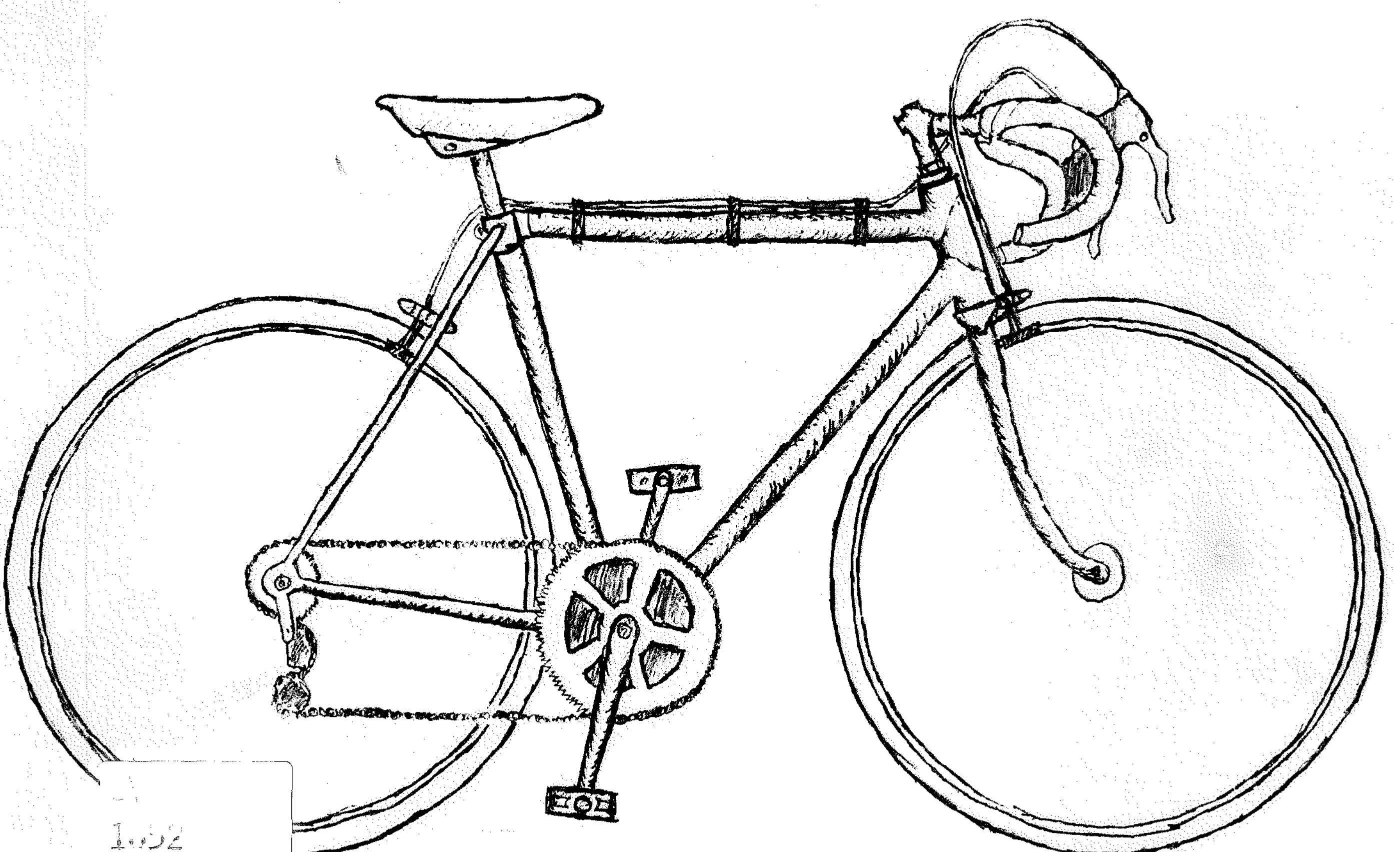
BICYCLING IN MAINE



BUREAU OF PARKS & RECREATION
DEPARTMENT OF CONSERVATION
AND THE
DEPARTMENT OF TRANSPORTATION

MARCH 1974

BICYCLING IN MAINE

An Examination of the
Transportation, Recreation and
Safety Aspects of Maine Cycling

Prepared by

the

Bureau of Parks and Recreation
Department of Conservation

and the

Department of Transportation

at the request of the

106th Legislature

March, 1974

"Many important questions in regard to the rights and liabilities of bicycles are daily arising and a solution of these is frequently sought."

Clementson
The Road Rights & Liabilities of Wheelmen
1895

LETTER OF TRANSMITTAL

TO: Governor Kenneth M. Curtis

The Members of the 106th Legislature
of the State of Maine

The Bureau of Parks and Recreation, Department of Conservation and the Department of Transportation are pleased to submit herewith "Bicycling in Maine: An Examination of Transportation, Recreation and Safety Aspects of Maine Cycling." This report has been prepared at the special request of the 106th Legislature, regular session, persuant to Chapter 133, Private and Special Laws.

Respectfully,

Roger L. Mallar
Commissioner
Department of Transportation

Donaldson Koons, Ph.D.
Commissioner
Department of Conservation

Lawrence Stuart
Director
Bureau of Parks & Recreation

ACKNOWLEDGEMENTS

Much appreciation is owed to those individuals and organizations who contributed to the compilation of material contained in this report.

Included are staff of the Bureau of Parks and Recreation of the Department of Conservation, the Department of Transportation, members of the general public, town officials, school students and teachers, police chiefs, bicycle retailers, state park supervisors and college deans. In addition, the following agencies, organizations and individuals have been of considerable assistance:

DEPARTMENTAL

Attorney General's Office
Department of Education & Cultural Services
Bureau of Library Services
Division of Management Information
Law and Legislative Reference Library
Department of Public Safety
Police Bureau
Public Utilities Commission

ORGANIZATIONS AND INSTITUTIONS

Penobscot Wheelmen
Bicycle Institute of America
League of American Wheelmen
Maine Snowmobile Association
American Youth Hostel
American Right-of-Way Association
Maine State Liaison Committee
Recreational Vehicles Rights-of-Way Use Subcommittee
New England River Basins Commission
Maine Regional Planning Commissions & The Greater Portland Council of Governments
British Information Services

INDIVIDUALS

James Christiansen, Director of Public Relations,
American Automobile Association
Leslie Vincent, Executive Assistant,
Maine Executive Department, Washington Office
Aaron Weissman, Assistant Librarian
Bowdoin College

Mrs. Virginia Burgess)
Mrs. Jean Kinney) Bur. of Parks & Recreation secretaries
Mrs. Ruth Willette)

A special expression of appreciation is due to the following legislators for assisting both agencies with the public meetings and for their continued support throughout the study.

Rep. Theodore S. Curtis, Orono
Rep. James P. Dunleavy, Presque Isle
Rep. Thomas R. LaPointe, Portland
Rep. Frank John Murray, Bangor
Rep. Neil Rolde, York

It should be noted that several other legislators attended the public meetings. Our thanks to them also.

INTER-AGENCY STUDY GROUP

Department of Conservation
Bureau of Parks and Recreation

Donaldson Koons, Ph.D., Commissioner
Lawrence Stuart, Director
Thomas J. Cieslinski, Supervisor, Planning and Research
Patricia Stimets, Study Coordinator
Robert E. Hodgdon, Community Recreation Specialist
Jan E. Saleeby, Civil Engineer
Bryan Walker, Landscape Architect

Department of Transportation

Roger L. Mallar, Commissioner
Richard Luettich, Deputy Commissioner
Daniel Webster, Jr., Acting Director, Bureau of Planning
Bert Campbell, Engineer
Harland L. Robinson, Highway Safety Coordinator
Albert Belz, Traffic Safety Engineer
Alden Small, Urban Project Design Engineer

TABLE OF CONTENTS

STUDY OBJECTIVES

In September of 1973 a joint study of the transportation, recreation and safety aspects of Maine bicycling was undertaken by the Bureau of Parks and Recreation (BPR), Department of Conservation and the Department of Transportation (DOT) at the request of the 106th Legislature. Preliminary research and coordination was conducted by a student intern employed by DOT during July and August 1973.

The general objectives of the study as outlined in the legislation (See Appendix) were as follows:

To study:
1) the volume of present bicycle traffic on and off the highway

2) projected increases in bicycle traffic on and off the highway

To inventory:
3) existing and potential bicycle trails

4) methods of bicycle path construction and

5) innovations used in other states to meet increasing needs.

To recommend: "how Maine can best provide for recreational, transportation and safety needs of bicyclists."

The report was to be made to the First Special Session of the 106th Legislature after January 1, 1974.

STUDY APPROACH

In compliance with the legislative mandate, the Bureau of Parks and Recreation and the Department of Transportation formulated a basic study outline, (see Appendix) which governed the research activities of both agencies during the course of the study. The outline called for a review of literature and laws; an inventory of Maine bicycles, facilities and users; accident statistics; public opinion surveys including school children and police chiefs; potential bikeways; highway bicycling; and design and construction criteria.

A special project worker with experience in recreational and transportation oriented bicycle facilities planning in the Greater Portland region was hired by the Bureau of Parks and Recreation to coordinate the study.

It was also felt by both agencies that considerable input should be gathered from the citizens of Maine. To this end, Northeast Markets, Inc. of Yarmouth, a market research firm, was selected to conduct a random statewide telephone survey of Maine households. This survey was designed to derive data on the number of bicycles in Maine and their present and potential use by Maine cyclists.

To augment this survey a series of eleven public meetings were conducted throughout the state during October and November 1973. Legislative representatives and personnel from both study agencies exchanged information with the public on regional and state bicycling uses and needs. Participants represented a broad spectrum of the Maine citizenry and included experienced and inexperienced cyclists, municipal and regional officials, law enforcement officers, recreation and public works directors, educators planners conservationists, bicycle retailers, the wealthy and low income, and the young and old. It is important to note that these meetings were held at the outset of the study. With the exception of the study outline, and surveys which were underway, data analysis and conclusions took place after the meetings. The information gathered at these public sessions therefore provided fundamental guidance for the study. Many of the suggestions appearing in this report were first presented to the legislative and agency representatives at these meetings.

Due to time constraints and the primary need for basic planning data, it was agreed that specific bicycle route designation would not be an objective of the study. Demand corridors for a statewide bicycle facility network and general recommendations for appropriate commutor and recreational routes were felt to be more practical and germane to the study concept. Written and oral communications with the public have served to guide these potential facilities recommendations.

As the study progressed, other items related to an examination of Maine bicycling were added. Data on retail bicycle sales, the impact of bicycling on state parks, bicycling on Maine college campuses, the Maine climate, and the energy crisis were incorporated.

TERMS

Several terms which are used in the study are defined below.

BICYCLE

"Bicycle" shall mean every defice propelled by human power upon which any person may ride, having 2 tandem wheels either of which is more than 20 inches in diameter.

BIKE PATH

A completely separated right-of-way designed for the exclusive or semi-exclusive use of bicycles. Cross-flows of vehicular and pedestrian traffic is minimal. Pedestrian use often is combined with bicycling in this facility.

BIKE LANE

A restricted right-of-way utilizing city streets and secondary roads designated for the exclusive or semi-exclusive use of bicycles. It is designated by means of a white line or physical barrier such as curbed sections to prohibit use by motorized vehicles. Through-travel by motor vehicles or bedestrians is generally not allowed. However, cross-flows by motorists, for example, to gain access to parking facilities or associated land use is allowed.

BIKE ROUTE

A bikeway along an existing street or road, marked by signs or on-the-road stencils. No provisions are made for physical separation from vehicular or pedestrian traffic.

BIKEWAY

This is a general term used to describe all facilities specifically assigned to bicycles.

CLASS I BIKEWAY

Same as Bike Path.

CLASS II BIKEWAY

Same as Bike Lane.

CLASS III BIKEWAY

Same as Bike Route.

MOPEDS

A motorized bicycle; commonly seen in European countries. Not to be confused with a motorcycle.

SUMMARY

In 1972, for the first time since the rise of the automobile, more bicycles than cars were sold in the U.S. --- 13.9 million as opposed to 11 million. It is estimated that by 1980, 50% of the American public will be bicyclists.

Maine currently has some 272,700 bicycles or approximately 0.9 per household. These figures do not exhibit a fad, but rather a gradual and sustained growth of cycling in Maine and nationally.

Annual Bicycle Sales in Millions: U.S. Manufacturers and imports

Year	Domestic Sales	Import Sales	Total: U.S. & Imp.	Bikes in Use*	Est. Users*
1960	2.6	1.1	3.7	23.5	35.2
1965	4.6	1.0	5.6	32.9	49.3
1968	6.0	1.5	7.5	42.3	63.4
1969	5.1	2.0	7.1	47.7	71.5
1970	5.0	1.9	6.9	50.0	75.3
1971	6.6	2.3	8.9	53.1	79.6
1972	8.8	5.1	13.9	61.2	91.9

Bikes in use estimate is based on estimated bike "life" multiplied by a unit sales factor. Rentals and other multiple use situations are calculated into the Estimated Users estimates.

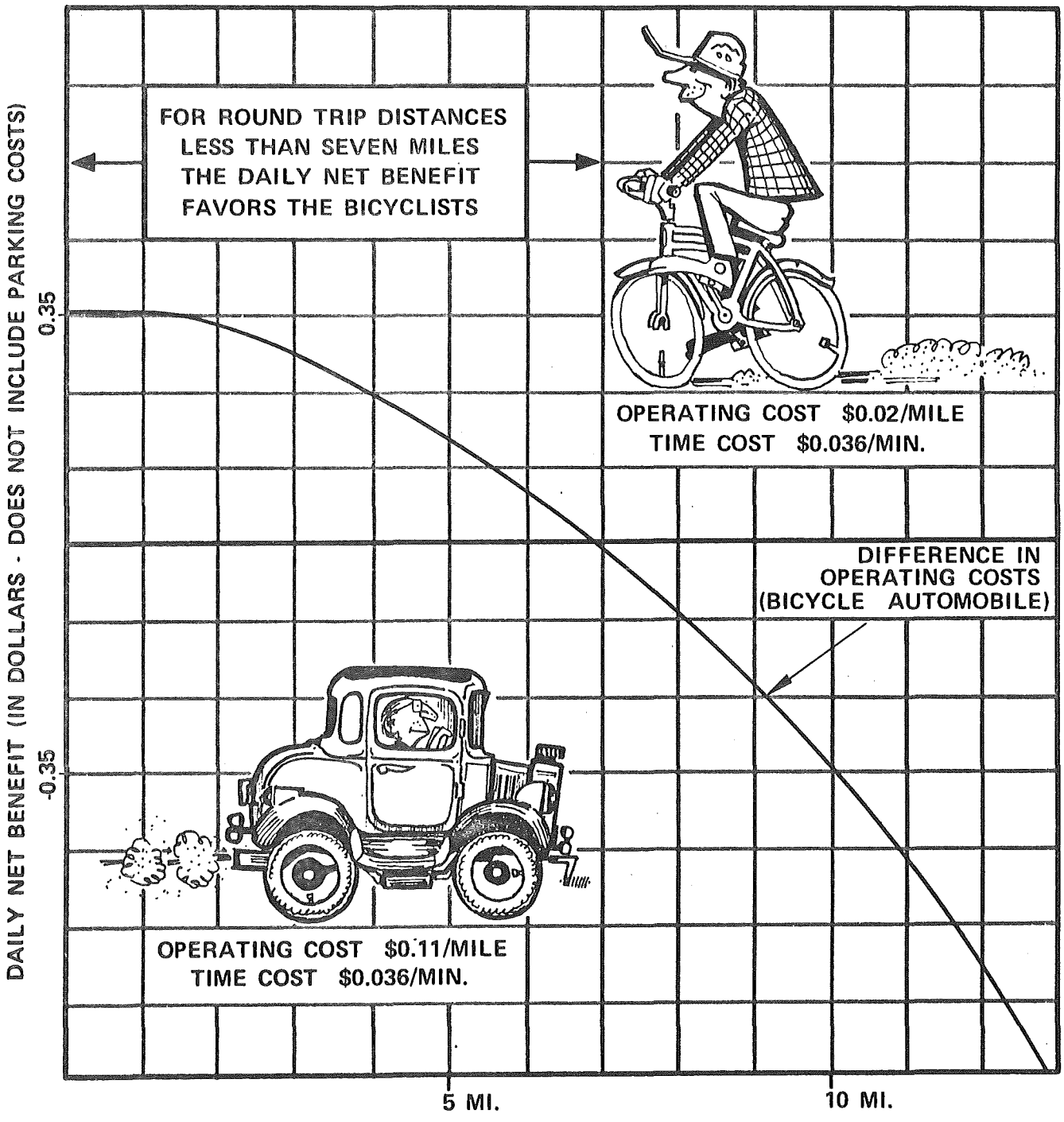
(Source: Bicycle Institute of America)

Bicycles are not merely a child's toy, they are a serious means of recreation and transportation for adults as well. More than half of the bicycles sold in the U.S. in 1973 were to adult users. Realizing that bicycling is healthy, non-polluting, economical and efficient, adults are using bicycles in increasing numbers despite the many hazards and obstacles they face.

The bicycle can be an extremely viable urban or short distance mode of transportation. In Davis, California 40% of the commutors on a busy major arterial are bicyclists. Consider the following comparison of cars versus bicycles in light of the fact that 40% of all urban trips are under 4 miles.

Cars	Bicycles
-the average urban speed of cars is 13 m.p.h.	-the average speed of bicycles is 10 - 15 m.p.h.
-50% of all fossil fuels are expended on transportation	-bicycles require no fossil fuels - just calories
-a trip of 4 miles would take a car 17 min. plus delays for parking	-a trip of 4 miles would take the average bicycle 15-30 min. without parking delays

DAILY NET BENEFIT TO COMMUTER VS ROUND TRIP DISTANCE



Source: OREGON BIKEWAYS PROGRESS REPORT February 1973

Despite the above realities the use of bicycles in Maine and elsewhere is presently less than what it could be due to some serious problems.

1. Visability - failure to be seen by motorists, especially at night.

2. Stability - wet pavement, sand, gravel, pot holes in the road, air currents created by passing vehicles all create problems for the cyclist in balance maintenance.

3. Competition - conflicts with motorists using the same paved surface.

4. Security - increasing thefts especially of multi-speed bicycles.

5. Barriers - expressways, bridges without pedestrian lanes, etc. prevent bicyclists from getting from one point to another.

6. Destination facilities - lack of places to park bicycles, change clothes, shower at end of trip.

7. Weather - cold and inclement weather extremes not suitable for bicycling.

8. Education - lack of understanding on the part of both bicyclist and motorist about their relationship to one another; who belongs where, who has right of way, lack of knowledge of safe driving safe riding techniques.

In the last three years several states, California, Oregon and New York have legislated and funded landmark bicycle programs in statewide registration and licensing; bikeways and bikeways funding; and mandatory bicycle safety education respectively. Our sister New England states, New Hampshire, Massachusetts and Connecticut have also passed bicycle legislation.

New Hampshire has provided for designation and publication of a statewide bicycle route system. Their Director of Community Recreation conducts the program with review and approval by the Department of Public Works.

Massachusetts recently submitted a multi-agency report on that state's bicycling needs to their legislature. Proposed plans call for two bike path pilot projects ; 1) from Boston to Lexington/Concord in conjunction with the Bi-Centennial celebration, and 2) a network of recreation and commutor trails around Amherst to serve the Five College area. Massachusetts has new bicycle trails in nine of its state parks and in January 1974, the first phase of the Statewide Bicycle Atlas was published.

In 1973, Connecticut passed the State Bike Act which calls for the Department of Transportation to prepare a Statewide Plan for Bicycle Trails and Foot paths adjacent to state and local roads. Fifty percent local grants are also provided through DOT for bicycle path construction.

Significant bicycle legislation was passed in 1973 at the National level. The Federal Highway Act of 1973 authorized $120 million over the next three years for bikeways - $40 million per year. The legislation defines the bicycle as a legitimate user of the nations highways. Federal funds - up to $2 million per state can be authorized on a 30/70 matching basis. The bill also calls for bicycle safety education to be added to driver education and sets up a $5 million study on bicycle safety targeted for completion in 1975.

Providing for safe bicycling requires a dual system of education and facilities. In 1972, 305 bicycle accidents were recorded in Maine, seven resulted in fatalities. Maine has already had one bicycle fatality, in 1974. From an analysis of Maine bicycle accident statistics, we know that more than 80% of fatal accidents occur in rural areas, while 70% of all bicycle accidents occur in urban areas. The problems of bicycle safety are not conveniently located in either rural or urban areas, but must be considered in both environments. Bicycle safety education programs for adults, as well as juvenile cyclists, can help significantly to instill safe riding practices.

Bikeways provide the greatest safety to cyclists, especially where they are properly designed to separate bicycle from vehicular traffic. Several European studies report a 20/40% reduction in accidents when bicycle paths are provided.

While several Maine communities have already established marked bike routes, it is well recognized that these are but first stage bicycle facilities. Preliminary evidence in other states indicates that this type of bikeway has the least safety value and may even create a false sense of security on the part of the bicyclist.

As has been mentioned, Maine has some 272,700 bicycles but significantly few bicycle facilities and only one bike path. All efforts thus far have been at the local level. The average cost per mile of constructing a Class I Bikeway is high. However, some perspective is gained by comparing bikeway costs with expenditures for familiar recreation and transportation facilities which are already part of Maine life.

Tennis, like bicycling, is growing in popularity in Maine communities. In 1973, $142,250 in Federal-State assistance was allocated for construction of tennis facilities. Average cost of double court facility was $16,000.

Maine highways, some of the finest in the nation, provide citizens with a contiguous transportation system. A modern two lane rural Federal-aid primary highway costs approximately $700,000/mile.

While it may be granted that the bicycle is a recent newcomer in Maine as a transportation mode, it was already well recognized as a means of recreation. Maine already provides for safety education and facilities for some 65,960 snowmobiles, 50,522 boats and 469,767 automobiles. Today as bicycle numbers increase, Maine should recognize that the time has come to provide safety education and facilities, backed by a reliable registration program for bicycles, too.

SUMMARY OF FINDINGS AND TRENDS

During the course of the study, every attempt has been made to incorporate as many contacts and sources into the process as time would allow, in order to arrive at the most current and applicable information for possible solutions to Maine's bicycling needs.

At the outset of the study, it was determined by both study agencies, that a series of surveys would serve as focal points for data gathering. Maine citizens who too often are incorporated at the final stage of a study, were brought into the process very early in a series of eleven statewide meetings. Information in these meetings presented to representatives of both study agencies and some dedicated legislators guided a number of the areas later explored by the study group as well as recommendations that appear in the study.

The public meetings coupled with the statewide survey of Maine households; bicycle retailers; school children and teachers; police chiefs; state park supervisors; colleges; municipalities; hosteling groups; and some 49 other states gives us, what we believe is a study which is thorough and truly representative of Maine cycling needs. NOTE: All findings and trends are presented in greater detail in later portions of the text.

BICYCLE BOOM MYTH

The first question, of course, must be "Is all this resurgence purely another "bicycle boom" or will bicycles be here to stay?" Indications from several studies done in other states, as well as a survey conducted as part of the Maine Study, negate charges of a "boom." In order to look at the figures accurately, there must be a separation of sales from use data. U.S. and Maine bicycle sales are at an all time high and will continue to increase until the market is saturated. Based on current statistics for the Netherlands and Davis, California, which offer ideal situations for bicycling, the maximum potential market for bicycles will be 0.7 per capita. Maine currently has 0.9 per household. When the current sales boom tapers off, there will still, of course, be the bicycles in use and the users. In 1970, the U.S. population was at 203,000,000 and there were 50,000,000 bicycles; but users numbered 75,300,000 or nearly 1/2 again as many persons as owning bicycles. In 1970 the Bicycle Institute of America estimated 0.25 bicycles per capita and 0.37 users per capita.

The survey of Maine households conducted as part of the bicycle study placed the Maine bicycle population at 272,700, or 0.9 bicycles per household in 1973. The Bicycle Institute of America estimates that by 1980 there will be 0.48 bicycles per capita in the U.S. Based on this figure and the 1980 Maine population projections of 1,038,000 as issued by the State Planning Office, Maine can expect the total number of bicycles to reach 498,240 by 1980. This increase in seven years of 225,540 is not unrealistic barring interruption of the supply of bicycles due to scarcity of materials or decreased exports by foreign manufacturers as the European and Japanese markets increase. Maine retailers report bicycles are definitely in demand.

The 1970 Survey of Outdoor Recreation Activities issued by the U.S. Department of the Interior Bureau of Outdoor Recreation reported 22% of the total U.S. population over age 9 were bicyclists. This compared with 21% of the same population sample in New England. The study also reported 41.8 participation days or 8.9 days per person were spent in the New England region for bicycling as compared with 46.8 participation days and 10.3 days per person nationally

VOLUME OF PRESENT TRAFFIC ON AND OFF THE HIGHWAY

Actual bicycle traffic counts were first taken in 1973 on the same basis as motorized vehicles, i.e. manual traffic counts. All types of traffic were classified at 29 stations throughout the state representing urban, rural and recreational locations. It should be noted that only federal aid and State highways were included. From other information gathered during the bicycle study we know that bicyclists tend to use less heavily traveled lower speed roadways. Accident statistics, for example, show a majority of accidents occur off the more heavily traveled roads. For this reason counts of bicycles only were taken in the Portland area. However data collected in the Portland survey was not felt to be as reliable as the statewide survey.

Results of the 1973 statewide survey were as follows:

- Bicycle volumes rural areas 0.3% of total traffic
- Bicycle volumes recreational areas 0.8% of total traffic
- Bicycle volumes urban areas 1% of total traffic

Results of the Portland survey were similar to the urban counts of the above survey. An average of 113 bicycles were reported in 1972; an average of 119 bicycles were reported in 1973. Other factors noted in the count were bicycle type, age group, and trip purpose. An increase of 15 percent was noted from 1972-1973 in the touring bicycles. This is compatible with Maine retail sales figures. Also significant was the increase of 17% in the 15-30 age riders and a decline in the under 15 age group.

It is clear from these traffic counts coupled with information gathered through the public meetings, telephone survey and letters from cyclists that many Maine bicycles go unused due to deficient or lack of facilities for bicycling. Fifty-five percent (55%) of those interviewed in the telephone survey reported they were "not very satisfied" or "dissatisfied" with conditions for riding bicycles in their community. Residents of Biddeford-Saco, Bath-Brunswick, Lewiston-Auburn, and Portland areas ranked highest in dissatisfaction. When asked how these conditions might be improved 43.6% responded that bicycle paths, trails or areas were needed; 12% wanted separate lanes on highways and roads; 12% wanted improved road conditions and paved shoulders.

As for projected increases of bicycle traffic on and off the highway, it is apparent,1) that bicycle sales are up and will continue to climb,2) that Maine can expect approximately 498,240 bicycles by 1980 if national and state trends continue,3) that Maine cyclists want safer places to ride,4) that Maine cyclists specifically have requested bicycle paths, lanes and improved road conditions, and 5) that Maine cycling accidents will increase without proper, safe facilities for bicycling.

EXISTING AND POTENTIAL BIKEWAYS

It is the safety factor, mostly a lack of it that prompts so much talk about bicycle facilities. The separated path is by far the safest of the three general types of bikeways. As was mentioned earlier, European experience have shown a 20-40% reduction in auto/bicycle accidents when the separated path is used. Oregon's program, which now has some 30 miles of paths, was premised on provision of safe routes for adult commutors, shoppers and school children. The bicycle is seriously recognized as a mode of transportation.

One of the best examples of serious incorporation of the bicycle into the transportation system in the U.S. is Davis, California. An academically oriented community of 24,000 people, and 18,000 bicycles, Davis citizens have been joined by city and University officials in the planning and implementation of a system of bicycle routes. The University campus is closed to all motorized traffic with the exception of delivery and University maintenance vehicles. New housing construction must provide for bicycle routes with lanes separated for motorized traffic. Even during the summer when there are few students, one major arterial in rush hours has 40% bicycles with 90% being ridden by adults. A recent Davis survey estimated 10,000 persons commute to the Campus daily. Within this year, the city plans to build 12 more miles of bicycle routes with five miles in paths on completely separated rights-of-way.

The Netherlands is perhaps the best European example. There are presently 8 million bicycles in this country of 13 million people. Bicycle sales were 850,000 in 1970 and are expected to top 1.5 million by 1980. Seventy percent (70%) of the movement in urban areas is by pedestrians and bicycles. While motorized mopeds are also included in the count, they are outnumbered 2-1 by non-motorized bicycles. The Netherlands currently has 2375 miles of completely separated "cyclepaths" <u>outside</u> urban areas.

To the Netherlands can be added Copenhagen, Denmark; Uppsala, Sweden; Germany; Tehran, Iran; Japan; Bangalore, India; the USSR; and the British "New Towns" all of which consider the bicycle as an integral part of their transportation system.

EXISTING BIKEWAYS IN MAINE

As of December 1973, four Maine communities, Bangor, Brunswick, Falmouth and South Portland had bicycle facilities. In 1972, South Portland became the first community in Maine to establish bicycle routes. Falmouth has a bicycle path and expects shortly to implement bicycle routes. Bangor and Brunswick have marked bicycle routes designed for both recreational and commuting purposes to link parks and schools and the central business district with residential areas.

Eleven communities; Auburn, Cape Elizabeth, Gorham, Lewiston, Old Town, Orono, Portland, Scarborough, Waterville, Westbrook and Windham have plans for bicycle routes or paths underway.

The Greater Portland Council of Governments worked with ten communities in that area in 1972 to formulate a regional system of bicycle

routes. Several of these routes have been implemented and are listed later in this report. The COG system offers recreation and commutor links within a ten mile radius of Portland. This concept which has been followed in other areas of the country and Europe, incorporates the idea of the bicycle as a mode of transportation as well as a recreational vehicle.

POTENTIAL BIKEWAYS

The existing road system probably offers the most immediate potential for bicycle facilities. This is especially true when the facility is a commutor lane or Class II Bikeway within the paved portion of the highway right-of-way. Class III Bikeways or marked Bicycle Routes - while usually the least safe of all the bikeways- also use the paved shoulder of the highway.

The lesser traveled roads with low traffic volumes and sufficient width offer real potential in rural areas. However, due to high frequency of fatal bicycle accidents in these areas, sufficient route warning signs and driver and bicycle safety education programs should also accompany route designation.

Studies conducted in other states indicate a desire by commuting and recreational touring cyclists to travel to a destination following a safe, direct route. Availability of services is also an important consideration.

A review of various kinds of rights-of-way was conducted during the study to determine their feasibility as bicycle paths. Abandoned railroads offer the greatest potential and are extensively detailed in a later portion of this report dealing with Potential Bicycle Paths. Due to the flat terrain, well drained roadbed and usual proximity to towns, abandoned lines offer excellent opportunity for bicycle paths. These same routes can also serve as linear parks, providing facilities for hiking, cross-country skiing and/or snowmobiling. Several Maine lines offer immediate potential. Eleven routes, some in close proximity to high population centers have been designated for serious review by the Bureau of Parks and Recreation, regions and localities as possible bicycle paths as well as linear parks for other recreation uses. Perhaps the greatest find is the 41 mile stretch from Poland to Canton. This route near the new Range Pond State Park offers a pleasant weekend trip. Portions of the route are already used by local snowmobile clubs.

Use of other rights-of-way such as utility ROW's is not advised except in unusual circumstances due to the need for guaranteed longevity of the bicycle path which cannot be obtained from the utility. Further, many ROW's are not owned outright but leased for the specific utility purpose. The ROW often stretches over rough terrain and is not graded or brushed out in the manner of which makes railroad ROW's so much more suitable.

DESIGN & CONSTRUCTION CRITERIA

An extensive review of the many types of bikeway designs in other states and some European countries was undertaken by the Design Division of the Bureau of Highways, Maine Department of Transportation. From this review, detailed criteria were developed on appropriate bikeways for Maine. This material is presented at a later point in the report.

In preparing this information, a comparison of urban and rural bicycling and bikeways was made. Bicycling was viewed in three broad categories:

1. the bicycling primarily for transportation purposes

2. bicycling primarily for recreational purposes

3. bicycling for recreational purposes, but with a specific destination in mind where some significant amount of time will be spent

Those who will commute by bicycle are probably living within 5 or 6 miles of their place of work. Beyond this distance, the number of bicycle commuters is expected to decrease if Maine follows national trends. Accordingly, most commuting bicycling is usually no more than 10 miles, of the more urban areas. There are few who will be using the bicycle to commute any great distance and there will be very few commuters on the rural bikeways.

Another aspect of bikeways is the volume or number of bicycles that would be likely to be using the facility at any given time. Just as city streets are expected to accommodate greater volumes of traffic, so it is with urban bikeways. Conversely, rural bikeways would normally be far less crowded, and, in general, get less use. This suggests that the first bikeways should be located where there is some population density, for this is the area where the facility would get the greatest use.

An additional and real concern appears to be providing facilities in areas where they are immediately needed to reduce accidents. Usage appears to be increasing as reflected in the rise in bicycle accidents. The number of accidents appears to have doubled in the last five years. If bike travel were increasing at the same rate, then such a trend over very few years could have a substantial impact on our highways.

Costs for three basic types of bikeways or modifications of same were developed on a per mile basis. The range of costs for completed bikeway facilities, in other states is generally from a low of $20,000 per mile to a high of $48,000 per mile for an 8-foot wide, Class I bikeway.

General grading, earthwork, and other important factors would

vary significantly with the terrain. Some of the costs, other than grading, include signs, striping, fences, lighting, landscaping and right-of-way acquisition costs. The minimum cost per mile estimate could be increased by whatever else was necessary.

Costs for Maine facilities as suggested by the Bureau of Highways basing estimates on 1973 material prices are as follows:

The 8-foot wide Class I Bikeway, or completely separated facility, can be expected to have a minimum cost per mile of $18,000, and this cost includes only surface, base and excavation.

An estimate for drainage ditching, fencing, landscaping, striping and signing (used on approximately 30% of the project) would add another $8,000 per mile, bringing the total cost per mile for a conservative project to $26,000 per mile. If the foregoing $8,000 for supplemental work were expanded (assuming supplemental work on 60% of the project) the upper limit for an average project would be $33,000. This describes a range from $26,000 to $33,000 per mile for average projects and is on the conservative side.

Class II bikeways fall into several categories and they must be costed out separately.

A Class II-A (one-way) bikeway is a 3'-6" paved facility adjacent to and at sidewalk level and the minimum cost for surface, base and excavation would be $6,000 per mile on new construction. If the supplemental work of shrubs for screening or barriers, striping and signing costs were applied to 30% of a one-mile project this would add $4,150. This would bring the total to $10,150 for the lower limit and the higher range will be $14,300. This means a conservative estimate of the middle range of costs would be from $10,000 to $14,000 per mile for Class II-A bikeways, as part of a new construction project. Widening an existing facility would result in noticeably higher costs, specifically, an additional $6,000 per mile. This brings it up to a $16,000 to $20,000 per mile range.

The costs shown in the tables prepared by DOT increase significantly as the complexity of the bikeway plan increases. Increased costs could be expected especially in the more urbanized areas of the State.

As would be expected, the most immediately feasible bikeway from an economic standpoint, appears to be the paved shoulder. This is an acceptable approach where the highway is of a rural design. This would occur in most rural areas and some sub-urban areas. This type of bikeway could be accomplished in the least amount of time and with the least disruption of traffic. It would provide the connecting links between bikeway networks, in the various communities and eventually lead to a connected statewide network of bikeways. Such a statewide network could be planned to provide for biking across the State, as well as bike travel between the major urban areas. However, it should again be stressed, the signed bike routes or bike lanes are the least safe of all bikeways. The best protection and safety is provided by the separated bike path.

INNOVATIONS USED IN OTHER STATES

A thorough review of legislation and current bicycling activity in the 49 other United States was made as part of this study. Over eighty-one percent of the states and their localities have delt with bicycling either through actual construction and study of bikeways or through legislation providing for registration, safety education, safety equipment, bikeways funding, etc.

Some of those innovations have already been mentioned. However, a registration program in California is especially worth noting.

Two statutes, one effective 1972, another to be implemented in 1975 give California the most significant statewide bicycle licensing program in the country. The first statute provides for local licensing where communities have adopted the appropriate ordinance. No resident may ride an unlicensed bicycle in the political subdivision. Licensing agencies (usually the police department) keep a record of the license number; name of licensee; serial number of bicycle; make, type and model of bicycle. After December 31, 1973, no bicycle can be sold which does not have a permanently cast or stamped serial number unique to the particular brand of bicycle. Bicycles with 20"+ diameter wheels and 14"+ frame are subject. Licensing fees are retained by the locality for use in licensing and safety programs implementation and improvement. The State Department of Justice administers the programs and establishes regulations after consultation with local authorities, bicycle manufacturers, retailers and bicyclist organizations.

On June 30, 1975 a law which will provide for a statewide system of registering and licensing bicycles to be administered by the Department of Motor Vehicles goes into effect and the prior law is repealed.

Records of all licensed bicycles in the state will be automated and available to all authorized law enforcement agencies through the Automated Management Information System. The law is primarily implemented through new bicycle sales; however after July 1, 1976 no person is allowed to ride, haul or leave standing any bicycle on public property unless the bicycle is licensed under the statewide system. This does not apply to manufacturers or dealers transporting bicycles. Every dealer must register and license each bicycle he sells. The registration form must contain: the name and address of the registered owner; make, type and model of bicycle; serial number and license number; date of sale; a place for transferer. A copy of the registration form sold by the dealer must go to the Motor Vehicle Department; the owner's home law enforcement agency; the owner; and the dealer. All records of the dealer are subject to inspection. The registration fee is $3.00. Fifty cents is retained by the bicycle dealer or a local law enforcement agency or fire department which is responsible for the registration program. Two dollars and fifty cents goes to the Motor Vehicle Department. Licenses are valid for three years from date of issue. When licenses expire re-registration may occur when the bicycle, the last registration form and the fee are presented. No dealer is required to issue a license. When the registrant changes address or transfers ownership of the bicycle, he must notify the Department of Motor Vehicles. Violations of the act are a misdemeanor.

SUMMARY OF RECOMMENDATIONS

It is apparent from the investigations conducted as part of this study that there is a significant amount of activity in Maine communities with regard to designation of bikeways. It is also highly probable that with the growth of bicycling, this activity will continue.

