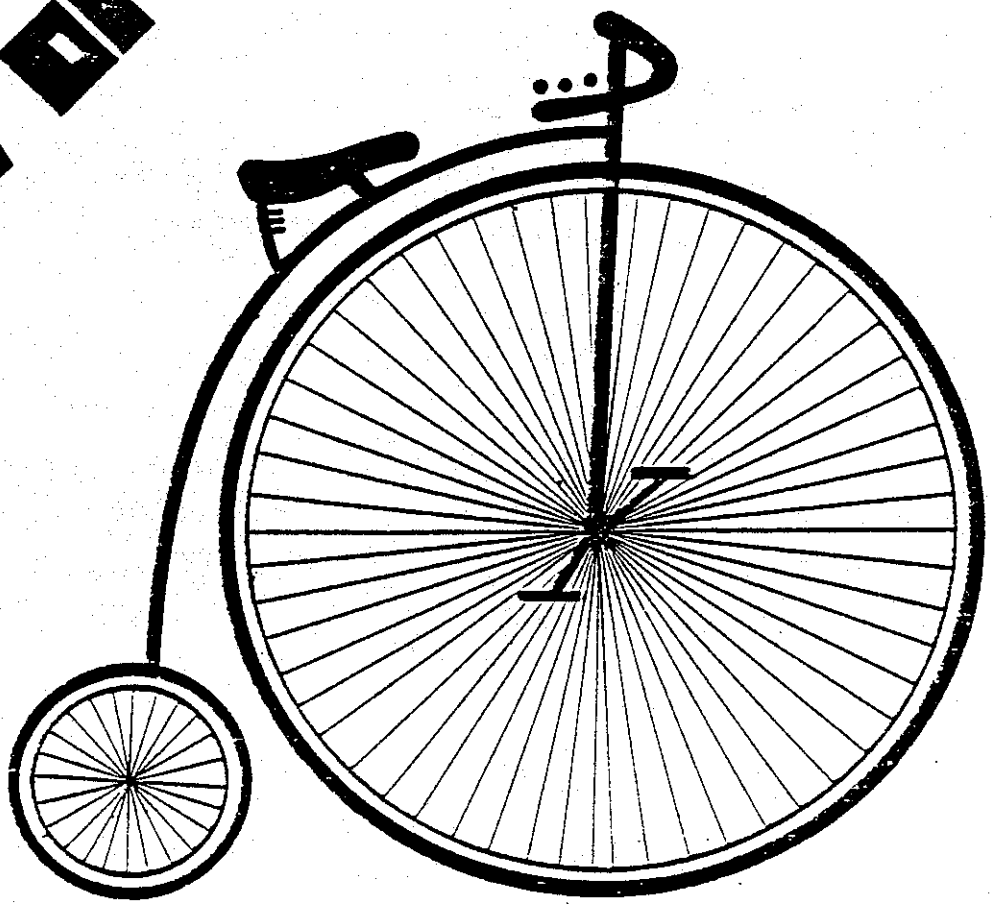
For revision/update

1977

BICYCLE PROGRAMS CITY OF DAVIS



City of Davis
23 Russell Boulevard
Davis, California
95616

BICYCLE PROGRAMS

Davis City Council

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Preface

This publication is a composite of many documents gathered together for the purpose of informing the public on bicycle programs in the City of Davis.

We are indebted to the many contributors both on the City staff and those in the community interested in promoting biking for all citizens. Special thanks go to Tosca Arbini, Departmental Secretary, for her many hours of work in collecting, typing and assembling the documents into readable form, and to Kathy Johnson, for the cover design.

DAVID B. PELZ
Public Works Director

INDEX

DEVELOPMENT OF BICYCLE FACILITIES

Interim Status Report

David B. Pelz, Director
Public Works Department
City of Davis

November 1975
(Revised August 1977)

ARE BIKE FACILITIES NEEDED?

The answer is an unqualified yes. If the community will provide the necessary system of bike lanes and pathways, the citizen will use them. Nowhere is this more graphically demonstrated than in Davis.

For eight years Robert Sommer and Dale Lott have provided a continuous analysis of the Davis system. Their article in Bicycling!, a magazine for the industry, revealed that apart from those using the school bus, 80 percent of Davis junior high students rode bikes to school while only 38 percent did so in Woodland. Among high school students, the comparable figure drops to 60 percent in Davis and down to 7 percent in Woodland.

It was reported in the DeLeuw, Cather Study that over 25 percent of the travel done in Davis is by bicycle. Counts have been made on streets where the number of bikes exceeds the motor vehicles during peak hours.

WHAT FACILITIES ARE PROVIDED?

Two basic types of bikeways are in use. Variations have been tried in the past and some are still in use (Sycamore Lane, between Russell and Wake Forest, and Villanova Drive, Anderson to Redwood, for example). The standards adopted by most agencies define three basic classes:

Class I: Completely separated right-of-way designated for use by bicycles. Crossflows of motorists are minimized. These are designated in the Davis vocabulary as bike paths. Examples, Covell Greenbelt; Russell Blvd. west of S.R. 113; Covell Blvd., Anderson to Catalina.

Class II: A restricted right-of-way designated for exclusive or semi-exclusive use of bicycles. Crossflows by motorists for parking or entering driveways is permitted. Designated bike lanes in Davis. Examples, 8th Street, 14th Street, Anderson Road.

Class III: A shared right-of-way designated by signs marking a route. No such class exists in Davis and should not be used. If a street does not have sufficient width to accommodate a cyclist in a

designated lane, then it should not be a signed route, either. In Davis the local streets serve all modes adequately and this mixed traffic needs no special designation.

As a very general guideline the plotted curves in Figure 1 show the relationship of the various types of facilities to ADT and motor vehicle travel speed. The use of these data must be tempered with a knowledge of who will be using the bikeway, the user's needs, and where he or she will be going.

The entire portion of the City's on-street bike lane system is designated for streets well in excess of 500 ADT. Most streets painted with the standard bike lane line carry approximately 2,000 to 10,000 ADT. Speed limit for these streets averages 25 mph.

Existing streets built under former standards generally are 50 feet in width with bike lane lines painted 14 feet out from the curb line. (This allowed 8 feet for parked cars and 6 feet for the one-way bike lane on each side of the street, with the remaining area divided into two 11-foot auto travel lanes.)

Our experience has shown that the absolute minimum width for a one-way bike lane is 6 feet. Studies have determined that 7 feet is more desirable from the standpoint of ease of traveling. This width allows two bicycles to travel together without encroaching upon the traveled way. Current standards as adopted in the General Plan have added one more foot (to a total of 7 feet) to each bike lane, for a total street width of 52 feet.

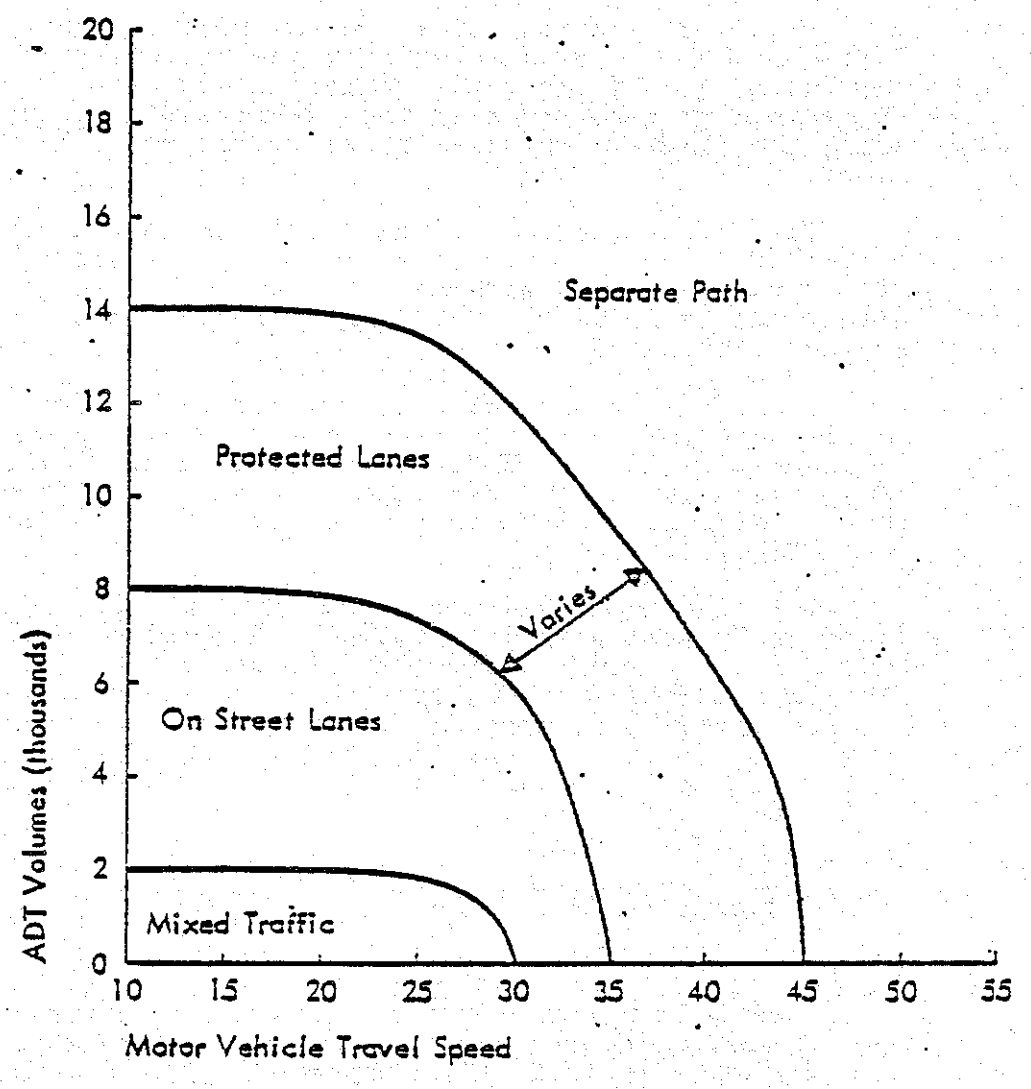
HOW DO YOU PLAN FOR THE RIGHT BIKE FACILITY?

A. Who will use it?

A general process for planning can be outlined and applied as needed to any situation. Before you can look at a specific area, however, there must be an understanding of the bicyclist and his or her needs.

Certain factors can be attributed to cyclists and the intensity or weight of these factors varies with age and ability. These are:

Speed - short distance
Speed - long distance
Degree of purpose



RELATIONSHIP OF MOTOR VEHICLE SPEED
VOLUMES TO BICYCLE FACILITIES REQUIREMENTS

Awareness
Confidence
Directional stability
Knowledge of street system
Knowledge of vehicle code
Reaction to intimidation
Desire to avoid traffic
Willingness to violate rules of the road

As you can see, the various shades of difference in each of these factors can have a marked effect on how we look at the nature of ridership. It is easier to classify the bike rider by trip purpose for planning purposes. Broad categories to be used are outlined below.

1. Commuter trip
   Usually home to work or school and back again, although the trip home may be a...

2. Utility trip
   A trip to the neighborhood "mom and pop store" for milk or to the hardware store for a "plumber's friend" or just maybe a neighborhood visit.

3. Recreational trip
   This might mean a 20-mile ride for an overnight campout or a short half-hour ride to work off an excess pound or two.

4. Sporting or racing trip
   Usually long and out-of-town by a few muscular enthusiasts on $200 bikes.

For our purposes an adequate planning job can be done for the first three categories. The bikers in the fourth category are a small group with unusual needs and can only be dealt with during special events.

B. Where will they go?

Now that the user is identified, it is necessary to analyze the trip generators for any particular neighborhood. Some suggested ones are listed below.

1. Schools (Junior High, High, Elementary or University)

2. Shopping facilities (neighborhood or core area)

3. Life enrichment facilities (library, pools, parks, Senior Center, day care center and schools, again)

4. Centers of work activity (University, core area, factory, etc.)

C. How many will there be?

In Davis we can use statistical data on trip generation characteristics available from Dept. of Transportation studies and assume that 25 percent of those trips will be on bikes.

D. Which route will they take?

The answer to this question is the critical one when you are faced with subdivision design. To some extent the future decision of a resident on whether to use a car or a bike for a certain trip can be influenced at this point.

Key design decisions need to be made after a careful analysis of factors listed in parts A, B and C above. These design features are not limited to the list below.

a. The right combination of lanes and paths
b. Special intersection treatment
c. Midblock "shortcuts" or access openings
d. Curb cuts
e. Lighting
f. Grade separation structures
g. Visibility
h. System continuity
i. Minimize number of stops

Each tentative subdivision map is looked at from the standpoint of bike circulation and what easements may be appropriate to connect neighborhoods with shopping and public facilities. Construction of bike paths is then required of the developer during subdivision work. The onstreet lanes are required by specific street sections detailed in the General Plan. The developer is required to pay for all necessary street width to accommodate the lanes, but City crews do the actual painting and signing at general City expense. Developers may be required to dedicate right-of-way and construct facilities in accordance with the master plan for extension of the bike path system.

E. How will they be financed?

Costs for onstreet bicycle lanes were first funded through gasoline tax revenues and subsequently have been funded through the use of S.B. 325 funds or gasoline sales tax revenues.

THE SUMMARY

The selection of the type of bike facility can only be made in the contaxt of a thorough understanding of the factors outlined above. The pro and con arguments for Class I and Class II facilities are shown below.

	ARGUMENTS FOR	ARGUMENTS AGAINST
Class I - Separate Paths	1. Good for leisure-time recreation. 2. Peaceful ride away from noise and confusion. 3. Peace of mind from a safety standpoint.	1. Higher cost. 2. Increased maintenance (or none at all). 3. Problem at terminals. 4. Street crossings become safety problem.
Class II - On sidewalk	1. Less cost. 2. May be only alternative in existing condition.	1. Increased accident rate (doubled in Palo Alto when tried). 2. Intersection problems. 3. Conflicts with pedestrians. 4. In residential areas, smooth travel interrupted by toys, children playing, etc.
Class II - On street	1. Assigns space on road. 2. Desired by most bikers. 3. Alternatives usually more expensive. 4. Shared by all modes of transportation. 5. System continuity easier to maintain.	1. Right-turn conflict. 2. Bike space not clean enough. 3. False sense of security.

An example of a Class II sidewalk facility is the portion along Villanova Drive between Redwood Lane and Anderson Road. This facility, designed into a new subdivision, was intended to provide a 6' wide meandering path for bicycles, combined with an additional 8' paved section to be occupied by pedestrians and the various surface utilities normally found in a subdivision. It was determined very early that the majority of bikers (on commuter and utility trips) did not like to meander and preferred the street, while others had difficulty with the driveway ramps at each intersection and the condition of the surfacing. This street has been widened to provide for lanes on the street and the sidewalk facility narrowed.

For some time Davis also included a Class II, Type B bike lane in the standards. An example of this type is still being used on Sycamore Lane between Russell Boulevard and Wake Forest Drive. This facility is constructed on a 64' wide street and includes concrete bumper blocks placed approximately 10' out from each curb. Parked cars occupy the street side of the blocks and bikes use the space between curb and blocks.

An attempt was made to apply the Type B lane to a portion of 14th Street between Redwood Lane and "F" Street. It was found that due to the residential nature of the south side of this street and the many intersecting driveways difficulties were created for the residents and hazards for the bikers. Normal residential services, such as garbage and yard pruning pickup, contributed to the problem. This type of lane is no longer part of the Davis specification.

ADDENDUM #1, August 1977

Construction Information. Bike Paths

Soil Characteristics. Our local soils are basically low "R" Value (8 to 20), clays and silts, with high expansion characteristics.

Types of Sections Used.

1. 3" of 3/8" max., 6% oil, asphalt concrete placed in one lift on native material processed and compacted 6" deep to a relative density of 90% minimum. The completed subgrade is sterilized at the following rate: four pounds of dry mono-bor-chlorate per 100 ft.^{2}; mixed with water and applied as a solution. A light fog seal (up to .10 gal/yd.^{2}) is applied to the finished pavement.

   This section has provided very satisfactory results at reasonable costs.

2. 2" of asphalt concrete on 4" of 3/4" aggregate base on 6" of compacted native material. This section has also produced satisfactory results, but with increased costs and construction time.

