Fifty Years of Bicycle Policy in Davis, California

Ted Buehler and Susan Handy

Davis, California, has long been known as the bicycle capital of the United States. It was in the 1960s, citizens lobbied for bike lanes to make bike travel safer. After 2 years of lobbying and 1 year of engineering, Davis created the first bike lanes in postwar America. After 1967, transportation in Davis was oriented toward the bicycle. The city’s Public Works Department staff developed many innovative designs and programs that were fine-tuned in Davis and then exported elsewhere. The university and city worked together on engineering, education, enforcement, and encouragement efforts. In the 1980s, greenways were added to the system. Davis now has 50 mi of bike lanes and 50 mi of off-street paths in a 10-square-mi city, making a highly functional bicycle transportation system. However, bicycling levels have decreased since 1990, falling from 28% of work trips in 1980 to 14% in 2000. City and University of California, Davis, staff attribute this to changing demographics, intercity commuting, and increased transit. In addition, during this time, bicycle programs have contracted and infrastructure expansion has slowed. Application of theories of public policy change suggest that the advocacy efforts in the 1960s led to a policy shift emphasizing bicycling that continued through the mid-1990s, when most programs had dwindled or disappeared. In the future, a resurgence in advocacy might reverse the deterioration of bicycle programs and result in increased bicycle use by Davis residents.

Davis, California, has long been recognized as the bicycle capital of the United States. The city’s logo is a highwheeler bicycle, and there is a long history of support for bicycle facilities from city council, staff, and University of California, Davis, officials. Since the early 1960s, it has boasted the highest bicycle per capita ratio, the highest bike-to-work commute mode share, and the highest proportion of bike lanes on city streets in the United States (1, 2). Its most recent recognition was in 2005 when it became the only city to receive the League of American Bicyclists “Platinum City” rating, confirming once again that Davis is the best bicycling city in the United States. Today Davis has 50 mi of bike lanes (on 95% of arterial streets) and 50 mi of Class I bike paths, all in a city of 10 mi².

Davis is more than just the best city in the United States for bicycling. It is, rather, the only city in the United States that has been designed for bicyclists from the ground up—a veritable “bicycling paradise,” at least by U.S. standards. In Davis, ordinary Americans can and will ride a bike for their daily travel needs. Bicycling in Davis has few barriers—physical or psychological—and requires a minimal skill level. Anecdotal stories are common about adults of all ages who hadn’t ridden a bike since childhood until they moved to Davis. By contrast, other U.S. bicycle-oriented cities have populations of deliberate bicyclists—people who achieve a modest level of skill, ride well-maintained bikes, and often wear helmets. Davis is more like Amsterdam, where typical bicyclists ride single-speed bikes with baskets, wear street clothes, and shun helmets.

While Davis’s achievements in bicycle culture have long been recognized, the sequence of events that created the unique circumstances has not been thoroughly investigated. Recognition is usually given to such factors as Davis’s status as a university town, and its “ideal” geography, and to the role of citizen activists in the 1960s in inventing and implementing the modern bike lane. The importance of civic support and continued infrastructure expansion in later years is also noted. But these accounts fail to explain why similar cities, such as Tucson, Arizona, Chico, California, or Eugene, Oregon, have never achieved the same intensity of bicycle use and culture. Why is Davis the only American city to have achieved such a high level of bicycle use? What were the unique events that triggered this condition, and how did they perpetuate themselves?

These questions are fascinating from a historical perspective, but they also have current relevance. First, climate change and high fuel prices are increasing the value of bicycle transportation, and if the successes enjoyed in Davis were better understood it would be easier to replicate them elsewhere. Second, Davis has experienced a marked decrease in bicycle use since the mid-1990s, and understanding the initial emergence of intense bicycle culture can cast light on elements that may have been lost in subsequent decades and could help policymakers reverse this trend.

RESEARCH METHODS

Research was conducted through a series of interviews with city and university staff and members of the community. The 27 individuals interviewed referred the authors to about 100 documents, including plans, reports, and meeting minutes. Local newspapers were reviewed on microfilm for the years of rapid policy change.