While Maine is not completely lacking in mechanisms to meet the State's bicycling needs, there are steps which should be taken to assure greater safety for all cyclists regardless of age, cycling experience, or purpose. The needs of Maine cyclists will not necessarily be met instantaneously or overnight. Some will require interim or long range solutions. Others, like the problems facing Maine in the Spring and Summer 1974 cycling season, will require more immediate attention. The recommendations which follow have been set out accordingly. To the extent possible, existing state, regional and local services are brought to bear.

MAJOR AGENCIES ---

A great deal of expertise in Maine bicycling problems and needs has been established in both the Bureau of Parks and Recreation and the Department of Transportation which should not be lost to the cyclists and taxpayers of Maine.

IMMEDIATE RECOMMENDATION

A Bicycling Coordinator should be established in either agency to serve as main contact person with the public and to assure program implementation.

INTERIM RECOMMENDATION

A statewide trails system incorporating bicycle paths should be established by the Bureau of Parks and Recreation.

A statewide system of touring routes should be established by the Department of Transportation.

The two agencies should work in consultation as the systems are developed and coordinate the routes and trails where possible.

LONG RANGE RECOMMENDATION

Joint research, and problem solving regarding Maine bicycle needs should be continued.

BICYCLE SAFETY EDUCATION

Programs are currently sporadic or non-existent. They need to be geared at both juvenile and adult, motorists and cyclists.

IMMEDIATE RECOMMENDATIONS

During Spring 1974, bicycle safety representatives from the Department of Transportation, Department of Public Safety, Department of Education and Cultural Services, the American Automobile Association and members of the Penobscot Wheelmen should coordinate efforts to reach all areas of the state to present new techniques in safety instruction to Maine law enforcement officers and teachers involved in bicycle safety presentations at Maine schools.

A series of public safety messages should be prepared by the Maine Highway Safety Advisory Committee to alert motorists and cyclists to their mutual responsibilities on Maine roadways.

INTERIM RECOMMENDATION

Maine Motor Vehicle license exams should incorporate questions regarding bicycling.

LONG RANGE RECOMMENDATION

Bicycle safety education should be mandatory in all Maine schools.

LEGAL CONSIDERATIONS

Maine bicycle legislation does not reflect the adult cyclist nor the use of the bicycle as a transportation mode.

IMMEDIATE RECOMMENDATION

A committee comprised of the Attorney General, the Director of Parks and Recreation, the Commissioner of Transportation, and the Commissioner of Public Safety or their designees should be established to review in detail any necessary statutory changes reflected in this study to assure greater bicycling safety. Presentation of this material should be made to the 107th Legislature.

BICYCLE FACILITIES

Reduction of bicycle accidents can be accomplished with proper

education and appropriate facilities.

IMMEDIATE RECOMMENDATIONS

1. Pilot bikeway projects should be established and monitored in various parts of the State to determine suitability of specific facilities for Maine cyclists.

   a. The Sebago Lake State Park Campground and environs (see later details)

   b. Commutor lanes in Portland and Lewiston-Auburn.

   c. Combination recreation/commutor lanes in the Orono-Old Town area.

   d. Bicycle paths along an abandoned railroad lines in York and Poland-Canton.

2. A map of appropriate touring routes should be published for Summer '74 by the Department of Transportation in conjunction with the Bureau of Parks and Recreation, Department of Public Safety, Department of Commerce and Industry and the Penobscot Wheelmen.

3. Municipalities should be encouraged to make road repairs along shoulder or edge areas to provide reasonably safe roadway cycling. Storm grates should be turned perpendicular with the roadway to avoid serious accidents.

INTERIM RECOMMENDATIONS

1. Communities should be encouraged to develop bicycle facilities which blend with municipal, regional and state transportation and recreation systems within their borders.

2. Regional Planning Commissions should incorporate bicycle facilities into area wide recreation and transportation plans.

3. The Maine Bicentennial Commission should follow the example of several other states by incorporating bikeways of historic orientation into their plans.

LONG RANGE RECOMMENDATION

A Statewide Bicycle Facilities Plan should be developed.

1. Drawing from data collected in Bicycling in Maine, rural bikeways networks should be planned to connect with existing and future urban bikeways using a corridor concept refined to specific routes.

2. Surveillance of bicycling on highways and lower speed volume roadways should occur on a continuing basis to

assess the demand for bikeways, the type and amount of bicycling, and location and type of bikeway facility needed.

DESIGN & CONSTRUCTION OF BIKEWAYS

IMMEDIATE RECOMMENDATION

Standard bikeway design and construction including signing should be followed by Maine communities to assure continuity. This is especially important where bikeways extend from community to community.

INTERIM RECOMMENDATION

The planning and construction of Class II and Class III Bikeways (Bike Lanes and Bike Routes) should recognize the greater safety of the lower volume and lower speed highways. Normally, only Class I. Bikeways (Bike Paths) should be planned adjacent to higher speed arterials.

LONG RANGE RECOMMENDATION

The primary responsibility for urban bikeways should rest with the community responsible for building and maintaining the facility.

Rural bikeways, forming links between communities should be the responsibility of the State.

REGISTRATION AND ENFORCEMENT

Bicycle thefts, especially of expensive ten speed bicycles, are increasing. Local enforcement of bicycle laws is seriously limited due to staff and funding problems.

IMMEDIATE RECOMMENDATION

Bicycle registration should be a mandatory state requirement. Inspection and registration should be conducted by the municipality. A fee of $3.00 should be collected annually to be divided accordingly: $.50 to the community for administration of the registration program; $.50 to the state for administration of statewide bicycle records; $1.00 to the local law enforcement department for enforcement of bicycle laws and bicycle educational programs; $1.00 to a bikeway fund for the purposes of construction, operation and maintenance of bikeways.

INTERIM

Written tests, or oral tests in the case of young children, should be administered prior to registration of bicycles to assure that there is sufficient knowledge of rules of the road on the part of the cyclist. (Safe equipment is only part of

the solution to safer bicycling).

LONG RANGE

Special training seminars on bicycle safety should be held for local law enforcement officials to assure knowledge of current enforcement practices.

FUNDING

Class I Bikeways or separated Bike Paths are the safest type of bicycle facility. They are also the most expensive to construct.

IMMEDIATE RECOMMENDATIONS

1. Federal and State funds which might qualify for participation in bikeways construction are currently committed. Pilot testing in Maine should be fully underway by Summer '74 in order to present findings to the 107th Legislature.

It is therefore recommended that a special appropriation be made to the Bureau of Parks and Recreation in conjunction with the Department of Transportation to conduct Pilot tests.

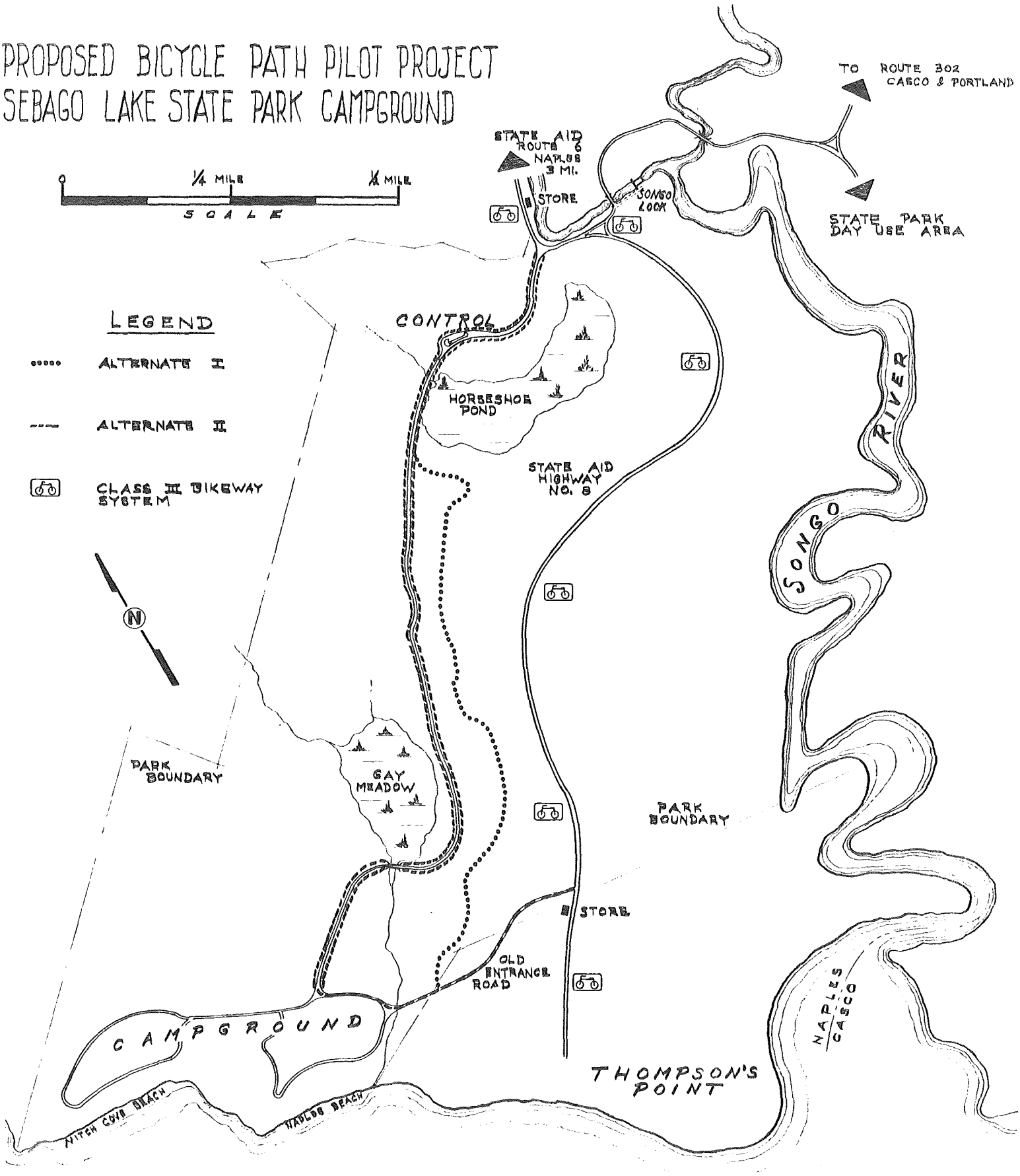
2. Recognizing the serious potential of increased bicycle accidents as greater numbers of cyclists are traveling Maine roadways, every attempt should be made by both the Bureau of Parks and Recreation and the Department of Transportation to assign monies within their 1975 budgets for bikeway planning and construction and bicycle safety education programs.

INTERIM RECOMMENDATION

Application to the several Federal programs where bikeway funding will soon become available should be made by municipalities and the State to enable bikeway construction projects to be underway in Spring 1975.

LONG RANGE RECOMMENDATION

The State should seriously consider special funding for non-motorized trail systems. These facilities would be available for hiking, cross-country skiing, snowshoeing, bicycling and horseback riding.


PROPOSED BICYCLE PATH PILOT PROJECT
SEBAGO LAKE STATE PARK CAMPGROUND
1/4 MILE
1/4 MILE
SCALE
LEGEND
ALTERNATE I
ALTERNATE II
CLASS III BIKEWAY SYSTEM
N
TO ROUTE 302 CASCO & PORTLAND
STATE AID ROUTE 6 NAPLES 3 MI.
STORE
SONGO LOCK
STATE PARK DAY USE AREA
CONTROL
HORSESHOE POND
STATE AID HIGHWAY NO. 8
SONGO RIVER
PARK BOUNDARY
GAY MEADOW
PARK BOUNDARY
STORE
OLD ENTRANCE ROAD
CAMPGROUND
THOMPSON'S POINT
NAPLES
NITCH COVE BEACH
NAPLES BEACH
SEBAGO LAKE

PROPOSED BICYCLE PATH PILOT PROJECT

SEBAGO LAKE STATE PARK CAMPGROUND

In November 1973, a survey was made of Supervisors of Maine State Parks to determine the impact of bicycles in the park during the 1973 season. As a result of information gathered, Sebago Lake Campground was chosen for detailed review for the possible installation of a bicycle path within the park boundaries.

Sebago Lake State Park is situated on the east side of Maine's second largest lake and within 1/2 hours drive from Maine's most populated area around Greater Portland. The Campground, an extremely popular area for Mainers and tourists alike, is filled to capacity from June to mid-September when the park closes.

Park operations personnel have indicated some conflict between foot traffic, autos and bicycles on the campground entrance road, especially between the 300± unit campground and the control area, a distance of approximately 1 mile. The typical template for the entrance road section is a 16' paved surface, with 1.5' gravel shoulders. The road alignment twists and winds through hilly topography making an aesthetic campground entrance with a posted speed limit of 25 mph.

To alleviate any conflict between foot traffic and autos, past attempts have been made by developing foot paths from the campground to the control area, but these paths were remote from the road and never generated much use. With the marked increase in use of bicycles during the 1972 and 1973 seasons, consideration was given to the development of a Class I Bikeway to accommodate both bicycles and foot traffic.

Alternate I

A proposed path location was field investigated by the Bureau. The path was to start at the perimeter of the campground, (refer to map) running in a northerly direction, generally parallel, 300' to 500' easterly of the entrance road for a distance of about 4900'. The path would come back onto the road about 800' inside the control area, and travel from this point would be on the existing roadway.

Further investigation into the development of this path, however, raised the following questions:

1) Primary justification for considering this path was to alleviate conflicts along the roadway between autos, foot traffic and bicycles. Would this location accomplish this?

2) A Class I Path should be constructed in a manner such that the natural surroundings are disturbed to a minimum and the pathway constructed in a manner to be interesting and aesthetic. Could this pathway be constructed considering these criteria?

3) In order to maintain a surface compatible with the surroundings it was at first thought that the surface of the pathway

should be constructed of compacted stone dust or other natural materials. Since the roadway which parallels this path is paved, would the bicyclist use a stone dust or compacted gravel path by preference over the roadway?

4) In our cost figures, as compared with those of D.O.T., the cost of constructing a path less than 8' in width would exceed the cost of constructing a path 8 or 9' in width.

   This is brought about by the fact that conventional equipment can be used if a bikeway 8 to 10' wide is developed but for a 6' or 7' pathway small very light construction equipment has to be used along with a large amount of hand labor which increases the cost of removing excavation, placing gravel and surface materials. Under these circumstances, would it be desirable and compatible with the design of the park to construct an 8' paved path through this section of the park?

After giving these questions due consideration it was felt that since the roadway was a more direct route from the campground to the control area it would be difficult to generate use on the path and eliminate all bicycles and foot traffic from the road. It was also concluded that an 8' paved path through the woods would not be desirable aesthetically or attractive and compatible with the general design of the park. Since the cost of considering a narrower pathway would be excessive and yet possibly not solve the problem, further study was given to the other possible alternatives.

Alternate II

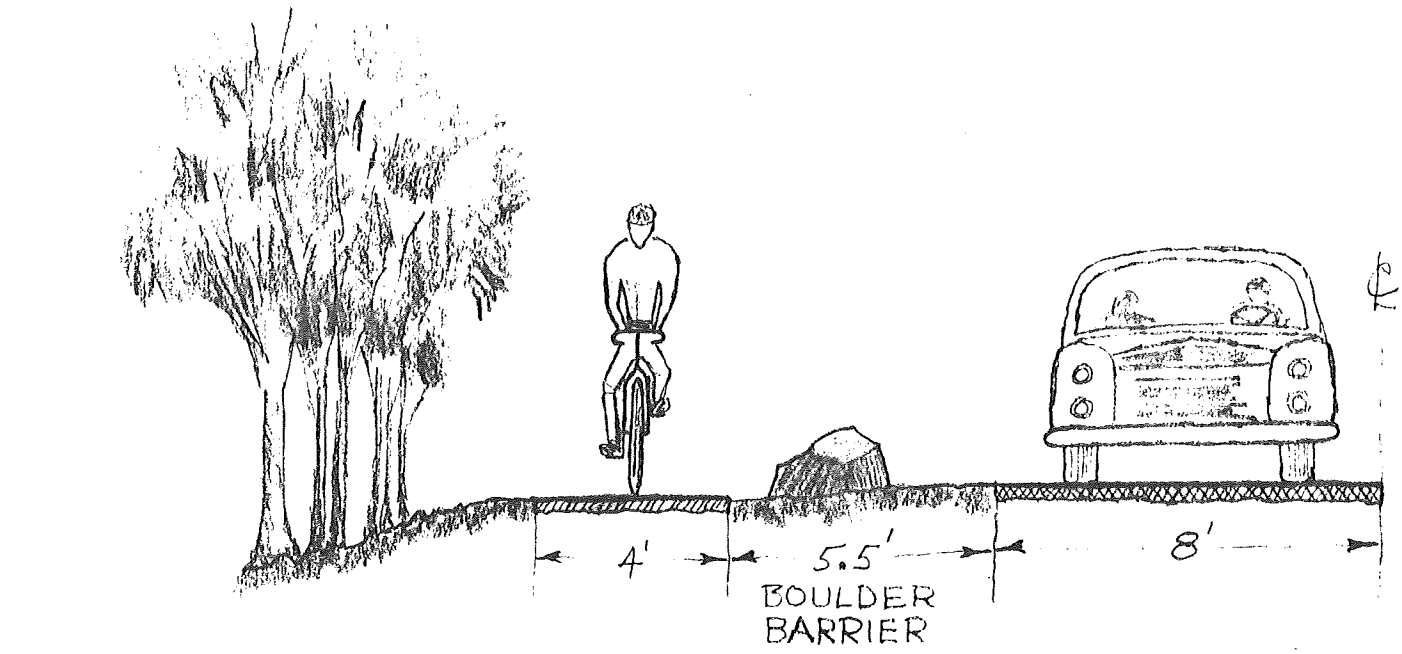
Consideration was given to developing a Class II Path along the park entrance road since this was the most direct route from the campground to the control area and other destinations outside the park. One-way paths on either side of the road would generally follow the interesting road alignment, separated in varying degrees by a minimum of a two foot gravel shoulder to a separation allowing for some trees and shrubs. (Refer to typical section sketches).

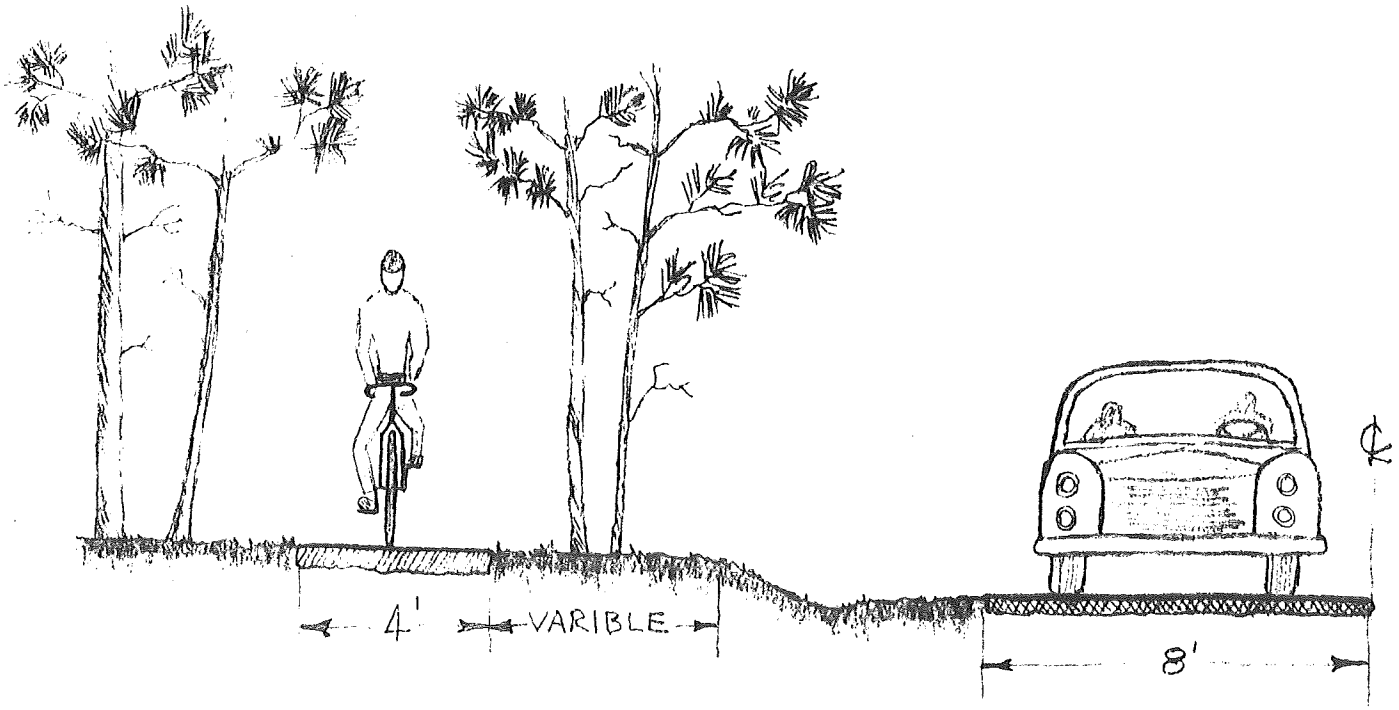
The road cross-sections were further investigated to see what problems might be encountered in drainage areas, heavy cuts and fills and ditch sections. It appears that most culverts can be left undisturbed, but this will require the construction of cribbed headwalls. At Gay Meadow, an existing concrete box culvert allows no room for the paths, therefore, two timber bridges supported on timber bents are proposed to cross these approximately 40' and 70' long wet areas.

COST CONSIDERATIONS ALTERNATE I & II

CLASS I

The construction of a Class I pathway; 6' or 7' wide, adequate for two-way bicycle traffic, will require special, non-standard construction methods and equipment, unless the path is located in open improved areas or on old road beds where conventional construction equipment can





ALTERNATE II

Proposed Bicycle Path Pilot Project
Sebago Lake State Park Campground

do the work. The increased cost is more directly related to the methods used to accomplish the work than the materials. Where the conditions prohibit the use of conventional equipment to move the materials, labor costs increase greatly, requiring more supervision and longer time periods to do given volumes of work completely. The total cost, therefore, increases greatly.

At a cost comparison, the Bureau of Parks and Recreation developed approximately 1 mile of 4' wide and 7' wide gravel foot paths at Wolf Neck Woods in 1972. These walks were constructed in wooded areas not accessible by conventional equipment, therefore, requiring the use of small tractors for removing stumps and carrying materials in. The standards used for these foot paths were similar to criteria for a Class I path, except that they did not have any surface treatment.

In 1973 a portion of this same walk system was improved and surfaced with stone dust to provide a compacted surface for wheel chair traffic. This work was completed by Bureau crews.

The following table shows the breakdown of the costs and explains the work involved.

CLASS I PATH

OPERATION	6' SURFACE	8' SURFACE
Clearing & Grubbing	$16,000/mi[1]	$4,000
Gravel Base - 6"	3,500/mi	4,000
Surface - 1" Stone dust	6,500/mi[2]	--
2" Bituminous Surface	--	13,000[4]
Total	$26,000/mi[3]	$21,000

1. This does not include any excavation, only the removal of sod, stumps and rocks from the pathway.

2. This material was hauled with a small park tractor with no charge to the project, therefore, if equipment was to be hired another $2500/mi should be added.

3. This does not include costs for drainage structures which vary greatly with each area. Also not included in the cost, but added items for consideration would be -- land acquisition, where necessary; signs and signals; landscaping; bridges and possibly bulkheading and ditching.

4. We have no figures for placing stone dust by this construction method, therefore, we used the bituminous concrete surface If 1" stone dust surface were used on the 8' path an estimate of cost would be about $1200/mile.

CLASS II

The construction of the Class II pathway, 4' wide to accommodate one-way bicycle traffic and foot traffic, would be constructed along both sides of approximately 6000' of the roadway, utilizing the roadway for equipment access and operating room.

The Bureau has had no experience in construction of paths of this type, but we have estimated quantities and projected cost to 1974 as a basis for estimating costs.

The following table shows the estimated costs for this particular study which reflects a fairly high cost in order to vary the configuration, create varying separators and to construct two timber bridges across Gay Meadow.

CLASS II PATH

OPERATION	COST
Clearing	$ 2000
Excavation	4000
Aggregate Subbase 6"	6000
Bituminous Surface 2"	14000
Culverts & Headwalls	1000
Bridges (2)	6000
TOTAL[1]	$29,000
Cost/mile (bothways)[2]	$25,000/mile

[1]This estimated cost is for the 4' Class II pathway along both sides of the road. Since this is within the park boundary, no acquisition costs are reflected and costs for signing or other traffic control is not included.

[2]The per mile cost is for both ways, that is both sides of the road. The cost of 4' Class II pathway which would accommodate one-way bicycle and foot traffic would be 1/2 the table cost or $12,500/mile.

EXPANSION OF THE PARK SYSTEM

Serious consideration should also be given to expansion of the Class II Path network within the park (approximately 3.1 miles) by marking Class III routes along road systems outside the campground area.

A. Bicycle routes could be marked along State Aid #8 which bisects the park property near the campground and serves Thompson Point residents. A trip using this route would start at the campground following the Class II bicycle path along the camp road and form a 5 mile loop by including State Aid #8 and return by the old entrance road. The entire trip would be on low volume roads and

bicycle paths through picturesque countryside; a good family outing. Additions can be made to this trip by side stops at the Songo Locks where good fishing and boat watching are already popular. Two stores and some picnic spots are also found along the route.

B. Again starting from the campground paths, trips of three miles are possible into the busy summer tourist center of Naples following State Aid #6 and Routes 114 and 11. These marked routes could serve residents of Tricky Pond and the Bay of Naples as well.

The Department of Transportation has reviewed this pilot and generally endorses participation in the Class III system. Implementation by both agencies would allow monitoring of several different types of bicycle routes which would serve a variety of uses from at least five traffic generator areas.

Funding for the Class III system signs and warning markers is possible through Federal DOT demonstration monies. Funding for the Class II paths in the park could be provided from both the Federal Bureau of Outdoor Recreation, the Federal Department of Transportation and State Bureau of Parks and Recreation.

Implementation of this project should be undertaken with the participation of the town of Naples and its seasonal residents who would be affected.

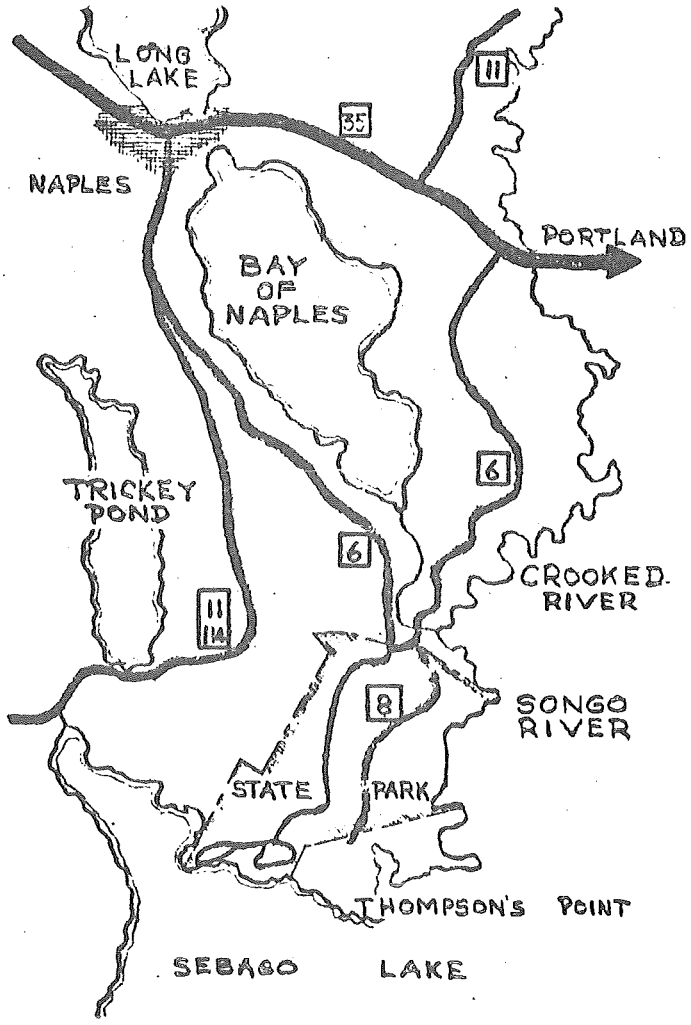
PROPOSED BIKE PATH

PILOT PROJECT

SEBAGO LAKE

STATE PARK CAMPGROUND

AND ENVIRONS



DESIGN & CONSTRUCTION CRITERIA - BIKE WAYS (IN STATE PARKS)

In recognition of special treatment which should be given to Bicycle Ways constructed within Maine State Parks, the following design and construction criteria have been developed.

CHARACTERISTICS OF WAYS - Serves general recreation use for families and general public, many of whom do not bicycle extensively; allows for a wide range of equipment, ages and capabilities.

CLASSIFICATION OF TYPE

CLASS I - A Pathway completely separate from auto route to be used by bicyclists and other non-conflicting recreational trail users. Variations within this class may regulate type of use (i.e. bicycles only). Surface, treatment, path width, and other design criteria are governed accordingly.

CLASS II - Pathway along the auto route but, separated, in varying degrees. May be a 2' gravel or shrub or fence demarcation or a completely separate path on different grade level.

CLASS III - Route along the auto way, using the same travel lane, yet designated as such and with controlled speed to make the two more compatible.

GENERAL CRITERIA

GRADES

3% or less can be carried for extended lengths
3-4% shouldn't be maintained more than 600'-1000'
4-6% shouldn't be maintained for a distance in excess of 400'-600'
10-12% shouldn't extend for more than 200'-300'

CROSS-SLOPE

Two-way path should not exceed 1/2"/ft=4%
One-way path should not be greater than 3/4"/ft=6%

HEIGHT CLEARANCE

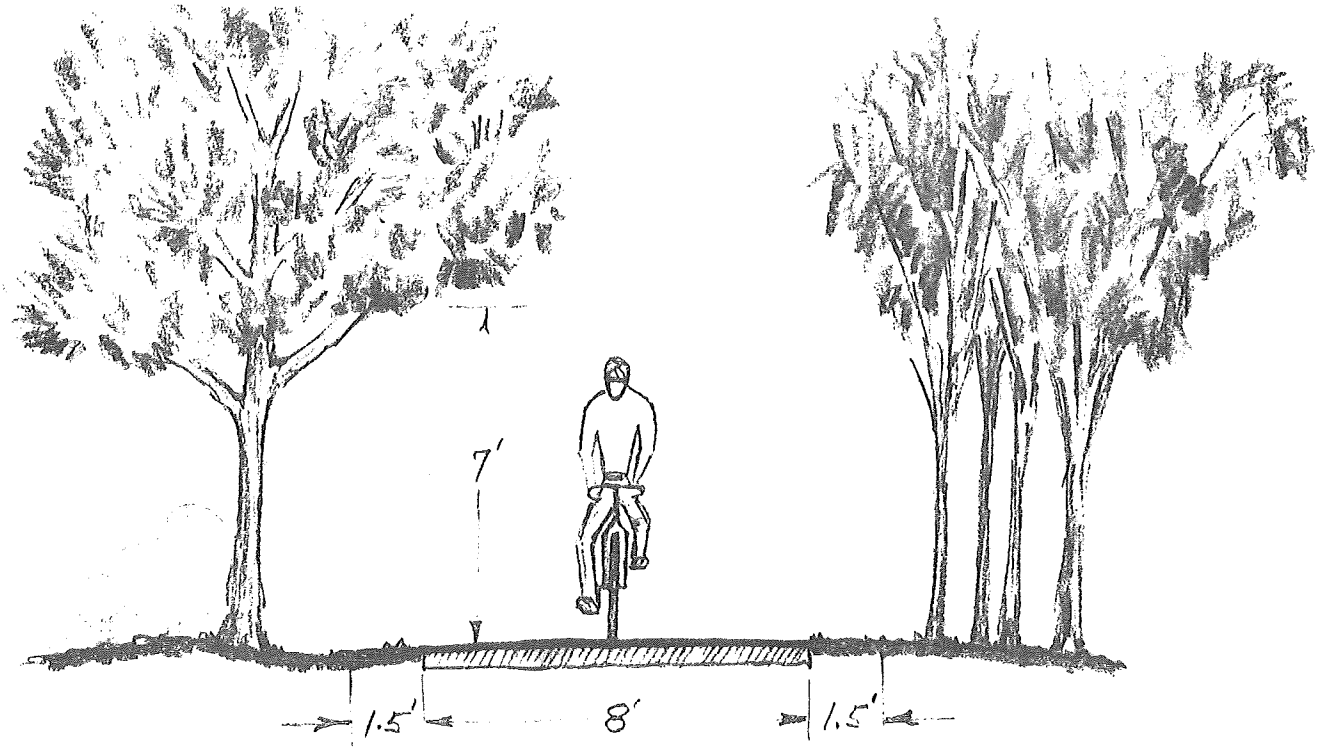
All branches and obstructions shall be removed to a height of at least 7' above the path surface.

CLASS I & II PATH

Minimum width for one-way path surface should be 3', with 1.5' clearance on either side.

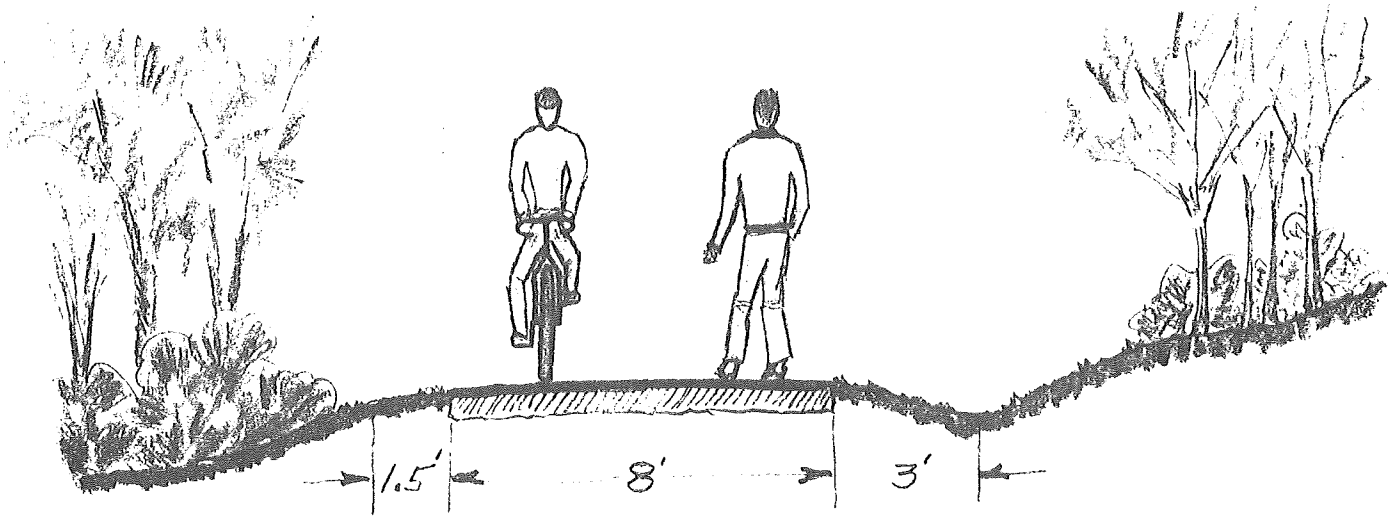
Minimum width for two-way path should be 7' with 1.5' clearance on either side.

CLASS I BIKEWAY



METHOD A

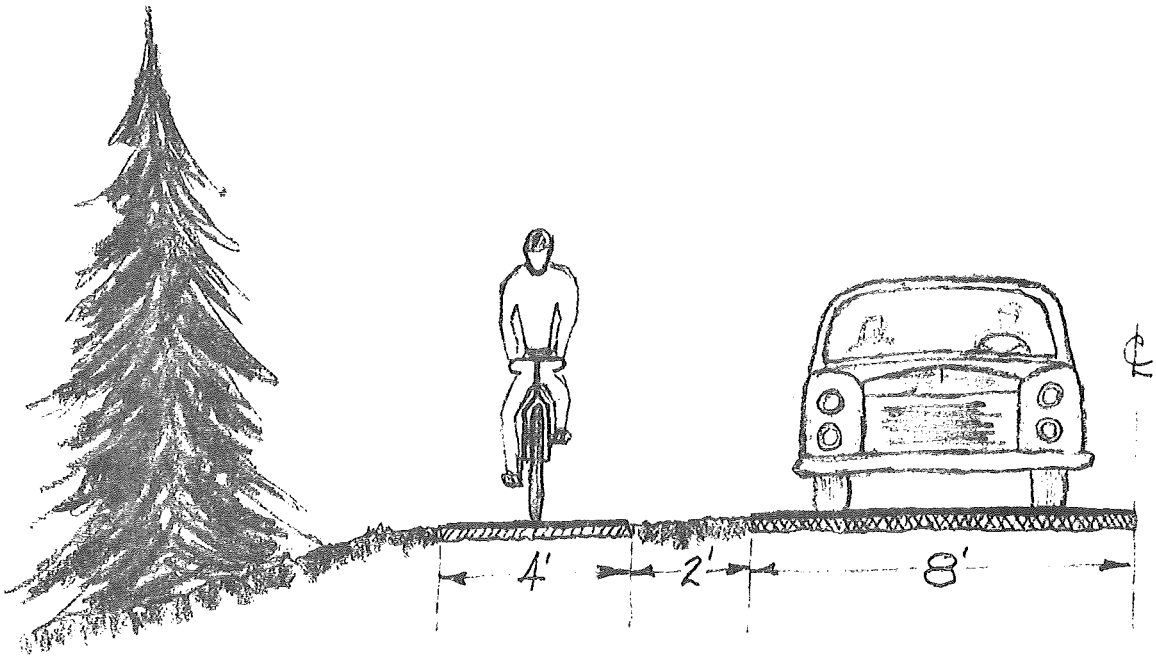
A two-way path for bicycle and foot traffic, completely separated from roads. This method preferred where no drainage problems exist, offers a more aesthetic setting for path.



