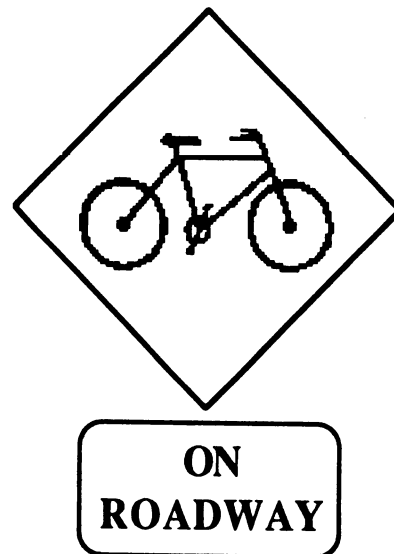
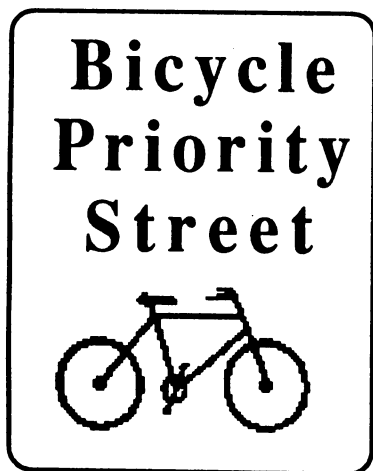


**City of Cambridge
Mayor's Bicycle Committee**

**Initial Report to Mayor Alice K. Wolf
and the Cambridge City Council**

10/9/91



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Members of the Mayor's Bicycle Committee

John Allen	Will Peck
Rebecca Hall	Andy Rubel
Hilary Hamilton	Rosanne Wagger
Douglas Kline	Walter Willett
Peter Mui	

Cara Seiderman (facilitator), Cambridge Community Development Department

The committee would like to thank the following people for their review of and feedback on a draft copy of this report:

Perry Anderson, Police Commissioner
Richard Easler, Transportation Director, Community Development Department
Susan Goldwitz, Commuter Mobility Coordinator, Community Development Department
David Haley, Commissioner, Department of Public Works
Lauren Preston, Deputy Director, Department of Traffic and Parking
Cara Seiderman, Community Development Department
John Silva, Department of Safety and Security, Cambridge Public Schools
George Teso, Director, Department of Traffic and Parking
Sue Tamber, Engineering, Department of Public Works

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Executive Summary

Bicycling provides effective transportation in densely populated cities like Cambridge. The distances are short, the terrain flat, and tree-lined residential streets can make for pleasant journeys across the city. Yet, fewer than 2% of Cambridge work trips are by bicycle, compared with 10% or more in U.S. cities that actively support bicycling, and typically 20-50% in modern European cities.

A major barrier to cycling is lack of safety, both perceived and actual. Many Cambridge residents say, "I'd love to bicycle, but I'm afraid of traffic," or "There's no place to ride." This perception prevails because many roadways do not accommodate bicycles safely with today's auto traffic density. Other barriers to increased bicycling are lack of education about safety and practical riding skills, insufficient or impractical bicycle parking, and a lack of promotion of bicycling as transportation.

Given current concerns about motor vehicle congestion, parking, and pollution, we need to encourage alternatives to the automobile. Developing our city's potential for bicycle transportation is a cost-effective way to relieve these problems significantly, while promoting health and a more livable city.

We recommend the following to promote bicycle transportation:

- 1) **Establish a bicycle route network** for safe bicycle access to all parts of Cambridge. Designated residential streets would have special signs, reduced speed limits, and other means to discourage motor vehicle through-traffic. Appendix A of this document and the enclosed map detail our initial "Cambridge Bicycle Route Master Plan."
- 2) **Evaluate and improve existing bicycle parking and create new facilities** throughout the city. This can involve the MBTA, MDC, private employers, and private developers to encourage adequate secure bicycle parking.
- 3) **Provide education to both bicyclists and motorists** about practical riding skills, how to share the road safely, and appropriate traffic laws. This can take the form of public service announcements, a pamphlet, a Cambridge bicycle map, adult and child safety programs, and perhaps a "bicycle safety week."
- 4) **Promote bicycling as transportation** via city government, police, schools, and employers as part of a traffic mitigation plan. Employers could promote bicycle commuting by providing bicycle parking, lockers and showers, and offering various other employee incentives. The use of bicycles by Traffic Control Officers and/or the police would increase the visibility of bicycle transportation and also benefit those departments.
- 5) **Appoint a full-time Bicycle Program Manager** in city government to develop and manage an integrated bicycle program consisting of these and other measures. This requires cooperation with city departments such as Traffic and Parking, Public Works, Community Development, Police, and schools, as well as with community groups, relevant state agencies, and bicycle organizations. The Bicycle Program Manager would seek state, federal, and private funding for bicycle programs.
- 6) **Establish a permanent bicycle committee** of community members and representatives of city departments to provide additional resources for information, review, and research.