From the material gathered, a general historical overview of events was identified from the mid-1950s to the present. After the order in which events occurred was determined, the development of policy was interpreted by using two different frameworks. First, the advocacy coalition framework describes how groups of actors, on the basis of common beliefs and personal connections, can effect changes in policy. Coalitions are necessary because of the technical information required, the long incubation period, and the distribution of power and knowledge across groups (3). The multiple streams theory describes a sequence of events required to change policy. Change requires the confluence of a problem, a policy solution, and political will, all of which can be shaped by a policy entrepreneur into open-
ing a temporal policy window. Once the window is open, major policy change can occur, and the window can be maintained as long as there is political reward for developing and testing new policies. After the policy window closes, policy tends to remain static for a long period of time (4).

HISTORICAL OVERVIEW

The 1964–1973 time period is commonly termed by Davis residents as the period “when everything happened,” framed by the time periods “before everything happened” and “after everything happened.” This division of time is only a slight oversimplification and is useful in understanding the policy changes through the multiple streams theory.

Pre-1964: “Before Everything Happened”

Davis has always been a bicycle-friendly city. In 1950, it had excellent circumstances for the development of a bicycle culture. It was a small town, home to the University of California’s agricultural research campus. The climate was mild, with occasional freezes in the winter and dry summers. It is topographically flat. The downtown was compact and located immediately adjacent to the university core. Rail service to Sacramento and the San Francisco Bay area was excellent. While there are no unusual historical references to bicycles in the 1950s, many people report that the city was dominated by bicycles to a greater extent than neighboring cities.

In 1959, Davis’s future prospects changed when the University of California made Davis an autonomous campus and planned for an increase from 2,000 to 10,000 students within a decade. This growth presented the opportunity to shape the campus, and the newly named chancellor, Emil Mrak, was a supporter of bicycling. As a teen he loved to ride his bike around the Santa Clara valley, and as chancellor he directed his architects “to plan for a bicycle-riding, tree-lined campus” (5, 6). The first campus plan featured extensive bike paths looping through the proposed developments, passing under streets, and having exclusive parking areas outside each building (Figure 1). Core campus would be closed to cars. In acceptance letters to new students, Mrak instructed them to “bring a bicycle to campus so you can get to classes on time” on the sprawling campus (Donna Lott, unpublished data, July 2005). Under Mrak’s leadership, bicycle use became almost universal on campus and resulted in increased bicycling in the city.

City leaders took a less enthusiastic view of bicycles. Bicycles crowded the streets, and many riders had little regard for traffic laws. In May, 1963, the city police chief orchestrated a crackdown on bicyclists, and the city council passed a broad range of penalties to be administered to errant riders, such as “be deprived of a bicycle for a period not to exceed 30 days” or “copy 100 times the section of the bicycle ordinance violated.” At the same time, city planners had enthusiastically razed a section of downtown businesses to open the first parking lot (7).

The growing enthusiasm for bicycling on campus and among city residents contrasted with retrenchment in the city, and it created an opportunity to open a policy window in the city government as the streams of problem, policy proposal, and political will converged.


Growing automobile use in the 1960s had an adverse effect on bicycling conditions. Citizens such as maverick city councilor Kathleen Green, who won pro-bicycle language into the city’s first general plan in 1958, had made small steps in trying to control the impact of cars. But it wasn’t until 1963, when Davis residents Frank and Eve Child returned from a sabbatical in the Netherlands, that the simmering discontent heated to a boil.

Identifying the Problem and Winning Political Support

Frank Child was a professor of economics, and his family of six enjoyed riding bicycles in The Hague in the Netherlands so much that when they returned to Davis, they sold their second car. Davis had many bicyclists, but the streets provided no guidance for the interaction of bikes and cars. Conflicts were common, and bicyclists were literally being run off the city’s streets by increased driving. For Frank and his wife Eve, it made perfect sense that Davis could simply reconfigure their streets and reduce or eliminate the conflicts between bikes and cars (Frank and Eve Child, unpublished data, January 2007). When initial efforts got them nowhere, they penned a letter to the newspaper, proposing separate lanes for bikes, inviting supporters to meet at their house, and concluding “where there is no vision, the people perish” (8, p.45).