METHOD B

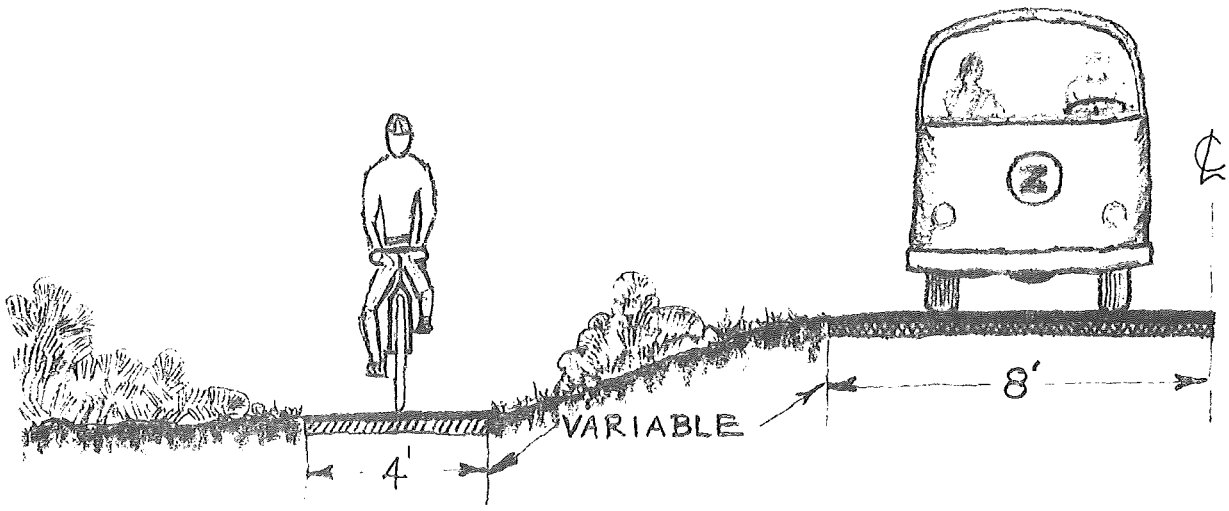
A two-way path for bicycle and foot traffic, completely separated from roads. This method showing ditching and embankment construction where drainage and ground conditions make it necessary.

CLASS II BIKEWAY



METHOD A

A one-way path for bicycle traffic moving along with the auto traffic, separated by a compacted gravel or turf median. Usually the most economical to construct, requiring only shoulder widening.



METHOD B

A one-way path for bicycle traffic moving along with the auto traffic, but grade separated, offering a variety of alignment and a variable median which can be planted and treated. Construction may be slightly more costly than Method A.

HISTORY OF BICYCLING

EARLY DEVELOPMENT

The current resurgence of bicycling which Maine has experienced over the last three years is not without precedent. On May 20, 1886, the Maine Chapter of the League of American Wheelmen was formed in Portland. In 1891, they published a "Road Book" which suggested routes the rugged cyclist might take on a venture through Maine. With the invention of the pneumatic tire, cyclists discarded hard rubber tires and many more Maine roads could be added to the list. In 1895, Torey and his Wheelmen published the second edition of the "Road Book" with revised maps and charts. It contained recommended lodging spots (for $1 - $3 per night); frank appraisals on road conditions ("sandy and hilly - take the train") and listed some 47 chapter representatives scattered all over the state. The main goal of the Wheelmen was expressed as a plea in both editions. Cloaked in diplomatic phrasing but clearly there, was a sincere campaign for better roads for bicycles. The zeal of the chapter in Maine and other states was such that eventually the national league was catapulted into the American Road Builders Association.

Maine bicycling popularity centered around the Penny Farthing or Ordinary which featured a high front wheel of 60 inches in diameter and a rear wheel of 16 to 20 inches. While it was faster than its precursors, the Ordinary was highly unstable, throwing the rider off in a "header" if the wheels hit a stone or rut. Despite the danger, however, it had reached the United States from Europe by 1875 and was being manufactured in Boston by 1879. Not surprisingly the first U.S. bicycle club, the Boston Bicycle Club was formed in 1876. The League of American Wheelmen, of which we spoke earlier, formed four years later in 1880.

The Ordinary was strong until 1900 when it was almost completely supplanted by the "Safety Bicycle", the prototype of today's bicycle. Design advantages provided for direct steering, wheels of almost equal size, easy mounting and stability. The cost dropped from a $60 in 1884 to $18 by 1900. This was a real bargain in comparison to the Penny Farthing which had been $313 when first introduced and was still at $150 by 1900.

With changes in mass production and the introduction of the pneumatic tire, the bicycle industry was thriving. Bicycling was opened up to middle and lower income groups. Bicyclists were not riding just for sport or exercise but were using the bicycle as a means of transportation to and from work, with the more venturesome traveling afield, touring locally and in other countries.

Cycling opened up a whole new life for women. Some of them had ridden the old "Draisienne" and tricycles, but the Penny Farthing with its demand for certain clothing inappropriate for women was essentially a man's

bike. The safety bicycle with greater proximity to the ground, good brakes, etc. appealed to all classes and to men and women alike. Women switched from long voluminous skirts to long baggy pantaloons which were ever so much more appropriate no matter how immodest.

Many hazards still faced the cyclist. Children poked sticks into the cycle spokes and most city streets were paved with cobblestones. No wonder the cry "better roads for bicycles".

In California "cycle path" buttons were sold for $1. An elevated bicycle path was proposed in Pasadena. The first section, wide enough for four bicycles abreast, was completed in 1900. The Pasadena Freeway now follows this route.

Just as the bicycle was experiencing its finest hour, the automobile became the darling of the leisure class and siphoned off engineering expertise to the horseless carriage. It was the men of the bicycle industry with their training and facility who designed and built the first automobiles, Glenn Olds and Henry Ford were among them. Bicycle repairmen like Wilbur and Orville Wright made basic contributions to airplane design and construction. Practically every mechanical improvement in the automobile today can be traced back to the bicycle; pneumatic tires; adjustable ball bearings; roller bearings, free wheel clutch; differential steering; variable gears; steel tubing and last but not least brakes. In that early surge in 1899, 1,883,000 bicycles were sold; by 1904 sales had dropped to 250,000.

EUROPEAN CONTRAST

There was a markedly different attitude in Europe and other parts of the world during this same period of decline in the States. In 1939 bicycles were the most common mode of transportation in Europe, for work and for pleasure. Bicycle paths were provided in large numbers for the safety of the many riders; Germany, Great Britain, the Netherlands and France were especially strong in their planning and implementation of bicycle facilities. New towns were designed with special bicycle path systems to transport parents and children from home to work, shopping and school without even going on the highway. Scarcity of cars and gasoline rationing during the war and post-war years kept bicycling popularity on the rise until the early 60's, when automobiles became more readily available.

AMERICAN RESURGENCE

The first sign of resurgence in North America came in the late 50's and early 60's due to a growing interest in health. Dr. Paul Dudley White, former personal physician for President Eisenhower and noted heart specialist said, "I would like to put everybody on bikes...not once in a while, but regularly, as a routine." In 1961 the current bicycle renaissance started in Homestead, Florida. Between 1966 and 1971 Dade County, Florida, which includes Miami as well as Homestead, completed 100 miles of bicycle routes.

In 1965 the State of Wisconsin began assembling the links of what today is a 300 mile statewide system. This system includes a 32 mile stretch of abandoned railroad which passes through three tunnels and crosses 38 trestles. In 1972 the Elroy Sparta Trail had 30,000 bicyclists using the path. This same trail serves snowmobilers and hikers as well without conflict.

During the course of the Maine bicycle study all 50 states and U.S. possessions were contacted. Over three-quarters reported either local or state level activity in bicycle facilities. This fact is not surprising in light of recent sales figures. The Bicycle Institute of America reported 13.9 million bicycles were sold in the U.S. during 1972 and estimated over 15 million for 1973. Over 50% of the sales were to adult users as compared to 12% in 1969. In 1972 bicycle sales also topped car sales by 2.7 million.

What caused this resurgence? The interest in health generated in the fifty's and early sixty's has already been mentioned. To this was added a growing disenchantment with the automobile, its pollution and antecedent problems of parking and snarled urban and freeway traffic. By the late sixties, the bicycle itself had undergone more changes. Made of metal alloy and multi-geared (3, 5, 10 and even 18 speeds) bicycles are now extremely light-weight. Some can even be folded and carried in one hand or placed in a car trunk. As a result, the bicycle itself is no longer a toy but a sophisticated machine able to carry its passengers efficiently to work, school, or shopping as well as for a leisurely tour or highly competitive road race.

Apart from health, the protection of the environment and recreation concerns, a very real rediscovery of the bicycle as a mode of transportation occurred during the last three months.

In October when we first made contact with the British Information Center, we were told bicycles and bicycle paths were hardly used in Great Britain anymore. By late November that fact had been dramatically reversed with severe gasoline shortages making a trip by autos hard to rationalize if not impossible.

CURRENT MAINE CYCLING GROUPS

A discussion of bicycling history would not be complete without some reference to the current Maine Chapter of the League of American Wheelmen or the state bicycling club, the Penobscot Wheelmen.

In 1970 the League had only three members and no formal cycling club was in existence. Dr. Harris J. Bixler, a jogger turn cyclist, moved to Camden in that year and started the Penobscot Wheelmen in the summer of 1971. The group, many of whom were middle-aged men who themselves had turned from jogging to cycling made Sunday trips of 10-50 miles in various parts of the state to Mt. Desert Island, Islesboro, Penobscot Valley, etc.

The first group has now grown to over 100 members, mostly from Augusta, Camden-Rockland area but from Portland and Bangor as well. The Sunday trips are still planned by a rides chairman who prepares a map and description of the ride. In order to provide for every type of cyclist, each Sunday outing has two or three rides of varying pace lead by someone familiar with the route. An informal long distance touring section has been active for the last two summers.

In 1972 a racing section was added. The Penobscot Wheelmen boast several champions - among them Larry Poulin, winner of the State title for 1971 and 1972. In 1973 Maine sent several competitors to the Nationals. Charles Neidner of Livermore Falls placed an admirable 6th in the Jr. Competition (age 15-18 riders).

A survey of retailers, detailed later in the report, revealed that late 1973 sales were to adult users for transportation purposes. This trend is reported to be continuing. Maine, it would seem, has much reason to take resurgence in cycling that began as a ground swell and has now grown to a tidal wave very seriously from both transportation and recreation aspects.

LEGAL STATUS OF BICYCLING

The earliest bicycle law in Maine dates back to 1899. The law, passed on March 17, 1899, provided for regulation of bicycles under municipal ordinance by "establishing police regulations for the prevention of crime, protection of property, and preservation of good order and to regulate the use and manner of the use of bicycles in the streets in the nighttime."

Until 1957, this section was amended only once, specifically to remove nighttime regulation. Maine regulation of the bicycle was therefore left solely to municipalities for some 58 years.

In 1957, state regulations regarding operation of bicycles were passed. The law was very similar to that in existence today and followed recommendations of the Uniform Vehicle Code as adopted in some 38 other states. In 1967, an important amendment to the state statute was made which gave bicycles clear and legitimate right to the roadways of the state. The statutory change read as follows: "Every person riding a bicycle upon a roadway shall be granted all of the rights and shall be subject to all of the duties applicable to the driver of a vehicle by this title, except as to special regulations and except as to those provisions in this Title which by their nature can have no application."

In 1973 several more changes were made. Municipalities were given powers to regulate bicycles other than by provisions strictly in compliance with the State law. For example, riding to the right of the road now need not apply to "municipalities which, by ordinance and with the approval of the Department of Public Safety and the Department of Transportation, shall make other provisions for the location of bicycle traffic." This provision opens possibilities for such items as two way bicycle lanes on one side of the street.

As of 1973, bicycles also are required to have lighted headlamps not only at nighttime when they are in use but "at other times when motor vehicles are required to display headlamps by section 1366." (Motor Vehicle Laws Title 29). Red reflectors to the rear are also required to be visible from 200 feet, not 50 feet as had previously been the case. Bicycle pedals now must bear reflector strips and bicycle handlebars must have reflector tapes when used in the nighttime or at other times when motor vehicles are required to display headlamps.

The present Maine bicycle law follows on p.II-B-2. While Maine law compares favorably with bicycle laws in other states in reference to rules of the road, equipment and penalties, it unfortunately contains similar foibles. Most state statutes do not recognize the bicycle as a serious mode of transportation nor as a conveyance used by adults as well as children. Penalties are geared for children and even in this respect seem to be failing to follow due process which is demanded whether the offender is a child or an adult.

BICYCLE LAWS

Title 29 (Me. Revised Statutes)

Effective October 3, 1973

SUBCHAPTER XI
BICYCLES

Sec.
1961. Regulations.
1962. Equipment.
1963. Penalties.

§ 1961. Regulations

Every person propelling a bicycle shall ride said bicycle as far as practicable to the right side of the roadway at all times except when making a left turn.

This paragraph shall not apply to municipalities which, by ordinance, and with the approval of the Department of Public Safety and the Department of Transportation, shall make other provisions for the location of bicycle traffic.

A person propelling a bicycle shall not ride other than astride a regular and permanent seat attached thereto. No bicycle shall be used to carry more persons at one time than the number for which it is designed and equipped.

No person riding upon any bicycle, coaster, roller skates, sled or toy vehicle shall attach the same or himself to any moving vehicle upon a way.

Every person riding a bicycle upon a roadway shall be granted all of the rights and shall be subject to all of the duties applicable to the driver of a vehicle by this Title, except as to special regulations and except as to those provisions in this Title which by their nature can have no application.
1967, c.245, §§ 24, 25.

§ 1962. Equipment

Every bicycle when in use in the nightime or at other times when motor vehicles are required to display headlamps by section 1366 shall be equipped with and have lighted a lamp on the front which shall emit a white light visible from a distance of at least 200 feet to the front and a red reflector to the rear which shall be visible at least 50 200 feet to the rear.

Bicycle pedals shall bear reflector strips and bicycle handlebars shall bear reflector tapes when in use in the nighttime or at other times when motor vehicles are required to display headlamps by section 1366. Every bicycle shall be equipped with a brake which shall enable the operator to stop the bicycle within a reasonable distance.

§ 1963. Penalties.

Any person of the age of 17 years or over who violates any of the provisions of sections 1961 and 1962 shall, upon conviction, be punished by a fine of not more than $10. The chief of police of any municipality, or where there is no chief of police, the chairman of the board of selectmen, when satisfied that a juvenile under the age of 17 years has ridden a bicycle in violation of any of the provisions of sections 1961 and 1962, may impound the bicycle for a period not to exceed 5 days for the first offense, for a period not to exceed 10 days for a second offense and for a period not to exceed 30 days for any subsequent offense.

* * * * * * *

In Maine, although bicycles are used as transportation modes, they are not legally recognized as vehicles. The cyclist is, however, "subject to all of the rights and the duties applicable to the driver of a vehicle, exempting the provisions of the motor vehicle law which by their nature" can have no application. This ambivilence can create legal problems in terms of current bicycle use trends.

Edward Kearney, Executive Director of the National Committee on Uniform Traffic Laws and Ordinances raised several legal questions in a speech before participants at the Conference on Bicycles U.S.A. in Cambridge, Massachusetts May 7-8, 1973. These should also be considered in Maine if the bicycle is truly recognized as a legitimate user of the highway.

1. What is the bicyclist's status under a no-fault auto insurance?

2. Should a bicyclist on a crosswalk be treated as a pedestrian?

3. Who yields at an intersection in the situation when a bicyclist is going straight ahead and a car driver wants to turn right?

4. Should bicycle riders have drivers licenses or should some other program be developed to assure knowledge of rules of the road and proper riding abilities?

5. What's the proper and safest course for making a left turn?

Legal questions such as these have been raised during the course of the bicycle study. These are questions which for the most part will take the experience of time and patterns of bicycle use in Maine to resolve. One important question concerning use of highway dedicated revenue for bicycle facilities, however, was fundamental to the study.

In late January, 1974 a request for a formal opinion from the Attorney General's Office was posed by the Department of Transportation. The highly significant response to that request revealed that dedicated highway revenues could be used for certain bicycle facilities. A copy of the response follows.

JON A. LUND
ATTORNEY GENERAL

GEORGE C. WEST
JOHN W. BENOIT, JR.
RICHARD S. COHEN
DEPUTY ATTORNEYS GENERAL

STATE OF MAINE
DEPARTMENT OF THE ATTORNEY GENERAL
AUGUSTA, MAINE 04330

March 21, 1974

Daniel Webster, Jr., Acting Director
Bureau of Planning
Department of Transportation
State Office Building
Augusta, Maine 04330

Re: Use of Highway Funds for Bicycle Facilities

Dear Mr. Webster:

This is in response to your request of January 28, 1974: "Can monies from the State's General Highway Fund be used for the purposes of constructing bicycle facilities in the following locations and situations?"

1. "To construct a paved shoulder for bicycle use, and concurrently to provide a painted stripe along the edge of the travel lane for motor vehicles, as an indication of separation between motorized vehicles and bicycles,"

   Ans. Yes.

2. "To construct a bikeway separated from the highway traveled way (by a barrier or open space), but adjacent to the aforementioned traveled way and falling within the highway right of way,"

   Ans. Yes.

3. "To construct a bikeway paralleling the highway, but outside the highway right-of-way,"

   Ans. Yes, provided there were enabling legislation which authorized such construction.

4. "To construct a bikeway outside the highway right of way and completely unrelated to the highway,"

Ans. Yes, provided there were enabling legislation which authorized such construction.

5. "To provide for the costs of signs to designate a shoulder or path as a bicycle route."

Ans. Yes.

It is well settled law that everyone has an equal right to use the public highways for the purpose of travel by proper means. The right is not an unqualified right. The right is subject to be limited and controlled by the State whenever necessary to promote the safety, peace, health, morals and general welfare of the people. State v. Mayo, 106 Me. 62.

The traveler is not entitled to the whole width of the street for his accommodation and portions may be set off for sidewalks and the use of the remaining width of the way so regulated that other vehicles shall use exclusively different portions thereof and still no one be deprived of his rights. State v. Boardman, 93 Me. 73. In fact, the public authorities could be empowered by the Legislature to set apart a portion of the highway for the exclusive use of bicycles. 7 Am Jur 2d Automobiles and Highway Traffic 175.

The limitation on expenditures of highway funds set forth in Section 19, Article 9, Constitution of Maine, is to prevent diversion of certain revenues to other than highway purposes. Opinion of the Justices, 155 Me. 125. Article 9 declares "construction, reconstruction, maintenance and repair of public highways" to be a highway purpose. And, increased traffic safety - the promotion of safety for members of the public who use the highway is a highway purpose. Ward v. Louisville & Nashville Railroad Company, 402 SW 2d 98.

The conclusion is self-evident: If the Department of Transportation determines public necessity and convenience requires construction of a paved shoulder etc., for the accommodation of bicycles which promotes the general welfare of the people and safety of the user such construction is a highway purpose and a proper subject for expenditure of highway funds.

Article 9 of the Constitution restricts use of general highway funds to construction, reconstruction, maintenance and repair of those highways "under the direction and supervision of a State department having jurisdiction over such highways." The Department of Transportation cannot construct a bikeway outside existing highway rights-of-way first because it is not authorized to lay out and construct other than "seasonal access roads," 23 M.R.S.A. § 53-A, "State and State-aid highways," 23 M.R.S.A. § 153, "parkways or a free way," 23 M.R.S.A. § 252, "service roads," 23 M.R.S.A. § 253, "controlled access highways," 23 M.R.S.A. § 302, and "a system of State and State-aid highways," 23 M.R.S.A. § 701; and second until such right to lay out and construct a "bikeway" were placed under its jurisdiction, expenditure of general highway funds therefor would be prohibited.

Note your use of the word "bikeway." In question 2, it is used in the context of being a portion of an existing public highway but separated from other traffic on the highway, and in the 3rd and 4th question as a way separate and apart from any existing highway. A "bikeway" laid out, constructed and maintained outside an existing public highway pursuant to legislative direction and in which bikeway there existed the common right of enjoyment would, in fact, be a public highway. 39 Am Jur 2d Highways, Streets and Bridges 1.

A "bikeway" under appropriate legislative authorization would be no less a public way than those ways now provided for by statute: "Seasonal Access Road," "State Highway," "State-Aid Highway," "Parkway," "Freeway," "Service Roads," "Interstate" and "Controlled Access Highways." These ways differ one from the other but are none the less public highways. Accordingly, the test of what is a "highway" is not the type of vehicular use which is served by the way, but rather the test is the right of public use.

The term public highway in a general law should be regarded as having been used in its general sense unless there is reason for believing it was used in a limited sense by the subject matter of the statute in which it is employed. 39 Am Jur 2d Highways, Streets and Bridges 1, Weirich v. State 121 NW 652.

We view a bikeway to be within the ambit of "public highways" as used in Article 19. We construe the words according to the common meaning of the language and further opine it a fundamental duty to construe both statutes and the constitution and ascertain not only from the words themselves but from the context from the

context from the purpose to be sought. Moulton v. Scully, 111 Me. 428. In Wakem, Receiver v. Town of Van Buren, 137 Me. 127 the Court said "A constitutional provision should receive such a liberal and practical construction as will permit the purpose of the people therein expressed to be carried out, if such construction is reasonably possible." And in Opinion of the Justices, 152 Maine 449, "The language of the constitution should not in our view be extended beyond its plain and ordinary meaning."

Yours very truly,

JON A. LUND
Attorney General

JAL/jwp

RECOMMENDATIONS

Other issues of legal orientation were also explored by the study with the assistance of the Attorney General's staff. The following recommendations are a result of that examination:

1) Closer examination should be made of flaws in the existing bicycle legislation in the following areas:

   a. the penalty provisions which do not incorporate due process for the juvenile offender

   b. the impoundment penalty which, though infrequently used by law enforcement officers, may be unconstitutional

   c. the fine for adult offenders which is now set at a $10.00 limit should probably be raised

   d. redefinition of "bicycle"

2) The widespread lack of enforcement of bicycle laws should be reviewed by the Maine Police Chiefs Association, Maine State Police and the Law Enforcement Assistance Agency and the Attorney General's office to see what remedies can be taken. Twenty-two of the police chiefs surveyed during this study reported difficulty with enforcement due to lack of personnel. Other reasons listed were lack of time, reluctance to enforce laws where juvenile offenders were involved and lack of public education. At the same time the same survey revealed a concern with making the existing laws work.

3) Suggested statutory changes as per use of highway dedicated revenues for bicycle facilities should be considered for formal presentation to the 107th Legislature.

BICYCLE TRAFFIC VOLUME

Bicycle traffic volume on Maine highways was counted during 1973 for the first time. Using the same methodology as that used for motorized vehicles, the State Department of Transportation count included twenty-nine locations throughout the State where the mix of traffic is regularly determined. This provided information on bicycles in relationship to all other types of vehicles using the highways. The percentage of the mix of summer traffic represented by bicycles was then determined. The numbers and percentages of bicycles at several representative locations will be found in Table 1.

Several urban and several rural locations as well as, several recreational locations were examined and compared to see what differences existed. It was expected and later substantiated that the number of bicycles using urban highways would be somewhat different from the number of bicycles using rural highways. It was also recognized that in any comparison of traffic volumes, seasonal variations are appreciable. In the case of bicycle traffic, it is practically nonexistent in the winter months. Because of this usual lack of bicycle traffic in the winter months, it was deemed appropriate to compare bicycle traffic with motorized traffic on a vehicles per day basis from April to September.

Examining the traffic on this basis, we find that on most summer days, bicycle volumes in urban areas are approximately one percent of the summer traffic, and in rural areas the bicycle traffic averages less than one-half of one percent. On routes where the traffic is highly recreational in nature, the bicycles make up approximately eight tenths of one percent. The higher volume summer days show daily bicycle usage as follows: Urban 156 bikes, rural 11 bikes and recreational 45 bikes per day. This is shown in Table 2.

In order to keep the evaluation in perspective, the seasonal variations in total traffic should be appreciated. The motorized vehicles on the highway represent year round usage. Urban traffic generally varies from 90 percent of the annual average in the winter to 110 percent in the summer months. The rural varies from 70 percent in the winter to 140 percent in summer, and recreational traffic varies from 60 percent in winter to 190 percent in summer. BIKE TRAFFIC IN GENERAL VARIES FROM SUBSTANTIALLY ZERO IN MARCH TO A HIGH IN THE SUMMER MONTHS AND BACK TO PRACTICALLY ZERO IN NOVEMBER. This all points to the fact that even though bicycle traffic is shown as generally one-half to one percent of total summer traffic, it is a substantially smaller percentage of the total annual traffic.

It should also be recognized that the counts just discussed were taken on federal-aid and state highways, the more heavily traveled roads. This traffic is also traveling, in general, at higher speeds that would be found in the more residential areas, or on town ways or on some of the less populated state-aid highways. From other information gathered during this study bicyclists, in general, tend to avoid federal-aid and state highways (where motorized traffic travels at greater speeds) and use the roads with lower traffic volumes. This is generally supported by accident statistics, which show the majority of accidents occur off the more heavily traveled roads. Accordingly, it is believed that a greater portion of the total bicycle traffic, is in all probability, using other than federal-aid and state highways.

On the basis of the above, a review was made of a special count of bicycle traffic in the Portland and South Portland area. A count of bicycle traffic was made in this area in July of 1972 and again in August of 1973. The 1972 bicycle counts were taken by Department of Transportation personnel stationed at eleven arterial routes where traffic volumes were relatively high, but where speeds were generally lower than highway speeds. The numbers of bicycles using these routes were not significantly different than the number reflected in other previously mentioned urban classification counts (generally between 100 and 150 bikes per day). More specifically, a 1972 bike study count was made on Forest Avenue in Portland and indicated 163 bicycles per day were using this route. The classification count made in 1973 while not taken in the same month as the 1972 count, indicated the summer bicycle traffic to be 144 bikes per day. This appears to be a reasonably good indicator that there is some steady use of bicycles in the Portland area. From other sources of the study, there is reason to believe that inexperienced cyclists whether young or old are riding either in their own neighborhood or on the roads with less traffic than the arterial routes. Two of the routes counted in South Portland, Cottage Road (near Pine Street) and Highland Avenue (near Stillman Street), are examples of these lesser traveled neighborhood streets. These counts were 175 and 101 bikes per day, respectively (average 138 bicycles per day).

There were other factors noted during the bicycle counts in the Greater Portland area, specifically, bicycle type, age group and trip purpose. The increase in touring type of bikes was approximately 15 percent when comparing the same stations over the one year time span. The change in trip purpose was small, however, the change noted was an increase of six percent in work related trips (and a corresponding decrease of six percent in pleasure trips). The total number of trips (from 1972 to 1973) on a daily basis did not change significantly. There was also

noted a 17 percent increase in the 15 to 30 year old age group (contrasted to a corresponding decrease in the under 15 year old age group). This data is, of course, derrived on the part of personal observations made by the "counter" and may vary slightly if direct questioning methods were developed. However, trends are indicated which have validity in determining use patterns of cyclists in Maine's urban areas.

In summary, summer bicycle traffic volume on the more heavily traveled arterial highways makes up one percent or less of the the total. Urban areas show approximately twice the percentage of bicycles when contrasted with the rural arterials.

1973 BICYCLE TRAFFIC COUNTS

TABLE I

URBAN	MOTORIZED VEHICLES ANNUAL AVERAGE DAILY TRAFFIC	MOTORIZED VEHICLES AVERAGE DAILY TRAFFIC (SUMMER)	BICYCLES AVERAGE DAILY TRAFFIC (SUMMER)	BICYCLES PERCENT OF ALL TRAFFIC (SUMMER)
Classification Station				
AR#				
16 Portland (Forest Ave.)	15,444	15,700	144	0.9
18 Lewiston (Sabattus St.)	12,998	13,700	180	1.3
20 Bangor (Main Street)	19,596	21,700	136	0.6
19 Sanford (Main Street	12,237	13,000	165	1.3
Average			156	1.0
RURAL				
Classification Station				
2 Ellsworth (U.S. #1)	4,381	5,250	9	0.2
4 Readfield (Rt. 17)	1,953	3,180	14	0.4
10 Hollis (U.S. 202)	1,626	1,800	10	0.5
77 Rockport (U.S. #1)	7,059	8,430	12	0.1
Average			11	0.3
RECREATIONAL				
Classification Station				
67 York Harbor (U.S. 1-A)	2,592	3,950	51	1.3
23 Saco (Route 5)	8,057	10,270	40	0.4
Average			45	0.8

(1) Average summer traffic is an estimate of the average day of all types of vehicle traffic during the months of April through September.

(2) Average daily traffic for bicycles is the estimated bicycle traffic on an average summer day (April through September).

TABLE 2

BICYCLE TRAFFIC COUNTS
GREATER PORTLAND AREA

	1972 (11 stations)	1973 (4 stations)
Total Number of Bicycles	1,249	475
Average Number of Bicycles	113	114
Type - Balloon Tired	28.3%	27.6%
English	71.7%	72.4%
Age - Under 15	53.4%	51.0%
15 - 30	43.0%	46.3%
30 - 50	3.4%	2.5%
Over 50	0.2%	0.2%
Trip Purpose		
Work	6.8%	5.3%
Pleasure	93.2%	94.7%

NOTE: The above is a comparison of the 11 stations in 1972 with the 4 stations done in 1973. Counts were made at each station for one day each. The age and trip purpose was based on the judgment of the surveyor.

MAINE BICYCLE ACCIDENTS AND SAFETY

METHODOLOGY

All bicycle accidents as reported for the years 1958-1972 were reviewed and analyzed by the Department of Transportation staff. Accident statistics were contained in two source areas 1) Maine State Police computerized summary tapes of accidents for 1970-72 and 2) State Police files of reported accidents for 1958-1972. Because of the number of bicycle accidents occurring on the lesser traveled State aid/town systems versus the heavily traveled Federal aid and state highway system, it was decided to review statewide bicycle accidents rather than those on the computerized system only.

Information on bicycle accidents included age of bicyclist, hour and month of accident, county severity, light conditions and type of location associated with type of bicycle movement. This section discusses the results of that review and displays some of the information graphically.

A. MAGNITUDE OF THE PROBLEM

National statistics are available for bike accidents involving motor vehicles. Personal injuries resulting from bicycle accidents increased from 30,000 in 1962 to 40,000 in 1972. During this same time period, bicycle deaths increased from 500 to 1100 and 540 of those in 1972 were youngsters between the ages of 5 and 14 years.

In Maine, bicycle accidents over the last 3 years (1970-1972) were studied, and state police summaries were reviewed for the 15 year period, 1958 to 1972. During the last fifteen years, the number of bicycle accidents increased from approximately 80 to a high of 305 in 1972. The estimated 1973 total appears to be 292. This is based on actual counts for the first three quarters and an estimated fourth quarter of twenty (an average of the last three years fourth quarter). The gain in 1972 over 1971 (225 to 304) was a 50% increase. Preliminary 1973 data indicates a leveling off of bicycle accidents.

Bicycle accidents have accounted for slightly less than one percent of the toal reportable motor vehicle accidents in past years, and slightly over one percent in 1972.

The total annual bicycle accidents in Maine are shown by year in Figure #1.

B. SEVERITY

In the last three years bicycle accidents account for 5 to 7 deaths each year. This represents approximately 2.4% of each year's total bicycle accidents. More significant is the rate of percent of personal injury. For example, the percent of accidents involving personal injury, in Maine, averages 30% for all motor vehicle accidents and by contrast, it's 90% of all bicycle accidents. This says, every time there are 10 automobile accidents, 3 people are injured; and when there are 10 bicycle accidents, 9 people are injured. It can be readily seen that a bicycle accident results in a higher rate of personal injury.

ANNUAL BICYCLE ACCIDENTS IN MAINE

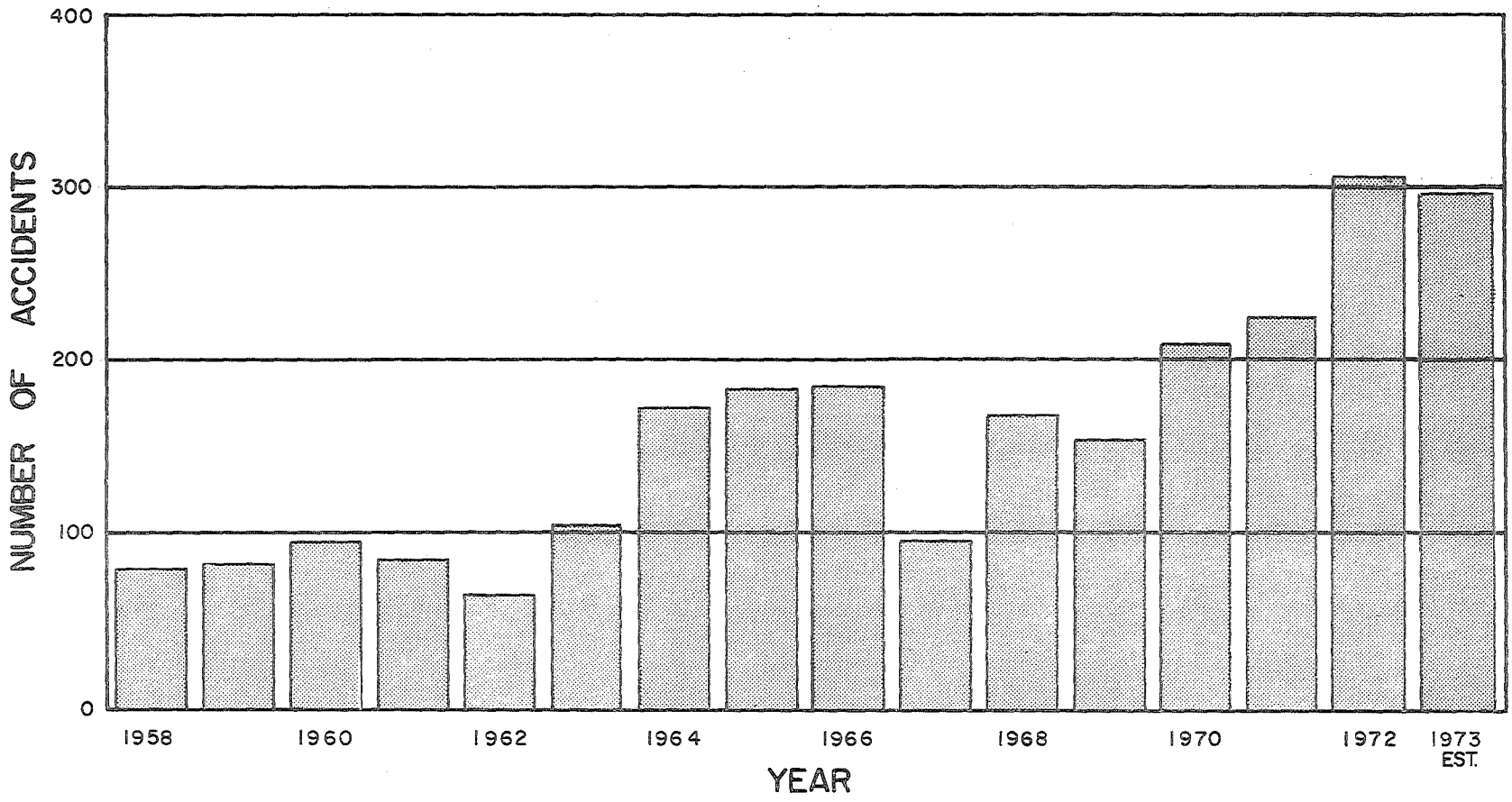


FIGURE #1

1/30/74

Equally important is the seriousness of the injury. The injuries which occur in bicycle accidents are generally much more severe than the injuries which occur in motor vehicle accidents. As can be seen below, injuries are rated from "A" to "C", with "A" being more serious and "C" being less serious. An examination of the Severity of bicycle accidents during 1970, 1971, and 1972 reveals the following when compared with the total number of bicycle accidents:

	Bicycle Accidents	All Motor Vehicle Accidents (71-72)
Fatals	- 2.4%	0.9%
A injuries	- 26.6%	8.9%
B injuries	- 45.6%	10.8%
C injuries	- 14.3%	9.4%
Property Damage only	- 10.9%	70.0%

C. WHO IS INVOLVED IN ACCIDENTS?

An analysis of accident data for the three year period 1970 through 1972 indicates over 85% of the bicyclists involved in accidents are in the five through seventeen age group. It can also be noted from Figure #2 that over 68% of the accidents are attributable to youngsters between the ages of 6 and 14.

A review of the bicycle accidents occurring in 1972 indicates the same general relationship in involvement by age group and no significant increase in older bicyclist involvement. The percent of total bicycle accidents by age group is shown graphically on Figures #2 and #3. School age males were involved in the great majority of accidents.

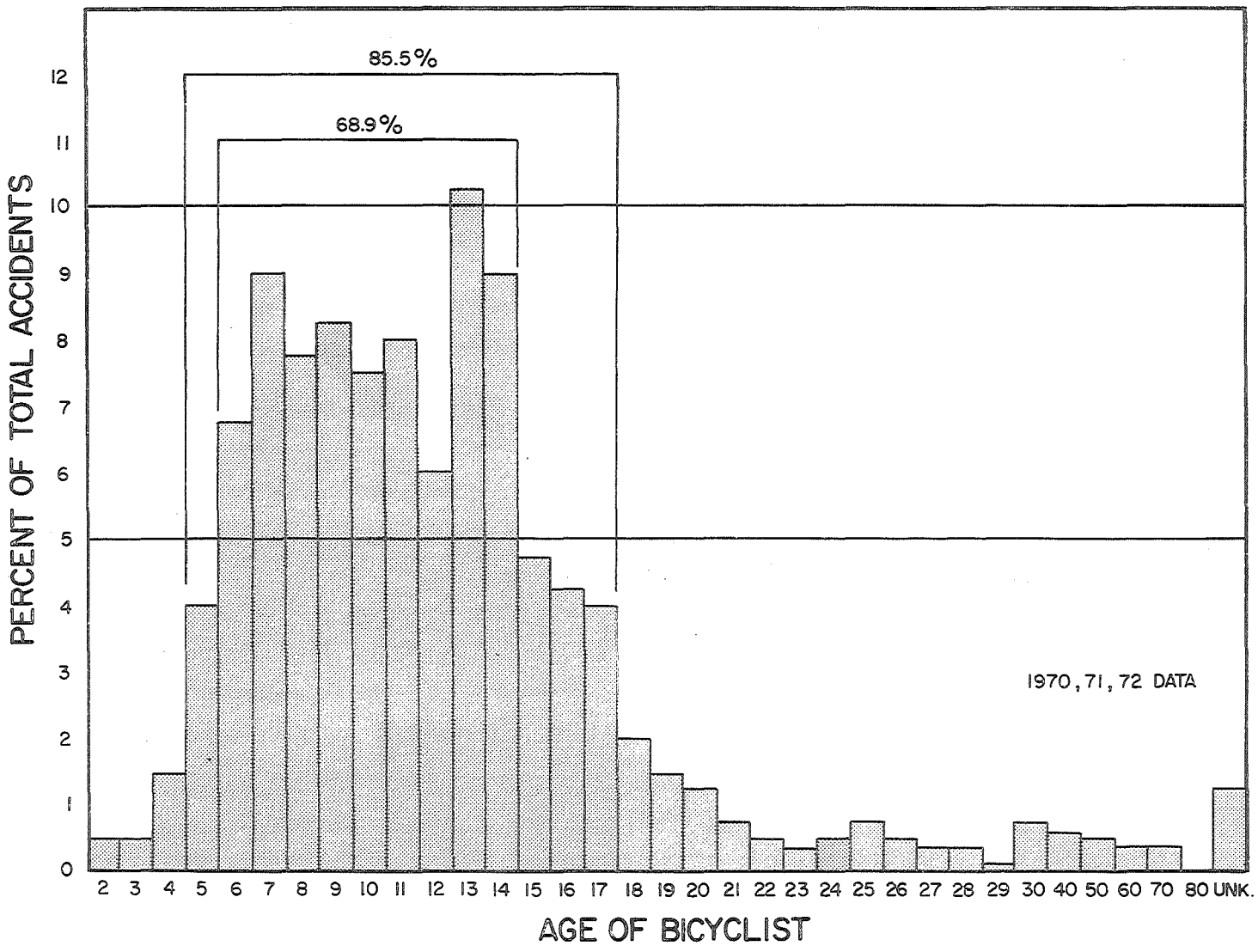
D. WHEN DO ACCIDENTS TAKE PLACE?