Rationale

It's no secret that the traffic congestion and parking in Cambridge are serious problems. The number of cars registered in Cambridge increased 40% from 1970 to 1986. The resulting traffic congestion degrades our mobility, our air quality, and our quality of life in the city. Cambridge is actively pursuing traffic mitigation measures as required by state and federal agencies due to Massachusetts' violations of federal clean air standards. Encouraging bicycle transportation can be a highly effective component of an overall plan to reduce automobile use. Here's why:

1) **Bicycle transportation is extremely underutilized in Cambridge.** While our utilization of walking (15.3% of commuter trips) and public transit (21.7% of commuter trips) are excellent, bicycling makes up less than 2% of trips, while 43% of commuter trips are by single-occupant auto. *Twelve thousand people* who both live and work in Cambridge drive alone to work (entirely within Cambridge) every day [1] [numbers in brackets refer to references at the end of this report]. Cities in the U.S. with bicycle programs have much better rates for bicycle transportation, and modern European cities have even higher rates:

<u>City</u>	<u>Percent of trips by bicycle</u>	
Cambridge, MA	under 2%	(1980 census data)
Eugene, OR	8-10%	(various sources)
Palo Alto, CA	10%	(1980 census data)
Madison, WI	11% of summer work trips	(Wisconsin DOT [2])
WI urban areas	5% of summer work trips	
WI urban areas	1% of winter work trips	
Davis, CA	23%	(Worldwatch est., quoted from Minnesota DOT [3])
Basel, Switzerland	20% of daily passenger trips	(Worldwatch [4])
Copenhagen, Denmark	20% of daily passenger trips	
Erlangen, (W.) Germany	26% of daily passenger trips	
Groningen, Netherlands	50% of daily passenger trips	

Many other modern industrialized European cities (e.g., Munich, Amsterdam) have similar statistics. In the Netherlands, 30% of work trips and 60% of school trips are made by bicycle. In western Europe, 10-55% of suburban rail passengers use bicycles in conjunction with their rail trips¹.

Based on other cities' experiences and the personality of Cambridge, we expect that we could easily achieve 10% of trips by bicycle, and probably much more. This would have a significant effect on traffic congestion, air quality, and livability of Cambridge.

2) **Cambridge and greater Boston are potentially ideal for bicycle transportation.** Many people live within biking distance of work and shopping, the terrain is mostly flat, and roadways are clear of snow and ice most of the year. Given that over 50% of all auto trips are less than 5 miles, 30% of auto trips are less than 2 miles, and average auto occupancy is 1.2 persons, there is potential for a significant shift to bicycling *if it is perceived as safe and supported by local government.*

¹ All figures in this paragraph are from Worldwatch Institute [5].

3) **Bicycles are a cost-effective form of transportation.** It is easy and inexpensive to maintain and store a bicycle, and there are no exorbitant insurance premiums to pay. It is also inexpensive for the city to provide bicycle facilities compared to motor vehicle facilities, hence the city gets more mileage (figuratively and literally!) out of each transportation dollar.

4) **Bicycle transportation is quiet and completely non-polluting.** It is the most energy-efficient form of transportation known. If more people used bicycles rather than cars, noise and smog levels in the city would decrease, and we would be contributing less to global warming (each gallon of gasoline burned produces over 20 pounds of carbon dioxide, the major contributor to global warming).

5) **Bicycling is an excellent form of physical exercise.** Medical research shows that exercise can reduce the rates of heart disease, several forms of cancer, and osteoporosis, and generally leads to a longer, healthier life.

6) **Advances in bicycle, facilities, and program design have made bicycle transportation even more practical.** In the last 20 years, bicycle design has moved from finicky racing bikes to include a variety of comfortable bikes that are easy to ride. Bicycle helmets, lighting systems, and other equipment have also improved substantially. Equally important are the advances in bicycle facilities and program design. There are now considerable resources in terms of design standards and documentation for both bicycle facilities and for successful bicycle transportation programs at all levels of government.