The Childs and others formed the Citizens’ Bicycle Study Group and began quietly meeting with city officials. Their proposal was politely turned down by the city’s planners, engineers, police, and council itself. The city engineer assured them that since most bicycle accidents occurred at intersections, lanes wouldn’t solve safety problems. The police chief didn’t think it would be enforceable (Donna Lott, unpublished data).

Unperturbed, in the fall of 1964 the group began circulating a petition for bike lanes, citing the health and economic benefits of bicycling, the growing hazards of bicycling, and the self-reinforcing traffic problem. They petitioned the city council to provide bike lanes on all arterial streets and to take action before city growth “made such action prohibitively expensive” (7, p.1). This well-reasoned, well-articulated argument received wide public support. Frank Child routinely appeared at council meetings and reported how many citizens had signed. After some discussion, the council considered the matter, voted to study bike lanes on neighborhood streets to elementary

![FIGURE 1](https://example.com/figure1.jpg)  On campus, nearly everyone bicycled in 1966 (Ansel Adams, Fiat Lux Collection).
schools, and formed a study committee with representatives from everyone except the Citizen’s Bicycle Study Group (7).

As another year went by, the number of signatories grew to 2,000, and city council elections were coming up. By this time, the Childs were known as representatives of the large bicyclist population, and Child was courted by and endorsed several candidates who made bike lanes a campaign issue. One even put cardboard discs in his supporters’ bike wheels proclaiming “Maynard Skinner for Council!” (Maynard Skinner, unpublished data, January 2007). Bike lane supporters won a landslide victory. Now, with a problem, a proposed policy, and political will, a policy window was opened. Within a few months, the council voted to instruct Public Works staff to create bike lanes on city arterial streets.

Implementing a Policy

Now that the problem was identified and political will assembled, the policy needed to be refined and proven. The advocacy coalition expanded from its citizen base to include elected officials and city staff. The engineers, planners, and police officers all quickly changed their approach to dealing with the bicycle study group, and everyone met and discussed their visions and concerns. They then set out to develop geometric standards for striping bike lanes on the streets of Davis (8).

Another challenge was changing the state street and highway legislation to accept bicycle lanes as legal elements of California roadways. Fortunately, city councilor Norm Woodbury was a professional lobbyist at the state capitol in Sacramento and was able to steer city staff to the right contacts to get a bill through the Assembly and signed by Governor Reagan (Maynard Skinner, unpublished data).

In the fall of 1967 the plans were ready, the state laws were changed, and Davis striped bike lanes on several city streets. The bike lanes were an instant success. Bicyclists liked having a designated spot on the roads, and motorists liked having bicyclists out of the way. The momentum began with Chancellor Mrak in 1961 and continued with the Childs in 1964, resulting in the creation of the first bike lanes in the United States.

Experimentation in Policy Application

City staff were under pressure to create bike lanes with few precedents. Everyone had different ideas about how bikes should be accommodated. Frank Child preferred the Amsterdam model, with bikes on paths behind curbs or parked cars (Figure 2). City staff thought bikes would be best ridden in the street next to the moving traffic. Fortunately, city staff had adequate support from the council to experiment with different lane and path configurations, including

- A bike lane between the moving traffic and parked cars;
- A bike lane between the parked cars and the curb;
- A bike path behind the parked cars and the curb;
- A two-way bike lane on one side of the street, behind concrete buttons; and
- A reverse-flow bike lane on a one-way street (Bob Sommer, unpublished data).

Eventually all lanes were converted to the now-familiar configuration of the bike lane between the moving cars and parked cars (Figure 3), but this example is illustrative of the type of experimentation that was done to see how different configurations worked. “The city was our laboratory,” Bob Sommer, a professor of psychology at Cal-Davis, observed, and it is likely that the eventual success of bike lane design benefited by open experimentation. Had one mindset ruled the process, the lanes might have been only a partial success, and Davis bicycle use might never have reached the famously high levels it enjoyed in the 1970s.

Other city and university programs also blossomed during this time. Students opened a Bike Barn on campus where bicyclists had access to tools, instruction, and emotional support when repairing their bikes. The university closed the core campus to cars in 1967 and soon invented bicycle roundabouts to channel gridlocked bicycle flow during peak periods. Several greenbelts were constructed—linear parks with class 1 bikeways and grade-separated intersections.
The subdivision code required bike lanes on all new streets. The police department had extensive education programs, including a talking bicycle named Mr. Smartspokes that would visit schools.