The time, or hour of the day, when bicycle accidents occur, is shown on Figure #4 and indicates that over half of the accidents occur between the hours of 2:00 p.m. and 6:00 p.m.

Light conditions appear to be less significant than expected. Statistics reveal that 8% of the accidents occur during hours of darkness and 8% occur during dusk and dawn with 84% occurring during the daylight hours. Recent concern and state legislation has been addressed to night-time oriented problems.

As would be expected, most of the accidents took place during the warmer months, when bicycling is at its peak. The peak months as indicated by accidents are May through September, displayed graphically in Figure #5.

PERCENT OF TOTAL BICYCLE ACCIDENTS BY AGE



NOTE: The Data Shown Above Ages 30,40,50 etc.
Represents 10 Years Data; 30= 30-39, 40=40-49, etc.

FIGURE #2

1/30/74

A QUESTION OF PERSPECTIVE

In a recent speech on bicycle safety James J. Hayes, Executive Director of the Bicycle Manufacturers Association, noted that 1100 people were killed on bicycles in 1973. At first glance that figure may seem excessive (indeed, ideally, it represents 1100 too many fatalities), but Mr. Hayes pointed out that in actual fact it denotes a significant decrease in fatalities per 100,000 riders when compared with the figures of twenty years ago. In mentioning these facts Hayes was not trying to minimize the importance of bicycle safety, but was merely trying to lend a little perspective to a problem that has too often been blown out of proportion.

To lend further perspective to the matter, it is also worth noting that in 1973 10,500 pedestrians were killed in accidents. This is not to suggest that walking is ten times as dangerous as bicycling. Such facile statistical reasoning would be deceptive. This fatality figure is noted only to illustrate the harsh fact that in the real world *nothing* is absolutely safe, and in fact, bicycling in its present state may already be one of the safest means of personal transportation available.

In this context the Consumer Product Safety Commission's bicycle standards seem rather redundant—particularly when, as Mr. Hayes also noted, senior officials of the C.P.S.C. have admitted that the most perfect standard in the world would probably not reduce the accident figures by more than 5%. Hayes correctly suggested that "the major (safety) problem is not with the bicycle." He also said that among the primary components of any accident situation—the bicycle, the rider, and the environment—the bicycle "is the least culpable of the three".

Here again it is interesting to draw a comparison to pedestrian safety. Regulating the construction of already soundly built bicycles to prevent riders from being killed in traffic could be likened to regulating the construction of shoes in an attempt to prevent pedestrians from being run over by autos. (After watching the C.P.S.C. closely for several months, one might not be terribly surprised if at some future date it were announced that the C.P.S.C. had drawn up standards for "pedestrian clothing".)

Since neither the five C.P.S.C. Commissioners nor any of their staff are elected officials, our power to influence them is limited to the filing of written comments. (For this purpose, a special pre-addressed postcard was included in last month's BDS).

The C.P.S.C. notwithstanding, the bicycle itself is a safe vehicle. However, there remains a lot to be done to improve the other two components—the rider, and the environment.

Presently, the B.M.A. is working to get the Federal Highway Act of 1976 to subsidize bicycle driver education in all schools where automobile driver education is so subsidized. Through subsidized educational programs, the bicycle rider can be greatly "improved".

To significantly improve the general cycling environment, we must all contribute. The eloquence of Mr. Hayes' plea in this regard cannot be improved upon:

> "We urge you to lend your not inconsiderable talents to the challenges of improved bicycle safety through environmental planning. We urge you to plan newer, better, improved bikeway systems. If bikeways aren't the answer, we beg you to create new solutions . . . to design, plan, to dream your dreams on paper, and in so doing, to make room in those dreams and plans for growing millions of cyclists of all ages, so they can ride safely to school, to shopping centers and recreation facilities."

STEVE READY

ACCUMULATIVE PERCENTAGES BICYCLE ACCIDENTS BY AGE

FOR 1970-1971-1972

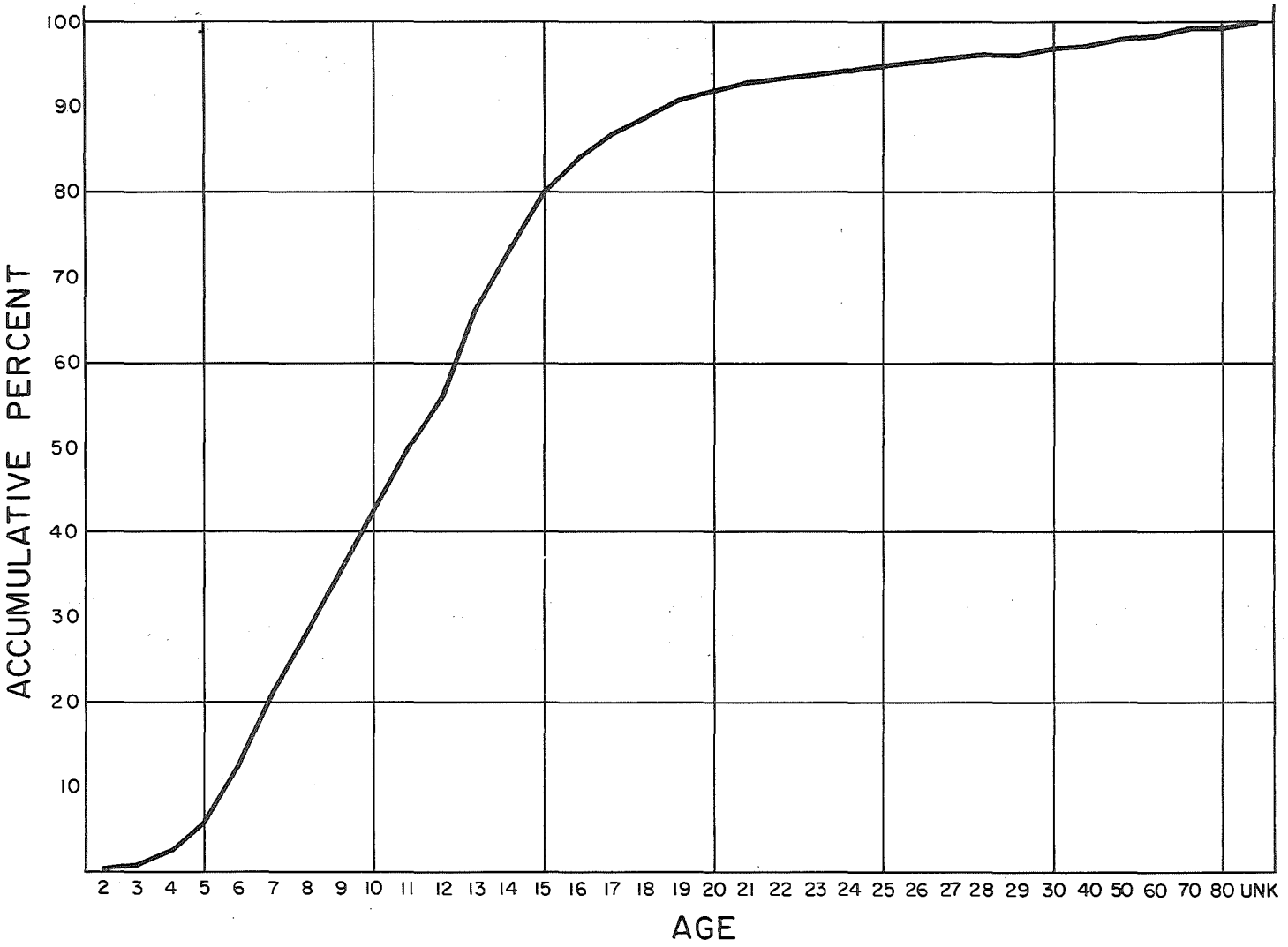


FIGURE #3

1/30/74

BICYCLE ACCIDENTS BY HOUR OF DAY FOR 1970-1971-1972

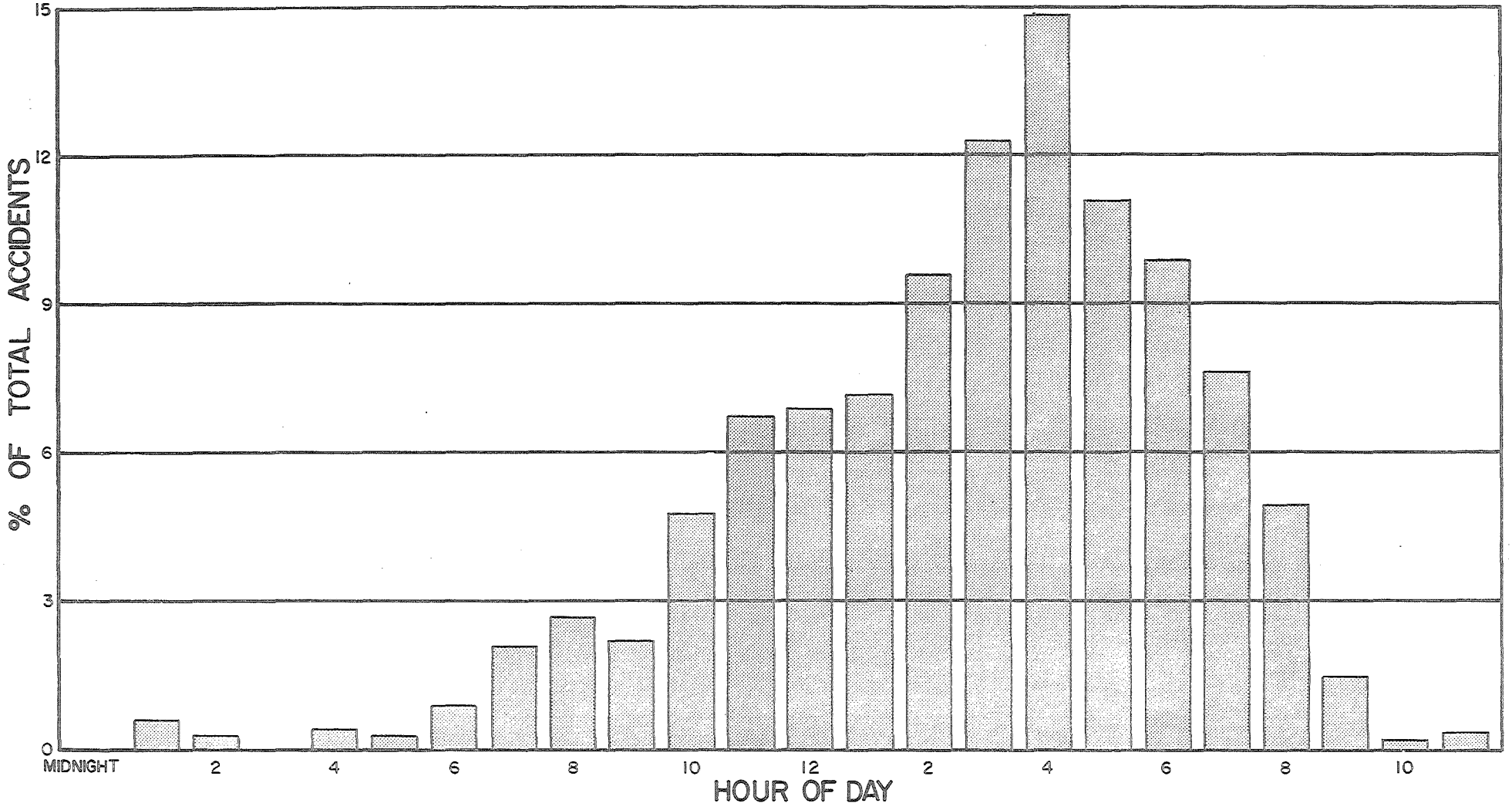


FIGURE #4

1/30/74

PERCENT OF TOTAL BICYCLE ACCIDENTS BY MONTH

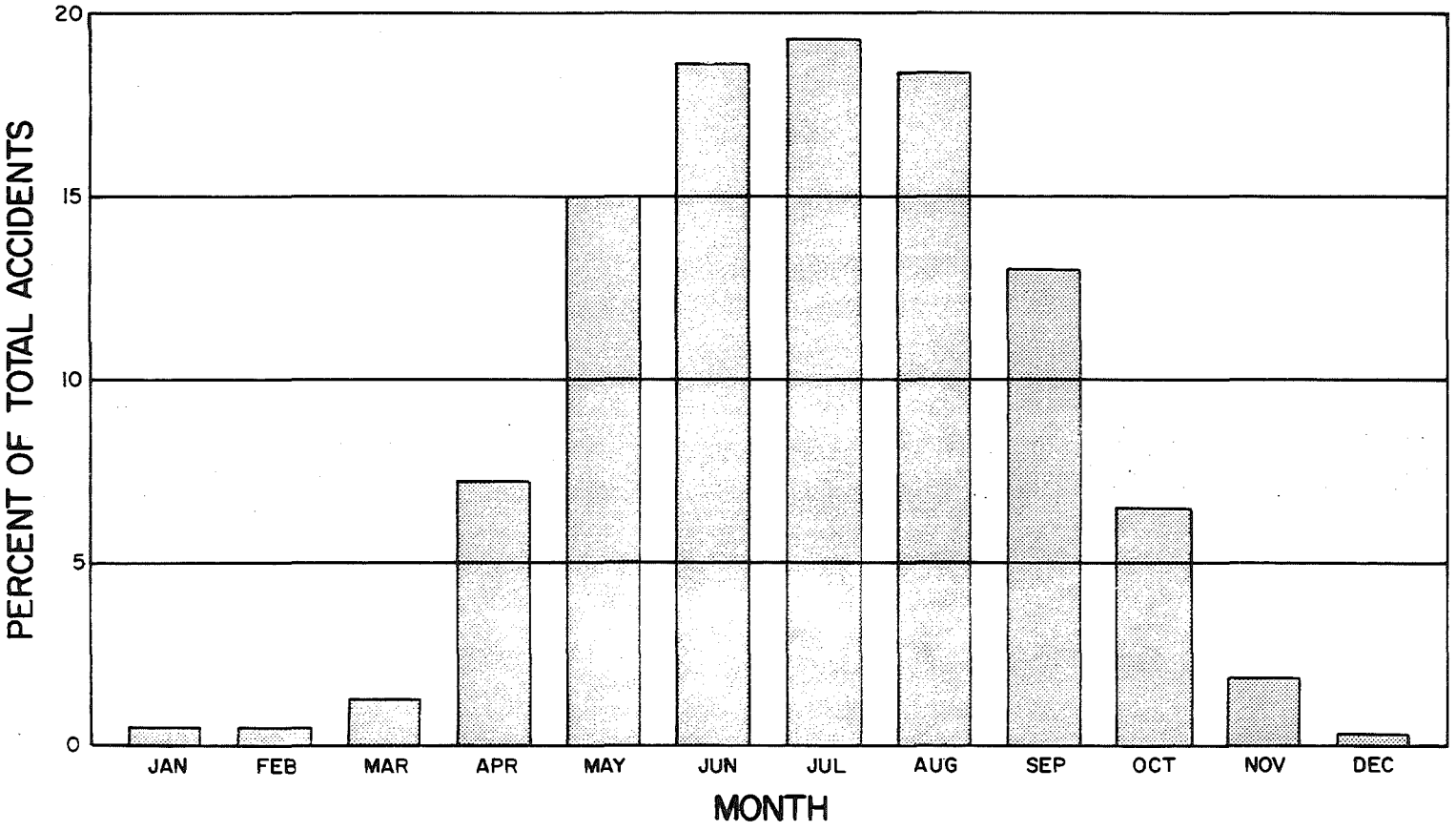


FIGURE #5

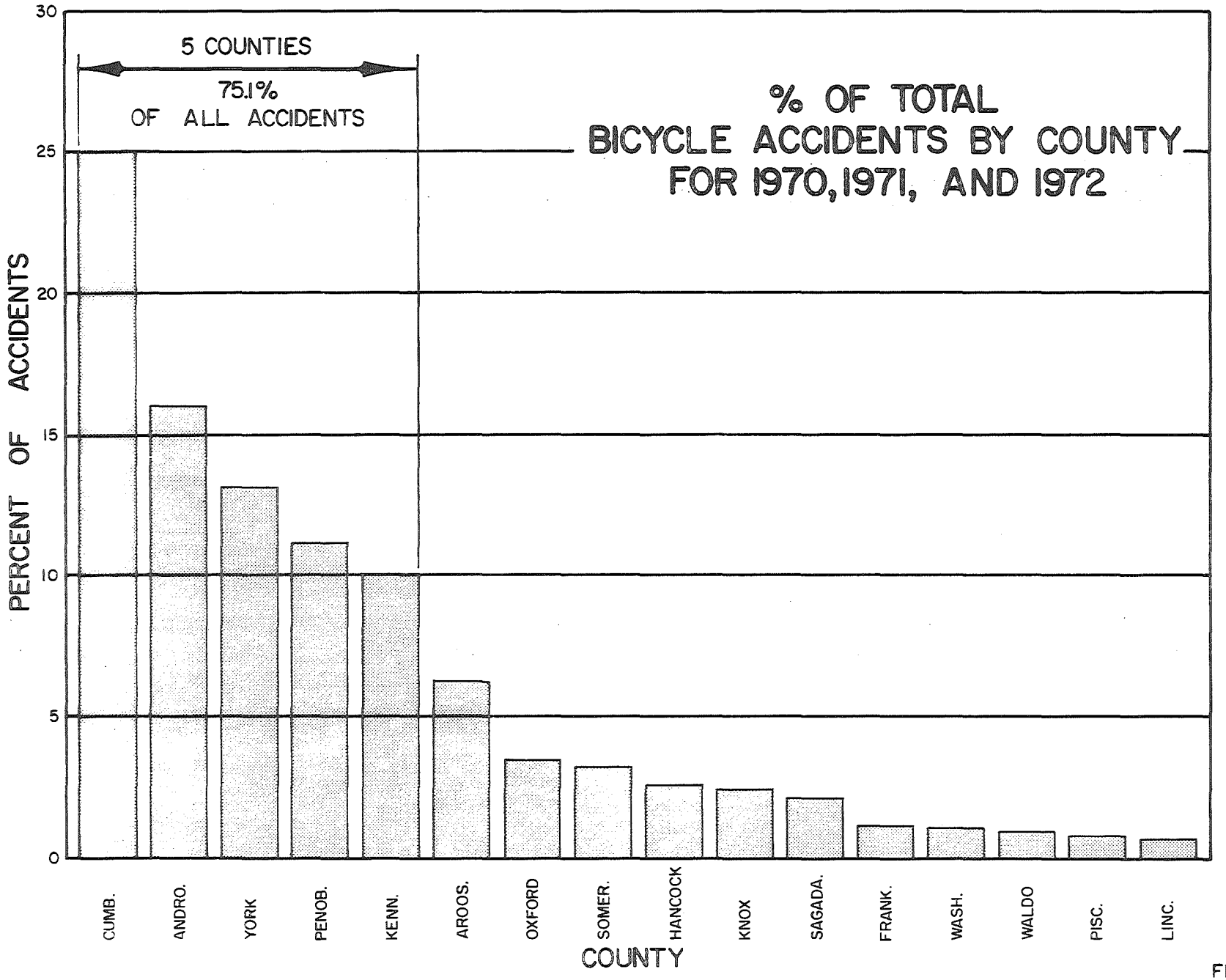


FIGURE #6

1/30/74

E. WHERE DO BIKE ACCIDENTS TAKE PLACE?

In analyzing accident locations, one of the more significant factors is population density. The bicycle accident problem appears to be primarily urban as 70% occurring in 1970, 1971, and 1972 took place in urban areas. The remaining 30% of the bicycle accidents took place on rural highways. During the same three year period, however, 80% of the fatal bicycle accidents occurred in rural areas, leaving only 20% in the urban area, a complete turn around from the overall bicycle accident picture.

Intersections and driveways appear to be high accident locations for bicyclists. A review of accidents, during the above time frame, revealed that 40% of bicycle accidents took place at intersections and another 25% occurred at driveways.

An examination of the topography (hills and grades) revealed that 67% of the accidents occur on level roadways, flat grades, while 33% were on other than a flat grade.

The highways in the state that are more heavily traveled by motor vehicles (federal aid and state highway systems) account for 60% of the motor vehicle traffic accidents, while only 45% of the bicycle accidents, during the last three years, occurred on these more heavily traveled highways. A significant 55% took place on the lesser traveled state aid and town way systems.

The more urban counties account for the great majority of bicycle accidents. Over 75% of these accidents took place in 5 counties shown graphically on Figure #6. The statistics reveal that, during 1970, 1971, and 1972 Cumberland County had 25% of the accidents while Waldo, Lincoln and Piscataquis Counties each had 1% or less, of the accidents.

The accident data indicates that 70% of the accidents involve bicyclist crossing the highway, with 47% crossing from the motor vehicle driver's right.

F. CONCLUSIONS AND RECOMMENDATIONS

SAFETY EDUCATION

Bicycle safety education as a means of reducing bicycle accidents appears to be a real necessity for those youngsters in the early grades. This is based on the accident analysis indication of 56% of bicycle accidents involving young people twelve years of age and younger. National experience seems to show that this kind of safety effort produces the most immediate results. In Maine it is most needed in the urban communities of the more urban counties.

Rural areas are where the majority of the fatal accidents occur. These 15 fatal accidents occurring in the rural areas, of a statewide total of 19 fatals, (1970-1972), were examined in detail. Results are as follows: all occurred in clear weather; 13 on dry surface; 11 on a straight road; 8 on a level road; and 11 during daylight hours.

This indicates weather, road conditions, light condition and geometry were not major factors in these accidents. The age of the bicyclist in 13 of the 15 fatal accidents was 15 or under, and in the majority of cases, the bicycle moved into the path of the automobile. This reinforces the idea that safety education with the younger bicyclist may well be an effective way to approach the problem.

SAFETY GRANTS AND CODES, EDUCATION AND ENFORCEMENT

The highway safety effort in the State of Maine is reinforced by the federal, 402 program, that provides funds for state and community safety grants. Money granted to the states, under this program, supports safety related activities in the areas of pedestrian safety, traffic records, identification and surveillance of accident locations, emergency medical service and others. The funds also support police traffic services (enforcement training) and driver education. These are all areas where the concept of improved bicycle safety can be strengthened.

We believe we have provided a good definition of the problem immediately associated with Maine bicycling accidents. A program which achieves real, direct and immediate results in lowering the bicycle accident rates and improving bicycle safety must now be undertaken. This starts with an update of the codes and laws, safety education in the schools (including driver education classes) a good program of law enforcement and provision of special bicycle facilities. Bicycle safety can be improved significantly if all of the above areas can be brought to bear on the problem.

SURVEYS AND INVENTORIES

The basic data collecting tools of the study were a series of surveys administered to Maine households; school students and teachers; police chiefs; municipalities; bicycle retailers; state park supervisors and Maine colleges. Eleven public meeting in various parts of the state also assisted the Study team to gain a better understanding of Maine bicycling needs. Survey methodologies and results are reported on this and the following pages.

TELEPHONE SURVEY

METHODOLOGY

A statewide survey of Maine households was conducted for the Bureau of Parks and Recreation by Northeast Markets, Inc. of Yarmouth. A two stage random sample of Maine households was employed during the months of October and November 1973.

The first wave of 500 interviews were conducted with a random selection of Maine households. These households were selected from the published telephone directories of the state.

The results of this wave of interviews provided the census related data as to the number of bicycles in the state.

The second wave was necessitated by the desire to isolate findings in specific geographic areas of the state. An additional 300 interviews were concentrated in eight major geographic regions. These regions were defined as containing all communities within a ten mile radius of the respective center city, i.e. Portland, Biddeford, Presque Isle, Lewiston-Auburn, Augusta, Bath-Brunswick, Waterville amd Bangor. (See Appendix for further detail) The 300 interviews were distributed in such a way that the total number of interviews conducted in each area equaled 70. The total was composed of the number of interviews which randomly fell in each area during wave 1 and the supplemental interviews of wave 2.

A review of studies from other states revealed that most bicycle facilities and the highest frequency of accidents occur in population centers. With this knowledge, the Telephone Survey was purposely geared to gain information on not only on a statewide basis but also urban centers so that future comparisons could be made with accidents, enforcement, and facilities demand data.

RESULTS

The data derived from the survey is the most pervasive to date on Maine cyclists and cycling. Prior to this time, only educated guesses could be made concerning the number of bicycles, the use of the bicycles and the problems encountered by Maine cyclists.

While a detailed analysis of the survey appears in the Appendix, some of the important benchmarks that we now know about Maine's population and bicycling are as follows:

- Maine has 272,700 bicycles or 0.9 per household

- Urban areas have .95 bicycles per household

  Rural areas have .85 bicycles per household

- 46.3% of Maine households have at least one bicycle; 16.3% have 3 or more bicycles

- 24.6% of all bicycles in Maine are 10 speed (which cost anywhere from $80 - $600)

- 84.7% of all bicycles in Maine Survey are three to five years old

- Only 36% of the households with bicycles will replace them within the next couple of years

- 63.6% of all bicyclists are between the ages of 6-15

- 75.8% of the cyclists are between the ages of 6 and 20

- 16,907 of the cyclists in Maine are between the ages of 21-25

- During a defined cycling season of April to October, 43.6% of Maine cyclists use their bicycles 1-5 hours per week; 24.9% of the cyclists use their bicycles 6-10 hours per week

- The highest percentage of cycling is done during the afternoon (43.9%) NOTE: This is also the time of highest number of Maine accidents (see Accident Data Analysis)

Many respondents reported several purposes for bicycling. The highest category was pleasure cycling at 80.7%. Data on urban areas is interesting to note on a statewide comparison basis. Cycling for exercise was most frequently reported in Biddeford - Saco. Augusta residents use the bicycle most for visiting friends. Lewiston-Auburn residents reported the highest percentage of pleasure riding. Bath-Brunswick has the highest state percent for use of the bicycle for transportation purposes.

While we still have very little information on the growth rate of touring per se, we know that 88.4% of the bicyclists do not take a trip of 10 miles or more during the year. Sixty-eight percent of all the trips are under 20 miles; 94% are less than 50 miles. This would seem to give credence to facts becoming nationally known that most cyclists prefer short trips under 10 miles and are apt most to take trips of only six miles and under. As for extended touring, we are following national trends with the ages at which touring is popular. The 11 to 20 age riders take the most trips of greater than 10 miles. Twenty-one to fifty years olds also follow national trends by taking up to three trips of more than 10 miles duration. (see map)

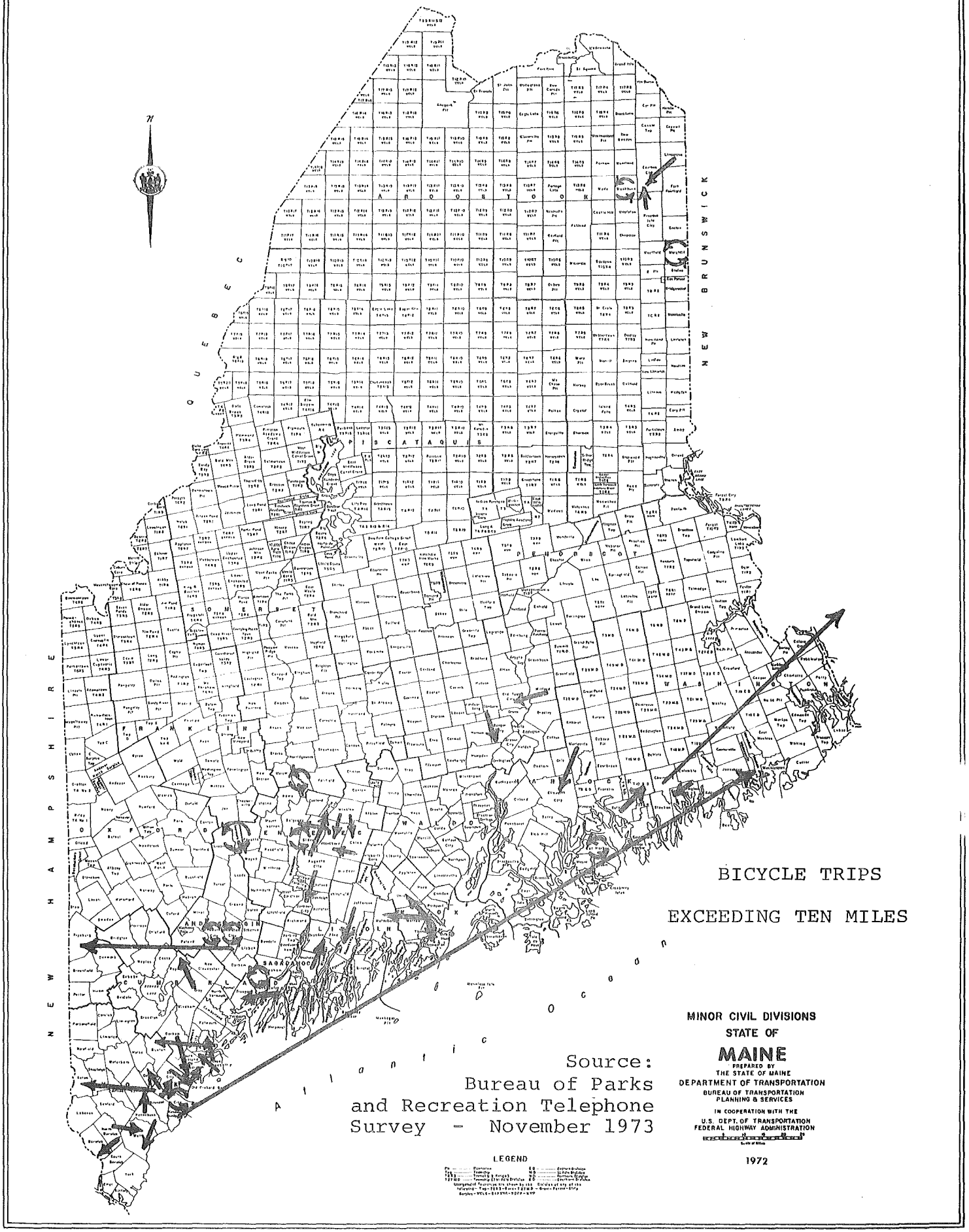
Cyclists in Maine are for the most part dissatisfied with cycling conditions in their community. Fifty-five percent of those interviewed expressed negative opinions. Rural cyclists, and those residents of Biddeford-Saco, Bath-Brunswick, Lewiston-Auburn and Portland ranked highest. It is interesting to observe that Portland and Lewiston-Auburn are the two most populated communities in the state. One can surmise, with some degree of certainty, that there is the possibility of auto traffic beginning to create problems for the increasing number of cyclists. Both cities currently have bicycle facilities awaiting approval.

Multiple responses were given to a question asking interviewers to suggest how conditions might be improved; 43.6% expressed a need for bicycle paths, trails or separated facilities; 12% wanted separate lanes on highways and roads; and 12% wanted improved road conditions and paved shoulders.

Responses regarding possible funding methods were extremely varied. The most often mentioned were state funding, licensing and registration revenues, city and local funds, Department of Transportation funds. Some suggested a tax on bicycles, bicycle marathons and funds from the Bureau of Parks and Recreation.

RECOMMENDATIONS

We have noted that the total number of bicycles in Maine is 272,000. Were we to go by bicycle registrations for 1973, a total of only 20,830 bicycles would be reported for Maine. This lack of data is not uncommon in other states where similar studies have taken place. The solution in California has been to require statewide registration of all bicycles. Lack of an efficient registration program works to the detriment of the user and for would be user. The sheer fact that most stolen bicycles are not recovered suggests that the local systems, sporadic as they are, can do little to curtail theft which moves from community to community in an efficient manner. Ten speed bicycles average in cost about $130. This property should be protected by an effective system. One which, we suggest, should be statewide.


QUEBEC
NEW BRUNSWICK
NEW HAMPSHIRE
ATLANTIC OCEAN
AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
FRANKLIN
OXFORD
KENNEBEC
WASHINGTON
HANCOCK
ANDROSCOGGIN
LINCOLN
SAGADAHOC
CUMBERLAND
YORK
KNOX
WALDO
BICYCLE TRIPS
EXCEEDING TEN MILES
Source:
Bureau of Parks
and Recreation Telephone
Survey - November 1973
LEGEND
MINOR CIVIL DIVISIONS
STATE OF
MAINE
PREPARED BY
THE STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
BUREAU OF TRANSPORTATION
PLANNING & SERVICES
IN COOPERATION WITH THE
U.S. DEPT. OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
1972

TELEPHONE SURVEY

Origin and Destination Of Bicycle Trips Exceeding 10 Miles Round Trip As Reported Per Respondent

County	Origin	Destination	Number of Trips (If more than 1
Aroostook			
	Washburn	Around town	
	Limestone	Caribou	
	Presque Isle	Caribou	
	Mars Hill	Around town	
Kennebec			
	Smithfield	Around town	
	Augusta	Waterville	2
	Sidney (via old Belgrade Road)	Around town	
	Augusta	Gardiner	
	Winslow (Rt 201)	China	
	Winslow (Rt 201)	Vassalboro	
	China	Belgrade	
Penobscot/ Washington			
Hancock area			
	Milford	Old Town	
	Glenburn (Pushaw)	Bangor	
	Harrington	Milbridge	
	Cherryfield	Canada	
	Marionville	Ellsworth	3
	Sullivan	Tunk Lake area	2
	Bar Harbor	Around town	
Androscoggin Area			
	Lewiston (Shore Rt)	Taylor Road	
	Lewiston	Jefferson, N.H.	
	Auburn (Lake shore Drive)	East, North & West Auburn	
	Livermore Falls	Around town	
	Lewiston	Turner	
	Lewiston	West Paris	
	West Paris	Norway	
	Lewiston (Sabattus Rd to Green Rd)	Around town	

continued .....

County	Origin	Destination	Number of Trips (If more than 1)
Cumberland			
	Gorham	Scarborough	
	Gray	North Raymond	
	South Portland (West end Capesic, Brighton	Hall School	
	Pine Point	Prout's Neck	
	N. Deering	Allen Avenue	
	Portland	Buxton	
	Cape Elizabeth	Maine Mall	
	Brunswick	Freeport	
	Brunswick	Bowdoin	
	Brunswick (Mere Pt)	End of road	
	Brunswick	Around town	
Sagadahoc/Waldo Areas			
	Woolwich	Wiscasset	
	Rockland	Union	
	Rockland	Spruce Head	
	Jefferson	Newcastle	
	Rockalnd	Waterboro	
York Area			
	Biddeford	Dayton	
	Kennebunk	Goodwin Mills	
	Kennebunk	Wells	
	Saco	Old Orchard	
	N. Berwick	Wells	
	N. Berwick	Noble Heights	
	N. Berwick	Berwick	
	Kennebunkport	Machias	
	Biddeford	Acton	
	Biddeford (Rt.9)	Old Orchard	
	Biddeford (Rt.9)	Kennebunkport	
	Biddeford (Maynard, Main St)	Around town	
	Saco	Pine Point	

MORE SURVEYS

Three surveys were conducted by the Department of Transportation during the months of October and November 1973. Information was collected on bicycle ownership, usage and the need for bicycling facilities from school students, teachers and police chiefs statewide. The data collected from these surveys was analyzed by the Department of Transportation. Data was reviewed by rural and urban areas. All surveys and more detailed data appear in the Appendix.

A. SCHOOL SURVEY

A questionnaire was developed jointly by the Department of Transportation and the Bureau of Parks and Recreation. It was reviewed and approved prior to mailing by the Commissioner of Education. Questionnaires were administered to students in grades five through eight in 59 randomly selected schools on a statewide basis. Forty-four hundred questionnaires were distributed to the students. Of that number 2869 were returned and analyzed.

B. TEACHERS SURVEY

Survey forms were also forwarded to instructors of the students receiving the questionnaires. Questions were asked regarding school safety programs and provided or perceived facilities. Ninety-two of these questionnaires were returned and analyzed.

C. POLICE CHIEFS SURVEY

Questionnaires were forwarded to all 124 Police Chiefs in the State. These were again developed by the Department of Transportation and Parks and Recreation. The survey included questions regarding registrations, inspections, safety programs and enforcement of bicycle laws. An analysis of the 108 questionnaires returned was made.

A. SCHOOL SURVEY RESULTS

A random sample of grades 5,6, 7 and 8 were sent questionnaires in October 1973. This involved approximately 4,400 students. There were 2,869 responses in total and 2,711 students indicated they owned a bicycle.

The responses to the questions were tabulated and some of the more significant results are as follows:

Question Number	Response
1	94% of the students responding own bicycles
2	60% own a form of standard speed bike as opposed to touring
3	18% of their bikes have headlights
4	20% of their bikes have been registered

5	63% of their bikes have been inspected
6	51% of the students had a course in bicycle safety
8f	42% of the students rode their bicycles after dark
9	51% of the students rode on sidewalks
13	51% of the students played games on their bikes
14	49% of the students carried someone on their bikes
15	11% had an accident with a car while riding
16	64% stopped for school buses

A few of the questions did not lend themselves to simple short responses and were not readily broken down and summarized. For example, Who taught you bicycle safety?, (question #6). They had an opportunity to choose one of four replies and the responses were:

1. A policeman (469)
2. A school teacher (277)
3. Your mom or dad (390)
4. Other (240)

When asked who inspected their bikes, they responded:

1. A policeman (282)
2. A bicycle rodeo worker (148)
3. Mom or dad (934)
4. Other (325)

It is interesting to note that 94% of the students owned bicycles. In the age group 9 to 12 years, the majority did not have 10 speeds. One response indicated that only 18% had headlights on their bikes, but 42% rode their bicycles after dark. This would indicate either they are not aware of the law requiring headlights on bicycles, when used after dark, or they are ignoring it.