3. 2" of asphalt concrete on 6" of lime treated base. This section was constructed on one path in conjunction with a major street. It has produced excellent results, but would probably be cost prohibitive in bike path construction only.

4. 4" of Portland cement concrete on 6" of compacted native material. This has also proved successful in selected areas where there are not extreme wet-dry moisture cycles. Costs here are also high. Movement of slabs at expansion joints if soil is allowed to go through the wet-dry moisture cycles can be a problem for bikes, especially those with high pressure tires.

Some Problem Areas.

We have encountered some severe problems with weed intrusion through asphalt paths when soil sterilant was omitted. Cracking and heaving is almost always a problem when paths are constructed in areas with extreme wet-dry moisture cycles. Asphalt paths also deteriorate quickly when drainage off and away from the paths is not provided.

The following 1976 costs are typical for the standard bike path:

Asphalt concrete	$19/ton
Grading	$0.25/ft.^{2}
Soil Sterilant	$0.03/ft.^{2}
Header Boards	$1.50/Lin. ft. (x2 for both sides)

In some cases we may eliminate the header and substitute an extra 6" to 1 ft. width of pathway.

CHAPTER 5.

BICYCLES.[1]

Article I. In General.

Article II. Licenses.

Article III. Operation Generally.

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1. For state law as to operation of bicycles, see Veh. C., § 21200 et seq. As to authority of city to license and regulate the operation and equipment of bicycles, see Veh. C., § 21206.

   As to bicycle parking zones, see § 16-66 of this code. As to special bicycle travel lane on "A" Street, see § 16-11

Article I. In General.

Sec. 5-1. Definitions.

For the purposes of this chapter, the following words and phrases shall have the meanings respectively ascribed to them by the section:

Bicycle lane. That portion of a roadway set aside for the use of bicycles and so designated as provided in section 5-32.

Bicycle path. A pathway for bicycles and pedestrians parallaling a roadway, the side of the bicycle path closest to the roadway being not more than seventy-five feet distant from said roadway. Persons riding bicycles upon such pathways shall be subject to the provisions of section 5-22.

Sec. 5-2. Responsibility of parent.

The parent of any child and the guardian of any ward shall not authorize or knowingly permit any child or ward to violate any of the provisions of this chapter. (Code 1964, § 4-3.1701.)

Sec. 5-3. Applicability of chapter.

The regulations contained in this chapter shall apply whenever a bicycle is operated upon any street or sidewalk, or upon any public path set aside for the exclusive use of bicycles, subject to those exceptions stated herein. (Code 1964, § 4-3.1701.)

Sec. 5-4. Penalty for violating chapter.

Where this chapter has been violated by persons under the age of eighteen years, in lieu of fines and imprisonment therefor, and in lieu of filing charges in juvenile court, the chief of police or his duly appointed representative may impound the bicycle so used in such violation for a period not to exceed thirty days and the owner's registration card shall be held for like period or require of the violator any of the following or any combination thereof:

(a) Attend traffic school for a period of six Saturdays.

(b) Be deprived of bicycle for a period not to exceed thirty days.

(c) Have parents of violator deprive violator of bicycle for a period not to exceed thirty days.

(d) Have bicycle equipment inspected at the police department within five days of any equipment violations.

(e) Write a composition of not less than two hundred words on a subject, title specified by the chief of police or his representative.

(f) Obtain a city bicycle license immediately and pay the penalty required in section 5-9.

(g) Copy the section of bicycle chapter violated one hundred times. (Code 1964, § 4-3.1701.)

Article II. Licenses.

Sec. 5-8. "Bicycle" defined.

For purposes of this article, a bicycle is any device upon which a person may ride, which is propelled by human power through a system of belts, chains or gears, and which has wheels at least twenty inches in diameter and a frame size of at least fourteen inches. (Ord. No. 775, § 1.)

Sec. 5-9. License--Required.

No person shall ride, move or leave standing or allow to be ridden, moved or left standing any bicycle on any street, highway, public way or public property within the city unless such bicycle has been registered and licensed pursuant to the licensing requirements of state law, and a current license or renewal tag affixed to the bicycle in accordance with the provisions of this chapter.

Any license tag issued prior to October 1, 1975 shall be recognized as valid in satisfaction of the requirements of this section until August 31, 1976, at which time a new license must be obtained pursuant to this chapter. (Ord. No. 755, § 1.)

Sec. 5-10. Same--Application.

Application for a bicycle license shall be made upon a registration form provided by the city. The registration form shall contain the name and address of the owner of the bicycle; a description of the bicycle, including its serial number; the make, type and model of the bicycle and such other information as may be required by the chief of police to properly register and identify the bicycle to be licensed. (Ord. No. 775, § 1.)

Sec. 5-11. Same--Renewal.

Application for renewal of a bicycle license shall be made upon a renewal form provided by the city. The renewal form shall contain such information as may be required by the police chief to properly renew the bicycle license. (Ord. No. 775, § 1.)

Sec. 5-12. Same--Fees.

Every applicant for a bicycle license and every applicant for renewal of a bicycle license shall pay to the police chief a license fee to be assessed on the basis of one dollar and fifty cents per year or fractional part thereof. The time period for which the license fee is to be calculated shall commence from the date the applicant is liable for the licensing of the bicycle to the last day of the license period.

All amounts collected in excess of the cost of conducting and administering the bicycle licensing program shall be used for the support of this article and to improve bicycle safety programs and to construct, maintain and promote bicycle trails, paths, and lanes. (Ord. No. 775, § 1.)

Sec. 5-12.1 Same--Refunds.

Whenever the owner of a bicycle licensed by the city under this article intends to establish residence in another state or foreign country and to remove such licensed bicycle to out of state or foreign residence, such person may, within sixty days of the change of residence, apply for a refund of a prorata portion of the license fee attributable to the unexpired licensing period calculated from the first day of the month following the change of residence.

All such applications for refund shall contain a declaration under penalty of perjury that the applicant intends to terminate his or her state residency upon a stated date, within sixty days of the application for refund. Such application shall be accompanied by the bicycle license indicia. (Ord. No. 785, § 1.)

Sec. 5-13. Same--Period of validity.

The license period shall be as specified by the director of the department of motor vehicles for the state. A license issued after the first day of a license period shall be valid from the date of issuance of the license to the last day of license period. (Ord. No. 775, § 1.)

Sec. 5-14. Same--Issuance by sellers.

The police chief may authorize the issuance of licenses by sellers of bicycles in conformity with the requirements of the chapter, and may adopt administrative regulations to implement this section. (Ord. No. 775, § 1.)

Sec. 5-15. License and registration certificate.

Upon satisfactory completion of the registration form and payment

of the license fee, the city shall issue to the applicant a license and a registration certificate which shall have corresponding number. The license shall be provided by the state and shall be affixed to the frame of the bicycle on the seat support member halfway between the seat and the pedals facing forward. The police chief shall keep a record of the date of issue of each license, to whom issued and the number thereof. The license shall bear a unique license number and shall be permanently assigned the bicycle. Renewal tags shall be provided by the state and shall be affixed in the manner prescribed by law. If a license is damaged or destroyed, a replacement shall be obtained from the police chief upon presenetation of the registration certificate and a fee to be determined by the police chief, but not to exceed one dollar. (Ord. No. 775, § 1.)

Sec. 5-16. Removal or alteration of numbers or licenses.

No person shall wilfully or maliciously remove, destroy, mutilate or alter the number of any bicycle frame licensed under this chapter. No person shall remove, destroy, mutilate, reproduce or alter any license renewal tag or registration certificate during the time such license, renewal tag or registration certificate is in effect; provided, that nothing in this chapter shall prohibit the city from stamping numbers on the frames of bicycles on which no serial number can be found, or on which the number is illegible or insufficient for identification purposes. (Ord. No. 775, § 1.)

Sec. 5-16.1 Authority of police chief to number bicycle.

All bicycles shall have, as a means of identification, serial numbers stamped on the frame of the bicycle. The police chief, or the police chief's authorized representative, may stamp numbers or symbols on the frames of bicycles not bearing manufacturer's serial numbers. (Ord. No. 775, § 1.)

Sec. 5-16.2 Retailers.

Any person engaged in the retail business of selling new or second-hand bicycles shall make periodic reports to the police chief, as specified by the police chief on forms provided by the city, giving a list of all sales by such retailer which shall include:

(a) The name and address of each person to whom a bicycle is sold.

(b) A description of the bicycle sold, including the brand name, color and other distinguishing marks.

(c) The serial number and where located on bicycle.

(d) The number of the state license affixed thereto, if any.

Such retailer shall also send to the police chief with such reports the registration certificate, if any, of the former owner of each second-hand bicycle sold. In addition, such retailer shall supply to each purchaser a record of the information, name of retailer, address or retailer, year and make of bicycle and serial number. (Ord. No. 775, § 1.)

Sec. 5-16.3. Change of owner or address.

(a) Whenever the owner of a bicycle which is licensed pursuant to provisions of this chapter sells or otherwise disposes of the bicycle, he or she shall, within ten days, notify the police chief of such disposition.

(b) Whenever the owner of a bicycle which is licensed pursuant to the provisions of this chapter changes his or her address, he or she shall, within ten days, notify the police chief of the old and new address.(Ord. No. 775, § 1.)

Sec. 5-16.4. Transfer of license.

Any person who purchases or otherwise acquires possession of a bicycle which is licensed pursuant to the provisions of this chapter shall, within ten days of taking possession, apply for the transfer of the license to his or her name. Such person shall present the current registration certificate for the bicycle and other proof of ownership as may be required by the police chief with a fee to be determined by the police chief, not to exceed one dollar at the time of application for transfer of the license. (Ord. No. 775, § 1.)

Sec. 5-16.5. Rental agencies.

A rental agency shall not rent or offer any bicycle for rent in the city unless the bicycle is licensed, a license is attached thereto and the bicycle complies with the equipment requirements of the state Vehicle Code. (Ord. No. 775, § 1.)

Sec. 5-16.6. Exceptions to license requirements.

(a) Bicycles owned by children living in any charitable institution or owned by such institution shall be licensed, but no fee shall be collected for these licenses.

(b) Bicycles purchased by any group or organization qualifying for the state welfare exemption as defined in Revenue and Taxation Code section 214 shall be licensed, but no fee shall be collected for these licenses.

(c) Any person who is not a resident of the city is not required to obtain a city license for a bicycle which remains in the city for a period of less than five days. (Ord. No. 775, § 1.)

Sec. 5-16.7. Penalties.

(a) Any bicycle left standing in a public place, which bears no license, may be impounded until the owner obtains a license as

required under this chapter. If the bicycle is held for ninety days and within that time no one lawfully entitled to the bicycle appears at the police department and requests the release of the bicycle and obtains a license, the bicycle may be sold or disposed of according to law.

(b) No parent of any child or the guardian of any ward shall authorize or knowingly permit any such child or ward to violate any of the provisions of this chapter.

(c) Any violation of this chapter shall be deemed to be an infraction. The fine imposed for any violation shall not exceed the sum of five dollars.

(d) Failure of owner to claim a bicycle within seven days after notification of storage by the police department may result in the charging of twenty-five cents per day storage fee. Fees shall not be charged for the first seven days of storage. (Ord. No. 775, § 1.)

Article III. Operation Generally.

Sec. 5-17. Applicability of traffic laws.

Every person riding a bicycle upon a street or sidewalk shall be granted all of the rights and shall be subject to all of the duties applicable to the driver of a vehicles, this Code or other ordinances of this city applicable to the driver of a vehicle, except as to those provisions of laws and ordinances which by their nature can have no application, and except as otherwise provided in this chapter. (Code 1964, § 4-3.1713; Ord. No. 442, § 1.)

Sec. 5-18. Obedience to traffic control devices.

Any person operating a bicycle shall obey the instructions of official traffic control signs, and other control devices applicable to vehicles and bicycles, unless otherwise directed by a police officer. (Code 1964, § 4-3.1714; Ord. No. 442, § 2.)

Sec. 5-21. Speed.

No person shall operate a bicycle at a speed greater than is reasonable and prudent under the conditions then existing. (Code 1964, § 4-3.1717.)

Sec. 5-22. Emerging from alley, driveway, bicycle path, etc.; entering bicycle lane or roadway.

The operator of a bicycle emerging from an alley, driveway, bicycle path, building or otherwise approaching upon a sidewalk or a sidewalk area extending along any such area shall yield the right of way to all pedestrians approaching on such sidewalk or sidewalk area, and upon entering a bicycle lane, shall yield the right of way to all

bicycles approaching on such lane, and upon entering the roadway shall yield the right of way to all vehicles or bicycles approaching on such roadway. (Code 1964, § 4-3.1718; Ord. No. 442, § 4; Ord. No. 568, § 2.)

Sec. 5-26. Riding on sidewalks, playgrounds, etc.

(a) No person shall ride a bicycle upon a sidewalk within the central traffic district.

(b) The city traffic engineer, with the approval of the Safety Advisory Commission, is authorized to erect or place signs in any other district on any sidewalk or roadway, prohibiting the riding of bicycles thereon by any person and when such signs are in place no person shall disobey the same. Before such a sign is erected or placed, it must be found by the Safety Advisory Commission, (1) that the riding of bicycles on such sidewalk or roadway will endanger pedestrian traffic or the public safety, or (2) that a property right or interest belonging to the city may be terminated or forfeited if the riding of bicycles on such sidewalk or roadway is not prohibited.

(c) Whenever any person is riding a bicycle upon a sidewalk such person shall yield the right of way to any pedestrian and shall give audible signal before overtaking and passing such pedestrian.

(d) No person shall ride or operate a bicycle upon any playground, park or school ground, where children are playing, without the permission the persons having supervision of the playground, park or school ground. (Code 1964, § 4-3.1722.)

Sec. 5-32. Establishment: signs.

The city engineer, upon approval of the Safety Advisory Commission, is authorized to erect or place signs upon any street or adjacent to any street in the city indicating the existence of a bicycle lane and otherwise regulating the operation and use of vehicles and bicycles with respect thereto.

Sec. 5-37. Walking bicycles.

Bicycles may be walked subject to all provisions of law applicable to pedestrians. (Ord. No. 442, § 5.)

Section 5-38. Vehicles exempted from Sec. 21209 of the Vehicle Code of the State of California

Traffic enforcement vehicles operated by the Police Department

and maintenance vehicles involved in routine or emergency maintenance operated by Public Works Department, Life Enrichment Department, Post Office and waste collection are exempted from Section 21209 of the Vehicle Code of the State of California.

RESOLUTION NO. 3, SERIES 1964

RESOLUTION ADOPTING POLICY ESTABLISHING DEVELOPERS' RESPONSIBILITIES IN CONSTRUCTION OF NEW STREETS

WHEREAS continuing growth of the City of Davis requires modification of City policy regarding City participation in the construction of new subdivision streets; and

WHEREAS it is in the interest of the developer to know his improvement requirements; now, therefore,

BE IT RESOLVED that the developer shall be responsible for the following improvements on new streets, as classified in the City General Plan:

1. Local and Cul-de-sac Streets -- all required improvements.

2. Collector Streets - all required improvements.

3. Secondary Streets - all required improvements.

4. Major Street without vehicle access from adjacent property.

   a) Dedicate required right-of-way;

   b) Relinquish access rights;

   c) Construct frontage road if required;

   d) Construct major street curb and gutter;

   e) Construct drainage facilities to serve the major street and abutting properties;

   f) Construct sidewalk, bicycle path and fencing if required by the City;

   g) Construct street lighting for the major street;

   h) Grade and construct tamporary pavement between the major street gutter and existing major street pavement, unless City is concurrently constructing permanent major street pavement.

5. Major Street with vehicle access from adjacent property.

a) Dedicate required right-of-way;

b) Construct major street curb, gutter and sidewalk;

c) Construct drainage facilities to serve the major street and abutting properties;

d) Construct bicycle path if required by the City;

e) Construct street lighting for the major street;

f) Grade and pave with permanent pavement between gutter and median curb.

BE IT FURTHER RESOLVED that Resolution No. 10, Series 1958, is hereby rescinded.

PASSED AND ADOPTED by the City Council of the City of Davis this 13th day of January, 1964, by the following vote:

AYES: Councilmen Jacobs, Markham, McMurdie, Nicholson and Mayor Woodbury.

NOES: None.

ABSENT: None.

