Fifty Years of Bicycle Policy in Davis, CA

UC Davis campus, 1966, Ansel Adams

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Chapter 1: Davis: Davis, the Bicycle Capital of America

Davis is a quiet university town in Northern California, 15 miles west of Sacramento and 75 miles northeast of San Francisco. The place known as "Davis" is comprised of a city with about 65,000 residents, and an adjacent campus of the University of California with about 10,000 residents and a daytime population of 40,000 people. Davis is a free-standing city in the midst of agricultural land, with no urban areas for 8 miles in any direction. Davis is one of hundreds of small cities in 500-mile long central valley. But it stands out by the fact that in Davis, "everyone bicycles."

Figure 1 Davis is located in Northern California

In fact, "bicycling" and "Davis" have been synonymous for as far back as anyone can remember. Old-timers will always remind people that before the "bicycle revolution" of the 1960s, everyone already rode a bike.

What this means, is that unlike other American cities, Davis is a place where ordinary people can and will ride bikes. Bicyclists are as common as birds, bicycling is a way of life, people are as comfortable on a bike as they are in their car or on their feet.

Origins of "Bicycle Capital" status

Davis, California is known as "The Bicycle Capital of America." Since the early 1960s, Davis has been known as the place with the highest concentration of bicycling in the United States. For decades, bicycle use in Davis was so high that it had no peers in North America. Davis is the only place where ordinary Americans can and will use bicycles for their daily travel needs.

While it is difficult to determine how dominant bicycling was before 1960, it is plain that from 1960 until the mid-1990s, descriptions of bicycling in Davis used strong superlatives without qualification.

In 1963, the campus's Long Range Development Plan stated "The Davis campus is characterized by the universal use of bicycles" (LRDP 1963). In 1964, bicycle advocates noted that "It is felt that Davis is unique among American cities since it already has 7280 registered bike riders, with more to come as the University of California at Davis population grows" (The Enterprise, Oct 6, 1966) In 1972, a bicycle study for Davis stated

> In speaking of Davis the word most commonly used is 'unique', perhaps the only accurate portrayal of the community as regards its most outstanding characteristic – the bicycle. 'Davis' and 'bicycle' are virtually synonymous. … In Davis, the bike is far more than a recreational toy of exercise vehicle. It is a vital element of the transportation system. (DeLeuw Cather, 1972)

In the 1990s, however, bicycle levels began declining in Davis, while car and transit trips increased. Little by little, the bicycle utopia created in the 1960s and 70s was eroded away. Even so, bicycling remains popular and nearly ubiquitous, even if it is no longer the dominant mode of transportation in the city.

By the 1990s, the use of superlatives had diminished. A 1998 summary of Davis's accomplishments and status continued the "bicycle capital" claim, but qualified other descriptions. "…a community with *perhaps* the most bikes per capita of any city in the U.S." (Takemoto-Weerts, 1998) and the 2005 "Platinum" award by the League of American Bicyclists asserts Davis's claims, but makes no superlative claims beyond level of staffing and number of bicycle committees (League of American Bicyclists, 2005).

In search of more precise superlatives

Extreme success can make evaluation of progress difficult. Satisfaction and success provide no inherent motivation to use resources to gauge your progress toward a goal. There are no peers by which you can compare your progress. To understand what Davis achieved, and what it may have lost to various degrees, we need more precise language.

The title "bicycle capital" appears to be used to differentiate Davis from all of the lesser bicycling cities. The title suggests that Davis is the place where people bicycle the most, or where bicycles reign supreme over other forms of transportation. But lack of precision inherent in the term is the term is restrictive to innovation, goals for improvement, and early awareness of decline. For instance, if bicycling is more common in Davis than elsewhere, if there are no contenders to the title there is no need to assess how prevalent bicycling is, how it might be further encouraged, or whether bicycle levels

are declining. Or, if bicycles reign supreme, there is no indication of how much supremacy must be lost before the title is no longer applicable.

The ambiguity in the title is manifest by the changes in bicycling in Davis from 1964 to 1974. In 1964, Davis was already secure in its title of "Bicycle Capital of America." But, it didn't have bike lanes, city government did not favor bicycling as transportation, and by many accounts bicycling was on the decline. Had bicycle advocates simply declared that Davis was already victorious and no more improvements were necessary, the impressive developments from 1964 to 1974 might never had occurred.

Similarly, bicycling levels clearly declined from 1995 to 2005, but Davis retains the title of "Bicycle Capital" because it is still the place where people bicycle the most, relative to other cities.

Figure 2 This column filler in The Enterprise demonstrates how bicycle travel was the norm, even for complex trips. (1966)

The term "bicycle capital" fails to recognize the important levels of bicycle activity and culture obtained by Davis in the 1960s, then partially lost by 2005. More than simply being the bicycle capital, Davis achieved the following conditions during the peak era of bicycle activity:

- Universal bicycle use: Davis was a place where ordinary

Americans could and would bicycle for all of their daily travel needs.

- Ubiquitous bicycles: Davis was a place where a very high percentage of the population traveled by bicycle at least occasionally.
- Possible use of bikes: Safe, comfortable bicycle routes connected nearly all points in the city.
- Availability of bicycle travel: Travel by bike required no special equipment, skills, attitudes or beliefs.
- Bicycling as the norm: Bicycling was the norm for personal travel.
- Induction of newcomers: Newcomers to Davis were likely to begin bicycling for their travel needs.

While Davis remains the undisputed "Bicycle Capital of America," it is clear that some of the above conditions have deteriorated substantially since the peak of bicycling in Davis. In other words, Davis was formerly a more ideal bicycling city than it is today.

This research is an attempt to 1) understand the magnitude of Davis's achievements in the 1960s and 70s, 2) understand how those achievements were reached, and 3) document and define the areas in which bicycle activity has since declined.

By identifying and quantifying levels of bicycle activity, the conditions that led to their rise and the conditions that led to their decline, we can 1) create a framework which other cities can use to replicate the achievements of Davis, and 2) provide perspective on past successes and current problems for Davis itself to increase bicycle activity.

Research questions

- What were the underlying factors that resulted in Davis, CA becoming "The Bicycle Capital of America? To what extent were they driven by external circumstances? Internal circumstances?
- What obstacles were overcome to make Davis "The Bicycle Capital?"
- Did the bicycling movement ever nearly "fail?"
- To what extent did Davis succeed in its efforts to become an "ideal" bicycling city? Are there areas where it fell short? If so, why?
- What has been the relative contribution of" "physical environment," "social environment," "self selection," and "advocacy" in the creation and decline of The Bicycle Capital?
- How did Davis compare with its peer cities before the bicycle revolution of the 1960s? How does it compare with its peer cities now?

Research methods

To assess these questions, have located and evaluated the following:

- Locate histories and stories of bicycle policy in Davis.
- Review historical newspaper and other articles from key periods in the city's history.
- Interview historical figures involved with Davis bicycle policy, asking them about their account of historical matters and assessment of current issues.

- Interview contemporary figures in Davis bicycle policy, learn of their attitudes, perceptions, and expectations of the future.
- Attend and participate in meetings involving current bicycle policy in Davis.

With this information, I have developed a comprehensive evaluation of the events leading to the development of bicycle policy in Davis, what the drivers were of that policy, and how and why the policies have changed over the ensuing years. I have also identified discrepancies between different leading interpretations of events. I have finished with an assessment of the current state of bicycling in Davis. I have also identified some key theories of policy development, and characterized the events in Davis history in the context of contemporary policy development theory. Finally, I have taken a cursory look at similar phenomena of successful development of bicycle infrastructure in cities elsewhere, and compared them to the current state of bicycling in Davis.

Chapter 2: Theories of policy development

In order to examine the development of policy, it is useful to have a rationale for how and why policies change. This gives us a framework with explanations, terminology and case studies which we can apply to the Davis experience, making it easier to discuss our history and enabling others to compare the events and situations here to those experienced elsewhere.

My discussion includes the following:

* Definition and characteristics of policymaking
* Unique attributes of urban planning as an element of policymaking
* Need for theories to explain the process of policymaking
- Four theories of how policy is developed
- The “stages” theory
- The “punctuated equilibrium” theory
- The “multiple streams” theory
- The “advocacy coalition” theory
* Application of theories to discussion of bicycling policy

Characteristics of policymaking

To keep society organized, efficient and equitable, governments set and implement policy. Once set, a policy will dictate how current and future decisions are made. Without policy, governance would be tedious for those governing, and unsatisfactory for those governed. Policies are set by the governing organization, and

implemented by the government over time and space, guaranteeing a uniform, predictable and generally satisfactory means of organizing the activities of citizens.

The establishment of policy is of importance to all those being governed. Consequently, the establishment of policy is of interest to many, and policy itself requires policies for its very formulation, so stakeholders can have a must have a predictable pattern by which they can participate or critique the policies that affect them.

Policies are developed, to one degree or another, in ***stages***. A typical set of stages includes:

* initiation of a policy development process,
* estimation of the social requirements of a policy,
* selection of one policy from the range available,
* implementation of the policy,
* evaluation of the effectiveness of the policy,
* modification of the policy, and, sometimes
* termination of the policy.

(adapted from DeLeon 1999)

This interpretation of the policy creation process is referred to as the ***stages framework*** or ***textbook approach.*** The stages framework is universally accepted as the basic understanding of "what" is occurring when policy is developed, though in actual practice steps can be skipped or taken out of order.

More complex facets of the policy formulation process are exposed when we study "how" policy is formulated, or "who" formulates policy, or "why" policy must be formulated.

Complications of policy development

Policy development is of importance to most members of a society. This alone makes it a complex and volatile process, and it is made complex by several additional factors, as outlined by political scientist Paul Sabatier in the introduction to his book *Theories of the policy process.* These include:

1) Many "actors" with different agendas are involved.

2) Development occurs over a long time span.

3) Multiple levels and jurisdictions of government are involved.

4) Technical disputes occur over the nature of the problem and probably impacts of solutions.

5) Disputes involve "deeply held values, large amounts of money and at some point authoritative coercion."

(adapted from Sabatier (2) 1999: 3-4)

Complications of planning-specific policy development

When policy affects the development of land, it falls into the realm of "urban planning," the process by which use and development of land is regulated to ensure a satisfactory built environment (adequate environmental services?) in the present and future. These include:

Policies for land use, land development, or "urban planning" must address the following additional qualities"

1) As land is immovable, changes made (positive or negative) cannot be readily transferred to another location.

2) Once initiated, changes made to land are difficult or impossible to withdraw or undo.

3) Land is valued highly for both monetary (exchange) and quality of life aspects.

4) As everyone lives in the physical environment, policies affecting its development directly affect all members of a society.

5) Human relationship to land is deep-seated in the psyche, predating culture, civilization and governance.

6) Changes to land must be done in a way that they meet both present and future requirements of inhabitants, and negotiated compromises favor present over future needs.

(adapted from Buehler 2000 (1): 24-34)

Additionally, policies relating to transportation systems involve the following complications:

1) Transportation systems occur in linear space, and all segments of the space must be intact for functionality.

2) Space in linear corridors has competing uses for motor vehicle, nonmotorized transportation, and buffers.

3) Access given to motorized modes has a negative effect on use of the corridor space by other modes.

Need for theories to explain process of policy development

The complex nature of the problems presented requires interpretation of the situation. As stated by Sabatier, "Given the staggering complexity of the policy process,

the analyst *must* find some way of simplifying the situation in order to have any chance of understanding it" (1999 (2): 4).

Sabatier presents two traditional methods, ad hoc, or science.

Ad hoc

Ad hoc policymaking is simply using whatever information is available through a person's own experiences, and making decisions as best as one can. While this may be effective in many instances, it is limited by the scope of one's experience. And, "since its assumptions and propositions remain largely unknown," it is difficult to be internally inconsistent and lack methods for error correction (Sabatier 1999 (2): 4-5)

Science

Science relies on the assumption that "a smaller set of critical relationships" underlies complex phenomena. The characteristics of science are:

1) the methods of analysis presented clearly so they can be understood and replicated,
2) the propositions are defined so as to be falsifiable,
3) the propositions are as general as possible and address uncertainties, and
4) the methods and concepts are subjected to scrutiny.

(adapted from Sabatier 1999 (2): 5)

Realistically, these are on a spectrum, with the "ad hoc" approach varying with the extent of one's experiences, and the "science" approach limited by information and comprehension. Though approaches to the study of policy are ideally based on science, human behavior is so variable that falsifiability and replicability are only possible to a limited extent.

Next, we'll examine three theories that explain how policy is developed. The development of bicycle policy in Davis contains elements that are well described by these theories. By familiarizing ourselves with the theories, we can have a simpler understanding of events in Davis history, and a better lexicon for prescribing policy for the future.

Three theories for analysis of "how" policy is shaped

Sabatier's 1999 book is a comparison of seven different theories of how policy is shaped. From those seven, I have selected three that seem most appropriate to the events that have occurred in Davis in the last 50 years.

Punctuated equilibrium theory

The punctuated equilibrium theory is an interpretation of the observed phenomenon of policies remaining static for long periods of time, then being completely revamped. Described by Baumgartner and Jones in 1991, it explains both the reasons underlying the stability and the reasons underlying change. They find that the American government structure has unique elements that favor a PE type of policy development.

A primary reason for the condition is the multiple layers of governance found in American government, and the ability of the American public to mobilize to create change.

The many layers of government make it difficult for any change to occur—jurisdictions are overlapping and ambiguous and power is held by various branches of government at the same level. These same features enable change to occur rapidly, because if momentum is gained in any one level of government or branch of jurisdiction,

the other levels are able to yield decisionmaking power and gain a revamped policy through little effort of their own.

When existing policies are inadequate, such as those protecting the environment or economic regulation, the populace can be mobilized fairly quickly and pressure government to change policy. But, lacking serious pressure, governmental authorities do not obtain significant managerial improvements of public recognition by making incremental changes in existing policies (True et al 1999).

Multiple streams framework—policy windows and policy entrepreneurs

Multiple streams theory describes what occurs in the "punctuation" point of policy development. It cites three elements of policy development, and when all three streams are simultaneously present, it creates a "policy window" in time where a "policy entrepreneur" can midwife the establishment of policy. Multiple streams theory was developed by Kingdon in 1985.

The three streams required to create a window are:

1) *Problems*—arising in the form of indicators, dramatic events, or feedback systems.

2) *Policies*—always arising from the "primeval soup" of policy.

3) *Politics*—triggered by "national mood," pressure, or administrative turnover

These three elements combined create the policy window, a brief period of time when it is relatively easy to implement new policy. The usual triggers for policy formulation can be from *politics*, when new politicians are in a position to apply their own philosophical solutions to existing problems, or from *problems*, where an event forces politicians to select an appropriate policy (Zhariadis 1999; Kingdon 1995).

Most interesting is the "policy entrepreneur," who can be from any position in the policy process. Kingdon describes them as "advocates who are willing to invest their resources—time, energy, reputation, money—to promote a position in return for anticipated future gain in the form of material, purposive, or solidarity benefits" (Kingdon: 179). They can come from anywhere—public, private, nonprofit, or unaffiliated, but they need to take the time to facilitate a melding of the three elements to "grease the pig" and enable a policy to quickly navigate the approval process, in the brief window of time when the usual barriers are removed.

Qualities found in a successful policy entrepreneur are

1) "The person has some claim to hearing."

2) "The person is known for his political connections or negotiating skill."

3) The person is persistent.

(Adapted from Kingdon: 180-181)

The presence of a policy entrepreneur is crucial for the development of policy—while some policies have entered the world on their own merits, Kingdon makes a strong argument that the entrepreneur is almost essential for ordinary issues to become policy. The skill of an entrepreneur is almost absolutely necessary, as windows can come and go fairly quickly, and unless the policy makes it through in short order, it will become waylaid and have a high likelihood of drying on the vine. Regarding the exceptional skills of "famous entrepreneurs," of one entrepreneur it was said "he could take the dog off the meat wagon" (181).

Advocacy coalition framework

The Advocacy coalition framework also describes circumstances in which punctuations can occur in the policy equilibria. Developed by Sabatier and Jenkins-Smith in 1988, it describes a system of coalitions that form among people with similar policy beliefs. A falsifiable theory, it predicts that coalitions' attempts to change policy will be determined by competition from other coalitions and/or events outside the policy development system. By assessing technical information, it can provide an unusually quantifiable assessment of the policy development process.

The Advocacy coalition framework is based on five basic premises:

1) Technical information about the facets, cause, and magnitude of a problem are useful in developing a theory for the policy process.

2) Understanding of technical information results in a long incubation period for policy.

3) The best unit of analysis is a "policy subsystem" rather than an organization or program.

4) Analysis should include groups of actors: *administrative agencies, legislative committees, interest groups, policy advocates** and *any government actors.**

5) All public policies and programs have implicit theories guiding their work.

(adapted from Sabatier 1999 (1): 118-119)

* denoted new actor group introduced in the ACF

The framework itself is a flowchart that theorizes that change occurs as stable parameters and external events are massaged by actors in a system to formulate policy (121). This is similar to the "policy entrepreneur" concept outlined by Kingdon, but

differs in that it is a coalition of actors with similar beliefs that brings the policy into existence. It also notes that the coalition can be made up of individuals from different positions—different levels of authority, different jobs, different groups, who are all working together.

Policy change and development, then, occurs in a predictable manner when a combination of external change and internal networking create a sufficiently strong coalition and/or viable policy.

Other necessary requirements to success are successful networking among coalition members (138), possessing the skills to influence policy (141) and the learning potential of members (145).

Applications to analysis of Davis bicycle policy

The development of Davis's unique bicycle policy, and successful implementation of policy and plans to maintain this policy over decades and growth can be analyzed in the context of these theories.

Davis bicycle policy was developed through an iterative process (the "textbook method") with a few variations. While later retelling of events may gloss over the less glamorous elements of the process, they all occurred, often requiring months or years to proceed with a single step to reach the end goal of bicycle infrastructure. The inherent complications of policy development were manifest in many instances. The inherent complications in planning were also dealt with, often in classic case studies for deftness and effectiveness seldom found in American urban planning.

Davis history can be described in terms of equillibria (pre-1964 and 1972–1999) and punctuation (1965-1972, possibly mid 00s?). The events that created the "bicycle

revolution" of 1966 are a natural "policy window." And several advocacy coalitions have been extant in Davis over the years, with different types of goals and different levels of success.

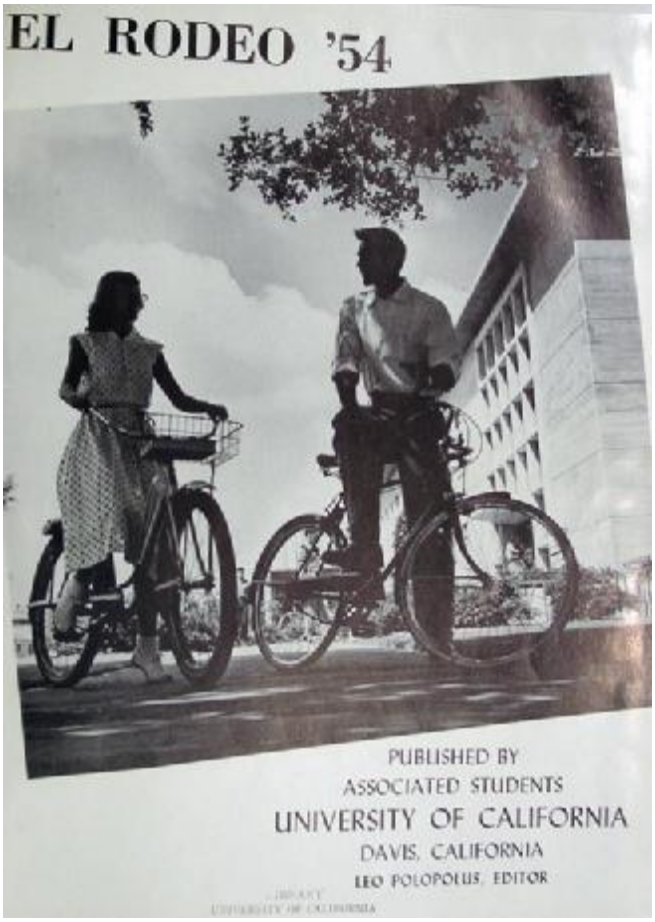


Figure 3 Yearbook frontspiece, 1954

Chapter 3. History of bicycle policy in Davis

Phase 1. Davis before 1960: few people, many cows, many bicycles

The history of Davis, California before it became a pioneered in bicycle transportation is fairly typical for a small US town, and a US university town. There are no distinctive features in its history that could have predicted its later role as "ground zero" in the development of bicycle infrastructure and use in the United States. There

are, however, a few features which are noteworthy in creating an environment that was fertile for such a development.

Davis before the university—1868-1906—typical small town

Davis's beginnings were like that of most small towns in the United States. The location of a railroad junction in an agricultural area resulted in the formation of a small town. The name Davisville was simply the surname of the original rancher who settled the area, but moved to Sacramento in 1868.

From inception in 1868 to 1906 it was a typical small town in the Central Valley of California. Issues facing Davis were similar to those facing all small towns—transients and crime, public services, agricultural problems, lack of local shopping, lack of economic development, etc. (Lofland 2004: 13-44).

Davis as the 'Farm Campus" 1906 - 1959

In 1906, a successful lobby by Yolo County investors and boosters resulted in Davisville being chosen for the University of California's "state farm". The selection criteria for the farm location included

a) availability of agricultural land,

b) availability of irrigation water,

c) proximity to a major rail line, and possibly

d) proximity to the State Capital in Sacramento. (Lofland 2004: 47-48).

The campus opened in 1907, and quickly became a reputable institution. In the early years many longstanding traditions, such as Picnic Day, were developed. The population of 1000 in 1906 grew to 2500 in 1945 and 6000 in 1959. The road network in

the area was gradually expanded, with the opening of the Yolo Causeway in 1914 and the Carquinez Strait Bridge in 1927, which put Davis on a major highway from Sacramento to the Bay Area. Highway 40 traffic was routed through town until 1942, when a bypass was built to the south of town. (Lofland 114).

According to the historical documents of the 1970s and memories of old residents, bicycles were known to be a regular feature of the campus and town at this time, but did not appear to have any particular prominence. (Takemoto-Weerts 2005; Pelz 2005). Representative photos from the Eastman's Originals Collection at UC Davis show a smattering of bicycles in downtown scenes, but not on the campus scenes (Special Collections, accessed 2006).

In his book *Davis: radical changes, deep constraints* Lofland has a "Bike troubles, early 1940s identifies a number of articles from the *Davis Enterprise* from 1940-43 that indicate a significant presence of bicycles. These include problems with bicycles on sidewalks, bicycles not obeying traffic laws, lack of headlights and reflectors, and hooking rides on cars. The articles do note, though, that there had been a "great increase" in their use, "particularly as a means of wartime transportation." (Lofland 2004: 120; Davis Enterprise, February 19, 1943).

Based on easily accessible historic resources, it appears that bicycling was a common means of transportation in Davis before 1959, but by no means universal. Bicycling levels may have been somewhat higher in Davis than in other comparable cities, but bicycling was still unremarkable and far from universal.

Figure 4 Chancellor Emil Mrak poses for Ansel Adams with his bikes and trees
University of California collection, 1966

Phase 2: 1959 – 1964 Chancellor Mrak shapes a "bicycle-riding" campus

I have asked our architects to plan for a bicycle-riding, tree-lined campus

Emil Mrak, 1961

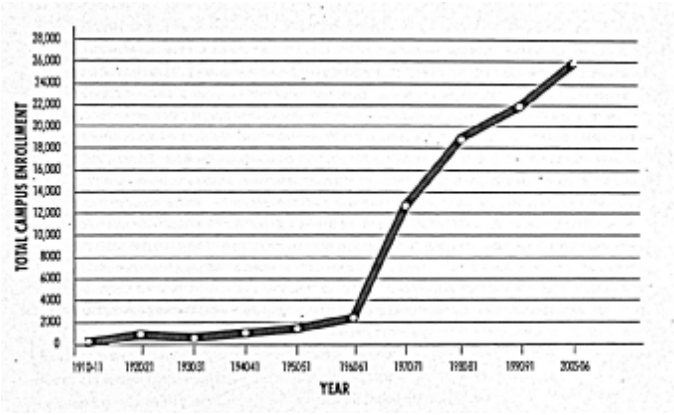


Figure 5 Campus enrollment, 1910 - 2006 (LRDP 1994)

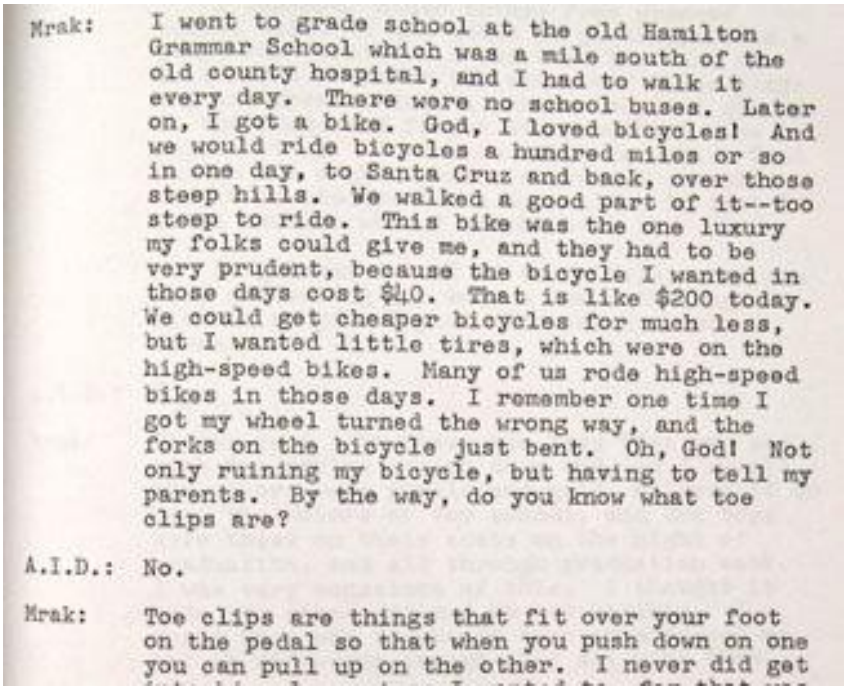
In 1959, the University of California changed the administrative status of the Davis campus. Instead of being the "farm" campus of the main UC campus at Berkeley, Davis became its own administrative university in the UC system, with plans to expand from 2000 students to 12,000 in 1970.