There were three questions on bicycle operation that gave an indication of their knowledge of proper procedures; such as, riding on the sidewalk, carrying someone on their bicycle and stopping for school buses. The responses indicated 50 to 60 percent of the youngsters knew what constituted proper operation of their bicycle. There was no significant change in the student in the older age group, at least

change that was discernable.

It would appear that the youngsters surveyed will be tomorrow's touring bicyclists and tormorrow's automobile drivers. As these people begin to travel the more heavily traveled roads and as the numbers increase, it becomes more important to assure their knowledge and understanding of bicycle safety. This awareness, concern and understanding of bicycle safety, on the part of the youngsters may help curb the rising number of bicycle accidents and accompanying injuries. This becomes even more significant, if the usage increases in proportion to bicycle sales.

B. TEACHERS' SURVEY RESULTS

Questionnaires were sent to the teachers as a part of the package with the school student survey on bicycling. There were ninety-two teachers responding to the questions on bicycle safety and facilities.

Eighty-three out of ninety-two replied that the bicycle safety instruction program at their school was inadequate. Eighty-six responded that nothing was being done to start a safety education program.

The most common violations of bicyclists observed by the teachers were "two or more on a bicycle", (44 teachers reported seeing this violation), and "not using hand signals", (27 reported this violation).

When asked what bicycle facilities were available, in the community, 41 replied that they did not know of any bicycle facilities in the community; 39 reported bicycle racks at school; and 3 indicated marked bicycle routes on existing streets (these responses came from Bangor, Brunswick, South Portland and Westbrook).

When questioned as to what facilities were needed, the teachers answered as follows: off-street bikeways (30), marked bicycle routes (20), bicycle racks at school (13).

When asked if they would like to receive bicycle safety literature or films, ninety out of ninety-two indicated they would like the material.

The responses from the teachers appeared to indicate an interest, concern and need in the area of bicycle safety education, and an interest in receiving literature on same, as well as, bicycle safety films. At this grass roots level, it appears that there is recognition of the bicycling problems and a willingness to do something about them.

C. POLICE CHIEF SURVEY RESULTS

All of the Chiefs of Police in the state were sent questionnaires on bicycling, containing questions which, it was felt, could best be answered by the police. Of the 124 questionnaires sent out, 108 of the chiefs responded. The results are shown on sheets with a percentage breakdown found in the Appendix.

The results indicate that 36% of all the communities surveyed have a bicycle registration program. The percent of urban programs is more than twice the rural registration programs. Also worthy of note is that only 18% of the communities have mandatory registration, interestly 84% of the police chiefs responding favor mandatory registration of bicycles. Also the majority of police chiefs favor registration at the local level as opposed to registration on the state level. Of the communities surveyed, 44% indicated there was some sort of inspection of bicycles, while only 10% indicated they had a mandatory program. Eighty percent of the police chiefs favored mandatory bicycle inspection. It appears from these responses that mandatory registration and inspection would be well received by police chiefs in the majority of communities.

Police chiefs were also asked to list some of the basic bicycling problems in their community. Inadequate lights and reflectors were problems in 46 communities and eighteen indicated double riding on a bike was a problem. Seventeen responses indicated riding against traffic was a problem.

Apart from state requirements for all bicycles to ride on the right side of the road going with traffic, when asked on which side of the road do most bicyclists ride, only 51% chiefs reported that most local cyclists rode on the right side. 41% reported riders on both sides, and 12% reported riders on the left. The seventy percent (70%) of the chiefs prefer that the cyclists ride "On the right."

One of the most significant comments indicated that there was either not enough time or not enough personnel available for law enforcement...This was also a factor reported at several public meetings. It appears that Maine police chiefs recognize the problems. They would like to do more in the way of bicycle safety and enforcement.

SURVEY OF MAINE MUNICIPALITIES

INVENTORY OF BIKEWAYS, ORDINANCES AND REGISTRATION PROGRAMS

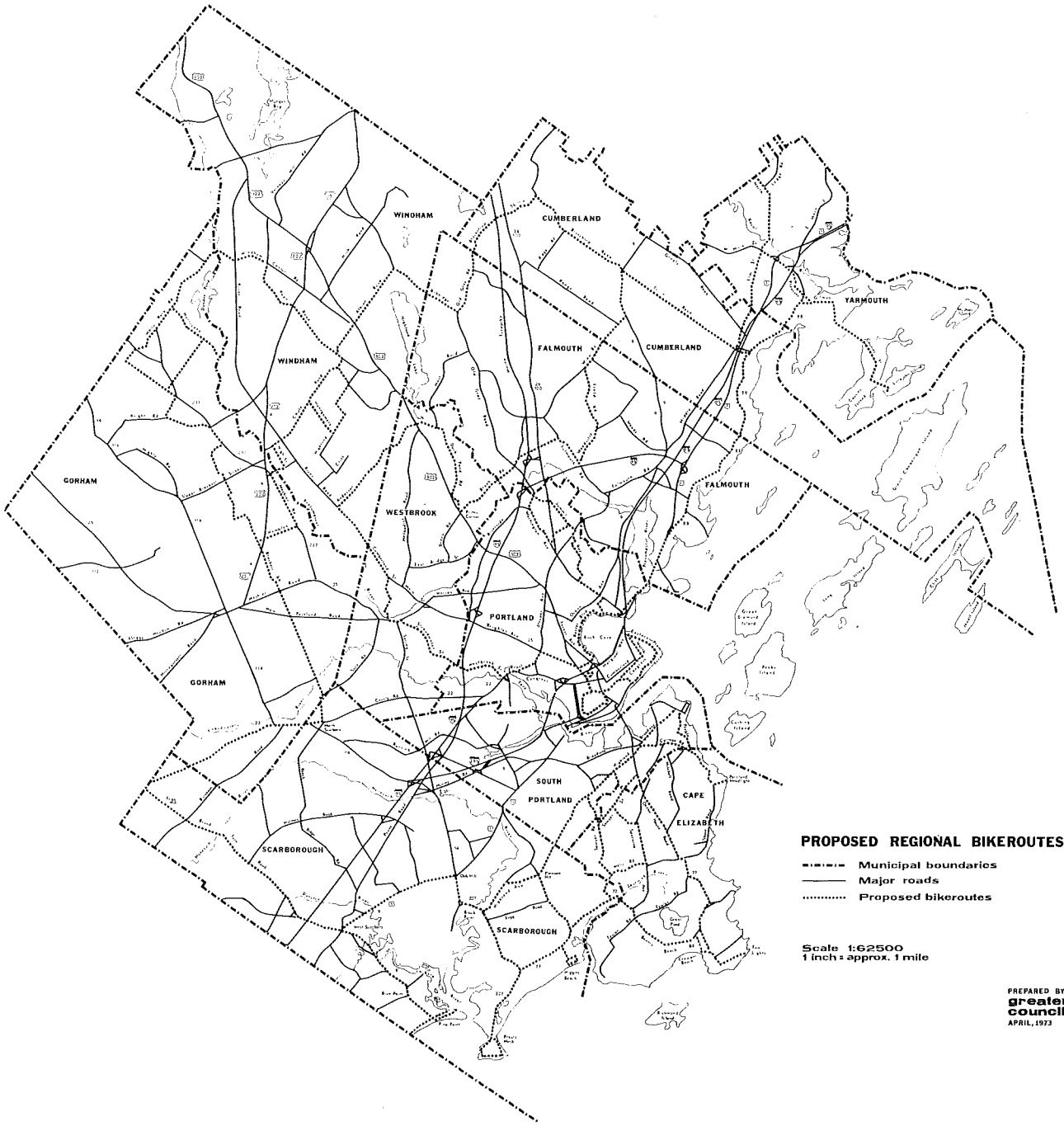
A survey of thirty-nine of the most populated communities in Maine was made during the course of this study. Of that number twenty-three had bicycle ordinances or rules; one had repealed its ordinance and one was preparing an ordinance. Sixteen had registration and licensing programs. Fifteen had either proposed or implemented bicycle facilities. Only one community has a bicycle path. Falmouth constructed the path in 1973 by referbishing a sidewalk which parallels Route 88, a scenic shore route. Three communities, Bangor, Brunswick and South Portland have marked bicycle routes. South Portland had the first routes in the State in 1971. Several communities of lesser population also have bicycle facility plans underway and are noted in the Inventory Listing.

PROPOSED REGIONAL BIKE ROUTES FOR GREATER PORTLAND

Ten communities in the Greater Portland area began in 1972 with the assistance of the Greater Portland Council of Governments (COG) to establish a regional network of safe bicycle routes using existing roadways as a first step. The planning for the route system was coordinated by COG which worked with representatives from each community assisted by the United Community Services, State Bureau of Parks and Recreation and the State Department of Transportation. Proposed route systems were drafted by each community, checked against criteria established by COG and reviewed by State DOT representatives. Communities included in the plan were Cape Elizabeth, Cumberland, Falmouth, Gorham, Portland, Scarborough, South Portland, Westbrook, Windham, and Yarmouth. (See map of Proposed Regional Bikeroutes) The system is now complete and partially implemented. South Portland established signed routes in 1972; Cape Elizabeth received Town Council approval in 1972 and expects to fully implement the routes in the near future; Falmouth has partially implemented its segment of the system with the bike path construction projects. Further implementation in Falmouth and other communities may be expected this summer.

The COG system is an example of planning and implementation of bicycle facilities on a regional basis. The concept is highly appropriate in an urban area or where population concentrations lend themselves to a network of routes. National studies show that commuting routes of 7 miles and under are faster by bicycle than by car when traffic controls, jams and parking are added to the trip time (See Section on Energy Crisis & Bicycling). Recreation routes for enjoyable day trips around the urban area or into the suburban and rural areas also can be planned using the regional network. Although the road system was used in this first phase, safest routes for cyclists were chosen. In certain areas these should be greatly improved with marked lanes especially for bicycles and separated bicycle paths.

Communities such as those in the greater Bangor area should look to a similar regional network for commuting and recreational routes. Students, faculty and personnel at the UMO campus represent a concentration of some 4,000 bicycles. Citizens in Orono and Old Town are



PROPOSED REGIONAL BIKEROUTES

Municipal boundaries
Major roads
Proposed bikeroutes

Scale 1:62500
1 inch = approx. 1 mile

N

PREPARED BY:
greater portland council of governments
APRIL, 1973

themselves making efforts to establish bicycle facilities. Bangor already has some eleven miles of signed routes. A pilot commutor project might be considered around the Orono campus following the example of another University community, Davis, California which has some 40% of its commuting population on bicycles. If a University pilot is undertaken apart from the regional systems, it should be planned with an eventual regional network in mind.

BICYCLE ORDINANCES

Bicycle ordinances have two major purposes, theft and accident prevention. Municipal bicycle ordinance and regulations in Maine vary in sophistication and complexity. All, no matter how long, unfortunately have similar problems to those encountered in municipal ordinances of other states.

The most distinct problem resides in the lack of recognition of bicycles as a serious mode of transportation. This is no doubt due to the fact that only since in the late 1960's and early 1970's have sophisticated multi-speed bicycles been on the market. Bicycles ARE no longer toys and no longer just for children. All municipal ordinances and even portions of the Maine state statutes as well should therefore be re-examined to make sure they recognize the increasing number of adult and commuting cyclists in Maine. Of the ordinances reviewed, Cape Elizabeth, Lewiston and Portland were the most recently updated and reflected a greater legitamacy of bicycles in the community. Several considerations which all Maine communities should examine in adopting or revising ordinances for bicycles are listed below. A model ordinance which is suggested by the Bicycle Institute of America with additions from the Maine study is also included in the Appendix.

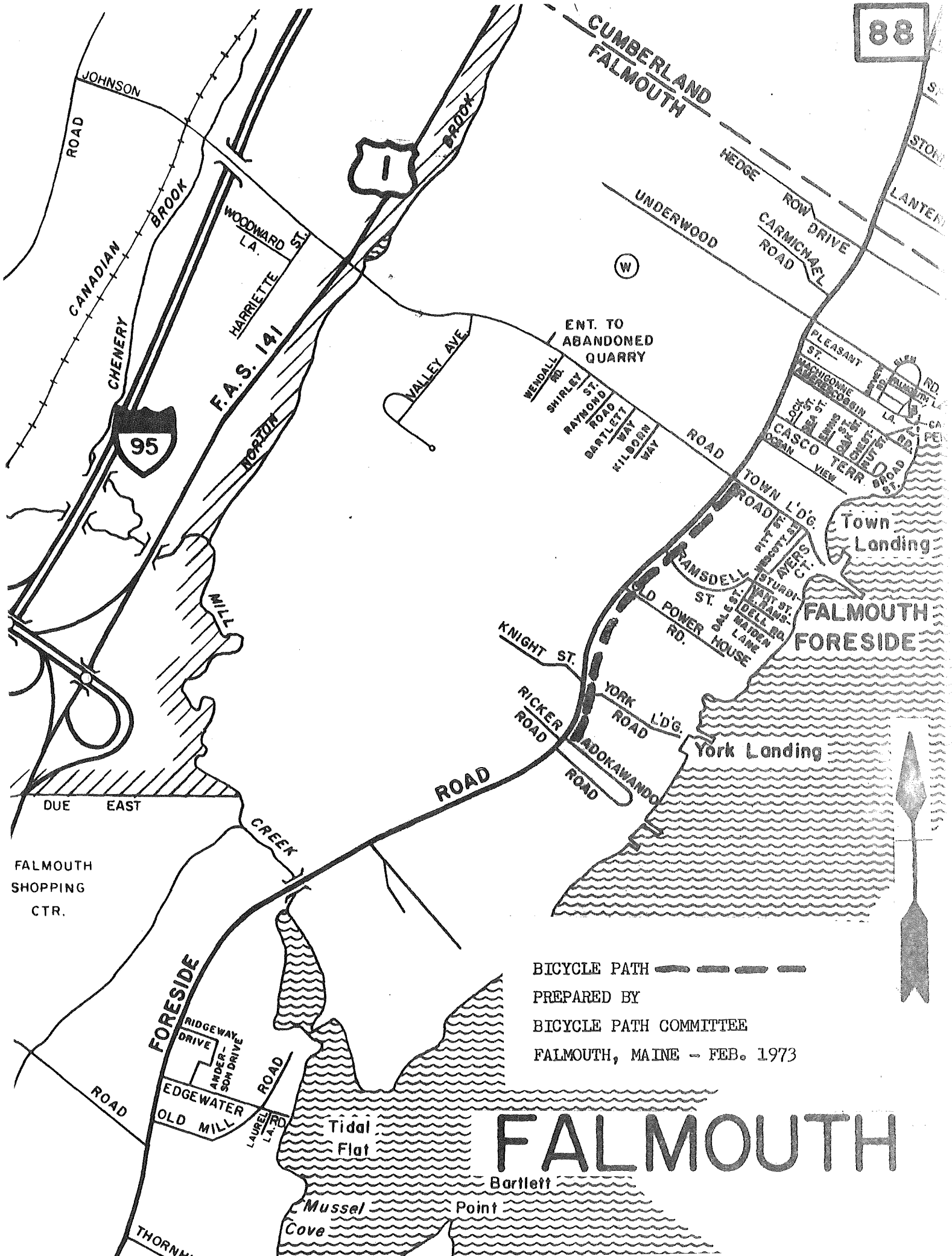
1. Cyclists travel from community to community. Many are adults and teens. Rules and regulations should be drafted accordingly.

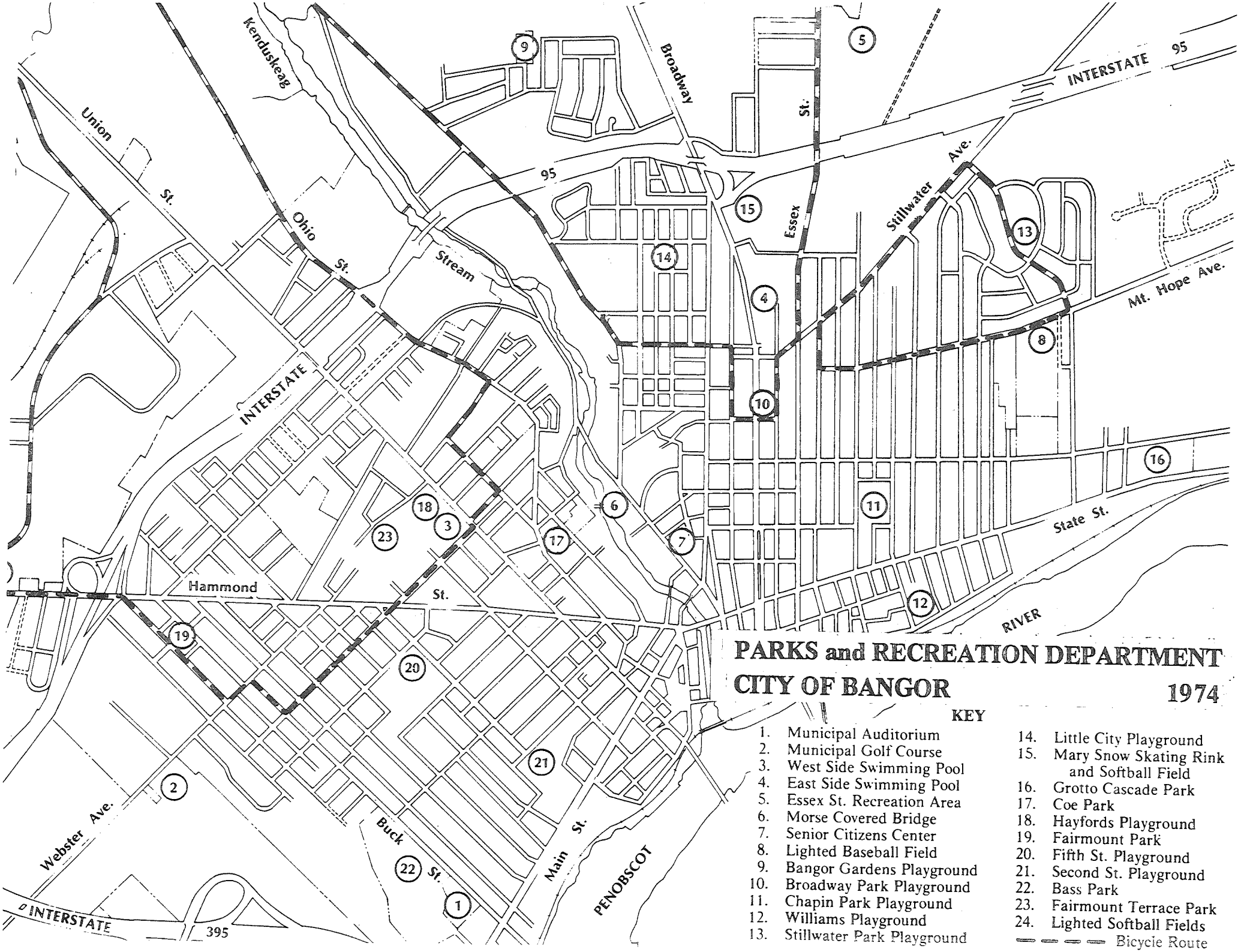
2. Communities should consider adoption of similar or standard ordinances. Rules of the road and equipment for motorized vehicles are standardized; the same should be true for bicycles. Variations such as designated parking areas, routes or streets for cyclists and prohibitions on certain sidewalks can still be added to the basic ordinance.

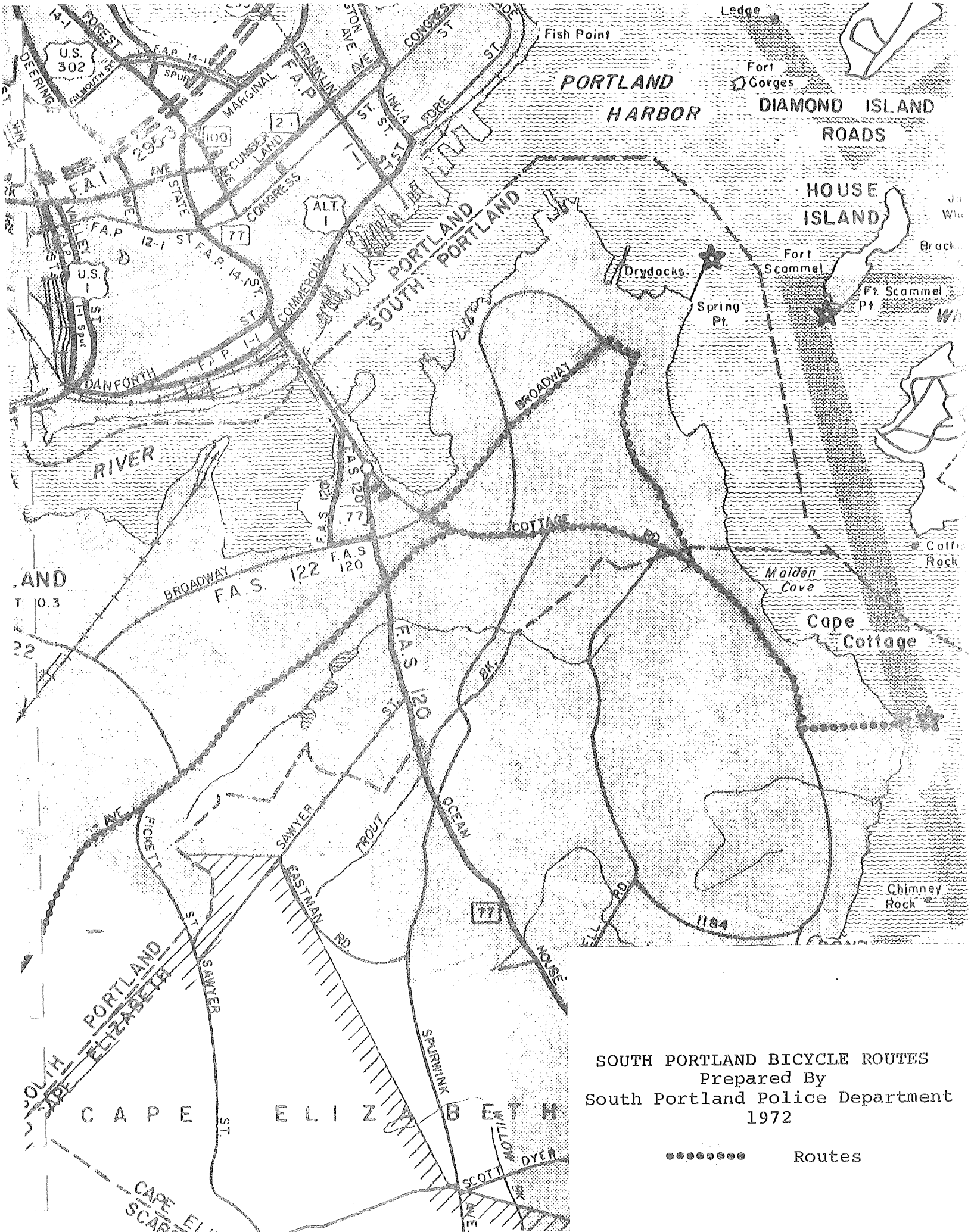
3. Expiration dates for bicycle licenses vary from community to community. One date, at the beginning of the season in late March, should be adopted statewide.

4. Ordinances which call for placement of licensing stickers on the bicycle rear fenders fail to recognize modern bicycle construction. Few bicycles are now sold with rear or front fenders. Fenders are an added accessory. Ordinances should therefore call for licensing stickers to be mounted on the frame.

5. Bicycles are capable of high speeds of up to 45 m.p.h. Ordinances should be sure to require bicycles to follow the posted speed limits.

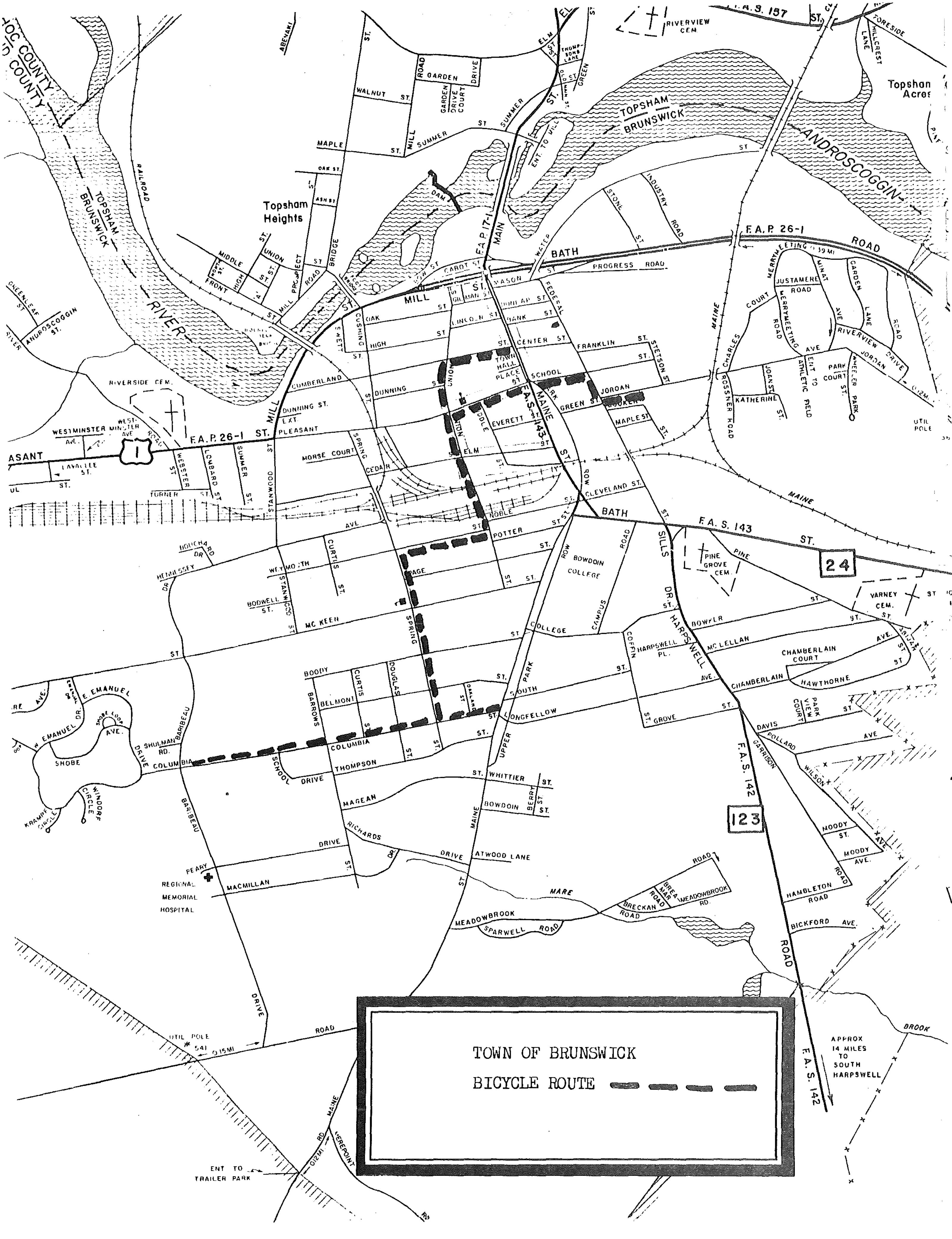

88
CUMBERLAND
FALMOUTH
JOHNSON
ROAD
CANADIAN
BROOK
CHENERY
BROOK
WOODWARD
LA.
ST.
HARRIETTE
F.A.S. 141
NORTH
95
1
BROOK
MILL
HEDGE
ROW
DRIVE
UNDERWOOD
CARMICHAEL
ROAD
ENT. TO
ABANDONED
QUARRY
VALLEY AVE.
WENDALL
RD.
SHIRLEY
ST.
RAYMOND
ROAD
BARTLETT
WAY
KILBORN
WAY
ROAD
PLEASANT
ST.
MACHIGONNE
PASSAGASSIN
LA.
CASCO
OCEAN
VIEW
TERR.
BROAD
ST.
TOWN L'D'G.
ROAD
Town
Landing
PITT ST.
WESCOTT ST.
AYERS
CT.
STURDI-
VANT ST.
RAMSDELL
ST.
OLD POWER HOUSE
RD.
DWIGHT ST.
HART ST.
L. RAMS-
DELL Rd.
MAIDEN
LANE
FALMOUTH
FORESIDE
KNIGHT ST.
RICKER
ROAD
YORK
ROAD
L'D'G.
York Landing
ADOKAWANDO
ROAD
ROAD
DUE
EAST
CREEK
FALMOUTH
SHOPPING
CTR.
FORESIDE
RIDGEWAY
DRIVE
ANDER-
SON DRIVE
EDGEWATER
ROAD
OLD MILL
ROAD
LAUREL
LA.
RD.
Tidal
Flat
Bartlett
Mussel
Point
Cove
BICYCLE PATH
PREPARED BY
BICYCLE PATH COMMITTEE
FALMOUTH, MAINE - FEB. 1973
FALMOUTH

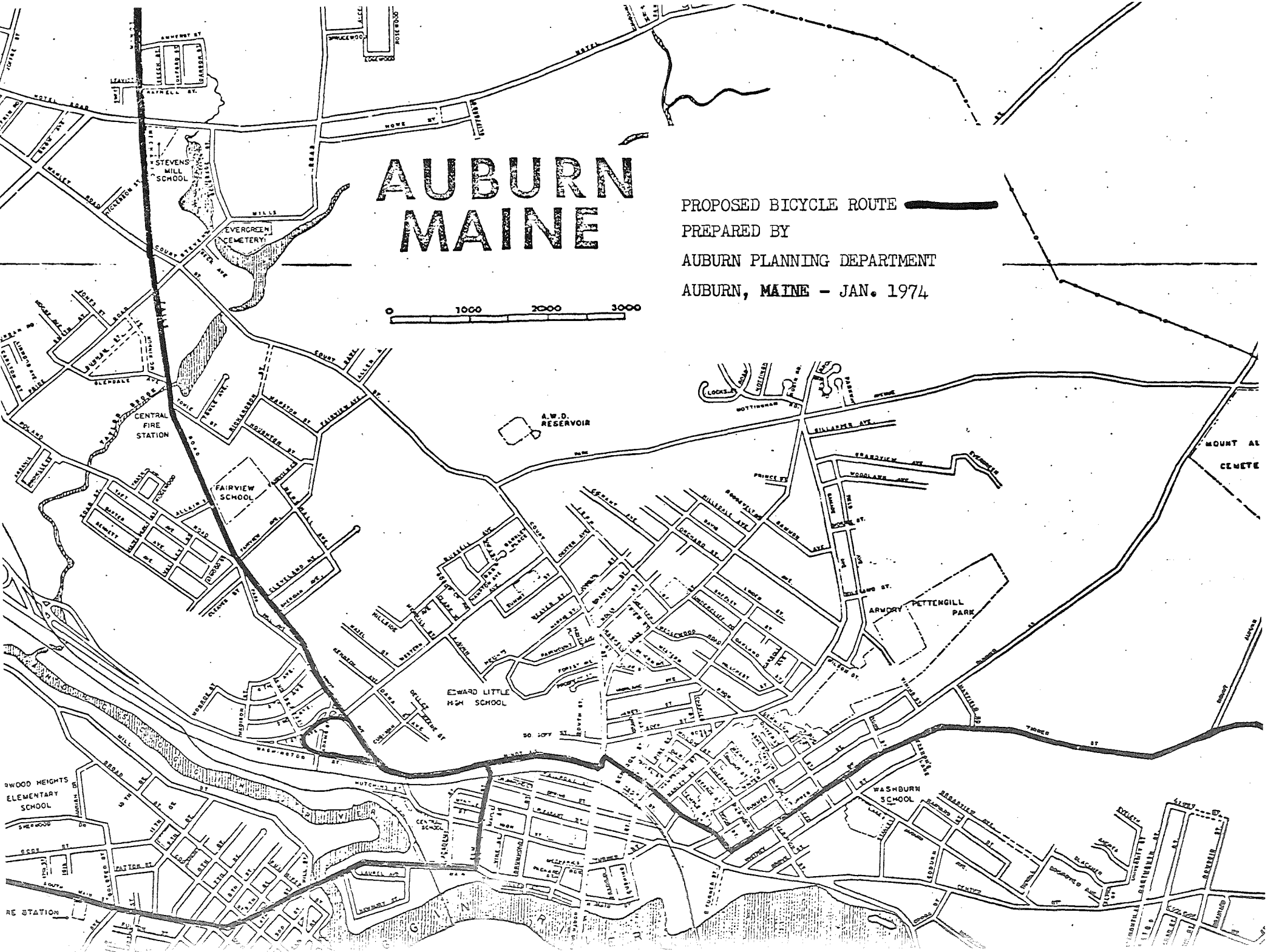

Kenduskeag
Union St.
Ohio St.
Stream
Broadway
St.
INTERSTATE 95
95
Essex
Stillwater Ave.
Mt. Hope Ave.
INTERSTATE
Hammond St.
State St.
RIVER
Webster Ave.
Buck St.
Main St.
PENOBSCOT
INTERSTATE 395
PARKS and RECREATION DEPARTMENT
CITY OF BANGOR
1974
KEY
1. Municipal Auditorium
2. Municipal Golf Course
3. West Side Swimming Pool
4. East Side Swimming Pool
5. Essex St. Recreation Area
6. Morse Covered Bridge
7. Senior Citizens Center
8. Lighted Baseball Field
9. Bangor Gardens Playground
10. Broadway Park Playground
11. Chapin Park Playground
12. Williams Playground
13. Stillwater Park Playground
14. Little City Playground
15. Mary Snow Skating Rink and Softball Field
16. Grotto Cascade Park
17. Coe Park
18. Hayfords Playground
19. Fairmount Park
20. Fifth St. Playground
21. Second St. Playground
22. Bass Park
23. Fairmount Terrace Park
24. Lighted Softball Fields
Bicycle Route

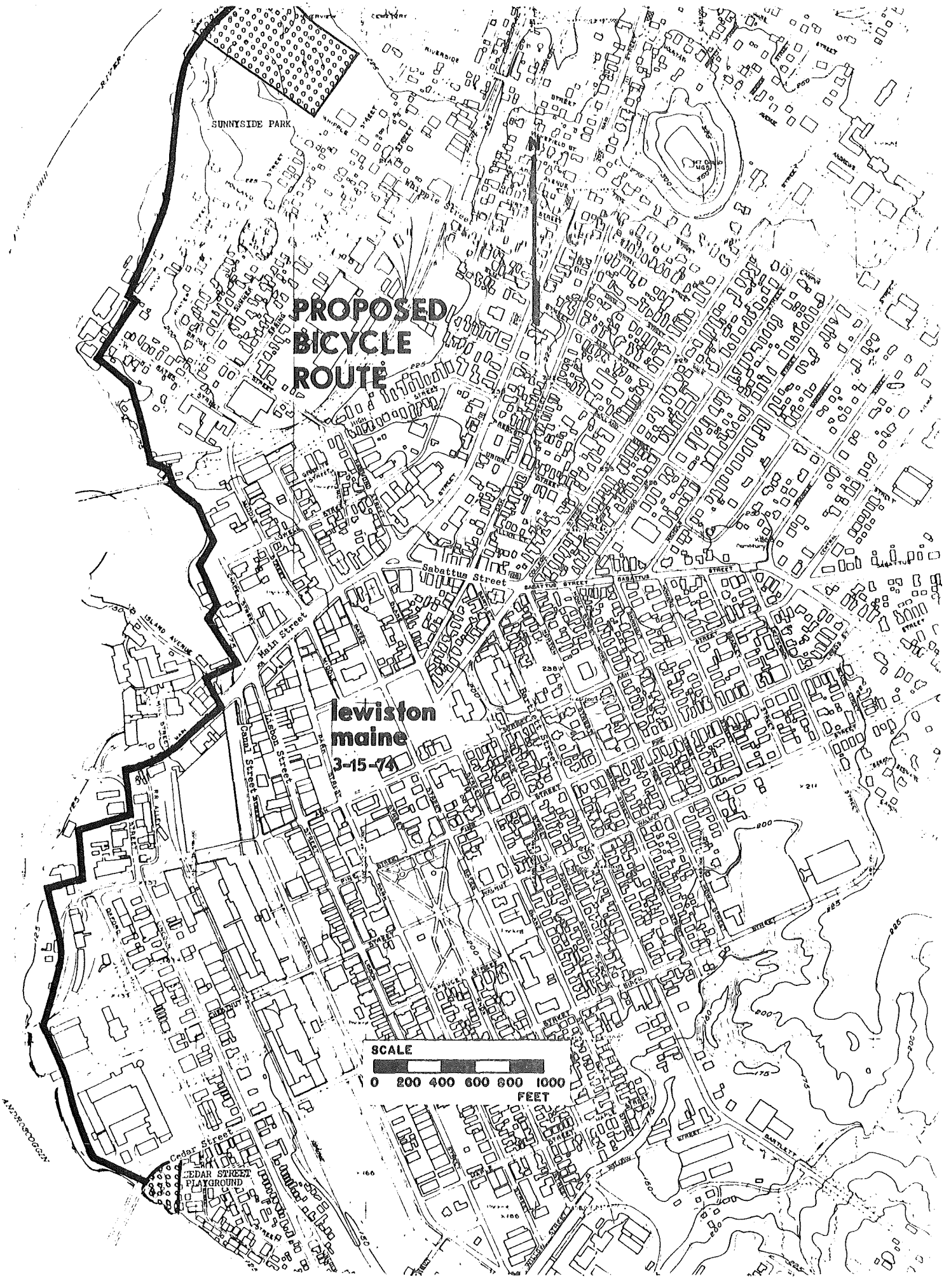


SOUTH PORTLAND BICYCLE ROUTES
Prepared By
South Portland Police Department
1972

●●●●●●●● Routes


TOWN OF BRUNSWICK
BICYCLE ROUTE
Topsham Heights
Topsham Acres
TOPSHAM
BRUNSWICK
ANDROSCOGGIN
RIVER
RIVERVIEW CEM.
RIVERSIDE CEM.
PINE GROVE CEM.
VARNEY CEM.
BOWDOIN COLLEGE
TOWN HALL PLACE
F.A.P. 26-1
F.A.P. 17-1
F.A.S. 143
F.A.S. 142
F.A.S. 157
BATH ROAD
MAINE ST.
MILL ST.
PLEASANT ST.
BATH ST.
HARPSWELL RD.
SILLS DR.
UPPER PARK ROW
COLLEGE ST.
MC KEEN ST.
SPRING ST.
UNION ST.
COLUMBIA
LONGFELLOW
SOUTH ST.
POTTER ST.
NOBLE ST.
ELM ST.
SCHOOL ST.
GREEN ST.
JORDAN AVE.
CUMBERLAND
DUNNING ST.
FEDERAL
FRANKLIN
STETSON ST.
CENTER ST.
LINCOLN ST.
OAK
HIGH
CUSHING
STANWOOD
LOMBARD ST.
WEBSTER ST.
SUMMER ST.
WEYMOUTH
CURTIS ST.
PAGE
BOODY
BELMONT
DOUGLAS
BARROWS
THOMPSON
SCHOOL DRIVE
MAGEAN
RICHARDS DRIVE
WHITTIER ST.
BOWDOIN ST.
BERRY ST.
ATWOOD LANE
MACMILLAN
PEARY
REGIONAL MEMORIAL HOSPITAL
BARIBEAU DRIVE
SHULMAN RD.
SHOBE
WINDORF CIRCLE
KRAMPF CIRCLE
EMANUEL DR.
MEADOWBROOK
SPARWELL ROAD
BRECKAN ROAD
MARE
CHAMBERLAIN AVE.
HAWTHORNE
MC LELLAN
BOWKER
HARPSWELL PL.
COFFIN
GROVE
DAVIS
POLLARD
GARRISON
WILSON
MOODY ST.
MOODY AVE.
HAMBLETON ROAD
BICKFORD AVE.
PINE
ROSSNER ROAD
KATHERINE
ATHLETIC FIELD
MERRYMEETING
RIVERVIEW DRIVE
JUSTAMERE ROAD
PROGRESS ROAD
INDUSTRY ROAD
STONE ST.
WATER ST.
MAPLE ST.
WALNUT ST.
GARDEN DRIVE COURT
BRIDGE ST.
MIDDLE
FRONT
UNION
ANDROSCOGGIN ST.
WESTMINSTER AVE.
LAVALLEE ST.
MORSE COURT
CEDAR
HENNESSEY DR
BOUCHARD DR
BODWELL ST.
RAILROAD
UTIL POLE # 541
0.15 MI
ENT TO TRAILER PARK
MERE POINT
BROOK
APPROX 14 MILES TO SOUTH HARPSWELL
1
24
123


AUBURN
MAINE
PROPOSED BICYCLE ROUTE
PREPARED BY
AUBURN PLANNING DEPARTMENT
AUBURN, MAINE - JAN. 1974
0
1000
2000
3000
STEVENS MILL SCHOOL
EVERGREEN CEMETERY
CENTRAL FIRE STATION
FAIRVIEW SCHOOL
A.W.D. RESERVOIR
EDWARD LITTLE HIGH SCHOOL
ARMORY
PETTENGILL PARK
WASHBURN SCHOOL
MOUNT AU
CEMETE


PROPOSED
BICYCLE
ROUTE
SUNNYSIDE PARK
Sabattus Street
Main Street
Lisbon Street
Canal Street
ISLAND AVENUE
CEDAR STREET
PLAYGROUND
Cedar Street
lewiston
maine
3-15-74
SCALE
0 200 400 600 800 1000
FEET

SURVEY OF MAINE MUNICIPALITIES

INVENTORY OF BIKEWAYS, ORDINANCES, AND REGISTRATION PROGRAMS

COMMUNITY	1970 Population	Bicycle Ordinance and Rules	Registration and Licensing Program	Bicycle Facilities
Portland	65,116	Ordinance (1968,1973 rev.) Prohibits unlicensed bicycles from city streets. Bicycles allowed on sidewalks except where prohibited. Requires parking at racks, curb or against building. Penalties: impounding - 5 day limit. Fines - $5.00 limit. Traffic laws apply to bicycles.	Mandatory. $1.00 bi-annual fee. Records kept by City Clerk. License must be attached to bicycle frame. Number recorded. 10,000 bicycles reg. 1973.	Proposed system of marked bicycle routes for commuting and recreation purposes. Part of Greater Portland Council of Governments regional route network. Under consideration by Portland Traffic Committee.
Lewiston	41,779	Ordinance (1973 rev.) Prohibits unlicensed bicycles from city ways. Allows spot check inspections by police officers. Unsafe bicycles may be prohibited from city streets or bicycle paths. Traffic laws apply to bicyles.	Mandatory. License for "life" of bicycle In case of transfer, new license issued. Frame number recorded. 1,000 bicycles registered 1973.	Proposed bicycle path/ pedestrian trail along Androscoggin River using interceptor sewer easement. Trail will form links with their riverside parks. Proposed implementation 1975. High priority in Lewiston Public Recreation Plan.
Bangor	33,168	N.A.	Not mandatory.	City Parks and Recreation Department has implemented 20 miles of marked bicycle routes. Funding of signs under the Dept. budget.