Policy Maturation

By the early 1970s, the policies that governed the city had been set, bike lane configuration had been standardized, and new policies were in place. Yet public support was so broad that innovation and invention continued for several more years, until it seemed there wasn’t anything left to try. Bob Sommer, Dale Lott (a professor of conservation biology), and researcher Donna Lott conducted surveys on bicycle use, such as the effect of opening new bike lanes through a “road diet”—reconfiguring a four-lane street into three lanes plus bike lanes—and on the development of the bicycle left-turn lane. Civil engineering professor Mel Ramey led a team to determine the appropriate widths and standards for bicycle facilities. Public works officials Dave Pelz and Duane Copley were routinely invited to give presentations on the latest practices invented in Davis. Meanwhile, the bike lane design standards established by Davis were adopted as part of the state highway code and in 1974 by the Federal Highway Administration (Mel Ramey, unpublished data, September 2006).

In 1971, the engineering consultant firm DeLeuw Cather was commissioned to write a bicycle circulation and safety study that identified all the current best practices and charted a course for the city and campus for many years to come (9). This document symbolized the end of local, passionate, organic research and represented an end point to the policy innovation. Local research and inventions slowed down after this point not so much because of a lack of support or interest, but because facility designs were fine-tuned to a high level of function and researchers had answered all of their questions.

Also at this time, civic attention had spread to other progressive issues. In 1964 the environmental movement was in its infancy, but by the early 1970s, it was in full bloom, and Davis had transferred its small and flat enough that people didn’t need bikes fancy enough to be stolen, and navigation wasn’t difficult enough to warrant signage. As the town grew into a small city, this attitude may have been responsible for the lack of subsequent innovation.

Although citizen’s advocacy groups emerged in many cities across the state in the 1990s, they had been absent in Davis since the late 1960s. The role of upholding good design was held by the city’s Public Works Department. In the late 1990s, the three senior engineers, all regular bicyclists who had run the program since the mid-1960s, quietly retired.

While the city’s and university’s commitment to ensure high-quality bicycling as the city grew continued, officials evidently failed to foresee the full range of improvements necessary for a city of 60,000 residents. As Davis grew in size and area, distances grew longer and motorized traffic became denser, and the quality of the core Davis bike system saw little improvement to compensate for these changes.


In 1974, Davis’ unique transportation system was firmly entrenched. Bicycle advocates from around the country made pilgrimages to Davis to marvel at the sight of a modern American city teeming with bicycles.

In the ensuing years, Davis grew from 20,000 residents to 40,000 residents, with the bicycle infrastructure and bicycle use growing proportionally. Relatively few changes occurred during this time as the early pioneering efforts had proven so successful that the bicycle programs were almost on autopilot. All city codes required bicycle facilities, and the team of engineers at the city’s Public Works Department was able to ensure that codes were followed and made appropriate modifications in unique circumstances. Because bicycling programs were institutionalized throughout city and university governments, there was no longer the need for advocacy coalitions to advance innovative policy.

The Davis Greenway

The greenway network is one important element of modern Davis infrastructure that appeared during this time. In the early 1970s some neighborhood greenways had been built that connected schools, neighborhoods and parks. In 1988, University of California, Davis, professor Mark Francis and a coalition of students and colleagues developed a plan for a greenway system—a multiuse trail that would loop around the city, with spokes radiating into downtown and out into the country. After being rebuffed by engineers, planners, and the city’s general plan update committee, Francis established an advocacy coalition with city councilors and the university chancellor, and eventually the concept was added to the general plan (11).

Francis’s timing was excellent, as Davis was on the cusp of a building boom that would see most of the undeveloped land in the city built out over the following 10 years. The greenway, complete with lawns, playgrounds, picnic areas, water retention ponds, and grade separations at most streets, is now complete around 80% of the city’s perimeter, with a green-street connection bridging the gap.

Innovation Elsewhere

Elsewhere in the United States, however, bicycle infrastructure design was still evolving. Bike routes acquired names or numbers to improve navigation. Residential yard waste was collected in containers, rather than dumped in and collected from bike lanes. Bike parking standards were established to ensure riders all had access to secure racks. Multiuse paths adjacent to streets were discouraged and phased out. Engineering standards for lane surface quality, traction, and markings were developed. The California Highway Design Manual called for multiuse paths with clear zones, long sight distances, and painted markings around bollards.