/s/ NORMAN E. WOODBURY
Mayor

ATTEST:

/s/ C. W. BIRKELO
City Clerk

(EXTRACT FROM CITY OF DAVIS GENERAL PLAN, SEPTEMBER, 1975)

CIRCULATION-TRANSPORTATION ELEMENT

The Circulation Element is provided for in Section 65302 (b) of the Government Code. This section calls for "A circulation element consisting of the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals and other local public utilities and facilities, all correlated with the land use element of the plan." As Davis' size is not large enough to warrant separate elements, these are included in a single Circulation and Transportation Element.

GOAL:

The provision of a balanced, comprehensive transportation and circulation system coordinated with land use that adequately accommodates the total travel needs of the community

Objective No. 1: Provision for mobility for all segments of the community

Policies:

1. Planning and development of convenient and efficient public transit
2. Preservation and expansion of the bicycle circulation systems, including adequate provision for bicycles in all new developments
3. Preservation and expansion of the pedestrian circulation system

Objective No. 2: Minimization of pollution of the environment caused by the total transportation system

Policies:

1. Support and development of effective alternatives to the use of the automobile, such as bicycles and public transit
2. Maintenance of an automobile circulation system consistent with the goal of reduced automobile travel

3. Development of planning policies (such as land uses near freeways, building and site design, etc.) to reduce the impact of transportation generated noise upon adjacent land use

4. Development of control standards for transportation pollutants

5. Development of standards for the depression and/or screening of freeways

6. Development of standards for the synchronization of traffic signals

Objective No. 3: Improvement of the safety, efficiency and convenience of all modes of transportation

Policies:

1. Encouragement of the use and enhancement of the safety of public transit through the location and design of transit facilities

2. Coordination of intracity and intercity public transit within the region and with other forms of transportation such as air and rail

3. Provision for the safe use of all circulation systems by the handicapped through the imposition of design standards that recognize their needs

4. Minimization of conflict between vehicular, pedestrian and bicycle traffic

Objective No. 4: Development of circulation and transportation plans as part of a total land use plan

Policies:

1. Coordination of the total transportation-circulation system with the Land Use Element

2. Location, operation and maintenance of transportation facilities so that they are compatible with adjacent areas

3. Development of circulation and transportation standards that serve the needs of the area

Objective No. 5: Development of realistic parking standards

Policies:

1. Consideration of de-emphasis on the use of the automobile when setting parking standards

2. Consideration of reduced parking requirements to encourage non-auto use developments

(EXTRACT FROM CITY OF DAVIS GENERAL PLAN, SEPTEMBER, 1975)

STREET STANDARDS

Definitions

1. Major Arterial - A continuous street, existing or proposed, so located as to serve arterial traffic and so designed to minimize access to abutting property via driveways alleys and business entrances. Streets feeding into major arterials should be spaced at one quarter mile intervals. Major arterials should not penetrate neighborhoods and should be planned so as to eliminate through traffic in residential neighborhoods and adjacent to schools

2. Minor Arterial - A continuous street, existing or proposed, so located as to provide a direct route between but not through separate neighborhoods. Minor arterials should be planned to eliminate through traffic in residential neighborhoods and adjacent to schools

3. Collector Street - A noncontinuous street, existing or proposed so located as to collect traffic from local streets and distribute it to minor and major arterials. The difference, other than size, between a collector and an arterial is that a collector penetrates a neighborhood while an arterial does not

4. Local Street - A street, other than a collector or arterial, providing access to abutting property and designed not to accommodate or encourage through trip activities

5. Cul-de-sac - A local street terminating in a turning area and generally not exceeding 400 feet in length

NOTES:

1. Additional street and right of way widening at intersections may be necessary to accommodate turning vehicles and transit stops

2. Additional easements may be required for utilities and planting

3. General locations of the major and minor arterials are indicated on the Circulation Map in the Circulation-Transportation Element

4. The Planning Commission may approve street widths narrower than above in P-D (Planned Development) and PUD (Planned Unit Development) zoning districts

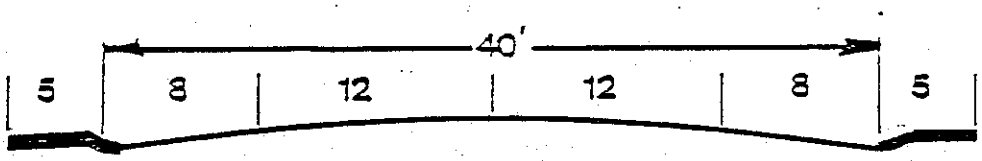
5. Collector and local streets should be designed, when possible, as to limit their length to reduce the amount of traffic being carried

6. Bicycle facilities will be considered in the design of all arterial and collector streets

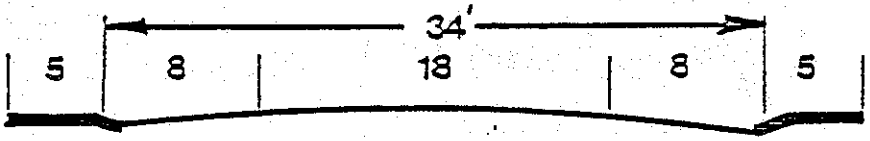
7. Right of way width shall be measured at the back of sidewalks for all streets with the exception of major arterials. Additional right of way or easement will be required for sidewalk, bike paths, and landscaping on major arterials. Additional right of way or easement may be required for other streets in order to provide for separate bicycle facilities

Suggested Geometric Cross Sections

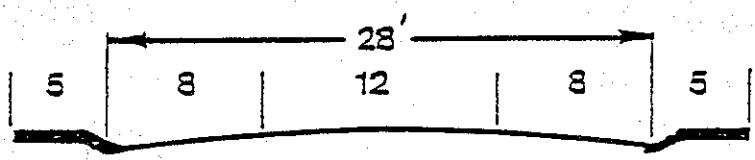
Item	Minimum Width	Street Classification
Moving Lane	12'	Arterials (subtract 1 foot when adjacent to emergency parking)
Moving Lane	11'	Collector with bike lanes
Two Way left turn lane	11'	Minor Arterials
Parking	8'	All streets
Emergency Parking	6'	All streets
Center Median	14'	Arterials
Bike Lane	7'	Minor Arterial and collectors (add 1 foot next to curb lane)
Bike Path	10'	Arterial and collector
Curb Lane	Add 2 feet to minimum lane width ("shy distance")	



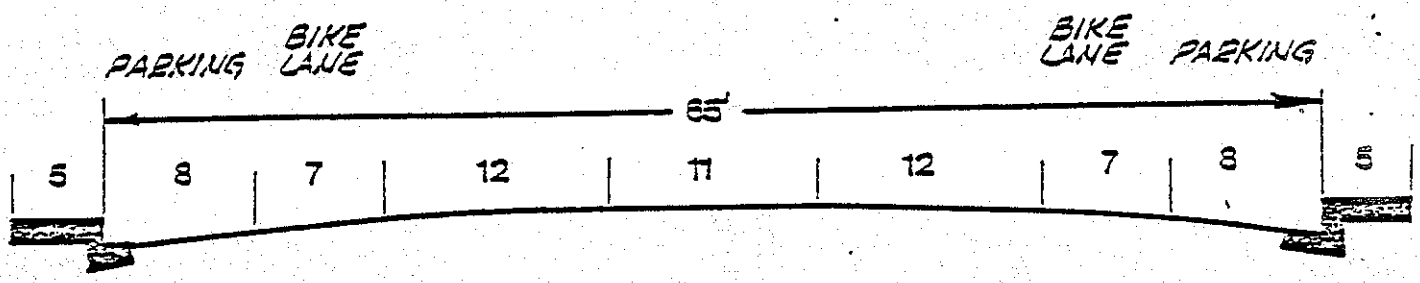
MODIFIED LOCAL



LOCAL

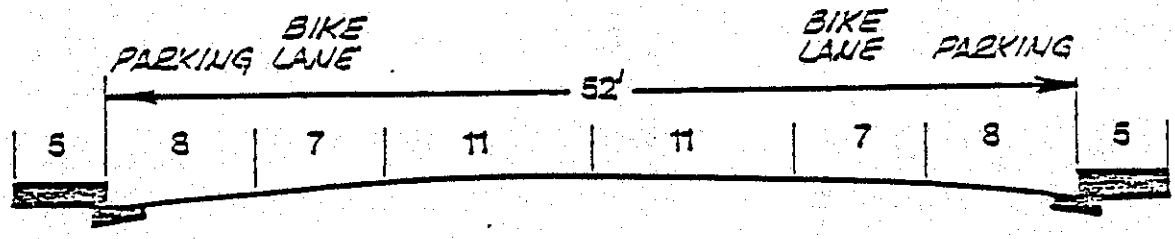


CUL-DE-SAC



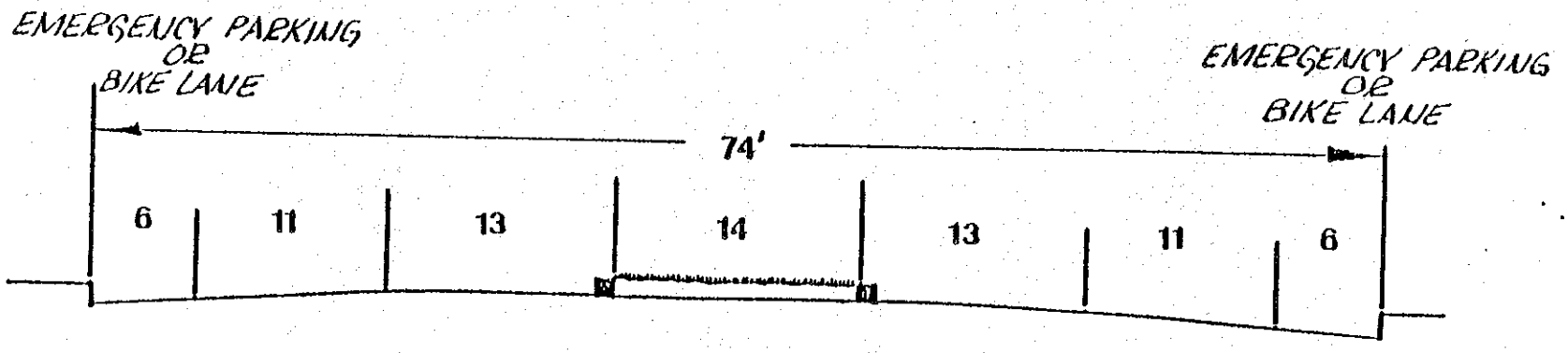
MINOR ARTERIAL WITH BIKE LANES

CLASS II BIKE FACILITY



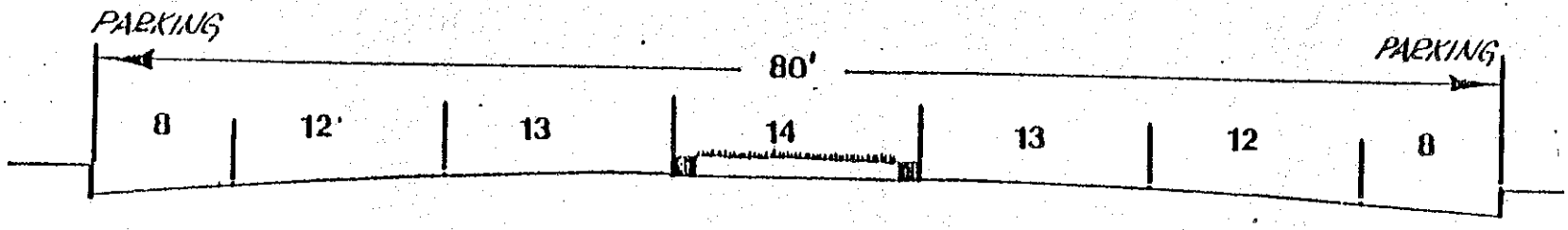
COLLECTOR

CLASS II BIKE FACILITY



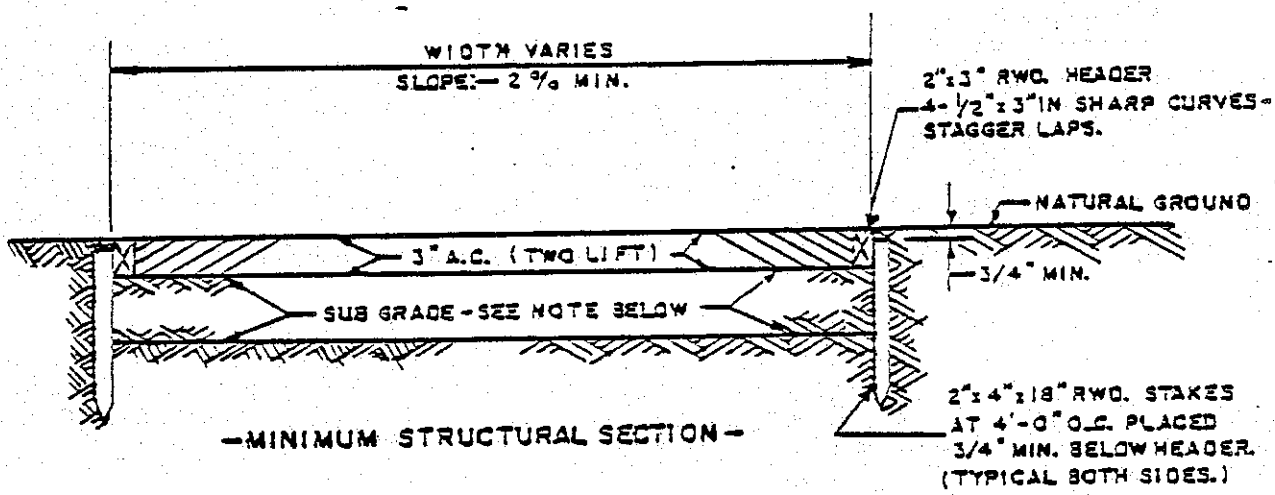
MAJOR ARTERIAL WITHOUT PARKING

MAY INCLUDE CLASS I BIKE PATHS, BOTH SIDES



MAJOR ARTERIAL WITH PARKING

MAY INCLUDE CLASS I BIKE PATHS, BOTH SIDES



—MINIMUM STRUCTURAL SECTION—

SPECIFICATIONS:

ASPHALT CONCRETE:

GRADING: TYPE "B", 3/8" - 85-100 PENETRATION
OIL CONTENT: 5.8 TO 6.2
FOG SEAL: SS-1 AND EQUAL PART WATER AT 0.07 GAL. PER SQ. YD.

SUB GRADE:

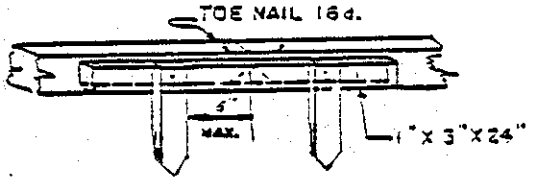
SOIL SHALL BE PROCESSED AND COMPACTED TO 90 % RELATIVE COMPACTION TO A DEPTH OF 6" BELOW FINISH SUBGRADE. SUBGRADE SHALL BE WITHIN ± 1/2" OF PLAN.