INVENTORY OF BIKEWAYS, ORDINANCES, AND REGISTRATION PROGRAMS

COMMUNITY	1970 Population	Bicycle Ordinance and Rules	Registration and Licensing Program	Bicycle Facilities
Auburn	24,151	Ordinance. No bicycles on sidewalk in business district. No person age 16+ may ride a bicycle on a sidewalk in any district. Speed must be reasonable and prudent to existing conditions.	No response.	Proposed commutor route approved by planning board. Received unfavorable review from State DOT. City has established Bicycle Committee to work on route planning and implementation.
South Portland	23,267	Ordinance. Violations are misdemeanors. Parents and guardians may not knowingly permit an authorized violation. Unlicensed bicycles prohibited from city streets. Retailers must keep record of sales and purchases and report to Chief of Police. Bicycles prohibited on sidewalks in business district; outside business district children under 16 may use sidewalk. Traffic rules apply.	Mandatory. Annual fee 25¢. January 1 expiration. Record of frame number and fees etc. (1500 bicycles registered 1973)	A marked system of bicycle routes has been implemented.

INVENTORY OF BIKEWAYS, ORDINANCES, AND REGISTRATION PROGRAMS

COMMUNITY	1970 Population	Bicycle Ordinance and Rules	Registration and Licensing Program	Bicycle Facilities
Augusta	21,945	Ordinance. Traffic rules apply. Prohibits unlicensed bicycles from city streets. Bicycles allowed on sidewalks if operated prudently and equipped with a bell or warning device. Scotch-like tape required after dark; prerequisite to license. Penalties impoundment in accord with state bicycle statute.	Mandatory; annual. Chief of Police administers. Dec. 31 expiration. Fee 50¢. No license to child under 10 without parental consent. (1065 Bicycles registered in 1973).	None present or proposed.
Biddeford	19,993	No response	No Response	None reported.
Waterville	18,192	Ordinance. Prohibits unlicensed bicycles from city streets. Traffic rules of the road apply. City council may prohibit bicycles from city ways so marked. No bicycles on business district sidewalks. No bicycle measuring 42 inches from ground to top of seat may be ridden in the city.	Mandatory; annual. Expiration: April 1; Fee 25¢. Chief of Police administers. Record of frame number (1234 bicycles registered 1973).	Bicycle committee is active on facility plans. Is working with local officials and No. Kennebec Reg. Planning Commission.

INVENTORY OF BIKEWAYS, ORDINANCES, AND REGISTRATION PROGRAMS

COMMUNITY	1970 Population	Bicycle Ordinance and Rules	Registration and Licensing Program	Bicycle Facilities
Brunswick	16,195	No ordinance. Only rule requiring bicycles to be ridden as far to right of road as practical.	No response.	A Bicycle Committee has worked successfully to implement marked routes from schools to the downtown area along routes followed previously by students.
Sanford	15,812	Ordinance (1967) prohibits bicycles from sidewalks. Sales records reported to Police Dept. New or transferred bicycles must be registered within 5 days. All rentals and dealer held bicycles must be registered. Serial number defacing prohibited. Unclaimed bicycles (after 90 days) may be disposed of by P. D. Penalties, District court summons and fine ($10 limit) for defacing reg. card and seal; $10 fine for riding violations age 17+ and impounding for those under 17.	Mandatory; annual administered by Police Dept. Registration card and scotchlite sticker issued. Expires Dec. 31. Mounted on rear fender. Serial numbers may be engraved on bicycles where manufacturer failed to do so. Wednesdays & Saturdays specific registration days. No reported reg. figures for 1973.	No reported facilities

INVENTORY OF BIKEWAYS, ORDINANCES, AND REGISTRATION PROGRAMS

COMMUNITY	1970 Population	Bicycle Ordinance and Rules	Registration and Licensing Program	Bicycle Facilities
Westbrook	14,444	Ordinance Copy not available.	Mandatory; 1000 bicycles registered 1973.	Route system part of G.P. COG network. The Parks & Recreation Department also has engineering draf of a path along the Presumpscot River to serve S.D. Warren commutors and recreational cyclists
Saco	11,678	Ordinance (1944) prohibits unlicensed bicycles from city streets. Rules of the road; prudent use on sidewalks. Chief of Police may prohibit bicycles from city ways as marked. Penalties impoundment + 30 day limit.	Mandatory; annual July 1 expiration. Fee 25¢. Administered by Chief of Police (1000 bicycles registered 1973).	None reported.
Presque Isle	11,452	Ordinance (1950) prohibits use of unlicensed bicycle in city. Police Chief and City Manager shall mark sidewalks in business districts prohibited to bicycles. Rules of the road apply. Bicycles on Maine & State Streets must be parked only in racks. Penalties--impounding for not more than 30 days.	Mandatory; annual. No license to child under 6. Fee 25¢. April 30 expiration. Chief of Police administers. Record of description frame number inc. (700 bicycles registered in 1973).	None reported.

INVENTORY OF BIKEWAYS, ORDINANCES, AND REGISTRATION PROGRAMS

COMMUNITY	1970 Population	Bicycle Ordinance and Rules	Registration and Licensing Program	Bicycle Facilities
Kittery	11,028	None	None	None reported.
Caribou	10,419	None	None	None reported.
Limestone	10,360	None reported.	None reported. Base estimates over 4000 bicycles.	Air Force Base has reduced speed for automobiles on base roads t encourage bicycle use. Youth hostel being considered.
Orono	9,989	Ordinance--Copy not available.	Not mandatory.	A Bicycle Committee is working with State DOT, Legislative and university representatives to plan and implement commutor routes.
Bath	9,679	None	None	None reported.
Rumford	9,363	Regulations: Prohibits bicycles on sidewalks; no bicycles on public street during dusk and dark hours without lights.	None	None reported.

INVENTORY OF BIKEWAYS, ORDINANCES, AND REGISTRATION PROGRAMS

COMMUNITY	1970 Population	Bicycle Ordinance and Rules	Registration and Licensing Program	Bicycle Facilities
Brewer	9,300	Repealed November 1971	None reported.	None reported.
Old Town		Ordinance 1972. Violations are misdemeanors. Rules of Road apply. Forbidden left right and U-turns may be made if cyclist dismounts and becomes pedestrian. Closely resembles South Portland ordinance.	Not mandatory. (322 bicycles 1973)	The Director of Parks and Recreation is meeting with the Bicycle Committee in Orono to work on a multi-community bicycle commuting system.
Houlton	8,111	Ordinance (1898-1951 Rev.) Prohibits bicycles on sidewalks for riding or parking unless at outer edge of the sidewalk. Unlicensed bicycles are prohibited from town ways. Basic equip. required. Traffic laws apply. Penalties impounding for up to 30 days.	Mandatory; annual. Administered by Chief of Police. March 1 expiration. No license until inspected and found in proper mechanical condition. Fee 25¢ (no 1973 figures reported).	None reported.
Rockland	8,505	Regulations. Prohibits bicycles on sidewalks. Traffic laws and basic equip. (bell or horn, lights) apply.	Mandatory; annual. Administered by Chief of Police. March 1 expiration. No license until inspected and found in proper mechanical condition. Fee 25¢ (no 1973 figures reported).	None reported.

INVENTORY OF BIKEWAYS, ORDINANCES, AND REGISTRATION PROGRAMS

COMMUNITY	1970 Population	Bicycle Ordinance and Rules	Registration and Licensing Program	Bicycle Facilities
Cape Elizabeth	7,873	Ordinance (1972) prohibits unlicensed bicycles from town ways. Bicycle rentals must be licensed. Bicycle purchase sales records must be reported quarterly by dealers. Traffic laws apply. Defines bicycle as "every device propelled by human power upon which any person may ride, having two tandem wheels. Penalties-written warning on first offense; impounding on second. Removing or defacing sticker misdemeanor; subject to $25.00 fine in District Court.	Mandatory; annual administered by Chief of Police. May 1 expiration. Fee 50¢. Copy of bicycle ordinance must go to each registrant. Records frame number. Bicycle license sticker used. Removing or defacing sticker prohibited. (442 bicycles in 1973).	Proposed routes part of the GPCOG system. Approved by the Town Council.
Scarborough	7,845	None	None	Proposed routes part of the GPCOG system. Prepared by the Recreation Committee and Police Dept.
Gorham	7,839	None reported	None	Proposed routes drafted by Recreation Committee part of GPCOG route system.
Millinocket	7,742	NA	None reported	None reported.

INVENTORY OF BIKEWAYS, ORDINANCES, AND REGISTRATION PROGRAMS

COMMUNITY	1970 Population	Bicycle Ordinance and Rules	Registration and Licensing Program	Bicycle Facilities
Skowhegan	7,601	Regulation (1906) prohibits bicycles on sidewalks within town limits. Exceptions may be made where sidewalks are "little used". Penalty for violation $1.00.	None	None reported.
Winslow	7,299	None	Not mandatory	None reported.
Gardiner	6,685	N.A.	Mandatory. Chief of Police administers. (180 bicycles registered 1973).	None reported.
Windham	6,593	N.A.	N.A.	Recreation committee proposed routes incorporated in the GPCOG system. Not presently implemented.
Lisbon	6,544	Follow State statutes.		None reported.

INVENTORY OF BIKEWAYS, ORDINANCES, AND REGISTRATION PROGRAMS

COMMUNITY	1970 Population	Bicycle Ordinance and Rules	Registration and Licensing Program	Bicycle Facilities
Falmouth	6,291	Ordinance currently being prepared.	Not mandatory.	A Bicycle Path Subcommit has prepared an extensiv road system in conjuncti with the GPCOG. A side- walk along Rte. 88 was refurbished as a bike pa and is now in use. A di path was also cleared an prepared through an exis ing park. A proposed en- gineering study for a co bination bicycle path/ pedestrian route was de- feated by the town counc
Belfast	6,593	Ordinance (1972) pro- hibits unlicensed bi- cycles from city streets. Prudent use of sidewalks permitted. Traffic rules apply. Chief of Police may mark prohibited streets and ways. Penalties, impounding for not more than 30 days.	Mandatory; annual. May 1 expiration. Chief of Police administers. Reg. tags are issued for 25¢. (1350 re- gistered in 1973).	None reported.
York	5,690	Regulations (1952) Volun- tary registration. Traf- fic rules apply. Penal- ties - right to operate bicycle on any highway or sidewalk in town for 10 days.	Not mandatory. Fee 25¢. Serial number recorded. (no figures for 1973).	None reported.

INVENTORY OF BIKEWAYS, ORDINANCES, AND REGISTRATION PROGRAMS

COMMUNITY	1970 Population	Bicycle Ordinance and Rules	Registration and Licensing Program	Bicycle Facilities
Fairfield	5,684	NA	NA	NA
Farmington	5,657	None	None reported.	None report
Kennebunk	5,646	Ordinance (1971-1972 rev.) no bicycles allowed on or along any beaches within town from May 15 - Sept. 15. Bicycles prohibited on sidewalks on Main St. from Water St. to Dane St. and Fletcher to Storer St. Penalties upon conviction: over 18 fined $2.00 - $10.00; under 18 fines charged to parents.	Not mandatory.	None report
Madawaska	5,585	Regulations. Prohibits riding of bicycles on sidewalks unless being pushed by operator. Lights and reflectors are required at night. Bicycles may not be parked on the sidewalks in front of business establishments.	None reported.	None reporte
Norway	3,595	Ordinance. Prohibits riding of bicycles on sidewalks or footpaths in town limits. Each bicycle must be equipped with [illegible] and, at night	None reported.	None reported

SURVEY OF MAINE BICYCLE RETAILERS

In December 1973, questionnaires were sent to fifty (50) known bicycle retailers and repair shops in Maine as listed in the Maine Register and local telephone directories. The survey included chain department stores such as Mamouth Mart, Sears, Zayres, etc. An example of the questionnaire appears in the Appendix.

A return of fourteen surveys or a 20% response was received as of mid-January when the questionnaires were tabulated. Due to Christmas rush and inventories, survey returns were perhaps lower than might otherwise have been expected. However, the survey was still statistically valid. Several trends, useful to the Maine bicycling study, can be derived.

1) Bicycle sales figures from 1970 to 1973 have changed markedly.

2) Purchases now are for ten speeds, three speed and five speed bicycles, in that order.

3) The average user age has shifted from fourteen to 25 and up.

4) Bicycles are being purchased for transportation, health and environmental reasons as well as recreation.

5) Bicycles are being used for family recreation purposes; Mom and Dad, as well as the kids now have bicycles which they use together.

MAINE BICYCLE SALES*

Type of Bicycle / Year	1970	1971	1972	1973
Sting-ray	316	367	1011	2329
3 Speed	590	383	1895	4185
5 Speed	147	170	242	1906
10 Speed	212	848	2391	5582
Total Sales	1265	1768	5539	14002

*based on figures received from Maine retailers (1973 survey: Bureau of Parks & Recreation)

Whether it be from a health, environmental preservation, energy conservation, economic savings, recreation aspect, bicycle facilities can be justified. If we spent the same amount on bicycle facilities as money spent on bicycles in Maine in the last year (a comparable situation to Maine automobile/highway expenditures), we would be spending $1,195,380 and this is a conservative estimate.

Total Value of Maine
Bicycle Sales - 1973

Type of Bicycle	Average Value	1973 Sales	Total Value*
Stingray	$ 30.00	2329	69,870
3 Speed	50.00	4185	209,250
5 Speed	100.00	1906	190,600
10 Speed	130.00	5582	725,660
			1,195,380

*The above figures were computed on the basis of partial sales figures reported by Maine bicycle retailers. Average market values are below actual market values.

The increased use of bicycles will depend on improved facilities for bicycling. Without the improved facilities bicycling will never reach its full potential. Accidents can be predicted to increase without proper safety education, enforcement of bicycle laws and bicycle facilities.

In planning for the future, it should not be a matter of bicyc versus cars but rather a question of how we can best develop a mix of many transportation and recreation modes that will meet the varyin needs of Maine people. Most people will continue to use both cars and bicycles and sometimes dual use will be part of the same trip. In the future we must build "bicycle thinking" into proposed projects including future highways, road improvements, city and state parks, regional and town plans, and housing and commercial development.

Whatever State action is taken, it should be remembered that poorly constructed and planned bicycle facilities are worse than no facilities at all.

Sales figures were difficult to obtain for the last four years, but what figures are available show trends similar to those exhibited nationally in bicycle sales. In 1970 three speeds were the most popular bicycle in Maine with juvenile sting-ray bicycles second. In 1971, the shift in purchase trends from childrens to adult bicycles came to Maine following the rest of the nation. More ten speeds and three speeds were sold than sting-rays; and noteably more ten speeds than three speeds. In 1972, the same trend continued with general bicycle sales up considerably from the previous two years. By 1973, with ten speeds clearly in the lead, even five speeds sales which had lagged behind over all other bicycles in the three prior years were beginning to run competitively. Childrens bicycles took third place to ten and three speeds.

BICYCLE SALES AND SERVICES AND THE MAINE ECONOMY

Economically speaking, Maine should look seriously at cycling as a generator of revenues and jobs. Were sales only in childrens bicycles or in less sophisticated equipment, one might dismiss the economic significance of bicycling. However, the ten speed bicycle, which now is the most frequently purchased bicycle in Maine is bought by adults for several serious reasons; health, the environment and transportation. It sells for an average of $130; as low as $80 or as high as $600. By multiplying sales tax for the average purchase or $6.50 by 5,582 (1973 sales figure) a total of $36,283.00 is achieved. This is a conservative example of sales tax revenues received into state coffers as a result of 1973 bicycle sales.

The average life of the ten speed is ten years with proper care according to the Bicycle Institute of America. This means shops for continuing repairs. Repair shops mean jobs. Six of the cycle shops replying to the questionnaire had been in business under three years. The remainder up to 30 years. This seems to indicate both stability and growth are occuring in areas allied with bicycling. There are also reasons to believe that bicycling is becoming big business.

In February 1974 it was learned that a national petroleum company had experimented successfully with bicycle repair shops in the second bays of several of their gasoline stations. The initial cost for tools and basic parts is $1,700. They're now looking at Maine for similar enterprises.

RETAILERS COMMENTS

Retailers were asked to comment on the change, if any, they had noted over the last four years in the type of bicycle purchased, the reason for the purchase, and the average age of the cyclist. Their comments follow:

- During 1972 and 1973 we sold mostly 10 speeds and 5 speeds or touring bicycles. People are doing more long distance riding. Average age 25. Could have sold more bicycles if stock had been available. (Sears - Augusta)

- More adult bikes are now sold. Many are purchased for family recreation and in November 1973 as many bikes were sold for transportation as for gifts. Average age has changed from 14 years to 24. Can't get enough bikes for the demand. (Ken's Cycle Shop - Brunswick)

- Average age of cyclist shopper 13-30 - most want 10 speeds; the oldest purchaser was 81. Reasons range from health, environment, transportation, thing to have. Participated in safety educational effort in 8 schools in 1973 around Augusta and Winthrop. Hope to follow same education tour in 1974. (Poulin's Cycle - Augusta)

- Need strong bicycle legislation to give both rider and motorist clear rules of road. Bicycle should have right-of-way as they do in Europe.
(Shepard Hardware - Ellsworth)

- Divide cyclist into three groups

  (1) inexperienced: need education; includes child and oldster returning to cycling; greatest causers of accidents

  (2) regular user: will use paths; needs constant safe use reminders; includes student, commutor, family groups, health enthusiasts; distinctly adults

  (3) the trouble riders: those of all ages who keep bicycles in poor repair; refuse to obey rules of the road. (Ernie's - Westbrook)

- Use an abandoned stretch of railroad which runs through Old Orchard as bicycle path. (Sea House Enterprises - Old Orchard)

- Cyclists of all ages. Mainly 10 speed bicycles are being sold. (Don's Power Equipment & Cycle - Portland)

- More light-weight bikes. Average age of cyclist up. More sophisticated equipment (accessories) being installed on bicycles. More bikes purchased for use as transportation. (Quinn's Cycle Mart - Old Orchard Beach)

- Change from standard to 3 speed and 10 speed. Ten speed age 16 - 20; three speed 20 - 45. Need more law enforcement as to rules of the road. (Snow's - Auburn-Lewiston)

SURVEY OF STATE PARK SUPERVISORS

In November 1973, a questionnaire was sent to all Maine State Park Supervisors to assess the impact of bicycling on Maine State Parks during the prior 1973 season. Returns were received for all 35 parks.

Fifteen parks reported that bicycles were used in the parks; four requested bikeways. Three of the parks i.e. Sebago Lake Campground, Crescent Beach and Two Lights kept excellent records. The other parks gave estimates of numbers of bicycles. More bikes appear to be brought to parks than used in the park. However, 30 parks allow use of the camp roads as a policy, but only 13 parks experience use of the roads for touring routes.

As a result of this survey, the Sebago Lake Campground was chosen for further investigation as to designation of a possible bikeway to alleviate conflicts occurring from a concentration of pedestrians, cars and bicyclists on camp roads. The results of that investigation are presented in the summary.

Impact of Bicycles on Maine State Parks 1973 Season

The following information was gathered in November, 1973 from Supervisors of Maine State Parks as part of the Statewide Bicycle Study requested by the 106th Legislature.

1. State Parks surveyed 35

Day-Use only	20
Camping only	1
Historic only	3
Combination day/camp.	9
Combination day/hist.	2

2. Total bikes brought to the parks 6,516 (See chart for #'s)

   Total bikes used in the parks 2,112 (See chart for #'s)

   Increase over '72 season? 325 / 2,437

	% increase	10%	15%	20%	25%	40%	50%
Yes 30		7	1	3	7	5	4

   No 4

   No comment 1 (Wolf Neck - no comparison - '73 first season)

3. Cyclists ride to the park mostly 25

   Cyclists bring bikes to the park on cars 15

   Rent bikes locally 1 (Camden)

4. Park fees for bicycles

None	31
20¢	2
Regular camp fee only	2

5. Present Bike Facilities in Park

Rack	1
Designated Trails	1

   Allow use of parks roads 35 /park roads used as touring rts. 13

6. Needed Bike Facilities in Park

Rack 19
Designated Trails 2 -- 1. Sebago - Naples 2. Bradbury
Other: paved shoulder of park road 2 -- 1. Reid -- 2. Popham

7. Routes needed to the park on highways

20 Yes 15 No

Yes

1. Sebago - Naples
2. Bradbury Mt. - Pownal
3. Two Lights - Cape Elizabeth
4. Crescent Beach - Cape Elizabeth
5. Jordan Beach - Scarboro
6. Ft. McClary - Kittery
7. Grafton Notch - Newry
8. Peaks Kenny - Dover Foxcroft
9. Rangeley - Rangeley
10. Lily Bay - Greenville
11. Mount Blue - Weld
12. Lucia Beach - Owls Head
13. Owls Head Lt. - Owls Head
14. Moose Pt. - Searsport
15. Damariscotta Lake - Jefferson
16. Peacock Beach - Richmond
17. Fort Pownall - Stockton Springs
18. Montpelier - Thomaston
19. Whip-Poor-Will - Litchfield
20. Camden Hills - Camden

8. Problems related to bicycles

"accidents" 1 -- Sebago

"park roads too narrow for bikes and cars" 13

1. Sebago - Naples
2. Sebago - Casco
3. Grafton Notch - Newry
4. Ancient Pemaquid - Bristol
5. Ft. William Henry
6. Ft. Edgecomb
7. Reid
8. Popham Beach
9. Ft. Popham
10. Moose Point
11. Damariscotta Lake
12. Peacock Beach
13. Ft. Pownall

"riding on footpaths" 1 -- Reid - Georgetown

9. Other observations

1. Sebago kept records on registration cards from July to close of park season in September.

2. Wolf Neck for nature lovers - no use ever of bicycles would be best.

3. Crescent Beach and Two Lights are exact figures - recorded June 7 - October 1 May 10 - October 15.

4. Jordan Beach needs safest routes possible to the park.

5. Several parks used by local bikers (children) mostly.

1. Ft. McClary	4. Ft. Knox
2. Ancient Pemaquid	5. Aroostook
3. Ft. William Henry	6. Lamoine

6. Bicycle campers (group of 20) at Lamoine.

7. St. George "would not like to see bikes banned from park use".

10. Further analysis of Question 2

Number of bicycles brought to the park

Park	# Brought
Crescent Beach	917
Two Lights	612
Lake St. George	534
Bradbury Mountain	500
Camden Hills	500
Montpelier	500
Moose Point	350
Vaughan Woods	300
Damariscotta Lake	300
Jordan Beach	252
Ft. McClary Memorial	200
Mt. Blue	200
Ft. Knox	200
Lucia Beach	200
Whip-Poor-Will	200
Lily Bay	150
Sebago - Casco	100
Rangeley	100
Aroostook	100
Peacock Beach	100
Grafton Notch	50
Peaks Kenny	50
Reid	50
Popham Beach	50
Owls Head Lt.	50
Lamoine Beach	40
Fort Pownall	30
Cobscook Bay	25
Quoddy Head	6

Park	Bikes Used	Bikeways Requested	Park Roads as Touring Rts.	Park Road Complaints
* Bradbury Mountain	300	X		
* Moose Point	300		X	X
Lake St. George	267			
* Camden Hills	250		X	
* Mt. Blue	200		X	
* Lily Bay	150		X	
Reid	150	paved shoulder		X
Popham Beach	150	paved shoulder		X
* Grafton Notch	50			X
* Peaks Kenny	50		X	
Ancient Pemaquid	80		X	X
Ft. William Henry	80		X	X
* Fort Pownall	30			X
Cobscook	15		X	
* Sebago - Naples	325	X	X	X

* marked highway bicycle routes to the park needed

INVENTORY OF BICYCLES ON MAINE COLLEGE CAMPUSES

In December 1973 a telephone survey was made by the Bureau of Parks and Recreation of the nineteen colleges and university campuses in Maine. The estimated number of bicycles as of fall 1973 and student enrollment figures for that same period were requested. The majority of the information was obtained from the Dean of Students. Only one institution, the University of Maine - Orono, had a registration program. Out of an estimated 4,000 bicycles, 1,280 were registered. Several schools reported bicycle racks. None have special bicycle paths, but allow bicycles to be ridden on campus roadways and sidewalks. The following table summarizes the inventory results:

BICYCLES ON MAINE
COLLEGE CAMPUSES
Fall 1973

TOTAL # OF CAMPUSES	ESTIMATED TOTAL # OF BICYCLES	TOTAL # FULL-TIME STUDENTS	TOTAL # RESIDENT STUDENTS
19	3,200 - 6,148	31,515	13,261

SOURCE: Bureau of Parks and Recreation Survey
December 1973

Based on the above information, there are an estimated .02-.46 bicycles per capita resident student population and .10-.20 per capita full-time student population.

RURAL AND URBAN BIKEWAYS

In comparing bikeways in rural and urban areas, it would be well to start with a description of the differences in use, that would be noteable in the two types. As would be expected, those who will commute by bicycle are probably living within 5 or 6 miles of their place of work. Beyond this distance, the number of bicycle commuters is expected to decrease. Accordingly, most commuting bicycling is within a few miles, usually no more than 10 miles, of the more urban areas. There are few then who will be using the bicycle to commute any great distance and there will be very few commuters on the rural bikeways.

Viewing bicycling in three broad categories of use will help keep bicycling in perspective. They are as follows:

1. the bicycling primarily for transportation purposes
2. bicycling primarily for recreational purposes
3. bicycling for recreational purposes, but with a specific destination in mind where some significant amount of time will be spent

Those, commuting by bicycle, fall in the first category and, at present, do not appear to constitute the majority. The point to be made is that urban bikeways will be transporting the majority of the people commuting by bicycle; whereas, there will be fewer commuters on rural bikeways.

Another aspect of bikeways, where differences are worthy of note, is the volume or number of bicycles that would be likely to be using the facility at any given time. Just as city streets are expected to accommodate greater volumes of traffic, so it is with urban bikeways. Conversely, rural bikeways would normally be far less crowded, and, in general, get less use. This suggests that the first bikeways should be located where there is some population density, for this is the area where the facility would get the greatest use.

Corridors of greatest demand or use can be determined by examining present vehicular traffic counts by projecting 10% to 40% of these drivers as potential commuting cyclists. Probable use of the bikeway can be derived. Counts can also be taken of present bicycle traffic. Since experience in other states, as well as information gathered during the Maine Study, indicates that cyclists usually do not ride on roadways where narrow widths and/or high speeds create unsafe cycling, counts of present bicycle use should be on lower volume roadways. Any counts of present bicycle traffic should be used very advisedly. Cyclists will appear in greater numbers after the way is made safe rather than before. After volume and type of use on bikeways is predicted this dictates the type of facility.

The many types of bikeway facilities were reviewed and the various designs with corresponding costs are shown on the following pages. This in-house review by the Design Division provides detailed information on bikeways that would be appropriate in the State of Maine, and some cross-section of roadway showing the relationship of the bikeways to the traveled way for motor vehicles. A review of the technical literature available indicated a number of states are describing the various type of bikeways by a class or category, a practice followed in part in the Maine Study.

BIKEWAY CLASSIFICATIONS

I. Class I Bikeway

A. Definition - A completely separate right-of-way designated for the exclusive use of bicycles. Crossflows by pedestrians and motorists are minimized.

B. General - The "ideal" bikeway in urban and rural areas is one that is completely separated from motor vehicles and pedestrian traffic, thus having a minimum number of interactions and conflicts with other travel modes. This is true whether the intent of the bikeway is primarily transportation or recreational.

C. Costs - The cost of the new Class I bikeways where they are considered feasible, vary greatly with the topographical, soil and climatic characteristics of the particular areas. As a guide, Table 1 indicates the minimum estimated construction costs for providing a typical bikeway structural section consisting of a 2 inch thick bituminous concrete surface over a 6 inch thick aggregate subbase.

Additional items that should be considered in estimating the cost of a Class I bikeway are:

Drainage:	This will vary considerably from place to place and depends greatly on soil, topographical, climatic, and bikeway cross-section characteristics.
Grading, Excavation and Embankment:	The table assumes a 8" excavation with no fills or borrow, on flat terrain. This item cost will vary extensively depending on the topography and location. Embankment construction or borrow may be required.
Barriers, Fences and Curbs:	If required, should be included.
Signs, Stencilled Messages, and Striping:	Cost estimates for these items should be included.
Lighting:	If night time use of the bikeway is anticipated, adequate lighting facilities should be provided.
Landscaping:	If required as a barrier, or if desired for aesthetic reasons, landscaping should be included.
Bridges and Retaining Walls:	Overcrossings or undercrossings to separate vehicles may be required along portions of the bikeway route.

Signals or Signal Modifications:	May be required to interfact the bikeway with the existing system.
Land Acquisition Costs:	Where the proposed bikeway is not located on public land, the cost of acquiring land may be the most significant cost.

CLASS I BIKEWAY
(one way)

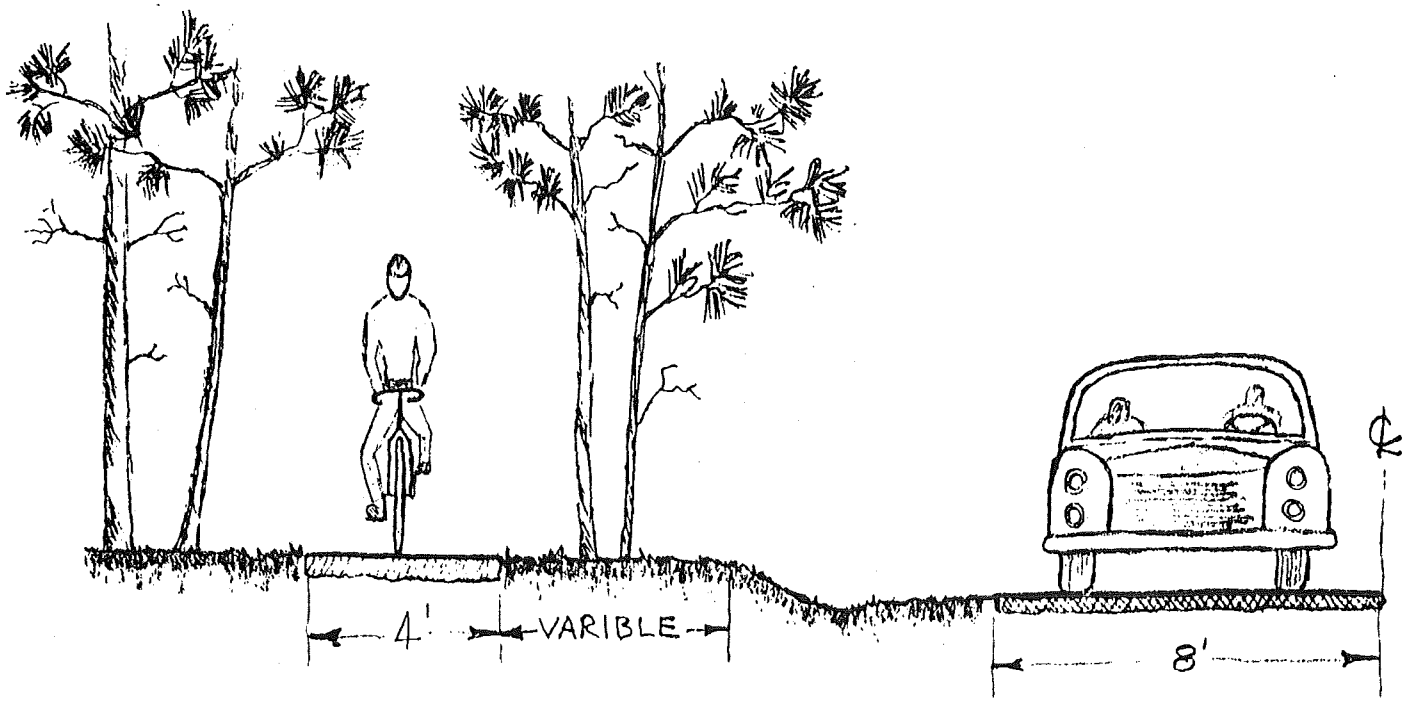


TABLE 1 MINIMUM COSTS PER MILE FOR CLASS I BIKEWAY

ITEM	UNIT COST	2 LANE BIKEWAY 8 FEET WIDE
2" Bit. Surface	$20 per Ton	$2.00/L.F.
6" Aggregate Subbase	$ 5 per C.Y.	$0.75/L.F.
Excavation	$ 2 per C.Y.	$0.40/L.F.
Sub-total	-	$3.15/L.F.
10% Contingencies	-	$0.32
Total	-	$3.47/L.F.
Min. Cost per Mile	-	$18,000/MILE

II. Class II Bikeway

A. Definition - A restricted right-of-way within the highway right-of-way designated for the exclusive or semi-exclusive use of bicycles. Through-travel by motor vehicles or pedestrians is not allowed. However, cross-flows by motorists for example to gain access to parking facilities or associated land use, is allowed.

B. Urban Areas -

1. General - In this section several alternate schemes for incorporating a Class II one-way bikeway shall be presented. Since there are serious problems in interfacing a two-way Class II bikeway with motorized and pedestrian traffic at intersections along a urban bikeway route, the analysis here is limited to one-way alignment alternatives. It is widely recommended that in general two-way designs be limited to Class I bikeways. One-way Class II alternative can be symmetrically employed on both sides of the street, or if conditions warrent, two different alternatives can be used for a given street section. The alternatives to be presented are thus only shown for one side of the street. Two sets of Class II bikeway alternatives shall be presented. The first set consists of bikeways incorporated at the grade of the sidewalk thus achieving grade separation with respect to the roadway; the second set consists of alternatives where the bikeway is on the roadway.