Davis was slow to adopt designs invented elsewhere. In the early 2000s, bicyclists still had to dodge piles of yard waste in bike lanes, the city built an entire subdivision with street-side class 1 bikeways, and over 5,000 campus bicyclists lacked secure bike parking. Not a single multiuse path had been built with state-required clear zones or bollard markings.

Early on, it was reasoned that these innovations were not needed for Davis. Davis had a high enough number of bicyclists and light car traffic that bike lane blockage was not an issue, and drivers knew to check for traffic on bike paths before making left turns. The town was small and flat enough that people didn’t need bikes fancy enough to be stolen, and navigation wasn’t difficult enough to warrant signage. As the town grew into a small city, this attitude may have been responsible for the lack of subsequent innovation.

Early 2000s: Bicycling in Flux

In the 1990s, many Davis residents noted that bicycling was falling out of favor, and there seemed to be many more people driving than in the past. Critics didn’t have any hard data to express their alarm or dismay, as the city has never counted bicycles or mode share, and the campus only conducted surveys every 10 years. The 1980
U.S. Census measured bicycling to work but did not explicitly publish results for small cities. It wasn’t until the 2000 census became available and was compared with the 1990 data that anecdotal observations were quantified and confirmed as precipitous. Bicycle commute mode share dropped from 22% in 1990 to 14% in 2000 (12, see Figure 4) [The 1980 mode share shown in the figure is interpolated from Davis- and Sacramento-area census data (13)]. Figure 5 compares mode share to work for 1980 through 2000 in the cities of Davis; Eugene, Oregon; and Boulder, Colorado (12, 13).

Quiet chatter began over the decline in bicycling. In a May, 2003 exchange in the Davis Enterprise, emeritus professor Bob Sommer penned an op-ed piece titled “Where Have All the Cyclists Gone?” The “masses of cyclists are gone from the intersections and from campus,” Sommer wrote. “I feel like a bird who has lost his flock.” Campus bicycle coordinator David Takemoto-Weerts responded with eight reasons why bicycling was declining, including the fareless transit program adopted in 1992, increased affluence among students, the retirement of Public Works Department staff, and increased intercity commuting of workers and students (7, Figure 6).

Curiously, there is no evidence that Davis’s leaders were particularly disturbed by the decline, nor were resources allocated to learn why people were bicycling less or to provide incentives to bicycle more. No planning documents since 1991 at the city or campus level indicate an effort to change the mode share. Instead, the campus and city combined spent over $60 million on new parking garages between 1991 and 2005, but no funds were allocated to replace obsolete bicycle parking.

Nor was there chatter about how internal factors might be responsible for the decline in bicycling—factors that are controlled at a city level. Our research revealed many internal factors that could be responsible for the decline. These are programs that early bicycling supporters cited as being pivotal to the success of the Davis bicycling movement in the 1970s, but that had quietly disappeared by 2000. These included

- Subsidized helmet programs,
- Elementary school education programs,
- Incoming university student orientation programs,
- U-fix services at the Bike Barn,
- Removal of abandoned bicycles from racks,
- Strict enforcement of traffic laws, and
- High minimum standards for new bicycle infrastructure.

When current staff were asked about these programs individually, the response was that they had become too difficult to manage, too costly, or they weren’t really all that important anyway. In many ways Mr. Smartspokes, the talking bicycle, had retired, and nobody saw fit to find a replacement.

**BICYCLING AND THEORIES OF POLICY CHANGE**

Development of Davis’s bicycle policy is a classic case study in the effectiveness of advocacy coalitions and use of the multiple streams theory. Both the rise and decline of bicycling can be described through these frameworks. Davis’s past, interpreted through policy change theory, can be used to predict the future of bicycling in Davis.

**Understanding the Past**

In the 1960s, the Childs and others formed an advocacy coalition, a group of people with similar values and goals, and they networked with members of the community until they had assembled enough power to affect political change. The first major achievement was to assemble enough political power in town to change the priorities of city council and city staff. Of the three streams required for policy change, they now had the problem and the political will and needed only to develop a functional policy to open the policy window.