STERILANT:

4 LBS. OF DRY MONO-SOR-CHLORATE PER 100 FT.^{2}, MIXED WITH WATER AND APPLIED AS A SOLUTION.

HEADERS AND STAKES:

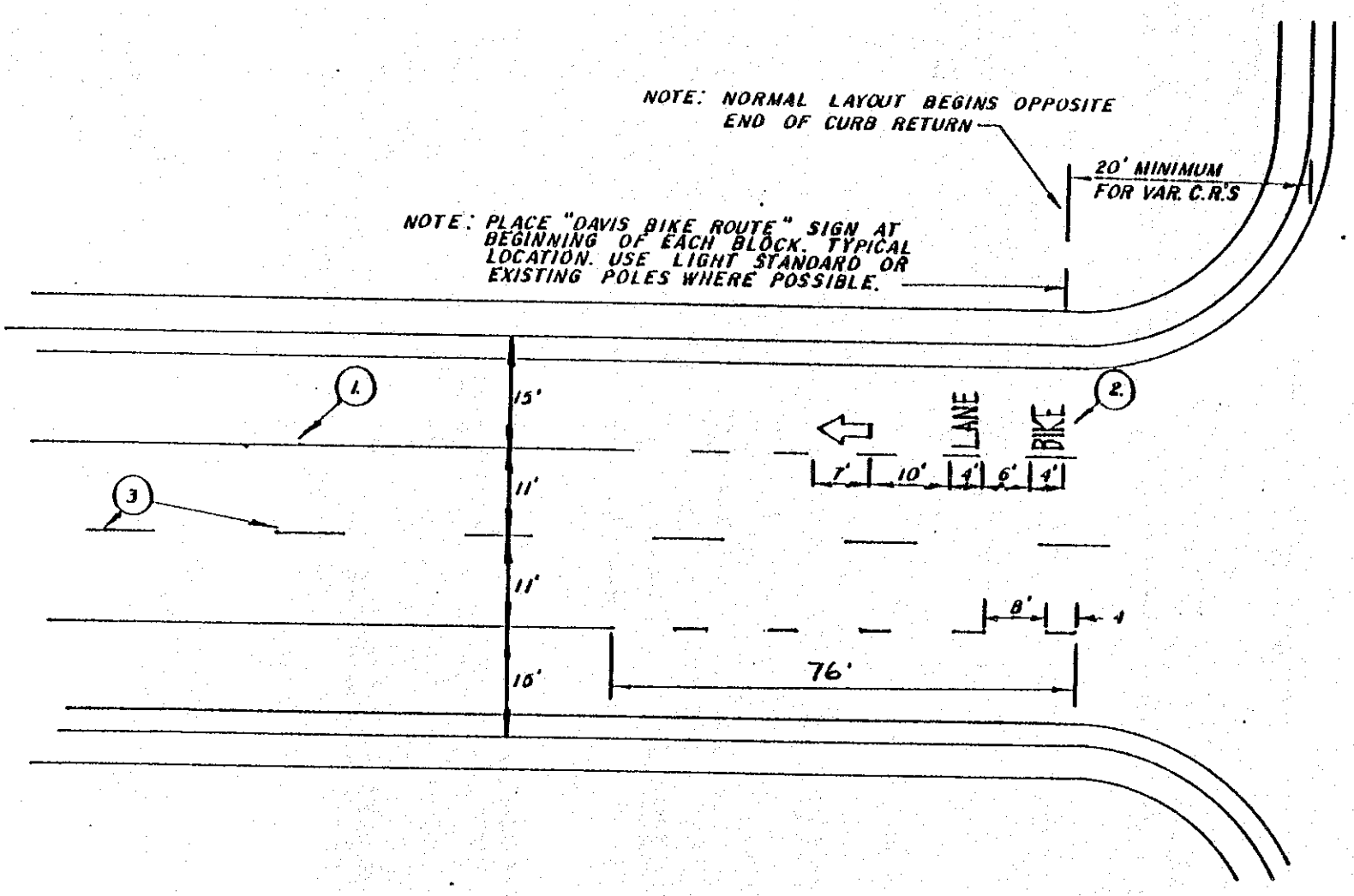
1. ALL WOOD SHALL BE CONSTRUCTION HEART REDWOOD OR BETTER.
2. JOINTS IN HEADERS SHALL HAVE A STAKE ON BOTH SIDES. SEE DETAIL BELOW.



REVISED 3-22-77
CITY OF DAVIS

STANDARD 34
BIKE PATH
CONSTRUCTION DETAIL

S.T. | NONE | JUNE



TYPE "A" BIKE LANE 52' STREET
TYPICAL LAYOUT

GENERAL NOTES :

1. SOLID 6" WHITE LINE.
2. STENCIL PAINTED WITH WHITE REFLECTIVE TRAFFIC PAINT.
3. DASHED 4" YELLOW CENTER LINE.

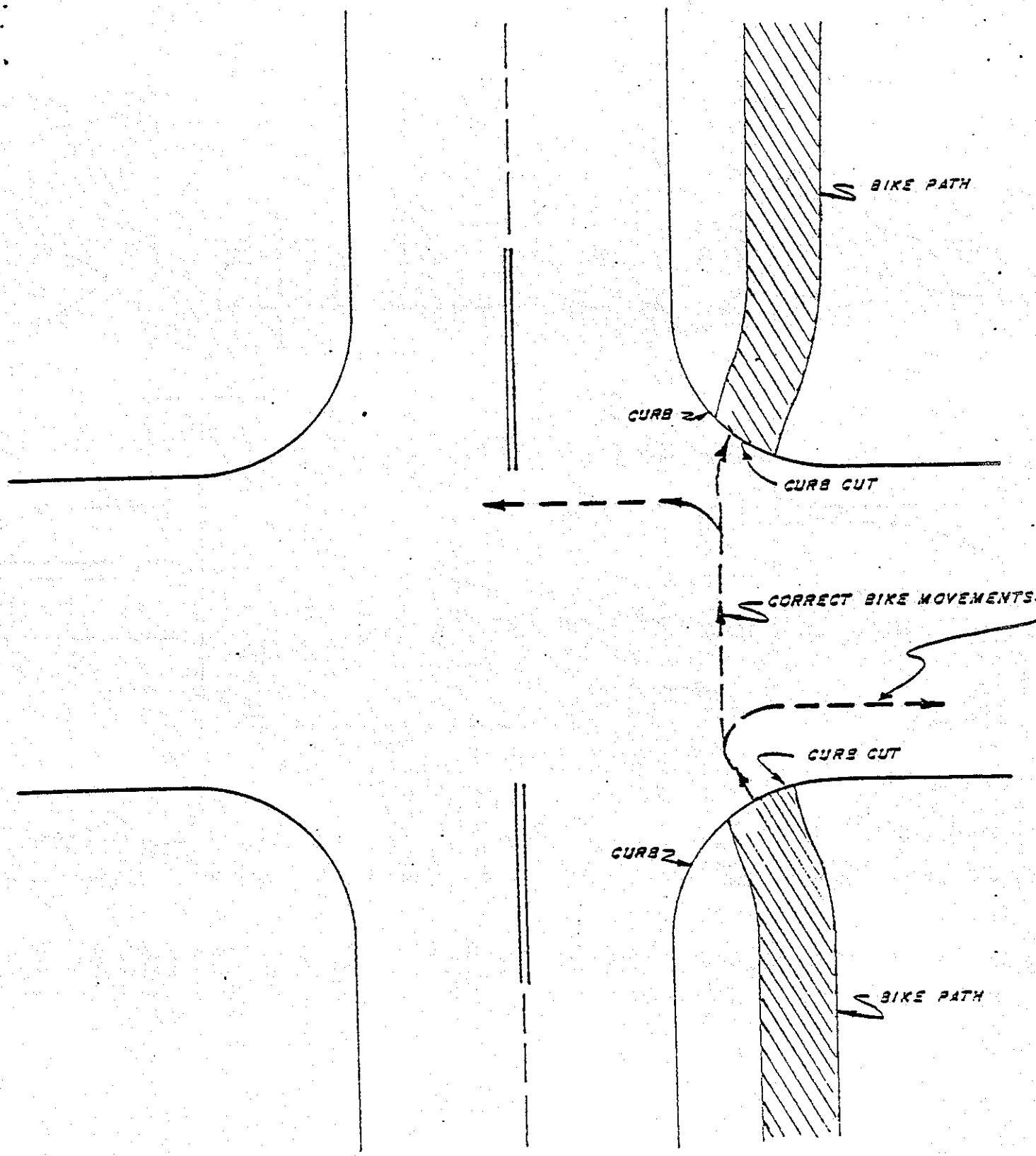
CITY OF DAVIS
California

BICYCLE

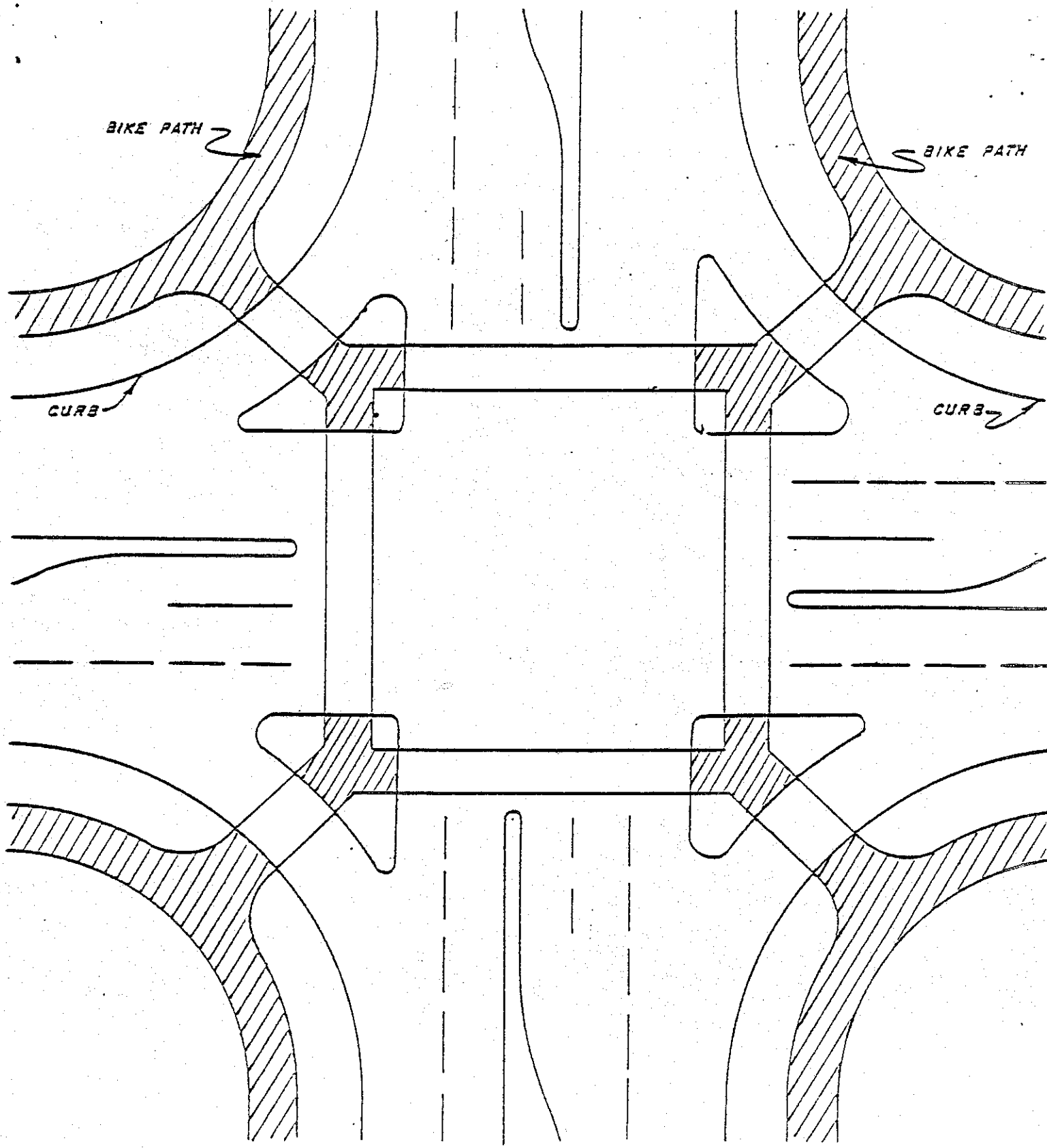
LAYOUT

REVISED: 3/18/76 (Interim)

DESIGNED A.E.	SCALE 1" = 20'	APPROVED 3-11 '77 David A. Pike
DRAWN D.R.C.	FIELD BOOK N/A	DIRECTOR OF PUBLIC WORKS
CHECKED A.E.	P. NO. N/A	R/W SHEET NO. 14E08
SHEET 1 OF 2 SHEETS		JOB NO. 508 - 21



TYPICAL INTERSECTION WITH BIKE PATH OFF STREET



INTERSECTION OF MAJOR STREETS WITH BIKE PATHS OFF STREET

City of Davis

BICYCLE SAFETY PROGRAM

The following is a brief description of the total bicycle education, safety and enforcement program provided by the City of Davis. Six separate programs are administered through the Police Department.

1. THREE "R" PROGRAM

A planned curriculum introduces bike safety in kindergarten classes and continues the educational process through the ninth grade. The curriculum on bikes includes a "talking bicycle," films, slides, lectures and hand-out material. The films used are:

"The Day the Bicycles Disappeared" (Color Print)
Produced by AAA Foundation for Traffic Safety
734 - 15th Street N.W., Room 803
Washington, D.C. 20005

"Somebody Stole My Bike" (Color Print)
Produced by Sid Davis Productions
1046 South Robertson Boulevard
Los Angeles, CA 90035

Additional aids used in this portion of the safety program are attached:

A. Outlines of lesson plans for grades 1 through 4.
B. Bicycle scripts used with slides and the "talking bicycle" (for grades 1 through 3).

2. THE BIKE RODEO

Held on school grounds during the school day. The bike rider's ability to balance, turn, stop and signal for turns is tested. A copy of the bike rodeo layout is attached.

3. BICYCLE SAFETY TRAINING SCHOOL

Coordinated between the Police Department and local PTA's, sessions are scheduled at the school to teach identification of traffic control signs and devices. The necessity for such controls and their various uses are explained. After a brief lecture the students are introduced to various signs and devices set up on a street diagram laid out on the school grounds; then they are taken by bikes on a prearranged route of local streets which incorporate traffic control devices.

4. BIKE SAFETY CHECK DAY

Each bike at the schools is inspected for safe use. Bolts, nuts, pedals, etc. are checked and minor repairs are done by the Police Officer.

5. BIKE LICENSING PROGRAM

Bike licenses are sold for a three-year period at a cost of $4.50. The computerized license and theft data, tied to the CLETS Program of the Department of Motor Vehicles, provides control over thefts and the return of abandoned or stolen bicycles and permits identification of Davis-registered bikes in other areas, both in and out of state.

6. BICYCLE CITATION PROGRAM

All uniformed patrol of the Davis Police Department can issue citations to individuals, regardless of age, who are in violation of the bicycle ordinance. Several correctional procedures are available depending upon the frequency of violation, including group meetings, parental involvement and counseling, through the Youth Services Division. (See sample citation letter attached.)

The "Bike Enforcement Officer" rides a 10-speed bike, in uniform, and enforces bicycle traffic laws. Currently this is a one-half time position. The "Bike Aide" is a regular employee who has the responsibility of locating and retrieving stolen and abandoned bicycles. The Bike Aide maintains the bike files, assists with licensing at rush times of the year and conducts bike auctions. Abandoned bicycles must be held 90 days prior to being auctioned. Approximately four auctions are held yearly.

Davis Police Officers devote over 1,000 class hours per year to the school curriculum program described in (1) above, paying three or four visits per grade, per year.

DAVIS POLICE DEPARTMENT

THREE R PROGRAM

FIRST GRADE

LESSON PLAN II - VISIT #2

TITLE: "SAFEST RIDE TO SCHOOL"

I. OBJECTIVES:

A. To emphasize the proper safety procedures necessary for riding a bicycle to school in a safe manner.

B. To demonstrate the proper method of riding a bicycle safely.

II. CONTENT:

A. A Police Officer, in uniform, visits the classroom. He is introduced by the teacher.

B. Police Officer enters classroom on "talking bicycle", and conversation takes place between officer and "Mr. Smart Spokes".

C. The Officer will encourage questions and class participation.

III. ASSIGNMENT:

None

IV. RESOURCE MATERIALS:

A. Talking Bicycle ("Mr. Smart Spokes")

DAVIS POLICE DEPARTMENT

THREE R PROGRAM

SECOND GRADE

LESSON PLAN II - VISIT #2

TITLE: "GHOST RIDER"

I. OBJECTIVES:

A. To emphasize the proper safety procedures necessary for riding a bicycle to school in a safe manner.

B. To demonstrate the proper method of riding a bicycle safely.

II. CONTENT:

A. The Officer should be prepared to talk about the bicycle laws pertaining to the community.

B. Officer should know the safety rules when riding a bicycle.

III. MAJOR ACTIVITIES:

A. A Police Officer, in uniform, visits the classroom. He is introduced by the teacher.

B. The Officer will use a series of overhead transparencies showing the proper safety rules to observe while riding a bicycle.

C. The Officer will encourage questions and class participation.

IV. ASSIGNMENT:

None.