2. Sidewalk Alternatives -

a. General - These alternatives minimize motor vehicle - bicycle interaction, and parallel pedestrian - cyclist conflict. If they are located where significant pedestrian crossflows will occur, the alternative can disrupt flow on the bikeway and increase the likelihood of pedestrian-bicyclist accidents. These alternatives provide separate lanes on the sidewalk allocated for cyclists and pedestrians. A painted stripe is the most feasible method of separation.

b. Alternate II-A (see figure 1) - This alternative is appropriate in residential areas which are characterized by infrequent pedestrians and where there are frequent driveways (cyclists would tend to use the pedestrian right-of-way if Alternate II-B were used in this case). Where crossflows are necessary,Alternate II-A when associated with single family dwelling units, and parking may reduce conflicts over Alternate II-B. This alternative is not recommended for commercial areas, as it provides no setback from the associated land use.

ROADWAY CROSS SECTION

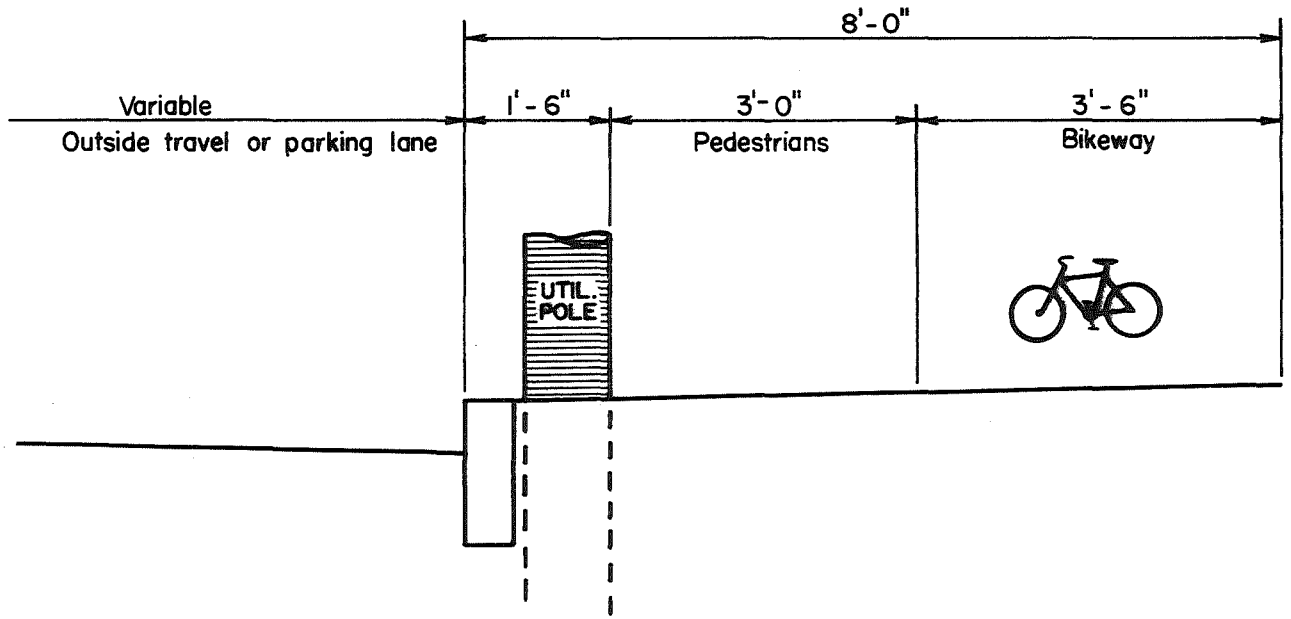


FIGURE I. Class II Bikeway Alternate II-A

ROADWAY CROSS SECTION

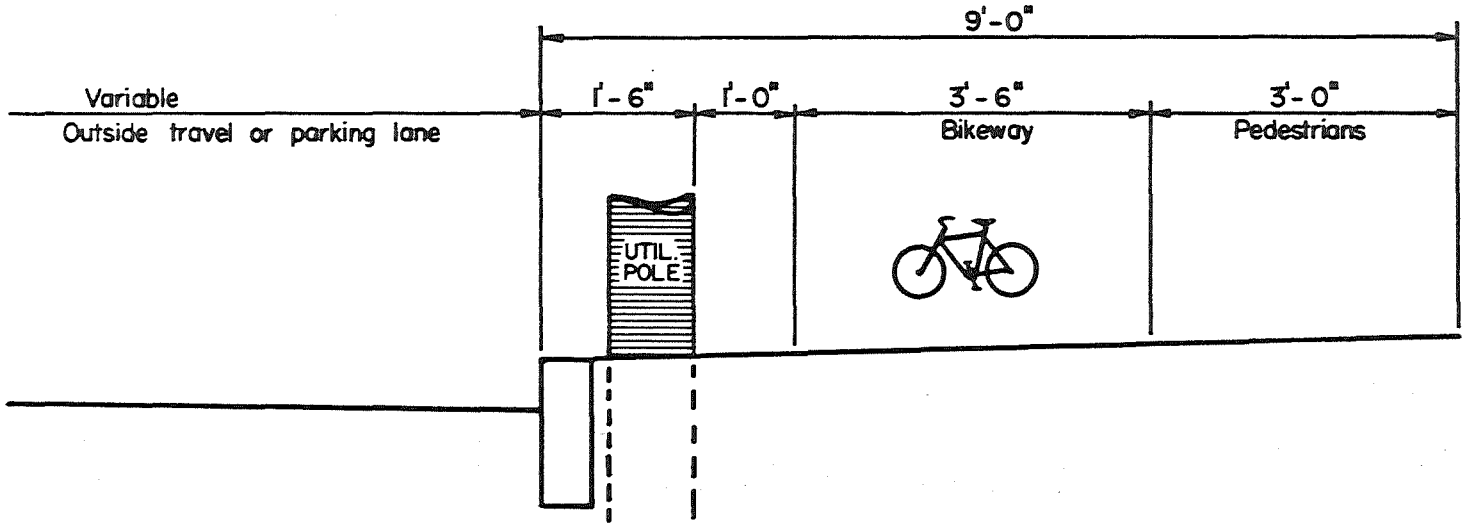


FIGURE 2. Class II Bikeway Alternate II-B

c. Alternate II-B (see figure 2) - This alternate is appropriate in multi-family development areas as it provides a clearance from frequent motor vehicles departing from driveways. If sidewalk alternatives are found to be feasible in commercial areas this alternate is recommended as it provides a set-back from the associated land usage. However, prior to selecting a sidewalk alternative in a commercial area impact studies must be performed even if low pedestrian flow and bicycle demand are anticipated. The feasibility of Alternate II-B in a commercial area depends basically on the parking rate turn-over and the bikeway demand, assuming sufficient paved sidewalk area is allocated to meet pedestrian demands, and land use impacts are favorable.

3. Roadway Alternate -

a. General - Incorporating the bikeway on the roadway requires more careful consideration than on the sidewalk as the conflicts from both the parked cars and moving motor vehicles pose more serious consequences to the cyclist. Thus the parking density, turnover rate, volume of traffic on the outside lane, percentage of trucks, speed, and bike volume are major determiners of the feasibility of separating the bicycle from the motor vehicle by a painted stripe.

b. Alternate II-C (see figure 3) - This alternate assumes that a parking lane exists which can be utilized as a bikeway by the elimination of parking. It reduces the parallel conflict of bicycle and motor vehicle by defining separate rights-of-way but since encroachments by moving vehicles is possible with striping, as is the encroachment of the bicycle onto the motor vehicle lane, it will not eliminate cross-conflicts. As this alternate assumes the bikeway is provided by the total elimination of parking in an existing lane, no cost is anticipated except that of striping and signing.

c. Alternate II-D (see figure 4) - This alternate provides a bikeway between the outside travel lane and the parking lane by defining an encroachable right-of-way. This alternate will have all the possible conflicts between the moving motor vehicle and the bicycle that were discussed under Alternate II-C and, in addition, will expose the bicycle to motor vehicles crossing the bikeway to park and to the likelihood of door opening conflicts. It is therefore only recommended under conditions of low parking turnover rates and low volumes and low speeds in the outside travel lane.

ROADWAY CROSS SECTION

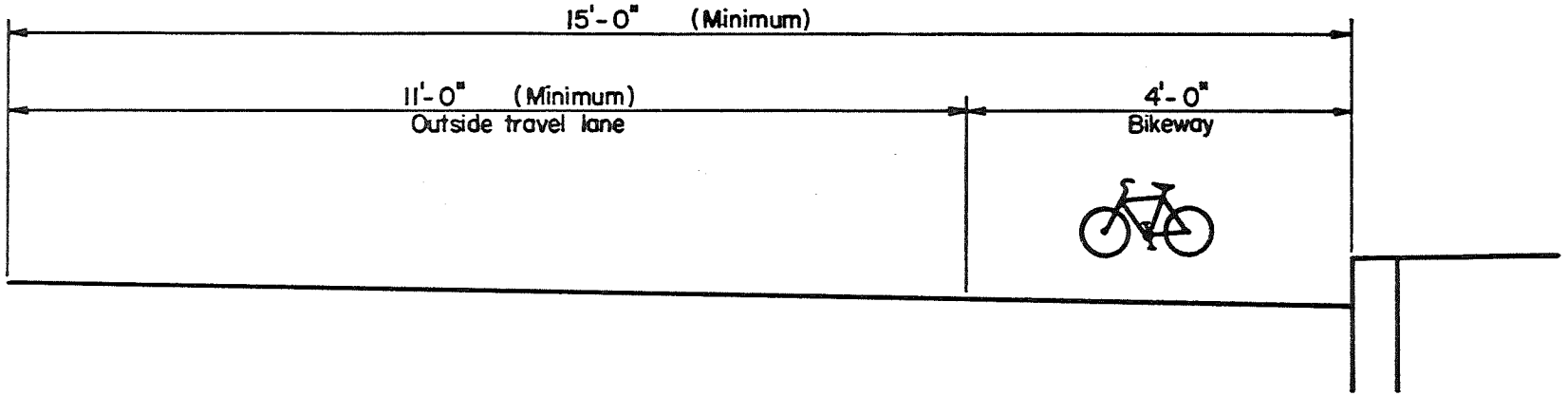


FIGURE 3. Class II Bikeway Alternate II-C

1/30/74

ROADWAY CROSS SECTION

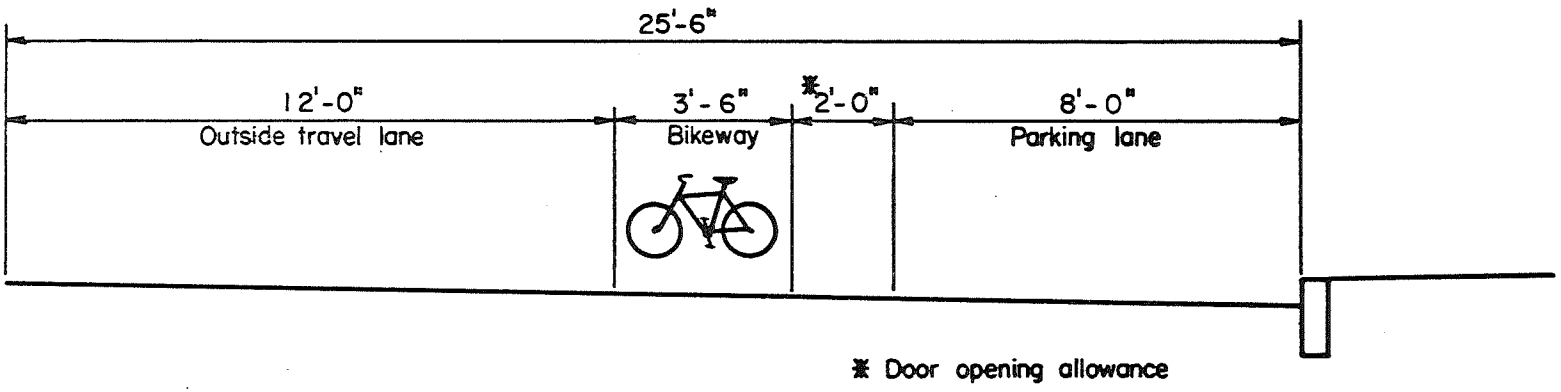


FIGURE 4. Class II Bikeway Alternate II-D

1/30/74

C. Rural Areas -

1. General - In this section a plan for providing a Class II one-way bikeway shall be presented. Since there are serious problems in interfacing a two-way Class II bikeway with motorized traffic at intersections and since the operation of a two-way system on one side of the highway would be contrary to the expected traffic patterns, the analysis here is limited to one-way alignments with the assumption that the alternatives can be symmetrically employed on both sides of the highway. The only alternative to be presented is the utilization of the roadway shoulder as a Class II bikeway. Minimum costs per mile are given in TABLE 2 for the conditions of new construction and the construction of the bikeway only along the existing highway.

2. Alternate II-E (see figure 5) - This alternate provides a bikeway on the shoulder of a rural highway. This alternate, by defining separate rights-of-way, will reduce parallel bicycle - motor vehicle conflicts but since encroachments by moving vehicles is possible with only a stripe separating the two, it will not eliminate cross-conflicts caused by either vehicle straying out of their designated area. For this reason it is recommended that the bikeway be located on the outside portion of the shoulder when it is economically feasible.

ROADWAY CROSS SECTION

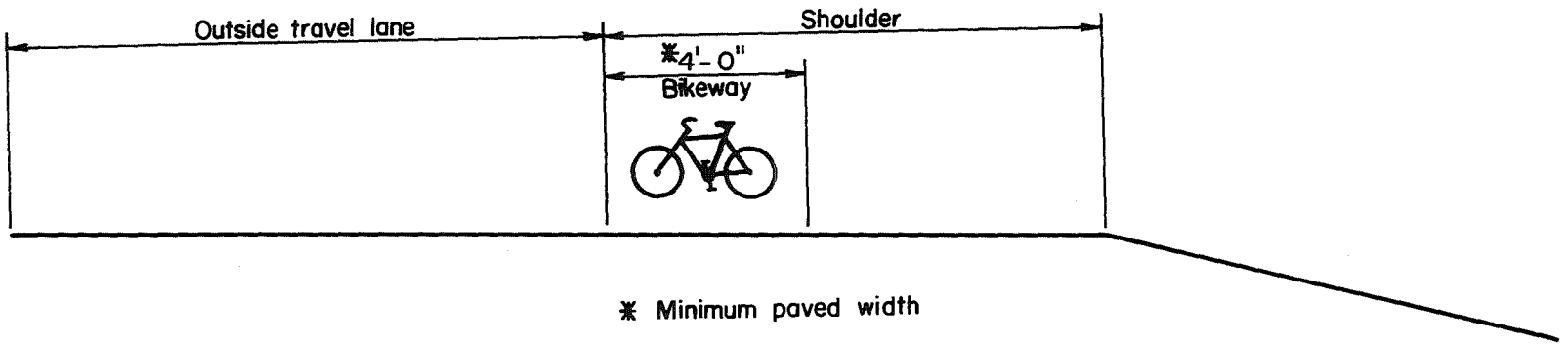


FIGURE 5. Class II Bikeway Alternate II-E

TABLE 2. MINIMUM COSTS PER MILE FOR CLASS II BIKEWAYS

ALTERNATE	ITEM	UNIT COST	COST
II-A (New Const.)	2" Bit. Surface	$ 30/ton	$ 0.73/LF
	6" Agg. Subbase	4/C.Y.	0.15/LF
	Excavation	3/C.Y.	0.15/LF
	Sub-total		$ 1.03/LF
	10% Contingencies		.10
	TOTAL		1.13/LF
	MINIMUM COST PER MILE		$6000/Mile
II-A (Widening)	2" Bit. Surface	30/ton	0.37/LF
II-B (Widening)	6" Agg. Subbase	5/C.Y.	0.09/LF
	Excavation	5/C.Y.	0.12/LF
	Sub-total		0.58/LF
	10% Contingencies		.06
	TOTAL		0.64/LF/FT
	MINIMUM COST PER MILE PER FOOT OF WIDENING		3,400
II-B (New Construction)	2" Bit. Surface	30/ton	1.10/LF
	6" Agg. Subbase	4/C.Y.	.22/LF
	Excavation	3/C.Y.	.22/LF
	Sub-total		1.54/LF
	10% Contingencies		.15
	TOTAL		1.69/LF
	MINIMUM COST PER MILE[2]		9,000

TABLE 2. MINIMUM COSTS PER MILE FOR CLASS II BIKEWAYS

ALTERNATE	ITEM	UNIT COST	COST
II-D (New Const.)	3" Bit. Surface	$ 15/ton	$ 0.96/LF
	28" Agg. Subbase	4/C.Y.	1.21/LF
	Excavation	3/C.Y.	1.00/LF
	Sub-total		3.17/LF
	10% Contingencies		.32
	TOTAL		3.47/LF
	MINIMUM COST PER MILE[3]		18,500
II-E (New Const.)[4]	2-1/2" Bit. Surface	15/ton	0.92/LF
	Tar	0.60 gal.	0.21/LF
	Cover Sand	10.00/C.Y.	0.11/LF
	2-1/2" Agg. Subbase	4.00/C.Y.	0.12/LF
	Sub-total		0.48/LF
	10% Contingencies		.05
	TOTAL		0.53/LF
	MINIMUM COST PER MILE		2,800

TABLE 2. MINIMUM COSTS PER MILE FOR CLASS II BIKEWAYS

ALTERNATE	ITEM	UNIT COST	COST
II-E (Existing)	Grading		$200/mile
	2" Bit. Surface	$20/ton	5,163/mile
	Sub-total		5,363/mile
	10% Contingencies		5,900/mile
	MINIMUM COST PER MILE		5,900/mile

[1]As previously discussed for Class I Bikeways, the cost will vary with the topographical, soil and climate characteristics of the particular area. The figures shown are for a minimum section and to these totals should be added the estimated costs for the applicable additional items discussed under Class I Bikeways.

[2]Estimate based upon the additional width required beyond the normal 6 foot sidewalk.

[3]Estimate based upon the additional width required beyond the normal 22 for roadway.

[4]No cost for high type highway which would normally have paved shoulders. For other highways cost shown is replacement of 4' tarred shoulder with bituminous surface.

IMPLEMENTATION

Alternative designs were considered by the highway design division of the Bureau of Highways, Maine Department of Transportation and the several classes were discussed.

Costs were developed on a per mile basis, describing minimum cost per mile; however, general grading, earthwork, and other important factors would vary significantly with the terrain. Some of the costs, other than grading, include signs, striping, fences, lighting and landscaping. The minimum cost per mile estimate would be increased by whatever else was necessary.

It should be noted that, not all rural highways will have the kind of bicycle usage which dictates a paved shoulder for bicycle use. More specifically, any and all of the designs being considered here, should be justified, based on the type and frequency of bicycle use.

In the preceding section, on bikeway design, the associated costs are indicated and the listing shows minimum costs per mile. Each section of bikeway must be evaluated on a case by case basis in order to determine what additional costs will be involved.

Examples of possible additional costs are shown here in order to indicate a possible range of costs for a bikeway facility.

Drainage ditching (min. 60¢ per L.F)	$ 3,000 per mi.
Barriers or fencing ($2.00 per L.F.)	$10,000 per mi.
Shrubs to form screen or barrier ($1.50 per L.F.)	$ 7,000 per mi.
Striping (3" Solid Line)	$ 500 per mi.
Signing (40 per mile)	$ 800 per mi.

(There are several areas of cost other than those listed and the above are a few of those noted in a review of technical publications.)

The range of costs for completed bikeway facilities, in other areas, is generally from a low of $20,000 per mile to a high of $48,000 per mile for an 8-foot wide,Class I bikeway.

The immediately available alternates, from the standpoint of time, cost and space are utilization of some portion of the existing highways.

A satisfactory granular base is required and this would be a free draining material. This provides some assurance of the base and the soil beneath the base retaining the strength and

bearing capacity required. Upon the suitable base, both alternatives would require a two inch thick bituminous concrete surface. Such a surface will provide a reasonable riding surface and should retain its shape. This type of construction would not support heavy loads, nor would it stand up under repeated use by motorized passenger vehicles. All layers of both base and surface should be properly compacted in order to withstand the weight of appropriate construction and maintenance equipment. In the case of paved shoulders, two inches of the existing granular material should be removed, in order to make room for a two-inch bituminous concrete surface. The existing tarred shoulders do not generally provide an appropriate riding surface for bicycling and may have to be replaced.

MAINTENANCE COSTS

Maintenance considerations involve a number of areas such as: sweeping the surface, striping, signs, cutting grass, cleaning up litter and other types of activities to provide reasonable bikeways. Others may involve signals, trash barrels, fences, barriers, etc.

General estimates of overall maintenance costs have run as high as ten percent of the initial construction costs.

Maintenance of the bikeway riding surface should cost far less than that of the highway, as greater numbers and greater weights would be using highways, as compared to bikeways. Striping may last for more than one year, even though that is not the case for highways. Signs do lose their reflective quality and fade considerably and these should be refinished or replaced, periodically. Vandalism in regard to signs will be a concern.

If grass is allowed to grow to the edge of the pavement, some mowing will be required; however, if a sterile strip of granular material is placed next to the pavement, the mowing could be minimized. Litter will probably be as much of a problem on bikeways as on highways, and thousands of dollars a year are spent on litter clean-up on highways. Trash receptacles, would, no doubt, be used and this would require small trucks, on the bikeways to pick up the trash.

Other considerations would be developed on a case by case basis, as different areas require different supportive elements as fences, barriers, lights, etc.

CONSTRUCTION COSTS

Construction costs are tabulated in the section prepared by the Design Division and list costs for the various classes of bikeways. To get the total picture, maintenance costs cannot be ignored. For purposes of this discussion, however, both right of way acquisition costs and maintenance costs will generally be considered separately.

The 8-foot wide Class I bikeway was shown as having a minimum cost per mile of $18,000, and this cost included only surface,

base and excavation. In addition, there are other costs which would normally be an integral part of a bikeway, in varying amounts. Minimum amounts of drainage, landscaping, barriers, fencing, striping and signing would provide a more realistic approach to estimating average costs for bikeway construction. A minimum and a maximum amount of the supplemental work has been costed out and added to the originally stated minimum cost per mile to describe a likely range of costs.

On a Class I bikeway (two-way) the minimum cost per mile for surface, base and excavation would be $18,000 per mile, and an estimate for drainage ditching, fencing, landscaping, striping and signing (used on approximately 30% of the project) would add another $8,000 per mile, bringing the total cost per mile for a conservative project to $26,000 per mile. If the foregoing $8,000 for supplemental work were expanded (assuming supplemental work on 60% of the project) the upper limit for an average project would be $33,000. This describes a range from $26,000 to $33,000 per mile for average projects and is on the conservative side. It does not include any cost for lighting drainage pipes, retaining walls or bridges. In effect, all we have described is a middle range of cost per mile for a completely separated bikeway. The more expensive bikeways would be more common in the area where traffic is heavy.

Class II bikeways fall into several categories and they must be costed out separately.

A Class II-A (one-way) bikeway is a 3'-6" paved facility adjacent to and at sidewalk level and the minimum cost for surface, base and excavation would be $6,000 per mile on new construction. If the supplemental work of shrubs for screening or barriers, striping and signing costs were applied to 30% of a one-mile project this would add $4,150. This would bring the total to $10,150 for the lower limit and the higher range will be $14,300. This means a conservative estimate of the middle range of costs would be from $10,000 to $14,000 per mile for Class II-A bikeways, as part of a new construction project. Widening an existing facility would result in noticeably higher costs, specifically, an additional $6,000 per mile. This brings it up to a $16,000 to $20,000 per mile range.

The same considerations were given to all Class II bikeways to arrive at a reasonable estimate of cost and are shown in the attached table. The costs shown in the tables increase significantly as the complexity of the bikeway plan increases. This would be expected in the more urbanized areas of the State.

TABLE

CONSTRUCTION COST PER MILE

FOR VARIOUS CLASSES OF BIKEWAYS

Class of Bikeway	Minimum Surface Base and Excavating	With Addition of Supplemental Items (Lower Range) [1]	With Addition of Supplemental Items (Upper Range) [2]
I	18,000	26,000	33,000
II-A			
New -	6,000	10,000	13,000
Existing -	12,000	16,000	19,000
II-B			
New -	9,000	13,000	16,000
Existing -	12,000	16,000	19,000
II-C	--	--	--
II-D			
New -	18,500	19,400	20,300
II-E			
New -	2,800	3,700	4,600
Existing -	5,900	6,800	7,700

[1] Applied over 30% of the length of the project.

[2] Applied over 60% of the length of the project.

Supplemental Items Include: Drainage ditching, fencing, shrubs, striping and signing.

Note: Class I is two-way and all others are one-way. In order to provide two-way traffice on Class II Bikeways, a similar facility would be required on the opposite side of the road doubling the cost.

SUMMARY GUIDELINES

As would be expected, the most immediately feasible bikeway from an economic standpoint, appears to be the paved shoulder. This is an acceptable approach where the highway is of a rural design. This would occur in most rural areas and some sub-urban areas. This type of bikeway could be accomplished in the least amount of time and with the least disruption of traffic. It would provide the connecting links between bikeway networks, in the various communities and eventually lead to a connected statewide network of bikeways. Such a statewide network could be planned to provide for biking across the State, as well as bike travel between the major urban areas. It appears, at this time, that bikeways in close proximity to urban areas would get the greatest use and in all probability should be the beginning of bikeway network development.

In other states, the opinion has been expressed that if 500 to 700 commuting automobile drivers could be diverted to bikeways, then up to $40,000 per mile could be justified for construction of a bikeway. They were not clear as to the basis for arriving at this conclusion. The point here, is that bikeway construction can be justified.

Bicycle traffic on highways, where the state has primary responsibility does not, currently, appear to warrant extensive construction of Class I bikeways. It may well be, that the bicyclist is staying off these more heavily traveled roads and using the town roads. More information on usage of such roads might well be a better gage of the increase in bicycling. This would also serve to define corridors of bicycle use and eventually a network.

The real concern appears to be providing facilities in areas where they are immediately needed to reduce accidents and/or where they will be used to reasonable degree. Usage appears to be increasing as reflected in the increase in bicycle accidents. The number of accidents appears to have doubled in the last five years. If bike travel were increasing at the same rate, then such a trend over very few years could have a substantial impact on our highways. During 1973, there appeared to be a leveling off in the number of bike accidents. The next twelve to twenty-four months should be very revealing and we should do all we reasonably can to evaluate the demand, needs, problems and impact of bicycling in the State of Maine.

As for future usage - bikeways are not limited use facilities - conversion to other uses is always possible. This fact should dispell doubts about outlays of money now for bikeways when future use may be questionable. However, the Maine study and that of other states seems to point to considerable future need and use for bikeways.

POTENTIAL BIKEWAYS

INTRODUCTION

The existing road system probably offers the most immediate potential for bicycle facilities. This is especially true when the facility is a commutor lane or Class II Bikeway within the paved portion of the highway or a Class III Bikeway - marked route. The lesser traveled roads with decent width and lower speeds also offer potential. Most studies conducted in various parts of the U.S. indicate a desire by commuting and touring cyclists to travel to a destination following a safe, direct route. Of course, in instances of short recreational, or health-orientated trips this same reasoning need not apply. Availability of services can also be a consideration of greater or lesser importance depending on the trip purpose.

Bikeways may be completely off the road or within or adjacent to the highway travel way. The latter group is usually more transportation oriented. When bikeways are in the former category they are usually recreation orientated. Although bicycle facilities are as varied as the bicycle, paths of five miles or greater generally are for recreation rather than transportation purposes.

As more states and localities become involved in bikeway construction projects, more variations arise.

It is the safety factor, mostly a lack of it, however, that prompts so much talk about bicycle facilities. The separated path is the safest by far of the three general types of bikeways. Whether it be an eighth of a mile or three or ten miles, the greatest factor in its consideration should be safety. Oregon's program, which now has some 30 miles of paths, is premised on provision of safe routes for adult commutors or shoppers as well as school children. The bicycle in Oregon is seriously recognized as a mode of transportation. Potential sources for both transportation and recreational bicycle paths in Maine follow.

HIGHWAY RIGHTS-OF-WAY

ABANDONED ROADWAYS

On those highways, where the Maine Department of Transportation has primary responsibility, the abandoned highway rights-of-way are generally short sections and the great majority of these have reverted to former property owners.

There are longer sections of abandoned town and county roads and some are currently being used as recreational trails. Some of these abandoned roads are overgrown but lend themselves to snowmobiling and hiking trails. Where extensive vegegation and surface interruption has occurred it appears that an appreciable amount of work and accompanying cost would be involved, in order to convert them to surfaced bikeways. While rural bicycle counts appear to indicate there would be insufficient use to justify the cost of rehabilitating such abandoned roads, rural accident fatality rates are high. Due consideration should therefore be given to use of these abandoned roads as alternate route systems.

EXISTING HIGHWAY RIGHTS-OF-WAY

Other areas of potential bikeways were described in the Design and Construction Criteria section. A great deal of that information was prepared by the design section of the Bureau of Highways--Department of Transportation and relates to possible bikeways on the existing highway rights-of-way. There are three classes of bikeways defined. The classifications are similar to current use in other states. The first, the Class I Bikeway, is separated from the existing highway traveled way. The second, the Class II Bikeway, is immediately adjacent to the traveled way (a shoulder or a former parking lane) and would be reserved primarily for bicycle use. The third, the Class III Bikeway, is the shared lane where both autos and bicycles use the same area. In this third category, certain of the existing roads and streets would be signed for bike routes. Signing would be the only change on the road or street.

While the Class III Bikeway offers the least safety for cyclists and is to be generally discouraged, without funding for Class I and Class II facilities, it may be Maine's only alternative. Class III bikeways should, however, only be established on highways with low traffic volume.

Paved shoulders which would allow Class II Bikeways should be seriously considered and could be created with little expense and substantially more safety for the cyclist. If properly signed and striped, these offer the greatest and most immediate potential for safe bicycle facilities in Maine. These bike lanes would be especially useful as connecting routes from community to community, providing commuting, touring and strictly recreational bikeways.

Table 1 provides an indication of the number of miles of treated shoulders on rural Maine roads as of March 1973.

TABLE I

BICYCLE STUDY

Miles of Rural Paved Shoulders*

As Of 3-1-73

	FAP[1]		FAS[2]	
	Treated	Untreated	Treated	Untreated
Androscoggin	30.67	70.31	10.33	117.53
Aroostook	47.32	341.96	15.55	783.55
Cumberland	30.88	169.52	40.44	342.96
Franklin	15.27	147.01	5.20	307.06
Hancock	22.75	158.73	11.93	336.41
Kennebec	7.58	151.46	6.67	690.17
Knox	5.54	117.72	3.50	69.94
Lincoln	2.49	63.09	3.25	141.71
Oxford	16.79	225.45	1.59	377.57
Penobscot	28.75	252.37	17.09	420.11
Piscataquis	11.47	129.25	142.61	142.09
Sagadahoc	3.80	21.14	2.61	132.15
Somerset	13.45	264.81	10.16	361.04
Waldo	11.57	129.21	12.26	157.58
Washington	19.35	182.57	8.86	549.72
York	24.85	215.49	15.36	307.98
TOTAL	292.53	2,640.09	307.41	5,237.57

* Shoulder Mileage is twice Route Mileage.
Rural Mileage does not include Federal Aid Urban.
Paved is either treated or Bituminous Concrete.

1 Federal Aid Primary

2 Federal Aid Secondary

UTILITY RIGHTS-OF-WAY

While at first glance, utility rights-of-way hold great promise as potential bicycle paths, mainly of a recreational nature, further examination leaves their desirability for such use somewhat lacking. During the course of the study, contact was made with several representatives of public utilities in Maine, as well as, the Recreational Vehicles Rights-of-Way Use Sub-committee of the Maine State Liaison Committee of the American Right-of-Way Association. Discussion was also conducted with Mr. Guy Twombly of the Maine Public Utilities Commission.

As a result of these meetings, several factors came to light. Construction of bicycle paths or multi-use trails along the rights-of-way require consideration of certain factors:

1) Recreational use whether for bicycles or cross-country skiing or snowmobiles must be compatible with the particular utility. The first consideration of the utility and the P.U.C. is to protect the safe delivery of service.

2) Liability usually will not be assumed by the utility other than for their own employees. The state, county or locality would have to bear liability or pass this on to the trail or path user.

3) Maintenance would have to be born by an agent other than the utility. The state, county or locality building the trail probably would also assume maintenance.

4) Enforcement of proper or posted use may have to be considered.

5) A bicycle path should be constructed for extended use as it generally requires significant investment to build. Future use, for example for 25 years, should therefore be guaranteed or reasonably assured.

6) In the event a bicycle path must be altered or discontinued, ample provision should be made for relocation and reconstruction.

7) Depending on the type of utility, varying degrees of use of the rights-of-way for bicycle paths is possible.

8) Utility rights-of-way may be acquired either by fee simple (outright clear title to the R.O.W.), or ease ment agreements with property owners. Easements are tied to a specific use and would generally require a request from the owner to alter the use for bicycle paths or other recreational uses.

The following comments concerning each utility will outline the extent of their desirability:

ELECTRICAL UTILITY RIGHTS-OF-WAY - EUROW

These ROW's usually traverse varried terrain cutting swaths of 100 to 170 feet. Little attempt is made by the utility in setting poles to clear away stumps, rocks, or boulders, except where direct pole placement is to occur. Temporary roads or rough routes for machinery are used only for the duration of the line construction. Most subsequent maintenance work is done on foot and helicopter. Brush spraying at 4-5 year intervals also introduces certain chemicals to ROW's surfaces. The potential path for bicycles would therefore be little more than a rough, gutted way cleared of brush and trees. Major path preparation would be necessary and could be costly; in many cases prohibitive. Guidewires would also have to be avoided, suggesting trail placement well outside the pole lines on the fringes of the ROW.

RECOMMENDATIONS

In general, use of electrical utility rights-of-way for bicycle paths should be considered in instances where stretches are reasonably short, and serve as supplements to a larger network of trails.

The Central Maine Power Company has responded verbally in a favorable fashion to inquiries of recreational use of their rights-of-way. However, they will bear no liability in case of accidents. Where rights-of-way were obtained on an easement basis, they caution that negotiations with landowners would be necessary for any additional use such as bicycle paths or multi-use trails. Further, the company will not react in general to a suggestion of bicycle paths on the utility right-of-way, but look for specific pro- posals. This we see as leaving the door ajar for possible negotiations in specific instances.

In conclusion, electrical utility rights-of-way are probably better suited for use by snowmobiles, cross-country skiers and hikers, except for the possible tie-in within suburban or urban bikeway systems.

MUNICIPAL WASTE TREATMENT FACILITIES RIGHTS-OF-WAY

As increasing numbers of Maine communities build public sewage treatment systems, rights-of-way for interceptor lines may serve dual purposes as recreational trail systems. If the community and its engineers are alert, provision for bikeways can be considered in the planning and design and acquisition process. Federal funds are available under the 1972 Water Pollution Control Act. If additional land is necessary, the Bureau of Outdoor Recreation, Land and Water Conservation Fund provides funds at 50% match for acquisition and development.

If only easements are to be taken, they should specify other desired uses such as bicycle paths, at the same time negotiations for sewer lines are being considered. This will save time and money. Bikeways can also be built at the same time interceptor rights-of-way are being regraded.

Lewiston is planning to build an urban bicycle and foot path following a new interceptor line along the Androscoggin River. The path will connect three riverside parks and link the downtown district with outlying residential areas.

NATURAL GAS RIGHTS-OF-WAY

There are approximately 300 miles of natural gas rights-of-way in Maine. Rights-of-way are underground easements only with the individual landowners in control of surface use. Paths would have to be constructed on the surface at the edge of the underground easement, thus avoiding disruption or distruction of the path. Agreements would have to be made with the landowner, probably by separate easement arrangements, for recreational use of the surface area within the cleared rights-of-way. From a legal and extended use standpoint, use of the right-of-way for bicycle paths would seem undesirable except where no other trail could be provided.

RAILROAD RIGHTS-OF-WAY

Perhaps the best sources for bicycle paths lie in the abandoned stretches of railroad rights-of-way which exist throughout Maine. An extensive survey of these rights-of-way was conducted during 1974 by summer interns for the Bureau of Parks and Recreation. Railroad lines were examined in terms of present conditions and potential use as recreational trails. Few are adaptable in their present condition, as bicycle paths. However, several offer significant potential, especially when viewed in terms of linear parks.

Development of linear parks with multi-purpose trails including bike paths is extremely valid in terms of railroad rights-of-way for the following reasons:

1) cost of initial construction is usually high for bike paths

2) this cost is further increased by land acquisition of the rights-of-way from the railroad or present land owners when the title has reverted

3) multiple use of the same rights-of-way by bicycles and hikers in spring, summer and fall and cross-country, snowmobile or snowshoeing enthusiasts in winter allows the greatest benefit for the maximum number of people for the financial outlay

4) development of a bicycle facility where multiple use is anticipated can allow gradual implementation Hiking and winter sports might be the first use groups. All preliminary trail preparation can be undertaken and trails skill used and tested by other groups before bicycle facilities are finally constructed. Vertical and horizontal trail width clearance; planned access points; preliminary surface preparation and bridge planking; route and hazard markings; camping facilities; and trail use monitoring; all can be done as time and finances allow.

Bicycle facilities along abandoned railroad rights-of-way can be divided into two groups 1) day-use 2) overnight touring. The day-use path system ideally should allow for a 5-10 mile trip with parking accommodations at the beginning and end of the trail, a loop or connection with a road should also be considered for those wishing a ride to the trail. If the trail is of state significance, provision of rest facilities must be incorporated. Scenic and historic features should also be included for variety.

Longer distance, overnight paths should consider a trail length of 15-30 miles. Although most touring cyclists prefer the open road, weekend trips along an interesting stretch of river could be especially appealing when cycling, camping and swimming are combined. Adequate rest areas and access points when possible should be 5-10 miles apart, while camping facilities should be 10-15 miles apart depending on trail length.

Day and overnight bicycle trails should usually follow the rights-of-way using connecting stretches of roadway if necessary.

Many railroads lie near population centers. These abandoned routes offer logical day-use recreation opportunity as linear parks and can also be adapted for overnight use with the provision of camping facilities. Launching areas for canoeing is also another possibility where railroads wind along a river or stream.

The federal Water Pollution Control Act of 1972 in conjunction with state efforts proposes to make all Maine waters fishable and swimmable by 1977 and completely pollution free by 1983. Greater land use pressures can therefore be foreseen along river shorelines. Preservation of the adjacent abandoned railroad lines for public recreational activity seems a sane consideration before the rivers of Maine have gone the same route, as the ocean and lake shore areas.

