number***

***Sources:***
- ***Proposed and Existing Bikeways Inventory, April 14, 1998***
- ***Wilbur Smith Associates***
- ***City of Berkeley Staff***

***North***

***Draft for Inclusion in the General Plan 12/28/98***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traffic calming devices is contained in Chapter 5. Finally, an implementation plan for developing the bicycle boulevards is included in Chapter 6.

## DEVELOPMENT OF REPORT

The Early Design Phase began in February 1999, after the adoption of the Bicycle Plan. The consultants conducted their field review of the seven bicycle boulevards and mapped the existing conditions. The Bicycle Subcommittee of the Transportation Commission has been the main citizen advisory group for this project, overseeing the progress of Bicycle Boulevard implementation. Staff, with the Bicycle Subcommittee, developed the Goals and Objectives for the design of the bicycle boulevards (included in this Chapter).

Three public workshops were held from September to November 1999. The concept of bicycle boulevards was presented, and input was gathered on the existing problems along the bicycle boulevard streets and on possible strategies to be used on the boulevards. These workshops were widely publicized, resulting in almost 200 people attending at least one workshop. The workshops included a mix of cyclists and residents on and near bicycle boulevards (many of whom also ride a bike). A summary of the public comment from the three workshops is available as an Appendix to this report.

The input from the public workshops, and from the many letters and e-mails sent to staff, has shaped the development of the toolbox and expanded the list of issues along the bicycle boulevards. As much as possible, this report responds to the comments brought up by the public regarding bicycle boulevard design. Those comments that could not be addressed during this phase of Bicycle Boulevard implementation will be examined during the upcoming detailed design and implementation phase.

## PURPOSE OF A BICYCLE BOULEVARD

The purpose of a bicycle boulevard is to improve bicycle safety and circulation (compared to other streets) by having or creating one or more of the following conditions:

- low traffic volumes (or bike lanes where traffic volumes are medium);
- discouragement of non-local motor vehicle traffic;
- free-flow travel for bikes by assigning the right-of-way to the bicycle boulevard at intersections wherever possible;
- traffic control to help bicycles cross major streets (arterials); and
- a distinctive look and/or ambiance such that cyclists become aware of the existence of the bike boulevard and motorists are alerted that the roadway is a priority route for bicyclists.

## GOALS AND OBJECTIVES

The Bicycle Subcommittee of the Transportation Commission developed the following goals and objectives to guide the design process for the bicycle boulevards:

### Goals

1. To create a safe bicycling environment for people of all bicycling abilities. The boulevards should ideally be a place where anyone would feel safe riding.
2. To develop a network of efficient routes for bicyclists. This essentially means reducing the number of times that a cyclist must stop along the route, and improving the ability to cross major intersections.
3. To increase the visibility of bikeways in Berkeley. Residents and visitors should know about and be able to easily find these safe and efficient routes.

### Objectives

1. Design the bicycle boulevards to be visually unique from surrounding streets and to invite safe, easy bicycling that is appealing to all ages and abilities.
2. Minimize changes to existing traffic patterns on bicycle boulevards and adjacent residential streets.
3. When traffic-calming devices are needed, utilize ones that do not significantly inhibit access of emergency vehicles and that also provide access for people with disabilities.
4. Where possible redesign existing barriers to allow emergency vehicle access.
5. Seek ways to improve neighborhood livability through bicycle boulevard designs.
6. Incorporate pedestrian safety elements near schools, parks, other public meeting places and other major pedestrian crossings.
7. Develop cost effective strategies for bicycle boulevards.
8. After changes are made to boulevards, continue to evaluate the bicycle boulevards to make sure they are functioning as designed and make changes as necessary.

## SELECTION OF STREETS FOR BICYCLE BOULEVARDS

The 1999 Bicycle Plan identified Berkeley's seven bicycle boulevards. The following criteria were used to the select the roadways that make up the seven bicycle boulevards:

- Local street or low-volume collector.
- Not a transit or truck route.

- Very little commercial frontage.
- Within ¼ mile of a major street or a high-traffic collector street.
- Spaced between ¾ and 1½ miles from another Bicycle Boulevard, (approximately the traditional spacing of major streets).
- Reasonably continuous; (i.e., it extends over half of the cross-section of the City.)
- Few jogs with main segments at least 0.5 mile long.
- Traffic signals at major intersections, or traffic signals are potentially feasible.
- Access to major destinations.
- Connections to routes in neighboring cities.

## BENEFITS OF BICYCLE BOULEVARDS

A bicycle boulevard provides benefits not only to bicyclists, but also to pedestrians and to the boulevard residents. Some of these are the general benefits of traffic calming, but others are unique to bicycle boulevards.

### Benefits to Bicyclists

**Safety -** Bicycle boulevards improve the safety of bicyclists in the following ways:

- The low volume of traffic, compared to a collector or arterial, reduces the potential for conflicts between motorists and bicyclists. These conflicts arise from autos passing bicycles, autos turning in and out of driveways, and autos turning at intersections. These turns are a major cause of bicycle-motor vehicle collisions.
- Traffic controls that give right-of-way to the bicycle boulevard reduce the potential for conflicts with traffic entering or crossing the bicycle boulevard from side streets.
- Bicyclists can cross collectors and arterials more safely at four-way stop signs or signals than at gaps in traffic at uncontrolled crossings.
- Slower traffic, compared to a collector or arterial, makes it easier for both motorists and bicyclists to avoid collisions, and reduces their severity if they occur.

The changes in vehicle volume and speed associated with various types of traffic calming devices are discussed in Chapter 5.