V. RESOURCE MATERIALS:

A. Overhead projector and screen.

B. Transparencies.

C. "Ghost Rider" Comic Books.

D. Classroom wall poster, "Rules of the Road."

DAVIS POLICE DEPARTMENT

THREE R PROGRAM

THIRD GRADE

LESSON PLAN I - VISIT #1

TITLE: "THE DAY THE BICYCLES DISAPPEARED"

I. OBJECTIVES:

A. To emphasize the proper safety procedures necessary for riding a bicycle to school in a safe manner.

B. To demonstrate the proper method of riding a bicycle safely.

II. CONTENT:

A. The Officer should be prepared to talk about the bicycle laws pertaining to the community.

B. The Officer should know the safety rules when riding a bicycle.

III. MAJOR ACTIVITIES:

A. A Police Officer, in uniform, visits the classroom. He is introduced by the teacher.

B. The Officer will refer to points covered in the film shown.

C. The Officer will use projector showing film, "The Day the Bicycles Disappeared."

D. The Officer will encourage questions and class participation relating to points of film.

E. Distribute new bicycle regulations.

IV. ASSIGNMENT:

None.

V. RESOURCE MATERIALS:

A. Projector and screen.

B. Film, "The Day the Bicycles Disappeared."

C. Handout.

DAVIS POLICE DEPARTMENT
THREE R PROGRAM

Fifth GRADE
LESSON I - VISIT #1

TITLE: "BICYCLE LAWS & SAFETY"

I. OBJECTIVES:

A. To reinforce the necessity for bicycle safety and courtesy.
B. To emphasize bicycle laws and citation procedures.

II. CONTENT:

A. The Officer will discuss with the class the regulations required for bicycle operation within the city.
B. The Officer will use a film to show safety rules for bicycling.
C. The Officer should be familiar with a 16 mm. projector.

III. MAJOR ACTIVITIES:

A. A Police Officer from Davis P. D. and U.C.D. and Bicycle Aide, in uniform, visits the classroom. They are introduced by the teacher.
B. The Officer will show a film to the students. The film illustrates proper bicycle safety rules.
C. The Officer will make the students aware of:
   1. proper safety rules to observe while riding a bike;
   2. licensing requirements;
   3. bike auctions;
   4. introduce him to Bicycle Aide.
D. Have students relate accidents experienced or seen.

IV. ASSIGNMENT:

None.

V. RESOURCE MATERIALS:

A. Film, "Somebody Stole My Bike."
B. Photograph, "Who was Careless?"
C. Bicycle Regulations.
D. 16 mm. projector and screen.

BICYCLE SCRIPT - GRADES 1, 2 & 3

Bike: Hi, Boys and Girls, it's really great to be here today!

Off.: Well, Mr. Smart Spokes what should we do today, should we dance or sing a song?

Bike: You know I can't sing, and you know very well I can't dance, let's tell the boys and girls about bicycle safety. Thats really important!

Off.: Why don't you introduce yourselves to the boys and girls and tell them about bicycle safety?

Bike: Hi, Boys and Girls. My name's Mr. Smart Spokes, and my job is bicycle safety. I'm here today to talk about Bike Safety. Do you know that over 22,000 people in Davis ride bicycles? That's right. They ride them to work, to school, for health . . bicycling is great exercise. They ride for pleasure, bicycles are great fun, for economy, it doesn't cost anything to ride a bike, and for ecology,. bikes don't pollute the air like cars and motorcycles. Really, Bikes, are one of the most useful means of transportation. They're fun to ride, take you where you want to go and provide healthful exercise, and more people are riding bikes today than ever before. There will be more bikes sold this year than automobiles, and thats alot of bikes and that creates a lot of problems for bikes like me. I don't like problems any more than you like problems. I believe that traffic safety, education, should begin right here! Today, Yes Sir! Right here in this classroom!

Off.: In that case, let's remind them of the rules of bicycle safety Mr. Smart Spokes. What should we start with?

Bike: Well, let's start with going to or coming home from school. I see lots of boys and girls riding down the wrong side of the road and riding side by side. Remember you must ride on the right hand side of the road in single file.

Off.: What does yield the right of way mean?

Bike: Well, you should always keep your eyes on the road and allow the cars to go first. You should always stop for cross-traffic. Don't ever ride your bike through cross traffic. When crossing the street with your bike, get off and walk it across the street. This is very important because many boys and girls are hit by cars each year while riding their bikes across the street.

Off.: How important is speed?

Bike: That's really important because more children are killed or injured by speed than any other cause.

Off.: Why is this? Bikes don't go as fast as cars?

Bike: A bike is just like a car, Officer. The faster you go, the less control you have. When you are riding your bike real fast, even a small stone can make you lose control and fall down. The faster you go, the longer it takes you to stop,. so you see that it pays to slow down.

Off.: Thats good advice Mr. Smart Spokes, how about giving hand signals before turning? Is this important?

Bike: You bet your life it's very important! Without a hand signal the driver of a car coming behind you has no idea what you are going to do. Don't forget, always check behind you before you make a turn. You may be driving a bicycle, but you should obey all the traffic laws and use all the hand signals your parents use when they drive a car.

Off.: Is it o.k. to give a friend a ride on your bike?

Bike: To be safe, Officer, there should only be one person on a bicycle at a time. When you ride double, it is too easy to lose control. The same thing goes for carrying packages. You should always carry packages in a basket. You should also keep both hands on the handlebars, except when you are signaling for a turn.

Off.: How about parking your bikes?

Bike: The best place to park is in a bike rack. If there isn't a rack available you should park in a place which will not be in the way of cars or pedestrians. Never leave them in doorways.

Off.: I've noticed that many boys and girls don't lock their bikes.

Bike: Well, Gang, those that don't lock their bikes will probably have them stolen. Always lock your bike when you leave it. That reminds me, I've seen many bikes in front yards at night. Whenever you go in for the night, be sure that your bike has been put away.

Off.: Why don't you tell them to get a bicycle license?

Bike: Every bike in Davis should have an up-to-date bicycle license just like mine. Those of you who don't have a license should ask your parents to take your bike to the Davis Police Department at 708 Third Street, Tuesday through Saturday during the day. Then if you lose your bike the police will know who it belongs to and will let you know that it has been found.

Off.: Well, Mr. Smart Spokes, after listening to you, it seems to me that the key to bicycle safety is common sense.

Bike: You're absolutely right. Common sense is the key. Everybody can be a safe biker. Know the rules of the road, be courteous, obey the traffic laws, and above all be alert because the other guy can cause an accident too. So Gang, be smart, use common sense, ride single-file, stay on the right, give signals, obey traffic laws, lock your bike, keep your eyes on the road, yield the right of way, stop for cross traffic, and keep your speed down. Aw, Heck, just use common sense!

Off.: Thanks Mr. Smart Spokes. I think the boys and girls get the idea. Have you anything more to say?

Bike: Well, I could talk about bike safety all day, but there are alot of other boys and girls waiting to hear from me, so I'm going to have to leave now. You'd better get on if your going with me.

Off.: O.K., Mr. Smart Spokes, I'm ready.

Bike: One more thing! All those boys and girls look like safe bikers so I'd like to give them a salute with my siren when we leave.

Off.: You're right. They are all safe bikers, Let's give them a salute.

Bike: Good bye Gang!! Don't forget to be a safe biker (Siren)

Bike: O.K., I have to be getting on to other class rooms you ought to get back to your tables now, good-bye.

BICYCLE SCRIPT

SOUND OF SIREN

MR. S. S.: Hi, Boys and Girls it's really great to be here today!

OFFICER: Well, Mr. Smart Spokes what should we do today, should we dance or sing a song?

MR. S.S.: You know I can't sing and you know very well I can't dance, let's tell the boys and girls about bicycle safety. Thats really important!

OFFICER: Why don't you introduce yourselves to the boys and girls and tell them about bicycle safety?

MR. S.S.: Hi Boys and Girls. My name's Mr. Smart Spokes. And My Job is Bicycle Safety. I'm here today to talk about Bike Safety. Do you know that over 22,000 people in Davis ride bicycles? That's right, they ride them to work, to school, for health...bicycling is great exercise. They ride for pleasure ...bicycling is really great fun. For economy...it doesn't cost anything to ride a bike. And for econology... Bikes don't pollute the air like cars and motorcycles. Really bikes are one of the most useful means of transportation. Their fun to ride, take you where you want to go and provide healthful exercise. And more people are riding bikes today than ever before...There will be more bikes sold this year than automobiles...and thats alot of bikes and that creates alot of problems for bikes like me. And I don't like problems any more than you like problems. I believe that traffic safety, education, should begin right here! Today! Yes Sir! Right here in this classroom!

(Turn Overhead Projector on with #1 transparency)

OFFICER: Mr. Smart Spokes, why don't you tell the boys and girls what a "Ghost Rider" is?

MR. S.S.: A Ghost Rider is a bike rider, but not just any bike rider. A Ghost Rider rides a bike safely. In other words, you watch out for the other guy. You ride as if you were invisible to cars, buses, trucks or people. Never assume that they have seen you and will get out of your way. Other vehicles are bigger and faster than a bike rider so watch out for the other guy! And remember...the other driver may not see you until it's too late and you could be badly injured.

(Put up Transparency #2)

OFFICER: Now Mr. Smart Spokes, why don't we tell the boys and girls about bicycle safety.

MR. S. S.: First, I want to tell you that a bicycle is not a toy. If your big enough and old enough to ride a bike you must know this... A bicycle is a vehicle that must follow rules of the road the same a s a car! It is important for you to know , understand, and obey all traffic regulations the same as if you were driving a car or riding a motorcycle. If you ignore these laws and regulations, you may get a ticket the same as the driver of a car. But most important is for your own safety.

(Transparency #3 should be turned on)

OFFICER: Well, Mr. Smart Spokes what do you have to say about riding a safe bike?

MR. S.S.: Here again, just like a car, you must drive a mechanically safe car..., you must ride a mechanically safe bike. If your Dad has worn out tires on his car, what does he do? That's right! He gets new ones! If his brakes are bad what does he do? That's right! He gets them working good. Remember! A good driver takes care of his vehicle. It makes it easier to operate and proper care makes it last longer. Riding an unsafe vehicle can get you into alot of trouble and may cause a very serious accident. Let the Officer point out a few of the major items you should check or your bike... and, do it today...not tomorrow!

(Transparency #4 should be turned on)

OFFICER: Mr. Smart Spokes, why don't you tell the boys and girls what signals and signs mean?

MR. S.S.: Remember what I told you before...a bicycle rider must obey all traffic regulations that includes all markings on the street. Officer why don't you explain to the boys and girls some street markings and signals .

(Transparency #5 should be turned on)

OFFICER: What can you say about this picture Mr. Smart Spokes?

MR. S.S.: Here is a law that far too many bicycle riders break. Never ride against traffic! Always ride with traffic!, on the right side of the street. And stay close to the curb! Can anyone tell me why you should ride on the right side and follow traffic? (Pause) Those are all good answers.

MR. S.S.: You know along time ago there were not too many sidewalks and very few cars. People would walk against traffic so they could see and dodge a car by jumping into a ditch. People rode bicycles with the same thought in mind...they could ride off the street into a ditch. But today, things are different...there are more and faster cars. It's not so easy to dodge. We have sidewalks to walk on and since the bicyclist should not ride on the sidewalk, he has no ditch to fall into...the safest way is to stay on the right side - close to the curb and drive a straight line, don't wobble or swerve. Stay off high speed highways and freeways! Use less-traveled roads.

(Turn on transparency #6)

OFFICER: Mr. Smart Spokes why shouldn't you ride with your buddies side by side or even three or four riders abreast. You own the street as much as anyone else!

MR. S.S.: Let me illustrate it this way...what if you were riding on the right side of the street close to the curb and your friend was riding next to you close to the traffic...there was a big rock or hole in the road...you pull away from the curb to dodge it and your friend is forced out into the street into the patch of a fast moving car... It could mean injury or instant death for your friend, or you, if the situation were reversed. Regardless of how many bicycle riders you have in a group...remember: Play it safe...always ride single file!

(Transparency #7)

OFFICER: Well, kids where do most accidents happen? (Pause) Where do you think it happens Mr. Smart Spokes?

MR. S.S.: At intersections! There is a reason for this...all traffic meets at intersections and they go every which way. The cars are always in a hurry and this is no place for a bike rider who may not be seen. So, what is a smart thing to do? Walk your bike! Yes!.Get right off your bike and walk it, in the protected pedestrian zone. Do you know what you become when you walk and push your bike? You become a pedestrian and all vehicles are on the look out for pedestrians. And if your making a left turn...don't risk getting involved in traffic, your no match for automobiles.
You won't safe any time, but you may save your life...

(Transparency #8)

OFFICER: Why should you use Turn Signals Mr. Smart Spokes?

MR. S.S.: To let the traffic behind you know what your going to do. Who can tell me how to signal for a right turn? (Pause)
You over there on the right, will you show me a stop or slow signal! (Pause) Will someone stand up and show us the signal for a left turn? (Pause) Very good! Before you turn give your signal...give a quick glance behind to be sure your signal is understood behind you... then return both hands to the handlebars and make your turn. Does that sound complicated? Well, it's not, and you've made a safe turn... and to be safe is alot better than to be sorry.

(Transparency #9)

OFFICER: What about cars making right turns Mr. Smart Spokes?

MR. S.S.: Watch out for cars making right turns! You know why? Because they are more concerned with cars coming from their left and may not see a bike rider on their right. This is the old squeeze play and your the one that's getting squeezed between the car and the curb. Whether you are right or wrong...you can get badly hurt and the car might not even get a scratch. So drive defensively, always be prepared to stop quickly. Now, look at this picture what is wrong? (Pause) More accidents are caused here than most all others put together. A bike rider... on the wrong side of the street approaching an intersection with a car making a right turn. POW! Scratch one bike rider.

(Transparency #10)

OFFICER: Has this ever happened to you! And suddenly a door opens.

MR. S.S.: And when it happens...Oh boy does it hurt? Your riding your bike along side parked cars on your right, perfectly legal, and suddenly a car door opens...whamo! This is called a moveable object hitting a immoveable object, and whatever it's called it hurts bad! I don't care whose fault it is... the bike rider is the loser. You've entered into what we call the drivers blind spot. He did not see you approaching and opened his car door. Now, what if you smartly turned out to avoid his door opening? You are a prime target for the fast car coming up behind you. It's up to you to watch! Be prepared to stop! And avoid changing lanes when you don't have time to signal. Again, you are a safe rider, so drive defensively.

(Transparency #11)

OFFICER: Mr. Smart Spokes, What is Yielding the right-of-way?

MR. S.S.: Yielding the right-of-way Officer, means letting the other guy go by first. The safest way of all is to give everyone the right-of-way including cars, trucks, buses and always yield to pedestrians. Be courteous!

(Transparency #12)

OFFICER: Well, what do you have to say about the boys and girls riding at night?

MR. S.S.: Well, first of all, I hate to see boys and girls riding their bicycles at night. Their very hard to see especially if it's foggy or rainey. If you must ride your bicycle at night besure your bike has a white front head light, a large red light, or red reflector that can be seen 300 feet away and you should have reflectors on your pedals. Always check your lights before you leave home. Make sure it's working properly

and keep your back reflectors clean. Be extra careful at night. avoid streets where there is heavy traffic. Wear light colored clothes if you must ride in the dark...do not! And I repeat!...Do not ride at night unless you have a headlight and a red reflector..on the bike O.K. ?

(Transparency #13)

OFFICER: What do you think of this picture Mr. Smart Spokes?

MR. S.S.: WOW! Look at this trick bike rider! Isn't he great! Well, if he's doing this in a open field or vacant lot...thats fine. But, if he's doing it in a street, he's just a fool. ~~Xxxxxxxxx~~ Stunting or trick riding in the streetsis very dangerous. A car could appear out of no where and Mr. Stunter has done his last trick. Don't stunt ride in streets and don't let some fools dare you into performing for them. And here's something else, only one person should ride on a bicycle at a time! It doesn't make any difference if a passenger is on front or rear or on top of your head. Only one to a bike! With two persons on a bicycle built for one it is difficult to keep balance and visibility is very ppor. For your own safety...this is a very dangerous thing to do. I don't want to get involved with a lot of statistics, but, I want to impress upon you that in 4 our of every 5 automobile bicycle accidents, the bicycle rider is to blame. Now, that is a pretty lousy record for bike riders. Don't you become a statistic starting right now, you drive safely and watch out for the other guy.

(Transparency #14)

OFFICER: Remember boys and girls protect your bike! It doesn't make any difference if your bike is worth $3.00 or $300.00. It's your property, it's important to you, and you should protect it. Did you know that there are people that make their living just stealing and selling bicycles like yours? ~~Xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx~~ Mr. Smart Spokes will give you a few suggestions on how to protect your bike!