Part of this was to facilitate the rapid growth needed in the UC system to accommodate baby boomers, and part was recognition of the increased geographical importance of the Capitol region and the Central Valley.

UC Davis's first chancellor was Food Science professor Emil Mrak. Mrak was born in San Francisco in 1901, grew up in the Santa Clara valley, and received his BS, MS and PhD at UC Berkeley. He became the chair for the Berkeley's department of Food Science and Technology in 1948, and in 1951, Mrak and the department were all moved to Davis. While Mrak is widely recognized for his abilities as an agent of rapid campus expansion and his interaction with students (Abundant Harvest, 2001), he has never been credited for his role as in development of Davis's "bicycle capital" status.

Evidence suggests that Mrak played a key role in creating the UC Davis's bicycle infrastructure and prominent bicycle culture. While it is difficult to determine the extent to which Mrak shaped the bicycle environment, three elements suggest that he was a powerful driving force—he loved bicycling, he instructed his planners to create a bicycle-riding campus, and he encouraged incoming students to bring a bicycle to campus.

Mrak's love of bicycling



Mrak: I went to grade school at the old Hamilton Grammar School which was a mile south of the old county hospital, and I had to walk it every day. There were no school buses. Later on, I got a bike. God, I loved bicycles! And we would ride bicycles a hundred miles or so in one day, to Santa Cruz and back, over those steep hills. We walked a good part of it--too steep to ride. This bike was the one luxury my folks could give me, and they had to be very prudent, because the bicycle I wanted in those days cost $40. That is like $200 today. We could get cheaper bicycles for much less, but I wanted little tires, which were on the high-speed bikes. Many of us rode high-speed bikes in those days. I remember one time I got my wheel turned the wrong way, and the forks on the bicycle just bent. Oh, God! Not only ruining my bicycle, but having to tell my parents. By the way, do you know what toe clips are?

A.I.D.: No.

Mrak: Toe clips are things that fit over your foot on the pedal so that when you push down on one you can pull up on the other. I never did get

Figure 6 Mrak enthusiastically recounts his affection for bicycles--as a 73 year old man! (Mrak 1974, 24)

Emil Mrak grew up on a farm in the Santa Clara valley, a few miles from San Jose. While many more Americans rode bicycles in the 1910s, Mrak's love for bicycling was still strong sixty years later when he was interviewed for his 655 page oral history.

While bicycling is absent as a topic in most of the history, it dominates the sections on his youth. For about twenty pages he enthusiastically tells about many different experiences bicycling as a child and young adult, and the many aspects in which he loved bicycling. When he was a child of seven and received his first bicycle, he would go on long rides with his father at night. Later, he was able to get a narrow-tired bike and go on much longer rides, such as over the mountains to Santa Cruz and back (100-mile round trip).

As a teenager he rode the eight miles in to San Jose to shop for his Mother on Saturdays, and he rode nine miles to see girlfriends. He told about how bicycle racers in that era were like baseball heroes in the 1970s (Mrak 1973, 18-36).

UC Davis's first Long Range Development Plan

The newly-established UC Davis needed a development plan for anticipated growth. The 1963 Long Range Development Plan (LRDP) is a thirty-page document that outlines the type and location of expansion for the next 20 years. Promotion of bicycling is infused throughout the plan, from creation of bicycle thoroughfares, provision of large parking areas, and elimination of cars from the campus core.

The "circulation" section is prefaced with a 1961 quote from Mrak" I have asked out architects to plan for a bicycle-riding, tree-lined campus" (LRDP 14). As per Mrak's instructions, planning for an ideal bicycling campus was woven into the plan at every step. Most noteworthy are the wide, high-speed bike paths shown on all the future parts of campus, effortlessly wandering around buildings and crossing under major streets. They connect to the planned Third Street Parade through downtown, and link campus to the city, housing to the campus, the main campus and the medical campus, etc. The plan also called for high quality bicycle parking located near buildings, separation of pedestrian and bicycle facilities,

While the campus was already "characterized by the universal use of bicycles," Mrak's planners created a vision for important improvements for bicycles. The planners were unsatisfied with already having an excellent campus infrastructure, they strove to make it much better as they created a campus on the "blank slate" offered by the fields to the west.

Figure 7 Excerpts from the 1963 LRDP

PEDESTRIANS AND BICYCLES

"I have asked our architects to plan for a bicycle-riding, tree-lined campus."
(E. M. MRAK, October 19, 1961)

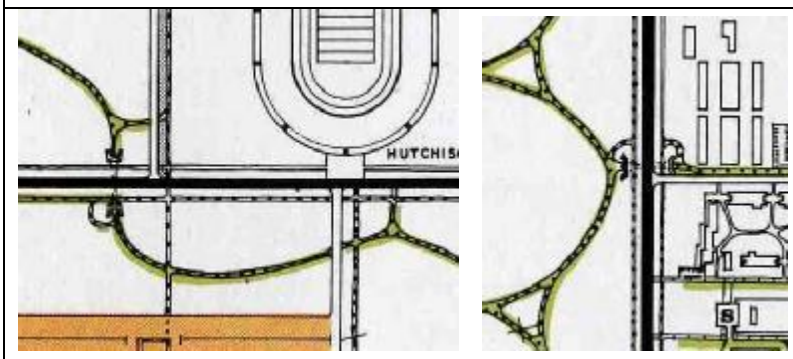
The Davis campus is characterized by universal use of bicycles. To avoid dangerous overcrowding, bicycle paths will be separated from those used by pedestrians. They will be designed to get people from one place to another easily and quickly, but with due consideration for the beauty of the campus. Specially designated bicycle parking lots will be screened from view and will be reasonably accessible to building entrances. Bicycles will be confined to their specified routes and parking areas, and will be prohibited along pedestrian walks and in areas of large pedestrian concentration.

The network of pedestrian paths and walkways will be separated from both bicycle and automobile circulation. There will be major malls and plazas for the uses of pedestrians — for circulation, for gatherings, and for the enjoyment of outdoor living on the campus. Tree-lined paths will include benches for rest and study between classes.

Mrak specifically directed planning for bikes.

Pedestrians and bicyclists will be provided with safe crossings at the boundary streets. In some locations pedestrian and bicycle grade separations will be necessary.

Not only were bikes separated from cars, but pedestrians were separated from bikes.



The plan called for high-speed bike paths separate from arterial streets.

The "Third Street Parade" fit well with the university's plans for separating bikes and cars.

Encouragement of incoming students to bicycle

Mrak was known for being directly involved with student activities, such as cheering on the fields at football games and negotiating with Vietnam war protestors for peaceful rallies. Mrak is known to have included an invitation to incoming students to bring a bicycle to campus, because buildings were well separated from each other, and it was the only way they could be sure to get to class on time (Lott, 2005). Unfortunately, the university did not keep such letters, so we are not able to see the exact wording and what other encouragement may have been included.

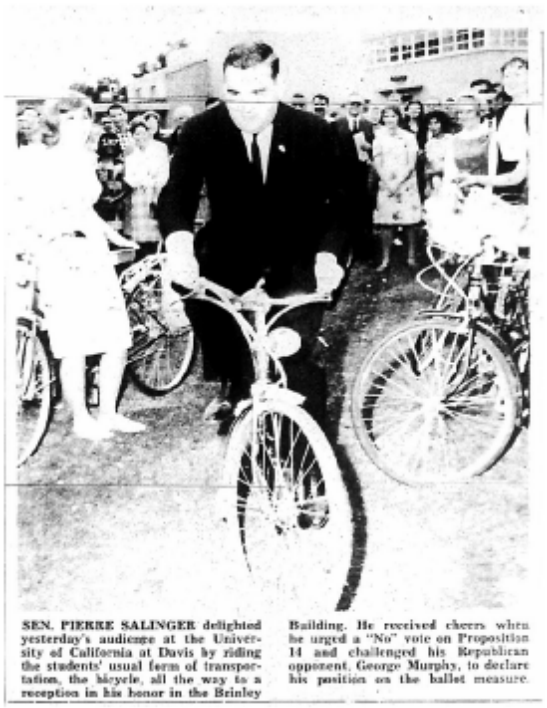
The letter is important because it ensured that all students knew it was normal and desirable to ride a bicycle on campus. This type of support matches the LRDP and other surviving evidence that Mrak had a direct interest in making an ideal campus for bicycling, and he used his power as chancellor to ensure that the infrastructure and culture were developed to the maximum extent possible.

Bicycling in 1964

As the campus grew, the city grew to accommodate new residents. It was predicted that by 1975, city population would rise to 75,000 residents (Davis General Plan 2001: 29).

Bicycling was prevalent in Davis before the innovative infrastructure was begun in the late 1960s. The 1952 General Plan favored bicycles, bicycles were the standard mode of transportation for students, Davis already had more bicycles per capita than any other city in the United States.

The 1952 Davis General Plan included fairly strong provisions for bicycles, having been compiled through a long public process, shepherded by League of Women Voters affiliate Katherine Greene. (Donna Lott 2005)



SEN. PIERRE SALINGER delighted yesterday's audience at the University of California at Davis by riding the students' usual form of transportation, the bicycle, all the way to a reception in his honor in the Brinley Building. He received cheers when he urged a "No" vote on Proposition 14 and challenged his Republican opponent, George Murphy, to declare his position on the ballot measure.

Figure 8 Bicycles were "the students' usual form of transportation" in 1964, when visiting US Senator Salinger rode from campus to downtown. (The Enterprise, Oct 24, 1964)

In November, 1964 US Senator Pierre Salinger visited the campus. The Enterprise story reports that "Senator delighted yesterday's audience at the University of California at Davis by riding the students' usual form of transportation, the bicycle, all the way to a reception in his honor in the Brinley Building (Enterprise Oct 8, 1964).

When the council agreed to "study bike problems" in 1964, the comment was made that "it was felt that Davis is unique among American cities since it already has 7280 registered bike riders…"(Enterprise Dec 15 1964)

And, when the bicycle group would write letters to other cities and ask them "what do you do with your bicycles?" the standard response (in addition to not having any bicycle provisions) was "*How* many bicycles did you say there were in Davis?!?" (Donna Lott 2005).

1964: bicycling threatened in the City of Davis

Local and national policies favored motorized transportation

At the same time, the US transportation system was orienting itself away from the traditional mix of walking, driving, bicycling and rail, and into an automobile-focused system. An improving economy and improvements in manufacturing efficiency enabled an increasing share of the US public to be able to own an automobile, and new land developments were oriented towards the car, making it difficult or impossible to meet daily transportation needs by non-car modes.

The combined effect of swift population growth and development of car-specific infrastructure had a two pronged-impact on the bucolic small-town bicycling conditions. First, the number of cars increased relative to the existing population, and second, new housing and services were built to be served by cars. The result was a dramatic loss of bicycleability in Davis. Increased traffic left less space on roads for bicycles.

This series of events, culminating in a rapid deterioration of bicycling conditions, set the stage for dissatisfaction among citizens and the need for change.


Davis Enterprise

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THE VOICE OF DAVIS — SINCE 1896 THURSDAY, SEPTEMBER 12, 196

ORIENTATION WEEK brings the first influx of fall students to the University of California here. Registration is shown above as one of the most time-consuming non-social activities. A small portion of the hundreds of student bicycles newly arrived in town is evident in the foreground.

Figure 9 Bicycles had become a prominent feature of the UC Davis landscape. Freeborn Hall, 1963 (The Enterprise, Sept 12)

How bad was it in 1964?

All accounts relate to a deterioration of bicycling conditions in the early 1960s, with friction developing between bicyclists, pedestrians and motorists. Higher auto traffic volumes made bicycling less safe on streets, and bicycles on sidewalks inconvenienced pedestrians. How much this was an actual change for the worse from earlier years is unknown, as there is no quantitative data. There are no traffic volume measurements (motorized or not) or accident reports (*??).*

The most oft-cited anecdotal evidence is an increase in bent front wheel repair orders in local bike shops due to motorists running bicyclists into the curb. Donna Lott reported that "the B&L Bike Shop was getting a certain number of pedals, the right pedal would have gotten crunched up against the curbside… …and they said people were beginning to think that bicycling was getting too dangerous—it was getting too big and too much traffic." While there is no hard evidence to back these claims, it is entirely plausible that an increase in motorized traffic with no formal provisions for bicycles would lead to increases in accidents.

Slightly more tangible evidence is a Davis Enterprise photo and article depicting two mothers with strollers being forced to the edge of the sidewalk by bicyclists. This suggests that while bicycles may have peacefully coexisted on sidewalks in small numbers, if a higher percentage of riders are on the sidewalks they could be having a detrimental effect on pedestrian use (Enterprise, Feb 20, 1964, as quoted in Lofland 131).

Not everyone noticed a decline in bicycling conditions. Rick Blunden, who later had a career in bicycle planning at CalTrans didn't report any dramatic changes in conditions during his undergraduate years from 1960 to 1965 (Blunden, 2006).

In any case, the growing town and increasing in vehicle traffic in the early 1960s certainly resulted in a deterioration of bicycling conditions. Whether the deterioration itself was the prime creator of the movement, or just a necessary factor, cannot be known. Certainly other cities also had a deterioration of conditions during this time, but lacked some of the other elements that led to formation of a movement.

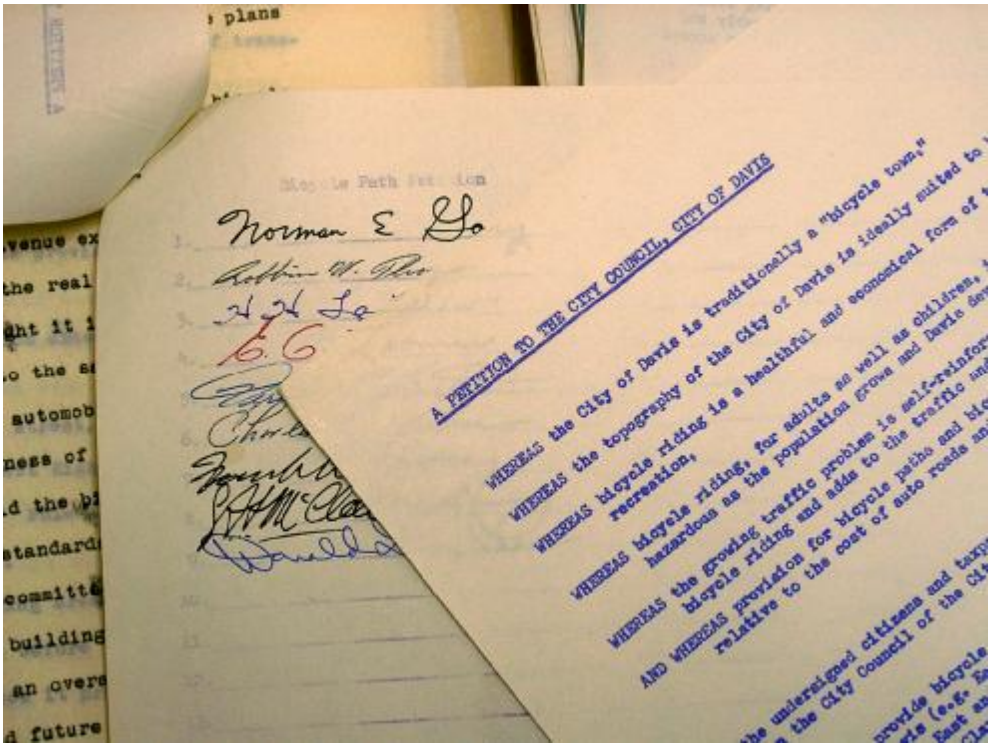


Figure 10 Copy of the petition presented to city council.

(Frank and Eve Child papers)

Phase 3: 1964 – 1966 Bicycle advocacy in the City of Davis

We were living in The Hague… The bike paths were large enough so that you could go both ways on them and you'd see not only children, but the elderly, too, using them.

Eve Child, 1976

The "bicycling movement" was created in Davis in just over two years—from a fall, 1964 letter to the editor to a fall, 1966 opening of several bike lanes in the city.

The popular accounting of this event is as follows:

1) Economics professor Frank Child, who has just returned from Holland, writes a letter to the Davis Enterprise suggesting that Davis, like Holland, is well suited to bicycle transportation. Childs bands together with four other citizens and creates the "Citizens' Bicycle Study Group," which is rebuffed by city council several times. After circulating a petition in support of bike lanes, council is still only mildly supportive and suggests a few routes on minor streets to enable safer access to elementary schools. Council's inaction sparks further interest from the public, and the election of a pro-bicycle council in spring, 1966. Council voted to study the bike lane issue, and after a year of study opened bike lanes on several city streets in fall, 1967.

This story is recounted, with only minor variations, by all of the original members of the Citizens' Bicycle Study Group, and it is retold in the same form by all subsequent generations of city and university staff. Frank Childs's and Dale Lott's account of the events of 1964-1967 are told in newspaper articles (Democrat, 1976, Enterprise 2003), and as part of this project we interviewed Bob Sommers and Donna Lott in 2005.

In some aspects, the "official" story seems almost too smooth to be credible—few revolutions occur without casualties, character failures, debilitating disagreements, replacement of the revolutionary vanguard by a managerial coup, and the minor failures caused by incorrect strategizing. Intuition would suggest that errors were made, opportunities lost through compromise, and historical inertia impossible to overcome.

But, further investigation suggests that the story is largely accurate, with only a few significant aberrations. The only major items about the rapid rise of a bicycle movement in Davis appear to be the level of cause and effect—what the major hurdles

were, why the movement was so successful that bicycle use Davis is still unparalleled in the US 40 years later.

Planting the vision for bicycling infrastructure

Frank and Eva Childs had spent four months in the summer of 1964 living in Holland. They traveled with their four children by bicycle wherever they needed to go. After living this bucolic lifestyle for the summer, they found Davis to be less satisfactory than before, but also more pregnant with potential. Childs wrote a letter to the editor of the Davis Enterprise in summer, 1964.

The Childs' letter is a case study in making an effective proposal. He starts off with describing the deterioration of conditions in the recent past, then outlines the problems of the present situation. These arguments against automobile dominance have been used by bicycle activists and planning reformers everywhere, but Child's comments have an elegant simplicity about them. Then he describes an alternative—the lifestyle enjoyed by himself and his family while living in Holland. Next, he proposes that Davis start painting bike lanes on city streets, to provide exclusive rights-of-way for bicyclists, and solve the problem currently vexing Davis citizens. Finally, he ends with a flourish—a call to action for the city—by stating "where there is no vision, the people perish." (Enterprise 1964)

The Davis "Citizens' Bicycle Safety Group"

After the letter (or a subsequent story) was placed in the newspaper, a small group of citizens began meeting as public interest group began meeting to devise ways to bring Child's proposal to fruition. When the story is told many years later, the Safety Group is

seen as a rousing success, a group that faced all difficulties and never succumbed to discouragement (Dale Lott 2003; Donna Lott 2005; Sommers 2005). Contrary to the rosy picture painted of this group in later years, Childs in 1976 recounts about the effect of the letter "Boy, that was a bomb. There were about four people and a reporter that showed up, but we went ahead anyway" (Democrat 1976).

(Mission? Get bike lanes and bike routes on streets? Achieve proposal of Child letter?)

The group met monthly in 1964 and 1965, meeting in the homes of members. The public was invited, and new people attended on occasion, but the core remained small.

Frank and Eve Child, 1976 (Daily Democrat)

Donna Lott, 2004

Dale Lott, 2000 (UCD Dateline)

Bob Sommer, 2003 (UCD Dateline)

Figure 11 Members of the Davis Citizens' Bicycle Safety Committee

Core members of the group included:

* Frank and Eve Childs. Frank was an Economics professor, Eve was a dancer. They worked well as a team, apparently, switching off writing and speaking roles as

they deemed most strategic. Frank and Eva stayed in Davis until the 1980s when they moved to Santa Cruz.

* Dale and Donna Lott. Dale was a young animal behavior professor, Donna was a social worker. Dale had done his PhD at the University of Washington in Seattle, where Donna reported that he bicycled daily to campus, and had been a student activist. They moved to Davis in 1964 and were impressed with Childs' letter to the editor, and joined forces. Dale died in 2004, Donna remains a civic activist in Davis, a role she has held for over 40 years now.

* Bob Powell. Bob was a Range Scientist professor, but no unique activities were mentioned by other group members.

* Bob Sommers. Bob was a Psychology professor, also new to Davis. Bob finally retired in his 70s in the early 2000s, but still teaches classes. His most recent public commentary on bicycling *Where have all the bicyclists gone?* (2003) is considered an key impetus for the recent refocus on bicycling at the campus and city.

* Mark Herrington. Mark was a UCD student (Dale Lott, 2003)

Strategizing for success

The group was small, but they believed that they had broad public sentiment behind them. They used a number of creative strategies to maximize their effectiveness. These include media coverage, networking, research, and a petition.

* *Use of media* -- The *Enterprise* had recently expanded to twice-a-week printing, and they were in need of material. Donna Lott, the secretary, would provide the *Enterprise* with announcements before each meeting, and a summary of the

discussions after the meeting. This gave the movement steady coverage and increased name recognition. Dale Lott reports that they didn't include the number of people in attendance, just the discussions (2003).

* *Meeting individually with key players* – They invited various civic leaders to attend their meetings. Donna Lott reports "…one time we'd invite the police chief to come and tell us it could be dangerous, and it's not a good idea. And we would invite the chief planner, and he'd come and say 'there aren't any plans for this—nobody in the United States has done anything like this." (2005). Even though the responses were not initially positive, if the group's proposal had underlying merit, they were the group would gain credibility by stating the case for bicycle facilities, or learning who their chief opponents would be.

* *Research* – The stories of the group indicate that there was no research done on bicycles at the time. Donna Lott reports that "I would write letters all over the country and say 'what do you do with your bicycles?' but the only city with any program in place was Bradenton, Florida, which had off-street recreational bike trail, used primarily for touring the historic homes. There must have been additional places that had success stories, as the Dec 15, 1964 Enterprise *Council to study bike problems* article reports that "Members of the audience cited other cities which have heavy bicycle traffic and suggested that Davis might learn from them how to deal with the problem."

* *Petition* – After being rebuffed by various layers of elected officials and public servants, the group composed a petition and circulated it among the citizens of Davis. The group also connected with new supporters who were encouraged to

take a petition and walk their block with it. Of the petition-signing period, Dale Lott reported "For the next couple weeks any social gathering of any size included petition signature solicitation. Sometimes most of the people present had a copy seeking signatures. It was a signer's market."

Crescendo of proposals

The group first brought their proposal to City Council in fall, 1964, suggesting that council should act to create bike lanes. Council cleanly turned them down.

Believing that the general public would back the bike lane proposal, they created a petition. Public support was not unanimous, but the proposal was clear and positive enough that it gained wide support. The act of circulating a petition also put them in contact with a broader range of core supporters—Donna Lott reports that with this project she "got acquainted with Davis, we got everybody's list of progressive folks…"

Eve Child reported that "From the amount of people contacted, over 95 per cent reacted favorably and signed." (Enterprise Dec 10 1964). Of the opposition, Dale Lott reported "There were those who said bikes had outlived their usefulness. Then there were those who said that confining bikes to lanes would deprive cyclists of full citizenship on the road." (2003).

On Dec 14, 1964 they again presented their proposal to Council, this time with 533 signatures on the petition. Council discussed the matter, and voted to budget $750 to the Traffic Commission to form a study committee. Police Chief Bill Bartholomew "concurred that the study should emphasize the three capital E's—engineering, education and enforcement." (Enterprise Dec 15, 1964).

Council was still reluctant to approach problems, as the *Enterprise* dutifully reported "It was explained that most accidents involving bicycles occur at intersections and the provision of bike paths alone will not solve the problem." This is probably in indication that city staff were not in support of the proposal, and they had done their own research and determined that the lack of paths and lanes did not appear to be an integral part of the problem.

While the headline reported "Council to Study Bike Problems," the actual scope of the study was a considerable modification from the demands of the petition. Rather than install lanes or paths on every arterial in the city, the study only involved safe routes from homes to elementary schools, and the study committee would "contain representatives from the schools, Chamber of Commerce, parent-teacher associations, and other groups." (Enterprise, Dec 15 1964). Conspicuously absent was representation from the bicycle group—author of the petition.

In April, 1965, the committee recommended a few short routes around elementary schools. The recommendations had no improvements for people going downtown or to campus. This was considered a complete group (Dale Lott 2003).

At this point, the impasse continued, but the bicycle group continued to work on behalf of creating bike lanes. In early 1966, city engineers finally responded to the bike lane proposal which raised seven points against bike lanes. Frank effectively refuted all seven points, and at this point bicycling had grown to be a significant civic issue (Democrat 1976).

1966 election

Two city council seats were up in spring, 1966. Frank Child considered running for council himself, but instead the group was approached by two of the candidates if he would run for council. He wasn't interested, but two of the three candidates started running campaigns in favor of bicycling—Norm Woodward and Maynard Skinner. Both publicly stated they were in favor of bike lanes, and Skinner went so far as to make campaign signs the size of pizzas and mount them in the front wheels of bicycles (Lott 2005).

The third candidate, incumbent Sam Smith, was an apartment building owner, and one of his campaign slogans, according to Donna Lott, was "The horse and buggy have had their day, and bicycles are on the way OUT!"

Woodward and Skinner were voted in by a landslide--with 60 and 68% of the popular vote they were tied with 1972 for the highest share of the popular vote received by winning candidates in the last 50 years (Lofland 128).

Bike lanes on arterials voted in by council—July 1966

The Pro-bike council wasted no time in acting on their campaign promise.

Dale Lott recalls "…it appeared bike lanes had a majority on the new council. I was on the edge of my seat at the first meeting. The council members eyed each other uneasily in lengthening silence and my heart began to sink. Then Maynard got up, pointed to Third Street on a map of the city and said 'I move that bike lanes be established on Third from B to L.' The motion passed. So did the motions he made for bike lanes on Sycamore, and nearly all the other streets in our petition. At the end of the

meeting, city staff was directed to meet with our committee and design bike lanes. We danced out of City Hall." (2003)

The vote was well-received by the citizens of Davis. But now the Public Works staff had the assignment to create something new—something that had not been built in the past, something that was not currently legal to build, and something that they had actively fought for eighteen months.