Building bike lanes was a challenge on many levels. The advocacy coalition had to expand to include a larger constituency, and it was able to make this transition smoothly. Now, as a unified front of elected officials, city staff, and citizens they developed reasonable policy proposals for how bike lanes might work. Issues of width,
markings, enforcement, appropriate reasons for bikes to leave a bike lane or cars to enter a bike lane all had to be worked out.

They then had to advance to a higher political plain at the state level and generate enough attention for their cause to get it through the legislature. It required a strong local coalition and a plausible policy proposal to broaden their group to include assemblymen and state senators, and the expediency with which this occurred is testament to their power as advocates and to the sensible, transparent nature of the policy solution. Finally, with the problem, policy, and politics all assembled, the policy window was open, and the city’s Department of Public Works was able to transform the city by installing bike lanes.

In this case, the policy window stayed open for many years. Citizen response to the bike lanes and other infrastructure was highly favorable, and the engineering staff and others were able to leverage the political support into a whole range of infrastructure and support services. Similarly, the emergence of bicycle culture on campus with Chancellor Mrak in the early 1960s and the development of the Davis Greenway in the 1980s were examples of advocacy coalitions and the convergence of multiple streams to open policy windows.

This synergy of public will, public coalition building, political support, and engineering skills three times between 1960 and 1990 are likely responsible for making Davis not only the Bicycle Capital of the U.S., but also a bicycling paradise. Without the concentration of advocacy, the ability to develop policy solutions, and the willingness of leaders to support solutions, Davis would not have become this bicycling paradise. Had Mrak, Child, and Francis been recruited by Chico State University (in Davis’s sister city in the Sacramento Valley), Davis might have become known only as The Square Tomato Capital of the U.S.

Possible Futures for Davis

In 2005, Davis was in a similar position to Davis in 1963. Bicycling was declining, car use was increasing, and casual requests at city hall for improved facilities had not yielded any results. There was no organized coalition of bicycle advocates, just a few lone agents. Of the three streams, the problem was poorly defined, the political will was lacking, and the policy solutions were unknown or ambiguous. If these conditions were to continue, no policy windows would be opened, no policy change would occur, and bicycling levels would continue to decline.

Conversely, if Davis were to address the decline in bicycling and create policy changes that would reverse the trend, it would require an organized coalition of advocates, a well-defined problem, political will, and effective policy proposals. The greatest problem in 2005 was, perhaps, the lack of policy proposals. Davis had been so entrenched in developing its own brand of bicycle infrastructure and programs and had for so long ignored successful programs developed elsewhere that a defeatist attitude became pervasive when bicycling declined. However, the fact that many of Davis’s once-launched bicycle programs and policies had fallen by the wayside, while other solutions had been developed elsewhere that could be cherry-picked to address problems in Davis, suggests that policy solutions do exist and that in concert with an advocacy coalition, political will, and a well-defined problem, the decline in bicycling can be reversed.

CONCLUSIONS

The Davis model of physically building a city for bicycles from the ground up has never been tried elsewhere in the United States. But at least two other American cities have become equally interesting case studies in policy development—Boulder, Colorado, and Portland, Oregon. Both of these cities had populations of bicycle advocates in the 1990s that opened policy windows around 2000, resulting in major improvements to bicycling. Now enthusiastic public works departments are retrofitting Portland and Boulder into very good bicycling environments. Portland now has many more bicycle commuters than Davis, and Boulder may have a higher bicycle commute mode share. In 10 years, these cities will certainly be lauded in the same way Davis was in the 1970s, having achieved what had never been done before and that few believed was possible. These other success stories suggest that bicycling levels can be dramatically increased in many American cities in the future. The combined experiences of Portland, Boulder, and Davis suggest that the requirements for high levels of bicycle use are not, as has often been cited in the Davis case, “ideal geography and a university town” but rather a strong advocacy coalition, clear identification of problems facing bicyclists, nourishment of political will, and development of policy solutions. With this as a basic requirement, Davis is well positioned to regain lost bicycle mode share, and many other cities around the country, regardless of geographical and other physical challenges, are candidates for comparable achievements in enabling large numbers of Americans to bicycle for their daily travel needs.

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REFERENCES