(Transparency #15)

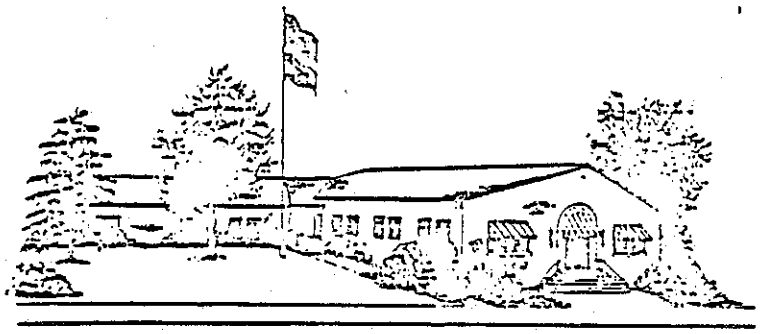
MR. S.S.: Alright Officer, ~~xxxxxxxxxxxxxxxx~~ I will give the boys and girls some pointers. Do not leave your bike even for a minute without locking it. When you lock your bike, if it is at all possible, lock it to a post or some stationary object. Can you tell me why? That's right! A thief would have a hard time stealing your bike without also stealing what it is locked to, and this could be difficult or impossible to do. And, use a strong lock and chain! Lock the front wheel, back wheel, and frame, Even at home. Keep your bike locked in your garage or room. Don't leave it out on the front lawn or side of the house where it can be seen. If you have accessories on your bike such as pumps, rearview mirros, carrying racks etc., fasten them very securely and tight. Don't leave your bike lying around just anywhere. Others might fall over it and get hurt and it's easier to steal too. How many here have had a bike stolen or know someone who has had a bike stolen? (Pause) And one more important item is to have your bike licensed and registered with the police department.

Do you know that we recover a lot of bikes, but there is no record of an owner and no one can identify them. So we have a bicycle auction and it's sold to the highest bidder. Don't let this happen to your bike.

OFFICER: Do you have anything else to say Mr. Smart Spokes?

MR. S.S.: Well, I could talk all day about bicycle safety, but there are alot of other boys and girls waiting to hear from me. So I'm going to have to leave. One other thing, Officer, show the boys and girls our book, it's full of cartoons, and all about bikes. It's the best book ever written for you about bicycle safety. Everyone here will get a copy of this book compliments of the Davis Police Department. I want you to study this book and remember what it says. Have your parents read it too!

O.K. Officer why don't you push me out of here, Goodbye kids have a nice day.



CITY OF DAVIS

226 F Street Davis, California 95616
(916) 756-3740

TO THE PARENTS OF:_____

This is to inform you that your son/daughter has received a bicycle citation.

☐ An appointment has been set for you and your child to appear on _____, at 7:30 p.m. in the City Hall Council Chambers, 226 F Street, Davis. This is a group meeting, if your child denies the alleged violation you may contact the Bicycle Citation Hearing Officer prior to the above date to discuss the matter individually.

☐ Since your child is under 12 years of age, and this is his/her first citation, we are asking that you discuss the violation with him/her pointing out the hazards of his/her actions.

☐ As you may recall, you were requested to discuss the first violation with your child. Since it appears the child has not responded to this disposition, we request that you and your child appear at the appointment scheduled above.

☐ This is to confirm our telephone conversation regarding rescheduling an appointment for your son/daughter with our Bicycle Citation Hearing Officer. Failure to appear at this appointment will result in the matter being referred to the Juvenile Traffic Hearing Officer at the Davis Justice Court.

☐ During his/her appearance for counseling on the last citation, he/she was advised the next violation would be handled by the Juvenile Traffic Hearing Officer at the Davis Justice Court. As a result of this citation, disposition of same will be handled by the Davis Justice Court, 424 3rd Street, Davis. You will receive notice from them as to time and date of your appearance.

If you have any questions regarding this matter, please contact the Davis Police Department, Youth Services Division at 758-3600.

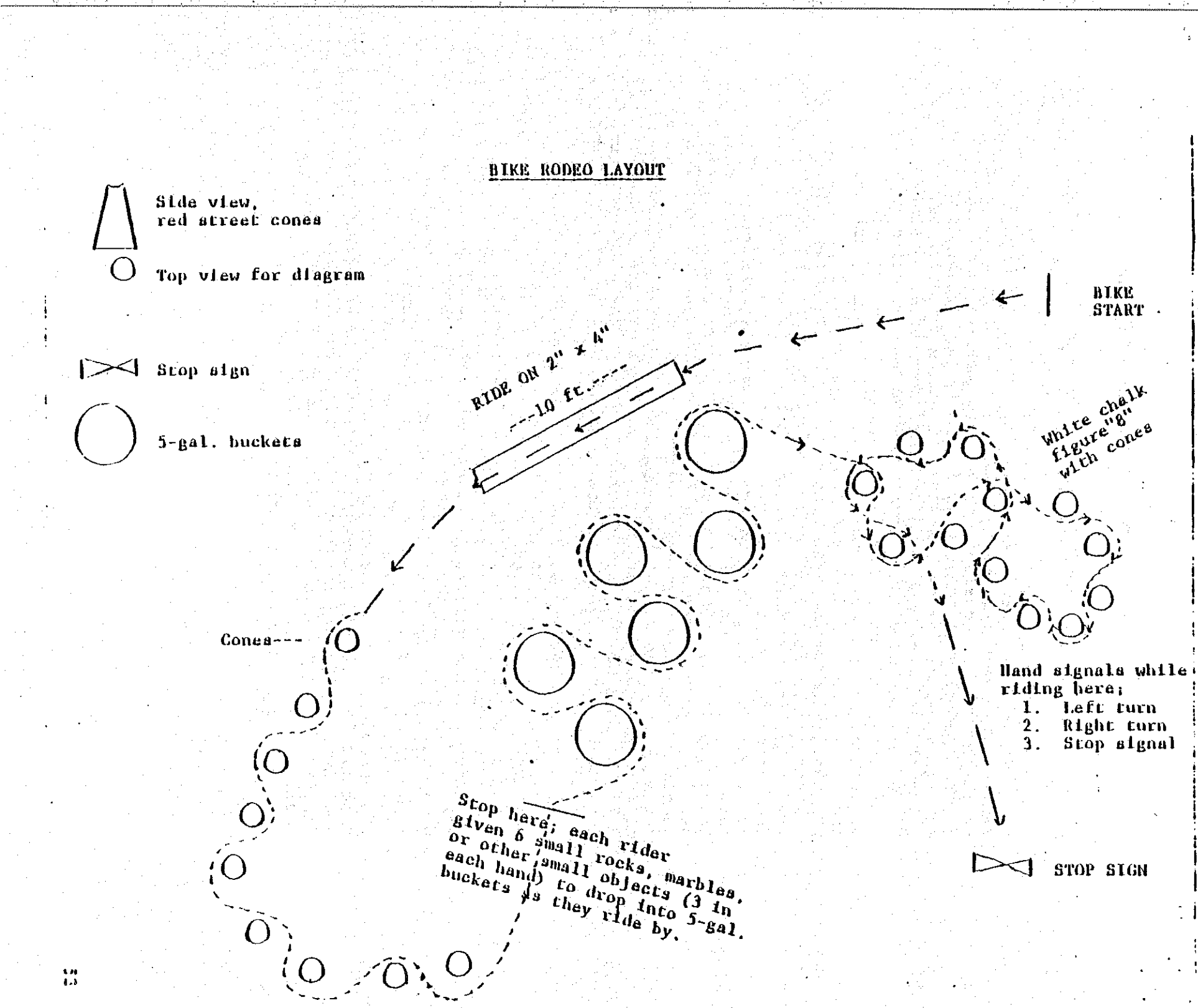
Sincerely,

B. D. BARTHOLOMEW
Chief of Police

Enclosure: ☐ Copy of Citation

☐ Copy of Bike Ordinance

BIKE RODEO LAYOUT



BIKEWAYS IN ACTION: THE DAVIS EXPERIENCE

Robert Sommer and Dale F. Lott

Leaving the freeway and entering Davis, the motorist sees a large sign telling him that this California city has 18,000 bicycles. Considering that its population is only 24,000, probably no other city in the United States has as high a proportion of its citizens owning bicycles and using them as a regular means of transportation. A number of factors produced this situation--the presence of many young people attending the Davis Campus of the University of California, the flat terrain, the mild weather, and the many wide streets. When the campus expanded greatly and the population in the area grew rapidly in the early 1960's, the streets became much busier. About the time the first stop light was installed, people riding bicycles began to feel crowded. At the local bicycle shop, it was common to see bikes appearing with damaged front wheels when riders were forced into the curb by passing cars. Competition, both for space on the streets and opportunities to cross at intersections, grew between bicycles and automobiles. It was a lopsided competition at best--bicycles are small and frail, automobiles large and sturdy. It became clear to a number of concerned Davis citizens that, if bicycles were to remain a viable part of the city transportation system, they would have to be given a place of their own in city traffic planning.

What was needed was some way to separate bicycles from automobiles and the plan adopted was the bicycle path or bikeway--a strip of pavement or concrete from which automobiles would be excluded. At first this suggestion was rejected by the City Council; it was considered to be visionary, impractical, and potentially dangerous and its proponents were regarded as cranks. Letters to the editor proclaimed that the day of the horse was past and the day of the bicycle was passing. It was time to build more and larger parking lots and shopping centers. Citizens were urged to welcome the twentieth century to their city and forget the gay nineties and all its trappings. However, as the debate continued, it became apparent that there was widespread support for bicycle paths. A citizens group circulated a petition asking the City Council to establish bicycle paths along principal streets and rights-of-way of an integral part of the city's transportation system. This petition was signed

by 90 percent of the several hundred voters approached. Bike paths became the central issue in a city election of 1966 and the pro-bikeway candidates won. Soon after that, the first bike paths were established along the sides of existing wide streets.

Since that time, Davis has been developing a bicycle path network that is probably unique in the United States. New housing tracts in the city are required to set aside space for bicycle lanes separated from traffic and a special act was passed by the California Assembly to enable the city to formulate traffic regulations for bicycles. It is important to realize that the bicycles are not merely owned, stored or used for recreational purposes; they are an important part of the transportation system. On one heavily trafficked street, traffic counts during the summer (with few University students in town) show that bicycles represented 40 percent of all traffic. During the rush hour, 90 percent of all riders are adults. The emblem of the city shown on many municipal vehicles is a gay nineties two-wheeler. Many business leaders in the community are strong proponents of bike riding, and admit that this is a matter of self-interest. The use of bicycles has meant that there are no parking meters in the city and the traffic situation at rush hours is tolerable. The bicycle has also helped preserve the central city core as a viable shopping district, since parking is not a serious obstacle to shopping downtown. The University and high schools have been able to set aside less space for parking lots than they would ordinarily. The acceptance of the bicycle as a viable means of transportation by virtually all segments of the community provides the unique opportunity to learn the structural and social requirements of safe, efficient and pleasurable bike riding.

Generally speaking, for the last 50 years in the United States, the bicycle has been assigned a low priority in traffic planning and the results of this policy were predictable. The situation in Christchurch, New Zealand, visited by one of the authors in 1969, is instructive. Only a few years ago, Christchurch was known as the Copenhagen of the Pacific because of the prevalance of bicycles in the city. The Sunset Travel Guide to New Zealand states, "Almost everybody rides two-wheelers in Christchurch; you can rent one easily for sight-seeing. The only city with more bicycles per capita is Copenhagen." The situation had changed dramatically by 1969. Few bicycles were seen in the central part of the city and places to rent bicycles were equally scarce. Bicycles were still in reasonable use in the outlying areas but they had been squeezed out of the downtown. The Christchurch

director of traffic safety attributed the bicycle's decline to the increased use of the automobile and the motorbike. However, there was no planning at all to preserve the bicycle as an alternative mode of transportation to motor-driven vehicles. The traffic director remarked that many merchants and automobile drivers considered bicycles a nuisance and in a few years' time they might have to be zoned out of the central business section entirely. The director was quite interested when I described a situation in other major cities where automobile traffic had reached a breaking point and there was a move to zone automobiles out of the central city and bring back the bicycle. The Christchurch experience makes it clear that bicycles as well as automobiles have their special requirements and when these are not heeded, they will be squeezed out by the automobile, apart from restricted recreational use.

The potential of bicycle transportation cannot be realized without the necessary environmental support system. Just as one cannot have a railroad without tracks, or a bus system without highways, so one needs special facilities and regulations for bicycle traffic. This means planning which must rest on firm knowledge of these special requirements of the bicycle. One simply does not design highways for automobiles and sidewalks for pedestrians, leaving bicyclists squeezed in between moving automobiles, parked cars and pedestrians.

First let us review the history of the Davis bicycle path network. About eight years ago a group of concerned citizens formed the Bike Safety Committee which investigated bicycle traffic problems in the city and made various suggestions about how to alleviate them. The city Public Works Department became interested and made traffic counts to determine the streets most heavily used. There was very little precedent to follow in developing bike lanes. The city Public Works Department believed that the most feasible plan was to create bike lanes on the outsides of the streets over 50 feet wide. Where this contradicted the California Motor Vehicle Code, a special bill relating to bike lanes was passed with the help of the State Assemblymen. This bill permitted the Davis City Council in 1967 to pass Ordinance 442 creating bike lanes and regulating bike traffic. The Davis City Council is very favorable to bicycle lanes and present plans call for 12 miles of bicycle paths by 1974, including five miles of lanes completely separated from the roadway.

The establishment of these pioneering paths offered an opportunity to study the use of the paths, the attitudes of

car drivers, bike riders and city officials toward them, and the effect of the paths on safety. The safety record of the lanes is very good. Thus far, not a single car-bicycle collision has taken place in the bicycle lanes. Damaged front wheels are rare problems at the bike shop. However, while the lanes protect the riders for the length of streets, they left them exposed and in a somewhat more vulnerable position at the intersections. There are some real problems connected with left turns from inside the bike lane, particularly when automobiles are turning right from what has become the center lane. There are also problems about educating out-of-town drivers about the bike lanes. For these reasons, and with the assistance of a small grant from the National Safety Council, we undertook a study of the bicycle path situation in the city. We felt that this information would be helpful to other cities planning bicycle paths. Over the past three years we have conducted a number of surveys among city and police officials, bike riders, and car drivers. Our goal was to get an overview of the bicycle situation in the city, the ways in which problems connected with the bicycle have been met and to specify the problems that remain and how they might be solved.

The location of the University in the city and the flat terrain are important reasons for the heavy use of bicycles in the city. However, in adjacent cities with similar terrain and also institutions of higher learning (Sacramento State College or University of the Pacific, in Stockton), the use of bicycles is nowhere near as heavy. The surveys to be described shortly also make it clear that in Davis the bicycle is used by older people as well as students. The University made an extensive survey of transportation among its 12,323 registered students during the winter of 1970. Overall, some 78 percent kept their bicycle at their campus residence. This included 89 percent of the freshmen and sophomores, 79 percent of the juniors and seniors, and 61 percent of the graduate students. By marital status, 81 percent of the single students had bicycles compared to 64 percent of the married students. More girls than boys kept bikes (86 percent compared to 70 percent of the men), but twice as many men as women owned cars and kept them on campus. Ownership of a bike was related to the distance the student lived from the campus (Table 1). Of greatest interest is use of the bike for transportation as a function of distance. About 70 percent of students living within one to two miles of the campus use a bicycle, but most of those living more than three miles away use an automobile.

In Davis the great bulk of the population lives within two miles of both downtown and campus. During the Spring of 1970, Marie Rorvik interviewed 327 young adults living in apartment houses at various distances from the campus and downtown. The bulk of those surveyed were college students. The percentage of students using bicycles as transportation to campus was the same whether they lived two blocks or two miles away, but the rate of use was not. Those students living within a mile averaged about 10 round-trips a week, while those 1-1/2 to 2 miles away averaged about five round-trips per week. The percentage of non-student young adults who use bicycles is about 70 percent (no different than the students) but the number of trips per week is somewhat less. Both students and non-students rarely used their bicycles as transportation at night. There were approximately 10 times as many trips during the day as at night.

It is the writers' feelings, supported by our survey results, that the bicycle path network in the city is an important factor in this heavy use of the bicycle. At Santa Barbara, where another campus of the University is located on flat terrain, one finds much less frequent use of the bicycle than at Davis.