Roads not taken – the "Third Street Parade"

An interesting parallel story in Davis at the same time as the "bicycle revolution" is the proposal for a Third Street Parade. In the summer of 1965, council approved preliminary plans for removing car traffic from 3rd St. from B St to G St. This was occurring in other cities in the US at this time to help downtown business remain attractive and competitive with new strip malls.

The plan, according to stories in the *Enterprise*, had far-reaching support from business and citizens. The primary impetus appears to be to keep the growth in commercial development in downtown, rather than let it occur in the suburbs. Third Street would become a pedestrian/bicycle thoroughfare but also a modern outdoor shopping mall.

In 1964, the Third Street Parade was big news in Davis. It commanded top-row headlines several times a month. For instance, when the bike lane proposal was presented to city council, it warranted a small story in the lower right-hand corner of the front page. The following week, however, the Enterprise ran a banner headline declaring *Third Street Mall Progress Told* (Enterprise, Dec 17 1964). In fact, the Parade proposal

appears to have been a large enough civic issue that it precipitated the closing of Central School to free up an entire square block for retail use (Enterprise, August 13, 1964).

Despite several years of top billing by the local paper, the "parade" was never built, and Third Street was replaced with a bicycle and pedestrian thoroughfare. Instead, Downtown Davis continues to lack focus, lack outdoor space for pedestrians, and lack a bicycle thoroughfare. Central School was closed, but public sentiment required the land be turned into the city's "Central Park" rather than new retail space.

In hindsight, the downtown corridor is one of the areas which have never been adequately served by bicycle lanes—the Third Street Bike Lanes opened in 1967, but they are now a second class facility, as cyclists need to deal with high densities of cars. Had the Third Street Parade been built, it would have changed the face of Downtown Davis, giving it a major pedestrian haven and bicycle corridor, and probably boosted commercial development as well. Boulder Colorado, for instance, is a small city with a major university. Also a pioneer in greenways, it was an early adopter of street reclaimation. Pearl Street, once its downtown thoroughfare, has been a bustling destination shopping area since the early 1970s—something Davis has been trying to develop ever since (Francis 2004).

Figure 12 Bike lanes opened in Davis in 1967. Experimentation and refinement led to testing of different designs.

(Bob Sommer photos)

Phase 4: 1967 – 1972 Bike Lanes: Invention and Implementation

The city was our laboratory

Bob Sommer, 2006

When City Council mandated that engineering staff seek means to create bike lanes on city streets, the implementation process shifted from political to technical.

At this point, the city staff who had consistently advised council against considering bike lanes were now given the task of going against their counsel. The risk of failure was still high, as the conservative course of action by staff would be to study

and experiment in a few locations, potentially delaying implementation until after the policy window had passed.

Fortunately, the political support was enduring and city staff supportive, and the first bike paths were opened in the fall of 1967, about 15 months after the initial request by council.

The path from a council mandate to a bikeway system had several other significant hurdles. First, a change to the California Vehicle Code was required to make it legal to build bike lanes. Second, a safe and functional type of lane had to be devised. Third, political will had to be extended to retrofit existing streets and push bike lanes into new developments.

This phase of bikeway development is what is truly unique about Davis. It is probably not unusual for a city council to be elected on a single issue and attempt to restructure part of the city to their liking. But the confluence in Davis included political will, political leadership, coordination with state government, and many layers of engineering innovation.

By 1972, all of the key elements of the modern Davis bikeway system were in place. More importantly, city staff were fully behind further bikeway system development, and had the skills to tailor solutions to new problems.

Background: Davis and UC Davis in 1967

In 1967, the social movements of the 1960s were just beginning in Davis. Opposition to the Vietnam War was growing, repression of dissidents was increasing, traditional sexual relationships challenged, and the environmental movement was beginning to emerge.

The changing events had different receptions on the campus and in the city. Like two fraternal twin cities, each had a newspaper, each had jurisdiction over its own activities, and each had a very different sociological base.

The campus appears to have had little resistance to the new ways of thinking. While it didn't have the radical factions of Berkeley, there was a rapid acceptance of change. The relatively peaceful transformation was perhaps facilitated by the benevolent Chancellor Mrak, who openly supported, for instance, open discussion of differences, and co-ed housing units. The city appears to have remained much more socially conservative, staunchly upholding traditional American values, promoting business, and being amazed at the speed of its expansion and the city's rising importance.

The differences in thinking are illustrated by comparisons of the newspaper content of the times.

The California Aggie was full of LSD-induced swirly advertisements for the Craft Center, discussions of the controversial firing of anti-war professors, and news of a recall campaign to recall Governor Reagan. Discussions of free love, premarital sex, and the availability of birth control pills dominated the social scenes. The early environmental movement was being given a good hearing as well.

The Davis Enterprise, by contrast, had headlines of amazing victories by the US war machine in Vietnam. Headlines included "US Scores Twin Viet Victories," "Record Air Armada Bombs Viet Staging Areas," "Air Troops Smashing Red Force in Mountains (Enterprise, October 1966)). Local news was about plans for new shopping districts, photos of old building being bulldozed for progress. Social scenes were all about men claiming brides, and extensive details about the wardrobe of the entire wedding party.

(James Rowe Claims Bride, Tom Martinez Claims Bride, Richard Davis Claims Bride (Enterprise, Oct 1966).

This difference was also manifest in the treatment of bicycles. The campus, since Emil Mrak was appointed Chancellor in 1959, had considered bicycles an integral part of the transportation system. The bicycles on campus were visually stunning, with landscape-dominating parking areas, legendary congestion during class breaks, and eye candy for Ansel Adams in his 100th anniversary of the University of California documentary series in 1966.

In the City of Davis, by contrast, the bicycles overflowed onto the existing streets, and caused problems for cyclists and drivers alike. Based on the cold reception of bicycle advocates among city staff and council, it is safe to assume that the contrasts found in other areas between campus and city existed in bicycle policy as well.

The contrast between city and university attitudes about progressive social issues set the stage for flash point between factions in transportation beliefs. Most of the conflicts of the times were of the type where people could simply agree to disagree and avoid conflict, such as whether the US was winning or losing in Vietnam, sexual habits, or attitudes about the Experimental College or new shopping malls. Differences in beliefs about transportation mode choice, on the other hand, affected all bicycle users regardless of their acceptance of conventional social norms, and these were exasperated by traffic growth. With a city growing in residents, and a population growing in progressive, environmental attitudes, a worsening of bicycling conditions could easily result in demands that the city, in this instance, abandon its traditional philosophies and create something new.

Approaches to bicycle problems was the first of many changes that would occur at city hall in the late 1960s and early 1970s. Following bicycles were early recycling programs, energy conservation programs, and the "ecovillage" of Village Homes. This was a peaceful revolution that transformed Davis for several decades, with the changing of attitudes toward bicycling the model by which other changes followed.

Steps between a council mandate and a bike lane

The passage of a mandate by the new City Council in no way guaranteed that any results would occur. Changes in attitudes about bicycles were just beginning, and there was no guarantee that the political support would last. Furthermore, the bike lane concept itself was untested and illegal in the United States. Major challenges would have to be overcome before a working system would be in place.

It appears that the relatively quick success of the untested concept was a result of several factors—

1) strong grassroots support,

2) willingness of city staff to experiment with new concepts,

3) willingness of state transportation officials to act quickly and approve an entirely untested concept, and

4) the inherent functionality of the standard bikeway design.

Each of these steps could have been an impossible barrier for the Davis Bikeway mandate. Fortunately, they were all cleared in a fairly timely manner.

Dale Lott describes the process as follows. This passage is an excellent example of both "design innovation" and the willingness of staff to experiment.

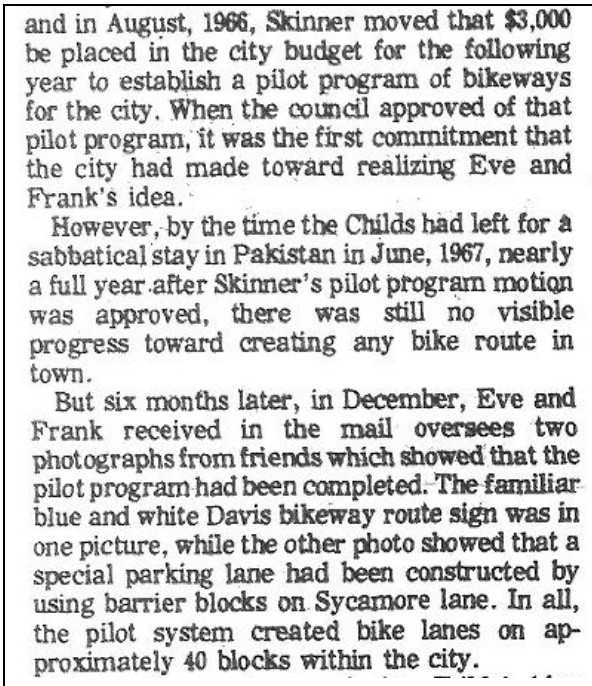
Fred Kendall, then Davis' city engineer, became a regular at our committee meetings. We had met with him before, and he had been polite but seriously skeptical. If he was still skeptical it didn't show. We got right down to cases.

How wide should these lanes be? As little as 3 feet would do for a single bike, but an open car door would block such a lane, and besides, we wanted people to be able to ride side by side — that would allow overtaking and be more sociable, and most Davis streets were wide.

OK, said Fred, 5 feet; 8 feet? We tried riding side by side — 8 feet was great but didn't leave enough space for a car traffic lane. We settled on 5 feet. OK, now what do we do at intersections? And so it went. We insisted on some experiments that turned out well and some that were flops. (Lott 2003).

Bike lanes built on the streets—Fall 1967

In fall, 1967, Davis opened bike lanes on Third St. through downtown and Sycamore Drive from Russell Blvd to 8th St. These were the first on-street bike lanes in Davis, the first in California, and apparently the first in the United States (Sommer, 2005, Takemoto-Weerts, 1998). These bike lanes have set a precedent that has now been repeated on thousand of miles of streets throughout the United States and Canada.



and in August, 1966, Skinner moved that $3,000 be placed in the city budget for the following year to establish a pilot program of bikeways for the city. When the council approved of that pilot program, it was the first commitment that the city had made toward realizing Eve and Frank's idea.

However, by the time the Childs had left for a sabbatical stay in Pakistan in June, 1967, nearly a full year after Skinner's pilot program motion was approved, there was still no visible progress toward creating any bike route in town.

But six months later, in December, Eve and Frank received in the mail oversees two photographs from friends which showed that the pilot program had been completed. The familiar blue and white Davis bikeway route sign was in one picture, while the other photo showed that a special parking lane had been constructed by using barrier blocks on Sycamore lane. In all, the pilot system created bike lanes on approximately 40 blocks within the city.

Figure 13 Frank and Eve recount the drama of whether bike lanes would actually be built. 1976, Woodland Daily Democrat

In hindsight, the three-year period from when Frank and Eve Child wrote the Enterprise letter that ignited the process to establishment of bike lanes may seem like a short moment in history, the Childs were beginning to have their doubts as to whether the project would come to fruition or be tossed in the policy graveyard. But after they left for a sabbatical leave in Pakistan, they received a snapshot of a bike lane in Davis.

Figure 14 The Childs were delighted to receive snapshots in the mail of bike lanes in Davis (Frank and Eve Child papers)

Design experimentation: determining the best design

Lane location relative to motorized traffic

The early experiments included three different types of bike facilities (see examples at the top of this section):

1) bike lanes between car lanes and the parking lane (Third St.),

2) bike lanes between the parking lane and the curb (Sycamore Lane), and

3) bike paths adjacent to the street, between the curb and the sidewalk (Villanova Ave.).

The first bike lanes included all of these types, to test them in real life to see how effective they were. The on-road lanes worked best, the behind-parking lanes were the worst, and the adjacent paths were found to work in certain circumstances.

This is an example of the wide level of experimentation that occurred during this period. Had the city tried to do extensive research without construction, it might have settled on an inferior design. And not having tried all three designs, it might not have recognized it as inferior, and the entire experiment could have been declared a failure.

Bicycle management at busy bicycle intersections

While bicycles were ubiquitous in the city, they were concentrated in time and space on the campus. During class breaks, as many as 200 bicycles per minute would pass through intersections (DeLeuw and Cather 1972: 46). As the campus population expanded and bicycle use increased, traffic jams got to the point where it required a solution.

Traffic channelization was the solution for simpler intersections, so bicycles could signal their directions to others by their location on the pavement. But this was hardly feasible for a four-way intersection, and the "bicycle traffic circle" was developed.

In May, 1972, the intersection of Hutchison Drive and California Ave was modified with a fire hose laid out in a circle in the middle of the intersection, and bicyclsts were instructed to go clockwise until they reached their exit point. Despite a

lack of public outreach beforehand, nearly everyone was able to navigate the intersection more easily than before, and it was declared a success (DeLeuw Cather 1972; Stamm and Sommer 1978). The concept has been applied to twelve other intersections on campus.

Accomplishments of the 5 year period

Five years after the bike lanes were opened first opened, Davis had an impressive resume of accomplishments.

Legislative approval for path construction

The California Vehicle Code had to be modified to designate bikes as vehicles. In an anti-bike environment, this might have been impossible, but in California in 1967 it was feasible. Maynard Skinner relates that the process was not particularly difficult, as council member Norm Woodbury had close connections with lobbyists at the State Capital. Under Woodbury's direction, city staff were able to make the right connections, and the legislation passed with little difficulty (Skinner, 2007).

Comprehensive system of bicycle routes

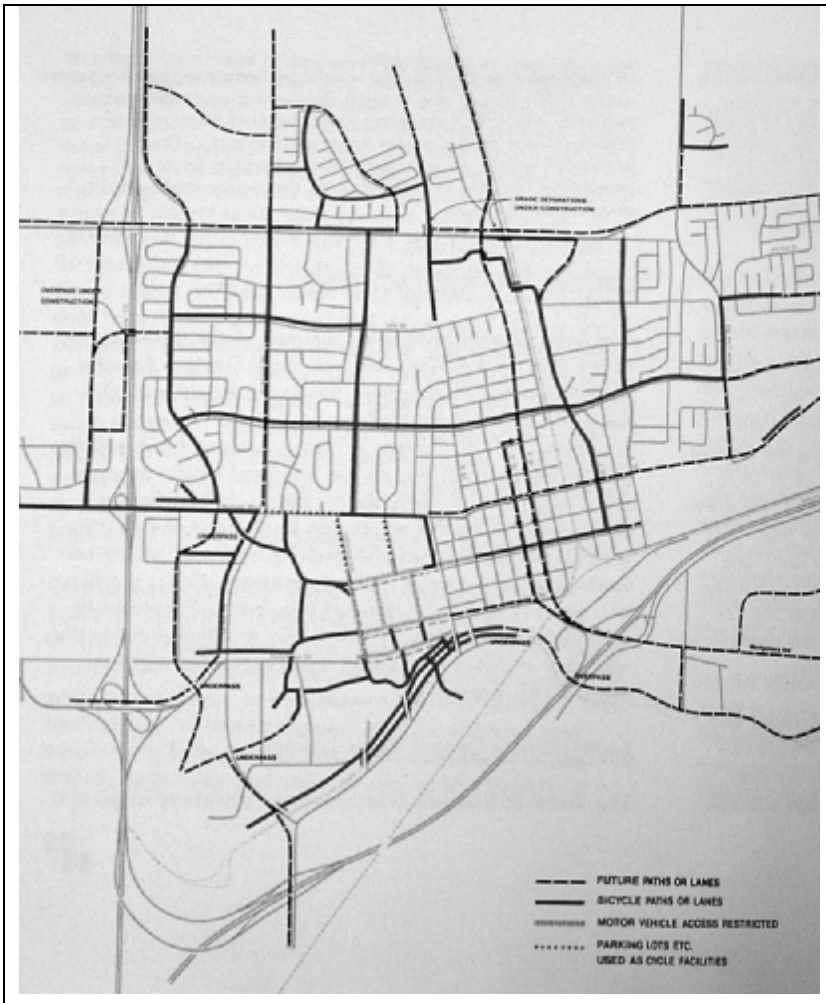


Figure 15 In 1972, Davis had a nearly complete network of bike routes, with ambitions plans for expansion (De Leuw and Cather 1972)

By 1972, bike routes were established on nearly all arterial and collector streets in the city. Of the core area from Pole Line Road west to Sycamore Lane, and First Street to Covell, nearly all roads had bike lanes or adjacent paths (City of Davis, Map 1973). It was safe, legal, and practical to ride a bike from any location in the city to any other.

Bike culture preserved and expanded

Figure 16 The bicycle scene at UC Davis, Olson Hall , 1969 (El Rodeo)

Frank Child, in his 1964 letter, emphasized that the bicycle culture found in Davis was an asset, and should be nourished and encouraged. By 1972, Davis bike usage and culture may well have rivaled that of The Netherlands (Sommer and Lott 1971).

Bikeway/street grade separations

Figure 17 An early bicycle underpass at Alhambra Drive, 1971 (Bob Sommer photo)

Two bike undercrossings had been built at LuRue Road on campus, one at the railroad tracks at 14th/Drexel, two in North Davis (under Alvorado and Anderson) and an overpass connected North Davis to Community Park and the B St. Bike lanes (City of Davis, Map 1973). This was the beginning of an

entire “secondary transportation network” allowing Davisites to travel around town on their bikes without encountering a single car.

Secure bike parking facilities

The evolution of bike racks is not documented, but it is claimed by some that the “coathanger” bike rack was invented in Davis. This offers several improvements over other types—it provides a secure, fixed object to lock a bike to, it allows the use of several different kinds of locks, provides physical support to keep the bike upright with lateral stability at two points, and it allows the bike to be secured above its center of gravity so it is resistant to being tipped over. While this type of rack has never been used extensively in Davis (in 2006 such racks are still in the minority), this type of rack is common elsewhere in North America.

Uniform design standards for bike lanes and paths

By 1972, Davis had established a uniform code for building bicycle facilities. These included all of the standard design guidelines found in conventional street templates, including cross-sections, longitudinal sections, intersection treatments, recommendations for special circumstances, etc. These, developed through no small effort by city staff, allowed the policy to be enforced with precision when new developments were being proposed in the city.

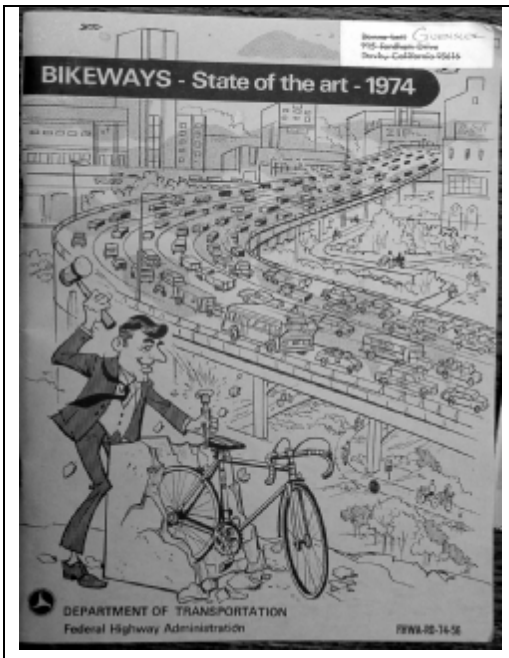


Figure 18 The 1974 FWHA design manual was based largely on design standards developed in Davis.

Adoption of Davis bikeway standards as state and federal standards

Not only were the standards established, but they were soon replicated at the state and federal level, and used as templates for all subsequent bikeway construction in the United States.

Subdivision codes

In 1968, City council passed new subdivision codes that required all new developments in Davis to dovetail in with existing bikeways.

Greenbelts

In 1969, a new type of bikeway was built into North Davis, running through a linear park behind the houses in a subdivision. Unlike the original three types of bike path, this one provided car-free travel, but did not have to interact with cars at intersections. The par-like quality of the area along the path provided additional pleasure while biking, and additional destinations to draw Davisites onto their bikes.

While these paths may not have been called "greenways" at the time, they became a prototype and were included in future subdivision development codes. These early greenbelts, built mainly in North Davis and in Village Homes in West Davis, enabled the interconnected "Davis Greenway" system proposed in the 1980s to come to an easier

fruition, as there were segments throughout Davis that could logically be linked by constructing the missing links.

U-Fix bike shop

The Associated Students of UCD established a "fix it yourself" bike shop on campus in 1971. Located in an old barn, it was a place where anyone could walk in and receive assistance in repairing their bike. It also sold parts, sold used bikes, rented bikes, and would repair customers' bikes for a fee. The Bike Barn would continue this service until 1999.

Education programs

By 1972, Davis had a bustling education program. A noteable part of the broader education program documented by Pelz (1977) is Mr. Smartspokes – a talking bicycle who made the rounds to Davis elementary schools. Smartspokes would teach children to ride on the right side of the road, use paths whenever necessary, not double friends on your handlebars, and to lock your bikes (Pelz, 1977). Davis also had a dedicated police officer who would make regular presentations in elementary schools (Sommer, 2005).

Smartspokes not only fulfilled the role of an educational program, but it exemplified the enthusiastic and creative thought that existed during this time.

Was anything not invented between 1967 and 1972?

So much of Davis's bicycle infrastructure was developed during this narrow window, that one wonders if anything was developed afterwards?

The only commonly used infrastructure component developed since 1972 was the bicycle signal mast, which was envisioned before 1972, but required 20 years of regulatory consideration before it was finally installed in the late 1995.

As we will note in later chapters, the sheer vastness of elements invented in Davis during this time appears to have had a limiting effect on future invention and progress in bicycle policy and planning.

Roads not taken

Of the original proposals in 1966, the only major element missing from Davis in 1972 was the banning of bikes from several streets. Director of Public Works Fred Kendall, in his original proposal, advocated banning bicycles from Fifth St., Russell Blvd, and F St through downtown (Enterprise, Sept 15, 1966).

Of the original routes proposed for bicycles, one was not adopted. I haven't examined the city records to find a failed motion, but since there is now only one arterial street without bike lanes (Fifth/Russell) and this was not part of the original plan according to Donna Lott (2005), it appears that the entire set of routes proposed in 1966 was built by 1972.

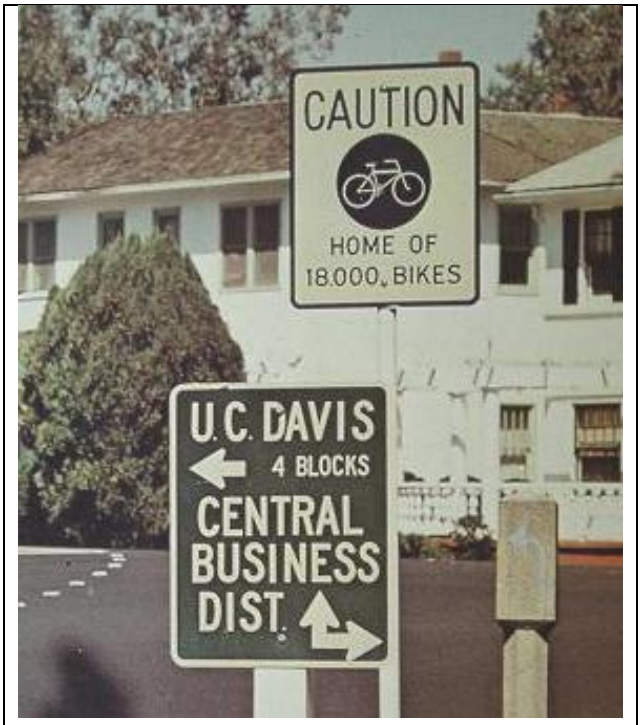


Figure 19 The first thing visitors saw when they arrived in Davis--directions to campus and downtown, and a flashy assertion of bicycle presence. (Rodeo, 1970)

Phase 5: 1972 – 1990s Expanding the Bicycle Capital

In 1972, Davis was a unique city in the United States. It was safe, legal, and convenient to ride a bike for personal and family transportation. Many people, perhaps most people, rode a bike on a regular basis. At the beginning of this era, bicycle planning had been formalized, proven, and was now being replicated across the country.

Davis's future as an oasis of bicycle transportation in an auto-oriented country was secure. Bikeway development retained popular support. A new city council elected in 1972 was far to the left politically. City engineering staff had proven that bikeways

could be built and were personally interested in making sure that they continued to be built. And city code required new developments to meet ever-increasing standards of bicycle friendliness.

From 1972 to 1998, most city developments were done in a manner that was consistent with the original vision of the late 1960s. The greenway system was gradually completed, problem intersections were usually modified in a manner satisfactory to drivers and bicyclists. New schools were built with greenway access so elementary school children could bicycle to work without crossing major roads.

The architects of this vision were Davis Public Works staff, primarily Dave Pelz, and Duane Copley. Copley began working for the city in 1965, Pelz in 1968. Both appreciated bicycling—Copley bicycled as a student at Stanford, and Pelz had toured Europe before hiring on at UC Davis (Copley, Pelz 2006). This group worked well together, and is largely credited for ensuring that the bikeway vision remained intact through decades of political and social change.

This era ends with the retirement of Copley in 1997 and Pelz in 1999.

Homogenous physical development of the city

During this time, the city expanded from 5 to 9.5 square miles and 16,000 to 60,000 population. A scan of a modern bike map indicates that virtually all developments built during this time have the standard characteristics—off street greenways, on-street bike lanes, greenway connections to shopping and schools, and grade separation under arterials and some collector streets.

What is remarkable is the consistency of these features across the Davis landscape, to the extent that the 20-mile greenway tour provides homogeneous suburban

scenery. A tour covers miles and miles of greenways, punctuated by underpasses, overpasses, occasional street crossings, and some stints on quiet streets with bike lanes.

The neighborhoods themselves do have some variation. South Davis, developed slowly since the 1970s, has bike paths, grade separations and bike lanes throughout the neighborhood, but it the only connections to other neighborhoods, downtown or the university involved freeway overpasses with treacherous exit and entrance ramps. Though this didn't change until the late 1990s when the Pole Line Road overcrossing was built, the plans for Pole Line, Pelz, and Putah crossings of -80 were advanced during this time, but because of the long lead-time required for freeway crossings. Wildhorse, designed at the end of this period, is the only neighborhood without any grade separations into or within the neighborhood. The only access into Davis is the busy intersection at Pole Line Road, notable as the only intersection in Davis where a bicyclist has been killed by traffic.