These factors would be expected to reduce the frequency and severity of bicycle-motor vehicle collisions along the bicycle boulevard. Since collisions are typically infrequent on streets suitable for bicycle boulevards, this expectation is hard to verify empirically. On the original two-mile Bryant Street Bicycle Boulevard in Palo Alto, two bicycle-motor vehicle accidents were reported in 1981. While

only one such accident was reported during the demonstration period in 1982, the number of bicyclists was much higher (see Tables 1-1 and 1-2 below).

**Efficiency -** Bicycle boulevards also improve efficiency for bicyclists:

- The route is more continuous and direct than most local streets.
- They have fewer stops or delays than local streets, improving travel time and reducing fatigue. By reducing the number of STOP signs on a street, travel time is reduced dramatically. A typical bicycle trip of 30 minutes is increased by 33% to 40 minutes if there is a STOP sign at every block. Travel time is particularly important to bicycle commuters.
- This extra time also takes a significant amount of extra energy on the part of the bicyclist.
- Reducing fatigue increases the feasible length of a trip by bicycle, and may be especially important to bicyclists who are hauling trailers carrying children or groceries.
- Traffic controls can reduce delay when crossing collectors and arterials.

**Other Benefits -** Bicycle boulevards may also provide other intangible benefits to bicyclists, such as the following:

- A perceived improvement in safety (independent of actual improvements).
- A quieter, less stressful bicycling environment that is especially attractive to children and casual or inexperienced cyclists.
- Greater alertness to bicyclists on the part of motorists.
- Experience riding on the roadway, as opposed to bike paths or the sidewalk.
- Greater visibility for and promotion of bicycles as an alternative means of transportation.

All of these benefits together should lead to an increase in the number of bicyclists using the bicycle boulevard. Table 1-1 shows 12-hour bicycle counts (7 a.m. to 7 p.m. on midweek days) along Bryant Street in Palo Alto before (May 1981 and April 1982) and after (October 1982) the bicycle boulevard was installed.

**Table 1-1**
**BICYCLE COUNTS ON BRYANT STREET BEFORE AND AFTER BICYCLE BOULEVARD INSTALLED**

| Location Along Bryant Street | Before* | After* |
|---|---|---|
| Churchill | 240 | 473 |
| Lowell | — | 725 |
| California | 290 | 536 |
| Matadero Creek Bridge | 360 | 546 |

*Number of bicycles traveling through intersection between 7 AM and 7 PM, midweek.

These increases were significantly greater than those on other Palo Alto city streets during the study period. At the same time, bicycle traffic on two parallel arterials, Middlefield and Alma, declined. It appears that total bicycle traffic remained approximately the same, but bicyclists prefer to ride on Bryant Street.

Table 1-2 shows increased usage for the bicycle boulevard extension implemented in 1992.

**Table 1-2**
**BICYCLE COUNTS ON BRYANT STREET BICYCLE BOULEVARD EXTENSION**

| Location Along Bryant Street | Before* | After* |
|---|---|---|
| Embarcadero | 285 | 455 |
| Between Everett and Hawthorne | 160 | 210 |
| *Number of bicycles traveling through intersection between 7 AM and 7 PM, midweek. | | |

In Berkeley, as reported in a 1990 study, afternoon peak hour bicycle traffic increased from 52 to 113 and from 73 to 109 on two blocks of Milvia Street before and after traffic calming through neckdowns, chicanes, and speed humps.

**Table 1-3**
**BICYCLE COUNTS ON MILVIA SLOW STREET**

| Location Along Milvia Street | Before* | After* |
|---|---|---|
| Between | 52 | 113 |
| Between | 73 | 109 |
| *Number of bicycles traveling on Milvia Street in the afternoon peak hour. | | |

## Benefits to Pedestrians

The following pedestrian benefits of bicycle boulevards stem from the reduction in motor vehicle traffic:

- A quieter, more pleasant environment for walking or sitting.
- Easier street crossings because of reduced vehicle volume and speed, or reduction of crossing distance.
- Safer crossing of major streets where new traffic control devices are installed.
- Reduction in the frequency and severity of vehicle-pedestrian collisions.

These benefits have special value near schools.

After the creation of the Milvia "slow street," afternoon peak hour pedestrian traffic increased from 63 to 93 and from 42 to 95 on two blocks of Milvia Street.

## Benefits to the Neighborhood

Residents along a bicycle boulevard street also enjoy the benefits of traffic calming, as well as the ambiance of the bicycle boulevard:

- Reduced through traffic.
- Safer, quieter, and more pleasant environment.
- Possible reduction in crime based on more active street life.
- Potential to enhance neighborhood appearance and to increase green space through expanded or new landscape strips, medians, and traffic circles.
- Improved neighborhood identity and coherence.
- Potential to increase property values through improved safety and livability.

Since one of the major actions that could be taken to improve the current streets for bicycle travel is to remove unnecessary or unwarranted STOP signs, it should be noted that the use of excessive STOP signs on neighborhood streets has disadvantages for the neighborhood as well. Many of these STOP signs are considered "unwarranted" in traffic engineering parlance because they were installed for traffic calming reasons, such as speeding or cut-through traffic rather than to assign right-of-way to conflicting traffic movements. However the use of STOP signs as traffic calming devices has the following disadvantages:

1. More likely to be ignored; increased non-compliance results in increased accidents; Liability issues for accidents at unwarranted STOP signs;
2. Increased air pollution;
3. Increased noise from acceleration and deceleration;
4. Increased fuel consumption;
5. Not effective at slowing traffic mid-block, in fact may cause speeding mid-block to make up for lost time.