The Davis city officials were very favorable towards the bicycle paths. However, to a man they commented about the intersection problems--the paths provided safety while riding parallel to the curb but did not help much at intersections. They also mentioned the need for continuous public education. It was difficult to reach new residents, incoming students and people who live elsewhere but come to Davis to work. The bike riders we interviewed were also favorable towards the paths. They felt it was safer and less anxiety provoking to ride in a bike lane. Virtually everyone stated his preference for a bike path over a conventional street if the distance were the same.

We were interested in knowing whether or not bike riders like bike lanes enough to go out of their way to use them. In our first survey we asked all bike riders if they would go a block out of their way to use a bike lane. Only one in five said they would.

The study of young adults in apartment houses asked a slightly different question, "Do you go out of your way to use bike paths?" In their answers to this question, college students and other young adults differed. Among the students, one female in four and one male in seven said they did. On the other hand, when the young adult non-students were asked the same question, 60 percent of the males and 75 percent of the females said they did.

The other responses supported the idea that many people would take the bike paths when available but would not make an extra effort to reach them. Virtually all of the automobile drivers who were interviewed in various parking lots were favorable to the bike lanes. Most confessed to feelings of apprehension when they rode on a street that contained mixed car and bike traffic (i.e. without bike lanes). They felt the paths made it easier to drive since the driver didn't have to worry about bicycles. The only improvement in bicycle paths they proposed was creating more bikeways and marking them better. Only two of the 18 drivers said they ever went out of their way to avoid streets with bike lanes. As a followup, a smaller survey was undertaken in Woodland, California, a nearby city of approximately the same size as Davis but with a much smaller number of bicycles. The city officials interviewed said that Woodland did not have a significant bicycle problem and special bicycle paths were therefore unnecessary. In Woodland the use of bicycles (with identical terrain and climate to that in Davis) was almost exclusively restricted to school children. All of these interviews were uninformative since the respondents had no contact with separate bike lanes and lacked any opinions about their potential value. It was clear that the bicycle was viewed as a minor and incidental part of the traffic situation in Woodland--something to be used by children getting to and from school. However, the survey did seem of some educational value to the adult respondents. A few of them, particularly parents, considered for the first time the possibility of bike lanes in Woodland.

During the Spring of 1970 a door-to-door survey was undertaken by Frank Becker in 132 households in a residential neighborhood of Davis. This is largely a white middle-class neighborhood with single family dwellings. Approximately equal proportions of men and women owned bicycles and ownership was clearly related to age. Of the adults in the 25-35 range, 60% owned bikes, compared to 46% of those ages 36-45 and only 14% of those over 46. More husbands than wives use their bicycles regularly. The major destination of the husbands was the University where they were employed or went to school, while for the women the major destinations were downtown stores or other households in the neighborhood. More men's bikes than women's had lights on them, which supports the greater reliance of the men on the bicycle for transportation.

Virtually all of the parents had discussed bicycle safety with their children. The major items mentioned were cautioning the children to watch out for cars, signaling,

driving on the correct side of the street (moving in the same direction as automobiles in Davis), stopping at lights and signs, staying in bike lanes, not hurrying, and obeying traffic rules. Several parents taught bicycle rules and safety to their children during actual practice rides. Two-thirds of the parents had specifically instructed their children to use streets with bicycle lanes whenever possible, and those who hadn't often mentioned that there were no bicycle lanes between their houses and the children's school. The vast majority believed it was safe for children to ride bicycles in Davis and that this was due largely to the bicycle lanes. Most everyone wanted to see more bicycle lanes in the city as well as better enforcement of existing regulations, both for bicycles and automobiles. Specifically this means keeping cars out of bike lanes, especially at intersections where cars moved into them to make right turns. No respondent expressed any dissatisfaction with the bicycle lanes or wanted to see them removed or restricted. In no case were bicycle lanes considered an inconvenience. Each respondent was asked directly whether he had ever avoided driving a car on a street containing a bicycle lane, and not a single one answered affirmatively. Most felt safer driving along a street with bicycle lanes because there was less to worry about. On the other hand, few were willing to go out of their way to drive on a street with bicycle lanes.

The parents were asked about bike usage by their children. Age was the determining factor in how far and when a child could ride. Preschoolers were restricted to the immediate vicinity of the home while children between six and 12 were allowed to ride to school. About half the children in this age group were allowed to ride downtown to the movies during the day, but not at night. Almost half of the junior high school students rode their bicycles to school every day, were permitted to go to daytime movies, and about half were allowed to go to movies at night. With the high school students there is an increasing radius of distance and freedom of movement. However, some 16-18-year-olds were still not allowed to ride bicycles at night, thus emphasizing the perceived hazards of night riding. To supplement the interview data, a brief survey of bike use was made in the nearby elementary school. Initially we had planned to do more work in the schools, but the close of the school year prevented this. The interviewer visited one class at each grade level to determine the number of students who had ridden their bikes to school that particular day. None of the kindergarteners had come by bike, compared to 22% of the first graders, about half the students in grades 2-5, and 71% of the sixth graders.

Observations

Along with the surveys, we have also observed bicycle traffic patterns in various parts of the city. Early in our work, it appeared that there were serious problems connected with signalling. In the driver education programs, school children are taught the various hand signals for turns yet even the most cursory observation of bike riders showed that very few people use hand signals. This is particularly true for right turns. A few hardy individuals will signal for left turns, but they are a definite minority. In fact, where traffic is particularly heavy, signalling may be dangerous since it requires the rider to remove one of his hands from the bars and keep it in a non-functional position which may adversely affect his balance.

Another problem concerns stop and yield signs. We have collected several thousand observations of bicycles and cars at different types of intersections. It is not easy to obtain a clear-cut definition of what "stopping" means. When pressed for a legal definition, a police official is likely to give the literal phrase "the complete cessation of movement." In practice, this can be measured in several ways. Some policemen insist that the rider's foot must come to the ground. Others will use wobbly handlebars as an indication of stopping. Whatever criterion is used, our observations indicate that whether or not a rider stops at an intersection is determined less by the sign at the corner than the presence of traffic in the intersection. Before a rider reaches an intersection he looks up and down the street. When his head sweep shows traffic present, he will stop to the point of placing his foot on the ground; but, if the intersection is clear, most riders will continue. The table shows some observations that were made in a major intersection in the city center.

OBSERVATIONS AT CORNER OF 3RD AND "F" STREETS

	Rider's Foot Placed to Pavement	Rider's Foot Not Placed to Pavement
Auto Present in Intersection	112	30
Auto Not Present	10	47

Bicyclists show much greater respect for stop lights than for stop signs. This might explain the results of another

survey dealing with preferred route from domicile over to the University campus. The investigator (David Kenny) was impressed by the fact that bike riders chose one route to campus and car riders, another. Further analysis showed that the bicyclists' preferred route contained an average of 4.9 stop signs and 1.8 stop lights. The automobile drivers chose, from the same origin to the same destination, a route that contained an average of 2.3 stop signs and 4.2 stop lights. Our observations provide some basis for interpreting this difference. Bikes don't usually stop at stop signs, they simply slow down and continue through, traffic permitting, while they stop completely at stop lights. For a car rider, subject to greater enforcement pressure, a stop sign always means stop, but he has a 50-50 chance of going through with a light. Another observation is that bicyclists generally make more turns than automobile drivers do. This may be due to the increased maneuverability of bicycles or to the fact that they are used for shorter trips than cars, whose drivers choose the most direct route. Whatever the reasons, the greater frequency of turns by bicyclists compounds the seriousness of intersection problems.

Existing Problems and Recommendations

The major problems connected with the bike paths appear at the intersections. There is some difficulty in making a left turn from the inside bike lane or a right turn from the automobile lane when there is cross-traffic present. Many bike riders and automobile drivers are unsure as to the proper turn procedures. The Davis Police Department distributes diagrams showing the proper turn procedures to school children and these are reprinted in the local newspaper. Some bicyclists sometimes solve the left turn problem by making their turn in the middle of the street before the key intersection. The result is that they are riding up the bike lane in the wrong direction, confusing the traffic situation for both car and bike riders.

Recommendation. If accidents or near-accidents resulting from left turns from bicycle lanes increase, some action will be necessary. One possibility would be to prohibit left turns from bicycle lanes at key intersections during peak traffic. This is similar to what is done in many cities with automobiles where one finds signs at key intersections declaring "no left turns between 7 and 9 a.m. or 4 and 6 p.m." With an appropriate campaign of education and enforcement, there would be value in signs in bicycle lanes that tell the bike rider at key intersections "no left turn between 4 and 6 p.m." In addition to going one block beyond the intersection and making his turn, he has the option of dismounting and

walking his bicycle across the intersection, thus gaining the priorities as well as the increased safety of a pedestrian. In Amsterdam, many of the bikeways have independent signal lights (a green, yellow or red bicycle lights up on the post), and these could make provision for bicycle left turns.

Problem. Drivers from out-of-town do not understand the bike lanes and occasionally drive in them. This behavior is understandable since the drivers have received no clear instructions as to the meaning of bike lanes.

Recommendation. A large sign at each of the major entrances of the city to inform visitors that driving in bike lanes is prohibited. Formerly the bicycle lanes as well as the center strips had been painted white, with bikeway signs over the sidewalk on the right lane. To help inform out-of-town drivers that they should stay out of bike lanes, the city authorities have now changed to a broken yellow line for the center strip and a solid white line to delineate the bicycle lane. The most unpleasant feature of the bikeway network in Holland is the ubiquitous presence of motor bikes (bromfiets). While riding on bike paths alongside the highway, it was frequently necessary to look back to see if a bromfiet was approaching since the noise of the highway traffic could obscure even the noisy bromfiet. In Davis motorized bikes of all varieties are excluded from the bicycle paths.

Problem. Some improvement needs to be made in present signalling practices. The small number of people who actually use signals indicates that the present system is not working.

Recommendation. Possibly drop signals or experiment with bike turn indicator lights.

Problem. Some of the newer streets contain a bike lane which is sandwiched between a pedestrian sidewalk and a parking lane for automobiles. This provides considerable safety for the bike rider but it is difficult for him to see automobiles coming along the street when he wants to pull out because the parked cars block his vision.

Recommendation. Where the bicycle path is inside a parking lane, the city has prohibited parking at some distance from an intersection so the rider can see traffic coming down the street.

Problem. Bicyclists, particularly children, have difficulty in knowing how to navigate in the parking lots of large shopping centers where the traffic lanes are not clearly marked.

Recommendation. It may be desirable to develop special bike routes in and out of major shopping centers.

Problem. There have been some accidents where bike riders have been injured in bike lanes when car drivers opened their doors just as the bike rider was coming along.

Recommendation. Bike riders must be cautioned about the possibility of doors opening in front of them and automobile drivers should be careful to look at oncoming bike traffic before they open their doors.

Problem. Downtown merchants used to be annoyed when the entrance of stores was blocked by bicycles.

Recommendation. The practice followed in Davis was to install bike racks on most blocks in the downtown area and require bicyclists to use them. Many of the bicycle racks were donated by local service clubs.

Problem. There is some ambiguity about the meaning of a bikeway, and little standardization in its meaning from one situation to another. In Sausalito, California, there are bikeway signs down the main street which is the main traffic artery containing virtually bumper-to-bumper traffic on weekends. In fact, one rarely sees a bicycle on this street. In Seattle there are bikeway signs but apparently these only have meaning on certain designated days. The out-of-town driver has no conception of what the signs mean. In Davis one occasionally finds an out-of-town driver in the bicycle lane trying to guess why people are gesturing to him. Some interpret the bicycle lanes to mean that bicycles must stay in them but that cars can use them, too.

Recommendation. The phrase "bikes only" might be praferable to "bike lane" or "bikeway." (Put into effect, Fall 1970)

Conclusions

The overall conclusion from the surveys and observations is that the Davis bikeways are almost unanimously regarded as a desirable safety feature. At present, many riders will use the paths when they are available but many will not go out of

their way to use them. As the city grows (to approximately 75,000 within 10 years), this situation will change. A bicycle path that is a good safety feature with light automobile traffic should be a much better safety feature in heavy car traffic. However, for the bicycle to remain a viable form of transportation, and not be squeezed out by the automobile, certain structural and social requirements must be met. Just as the automobile requires the availability of gas stations, good roads, highway regulation, licensing procedures and driver education, so the bicycle requires, in addition to a moderate climate and terrain, the separation of bicycle from automobile traffic at some points, the respect of motorists at intersections, special regulations pertaining to bicycles, bicycle racks in sufficient numbers in the downtown areas and bicycle education in the schools.

It should be clear that we are not advocating the bicycle as the sole means of transportation within cities or in the countryside. The complexity of modern society requires a mixed system of transportation which would include railroads, buses, private automobiles, bicycles and pedestrians. Each one of these not only has its unique capabilities and requirements, it also needs to be meshed in with the others. For a suburbanite to drive his car to the railroad station requires parking facilities at the railway station. If he should want to use a bicycle to get over to the station, there should be bike racks available for him. The system of mixed transportation presently available in Holland, the most densely populated country in the Western world, is instructive. A commuter can ride his bicycle to the station and check it in a rack inside the station, and then rent another bike when he arrives at his destination. Bicycles can be rented in more than 90 city railway stations. People on vacation can take along their bikes with them on special bicycle trains run by Netherlands railways. These are not "luxury" programs but rather these are indispensable ingredients of a successful mixed transportation system.

Our research has led us to the conclusion that at least in the cities--no bicycle paths, no bicycles. This should not be a cause for pessimism as much as an urgent call for action to create and maintain a viable bicycle support system.

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BEHAVIORAL EVALUATION OF A BIKEWAY SYSTEM

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Over the last 50 years the traffic system in the United States has been designed around the automobile to the neglect of alternatives such as rapid transit, the bicycle, and pedestrians. As money and facilities went into more and better highways, people used them in increasing numbers, and a host of related services such as motels, gasoline stations, new car dealers and repair shops followed the highways. The form and connectedness of many American cities, particularly the bedroom or suburban sections, are built around the automobile. All this cannot be changed overnight. People who locate their homes or businesses with a two-car family in mind will resist attempts to get them to change their commuting patterns. However, the problems associated with a transportation system built completely around the private automobile--including air and noise pollution, and congestion beyond the carrying capacity of more freeways or parking structures--have made it imperative to search for alternative means of transportation. The bicycle has many advantages in terms of cost, maintenance, noise, air pollution, physical health, and an excellent scale relationship with one's surroundings. It will never replace the automobile for 50-mile drives nor the jet airplane for cross-country trips. It is not a universal panacea or even a complete substitute for any other form of transportation, including walking which has much to commend it. However, there are many situations where a bicycle is a more efficient and economical means of transportation than anything else. For many families the alternative would not be doing without an automobile, but rather doing without a second or third car. Yet, if the bicycle's potential is to be realized, its unique environmental requirements will have to be respected. The current pressure for pedestrian malls in downtown areas and for car-free walkways in the suburbs reveals that even pedestrian traffic has its unique requirements. The alternative to the complete domination of the automobile consists of a transportation system that takes into account the unique requirements of all forms of transportation. To neglect any is to overload others beyond their optimal carrying capacity and thereby to do an injustice to all.

The Coney Island cycle path opened in 1895 and was the first path in this country reserved exclusively for bicycles.

Its original width of 14 feet was widened another three, six months later, due to heavy traffic, and doubled again in 1897 along its entire five-mile length. Saint Paul created 50 miles of paths exclusively for bicycles; Seattle by 1899 had 20 miles of path reserved for bicycles; and, in California, there was a 50-mile system connecting Sacramento and Stockton and another network in the Bay Area.[1] Subsequently the expertise and technology developed for the bicycle literally paved the way for the automobile. It was the League of American Wheelmen who in the 1890's lobbied successfully for good roads, highway signs, road maps and traffic regulations. Unfortunately, the technology of bicycle paths virtually disappeared in this country for almost half a century and all the old paths disappeared. In 1961 Homestead, Florida, developed a bicycle path and in 1966 Davis, California began a bikeway path system. These bikeways, like their predecessors half a century earlier, were developed on the basis of trial and error and frantic pleas of information from one city traffic department to another. The present bicycle boom has sparked a tremendous upsurge of interests in cycling, not only among the general public but also among city officials concerned about the rising number of bicycle accidents. The Bicycle Institute of America served as a clearinghouse for whatever information existed and published several newsletters on bikeways. Recent pamphlets from the Oregon Department of Highways[2] and the California Department of Highways[3] present a great deal of statistical information from various places and have put it together in the form of bikeway standards. While such information is exceedingly important in bikeway planning, it needs to be supplemented by more detailed studies of the day-to-day operations of bikeway systems. It is not enough to merely know the width of bikeways in Amsterdam, Tokyo and Austin; one must also know how the paths work in practice, the problems that have been encountered and how these have been resolved.