Differences between jurisdictions: city, university, county

The urban area of Davis, California is actually under three different jurisdictions, with different plans, different priorities, and different financial circumstances.

Most of the "city" is part of the incorporated City of Davis. Some of South Davis, however, is unincorporated Yolo or Solano Counties. The campus itself is unincorporated Yolo County, but does its own planning separately from the county.

The result of this is an opportunity to examine "the Bicycle Capital of the America" as a physical amalgamation of policies and plans from two major jurisdictions, each with its own strengths and weaknesses. This is more interesting to study than a

single governing body, because there are two simultaneous policy streams, allowing a comparison of strengths and weaknesses of each governance type.

Characteristics of physical environments

The City of Davis grew in an orderly fashion, with most growth occurring on agricultural land, usually at the margins. Development was predictable—single family homes, apartment buildings, and shopping malls were all that could be expected, and all could easily be planned using the basic Davis policies. Funding for transportation was fairly steady. Bicycle traffic, outside of downtown, was not high enough to cause congestion or require special management devices.

The university was different. Growth was not incremental. Future facility needs and sizes were unpredictable. Traffic was heavily concentrated in space and time. Budgets were always too small to meet all needs.

For bicycling to be a viable mode of transportation, it had to function in the city, at the origin of each trip, and at the destination, usually on campus, and there had to be a connection between the two.

Characteristics of policy environments

The City of Davis is governed by elected officials, voted in by the non-university residents of Davis. Unlike other universities, students living on campus cannot vote in civic affairs. This shifts the political focus of the mayor and council somewhat further away from student issues.

All decisions at the city need to be viable politically, as council members are reelected every few years. Quick action is helpful, long-term projects are vulnerable to being aborted when council changes.

At the university, there is relatively little incentive to provide well for bicyclists, and this was manifest by campus facilities rarely matching the quality of city facilities—in design or maintenance. Financial savings from high bicycle ridership accrued mainly to drivers, who had to pay for new parking facilities from increased parking fees.

Also, the campus never had the political pressure to prioritize bicycle systems with its staff, so it never acquired long-term engineers like Pelz and Copley who could see future needs and ensure that they were slowly brought on-line.

As a result of this, problems in the city tended to be addressed fairly quickly, while problems on campus lingered on for decades. For instance, the campus commissioned a *Bicycle safety improvement, enforcement and parking report* in 1980. The report listed ten locations on campus with significant safety and operational problems, and recommended fairly simple solutions (Gregg 1980). As of 2006, only three of the improvements had been made, (and one of them, shoulders on Hutchison Blvd was done in 2005). No similar issues appear to exist in city policy—all easily solvable problems were been rectified.

Differences in bicycle plans

The city always had a well devised plan for bicycles, whether explicit or not. The policy was simply bike lanes on streets and bike paths through neighborhoods. The greenway system [probably] had a master plan that was devised early on, and followed fairly tightly through subsequent development of the city.

The campus had a series of "long range development plans." Each plan's physical aspects varied widely from the previous, as building plans came and went, and campus styles changed. Bicycle policy was well established in the 1994 plan, as impacts on bicycling created by campus growth was to be mitigated by "development and implementation of additional pedestrian and bicycle facilities, such as widenings, new facilities, separation of bicycles and pedestrians, extension of bicycle/pedestrian precinct, and bicycle parking facilities" (LRDP 1994, as summarized in Fehr and Peers, 2002). While these appear to set a strong policy, lacking in this was an explicit goal of separating bicycle and *motorized* traffic, or defined criteria for evaluation of whether a project meets these criteria. As a result, there was no consistent development of bike facilities.

Unlike the city "general plans" and greenway plan, the LRDPs were rarely followed, as campus development is inherently more spontaneous and less predictable. For instance, the two grade separations under La Rue Road were envisioned by bicycle planners in the early 70s, but no subsequent campus planners maintained bicycle links to and from the tunnels. As a result, subsequent bicycle infrastructure has not been oriented towards the tunnels, and all four portals are difficult to locate, and they fail to provide the safe, comfortable travel route for which they were designed.

Additionally, the campus had never had an actual "Bike Plan" until 2001, when one was compiled to meet the requirements of CalTrans funding (Takemoto-Weerts, 2003). This "plan," however, does not function in the typical manner of a plan—there are no maps with planned facilities, no routes for future bikeways, no intention to offer

any policy changes. Indeed, some of the few recommendations found in the plan have not been implemented, as is seen in the following case studies.

Differences in campus and city facilities

The "bicycle capital," then, was a fraternal twin of two different, but adjacent, administrative areas. Each has very different procedures for establishing policy, and each has had a different set of plans, policies and implementation strategies to accommodate and promote bicycling.

The city's facilities were consistently of a high quality, and planned by a homogenous authority over time and space. Physical features of the system are replicated throughout, and bicycle riders can expect consistently good facilities for use.

The campus, however, has a wide range of facilities. In the central campus, the nonmotorized core has extensive infrastructure, with what are likely the heaviest bicycle traffic found in North America. But other sections of campus have shared pedestrian and bicycle facilities that are far too narrow for efficient travel, and result in constant conflicts between users. Bicycle parking was never addressed, and about half of the daytime bike population did not have secure rack space available.

The campus, has had more flexibility and less accountability in providing bicycle facilities. The city, partly because of more strict planning and policy guidelines, more predictable development needs, and a long-term core group of staff coordinating policy and design, has been much more consistent in their approach to providing good quality infrastructure.

Unique innovations in Yolo County residential areas

The unincorporated Yolo County locations offer a few variations on the standard bikeways of the City of Davis and the campus. For instance, Montgomery Avenue is an old farm-to-market road with a 1930s era concrete bridge over a slough. When bike lanes were added to the street, they simply installed prefabricated pedestrian bridges on each side of the road bridge, making a functional, if unconventional, crossing. El Macero, the 1970s era golf course community, is also unincorporated Yolo County land. Bicycle facilities there consist of a "bike lane" striped on the main loop street that is also the parking lane. This is only superficial infrastructure, and not actually a bike lane, as it is disappears wherever there is a parked car. This has the benefit of giving bicyclists a sense of legitimacy and raise motorist awareness, but the drawback of not providing a safe corridor for bicyclists.

Whether better or worse than the solutions created by the city or the university, the county-administered neighborhoods provide another aspect of the real of the possible in crafting bicycle friendly infrastructure.

Bicycle advocacy: coalitions and the lack thereof

The original advocacy coalition, the Davis Bicycle Safety Committee, disappeared completely after 1972. They were so successful that all of the requests in the 1964 petition were met, and usually exceeded. The city council had established strong policies favoring bicycles and bicycle infrastructure development, and the city had a group of skilled staff able to carry out the directives with ease and finesse. After several years of conducting research to evaluate existing and possible new infrastructure, there was now funding for outside consultants to continue the work.

As Davis continued to blossom, there was little to complain about. The original advocates were now sought by other communities for instruction and motivation to create bicycle facilities elsewhere. Bob Sommer reports that he could always impress audiences from elsewhere with a photo of the nearly-empty Davis High parking lot.

Individual members of the public appear to have lobbied for

The only longstanding bicycle organization is the *Davis Bike Club*, whose function is primarily recreation and secondarily service. It is reluctant to get involved in political or policy issues (Bustos 2005).

The end of research

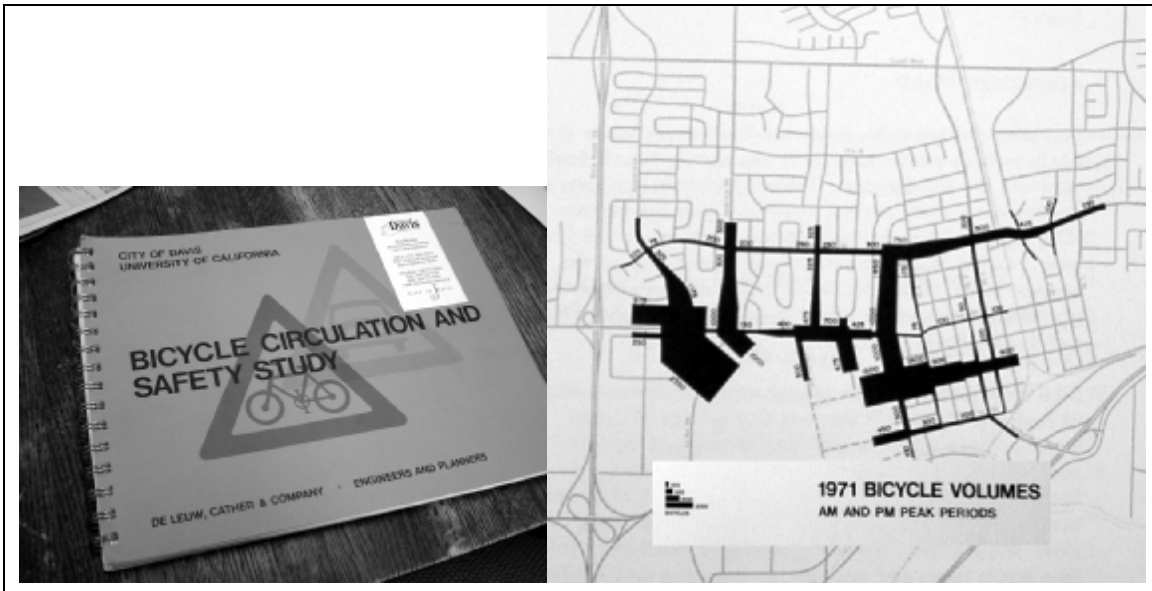


Figure 20 The 1972 De Leuw Cather Bicycle Circulation Study was a comprehensive, innovative document, but its completeness ended local research in Davis

Bicycle research ended abruptly in about 1972. Bob Sommer reports "Basically, the research by the Davis folks ended about 1972, and after that the money came into the field, and the Eastern engineering firms that made connections got the money. So after that we [academics] all went back to our respective areas of interest." Oddly, the

cessation was so complete that the bicycle traffic counts were never repeated, and campus bike traffic counts were only conducted once in 1980.

Since then, there has been relatively little research performed. Neither the city nor the university have had regular evaluations or audits of programs or post-occupancy studies of facilities. Neither has taken even sporadic bicycle counts to determine if bicycle traffic is rising or falling. Routine studies for campus "long range development plans" or city ""general plans" evaluate commute mode of the population.

A slow trickle of research continued to emerge from the university, but there was never a repeat of the "city as laboratory" approach to research.

The beginning of transit

In October, 1967, students at UC Berkeley challenged the dominant paradigm by burning draft cards. The Associated Students of UC Davis responded to the same issues with a more moderate approach, forming student-owned collectives. Under the direction of student body president Bob Black they formed the CoHo (a student-owned food cooperative), Unitrans (a student owned transit line), and the "Everyman's Bicycle Association" (a student owned fleet of public bicycles) (Aggie, 1967, Oct 6, Oct 3, Oct 9). Of these, Unitrans and the CoHo were successful, the EBA was abandoned after a few months.

Unitrans, starting with three donated London buses, grew slowly until the early 1990s, sporting a fleet of as many as eight double-decker buses. The rationale, presumably, was that the double-decker buses were visually unique and exciting to ride, and would cast a positive image on transit than conventional American equipment.

Unitrans ridership did not impact bicycling rates until 1992, when students voted to replace fares with a system of unlimited ridership for a fixed fee. As with most subsidized goods, ridership began to grow rapidly. The London buses were soon supplemented with an entire fleet of single-level buses, and each year more students rode buses (ridership was counted annually) and it was suspected that fewer biked (but ridership was only measured once per decade) (Palmere 2006).

While transit, like bicycling, is a member of the family of "lower impact modes" of travel, it has a significant cost per trip (about $1.10 in 2003) and doesn't provide the level of environmental benefits afforded by bicycling.

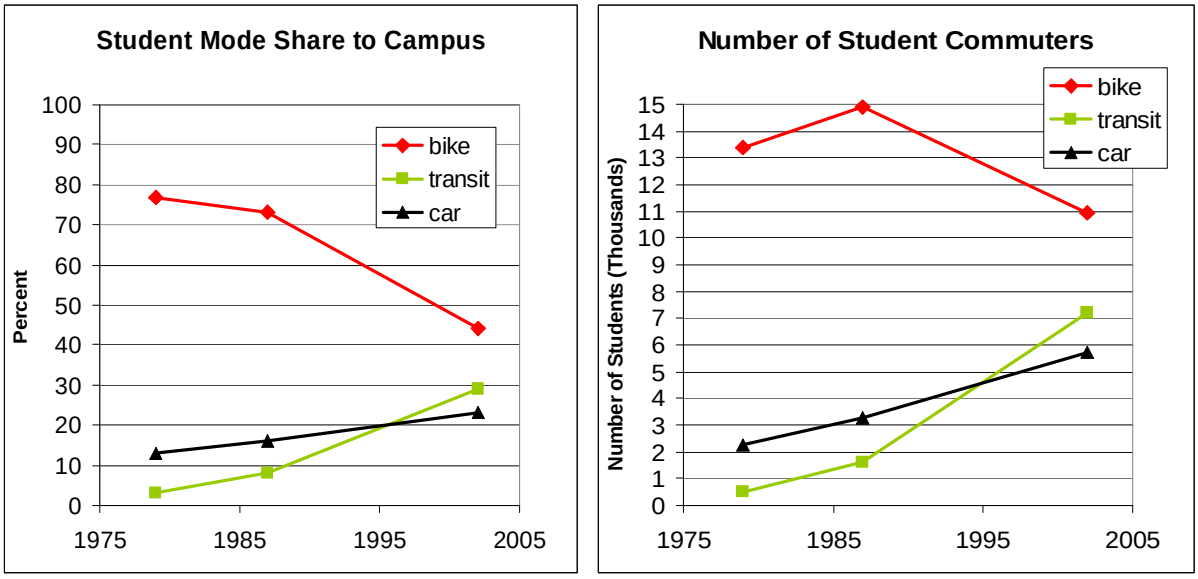


Figure 21 After remaining stable from 1979 to 1987, the percentage of bicycle commuters dropped by nearly half and transit commuters tripled between 1987 and 2002.

Issues of contention

Unlike many cities, there was relatively little contention in the development of Davis bicycle facilities.

This is well illustrated by Bob Sommer's comments on the topic—when asked if there were any points of contention, he simply responded with an emphatic "No," followed by stating that "the city has done a good job in keeping pace with the [need for facilities]… …People are happy. And bicycling has not been contentious like growth has been. And as long as they keep putting bike lanes…" (2005).

The lack of contention was partially a result of good policy and skilled planning, but it was also eclipsed by deep, bitter debates over growth. Davis was deeply divided over whether or not to grow, and the debate left little room for discussing "how" to grow, and what types of facilities should be included. A result of this is that in the 1990s, new developments in Davis looked and felt "less like Davis" as developers built larger, more expensive houses on smaller lots.

One example of contention that did occur during this period is the Richards Boulevard "subway" issue. In the late 1990s, proposals resurfaced to widen the main "gateway" to the city—Richards Boulevard at the railroad underpass that separates downtown from Interstate 80. Built in the 1920s, the "subway" was only wide enough for two cars. A bicycle "tunnel" was installed next to it in about 1970 to provide access for bicycles. Since congestion at Richards Boulevard was worse than allowed for in the General Plan, the city proposed to widen the tunnel for four lanes of traffic, two bike lanes, and two sidewalks.

A key element of the success of the Davis bikeway system was the ability to provide satisfactory infrastructure for both cars and bikes. But this was one case where it was impossible to provide for both. If four lanes of traffic were allowed into downtown, it would significantly reduce the quality of bicycling.

After a civic discussions in 1968, 1973, and 1987, in citizens voted (56% opposed) in1997 to retain the existing subway and accept the congestion, rather than face a wave of new motorized traffic on downtown streets (Lofland 2004: 149-150).

Roads not taken

Comprehensive Greenway System

Figure 22 Davis Greenways -- a secondary transportation network.

Greenbelts are linear parks, public land set aside for use as recreation and local transportation. Greenways are a system of greenbelts that serve as an integrated, nonmotorized transportation system. The terms are used to describe many different types of facilities, from city streets with special sidewalk and artwork treatment to recreation corridors through rural areas. The key components are 1) it is open to public use, 2) it contains "green" features that help link the user to nature 3) it can be used as parkland or as a nonmotorized travel corridor.

In Davis, the term "greenbelt" refers to corridors behind houses, isolated from the street, with a multiuse path. The first greenways, known as greenbelts, were built in North Davis in the late 1960s, and were then required in all new developments. After the greenway plan was accepted, greenbelts began being included in most new developments, and Davis became a greenway system.

The greenway system, at about 50% buildout by the late 1990s, had notable elements that make its use challenging. First is the lack of a navigation system. Greenway tours cannot be self-guided, because there are no location markers or directional signs anywhere on the system. Greenways, thus, cannot be used for casual travel unless the user is comfortable with getting lost several times per mile. Another element is that the greenways do not meet the design standards set by Caltrans for mixed use facilities of a "design speed" of 20 mph (Highway Design Manual, 2000). In many places, the narrow pathways and blind corners require bicyclists to operate at speeds below 10 mph for assurance of safe passage.

Bike Routes outside of Davis, 2002

<u>Roads not taken—rural and intercity bicycling</u>

For all its bicycle enthusiasm, Davis is an island in a sea of bicycle-unfriendliness. A map of the surrounding areas shows that of the 13 streets and highways radiating out from Davis, only four have bicycle

infrastructure—the others are county roads with no shoulder or freeways (Yolo County 2002).

This effectively creates an "island" of bicycle activity in Davis, with only four "bridges" to other places—the I-80 causeway to Sacramento, County Road 102 to Woodland, and Covell and Russell Boulevards to Winters. Of these routes, only Covell Boulevard to Winters is a facility that meets modern standards, and the other three routes contain features that compromise their safety or rideability. In other parts of rural America, there are networks of bike lanes, allowing recreational and intercity travel on a variety of routes.

It appears that development of rural bikeways does not appear to have been a significant topic for dialogue or planning. The 1994 Sacramento Area Council of Governments *Bicycle and pedestrian study* shows the four "exits" from Davis, with plans for a second link to Woodland on Road 99 and a link south to the west delta area on Mace Blvd/Road 104. Ten years later, the Yolo County Plan still calls for an extension of bike lanes on Road 99 (Yolo County 2002). Inspection of the section near Woodland already completed reveals narrow, rough bike lanes with encroaching vegetation—hardly up to Davis commuter standards.

The rural area surrounding Davis is markedly different than many areas or the country, where rural bike lanes are common. Considering that bike lanes and paths became a national policy (partly as a result of the adaptation of Davis's bike lane roadway profiles as national policy) in the 1970s, it is remarkable that the grid of county roads surrounding Davis is nearly devoid of bike lanes, to the extent of preventing casual bicyclists from leaving the city. Indeed, the physical appearance of most county roads is

that they are unchanged in profile since their construction in the 1950s, with no shoulder, paved or otherwise, for a bicycle to ride on or take refuge on. This situation may be suitable for experienced riders who do not fear vehicles traveling in close proximity at 60 mph, and know to keep an eye out for unusual events such as passing movements in the opposite direction (oncoming traffic in your lane at 75 mph), but such conditions are not suitable for casual riders.

Though rural routes have never been prioritized, interest is present among Davisites. In March, 2006, the Sacramento Council of Governments held a community workshop to assess the priorities of Davis residents for intercity travel infrastructure. The workshop had about 100 participants divided into twelve groups, and each group was assigned to determine transportation priorities. The result was that about half of the groups prioritized improved bike routes from Davis to Woodland, even more remarkable considering that intercity bike routes were not among the "palate" of choices offered to address future transportation issues.

The failure of Davis to create bikeways outside the city limits can be seen as a failure in policymaking. Funding would not have been great, engineering is state of the art, and right of way is preexisting. Yet, in the 40 years of bicycle planning in Davis, this has never been a priority. (In fact, the 45 miles from Fairfield to Sacramento is the only missing link in the "Bay to Sierras" bike route, a segment in which Davis sits squarely in the middle).

Paths not taken—rural greenways

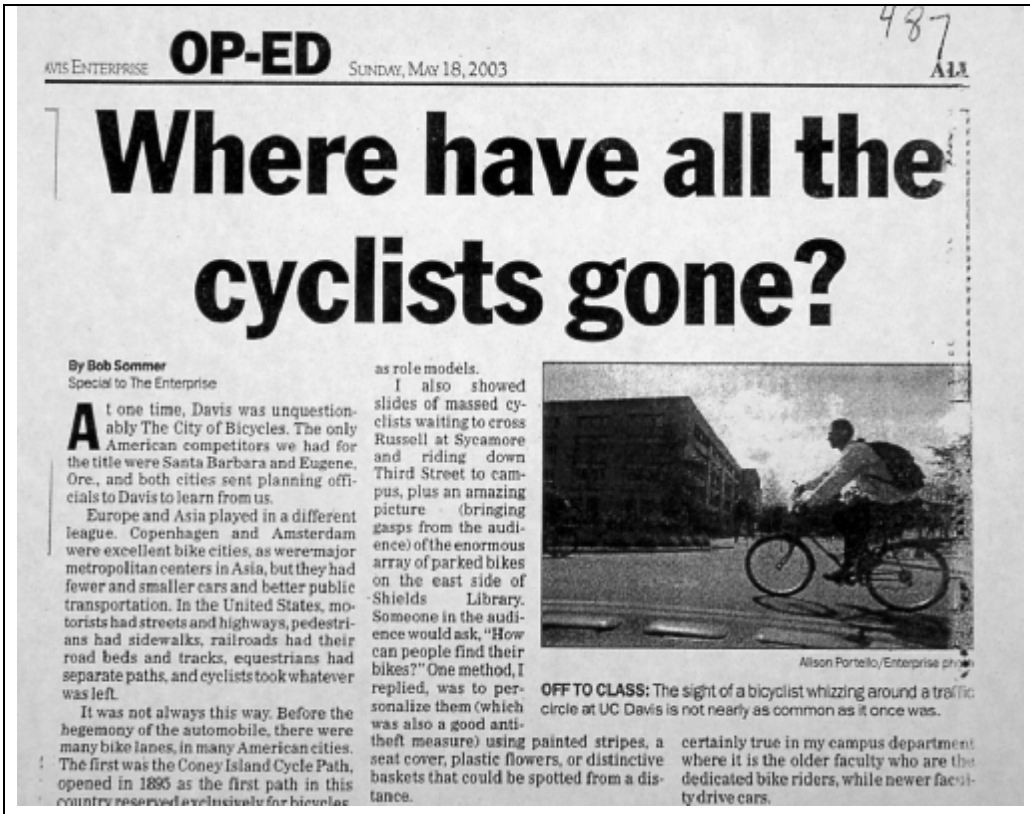
Figure 24 Mark Francis explains to a bikeway tour group that "these farm roads look like a great place to ride, but we're not permitted to go any farther."

Professor Mark Francis, the originator of the Davis Greenway Plan, envisioned that the greenway would lead riders to the edge of the city where they could continue on into more rural areas, as was the practice in Northern Europe (Francis et. al. 1987; Francis, 2004).

This concept dovetailed in well with the "Davis Greenbelt," farmlands that were preserved in perpetuity as "greenspace" around the city, but adding a human use and habitat dimension.

Unfortunately, when the Greenbelt agreement with farmers was negotiated, city council and staff were unable to reach an agreement with farmers that would allow Davis residents to travel freely on access roads in the agricultural land (Evans, 2006).

Had agricultural roads been included in the bikeway/greenbelt systems, it would have added an entire new dimension to the Davis bicycling experience, as Davis residents would be able to use their bicycles for casual, relaxing recreation on a network of traffic-free, paved and unpaved rural routes.



DAVIS ENTERPRISE **OP-ED** SUNDAY, MAY 18, 2003 A13

Where have all the cyclists gone?

By Bob Sommer
Special to The Enterprise

At one time, Davis was unquestionably The City of Bicycles. The only American competitors we had for the title were Santa Barbara and Eugene, Ore., and both cities sent planning officials to Davis to learn from us.

Europe and Asia played in a different league. Copenhagen and Amsterdam were excellent bike cities, as were major metropolitan centers in Asia, but they had fewer and smaller cars and better public transportation. In the United States, motorists had streets and highways, pedestrians had sidewalks, railroads had their road beds and tracks, equestrians had separate paths, and cyclists took whatever was left.

It was not always this way. Before the hegemony of the automobile, there were many bike lanes, in many American cities. The first was the Coney Island Cycle Path, opened in 1895 as the first path in this country reserved exclusively for bicycles as role models.

I also showed slides of massed cyclists waiting to cross Russell at Sycamore and riding down Third Street to campus, plus an amazing picture (bringing gasps from the audience) of the enormous array of parked bikes on the east side of Shields Library. Someone in the audience would ask, "How can people find their bikes?" One method, I replied, was to personalize them (which was also a good anti-theft measure) using painted stripes, a seat cover, plastic flowers, or distinctive baskets that could be spotted from a distance.

Alison Portello/Enterprise photo

OFF TO CLASS: The sight of a bicyclist whizzing around a traffic circle at UC Davis is not nearly as common as it once was.

certainly true in my campus department where it is the older faculty who are the dedicated bike riders, while newer faculty drive cars.

Figure 25 Bob Sommer's 2003 editorial articulated the feelings and observations of many long-term Davis residents. (Enterprise, 2003)

Phase 6: 1990s – 2006 Bicycling in decline

We've really done as much as we can really do for bicycle facilities. Unlike a lot of cities in California, we're really approaching buildout

Tim Bustos, 2004

Bicycle promotion efforts in [European university cities] demonstrate that considerable increases in bicycling are possible for cities with already high rates of bicycle commuting

Bay Area Economics report, 2006

By 1999, there was already a med decrease in bicycle activity in Davis. This would be confirmed in the 2000 census, where bicycle commute rates were found to have dropped by over 25% in the 1990s, from a 23% mode share to a 17% mode share.

Advocacy coalitions dissolved, poorly focused

Loss of Davis's primary bicycle advocacy coalition: public works staff retire

Integral to the success of the invention and development of the Davis bikeway through 1999 was the advocacy coalition among city public works staff. Dave Pelz and Duane Copley had been with the city since the early 70s, all rode bikes, all had extensive experience—designing all of the bicycle facilities in Davis. These three, however, all retired within a short period in the late 1990s.