THE WISCONSIN EXPERIENCE

In 1965 Wisconsin became the first state to purchase a thirty mile stretch of about to be abandoned railroad. The miracle of this purchase was the farsightedness of people involved. The route, complete with twenty-three bridges and three tunnels - one of which cost over a half-million dollars to construct new, were bought in a packet for an unbelievable $12,500. Today the trail provides splendid recreational facilities for bicyclists, hikers and snowmobilers.

Similar alertness, given the number of abandoned routes now reverted to landowners in Maine, could have provided Maine with like facilities. It is important, then, that such opportunities not be lost in the future.

RECOMMENDATIONS

Contact has been made by the Bureau of Parks and Recreation with all the known railway companies operating in Maine. Receptivity is high to providing the BPR with a review of the proposed abandonments before formal action is taken. Liaison should continue with these companies and a formalized notification process arranged.

Action of a more immediate nature on routes already abandoned is outlined on the following pages. For more detailed information on each route, see "Abandoned Railroads in Maine, Their Potential for Trail Use", Bureau of Parks and Recreation, Summer 1973.

SPECIFIC RECOMMENDATIONS

MAINE RAILROAD RIGHTS-OF-WAY FOR BICYCLE PATHS

RAILROAD	LOCATION	LENGTH	LEGAL STATUS	PRESENT CONDITION	RECOMMENDATIONS
Poland - Canton Line	Poland - Canton Southern terminous 10 mi.- Lewiston; 30 mi.- Augusta; 44 mi.- Portland. Northern terminous 30 mi.- Lewiston; 30 mi- Augusta; 60 mi.- Portland	41 mi.	Private ownership; one large landowner; used by three snowmobile clubs.	Excellent, has highest rating of abandoned ROW's in student inventory; presently suitable for use by bicycles; has beautiful granet trestle at Mechanic Falls; several R.R. stations; rest and camping facilities and services along the way; excellent access points; swimming facilities	Trail should be established immediately (Spring '74) by Parks & Recreation as combined bicycle route/snowmobile trail. Should become part of Statewide trails system. Proximity to large population centers, good weekend trip, southern terminous near new Range Pond State Park. Northern terminous has private campground. Some provision for rest area at West Minot - could be locally generated. Parks & Recreation should also work with American Youth Hostel to establish a hostel in Buckfield (20-5/6 mile from Poland) since no overnight facilities are available. Bus service from Canton and Mechanic Falls. Only signs need to be provided

SPECIFIC RECOMMENDATIONS

MAINE RAILROAD RIGHTS-OF-WAY FOR BICYCLE PATHS

RAILROAD	LOCATION	LENGTH	LEGAL STATUS	PRESENT CONDITION	RECOMMENDATIONS
Boston & Maine Eastern Route	South Berwick to Scarborough (Southern terminous 53 miles-Portland; 15 mi-Portsmouth; 75 mi.-Boston. Northern terminous 8 mi.-Portland; 40 mi.-Lewiston; 65 mi-Augusta.	50 mi.	Three owners - Portland Gas & Light Company, Div., Northern Utilities; Biddeford Water Dist.; Swenson Gravel Corp.	Generally good & passable; some trestles missing; access & services frequent.	Highly recommended in Abandoned Railway Study (ARS). Suitable for several trail uses. ROW should be seriously examined during Spring '74. Preliminary negotiations should be resumed with Northern Utilities for its use. Maintenance to be assumed by Bureau of Parks & Recreation. Exploration of northern extension from Scarborough to So. Portland should also take place at the same time. Location excellent to serve most populated area of the state; offers excellent long & short touring alternate to heavily traveled Route 1. Pilot Study recommended in ARS should be implemented.

SPECIFIC RECOMMENDATIONS

MAINE RAILROAD RIGHTS-OF-WAY FOR BICYCLE PATHS

RAILROAD	LOCATION	LENGTH	LEGAL STATUS	PRESENT CONDITION	RECOMMENDATIONS
York Beach	Kittery Point to York Beach	7 miles	Abandoned	3 miles is dirt road, 1 mile medium duty road	Both lines offer possible connecting routes with the So. Berwick to Scarborough ROW. These routes should be seriously examined for spurs of this longer route as well as for possible local development
Boston & Maine	Kennebunk to Coopers Mills	4 1/2 mi.	Abandoned	Passes along the Mousam River to Kennebunk Beach thru marsh to Kennebunkport.	

SPECIFIC RECOMMENDATIONS

MAINE RAILROAD RIGHTS-OF-WAY FOR BICYCLE PATHS

RAILROAD	LOCATION	LENGTH	LEGAL STATUS	PRESENT CONDITION	RECOMMENDATIONS
Bangor-Old Town Trolley Line	Bangor to Old Town	10 mi.	Reverted to private owners	Good passable condition; some use of alternate routes necessary	Proximity to Maine's third largest urban area and its major university campus, which reports some 4,000 cyclists, would seem to make this route highly desirable as a community recreation route. Also offers hiking and cross-country possibilities. Highly recommended for further exploration by the Penobscot Valley Regional Planning Commission and local citizens' committee with state assistance. Should also be considered as day-use linear park. Recreation easements with present owners may be a possibility

SPECIFIC RECOMMENDATIONS

MAINE RAILROAD RIGHTS-OF-WAY FOR BICYCLE PATHS

RAILROAD	LOCATION	LENGTH	LEGAL STATUS	PRESENT CONDITION	RECOMMENDATIONS
Sanford & Eastern	Springvale	2-3/4 mi.	Uncertain, possibly owned by the town of Sanford	Excellent for all but a few hundred feet of area requiring fill.	Possible ownership by the municipality; extreme proximity to Nasson College; access to Deering Pond a potential swimming facility; and present excellent condition make this a route of high local significance. It is recommended that a cooperative project of the college and community be undertaken to assure this route as a future combination bicycling, nature & cross-country trail.
Maine Central	North Yarmouth to Cumberland Center	6-1/2 mi.	Abandoned	No field check; exact condition unknown	ROW should be examined for possible link with Council of Governments Regional Bicycle network. Proximity to Bradbury Mtn. State Park and population centers of Portland and Bath-Brunswick.

SPECIFIC RECOMMENDATIONS

MAINE RAILROAD RIGHTS-OF-WAY FOR BICYCLE PATHS

RAILROAD	LOCATION	LENGTH	LEGAL STATUS	PRESENT CONDITION	RECOMMENDATIONS
Albion-Wiscasset	Alna to Whitefield	6 mi.	All ownership reverted to individual private owners. Recreation easements necessary	Generally poor, bridge missing, forested growth filling in.	ROW from Alna to Whitefield borders a favored white/water canoeing area; 6 mi. stretch offers great potential as hiking, cross-country, bicycling trail. Boat launch, parking and picnicking facility could be combined at either end of route. Location near several population centers. Significant restorative value.
Shawmut - Skowhegan	Shawmut to Skowhegan	5 miles	Very favorable; held in fee simple by Maine Central	Excellent condition trestles still remain.	While the only feature of this route is its parallel to the Kennebec which is not always in proximity, highly favorable legal status as well as suitable day use trail length warrent examination by Parks & Recreation & Department of Transportation before ROW is sold.

SPECIFIC RECOMMENDATIONS

MAINE RAILROAD RIGHTS-OF-WAY FOR BICYCLE PATHS

RAILROAD	LOCATION	LENGTH	LEGAL STATUS	PRESENT CONDITION	RECOMMENDATIONS
Bridgton - Harrison Narrow Gauge Railroad	Hiram - Bridgton	15mi.	Private ownership; permitted use of snowmobiles	Trail is in good condition; three snowmobile clubs maintain the trail systems & have erected 3 serviceable bridges over old trestles.	Serious consideratio should be given to development of this already maintained and groomed route as a multi-purpose trail for both bicycles and snowmobiles. Links can be made with the pilot route at Sebago Lake State Park and from Naples. The route could be some 25 miles in length through varied and scenic territory in the heart of sourthern Maine's prized lake district.

Recommendations have been made not only on the basis of present conditions but also with regard to restoration of ROW's for valuable future recreation and open space use.

CUMBERLAND AND OXFORD CANAL

This historic canal once ran from Sebago Lake to Portland at the mouth of the Fore River. A well known lending institution in Portland bears its name. While a good portion of the canal now resides in private holdings, the canal itself and the parallel tow path are visable along several miles. Considerable research has been done by Asst. Professor Joel Eastman of the University of Maine at Portland-Gorham. The Greater Portland Council of Governments has also reviewed the canal and its potential in their open space and recreation plans.

RECOMMENDATIONS

1. Consideration should be given to incorporating a bicycle path in conjunction with the proposed Westbrook Arterial. Safe commuting routes between Portland and Westbrook are practically non-existent. Such a facility could be financed by federal funds and provide much benefit.

2. Combination bicycle and pedestrian paths should be designed and built along sewer interceptor rights-of-way, which are build along the old tow path. Again, federal funds could provide financing.

3. Those portions of the route, where the canal and tow path still remain, should be placed immediately in recreation easements with the cooperation of local and state officials. This preserved area could serve as a linear park for bicycling, hiking and cross-country use. Historic markers could also be placed along the trail at strategic rest spots.

POTENTIAL FUNDING

In order to establish a system of safe bikeways, Maine should take advantage of several different funding sources. A listing of significant federal, state, and local programs is provided on the following pages. Federal prospects of late seem to be increasing as there's greater recognition of bicycling nationally. A note of caution must be interjected, however. Most federal funding requires bicycle facilities to be part of a wider comprehensive program i.e. a statewide recreation plan, or an urban renewal plan. Further, in the case of the Federal Highway Act, no new monies have been appropriated, but rather a new eligibility category. Funding may also be questionable due to impounding practices.

Several states, noteably Oregon and California have established their own bicycle funds. Oregon allots no less than 1 of its highway revenues annually to bicycle facilities. California allots $360,000 annually from the State Highway Budget to be set aside for construction of bicycle facilities related to the State Highway System. In addition, California has two other innovative means of revenue. One a Bicycle Lane Account absorbs $30,000 per month of the city/county share of the state gas tax for local bicycle lane projects.

Examples of local revenue generators include use of a portion of bicycle registration fees for facilities construction, safety education and enforcement.

In Maine, communities have already funded bicycle route signs. Falmouth has expended $3,000 for bicycle path construction. At the state level, municipal recreation funds have been available in combination with the Federal Bureau of Outdoor Recreation grants. These funds are specifically tied to recreation oriented projects but to date, no community has used this source. Transportation oriented bicycling has been undocumented until recently. Little has, therefore, been done to finance commuting facilities. There is some probability that use of the dedicated highway revenues may be possible to build certain types of bikeways. A formal legal opinion has been requested as part of this study to clarify the perimeters of such use.

Future bikeways, no mater what the funding source, should have close cooperation of local, regional, state and federal agencies and representatives to assure the greatest benefit for the dollars spent.

TABLE 1

POTENTIAL FEDERAL ASSISTANCE FOR BICYCLE FACILITIES

ADMINISTERING AGENCY	ACT/BILL	TYPE OF FUNDING (AMOUNT)	BASIS OF BICYCLE FACILITY FUNDING
Department of Interior Bureau of Outdoor Recreation	Land & Water Conservation Fund Act of 1965	50/50 cost sharing	Must be part of statewide recreational plan; must be sponsored by public agency; priority to urban areas; for planning, acquisition & development; State determines to which projects and in what order money awarded; special consideration to improving environment.
	Historic Preservation Program	Up to 50% of cost	Acquisition or development for historic preservation purposes of districts, sites, buildings, structures, objects; preparation of statewide historic preservation surveys & plans; must be in accord with comprehensive statewide historic preservation plan approved by Secretary of the Interior.
Jointly with Dept. of Agriculture	National Trails System Act	---	Primarily for land acquisition; possible aid for development & maintenance.

POTENTIAL FEDERAL ASSISTANCE FOR BICYCLE FACILITIES

ADMINISTERING AGENCY	ACT/BILL	TYPE OF FUNDING (AMOUNT)	BASIS OF BICYCLE FACILITY FUNDING
Department of Transportation Federal Highway Administration	Highway Trust Fund	90/10 cost sharing	Must be applied for by State Highway Department in conjunction with federal aid highway project. (inter-state)
		70/30 cost sharing	Money apportioned for urban and rural Primary and Secondary Road systems and urban systems can be used to construct separate or preferential bicycle facilities in conjunction with federal aid highway projects
	Highway Safety Grant (Bicycle Safety Project)	Grant	For education primarily. In some localities funds have been used to construct bicycle facilities.
Department of Housing & Urban Development	Section 702 of Housing Act of 1954	Interest-free advances	Planning of specific public works or facilities; repayable when construction commences.
	Historic Preservation Grants	Up to 50% of project costs	To states & local public bodies for acquisition, restoration or improvement of sites, structures areas of historical or architectural significance; must be in urban or urbanizing area.

TABLE 1

POTENTIAL FEDERAL ASSISTANCE FOR BICYCLE FACILITIES

ADMINISTERING AGENCY	ACT/BILL	TYPE OF FUNDING (AMOUNT)	BASIS OF BICYCLE FACILITY FUNDING
Department of Housing & Urban Development	Open Space Land Program (Title VII of Housing Act 1961)	Up to 50% of cost	Acquisition & development of land for open space use; must be in accord with local & areawide comprehensive planning; must be state or local public body; acquisition costs including cost of acquiring land & certain structures, demolition of inappropriate structure & real estate services; improvement costs include basic facilities such as roadways, signs, landscaping, etc., but not major construction, etc.
Department of Health, Education & Welfare Office of Education	Title I, II, IV & V of Elementary & Secondary Education Act of 1965 & Title I of Higher Education Act of 1965	Grant-in-Aid programs	Must be used in association with educational improvement or research depending on which grant applied for.
Department of Labor Manpower Administration	Neighborhood Youth Corps	Up to 90% of cost of approved projects	Projects which contribute to conservation, development, management of natural resource or recreation area; priority given to high training potential.

TABLE 2

SIGNIFICANT EXAMPLES OF STATE FUNDING FOR BICYCLE FACILITIES

TYPE OF FUNDING	PROGRAM	EXAMPLES
1% gas tax revenues	States, cities & counties must spend at least 1% on bicycle facilities; may credit to financial reserve for 10 years	Oregon Michigan Washington California
Gas	On-street marking & signing	Illinois
Highway Department funds	Bicycle facilities within highway system	Arkansas
Department of Natural Resources Grants	Acquisition, development and maintenance	Alaska
	Authority to buy rights-of-way, right of eminent domain	Ohio
$100 million Recreation Bond Program	Usually confined to state parks and forests	Michigan

TABLE 2

SIGNIFICANT EXAMPLES OF STATE FUNDING FOR BICYCLE FACILITIES

TYPE OF FUNDING	PROGRAM	EXAMPLES
Special appropriations	Williamette River Parks Program: 75% acquisition of right-of-way	Oregon
	Administered by Hwy. Dept. ($50,000)	Arizona
	Administered by Dept. of Natural Resources ($30,000)	Minnesota
	Administered by Dept. of Trans. ($25,000 planning, $50,000 pilot bicycle trail)	Georgia
	$10,000 to study needs	Iowa
	----	Tennessee
	----	Wisconsin
2¢ cigarette tax	Two long-distance trails	Minnesota

TABLE 3

EXAMPLES OF LOCAL AND PRIVATE FUNDING FOR BICYCLE FACILITIES

TYPE OF FUNDING	PROGRAM	EXAMPLES
Gas tax	$40,000 in 1971-72 $17,000 in 1973-74	San Jose, California
Capital improvement budget	$25,000 - 56,000	Denver, Colorado
General fund appropriation	$15,000 in 1971-72	San Jose, California
Dealer licensing	$10.00/year - used for administration	St. Paul, Minnesota
Bike licensing and/or registration	$1.00/year - 1/2 used for facilities	Portland, Oregon
	$1.00/year - used for administration	Denver, Colorado

BICYCLING VS. THE MAINE CLIMATE

The Maine climate is considered rugged by some - at least when it comes to the winter months. Bicyclists in Maine, even the hardier variety usually consider March to November as the bicycle season. During winter 1973 and the first of 1973-74, the weather had been milder than most we've been used to experiencing for years. A further chcek with the National Weather Service and the New England River Basins Commission meteorologist gave some parameters for determining the extent of Maine bicycling weather from Presque Isle to Kittery.

Data was available for five areas only (Presque Isle, Bangor, Waterville, Augusta and Portland). Criteria, set after the deliberations with cyclists of varying experiences, was as follows:

Criteria for Maine Cycling Weather

Temperature 20° - 98°
(65-70° is considered most comfortable for cycling)

Precipitation Sunny to showers

Snow cover data was also added in winter months for probability of road conditions

In Maine during 1971-1973, 52% of the days were suitable for biking. The worst year statewide was 1972 with 49.9% of the days suitable. The best of the three years was 1973 with 54.3%. As is not surprising, the Presque Isle area had only 38.8% of a possible 1,095 (3 x 365) days during the last three years when bicycling was possible or comfortable. Portland with 58.5% had the highest number of days. In 1973, Augusta and Waterville with 219 and 223 cycling days respectively, had an even higher number of suitable days.

All of this information is extremely valuable when balanced with facilities demand data in each area. Various types of bicycle facilities are possible. Cost/benefit analysis seems to have some validity in justifying the establishment of bicycle facilities. Climatological data should be part of that analysis. More specific study should, of course, be done on area climates, as well as other data, but for our purposes here generalities can be drawn. Presque Isle with lower traffic problems and fewer cycling days, might be examined in light of paved shoulder/bicycle lanes with route marking signs. Portland on the other hand with considerable traffic problems, more cycling days and citizen demand, should be considered for commutor routes and destination routes to local beaches and recreation areas.

While the average temperature may be warmer in other cities as in Tucson, Arizona which boasts some 85% bicycling days - some of those days are over 100° not our idea as pleasant. Maine can take comfort in the three-forths of the year which may produce favorable bicycling days. In recent years cycling may begin as early as February. We contend that's not bad for a "rugged" climate.

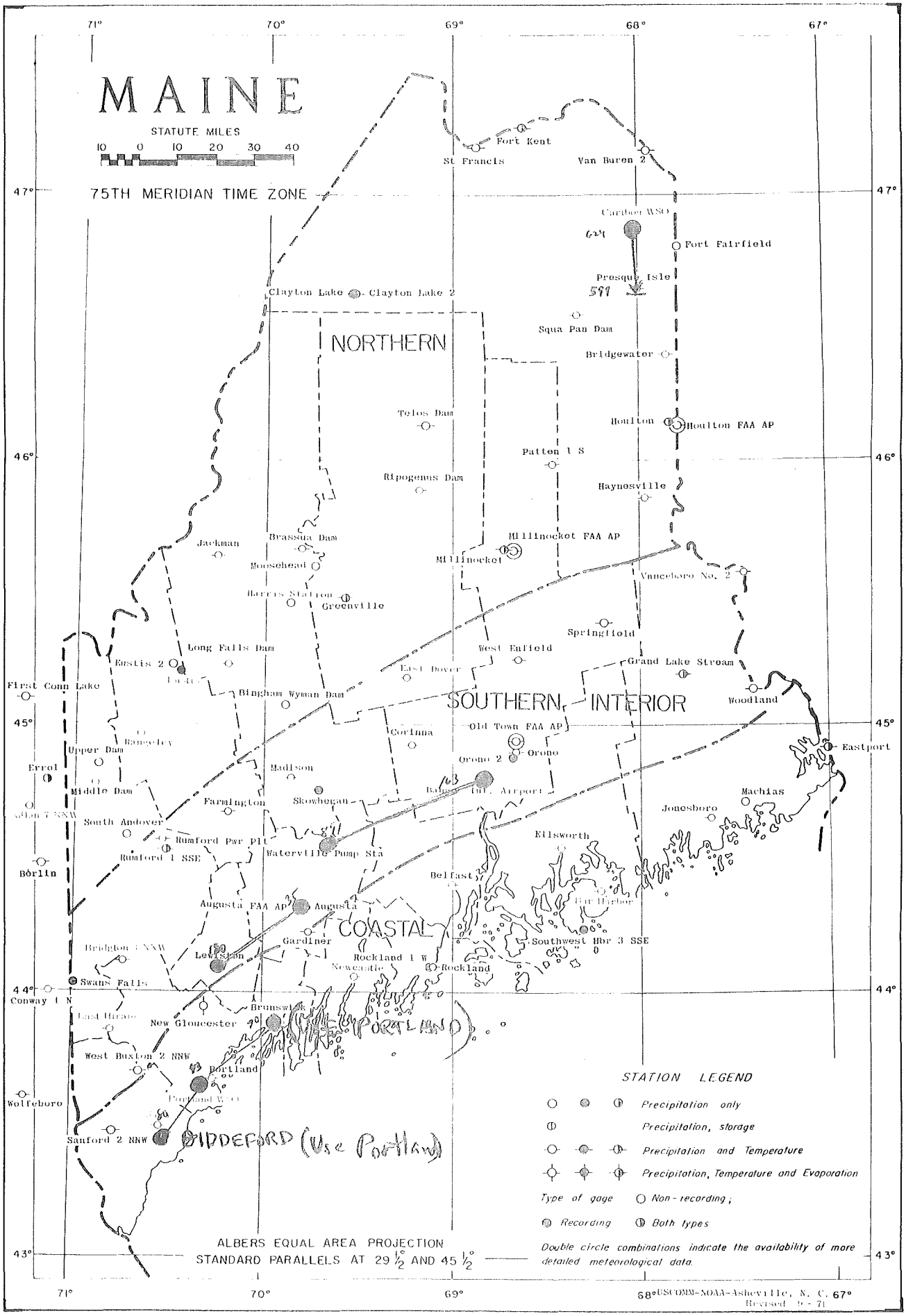
GOOD DAYS FOR MAINE BICYCLING

LOCATION	1971	1972	1973	AREA TOTAL			
Presque Isle	161	147	144	452	avg. of 1,095	=	38.8%
Bangor	188	NA (188)	NA (188)	(564) 88	(1 yr. only)	=	51.5%
Waterville	191	193	223	607		=	55.4%
Augusta	191	175	219	585		=	53.4%
Portland	214	209	218	641		=	58.5%
Statewide	945	724 (912)	804 (992)	2,849	5,475	=	52.0%
Average	189	182.4	198.4				
%	51.7	49.9	54.3				

Temperature -- 20° - 98°

Precepation -- Sunny - intermitent showers

Ground Cover -- No snow reported


MAINE
STATUTE MILES
10 0 10 20 30 40
75TH MERIDIAN TIME ZONE
71°
70°
69°
68°
67°
47°
46°
45°
44°
43°
NORTHERN
SOUTHERN INTERIOR
COASTAL
Fort Kent
St Francis
Van Buren 2
Caribou WSO
Fort Fairfield
Presque Isle
Clayton Lake
Clayton Lake 2
Squa Pan Dam
Bridgewater
Telos Dam
Houlton
Houlton FAA AP
Patten 1 S
Ripogenus Dam
Haynesville
Jackman
Brassua Dam
Moosehead
Millinocket
Millinocket FAA AP
Vanceboro No. 2
Harris Station
Greenville
Springfield
Long Falls Dam
Enstis 2
West Enfield
East Dover
Grand Lake Stream
First Conn Lake
Bingham Wyman Dam
Woodland
Old Town FAA AP
Corinna
Eastport
Upper Dam
Orono 2
Orono
Errol
Madison
Middle Dam
Farmington
Skowhegan
Machias
Jonesboro
South Andover
Rumford Pwr Plt
Rumford 1 SSE
Waterville Pump Sta
Ellsworth
Berlin
Belfast
Augusta FAA AP
Augusta
Bar Harbor
Gardiner
Southwest Hbr 3 SSE
Bridgton 3 NNW
Lewiston
Rockland 1 W
Newcastle
Rockland
Swans Falls
Conway 1 N
Brunswick
East Hiram
New Gloucester
PORTLAND
West Buxton 2 NNW
Portland
Portland WSO
Wolfeboro
Sanford 2 NNW
BIDDEFORD (Use Portland)
STATION LEGEND
Precipitation only
Precipitation, storage
Precipitation and Temperature
Precipitation, Temperature and Evaporation
Type of gage
Non-recording;
Recording
Both types
Double circle combinations indicate the availability of more detailed meteorological data.
ALBERS EQUAL AREA PROJECTION
STANDARD PARALLELS AT 29 1/2° AND 45 1/2°
USCOMM-NOAA-Asheville, N. C. 67°
Revised 9-71

THE BICYCLE AND THE ENERGY CRISIS

In light of the present, real and/or imagined crisis in energy that besets Maine, a few words on that topic would seem appropriate. At the outset of this study, in mid-summer 1973 and even more, especially in early March 1973 when the legislation for the study was passed, the energy crisis was only a gas shortage which seemed to be closing only certain independent stations. As of January 1974, a Federal Energy Office had been created and American and Maine life styles had begun to undergo noticeable change. In the midst of all this a new slant was given to bicycling.

Private automobile transport consumed over 65.8 billion gallons of fuel in 1970 or 55% of the total transportation energy consumption. The automobile is being used a majority of the time for short distances. In 1970, private automobiles in urban service used 35 billion gallons of gasoline; 60% of the trips were 2 1/2 miles or less.

This is an extremely inefficient use of energy. When used in an urban setting, the automobile is subject to constant acceleration and deceleration, cold engines and idling in traffic. Coupled with poor utilization (fewer passengers/vehicle), the results are a very high rate of energy consumption for every passenger mile traveled. For example, during 1950-1970, automobile traffic increased 142% but the energy efficiency declined by 11%.

There are fortunately more efficient modes of transportation than the auto. Buses are twice as efficient for inter-city traffic, mass transit is twice as efficient for urban travel. Human transport i.e. bicycles and walking are 10-40 times as efficient as motorized transport!

The bicycle is one of the most efficient transportation vehicles for short distances. For example, a bicyclist moving at 12 miles per hour uses only 97 B.T.U's per passenger mile, a pedestrian uses 500 B.T.U's per passenger mile walking at 2.5 miles per hour. The bicycle is efficient both structurally and mechanically. With the aid of the bicycle, man's energy consumption for walking a given distance is reduced by about one-fifth. Apart from increasing his speed, by a factor of three or four, the cyclist also improves his efficiency rating to No. 1 among moving creatures and machines. When comparing a bicycle to other modes of transportation (i.e. bus, rail, auto and aircraft) in the amount of consumption of energy (expressed in terms of B.T.U's) per passenger/mile the results shown on Table 1 are produced. The bicyclist traveling at 12 miles per hour is reaching the equivalency of 1,000 passenger miles per gallon of petroleum fuel.

THE BICYCLE AS A MODE OF TRANSPORTATION

Despite the efficiency of the bicycle in comparison with other forms of transportation, the bicycle is still questioned by some as a viable mode of transportation. In the past, the bicycle has been viewed from a limited (personalized) perspective as a recreation vehicle. The bicycle was viewed as a toy used only by children. However, the bicycle is gradually becoming accepted as a viable, day-to-day means of transportation for adults. Government agencies, at all levels are taking a serious look at the bicycle in conjunction with the need for new transportation alternatives.

Recent statistics show the bicycle is in demand as a means of transport, whether recreation or commutor. The statewide survey of Maine households conducted as part of the bicycle study showed that 33.3% of bicycle trips are for transportation purposes, i.e. commuting to work, school, going on errands, doing a paper route, visiting friends, and general transportation. This figure compares very favorably with uses reported in similar surveys conducted in Kentucky and California. The Lexington, Kentucky survey revealed that 34% of the trips were for transportation to school, university, work or shopping. The California survey conducted by the League of American Wheelmen indicated that 23% of the bicycle trips were for shopping, 23% for work, and 14% for school.

While most commuting cyclists travel distances of less than 10 miles, one gentleman at the Waterville public meeting on bicycles revealed that he regularly commutes from Belgrade to Waterville - a distance of some 30 miles. The trip averages him one hour. It is generally accepted by most investigators into the nubile science of bicycle planning that the bicycle is an excellent mode of transportation for commuters under 10 miles - and especially under 6 miles. The average speed of a car in urban traffic is 13 miles per hour. A bicycle travels between 10 and 15 miles per hour. Since about 40% of all work trips are four miles or less (Jan. '74 Bicycling), these facts could lead to potential bicycle use for urban working trips, shopping, visiting friends, etc. It would take the bicyclist less than 30 minutes to travel 4 miles! If all of these factors i.e. 1) bicycling efficiency 2) increased bicycle use 3) speed of the bicycle at 12 m.p.h., it appears that the bicycle should be considered a viable transportation mode.

A study conducted by the Philadelphia Coalition for the Federal Environmental Protection Agency noted that according to the 1970 census, 44% of those who worked in the center city live within six miles of city hall. Some 38% of the bike owners interviewed said they would commute by bicycle if safe bikeways and secure parking were available. Of the non-bike owners, 17% said they would buy a bike for commuting if there

were bikeways and bike parking. With modest provisions i.e. bike lanes and parking; an estimated 5 - 10% of all those who commute by auto could be diverted to bicycle commuting. Nationwide this 10% diversion could produce a saving of 5 1/4 billion gallons of petroleum!

All of this will remain a pipe dream. Until the bicycle becomes an accepted mode of transportation and facilities for safe riding and parking are available, the bicycle cannot possibly have this impace on the energy crisis. Local, regional, state and federal levels of government have to become involved if the bicycles potential as a mode of transportation is to be realized.

APPROVED

JUL 5'73

BY GOVERNOR

CHAPTER

133

P & S LAW

STATE OF MAINE

IN THE YEAR OF OUR LORD NINETEEN HUNDRED SEVENTY-THREE

H. P. 1480 — L. D. 1908

AN ACT Providing Funds for a Study of the Recreational and Transportation Aspects of Bicycling.

Emergency preamble. Whereas, Acts of the Legislature do not become effective until 90 days after adjournment of the Legislature unless enacted as emergencies; and

Whereas, the recreational and transportation aspects of bicycling are limited or nonexistent during the colder or winter months; and

Whereas, it is vitally necessary that the following study begin at once for any meaningful data during the height of such activity; and

Whereas, in the judgment of the Legislature, these facts create an emergency within the meaning of the Constitution of Maine and require the following legislation as immediately necessary for the preservation of the public peace, health and safety; now, therefore,

***Be it enacted by the People of the State of Maine,* as follows:**

Appropriation for bicycle study. There is appropriated from the Unappropriated Surplus of the General Fund to the Department of Parks and Recreation the sum of $10,000 for a study of bicycling. The Department of Parks and Recreation and the Department of Transportation shall jointly participate in a study of the volume of present bicycle traffic, on and off the highway; in an inventory of existing and potential bicycle trails; in projected increases in bicycle traffic, on and off the highway; and in methods of bicycle path construction and innovations used in other states to meet increasing needs. The departments shall report the results of their studies to the First Special Session of the 106th Legislature after January 1, 1974 with recommendations on how Maine can best provide for the recreational, transportation and safety needs of bicyclists.

Emergency clause. In view of the emergency cited in the preamble, this Act shall take effect when approved.

A STUDY OF THE RECREATIONAL AND TRANSPORTATION AND SAFETY ASPECTS OF BICYCLING

I. REVIEW OF LITERATURE AND LAWS

A. Historical Trends: Literary and Legislative History

B. Legislation

C. Rules and Regulations

(A, B. C, and D joint responsibility of Parks and DOT)

D. Compilation of Bibliography

E. Summary of Pertinent and Significant Findings .. Parks with review by DOT

II. INVENTORY AND USAGE

A. Number of Bikes in Maine

B. Usage of Bikes in Maine by Residents

C. Types, Hours, and Distances of Usage

D. Age of Bicyclists

E. Registration of Bicycles — Parks and Recreation

F. Existing Bikeways

G. Bicycle Traffic Volume . . . . . DOT

III. BICYCLE SAFETY

A. Gather Accident Reports

B. Evaluate/Analyze Accidents

1. Month, Day, Time
2. Urban-Rural Magnitude, Relationships, etc.
3. Severity
4. Age Groups
5. Alignment - Configuration of Location
6. Accident Type and Classification
7. Environmental Conditions
8. Other Accident Data

(all responsibility of DOT)

C. Description of the Problems, their Magnitude and Historical Trends

D. Conclusions and Recommendations (C and D responsibility of DOT)

a. from accident data

b. study of inspection/registration possibilities

c. meet with Maine State Highway Safety Advisory Committee, Sub-Committee on Bicycle Safety

IV. PUBLIC USE, DEMAND, AND OPINION SURVEYS

A. Determine Sampling Methods to be used (joint responsibility of Parks and DOT)

B. Develop Questionnaires and Sampling Procedures

1. Telephone Survey . . . . . Parks and DOT

2. School Survey . . . . . DOT with review by Parks

3. Police Chief Survey . . . . DOT with review by Parks

C. Revise Questionnaires (joint responsibility of Parks and DOT)

D. Engage Consultant for Telephone Survey

1. Pre-test questionnaire

2. Revise (all responsibility of Northeast Markets)

3. Actual Survey

4. Compilation of data gathered

E. Administer School, and Police Chief Surveys in-house

1. School Survey . . . . . DOT with Parks assistance

2. Police Chief Survey . . . DOT with Parks assistance

F. Gathering and Compilation of Data

1. Telephone Survey . . . . . Northeast Markets

2. School Survey . . . . . DOT

3. Police Chief Survey . . . DOT

V. GENERAL DEMANDS AND NEEDS FOR THE PRESENT AND FUTURE

A. Analyses of Results of Questionnaire Surveys

1. Telephone Survey

2. School Survey (responsibility of Parks with draft review by DOT)

3. Police Chief Survey

B. Public Comments Solicitation . . . Parks and DOT

C. Conclusion . . . Parks

VI. POTENTIAL BIKEWAYS

A. Railroad Rights-of-Way . . . . . Parks

B. Highway Rights-of-Way . . . . . DOT

C. Other Public Utility Rights-of-Way . . . . . Parks

D. Extensions of Existing Trails . . . . . Parks

E. Agency and Organization Solicitations

1. Regional Planning Commissions and Council of Governments .Parks

2. Bicycle Clubs and Organizations . . . . . Parks

3. Recreation groups; Community and campus . . . . . Parks

4. Snowmobile, Horse, amd Motorbike groups . . . . . Parks

F. Dual and Multiple Use Trails . . . . . Parks

VII. HIGHWAY BICYCLING

A. Guidelines for the Future

B. Possibilities of Funding (all DOT responsibility with draft review by Parks)

C. Rural and Urban Bikeways

D. Comparisons of Class I, II, III Bikeways

E. Implementation Alternatives and Costs

1. Review Technical Literature

2. Determine Alternative Designs

3. Determine Alternative Construction Methods

4. Determine Alternative Maintenance Techniques

5. Alternative Costs

6. Summary of Guidelines

RESOURCE MATERIAL

1. Abandoned Railroad Rights-of-Way As Potential Bicycling and Hiking Trails

   by the Study Committee Consisting of Representatives from the Department of Natural Resources and Indiana Central Bicycling Association; October 1972

   1A. Arizona Bikeways

   by the Arizona Highway Department in cooperation with FHWA, Arizona Outdoor Recreation Coordinating Commission, Bureau of Outdoor Recreation; Consulting Services by Bivens and Associates, Inc.; June 15, 1973

   2A. The Bicycle

   A Plan and Program For Its Use as a Mode of Transportation and Recreation prepared for the Atlanta Regional Commission by Barton-Asthman Associates, Inc. (St. Paul, Minn.) July 1973

3. Bicycle Accidents Fact Sheet and Boy vs. Girl Bicycle Accidents Fact Sheet

   by Youth Activities Department, National Safety Council, 1972

4. Bicycle Program in Oregon, the, and subsequent information

   by Oregon State Highway Division and the United States Department of Transportation; 1972

5. Bicycle Usage Fact Sheet

   by Youth Activities Department, National Safety Council, 1972

   5A. The Bicycle vs. the Energy Crisis

   by Nina Dougherty, Bicycling Magazine; January 1974

6. Bike Route Planning Strategies

   by Dr. Mike Everett, Department of Economics, Florida State University

   6A. Bike Tripping

   by Tom Cuttbertson, Ten Speed Press (Berkley, Calif.); 1972

7. Bikeway Planning Criteria and Guidelines

   prepared by ITTE, University of California, Los Angeles; April 1972

8. Bikeways: A System of Safe Bicycle Routes

as a part of the Greater Portland Council of Governments Open Space and Recreation Plan; June 1972 summary report

9. Bikeways for Lakewood

by the Citizens Advisory Committee, Lakewood, Colorado; Nov. 1971

10. Bikeways on Highways: Facts - Figures - Reasons

by the Bicycle Institute of America, Inc.; spring 1973

11. Boston Green Belt Bikeway

by the City of Boston, Department of Parks and Recreation

11A. The Complete Book of Bicycling

by Eugene A. Sloane, Trident Press (New York) 1970

12. Emerging Issue of the Bicycle, the

by the Bicycle Institute of America, Inc.

12A. Establishing Trails on Rights-of-Way: Principally Railroad Abandonments

by J. Lennon, Bureau of Outdoor Recreation, U.S. Department of the Interior

13. Guidelines for a Comprehensive Bicycle Route System

by the Department of Development and Planning, City of Chicago; March 1971

13A. Guide For Bicycle Routes

Prepared by the Standing Committee on Engineering and Operations American Association of State Highway and Transportation Officials, January 1974

14. Illinois Bicycle Rules of the Road

compiled by John W. Lewis, Secretary of State in Illinois; April 1971

14A. Maine Comprehensive Outdoor Recreation Plan

by Thomas J. Cieslinski, Department of Parks and Recreation, January 1972

15. Miami Valley Regional Bikeway Plan

by Miami Valley Regional Planning Commission; March 1973

16. Oregon Bikeways Progress Report

by the Oregon Department of Transportation, Highway Division, February 1973

16A. Planning for Urban Trails

by Mary E. Brooks, ASPO Planning Advisory Service Report No. 252; December 1959

16B. Reports on Bicycles USA Conference, May 7-8, 1973

Maine Bureau of Parks and Recreation, Department of Conservation; Vermont Division of Recreation, Agency of Environmental Conservation

16C. Riding High: The Story of the Bicycle

by Arthur Palmer, E.P. Dutton & Co., Inc. (New York), 1956

16D. The Road Rights and Liabilities of Wheelmen

by George B. Clementson, Callaghan and Company (Chicago), 1895

17. Safe Bike Routes Standards and Guidelines

as a part of the Greater Portland Council of Governments Open Space and Recreation Plan; April 1972