A bikeway system is more than a lane of asphalt devoted to bicycles. It must also involve the cooperation and support of the police and traffic officials; it must include bike education in the schools, special graphics for bikeways that are clear to both riders and motorists, and the support of downtown merchants and apartment owners who must provide bike parking facilities, as well as special traffic lanes that meet the unique requirements of a city's cyclists. There is no single best bikeway solution for all cities. Fresno, California, may be served best by a bikeway system along the irrigation canals; Eugene, Oregon, could creatively develop some of the town's alleyways; and Los Angeles could, with minimal expense, provide curb access to some of its unused

sidewalks. A successful bikeway system is a complex network of physical facilities and services involving virtually every segment of the community. The proper evaluation of a bikeway system must take into account the attitudes and actions of all these involved groups. One cannot simply evaluate a bike system by interviewing dedicated cyclists who have been riding for years without special facilities; one must also interview school officials and PTA groups, police and city traffic officials, downtown merchants and business people, as well as ordinary adults who would ride bicycles if adequate facilities were available but not under dangerous riding conditions.

In this article we will summarize six years of behavioral studies of Davis, California bikeways, probably the best developed system in the country. While research has been an integral part of the Davis bikeway system since its inception in 1966, our research budget was generally non-existent and these studies were bootlegged out of existing student and faculty time, and the helpful cooperation of city officials.

Research has accompanied the development of the Davis bikeway system at every turn. The presence of a university has made available a pool of talented and dedicated investigators from a variety of fields. Technical studies have been done in the Department of Physical Education on the energy expended at different levels of incline and with different widths of tires. People in engineering studied the width of bike paths, the turning radius of a cycle at different speeds, and similar topics. The present report presents a more complete and up-to-date behavioral evaluation of the Davis bikeway system than did our previous report in the Congressional Record and distributed by the BIA.[4] This behavioral data complements the valuable engineering standards presented by Ramey et al.[5] and will be of assistance to city officials planning bikeways. We do not assume that Davis is typical of other communities. Indeed in its pioneering interest in bicycles, Davis is very atypical. Davis has virtually no snow but surrounding communities which have an identical climate have no bikeways. On the other hand, Amsterdam and Copenhagen have much colder climates but many bikeways. The methods and policies we have evolved for Davis cannot be applied blindly or without modification elsewhere. Yet the basis of human culture is sharing of experiences from one place and generation to another. It is wasteful and inefficient to ignore what other people have learned about a similar problem. In our last report[6] we mentioned the ambiguity surrounding the phrase "bike lane," which many automobile drivers interpreted to mean--"Bikes Stay Inside"

rather than "Cars Stay Out"--and we recommended the use of "bikes only" instead. Unfortunately we have seen several instances of new city bikeways that still employ the ambiguous "bike lane" designation.

Here is a summary of our research findings. To present the specific studies in detail would require more space than is available. However, we felt it would still be valuable to make our findings available even in summary form to other cities and organizations involved in bikeway planning.

Summary

1. Bicycle riders will use bike paths when they are available and convenient.

2. In low traffic density situations at least, convenience factors are important to the cyclist. Bicycle riders are unwilling to go several blocks out of their way to use a bicycle path. This finding cannot be generalized to dangerous high traffic situations where data are not available.

3. Automobile drivers do not object to riding on streets that contain bicycle lanes. Very few will avoid streets with bicycle lanes and the majority prefer a predictable situation where the cycles remain in bike lanes.

4. Merchants in downtown Davis are either favorable to bicycles or noncommital. Virtually none believes that bicycle lanes reduce business in the downtown area. A number of merchants provide special parking facilities for bicycle customers and provide amenities such as special shopping bags that fit into bicycle baskets for bike customers. Merchants are concerned that bicycle riders park their cycles directly in front of store entrances rather than using available bike racks some distance away.

5. The attitudes of the Davis police are very favorable towards bicycle lanes. The Davis Police Department has one full-time officer working on bicycle problems and two part-time bicycle aides whose salaries are paid from bicycle registration fees.

6. With a large bicycle population, a city-wide registration system, is both feasible and desirable. However, even with a registration system, bicycle theft continues to be a serious problem in Davis as it is elsewhere. Strong locking devices and chains are a deterrent to theft. One study estimated that among college students in Davis the theft rate of bicycles is approximately 1 percent per month. In addition, about the same percentage will have various parts such as wheels, seats or bells stolen from them.

7. The probability that a bicyclist will use a device that permits anchoring the bike to a rack or some other fixed location depends in great part on (a) the value of the bike, and (b) the convenience of the anchoring device. In comparing three anchoring devices we learned that anchored chains and loops were used more often than anchored eyebolts.

8. Owners of expensive 10-speed bicycles desire a greater level of parking security than do other bike owners. A higher percentage of them park their bicycles inside their apartments at night and they make more use of secure parking spaces than do owners of less expensive machines. Where anchored parking racks are not available, 10-speed owners are more likely to chain their machines to trees, lampposts and other fixed settings.

9. The creation of bicycle lanes on residential streets by banning curb parking during certain hours was only partially successful. A significant number of illegally parked cars created tight, dangerous and discouraging squeezes at a time when the role of the bike paths as a link in a transportation system was at its peak. The situation was eventually resolved by banning automobile parking altogether.

10. People transporting themselves by bike are as eager to get where they are going as people being transported any other way. A bike path that makes travel slow or inconvenient by requiring deviation around landscaping features will discourage riders from using it.

11. Traveling to school by bicycle increases in Davis at each grade level and peaks at junior high school at 80 percent, dropping slightly after that as the use of automobiles increases.

12. The existence of bicycle lanes in Davis is one factor in increasing bicycle use among children and teenagers. Comparing the situation in Davis with that of a nearby town of the same population, topography and climate, twice as many Davis junior high school students ride bicycles to school as do students in the nearby town.

13. Negative stereotypes towards cyclists reduce bicycle riding in some communities. It is probable that the existence of bicycle lanes indicates civic acceptance of cycling and thereby helps to reduce negative stereotypes.

14. An effective bicycle transportation system reduces the amount of automobile use in Davis. It was estimated that in good weather the use of bicycles saves one automobile trip per day for every two households in the city. In

practical terms this means something like 7,000 single automobile journeys per day that would be undertaken by car if bicycles were not available. There is no guarantee that this figure can be generalized to cities with different sorts of residential or commuting patterns.

15. Even in the best of circumstances, only a minority of store customers can be expected to do their shopping by bike. Most bicycle customers in Davis are teenagers and young adults who do not have automobiles or whose spouses have used the family car for work. At two large supermarkets we observed approximately 10 percent of the customers using bicycles.

16. Shopping centers were designed around the automobile and there are consequent problems in entering and leaving for the cyclist. Cyclists prefer a separate entrance from a residential street rather than a main traffic artery.

17. Bicycle lanes are very safe while the cyclist is in the lane itself. Problems arise at intersections when the cyclist comes in contact with cars and either or both wants to turn.

18. Bike paths created by painting stripes alongside a car travel lane provide satisfactory auto-bike separation over most of their length. However, in some intersection situations cars sometimes divert into such lanes to make right turns or to pass on the right of left-turning autos. This problem as well as cars parking in bicycle lanes requires the conscientious enforcement of traffic laws by police to keep bike lanes clear. We have observed bike lanes in other cities becoming double-parking lanes for automobiles. Because of strict enforcement of parking regulations by local police, this rarely happens in Davis.

19. Special ordinances were necessary to implement the bikeway system in Davis. Permission was needed to erect special graphics for cyclists. Regulations about parking and designated racks were also necessary.

20. In spite of continued rider education in the school and on the University campus, breeches of regulations and rider courtesy are readily apparent. More often than not, cyclists make left turns on the basis of convenience rather than following the right angle method described by traffic law. Stop signs are respected only when there is a car in the intersection. At all other times the cyclist scans the traffic both ways and then proceeds through the stop sign with a slight pause, at most. Hand signals are virtually extinct among adult riders. Children who learn them in grade

school still use them. Many riders feel that keeping one's hands on the handle bars in a tight traffic situation is more appropriate than signaling. The value of hand signals for cyclists must be questioned.

21. Two-way bicycle lanes of a reasonable width are satisfactory but there are problems where the two-way path ends, leaving half the cyclists stranded on the wrong side of the street. Special provision should be made for channeling such cyclists over to the correct traffic lane.

22. The width of a bikeway as well as the distance from the traffic lane must take into account the speed of automobile traffic as well as the presence of barriers such as high curbs or parked cars. The faster the automobile traffic, the more space needed for the bicycle lane and the further away it should be from the main automobile flow.

23. Available statistics grossly underestimate the number of bicycle accidents that occur. Those accidents reported to the police are only the most serious ones and constitute about 5 percent of all accidents that occur. In one sample of teenagers who were asked about the severity of the injuries, fewer than half of the bodily injuries rated as moderate or severe were reported to the police.

24. Grade separations are a good technique for giving bike paths clear separation from other modes of travel, but bike speeds are very sensitive to length and steepness of grade in such facilities. Bikers anticipating a long, steep climb may reach speeds that greatly increase both the rate and seriousness of accidents.

25. Most cyclists do not use the recommended two-stage right angle procedure for making left turns at a major intersection. This is not a result of ignorance about traffic regulations but rather the cyclist's desire for convenience and safety taking precedence over his respect for minor traffic regulations.

Footnotes

*The following people contributed their time and labor to these studies. Without their help, there would have been no research program: Mike Adams, Dave Andrews, John Butler, John Connell, Carol Fehring, Peggy Glimes, Mike Hallen, Tammy Harrington, Bruce Hermann, Kathi Kohli, Bonnie Kroll, Kenneth Mah, Cynthia Mariano, Janet Peterson, Peggy Reaksecker, Agnes Safford, Tom Sloyan, Doug Thom, Eugene Wood.

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2. Oregon State Highway Division, Foot Paths and Bike Routes: Standards and Guidelines. January 1972. Report distributed by the Bicycle Institute of America.

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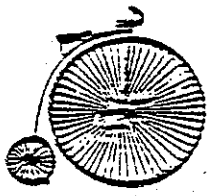
SUGGESTED BIKE FACILITIES TOUR - 1976

ATP WORKSHOP

April 23, 1976



NOTES: - BIKE FACILITIES TOUR

Davis is a City that has a bicycle as its emblem, and residents who exhibit an unusually high degree of bicycle ownership and use. In 1974, Davis had 27,000 registered bikes and 32,000 population! Mild climate and level terrain encourage year round bicycling for utility transportation and for recreation. The ages of bicyclists range from grade schoolers to senior citizens and they have a choice of many routes throughout the City and the Campus. Presently the City Staff is working on ideas for the improvement of parking for bicycles, in commercial areas and in apartment complexes. A network of lanes (14.5 miles), paths (7.2 miles), and grade separations is already well established with increments to be constructed in accordance with the Davis General Plan, as future urban development occurs.

The tour covers a wide range of projects. Cost information has been provided for representative facilities. At the present time, separate bike paths cost about $10.00 per lineal foot for a 10 foot wide path with headers. Most bike paths have been constructed by developers. The predominant funding sources for City built bike facilities have been Traffic Safety Funds and SB 325 Funds. Facilities are programmed into Davis' five year Capital Improvement Plan, revised and adopted annually.

FACILITIES ON MAP KEY

1. Rail Undercrossing — $8,000 - 1968 placed in old drainage channel under trestle, since replaced.
2. City easement through apartment complex
3. Rail overcrossing adjacent to major street
4. Bike path in park
5. Bike and pedestrian grade separation - overcrossing of a major street — $55,000 - 1970
6. Greenbelt pathway

7. Grade crossing of collector street, with offset curb opening

8. Bike undercrossing, collector street $20,000 - 1971

9. Off street pathway adjacent to major street

10. Future bike undercrossing of minor arterial Est. cost $40,000 - 1970

11. Off street path adjacent to minor arterial street

12. Four lane street with on-street lanes

13. Collector street with on-street lanes

14. Path through park to future bike overcrossing of depressed freeway

15. On-street bike lanes with barrier area

16. Special bike provisions at freeway interchange

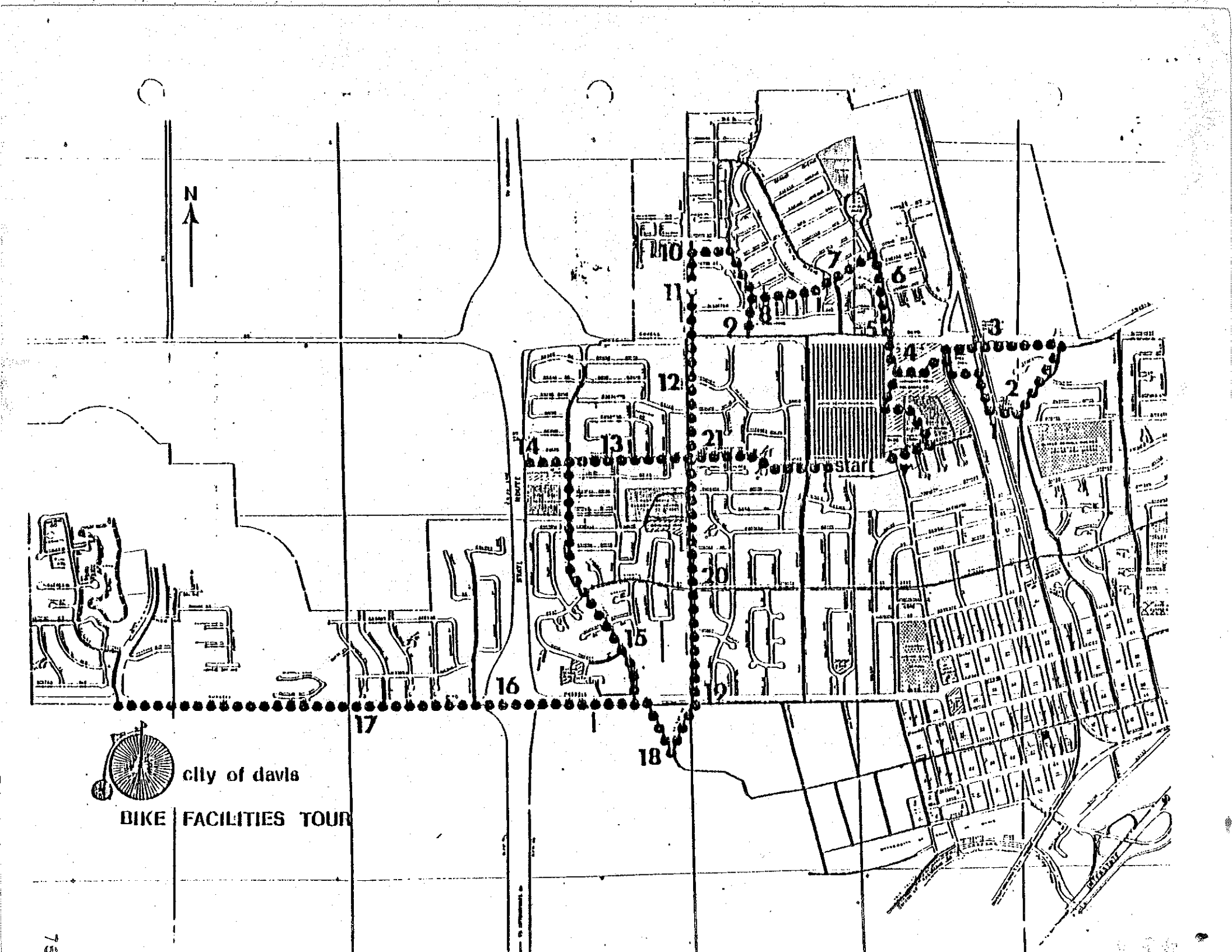
17. Off-street bike path along University boundary and historic walnut tree row; continues 5 miles as recreational path toward Lake Berryessa along County Road

18. UCD bike undercrossing of major street

19. Bike left turn lane

20. Bike lane on minor arterial with two-way left turn

21. Two-way bike path on each side of collector street adjacent to single family residences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