This coalition, evidently, did not include younger city staff, council members, or members of the public. When Pelz was nearing retirement, he hired a full-time bicycle coordinator, Tim Bustos, to ensure that the city still had in-house expertise and advocacy for continued development of bicycle facilities.

After the retirement of the key city staff, however, the development of bicycle infrastructure has lost the consistent good quality it once had. The quality of bicycling on projects designed after 1999 is irregular, with some well good designs, but some that are remarkably poor. This difference can be noted in both on-the-ground observations and reports of the attitude of public works staff towards bicycle needs before and after Pelz's retirement.

Bustos, working as a coalition of one, has not had the public, political, or administrative support to play a more active role in bikeway design, and there has been a dramatic break in the continuity of good facilities the city once enjoyed. Bustos has publicly and privately encouraged others to step forward and create a movement to refocus the priorities at the city and guarantee a better proof-of-design in the early stages of planning and design, but a coalition has yet to materialize.

Debate over the causes, importance and reversibility of the drop in bicycling

Before 2001, debate about the decline in bicycling was largely speculative, as neither the city nor university measured bicycle traffic volumes. The only data was provided by the university's mode share assessments done every 10-12 years, and the US Census, done every ten years.

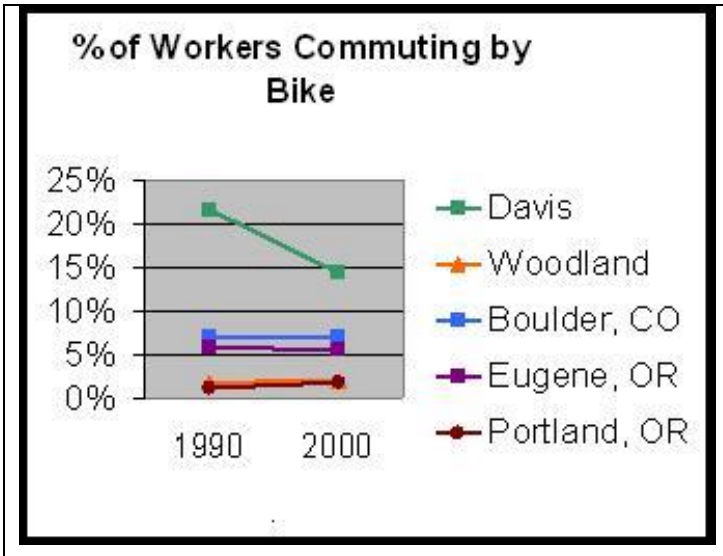


Figure 26 The percentage of workers commuting by bike dropped in Davis from 1990 to 2000. (US Census)

In 2001, the census figures declared what most people had already suspected, that there was not nearly as much bicycle commuting as there had been in 1990. Only 14% of Davisites commuted by bike in 2000, vs. 23% in 1990. Davis still had, by far, the

highest percentage of commuters of any city in the United States, but it appeared that further innovation, or restoration of the conditions found in the early 1970s would be necessary if that was to occur.

In 2004, the campus mode share assessment confirmed that fewer students, staff and faculty were commuting to campus than in 1992. (Chaheen et al 2003, LRDP 1992).

David Takemoto-Weerts, the university's bicycle public relations man, periodically writes articles in the Cal Aggie about bicycling, and he asserts that Davis is still a "great place to ride a bike," and the drop in numbers is largely the result of external causes, such as a generation of students unaccustomed to riding bikes, the ease of Unitrans service, and the unaffordability of housing in Davis.

[city staff don't think there's the possibility for an increase in bicycling].

[but still, no evidence one way or the other to prove or disprove the hypothesis, nor is there the notion that experimentation of incentives may improve ridership]
[resignation of city and campus staff to decreasing bicycle usage]

Recognition of the need for public advocacy

The planning process typically takes several years, so it was the early 2000s before the general public became aware of the changes in public works and the negative effects on bicycling. Many citizens realized that leadership was no longer coming from city council or staff, and that action would need to be taken by someone, somewhere if the general will of the people—that bicycling conditions be maintained, and bicycling be encouraged, was to be recognized by city hall.

In 2005, Davis finally organized a Bicycle Advisory Commission—a citizens' board to address bicycling issues in the city.

Steve Tracy, a long-time Davis resident and active bicycle advocate in the 1990s and 2000s, feels that the city staff have nor been able to face the new challenges of designing bike facilities with heavy traffic. He feels that the old-timers still think that bike lanes on arterials are adequate for Davis's needs, but that as traffic gets heavier, the paths become less suited for novice and timid cyclists (2005).

Tracy also laments the lack of interest among current city staff on the improvement of cycling facilities. He uses a case to illustrate his point—he measured the lanes on Russell Blvd in front of City Hall, and determined that the right hand lane in front of City Hall was wide enough (17') that it could be divided into a narrower vehicle lane (11') and a bike lane (6'). He made this suggestion to public works staff, but they not only rejected the proposal, but reconfigured the street making, both driving lanes somewhat oversize and eliminating the natural bike lane location. Tracy contends that this is a very different atmosphere at Public Works than existed when Pelz was director (2005).

Roads not taken

The early 2000s are marked by some significant deviations from the previously smooth design of bicycle facilities in Davis. Policy failures are difficult to identify in the past, because they are not lauded the way successes are, and they may be corrected later. But the early 2000s have some changes to the bicycle infrastructure that appear to be unique.

City of Davis: removal of Marden St. greenway connection

Figure 27 Davis's first closed greenway (arrow)

One of the basic premises of Davis land development is that all neighborhoods are to be connected through the bike path network.

In the early 2000s, a new neighborhood was added to the Pioneer School area, and was connected to the existing neighborhood park and school by a single greenway connection through a cul-de-sac.

Shortly after the neighborhood was built, new residents decided that they didn't want to be connected to the older part of the neighborhood, and petitioned that the greenway connection be closed. Lacking a "Transportation" or a "Bicycling Advisory Committee," the proposal was deliberated by the Safety Advisory Committee, which found no fault with it.

This not only makes it challenging for children and parent in the neighborhood to access the school and park (up to six blocks added to the walking/bicycling distance), but it also creates a precedent for neighborhoods to become geographically exclusive, at the cost of accessibility to their own residents.

Harper Junior High School

A hallmark of the "bicycle revolution" in the late 1960s was the concept that all children should have safe, convenient routes to school, and children would then be more

likely to walk or bike to school. Schools were oriented towards neighborhoods, and boundaries were porous to minimize the travel distance to school.

In fall, 2004 Davis opened Harper Jr. High on the east edge of town. The design was a radical change from all schools previously built. The main entrance was on Covell Blvd, a busy, suburban arterial. For a segment along the entrance, the bike lane on Covell was physically separated from the street by a fence, to prohibit access to the school by bicycle. This also has a negative effect on bicycle traffic, as the bike lane cannot be cleaned with city equipment.

A preexisting bike path could have provided access to the school from the southwest corner, but the site design dictated that a 12-foot tall fence, 1/4 mile long be erected to force children to access the school site from the northwest corner. The additional quarter-mile may be only a minor inconvenience to cyclists in good weather, but for pedestrians or poor weather it is a deterrent. Compounding the problem is the neighborhood design, which requires motorized vehicles in surrounding neighborhoods to use circuitous routes to drive up to Covell Blvd to access the school, resulting in a disproportionate increase in school-travel miles and adding traffic to a busy arterial street.

This is clearly a design failure, as grade separated bikeways in East Davis and over I-80 designed in the late 1990s were designed specifically to enable children to ride to the planned school, but the final leg to the school is unnecessarily cicuitous (Bustos 2004).

Campus bicycle planning impossible at worst, adequate at best: the tale of three campus bikeways

UC Davis never had the level of sophistication of bicycle planning as the City of Davis, and its bikeway system has been more of an ad hoc operation. While the 1994 Long Range Development Plan calls for improvements to be made in bicycle infrastructure as the campus grows and intensifies, application of this policy is inconsistent. This, combined with an insecure funding supply, has continued to result in inconsistent policy on bicycle issues, and rarely results in an improved outcome when confronted with change.

Northeast of the main campus is a group of residence units, and they are connected to the main campus by three separate bikeways. At the south was a path on the north side of Hutchison Drive, in the middle was a path on the south side of Orchard Park Drive, and at the north was a grade separated path under LaRue Road. These paths were built in the 1970s, and remained largely unchanged in 2000. They were about 8-12' in width, were multiple use (pedestrians and bicyclists) and were straightforward, direct routes from the housing area to campus.

In the early 2000s, all of these were displaced by construction on campus—one was removed entirely, one was replaced with an inferior path, and one was carefully studied and rebuilt to its prior quality.

Hutchison Path

The south path was displaced by construction of the Science Lecture Hall and the West Entry Parking Structure. As per the "bikes function best when treated as cars"

philosophy of UC Davis bicycle coordinator David Takemoto-Weerts, the path was eliminated altogether, and bike lanes were added to the adjacent street—Hutchison Drive.

The bike lanes are extremely narrow are not widely utilized, as many cyclists now use the sidewalk along the parking structure, bumping up and down curbs as they go. Intermingling bike traffic with motorized traffic at this intersection was a dubious choice, as peak hour traffic forecasts indicated over 2000 cars per hour would use this intersection, with a high proportion of buses and heavy trucks (Fehr and Peers, 2002). Much of the traffic is headed directly to and the freeway, and may not be familiar with sharing the road with bicyclists. Furthermore, there is no special provision to enable eastbound bicyclists to access the bike lanes, they need to cross Hutchison traffic (1000 cars per hour at peak period) as pedestrians at the traffic signal, or

When I queried campus staff over the decision to replace a popular, busy bike path with narrow lanes on a major arterial, Takemoto-Weerts defended the choice, stating that they felt cyclists would be adequately served by the bike lanes (UCD Bicycle Committee, May 2006). The dangerous nature of this choice was driven home on Sept 26, 2006 when a 28 year old graduate student on a bicycle narrowly escaped death when her bicycle was run over by a UPS truck. (Aggie 2006).

Orchard Park Path

The middle path was disrupted and shoddily rebuilt after construction of the ARC, to minimal standards far below those found in the Highway Design Manual (2001). There were tight turns, no clear zones (shoulders), and the width was narrower than the path it replaced. There was also a traffic circle installed with a relatively steep reverse

superelevation, requiring speeds of about five mph under good conditions. Minor modifications were made after a professor lost his kneecap in a spill, but it remains substandard, and nearly all cyclists simply ride through the parking lot instead. Despite the problems with the facility demonstrated by high accident rates and avoidance, campus staff insist that the design is adequate, and have no plans to improve the facility or to implement more stringent design reviews (UCD Bicycle Committee, May 2006).

Segundo Path

The north path was displaced by a new dining facility. Prior to reconstruction, detailed bicycle and pedestrian counts were taken, and it was determined that it was unfeasible to rebuild the path in its previous location, as at peak periods bicycle traffic would conflict with foot traffic at unacceptable levels. Rather than subject all users to tedious and dangerous interaction, the path was rebuilt on the south side of the facility (Dulcich 2001). It now handles traffic as well as it did previously, the only possible design flaw being the lack of a sidewalk so pedestrians and cyclists on the same route can use different facilities, as was recommended in the 2001 UC Davis Bicycle Plan (p. 4), and recommended specifically for this section of path in the 1980 Campus Bicycle Safety Improvement Report (p. 15).

Recent campus bicycle policy is adequate at best, poor at worst. These range of decisions in this corridor are similar to modifications found elsewhere on campus—plans made previous to dislocation may or may not exist, where they do exist they may or may not be followed, and the end result is not guaranteed to be safe or attractive to cyclists.

Summary

In 2005, there was a broad range of bicycle infrastructure being built. Even in the space of a few blocks, radically different approaches were made to bikeways. A mixture of on street and off street, high quality and low quality, functional and dreaded. It shows that there is no overarching commitment to building an excellent city for bicycling, but it also demonstrates optimism for the future—that the expertise is present, and if applied uniformly, we can avoid poor designs.

Chapter 4. Analysis: people, coalitions and policy: shaping bicycle infrastructure.

As seen in the previous chapters, the shaping of Davis was established between 1967 and 1972, and since then there have been relatively few changes in policy or design. In this chapter, I will analyze how the events occurred in the context of the theories of policy change—at what points did policy change, what were the drivers of the change, what were the limitations of the change, and how effective were the proponents. I will look at four instances of policy change and direction, each has played a major role in shaping the bicycling environment in Davis. They include

1) the creation of the bicycle safety committee (1964),
2) the construction of the first bike paths (1966-1967),
3) the strong core at Public Works (1970 – 1999), and
4) development of the Davis Greenway policy (1986 – 1990).

On the whole, these are the key policy formulation processes that have shaped Davis. Each instance involved politics, policy and problems. Each involved a major change in course for policy, each had a politic element, and each had advocacy coalitions seeking to influence the policy.

I will discuss each case study using the following template:

- Background: description of situation or event –people, problems, policies, politics.
- Action: description of what was done, who got together, what did they propose, what did they do, how did it turn out.

- Results: discussion—how successful was it? What can we learn from it? What compromises were made?

Case study 1: The Citizens' Bicycle Safety Committee and the establishment of pro-bike policy, 1964 - 1966

Analysis: *1964 – 1966: Building political support: Citizen advocacy coalition*

Preexisting policy

The existing policy was no policy. Bicycles were welcome to use the street, but there was no particular provision for them. Bicycles were discouraged from using the sidewalk, and there appeared to be a festering disgruntlement about bicycles on the parts of drivers and pedestrians.

Though the April, 1964 update to the Davis General Plan had strong language supporting bicycle infrastructure, this does not appear to have been realized in actual practice, based on the chilly response given to the advocacy coalition by city staff and council.

The three criteria for policy change: problem, policy, politic.

Problem (present)

Every year there were more cars, more bicyclists, and more pedestrians. While new streets were being built, the existing streets weren't widened, and conflicts were increasing. The campus policies had prevented this from becoming a problem on campus, made this "problem" nonexistent on campus, but had exacerbated it in the city by encouraging everyone to get around by bike.

Policy (present)

Frank and Eve Child, having spent four months in Holland, proposed a policy solution—striping of streets with separate lanes for cars and bikes. This policy appeared to be suitable for the situation in Davis, but there were no existing local examples that could be shown to policymakers, and existing road policy did not permit such a solution. Nonetheless, the idea was so logical that it stuck a responsive chord with many Davisites, and was an obvious candidate for adoption.

Politics (absent)

Lacking in Davis in 1964 was the political will to change policy. Council and staff were united against considering a citywide system of bike lanes or other infrastructure. They used conventional arguments to defray the proponents by denying the problem and discrediting the proposed policy ("we already have the most bicyclists of any US city" and "bike lanes will not solve the problem because most accidents occur at intersections.")

Advocacy coalition

Frank and Eve Child were the catalysts that assembled a small advocacy coalition to change bicycle policy in Davis. The members were all Davis residents, without any city staff or public officials. They met in homes, worked with each other, and slowly whittled away at arguments posed by opponents.

While the coalition started out small, the constant, illogical opposition in city hall contributed to their strength.

Policy entrepreneurs

The coalition's strength was in having patient, sensible, logical members. While it didn't have any political clout amongst the membership, it had the power of the logical policy solution to a problem. They wielded their strength well, some examples include:

- Frank Child returned to successive city council meetings and announced the number of signatures they had collected on the survey, from 600 to about 2000 a year later.
- Members met with police chiefs, planners, and others who had professional training to assure them that the status quo was sufficient for the needs of the city.
- Their petition was clearly worded and presented clear arguments.

These types of techniques are considered standard for policy-makers in waiting, as they craft their policy, assemble political support, and wait for an event that opens a policy window. By making friends with whoever they could befriend, and presenting themselves as benign, sensible citizens to potential opponents, they were well positioned to launch a policy when a suitable event might occur.

Opening the policy window

As the coalition's strength grew, they were induced into the political realm, and were asked to sponsor city council candidates at the next election. It turned out that bicycling was ***the*** primary issue in the election. And the bicycling advocates won an overwhelming victory. This created a policy window, where the new officials had a strong mandate to implement the policies proposed by the advocacy coalition.

Results

The efforts led to overwhelming results, including a decisive victory in city council elections, broad public support, and an enrichment in Davis's bicycle culture as people became more deliberate in their bicycling habits.

Case study 2: from policy to implementation—policy precursors necessary for bike path creation, 1966 – 1970

Preexisting policy

There was still no bicycle policy in the spring of 1966. All of council and staff's efforts had been to assure the citizen advocacy coalition that there wasn't really any problem, and that existing policies and procedures were adequate. The change in city council brought an immediate need for staff to quickly develop policy and engineer solutions.

The three criteria for policy change: problem, policy, politic.

Problem (present)

The problem was now ***how*** to implement the policies. The problem was established—better facilities needed for bikes. Bikes needed full design standards for city streets, so engineers could design streets to function well for cars, bicycles and pedestrians.

Policy (absent)

The policy was the engineering and other implementation steps needed to put the proposed policy on the ground. How wide would the bike lanes be? What treatment was required at intersections? How could lanes and paths be retrofitted in an existing city? How could the state motor vehicle code be modified to accept these new street configurations?

Politics (present)

In 1966, the politics were the strongest component of the policy changing force. City council had a strong mandate from the voters, and therefore a vested interest in expediting the development of new, effective policy.

Advocacy coalition/Policy entrepreneurs

In the 1966 – 1972 years, there was a very effective advocacy coalition of citizens, council and staff. By all reports, they worked together well, and developed standards and policies that were effective in inventing a new type of street layout. The group was able to get the state vehicle code changed in relative short order, and laid paint on Third Street in summer, 1967 to create the first bike lanes.

The coalition then succeeded in inventing and designing many other elements of bicycle infrastructure. The strength was a mix of people with different backgrounds, different positions of authority and expertise, all with a will to maximize the bicycle-friendliness of the city.

All members of the coalition appear to be policy entrepreneurs as well, there was experimentation taking place on all levels, and many problems were solved with different designs in different places to see which worked best.

Opening the policy window

The policy window, opened with the election of 1966, remained open until the early 1970s, when another equilibrium set in. This long period of flux—over five years—allowed for a maximal level of innovation to occur. There was no pressure to close the policy window and preclude further innovation. Instead, the window finally

closed when new policies had been shown to be more than sufficient to resolve the problem.

Results

The results were an unprecedented flurry of design and experimentation in bikeways. Davis build dozens of unique facilities. Many were not successful, but the most functional designs were advanced as state and national templates. By 1972, bike lanes or paths existed on nearly every street in Davis.

Case study 3: A resident population of pro-bicycle civil servants, 1970 – 1999

Analysis: *1972 – 1990s: City staff advocacy coalition*

Preexisting policy

In the mid 1970s, the skills of the city staff and others had developed a thorough, well designed set of templates for building bicycle lanes and paths. Endorsed by city council and the public, the template was to be used under ordinary conditions, and staff were to find suitable substitutes in unusual circumstances.

During this time, Davis gained a reputation for being on the forefront of environmental and social issues. In the early 1970s the "green suburb" of Village Homes was built, solar power was popular, the student-run transit service Unitrans was gaining popularity, and city council passed landmark ordinances on energy efficiency.

The three criteria for policy change: problem, policy, politic.

Problem (solution absent)

The problems during this period were as follows.

Relatively easy problems. These problems could be easily monitored and had easily definable technical and policy solutions.

1) Ensure that the design standards developed earlier were implemented in all new construction and reconstruction.

2) Ensure that new designs were developed as needed to make unconventional new construction fir seamlessly with other bicycle systems.

3) Keep education, enforcement and encouragement programs active and successful.

Unfortunately, larger problems were brewing, including

1) deal with the need to upgrade older facilities if they became obsolete or congested.

2) change policies as needed as city demographic changes. Older people, more Sacramento commuters, wealthier students.

3) change policies as needed as infrastructure changes. Unlimited undergrad access to Unitrans buses, changes to infrastructure on campus.

Policy (present)

Policies developed in the 1967-1972 era were successfully applied to most of the new problems encountered in this era.

Politic (present)

City staff enjoyed strong support from council during this time period.

Advocacy coalition/policy window

In the late 1960s public works staff were very pro-bike by nature of the new component of their job description—to create precedent, invent and implement.

At this time, they hired a young engineer named Dave Pelz to be on staff. Pelz had recently bicycled around Europe and was a personal advocate of bicycles as transportation. Pelz worked well with Duane Copley, who had been hired in 1965, and the staff at public works made an advocacy coalition on their own. At the same time, bicycle planning professionals were attracted to or created in Davis, and several major players at CalTrans in Sacramento were career-long residents of Davis, including state bicycle program director Rick Blunden (1967 – 1999) and Richard Haggstrom, various state bicycle positions, 1975 – present).

During this time, there was relatively little participation from the public or from elected officials, and Davis's bicycle infrastructure took shape in a uniformly good manner.

Results

Pelz and the other public works staff, by all accounts, worked together well and created a seamless bicycle network in all new developments in the city. There was little strife, little cause for citizen complaint. City council did little guidance. Policy had been set by 1972, and there were few new problems that arose requiring additional input from members outside this advocacy coalition.

This group is unique, perhaps, in that it did not set policy, nor did it have a political element. Rather, its purpose was to fine-tune existing policy to ensure that it was effective in all new developments in a growing town.

Some elements of the policy were emphasized more than others. Policy called for lanes on streets, and a secondary transportation system of paths. Pelz himself is an advocate for bikes being on streets and sharing space with cars, and this was manifest by

a stronger network of on-street lanes than paths. Lanes connect fairly well to all major destinations in Davis, they are well marked, and, consequently they are well utilized by residents.

Other elements that were brought to this group but not advances were specific safety issues in some parts of town, where Ed Martin from the Davis Bicycle Club suggested that the existing bike lane system was lacking in safety elements for less experienced cyclists. While these elements were periodically addressed, they did not result in major policy changes or a change in the structure of the advocacy coalition.

Discussion

The strength of the public works advocacy coalition was another result of the initial starting point for the Davis bikeway system—a strong mandate from council and engineers willing to design bike systems. This resulted in the hiring of a generation of city staff who had the mandate in their job descriptions from the beginning of their interview until the day of their retirement.

While this created a very strong system that did not require further political support for input for over 25 years, it was not able to replicate itself. In 1994, Pelz was successful in gaining approval to create a city bicycle/pedestrians coordinator, in an effort to ensure that the consistency and quality of work would continue after his own retirement. Somehow the transition was not successful, though, and the city has not had any strong advocacy coalition since 1999. It seems likely, at this point, that the success in the 1972-1999 era made it difficult for a smooth transition away from the Pelz-directed public works programs. There was little or no citizen involvement, little or no council oversight, and somehow momentum has not been carried through with city staff.

Case study 4: Development of the Davis Greenway, 1986 – 1992

Background

In 1986, Professor Mark Francis and his colleagues and students proposed that the city's general plan and subdivision code be revised to create a greenway loop around the city, with networks in each neighborhood. This would allow walkers and bicyclists to travel around and throughout the city without interacting with any cars at all, thus creating a more relaxed and inviting transportation system for pedestrians and young, old, and timid cyclists (Francis, 2007).

Problem (opportunity present, but problem absent)

Bicycling in Davis was as good as it could be, it would seem, in 1986. Car traffic was low, bike traffic was heavy, and all streets had bike lanes. Kingdon (1995) describes the three streams (problem, policy, politic) as being applicable to problems facing government, but it being unrealistic to expect government to take action on opportunities.

In this case, it appears to be purely the opportunity to create an entirely separate transportation system citywide that motivated the movement. By simply requiring new construction to include greenways, and slowly filling in missing links elsewhere, the city could have a huge future benefit to nonmotorized travel.

Policy (present)

In 1969, "greenbelts" were incorporated as components of the Village Homes development in West Davis and the Northstar development in North Davis. Greenways had been built in many other cities as well, from before Davis even built its bike lanes. Boulder, CO was a model, as was Eugene, OR.

Greenways were supported by the subdivision requirements adopted in 1969 and the city's general policy about making bicycling safe for both timid riders (children, elderly, novices) and proficient riders. But, after 15 years of policy, the city had only a few more greenways than it did in 1975, and some developments, such as West Davis beyond Lake Boulevard, had no greenways at all.

Politic (absent)

Initial support for the greenway proposal was mixed. Francis created a proposal for the General Plan, but found no sympathetic ears among the rest of the committee members. Plans for some parts of the greenway system, such as the Putah Parkway from campus to South Davis, had been in existence for over ten years, but there was no preexisting support for a proposal to build or expand the scope of the proposal.

Opening the policy window

Figure 28 The I-80 Putah Parkway component of the greenway system opened in 2000. At the grand opening, all parties were in support. (Russell Reagan photo)

After being soundly rejected by the General Plan Update Committee, Francis took his proposal to higher levels in hopes of finding an audience that would share his vision. He found this in UC Davis Chancellor Theodore Hullar and city councilors Lois Wolk and Ann Evans. With some gentle behind-the-

scenes networking he convinced both parties to ante up part of the initial costs, and the project began to gain recognition and support (Francis, 2007).

Results

Francis and his colleagues were primarily interested in design and use of the greenways. The political process seemed to be a necessary evil to accomplish their dreams. They never had a formal "Friends of the Davis Greenways" advocacy group, and while the vision was carried by a number of people in private and public positions, it lacked the focus necessary to ensure that projects didn't fall through the cracks. For instance, the at-grade crossing of Cowell Boulevard was a result of City Council "blinking" in a face-off with a developer, and the lack of a Putah Parkway-downtown connector along the railroad tracks is probably a similar seemingly minor compromise.

The overall project, however, is a success. In 2006, about 60% of the original plan had been implemented, much of it simply as application of the city's subdivision code. Davis residents love their greenways, going on walks to playgrounds, evening strolls, and casual bike rides. In the post-1990 suburbs they are considered a critical element of the bike-to-school infrastructure. While they are discontinuous, lack directional signage and are not designed to commuter path standards, they are a monument to the ability of an advocacy coalition using the multiple streams theory and policy entrepreneur concepts to make a permanent, positive change in their community.

Advocacy coalitions compared		*Preexisting policy streams*						
Coalition	*Time period*	*Problem*	*Policy*	*Politic*	*Level of ambition*	*Opposition*	*Coalition makeup*	*Outcome*
Bike lane lobby	1964-1966	X	X	—	High	Strong	Citizen	Entirely successful
Bike lane implementation	1966-1972	X	—	X	High	Weak	Citizen/ staff/ council	Entirely successful
Building a bicycle paradise	1972 – 1990s	X	X	X	High	Weak	Staff/ council	Largely successful
Greenway movement	1986 - 1990	—	X	—	High	Weak for urban, strong for rural	Citizen/ council	Success with urban greenways

Chapter 5. How does Davis compare with peer cities?

Comparison in the 1960s and 70s

The western United States had many small, progressive university towns in 1960. Each of these had external circumstances well-suited to bicycling, some more so than others. These included

- Chico and Santa Barbara, California
- Olympia, Washington
- Eugene and Corvalis, Oregon
- Missoula, Montana
- Provo and Logan, Utah
- Tucson, Arizona
- Fort Collins and Boulder, Colorado
- Las Cruces, New Mexico

External factors: comparison to Davis

All of these had between 50 and 75% of the same external factors as Davis. Some probably had additional factors that Davis didn't, such as mild summers or attractive outdoor recreational opportunities. In the 1950s, these were also sleepy little towns that had not yet felt the pressure of post-WWII urban growth or the influx of baby boomers into the university systems. In the early 1960s, Missoula, Eugene, Boulder and Santa Barbara all had sizable bicycling communities (Sommer, 2007).

In the 1960s, when growth was first occurring the 10-speed bike hadn't come into popular use yet, so the hillier towns would have had some challenges for riders until geared bikes became available. Snowy climates would have precluded bicycling as a 12-month activity by many people. And most of these towns are larger than Davis and had other industries that would have added more diversity to the residents and diluted that political power of the university-oriented voting block.

Internal factors

As Davis's unique bicycle culture blossomed largely as a result primarily of infrastructure and promotion, these other cities appear to have failed to become "bicycle capitals" because they did not have the same mix of leadership and supportive citizens enjoyed by Davis. Given Eve Child's determination and Frank Child's ability to articulate arguments, and the force with which their views swept away political opposition in Davis, the geographical challenges of these cities may not have been a formidable match. For instance, when asked whether they felt they could have achieved the same results in other cities with similar physical environments, Eve Child asserted "I was so excited about riding a bike that I would have gotten it done there, too." Santa Cruz, unfortunately, was not deemed a possible city, with extreme topographic relief and very narrow streets. (Frank and Eve Child, 2007).

Invention and ingenuity could have ameliorated external conditions in these towns. Had a town with winter weather had the same determined leaders as Davis, the mountain bike may have come into fashion many years earlier. Ten-speed bicycles were in common use elsewhere, and the mountain bike was invented by future Davis resident

John Finley Scott in 1953. Specialized equipment would have added another layer of challenge to the creation of a "bicycle capital," but if another town's leaders answered the challenge of infrastructure design needs with superb success, it is possible that other engineering needs could have been met with similar enthusiasm and success, and resulted in a city with fables swarms of studded-tired mountain bikes creating rush-hour traffic in Fort Collins, Colorado in 1971.

Summary

Many towns appear to have the same basic physical geography as Davis, could have become "The Bicycle Capital" themselves, where anyone could and would ride a bike for their daily travel needs. The primary differences between Davis and the other cities are climate and topography, which would have been a challenge to mass-produced bicycles of 1960. Another difference may have been the somewhat larger size and more diverse economies of other towns, so dilution of bicycle-oriented university community may have been more significant. While these were valid barriers to the other cities on a possible quest for "bicycle capital" status, they are only nominally more challenging than the political opposition faced in Davis. Had other cities had the same internal factors as Davis, or had inventors that could have brought early adoption of geared bikes or studded tires, "bicycle capital" status appears to have been within reach.

Davis's sister city, Chico, appears to be what Davis would have been without bicycle-oriented civic leaders. Chico has nearly all of the external factors, but few of the internal factors. This suggests that had the civic leaders that shaped Davis located instead

in Chico, that Chico would have become "The Bicycle Capital of America" and Davis would have secured the "Square Tomato Capital of America" title instead.

The tortoise and the hare—has Davis been superseded as the "bicycle capital?"

In 1990, Davis was the clearly the "bicycle capital of America" with 3% of commute trips made by bike. Though it was the national leader in bicycling, it had fallen far behind in development. Very few new concepts were "invented" in Davis after 1972, and policies invented elsewhere were slow to be adopted in Davis. For instance, other cities have bicycle commissions, design review commissions, regular monitoring of bicycle traffic volumes, aggressive bicycle plans that

Meanwhile, as older staff moved on in the city, university and police departments, they were often not replaced by equally enthusiastic new hires. For instance, Mr. SmartSpokes was a talking bicycle who would travel to schools and teach children about bike safety and bike benefits. But when the voice of Mr. Smartspokes retired, administration did not appoint a replacement, nor did anyone step forward on their own. Mr. Smartspokes is long gone, and there is no institutionalized education process for primary school students. (Copley 2006. Mr. Smartspokes' script is archived in Pelz 1977).

In the late 1990s, two other cities began programs that were analogous to the Davis "bicycle revolution" in the 60s and 70s.

Boulder, Colorado

Boulder, a city of 200,000 on the east face of the Rocky Mountains, was faced with a traffic congestion problem, started a movement to populate the city with bike lanes and other incentives to bicycle. The city began an ambitious effort to create Davis-style greenways, and retrofit the downtown with better bicycle facilities. This process was accelerated under the leadership of Mayor Will Toor in 1999, and in 2004 they boasted a [12% -- source] bicycle commute rate, up from [9%?] in the 2000 census ([County data] 2004; Toor 2005). Toor and his supporters are using all the same arguments used by Davis bicycle advocates in the 1960s, and are succeeding in creating a second "bicycle mecca" in the United States. They are challenging the age-old assumptions about Davis—that 1) Davis has unique social or political conditions that can't be replicated elsewhere, 2) flat topography is needed for the general public to begin bicycling (Boulder is fairly hilly) and 3) a mild climate is

In 2005 I met with Toor and asked him, amongst other things, whether he thought Boulder had surpassed Davis in bicycle commute mode share. He did some mental calculations and declared that Davis was, for the time being, probably still "in the lead."

Portland, Oregon

Portland, Oregon is the core city of the largest metropolitan area in Oregon. With a city population of over 250,000, it is far larger than Davis. In the mid 1990s, Portland began a long-term project to improve bicycle facilities in the city, emphasizing the connection of residential areas within a 5-mile radius of downtown.

Unlike Davis in 1966, which had unallocated space on city streets that could be readily designated as bike lanes, Portland's streets and bridges were marked as vehicle

lanes from curb to curb. Establishment of bicycle facilities, then, required a much more intensive, expensive and creative effort than was needed in Davis.

Over the next ten years, hundreds of segments of bicycle infrastructure projects were designed, funded and built, particularly on and leading to the bridges over the Willamette River.

In the 1990-2000 period, when bicycle commuter levels dropped in Davis, they rose overall in Portland. Interestingly, in the area within 2 miles of downtown on the east side of the Willamette River, bicycle commuter levels rose from 4% to 8%. By 2005, they were up to about 10% in may neighborhoods near downtown (Birk 2006).

The Portland experience questions the assumptions about the success of bicycling in Davis in the 1970s, and the inevitability of its decline in the 2000s. Portland is not a "company town," nor is it flat, nor is the climate particularly well suited to bicycling. And the success in Portland was achieved with the same American citizens as had been failing in Davis. It is conceivable that if the success continues, that there may be a district in Portland equal to the size and population of Davis that has a higher bicycle mode share, thus refuting not only the original assumptions about Davis's success, but also the perceived inevitability of its later demise.

Present comparison

Davis has been without peer among American cities since anyone started keeping track. When promoting bicycling in the early 1960s, advocates learned that no other city had the same levels of ridership as Davis, and that status was maintained until at least 2000. Now, Boulder CO appears to be approaching or surpassing Davis in overall levels of bicycling, and Portland appears to be approaching or overtaking in absolute numbers

of bicyclists. There has never been, as far as anyone has reported, a serious comparison done to compare Davis with other centers of bicycling in the world, such as cities in South Korea, China, Holland, Denmark, or Germany. Bicycle use in many of these areas appears to greatly surpass that of Davis.

Comparison with American cities—US Census data

The US Census includes a "journey to work" question, measuring where people work and how they commute. This is the only "apples to apples" comparison available for bicycling levels in different cities. It is limited in that it does not include journey to school or incidence of bicycle usage for pleasure, errands, or social visits.

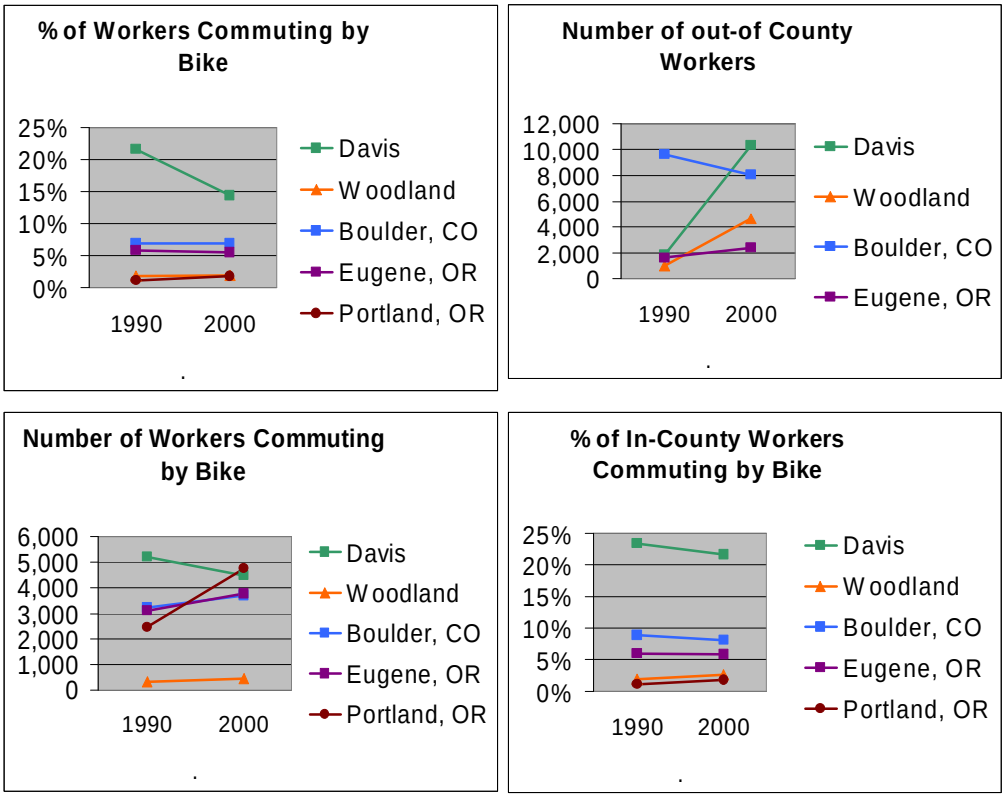


Figure 29 Comparison of bicycle use and county of residence between Davis and four peer cities (US Census data)

Davis was the clear leader in 1990 and 2000 in percentage of workers who bicycle to work. But, the proportion fell by over a third, from 22% to 14%. Peer cities maintained their share, or, in the case of Portland, increased it. In absolute numbers, Davis dropped about 500 riders, while Portland increased almost 2500 riders, slightly surpassing Davis.

Many have suggested that in the 1990s Davis had a major influx of out-of-county employees. Comparing the number of in-county workers, this allegation is confirmed, as Davis had enormous increase in out-of-county workers from 1990 to 2000, an increase of 10,000 workers. Boulder, Portland and Eugene did not have this challenge. Finally, when the bicycle commute mode is "corrected" for out-of-county workers, it shoes Davis well in the lead among "possible" bicycle commuters. This shows Davis well in the lead in both 1990 and 2000, but still with a three percentage point decline from 24 to 21%.

By these criteria, Davis is still the leader in bicycle use in 2000, and there will be no subsequent data available for comparison until 2011.

Looking at post-2000 trends, Davis has not fared so well. Boulder had a maverick mayor from the late 1990s until 2004, who promoted bicycling in many ways and nearly single-handedly changed the face of Boulder's commuting population. Boulder county reports 21.3% mode share in 2004, but this could include journey to school, so there is no comparison for Davis.

Comparison with American cities—intensity of policy development

While Davis remains the leader in terms of commuter mode share, its share is clearly falling, and other American cities have had increases during the same time period. Examination of other cities shows intensive advocacy efforts, intensive infrastructure improvements, and active development of the social environment. The specific projects done by these cities are somewhat similar to Davis's 1970-era developments, but are uniquely tailored for the needs of 21st century bicyclists.

Portland has been adding bike lanes and infrastructure to streets since the mid 1990s, and has documented long term improvements over time, directly correlated to the quantity and quality of bicycle infrastructure. Correlation helps justify continued expense in the system, as the bicycles require less infrastructure than cars, and if it is being used, it is an incentive to continue to build it.

Boulder has been actively adding bicycle infrastructure and promoting bicycle programs, and has recorded major increases in ridership. Programs are designed to cater to cyclists needs, and give them a sense of pride in bicycle use, such as bicycle drive-through automated teller machines.

During this same time period, Tim Bustos, Bicycle Coordinator for the City of Davis, often advised people that bicycling demand in Davis was saturated—that anyone in Davis who wanted to ride a bike was already doing it, and that it would be easier to get a one-percentage point increase in bicycling in Sacramento or Fresno than in Davis (Bustos, 2005).

The difference in civic bicycle attitude is a major difference between Davis and other cities.

Summary

In 2000, Davis had the highest levels of bicycle use among peer cities in bicycling by most metrics. But, bicycle usage is declining here and increasing in peer cities. The differences between Davis and its peers appear to not be external, uncontrollable problems, but a fundamental difference in how bicycle problems are treated and improvements prioritized. Given that Davis had higher ridership in the past, adoption of programs similar to those of peer cities would logically create a similar increase in bicycle use here.

Davis, however, is not the "leader" among bicycle cities. All data suggest that Davis had been resting on its laurels during the 1990s and early 2000s while peer cities are surging forward. While Davis may be the statistical leader in terms of mode share, in the metaphor of the tortoise and the hare, the Davis has been ambling back towards the starting line while the tortoises march forward.

Chapter 6. Discussion of research

Having taken a serious look at the history of bicycle policy in Davis, and a basic analysis of the key advocates and the policy windows that opened, we can now discuss the basic questions we set out to answer with this research. These include the following.

1. *What were the underlying factors that resulted in Davis, CA becoming "The Bicycle Capital of America? To what extent were they driven by external circumstances? Internal circumstances?*
2. *What obstacles were overcome to make Davis "The Bicycle Capital?"*
3. *Did the bicycling movement ever nearly "fail?"*
4. *To what extent did Davis succeed in its efforts to become an "ideal" bicycling city? Are there areas where it fell short? If so, why?*
5. *What has been the relative contribution of" "physical environment," "social environment," "self selection," and "advocacy" in the creation and decline of The Bicycle Capital?*

While these are complex questions, and many can not be answered with certainty, we have uncovered enough of the history to be able to start a basic discussion on each of these issues. If further insight of information is produced, or if other explanations emerge, then we can happily add to our body of knowledge as our research continues.

What were the underlying factors that resulted in Davis, CA becoming "The Bicycle Capital of America? To what extent were they driven by external circumstances? Internal circumstances?

In 1960, Davis was unusually well situated to become "the bicycling capital."—probably better suited than any other city in the United States. Much is made of Davis's nearly perfect physical geography for bicycling. In fact, many people casually cite geography as being the primary element that makes Davis so different (see for instance Dunning, 2007). Other researchers make a more realistic, complex explanation, including the young population and the university-centered town.

To categorize the basic "drivers" of the development of Davis as "The Bicycle Capital" we'll break them into the subcategories of "external circumstances"—circumstances beyond Davis's control, such as topography and position in the region, and "internal circumstances"—causes explicitly created by political action within Davis.

External circumstances

Physical geography was very favorable.

- It was topographically flat.
- The climate was mild in the winter, and dry in the summer.
- It was small and compact.
- It was expanding its commercial district in the downtown core, locating new commercial spaces on bicycle-friendly city streets (while other cities were expanding commercial space by building bike-unfriendly strip malls on suburban arterials)

- It's location in the region favored bicycle use by enabling car-free regional travel.
- Campus/city geography favored bicycling. Campus buildings were convenient by bike travel to downtown, residential neighborhoods and research fields.

Cultural geography was also very favorable.

- Many people used bicycles for transportation before any infrastructure was built.
- Bicycles were well-accepted in the community as a mode of transportation.
- The city had a young population.
- College students are naturally suited for bicycle riding, being generally unemployed, young and fit.
- Professors are also well suited, having spent many years in graduate school and likely being more accustomed to bicycling than average citizens.

Internal circumstances

Davis had unusual leaders that were able to take advantage of the external conditions and maximize favorable circumstances for bicycles. Chancellor Emil Mrak was assigned to transform an agricultural campus into a major research university. He chose to promote bicycles as transportation, and explicitly instructed his architects to "plan for a bicycle-riding… …campus." The 1963 Long Range Development Plan for the university focused on making the campus as good of a place as possible for bicycling. Cars were restricted from the core, bicycle paths were to lope around all the buildings and cross under major roads. All buildings were to have bicycle parking. Mrak followed through and by 1966 Davis had become the indisputable "Bicycle Capital of America." Had the chancellor's office taken a different approach and planned for a car or transit-

oriented campus, or restricted bicycles for aesthetic or other purposes, it seems likely that Davis would not have blossomed as a bicycle town.

As the city and campus gained population in the 1960s, the city did not have leaders that matched Mrak's efforts; indeed the city council, police, and engineers held views at least partially opposed to Mrak. In 1964, Frank and Eve Child stepped forward and began campaigning on behalf of bicycle infrastructure in the city. They were up against a difficult fight, but eventually efforts by bicycle advocates shited the power structure of the city. After two years of determined effort, the bicycle lobby won an overwhelming, decisive victory. The strength of their victory was a result of the good campaign, assisted by the favorable geography that made every Davis resident a possible ally.

Following the victory, citizens, council and city staff formed a remarkably cohesive, functional working group to create the very best bicycle infrastructure they could. Working together, they changed the state code so bike lanes were acceptable features on streets. Then they experimented with different designs. City engineers also rode bicycles to work themselves, which ensured that facilities would be designed by users, and would likely be "fixed" if the design was flawed. Through years of academic research, on-the-ground experimentation, and constant support from council, they devised templates for a highly functional toolbox of designs for bicycle infrastructure. Once again, the success was a result of excellent politicking and engineering rather than a natural result of external conditions.

In addition to leadership, bicycle efforts in Davis also benefited by having residents who were willing participants in the ambitions of their leaders. Several people

have said that in addition to the obvious factors, they felt that Davis has always had an unusual civic mindset that made it well-suited to follow visionary leadership. It is difficult to evaluate the strength of the civic mindset, or how it might compare with the mindset of other cities, but it appears to have been a contributing factor (Sommer, 2005).

Summary: Internal vs. external factors

Davis had excellent external circumstances that made it uniquely or unusually well suited to become "The Bicycling Capital." But, given the significant opposition to bicycles shown by a powerful minority of the community and the high level of political and technical development required for implementation, it appears that external circumstances alone would never have resulted in the bustling bicycling Davis of the 1970s. The near-universal adoption of bicycling for transportation was a result of internal circumstances. Davis had leaders with great ambitions to facilitate bicycles for transportation, skilled planners and engineers to create the very best facilities possible, and civic enthusiasm.

What characteristics did Davis have in the 1960-1975 era that resulted in it being the sole "bicycle capital?" What did peer cities lack?

The western United States had many small, progressive university towns in 1960. Each of these had external circumstances well-suited to bicycling, some more so than others. These included

- Chico and Santa Barbara, California
- Olympia, Washington

- Eugene and Corvalis, Oregon
- Missoula, Montana
- Provo and Logan, Utah
- Tucson, Arizona
- Fort Collins and Boulder, Colorado
- Las Cruces, New Mexico

External factors: comparison to Davis

A qualitative investigation based on site visits, conversations with natives of peer cities, and comparison on maps, all of these towns had between 50 and 75% of the same external factors as Davis. Some had additional factors that Davis didn't, such as mild summers or attractive outdoor recreational opportunities. In the 1950s, these were also sleepy little towns that had not yet felt the pressure of post-WWII urban growth or the influx of baby boomers into the university systems. In the early 1960s, Missoula, Eugene, Boulder and Santa Barbara all had sizable bicycling communities (Sommer, 2003, 2007).

In the 1960s, when growth was first occurring, the 10-speed bike hadn't come into popular use yet, so the hillier towns would have had some challenges for riders until geared bikes became available. Snowy climates would have precluded bicycling as a 12-month activity by many people. And most of these towns are larger than Davis and had other industries that would have added more diversity to the residents and diluted the political power of the university-oriented voting block.

Internal factors

As Davis's unique bicycle culture blossomed largely as a result primarily of infrastructure and promotion, these other cities appear to have failed to become "bicycle capitals" because they did not have the same mix of leadership and supportive citizens enjoyed by Davis. Given Eve Child's determination and Frank Child's ability to articulate arguments, and the force with which their views swept away political opposition in Davis, the geographical challenges of these cities may not have been a formidable match for advocates with comparable wits. For instance, when asked whether they felt they could have achieved the same results in other cities with similar physical environments, Eve Child asserted "I was so excited about riding a bike that I would have gotten it done there, too." Santa Cruz, where they moved in 1983, was not deemed a possible candidate, with extreme topographic relief and very narrow streets. (Frank and Eve Child, 2007).

Invention and ingenuity could have ameliorated external conditions in these towns. Had a town with winter weather had the same determined leaders as Davis, the mountain bike might have come into fashion many years earlier. Ten-speed bicycles were in common use elsewhere, and the mountain bike was invented by future Davis resident John Finley Scott in 1953. Specialized equipment would have added another layer of challenge to the creation of a "bicycle capital," but if another town's leaders answered the challenge of infrastructure design needs with superb success, it is possible that other engineering needs could have been met with similar enthusiasm and success. For instance, history could have presented the world with fables swarms of studded-tired mountain bikes creating rush-hour traffic in Fort Collins, Colorado in 1971.

Summary

A cursory review suggests that a handful of other towns had the same basic physical geography as Davis and could have become "The Bicycle Capital" themselves, where anyone could and would ride a bike for their daily travel needs. The primary differences between Davis and the other cities are climate and/or topography, which would have been a challenge to mass-produced bicycles of 1960. Another difference may have been the somewhat larger size and more diverse economies of other towns, so dilution of the bicycle-oriented university community may have been more significant. While these were valid barriers to the other cities on a possible quest for "bicycle capital" status, they appear to be only nominally more challenging than the political opposition faced in Davis. Had other cities had the same internal factors as Davis, or had inventors that could have brought early adoption of geared bikes or studded tires, "bicycle capital" status appears to have been within reach.

For instance, in 1960, Chico, CA had nearly all the same characteristics as Davis. It had a strong university, excellent climate and topography, and a compact urban form. Its differences appear trivial--it was not as flat, had a less-dominant university, did not have agricultural research fields, and did not have as frequent of train service. By accounts of several people who have lived in Chico over the last thirty years, Chico has all the same raw ingredients as Davis, but it never had a strong culture of bicycle advocacy, never constructed infrastructure and today its streets are dangerous for bicyclists (Therriault, Cozad, Burton, 2007).

What obstacles were overcome to make Davis "The Bicycle Capital?"

In the existing histories of Davis's rise to extreme levels of bicycle accommodation and use, little opposition is noted. Was this really the case? Or was there a more realistic account that includes battles long since fought and won, with history being written by the victors? Investigating this is not easy, as the people involved in the bicycle movement were much younger than their opponents, so not only do they have the victor's advantage, but also the survivor advantage, in telling the tales.

Pre 1964

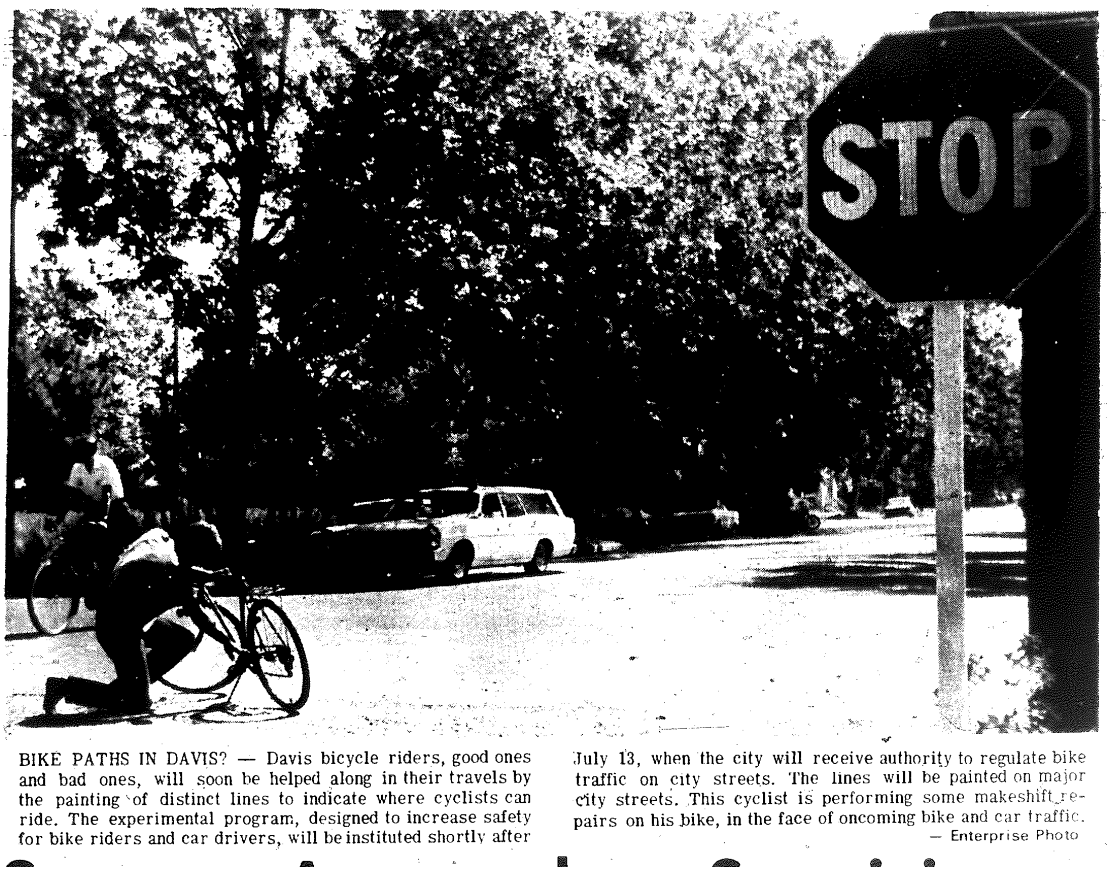
There is no evidence of resistance to Emil Mrak's proposals to create the most bicycle-friendly campus possible. The Long Range Development Plan contains no note of opposition, but supporting documents or contemporary public comments are unavailable. The bicycle language in the 1958/1964 Davis General Plan, as developed by Katherine Green, appears to be strong and undiluted, but again there are no records of public discussion or comment.

Given Mrak's firm grasp on power, the inherent appropriateness of his plan to the campus development, and the "blank slate" he had to work with, it seems likely that his proposals were accepted unchallenged. Greene's efforts in the General Plan were probably not universally accepted, simply because they were never implemented, and the pro-bicycle content was never mentioned by contemporary bicycle proponents. Most evident in this era, though, is the high profiles given in the Davis Enterprise to police enforcement of errant bicyclists, priorities given on headlines to parking lots and Co-ed weeks, with only the barest acknowledgement of Davis's unusual status as a city of

bicycles. This suggests that there was a sizeable public sentiment that did not value bicycling and would not necessarily support efforts to improve it.

1964 -1966

Opposition in this era is well documented. The Lotts and the Childs report opposition from every level of government—police, planners, engineers, and city council. Perhaps understated in their breezy accounts of eventual success is the vigor and universality of their opposition. It appears that all city staff opposed the bike lane proposals. There is no mention of anyone who was in favor, except possibly Councilor Woodbury. When the 1966 city council elections arrived, the losing candidate ran on the platform that "the horse and buggy have had their day, and the bicycle is on its way … *out!"* This suggests the presence of a large, well defined voting bloc of citizens supported city staff in their efforts to derail any efforts for bicycle lanes.



BIKE PATHS IN DAVIS? — Davis bicycle riders, good ones and bad ones, will soon be helped along in their travels by the painting of distinct lines to indicate where cyclists can ride. The experimental program, designed to increase safety for bike riders and car drivers, will be instituted shortly after July 13, when the city will receive authority to regulate bike traffic on city streets. The lines will be painted on major city streets. This cyclist is performing some makeshift repairs on his bike, in the face of oncoming bike and car traffic. — Enterprise Photo

Figure 30 Mixed reviews from The Davis Enterprise on the anticipated bicycle lanes (The Enterprise, July 7, 1967)

On the eve of the bicycle lane installation, the Enterprise photo caption indicates the depth of the schism, by reporting simultaneously two entirely different pitches on the new bike lanes—bike lanes as an unnecessary privilege to an undeserving minority, and bike lanes as a sensible, welcomed improvement for both cyclists and drivers).

1966 - 1972

During the second phase of "when everything happened" there is no recorded opposition to new bicycle programs and facilities. Support appears to be nearly unanimous among the public, staff, and elected officials. Given the high popularity of bicycling, and the subsequent celebratory sentiment that must have followed during the

OPEC oil embargos of the early 1970s, opponents to bicycling were probably limited to crying in their beer.

One interesting development during this time, however, was the birth of the "lane vs. path" and "lane vs. no lane" debates. John Forester, a self-described "bicyclist" in Palo Alto, declared that bicyclists were better without lanes, and certainly without separate lanes. "Bicyclists fare best when they act as, and are treated as drivers of motor vehicles" (Forester, 1977, 1). Opponents to bike lanes were a vocal minority in further changes to the state vehicle code, as they were concerned that bicyclists might be limited to riding in bike lanes, and prohibited from some streets and roads without lanes. The end result of this was legislation that both enabled the designation of lanes, but did not restrict bicycles to the lanes. This likely certainly slowed the development of bike paths and lanes elsewhere in California, but appears to have had little effect in Davis.

1972 – 1990s

"After everything happened" the opposition remained silent for many years, and never really gained a voice. Two notes of interest during this period is the opposition to greenways and development of parking garages.

When Mark Francis and others proposed the greenway network, it was dismissed by Public Works officials (the same officials that are widely lauded for their excellent work) as unnecessary and possibly dangerous. The bike lane system served users well, they asserted, and moving bicycles off streets opened up the potential for bodily crime. The now-lauded Putah Creek Underpasses under I-80 and the railroad, in particular, were seen as unnecessary, and Dave Pelz felt bicyclists could use an improved Richards

Boulevard overpass without any trouble. The overpass, however, was treacherous to many (with a challenging network of freeway on and off ramps to navigate), and eventually the greenway system was built.

Parking garages appeared in downtown Davis in 1988 (2nd and F) and on campus in 1992 (North Entry), at a cost of about $15 million each. This $30 million expenditure probably eclipsed the entire cost of all non-subdivision bicycle improvements made in Davis, ever. While the garages were small and didn't make a large physical imprint on the landscape, they indicated a fundamental shift in budgetary priorities away from the conventional mantra of expanding bicycle facilities with growth and encouraging all residents to use bicycles for transportation.

1990s – 2005

While there has never been an outspoken majority against bicycling and bicycle priorities, the "sanctity" enjoyed by previous generations of bicyclists was lost during this time. Bashing bicyclists was no longer taboo. Downtown traffic tangles began leaving both motorists and bicyclists frustrated. A clear decrease in public attention to bicyclists' needs is manifested by a change in campus bicycle parking—before the mid-1990s photographs indicate available parking spaces at every building, post 2000 photographs show bicycles overflowing every rack on campus. Meanwhile, parking garage construction investments are now approaching $100 million for the campus and city combined.

While opposition to bicycling is not manifested by reversal of the subdivision codes and street standards, it is seen in the cash-starved the bicycle development budgets,

failure to assign staff to consistently ensure all new development is compliant with high "Bicycle Level of Service" criteria, refusal to allocate funds to restore lost "critical" programs, and lack of recognition of the new challenges faced by bicyclists in a growing, densifying city. This does not necessarily indicate a high level of "opposition," but it certainly indicates a relatively low priority of bicycling programs among civic needs.

Summary

Opposition to civic embracement of bicycling was vocal and significant in early Davis, all-but nonexistent during the bicycle heyday years, and slowly redeveloped in the 1990s and 2000s. Recent opposition appears to be as widespread and organized as that encountered in the 1960s, but it is more aware of the broad public support for bicycling, Opposition, deliberate or not, is manifest by the unchallenged funding of infrastructure for motorized vehicles while denying funds to maintain essential bicycle programs.

Did the bicycling movement ever nearly "fail?"

The fragile points in bicycle development were 1963-1968 and post late 1990s. These are the only times when significant opposition was encountered, or when bicyclists have been in bodily danger (a condition which, if unchecked, leads to a reduction in people willing to bicycle).

1963 - 1968

In 1963, auto use was increasing, the city was actively funding auto infrastructure needs with no apparent consideration for those of bicyclists. Leadership was changing

the campus, but no bicycle-oriented leadership existed in the city. Bicycling was at risk, and it would take an effective leader to change conditions in the city to overcome the legal, engineering and procedural barriers to providing for bicycles in Davis like they did in Europe. Had this condition gone unchecked, bicycling in Davis would have gradually declined. This happened in Missoula, MT, which was known as a major bicycling center in the 1960s, but apparently deteriorated.

After the tide-turning letter to the editor by Frank and Eve Child in 1964, the movement to create bike lanes had begun. Opposition was organized, powerful, and supported by engineering standards. Had the Childs and Lotts been built of less stern stuff, they might have thrown in the towel at some point in the process and devoted their free time to something more rewarding. Fortunately for modern Davis residents, the Childs and Lotts persevered. They had skilled leaders, motivated individuals, and were successful in navigating a delicate route to eventual success. As for doubts, Eve Child reports "It didn't occur to me that it wouldn't be a success—it was an ideal place, so we set out to create a political movement" (2007).

Another bullet was dodged after the 1966 elections. City staff had been unified and vocal in their opposition to bicycle lanes. Now success hinged on them either changing their practices or moving out of the way. An obstructionist group at Public Works could have delayed the project long enough to reduce its chances of success, or insist on an extremely conservative but ineffective lane design. Similarly, cooperation was needed at the capitol in Sacramento to get changes passed to the vehicle code. Had any of these changes not occurred smoothly, the policy window could have closed

without any action taken, and city council would have decided that since there was no engineering solution, that it was not worth their time and effort.

But, by 1968, just two years after the city council mandate and in time for the next election, bike lanes had appeared on many streets in Davis and they were enormously popular.

1972 – 1990s

In 1986, failure of the greenway movement would have made Davis a much less interesting city for young and old bicyclists. The greenways add an additional layer of texture to the bicycling experience, and offer routes to school, shopping and friends' houses that can never be impacted by increases in traffic levels or deterioration of driver skills. Most importantly, the greenway movement arrived just before the major developments of the 1990s were built, when new housing was inhabited by people who worked elsewhere. The greenways provide a safe way for schoolchildren to travel where their car –oriented parents can rest assured they will not be hit by cars. Had the proposal come after the dilution in local employment occurred, it would have been more difficult to assemble the necessary political will to open the policy window.

Late 1990s - 2005

Recently, bicycling has been "failing" due to internal factors and/or external factors. While the number of people bicycling may be level at best, the number of people driving has increased dramatically—average daily traffic on city streets has grown 50% - 150% from 1970 to 2005 (City of Davis data).

By 2000, Davis, had failed to retain many of its laudable characteristics of earlier times. At its peak in the 1970s, Davis excelled in five criteria:

- A large proportion of the population bicycles at least occasionally.
- Riding a bike is uniquely easy, safe and comfortable.
- Anyone can, and many do, ride a bike for their transportation needs.
- No special equipment, training or skills are necessary to be a bicyclist.
- Bicycle lanes and paths make direct, safe routes connecting everywhere in town.

By 2000, many old-timers assert that a much smaller proportion of Davis residents bike, that it is no longer safe and comfortable in all circumstances, and that key safe links have been obliterated by heavy traffic, particularly at intersections. Most noteworthy and alarming, Davis is no longer a city where *anyone can and will use a bicycle for daily transportation needs.*

The "loss" of these elements has gone somewhat overlooked. There is little quantifiable data to illustrate it, in terms of bicycle counts, user activity surveys, or any other type of measurement. The original criteria were never spelled out, so they themselves could not be monitored qualitatively by civic authorities. And Davis remains the most bicycle-friendly city in the country, confirmed as recently as 2004 by the American League of Bicyclists, further reducing incentives for evaluation of success or failure. It is difficult to effectively describe the losses that have occurred. But they plainly have, based on the testimonies of hundreds of Davis residents whose faces become long and sad when asked to describe the difference in bicycling behavior between the present and decades passed.

Summary

Bicycling and bicycling culture have been strong through Davis history. But the eventual success appears to hinge on a number of key points, in terms of coalescence of advocates, willingness of policymakers to address policy needs, and cooperation of civil servants to "perform the impossible." In the 1960s, each of these elements were a serious threat to bicycling levels. Had any one or more of them failed, the entire program could have been permanently weakened, and possibly never blossomed into its full glory. More recently, equally sinister factors have been threatening bicycling, and relatively little priority was given to addressing them. While this is a major threat, recent developments from 2005 to 2007 indicate that the Davis residents are once again forming advocacy coalitions, identifying problems, policies and assembling political power, and may soon be opening a new policy window to once again avert failure.

To what extent did Davis succeed in its efforts to become an "ideal" bicycling city? Are there areas where it fell short? If so, why?

1967 - 1980

In this period, it appears that Davis did nearly everything "right" to facilitate bicycling as transportation. Engineering projects were generally over-designed to allow for future growth in traffic. Ample bicycle parking existed at all destinations, and the "pod"-style racks were adequate because theft was rarely an issue. City engineers sought were known for their abilities to adapt bike lane design templates to new problems and have a successful result. Overall, they were extremely successful, and there is no record or suggestion of an innovation that was not adopted.

One element stands, however, as a missed opportunity. The 1972 "Bicycle circulation and safety study," outlined the future Putah Parkway under the railroad tracks and Interstate 80. It noted that the wooden railroad bridge over Putah Creek would soon be replaced with a concrete culvert, creating a window of opportunity for a pedestrian underpass. This opportunity was missed, and it wasn't until 2003 that the tunnel was finally built (DeLeuw Cather, 1972)

1980 – late 1990s

By 1980, bicycle planning and design was fully in the mainstream in the United States, boosted by the environmental awareness, high gas prices and the Carter Administration's national policies. Cities and counties everywhere in the country were building bike lanes on their streets, and identifying mechanisms to facilitate the foreseen increase in bicycle use.

During this period, the city and the campus continued with their tried-and-proven templates developed a decade earlier. While counties all over the country were rapidly repaving county roads with wide shoulders, Yolo County proceeded much more slowly. The prevailing thought seemed to be that was the way they'd always done it. And, arguably, that Davis had a uniquely bicycle-friendly population, and could function fine without particular amenities.

There are several areas in which design fell short in ways that have affected present-day bicycle use. These problems would have been relatively easy to solve in the past, but much more difficult now. But, problems are easy to see in hindsight, and given

the vast set of new and unique problems faced during this era, it is difficult to fault the staff and council for not addressing them at the time.

From 1980s to the late 1990s, problems were becoming gradually more significant, and there was evidence that something was taking a toll on the "bicycle paradise" but little was done, probably due to the small magnitude of the problems, the lack of political interest, and the knowledge that Davis was still by far the most advanced bicycling city in the United States. But, the following programs were developed elsewhere and not adopted in Davis.

Modern bicycle racks

Substandard racks were used for many years that did not support the frame of the bike, only the front wheel, including the "pod" design and the "Mickey Mouse" design.

Bike Lanes on missing links

When asked what he might have done differently, retired Public Works Director Dave Pelz thought for a minute or two, and responded that he would have acquired land and planted shade trees to allow Fifth Street to have bike lanes. Fifth Street/Russell Boulevard, Olive Drive, LaRue Boulevard, Hutchison Boulevard West of LaRue and North B Street have always been barriers to bicyclists. Completing missing links are shown to increase bicycle use and comfort (Lott and Lott, 1972).

Band-aid solutions never updated

Much is made of the ingenuity of early bicycle planners, such as modifying and existing railroad trestle for an underpass, or routing an off-street bike path on a dogleg configuration to create a mid-block crossing (Copley 2006). While these were a innovative design solution requiring few resources when built, they quickly became obsolete, and are now frequently mentioned by cyclists as substandard facilities in need of reconfiguration.

Completion of separate bicycle infrastructure on campus

The 1963 LRDP called for building a separate transportation system for bicycles. As part of this, bicycles were to be given bridges or tunnels to cross major streets, which were built connecting the core campus with the Health Science District and the housing, and across SR 113.

- Campus plans in 1963, 1980 and 1987 called for an underpass under Hutchison between LaRue Blvd and SR 113, which has been sorely needed for a bicycle connection from the Health Sciences District to university housing areas and the City of Davis.
- The Arboretum underpass under A St. has never been made wide enough for bicycles and pedestrians, and in the 1990s $6,000,000 was invested to complete the link from the campus to South Davis.
- There has never been a grade-separated crossing of Russell Blvd, which most students must cross to get to campus.

Covered bicycle parking

A few academic building in the 1960s and 70s included extended eaves to cover bicycles from the elements, including Hoagland Hall (1956) Voorhies Hall (early 1960s) and Surge IV (1968). More recently, about 200 bike lockers have been installed around the campus, but this leaves about 15,715 of the 16,000 bicycle parking spaces on campus open to the elements. Apparently, the relatively dry climate in Davis discouraged a more intensive capital investment in covered parking. Nonetheless, the four months of rain and fog destroy brakes, shifting mechanisms and bearings if perpetually exposed, and the prospect of a soggy bottom from a wet seat is never attractive.

Wayfinding techniques

Many cities adopted methods to assist users in navigating a bicycle network, such as directional signs and route designations. This can assist each user whenever they are visiting an unfamiliar part of town, and generally expedites bicycle travel. The city and university have actively resisted proposals to install signage, and no routes have ever been designated as the best routes through different parts of town.

Bike lanes on rural roads

After the Davis-developed bike lane standards were adopted nationally, bike lanes began appearing on rural and suburban roads everywhere. For instance, in my hometown of suburban St. Paul, MN, bike lanes appeared in a flurry on many roads in the mid 1980s, to the extent that by 1986 a person could go on long bike rides through suburbs and countryside without ever traveling on a road that compromised personal safety. Rural Yolo and Solano county roads around Davis, however, remain treacherous for

bicycling in 2007, 40 years after bike lanes were developed in town, and 20 years after they became universal in other rural areas of the United States.

All of the above-listed services for bicyclists were developed elsewhere, and have never been applied to Davis. Many sources cite services like these as being helpful in increasing bicycle use elsewhere, so had they been implemented here it may have prevented or reduced the decline in bicycling (Tour and Harvick, 2003).

Late 1990s – 2005 era

In recent years, a number of projects have been built that prohibit or actively discourage bicycling. Unlike the "neglect" of the 1980s and 1990s, these projects have turned parts of Davis into areas where, like other cities, bicycling is impossible, illegal, or suicidal to bicycle to your destination. These include Hutchison Boulevard outside the West Entry Parking Structure on campus, the bicycle path outside the ARC on campus, the "bicycle merge" in heavy traffic on a blind bridge at Richards Boulevard, Covell Boulevard at Emerson junior high in East Davis, and unmarked curb bulbouts on Pole Line Road and other places. If projects like these continue to proliferate in Davis, gaps in the system will grow, and bicycling for the masses will become less possible with each development.

Loss of core programs

One last "might have been" for Davis is the continuity of bicycle programs through the decades. When inquired as to what made bicycle planning and policy successful in Davis, many of the long-time participants state that it was feature such as:

- the ability to fine-tune each new development so the bicycle facilities were adequate
- the extensive education program in schools
- promotion of bicycling for incoming students on campus
- effective enforcement by police officers

What was rarely noted by interviewees is that these programs *all dried up* between the 1970s and the 1990s. They were lost one by one, without any acknowledgement that a major component of what Davis bicycle planners attributed their success to was disappearing entirely. Had this slow vanishing act not occurred, modern Davis's bicycling levels might look much more similar to Davis in the 1970s.

What has been the relative contribution of" "physical environment," "social environment," "self selection," and "advocacy" in the creation and decline of The Bicycle Capital?

Davis, California has always been seen as an enigma to bicycle researchers. Many people have tried to explain what has made Davis uniquely successful. Explanations are focused on a combination of the "*university town,*" "*favorable geography,*" "*self-selected population,*" "*infrastructure*" and "*advocacy.*" Though these are plausible as underlying factors, they acknowledge that this fails to explain the

magnitude of success. It still leaves questions open, primarily an explanation of the large difference in bicycling levels between Davis and towns with similar demographic and geographic conditions.

For instance, if Davis's superior preexisting conditions were the were the fundamental drivers, then we would expect to see other towns with bicycle activity approaching Davis levels, such as Chico, CA or Tucson, AZ. Or, if these are the fundamental drivers, but are required in a certain minimum quantity with a "tipping point " into the level of success enjoyed by Davis, then perhaps an appropriate set of preexisting conditions has never been reached elsewhere. For example, one could theorize that a "university town with greater than 50% of employed citizens working at the university" ***and*** "climate with fewer than 20% of days with rain" might achieve a high level of bicycle use, and Tucson and Chico failed this test. Trying to do comparative analysis of 50 years of several university towns would be time consuming, and it may be easier to explain the relative differences between Davis and other cities through different means. Nor would it explain the dramatic decrease in bicycling activity experienced since the early 1990s.

Instead, it is useful to take yet another tour through Davis's history with a specific focus on drivers of success.

1960 – 1980: Importance of each factor in the rise of bicycling

Pre 1959—Geography and demographic, but unremarkable levels of bicycling

Davis was comprised of a small university campus (enrollment about 2000 students) adjacent to a small town (about 6000 people). With favorable physical geography and demographics, bicycles were used for transportation, but without fanfare. Bicycles are

occasionally featured prominently in the university yearbook, but not regularly. But accounts of bicycling in the 1970s report that the Davis bicycling phenomenon did not yet exist in the 1950s (Jewett, 1982). Thus, favorable geography and demographics alone were not enough to create a unique bicycle culture in a small university town in the 1950s.

1959 – 1964—Simultaneous development of bicycle infrastructure and culture

Emil Mrak and his staff declared that the campus would be built with transportation infrastructure favoring bicycle use. Mrak was also a dynamic leader and popular among students. Under his leadership, a bicycle culture grew and flourished on campus, and staff were explicitly directed to construct a highly functional network of bike paths. This effectively gave bicyclists the same freedom to move about campus as Mrak enjoyed as a child riding the farm roads of Los Altos. Mrak took "favorable geography" and transformed it into a built environment designed for the effortless movement of bicycles. The infrastructure effort was coupled with encouragement and enthusiasm. Every incoming student received a letter from Mrak urging them to bring a bicycle to college. And he took "university town demographic" and morphed it into a "bicycle enthused" demographic.

Self selection, social environment and infrastructure were not factors in this era, but advocacy and modifications to the physical environment were fundamental drivers, and existed in Davis at a level that appears to be absent in peer cities. Mrak had, essentially, a blank slate and centralized power control, and evidence suggests that he personally chose to create a University of California campus with these characteristics.

By 1964, photos show a simple, no nonsense campus with modest buildings, trees, and a tidy congregation of bikes clustered outside each building. Yearbooks had started to feature bicycles every year. The campus was growing quickly, and Mrak used his powers to ensure that development enhanced the bicycling infrastructure.

1964 -1967: Advocacy affects infrastructure

The dichotomy between campus and city in 1964 created a natural confrontation. The campus visibly demonstrated how designing infrastructure for bikes made it easier, safer, and more desirable to ride one. But the city's reluctance to follow created an opportunity to articulate the benefits, and propose that infrastructure be built. In the meantime, the infrastructure was deteriorating as a result of the increased car traffic. Simultaneously, infrastructure on campus was improving, and off campus deteriorating, proving both incentives and disincentives for bicyclists, and shaping a role for advocacy.

The long effort by the Childs, Lotts and others from 1963 to 1968 to create the political and engineering framework for infrastructure was purely the result of advocacy. While it would seem like a natural evolution, for the city to follow the campus on its own volition, and develop unique engineering for the unique infrastructure requirements, council and staff vigorously resisted. Advocacy, then was a crucial element of the shaping of Davis into its eventual degree of success.

Had advocacy been lacking, or had it been conducted by less skilled individuals, or had it faced a more entrenched resistance, Davis could easily have had an eventual infrastructure network less favorable to bicycles, and never achieved its mythical status of a place where "anyone could and would bicycle for their transportation needs."

1964 -1967: Advocacy affects social environment

Advocacy required focusing the public mind on the benefits to bicycling. The campaign could only be won by educating as many citizens as possible as articulate bicycle advocates. The exchanges wagered in city council meetings, the editorial pages of *The Enterprise,* and by petition-bearers on the street were eventually successful by finding resonance with the basic issue of bikes being a more desirable means than cars for a society to travel. This repeated assertion, and the repeated resistance by council and staff led to a civic pride in bicycling, an education about the benefits, and many individual efforts to prove the correctness of assertions by simply bicycling everywhere. For instance, in October, 1966, a city councilor made a claim in The Enterprise that "bicycle riders have no money to spend." This was publicly refuted by Frank Child on Nov 1. Then, to prove their point, at least one local bicyclist arrived at the grand opening of Grant's Department Store at University Mall and parked his/her bike directly outside the front door, so as to be included in The Enterprise's promotional photo (Nov 21). [get photo]

Thus, challenges to assertions made by advocates likely resulted in Davisites making choices to bicycle whenever possible, thereby fueling the development of a bicycle-friendly social environment.

1967 – 1970s: Infrastructure developed in the city

After the first bike lanes were created in 1967, the city rapidly expanded the network to most existing and new streets. This created an infrastructure unique in the

United States, and was likely a critical element in the escalation of bicycle use. By 1972, the city had bike lanes on nearly every street. Several "problem" gaps had been filled, such as bike lanes on 8th Street, a road diet on Anderson Road, and a bike tunnel under the north-south railroad tracks to enable a direct route to Holmes junior high school. Remaining gaps, such as Fifth Street, had good quality bike lanes on the parallel routes of Third and Eighth. This is one case where data was collected. Dale and Donna Lott's study of bicyclists living near Anderson Road before and after the addition of bike lanes found an relative increase in usage of Anderson over other routes, and that certain demographics, such as women over 25 years old, were much more likely to ride on the street after bike lanes were created—39% before, 64% after (Lott and Lott, 1975).

Late 1960 onward: social development result in self-selection of bicyclists coming to Davis

During the late 1960s, Davis was becoming well-known, in its own quiet way, as a "bicycle town" and campus. While there is only anecdotal evidence, it is likely that people began coming to Davis during this time because they wanted to live in a place where they could bike for transportation and/or recreation. This trend likely intensified over time, as time passed, and Davis's reputation and bicycling infrastructure grew.

1975 Before-after study of bike lanes on Anderson Road

In 1974, Dale and Donna Lott conducted a unique study in Davis history, where they performed a multifaceted research project on residents along Anderson Road before and after the road diet. They interviewed residents in many homes along the route

counted bicycle traffic, and analyzed all data by age and sex. This study illuminates the relative importance of infrastructure and gap-filling infrastructure, and sorts preferences by user type. People used Anderson Road before and after the bike lanes, there was a relative shift in use from Sycamore Lane to Anderson, and there was increased satisfaction by bicyclists with no decrease in satisfaction by motorists. Many people felt "safer" in the presence of bike lanes, and children especially were seen as benefactors, being allowed by their parents to ride only after the lanes were retrofitted.

Perhaps the most interesting finding from the 1975 study is that it was difficult to determine, even with longitudinal sociological research, what the relative importance of bike lanes was in enabling bicycle use. Though only a subset of the population required them for riding on Anderson, a large majority of those interviewed found that they improved the riding experience, clearly identifying "infrastructure" as a desirable, if not critical, element to enabling bicycle transportation.

Summary: pre-1975: Relative importance of each driver in development

The five "drivers" of bicycling played unique roles before 1975—physical environment, social environment, self-selection, infrastructure, and advocacy. Before 1975, there was a series of events, each involving only a few of the five possible "drivers" for bicycle use. With each additional component in the physical and cultural geography of Davis, bicycle usage appeared to increase. With simply a physical environment and university town, there was no magnetism towards bicycling. Davis was "born" as a bicycling town when Emil Mrak encouraged students to bike and dictated that the campus be designed to accommodate them. But, without infrastructure in the city,

bicycling was considered threatened in 1964, indicating that infrastructure is a necessary component—feeling like bicycles belong and not fearing being hit. Advocacy and a strong social environment was clearly necessary to create a tide-shift in city policy. Self-selection is more difficult to evaluate, as we have no idea what percentage of the people who relocated to Davis between 1960 and 1975 did so because of the bicycle culture.

1975 – 1990s: Stability

After 1975, the city enjoyed a long period of stability during which the five possible drivers remained relatively constant. While variations certainly occurred, they were not dramatic enough to result in people reporting changes.

Direction of causality, development	Affecting (A'fg)		Affected (A'fd)		
	Physical -natural	Physical-built	Social - community	Social - advocacy	Self-selection
Pre-1960	A'fg	0	A'fd	0	?
1959-1964	A'fg	+	A'fd	A'fg	?
1964 – 1966	A'fg	0	A'fd	A'fg	?
1967 - 1972	A'fg	A'fed	A'fg	A'fg	A'fd
1972 – 1990s	A'fg	A'fg/fd	A'fg/fd	A'fg/fd	A'fg/fd

1990s – 2005: Relative importance of each driver in decline

More interesting is an evaluation of how different elements were lost during the years of declining bicycling. After a long plateau of bicycle use in the 1970s and 1980s,

bicycling began to decline in the 1990s. This section will discuss the relative effect of changes to each of the five drivers of bicycling in eroding support.

Physical environment

The physical environment is largely unchanged. Winters are still mild and rainy. It is still as flat as a table. It's a bit hotter in the summer than in past decades.

The human-made environment has changed in many ways, but remains wholly conducive to bicycling. Davis is larger, but remains a modest-size with all residents within a reasonable bicycle ride of downtown, the university and the high school. According to the City of Davis bicycle map, no homes are more than a 20 minute ride from any of these destinations, a seemingly reasonable commute time for a modern city.

Some regional changes have occurred, such as a deterioration of travel on I-80, and hourly passenger rail service from Sacramento to Oakland, which would seem to favor bicycling.

Social environment

The social environment changed dramatically in the 1990s, with rapid growth in households with out-of-county employees. This change alone is responsible for much of the decline. Much of the success could be attributed to the universality of bicycling as a commute option. But with, in 2000, 10,000 of Davis's 30,000 workers unable to commute by bike, a third of Davis households have a head-of-household that is unable to set an example to other members by bicycling, and is unable to teach his/her children how to travel by bicycle based on intensive personal experience. In the past, the Davis

society had a “can-do” attitude of promoting bicycling and introducing new residents, but there has never been a program specifically focused on this demographic, with education programs for driving workers and children of driving workers.

Another social change is the gradual decline of school children commuting by bike, so each year a smaller percentage of Davis’s incoming students are personally familiar with bicycling. This problem has been dealt with to a limited extent by the UC Davis Bicycle Program, but the resources applied are somewhat small.

Another possible change is the popularity of Davis with retirees, but demographic data show only a one-year increase in average age of Davis residents from 1990 to 2000 (US Census data).

The decline in the social environment has had a causal influence in other areas. The 1964 petition noted that “…the growing traffic problem is self-reinforcing in that it discourages bicycle riding and adds to the traffic and parking problems.” By 2000 or 2005, this had arguably occurred at least partly as a result of the doubling of traffic on city streets with no additional vehicle lanes built.

Self-selection

Self-selection the process where bicyclists choose to live in bicycle-friendly locations. In Davis, this process appears to be largely unchanged over time. This is primarily because Davis remains “the bicycle capital”—there are no other places that compare to it in the United States. Secondarily, the decline in bicycling in Davis is poorly documented, unreported, and therefore unknown to outsiders. For instance,

current California Bicycle Coalition executive director KC Butler was unaware of the decline, and he has been involved in statewide bicycle issues for over ten years.

Self selection, however, remains strong. Over the two year course of this project, many people, of difference ages, genders and years of arrival, have indicated that the ability to bike for daily travel was an important factor in their decision to relocate to Davis.

Though it appears unchanged, with the complete absence of any firm data, conclusions are largely conjecture. If there have been changes in the number of self-identified bicyclists moving to Davis, nobody would be aware of it.

Infrastructure

The bicycling infrastructure itself has been fairly stable through the years. While some bike lanes have become narrower, and some major paths on campus have been removed, the lanes themselves are similar in form and size as in their original state. All new developments have had a minimum level of bicycle infrastructure, primarily lanes on streets, then greenways after the late 1980s.

There has been a fundamental change in car traffic levels, car parking frequency and car density. This changes the usefulness of the bike lanes to bicyclists. Bicycles are at greater risk, as a result of increased conflict potential, motorists driving through tighter gaps, and a decrease in the pleasure associated with bicycling.

The bike paths removed on campus at the ARC and West Entry Parking Structure represent a fundamental shift away from Emil Mrak's vision of free-roaming bicycle

paths that create pleasurable experiences for riders. Many riders report that they avoid routes with heavy car traffic.

In 1992, Unitrans went to a fare-less service for undergraduate students, a "competing infrastructure." Student bicycle use dropped and transit use increased over the next reporting period. Unitrans has benefits over bicycling, including ownership and maintenance by a third party and constant comfort and reliability in all weather conditions. Student mode share data are consistent with the oft-hypothesized theory that fare-less transit service is eroding bicycling levels.

Comparing undergrads, who have the service, with graduate students, who paid $.75 per ride in 2002, grad students were far less likely to use Unitrans. But the bicycling rates were roughly comparable, and the primary difference is that grad students drive much more and undergrads use transit. Given that many grad students live outside Davis, it appears there is at least a modest effect of the Unitrans service functioning as a competing infrastructure and reducing bicycle usage.

Advocacy

The loss of an advocacy coalition working to improve conditions for bicycles is a major shift for Davis. From 1960 to 1999 there was at least one group of people somewhere in Davis working to ensure that bicycles were well cared for. Problems certainly developed during these times, but by all accounts the advocacy was critical to the improvement of infrastructure and the development of bicycling culture.

Many people have attributed the decline in quality of new infrastructure since the 1990s to the loss of advocacy. They directly cite the loss of expertise at Public Works,

but the concept can be extended to all advocacy. At different times, different coalitions were ensuring that the needs of bicyclists, present and future, were looked after. A "strong" public works was not necessary, it could have been a diverse coalition or citizens, elected officials and city and university staff, or it could have been simply a coalition of citizens that would provide Public Works with feedback and expertise.

Though the Public Works staff were knowledgeable and effective, they only had jurisdiction over a small range of bicycling needs. Other key elements, such as education programs, enforcement, and university needs were largely unmet from an earlier time. So the lack of advocacy extends back well before the late 1990s, possibly when the

Ultimately, effective advocacy, such as has been done in other cities, has been shown to overcome obstacles more significant than Davis's deterioration of infrastructure and the social environment.

Summary: post-1990s: Relative importance of each driver in decline

"Bicycle culture" in Davis seems to have enjoyed a long plateau, with a decline first noticeable in data and observations during the 1990s.

Importance of each is speculative, but it appears that two early drivers are the relative quality of infrastructure and the bicycling culture. First, in the early 1990s the fare-less transit service provided an attractive alternative to bicycling. The provision of free transit likely led to casual bicyclists switching to transit when they encountered minor problems with their bike or commute, then not having incentives to switch back. Second, cultural change occurred when new housing was built in Davis at a time when the university was laying off employees in the early 1990s. This resulted in a heavy

influx of out-of-area commuters. People driving to work elsewhere need to go to extra effort to become local bicyclists, and by many accounts this population never has integrated itself into traditional Davis values and lifestyles. (See for instance Sommer, 2003).

Of the drivers considered, these appear to be the leaders in the changes. But other factors are entirely unknown, such as exactly when bicycle levels began declining—we only have it narrowed to a ten-year period.

The loss of an established coalition of advocates also appears to be important, but the Pelz and Copley didn't retire until the late 1990s, when bicycling levels already were declining. Had, for instance, a citizens' advocacy group been engaged in promoting bicycling during this time, new Davis residents might have found more activities and educational programs to entice them into a bicycle-oriented lifestyle.

Overall, it appears that self-selection and the physical environment were not factors in the decline of bicycling, but the relative deterioration of infrastructure, unmitigated changes to the social environment, and especially the lack of a citizens' advocacy group were important factors.

Chapter 7. Conclusion

The challenge of describing Davis

Davis is often referred to as the Bicycle Capital of the U.S. Historically, the claim is based on a number of features--percentage of bicyclists, number of bicycles owned by residents, percentage of workers bicycling to work, percentage of streets with bike lanes. Overall, it suggests a greater prevalence of bicycles than in any other U.S. city, or a greater degree of bicycle-friendliness.

But this title, though accurate for over 50 years, does not describe an interesting and important aspect of bicycling in Davis--manner in which bicycling peaked, the magnitude of its subsequent decline, or how Davis compares with other top U.S. bicycling cities, both in level of bicycling and trends in bicycling levels.

Davis in the 1970s—not just the most bicycle-friendly city but a bicycle paradise

Davis was a bicycling city in the 1950s, before car ownership became widespread. This condition was helpful to Davis remaining a city of bicycles, but was insufficient on its own to simply cause the series of events over the next 20 years. Davis had key leaders that went to Herculean efforts to keep Davis a city of bicycles. They were not satisfied, in 1960 and 1964, of being the best city for bicycling in the US. Their sights were set higher—to be the best possible city for bicycles. Mrak's staff designed campus to be smoothly navigable by bicycles. The Childs and Lotts insisted that nearly all streets have bike lanes, making the city universally bicycleable. City staff created high standards for bicycle facilities, ensuring that facilities would not become obsolete even as the city grew

and densified. Davis citizens made bicycling a matter of civic pride. As Davis's reputation as the best bicycling city grew, people who favored a bicycling lifestyle moved there. The infrastructure, culture, and influx of bicyclists kept Davis's "bicycle paradise" status maintained through high bicycle use and broad public support for improvements.

Many people I have interviewed and spoken with have spoken highly of this now departed "bicycle paradise" era, with statements like "when I was an undergrad in 1972, this campus was swarming with bicycles" and I raised my kids here in the 1960s and they could bike wherever they wanted to [because I knew it was safe]".

The bicycle paradise era persisted through perhaps the late 1980s. The Greenway movement being was last major engineering and political innovation, and the last instance of Davis outdoing itself out of principle—leaders recognized that they could make their city even better, and chose to do it.

Possibly as a side effect of Davis's stern modesty about its bicycle status, the condition of a "bicycle paradise" or a comparable term does not appear in Davis history or lore, though it was clearly recognized by people inside and outside of Davis, revered by cyclists elsewhere and rejoiced in by cyclists in town. The term "Bicycle Capital" was probably used to represent this condition, but as it can also mean the lesser condition of simply "better than everyone else" it is not useful as a term to describe what had been gained and is now lost. The term "bicycle paradise" or a comparable term will be a useful addition to the Davis lexicon for residents to express their transportation wishes to civic leaders.

Davis in the 2000s—still the most bicycle-friendly city but no longer a bicycle paradise

In 2005, Davis likely remained the “the most bicycle-friendly city” in the United States, but it was no longer a “bicycle paradise”.

Still robust are many of the attributes of the 1970s. A higher percentage of people bike to work here than anywhere else. Bicycles are still ubiquitous around town. Infrastructure is mostly adequate and often excellent. People still move to Davis because they want to be part of the bicycling culture. This is summarized in David Takemoto-Werts’s 2003 assertions of " There's a little less bicycling than there was, but compared to any other campus or city, we're still outpacing everyone in bicycling.” and “But we still have it pretty good in Davis as far as bike travel goes," (Dateline, 2003).

But some key elements have been lost. Perhaps the greatest loss has been that neither the city nor the university attempts to “out-do” itself anymore. There is no commitment to creating “paradise” among leaders. And the populace doesn’t seem to expect this to happen anymore, either. Cycling conditions have plainly deteriorated, with lower quality infrastructure and higher car densities, which appears to preclude many “ordinary Americans” from choosing to bicycle—to work, to shop, to socialize. Education and encouragement programs have thinned out. Many new bicycle infrastructure projects are mediocre at best, and efforts by advocates to engage in proposals for “the best possible infrastructure” were routinely rejected on campus and in the city in the 2000 – 2005 era.

Development of Davis as a bicycle city—environment, culture, or self-selection?

The origins and sustaining elements of Davis's development are complex and change over time. While the basic geography of Davis favors bicycling, the culture was clearly created by the residents themselves, and the extent of the infrastructure was only a result of leaders driven to create the best facilities they possibly could. Had a handful of Davis's key leaders never moved here, Davis could easily have taken an entirely different path and never achieved its amazingly high levels of bicycling.

The 1950s: a natural bicycle paradise

During the 1950s, Davis was certainly one of the most bicycle-friendly cities in the country, and had one of the highest rates of bicycle use. Environment and culture were the primary drivers—a small university in a small flat temperate city lended itself well to bicycling activity. The importance of culture is manifest in Davis's relative uniqueness in the central valley of California, where dozens of comparably sized communities have identical geography, but none save Chico are ever cited as having comparable bicycle use.

But there was no bicycle-specific infrastructure. Simply conventional town infrastructure, but with relatively few cars and many bicycles, so there was little need for anything specialized.

The 1960s: development of a deliberate bicycle paradise

In the 1960s, as population and car ownership grew, Davis was at a crossroads. To maintain a bicycle paradise, new infrastructure would have to be invented and built. But to merely remain a very good city for bicycling, or a slowly deteriorating city for bicycling, little action was required. Leadership and popular support was required to take the "bicycle" route at this crossroads, and Davis had such leaders. Separate demands were made—on campus and in the city--for "the best possible" bicycling environment. The demands led to engineering innovations which made cycling easier, safer, and more prominent. Residents—permanent and temporary—followed their leaders into a creating a city where cycling remained safe and desirable in an era when US culture took a dramatic shift toward automobile culture and infrastructure.

Choosing to invent, engineer, fund and implement a new type of infrastructure is a major challenge. Davis had unique leaders. The leaders had energetic opponents, and fought for many years to make their vision come to fruition. Had these leaders been made of less stern stuff, or had they hired on at Chico State University instead of UC Davis, the bicycle paradise of the 1970s could not possibly have come to fruition, and instead Davis would be known as "The Square Tomato Capital of America."

The 1970s and 1980s: life in paradise

During the 1970 and 80s ("after everything happened") bicycling enjoyed a long, stable period. The stability was created and deliberately maintained, by fastidious attention to environment needs, continued celebration and nourishment of culture, and a continual influx of self-identified bicyclists. Based on later events, it appears that if even

one of these would have lost strength, the "best possible bicycle city" conditions could have been lost.

The 1990s: paradise in decline

In the 1990s, three events occurred that appear to have triggered the decline in bicycling. First, thousands of homes were built when there were few jobs created in Davis, resulting in an influx of population that had to drive to work and was less self-selected to bicycle culture. Second, the Unitrans unlimited transit service created strong competition for bicycling for students commuting to school. Both of these made for populations that were not naturally acclimated to cycling by a daily commute, creating individuals and a culture less focused on bicycle travel and less likely to bicycle for basic transportation. Third, key public works staff retired, eliminating access to ninety work-years of bicycle facility design from the City of Davis staff.

Of these three events, self-selection was diluted by the influx of external commuters, non-commute travel was refocused away from bicycles by development of a large nonbicycling commuter population, and infrastructure development nearly ceased with the retirements at Public Works.

Self-selection and culture appear to be most impacted by these events. Chronologically, the retirements came last, with the effects not seen until a decade after the other two. And if the retirements had occurred at a time when bicycle culture was not already diminishing, the new leaders at Public Works would have faced strong political pressure to maintain emphasis on bicycle infrastructure projects.

It appears that maintaining bicycle culture and self-selected new residents are the most important elements to maintaining bicycle culture, at least in the case of Davis.

The future

By 2005, Davis had come to a civic awareness of the problems bicyclists were facing. For instance, long-time bicycle activist Bob Sommer wrote a his now-classic Op Ed piece in the Davis Enterprise, and there was talk of creating a city commission to address bicycling issues. Acknowledgement of the problem and attempts to rectify problems showed promise for halting the degradation, if not revering the trend.

This approach alone, however, will not result in a restoration of the bicycle paradise condition. None of the efforts made in 2005 had a vision for a better future, a commitment to outdo previous successes, or even a frank discussion of the feasibility of various conventional techniques to encourage bicycling.

Restoration of the bicycle paradise is possible, however, with the same techniques used in the 1960s. None of the problems Davis faces today are more challenging than those of the 1960s, and indeed many of them are identical. The technical solutions exist to many problems facing bicycle use and bicycle encouragement. But the application of solutions in a scale necessary to put Davisites back on their bicycles will require cultural change, specifically leadership and technical skills among civil servants. If successful, the change will have been caused, once again, by cultural conditions—leadership and an aware population, largely independent of geography and self-selection.

References

Bicycle circulation and safety study. 1972. De Leuw, Cather and Company. San Francisco, CA. 99 pp.

Birk, Mia. Principal, Alta Planning + Design. Presentation at Portland State University, Portland OR. May 1, 2003.

Birk, Mia. 2006. *Bridging the Gaps: How the Quality and Quantity of a Connected Bikeway Network Correlates with Increasing Bicycle Use.* Alta Planning + Design. *http://www.altaplanning.com/pdfs/SR2S.pdf* accessed Oct 1, 2006.

Blunden, Rick. CalTrans Bicycle Group Director (retired). Personal interview, March 13, 2006

Buehler, Theodore J. 2000. *Why to plan: an investigation of the theory underlying community and regional planning.* unpublished document.

Burton, Tom. Personal communication, 2007. (Also secondary information from his mother, Davis resident in 1950s)

Burton, Lindsey, 2007. Personal communication. Recent Chico resident.

Bustos, Tim. Bicycle Coordinator, City of Davis. Personal interview. April 22, 2005.

California Aggie, Davis, CA.
2003 Oct 23, *New bike route connects Davis, Dixon*
http://media.www.californiaaggie.com/media/storage/paper981/news/2003/10/24/FrontPage/New-Bike.Route.Connects.Davis.Dixon-1315570.shtml accessed Oct 1, 2006.

2006 Sept 28. *Semi-truck strikes bicyclist on campus: collision sends rider to UCDMC*. Talia Kennedy
http://www.californiaaggie.com/media/storage/paper981/news/2006/09/28/CampusNews/SemiTruck.Strikes.Bicyclist.On.Campus-2314168.shtml Accessed Sept 30, 2006.

Child, Frank and Eve. January 20, 2007. Personal interview.

City of Davis greenways: comprehensive greenway strategy for the City of Davis: from vision to action.

City of Davis. May, 2001. *Davis General Plan.*

City of Davis, maps and bicycle maps, 1965–2004. (Entire series available in Map Room, Shields Library, UC Davis)

City of Davis, *Comprehensive bicycle plan.* May 2001. Tim Bustos, Bicycle/Pedestrian Coordinator. *http://www.city.davis.ca.us/pw/pdfs/01bikeplan-images.pdf* accessed Sept 30, 2006.

City of Davis, Public Works. Traffic counts on city streets, 1980-2005. Accessed Sept 27, 2006.

Contreras, Cliff. Director of Transportation and Parking Services, UC Davis. Personal interview, June 2005.

Copley, Duane. Public Works, City of Davis (retired). Personal interview, March 9, 2006.

Copley, J. Duane and David B. Pelz. 1999. *It's all about connections: the city of Davis experience: what works for bicycles. 11 pp.*

Cozad, Shauna, 2007. Personal communication. Chico, CA native.

Daily Democrat, Woodland. Sept 30, 1976 B11 *They brought Holland to Davis.* John Knox. (microfilm, Shields Library, University of California, Davis). Archived at *http://www.daviswiki.org/Bicycle_News_Articles?action=Files&do=view&target=Holland.JPG* accessed May 20, 2007

Davis Enterprise, Davis (microfilm, Shields Library, University of California, Davis)

Dulcich, Matt. *Memo: Segundo dining commons replacement.* UC Davis Office of Resource Management and Planning. June 11, 2001.

Dunning, Bob. 2007. Personal communication. Davis Enterprise columnist.

Evans, Anne. Davis City Council (1976-1982). Personal interview, March 2006.

Fehr and Peers Associates. Sept. 9, 2002. Traffic flow analysis for West Entry Parking Structure.

Francis, Mark, Stan Jones and Kerry Dawson. 1987. "The Davis Greenway Plan," UC Davis Center for Design Research.

Francis, Mark. Presentations during a tour of Davis bikeways, March 12, 2004.

Francis, Mark. Professor of Landscape Architecture, UC Davis. Personal interview, February, 2007.

Forester, John. 1994. Bicycle transportation: a handbook for cycling transportation engineers. MIT Press, Cambridge, MA.

Garrick, Norman W. 2004. *Rethinking the street: place design and sustainability*. Presentation at the UC Davis, May 2004.

Gregg, Jean A. 1980. *University of California, Davis campus bicycle safety improvement, enforcement and parking report.*

Hamilton, Brodie. Former director of Transportation and Parking Services, UC Davis Personal interview, July 22, 2005.

Highway Design Manual, 2001. Chapter 1000 Bicycle Planning and Design. P. 1000-1-1000-34. *http://svhqsgi4.dot.ca.gov/hq/oppd/hdm/pdf/chp1000.pdf* accessed 2 October 2006.

Kingdon, John W. 1995. *Agendas, alternatives and public policies.* HarperCollins Publishers, New York, NY.

Langeland, Anders. 2006. *Sustainable transport in Davis, CA?* Draft paper, accessed Sept, 2006.

Li, Jon. 2007. Personal communication. Long-term Davis political figure.

Lofland, John. 2004. *Davis: radical changes, deep constraints.* Arcadia Publishing, Charleston, SC.

Lott, Dale F., Donna Y. Lott and Tammie Miller Harrington. 1975. *Bikeway usage and design*. Compendium of studies from 1969 to 1972.

Lott, Dale *How our bike lanes were formed: a determined group of Davis activists just wouldn't give up on our quality of life*. Op-ed, Davis Enterprise August 2003.

Lott, Donna. Davis community activist. Personal interview. July 11, 2005.

Nozek, Stan. Vice Chancellor for Administration, UC Davis. Personal interview, July 27, 2005.

O'Hearne, Jerry. Project Manager, UC Davis Office of Architects and Engineers. Personal interview, July 24, 2005.

Palmere, Anthony. 2006. Assistant director, Unitrans bus service. Personal communication.

Pelz, Dave. 1977. *Bicycle programs, City of Davis.* Compilation of various documents.

Pelz, Dave. 2004. *Development of bike lanes in Davis, California.* Presentation at UC Davis, November.

Pelz, Davis. Davis Director of Public Works, retired. Personal interview, November 2005.

Ramey, Mel. Retired UC Davis engineering professor, conducted original research for Davis and USFWA bike lane design standards. Personal interview, November 2006.

Sabatier, Paul A. and Hank C. Jenkins-Smith. 1999. *The advocacy framework coalition: an assessment.* in P.A. Sabatier ed.Theories of the Policy Process. Colorado: Westview Press 117-166.

Sacramento Area Council of Governments. 1994. *Regional bikeway and pedestrian study, draft.*

Sacramento Council of Governments. Metropolitan Transportation Plan Community Workshops. March 6, 2006, Davis, CA

Segar, Bob. Director, Office of Resource Management and Planning, UC Davis. Personal interview, July 2005.

Shaheen, Susan, Long-range development plan: a Davis smart mobility model. California Path Research Report, University of California, Davis. Oct 2003, 185 pp. http://its.ucdavis.edu/publications/2003/UCD-ITS-RP-03-14.pdf accessed Oct 17, 2006.

Skinner, Maynard. Former city councilor, mayor. Personal interview, January 2007.

Sommer, Robert. Professor Emeritus of Psychology. Personal interviews, June 6 and June 7, 2005.

Sommer, Robert and Dale Lott. 1971. *Bikeways in action: the Davis experience. Congressional Record,* Vol 117 No. 53, April 19, 1971.

Sommer, Robert *Where have all the cyclists gone?* Op-ed, Davis Enterprise May 18, 2003.

St. Cyr, Robert. Director, UC Davis Bike Barn. Personal interview, July 7, 2005.

Stamm, Richard and Robert Sommer. March, 1977. *How about a bicycle traffic circle?* in Bicycling, March 1977, 66-68.

Takemoto-Weerts, Davis. 1998. *Evolution of a cyclist-friendly: the Davis model.* Presented at UC Santa Cruz, 1998. *http://www.bicyclefriendlycommunity.org/davis1.htm* accessed Sept 30, 2006.

Takemoto-Weerts, David. Bicycle Program Coordinator, UC Davis. Personal interviews. Sept, 2003, May 2, 2005 and Feb, 2007.

Takemoto-Weerts, Davis. Bicycle Program Coordinator, UC Davis. June 2005, Discussion of Davis bicycle facilities with UC Davis transportation students.

Therriault, Renee, 2007. Personal communication. Chico, CA native.

Tracy, Steve. Transportation Director, Local Government Commission and Community activist. Personal interview, July 1, 2005.

True, James L., Bryan D. Jones and Frank R. Baumgartner. 1999. *Punctuated Equilibrium Theory: Explaining Stability and Change in American Policy Making*. in P.A. Sabatier ed.Theories of the Policy Process. Colorado: Westview Press

University of California, Davis. *Joint TSM plan study*. Dec 11, 1991. Wilbur Smith Associates.

University of California, Davis. 2006. *Alternative transportation and parking investment study*. Prepared by Bay Area Economics and Nelson/Nygaard Consulting Associates. Draft final report, May 11, 2006.

Yolo County General Plan, 2002. Figure Trans-8 *Existing bikeway facilities*.