7) **Bicycles are already widely used in Cambridge.** However, many Cantabridgians who could use bicycles do not do so because of concerns about safety, lack of routes, lack of parking, or perhaps just because they never thought of it. All of these concerns impede the use of bicycles for transportation, and are described in the balance of this report. Bicycles can provide effective and inexpensive transportation, but only with the support of local government and the community to make bicycling a viable transportation option.

The Problems -- Impediments to greater use of bicycling

Problem 1. Traffic and Safety Concerns

Many people would bicycle to work or elsewhere if they felt they could do so safely. According to a 1990 Harris poll, 20% of all U.S. adults would sometimes commute to work by bicycle if there were safe bike lanes on roads and highways. Some of the fear is due to lack of knowledge about how to ride safely, but many of the safety concerns are due to unsafe conditions on the roadways.

Sidewalks are constructed for pedestrians, and roadways are constructed for motor vehicles. Where do bicycles fit in? Legally, bicycles are vehicles (in all 50 states), with the same rights and responsibilities. But most roads are not designed to be safely shared by cars and bikes. Bicyclists are given little or no consideration in most roadway design and construction, and little guidance or education about how they are expected to ride.

A few bicyclists learn the rules of the road, and ride relatively safely even with poor or dangerous roadway design (from a bicyclist's point of view). Other bicyclists, either uninformed or rebellious at the poor conditions, ride unpredictably, endangering

themselves and others. Most people simply avoid bicycling on roadways altogether, because it just seems too dangerous.

Here are some of the roadway and bikeway issues:

- Some roads are too narrow to support safe sharing by motor vehicles and bicycles.
- At some times and locations, there are too many vehicles (both cars and bikes) trying to share the road.
- Many vehicle detectors for traffic lights are not sensitive to bicycles, encouraging (or sometimes forcing) bicyclists to run red lights.
- Bicycles are sensitive to road conditions, and roads are often in the worst condition in the section between parked cars and the travel lane -- exactly where bicyclists ride! Cambridge cable TV installation exacerbated this problem by tearing up precisely this part of the roadway.
- Even some new roads do not provide for bicycle traffic (e.g., narrow lanes on Binney Street and on Broadway in the Kendall Square area).
- Some facilities, specifically intended for bicycles, do not conform to accepted standards of width or are otherwise inadequate. The Charles River bikepath, for instance, is too narrow for safe two-way traffic (or even for one-way traffic in some stretches) and its drainage is poor, leading to icing in winter. At the crossing of Western Avenue there is no appropriate traffic signal phase for bicycle traffic on the path. At the Harvard Bridge there is neither a traffic signal nor an alternate route for crossing Mass. Ave.
- Because of poor conditions on the road, some bicyclists feel compelled to ride on the sidewalk, which can lead to conflict with pedestrians.
- Pedestrians, joggers, etc. are not accommodated adequately on the bicycle paths, and this multiple use leads to pedestrian-bicycle accidents.

All of this leads to friction between bicyclists and motorists, and between bicyclists and pedestrians as well. Some motorists, frustrated with bicyclists who are "in their way" due to narrow roadways advocate that bicyclists be banned from the roads. Other times, motorists are understandably angry at bicyclists who act erratically or in flagrant violation of the traffic laws. Pedestrians feel endangered by bicyclists who ride more than 5-8 MPH on the sidewalk or bikepath, and would prefer to throw them to the motorists. Much of this conflict could be alleviated by improved facilities for bicyclists along with pedestrian, bicyclist, and motorist education.

Problem 2. Inadequate Bicycle Parking and Security

Regardless of how one gets to a place by bicycle, there is often no secure place to lock a bicycle or there are insufficient spots. Even when bicycle racks are provided, they are often poorly installed, poorly maintained, or located in an area with inadequate security. There are many glaring examples. Using the bike racks at Fresh Pond shopping center (one *can* bike there safely via New Street) means half of the bike sticks out from the sidewalk into a travel lane of the parking lot. At the Davis T stop (Somerville), the rack is poorly located, so most bikes are locked to the railing outside the station instead. The bike rack at Star Market in Porter Square is used heavily, but using it as originally intended would require rolling the bike forward through a wall.

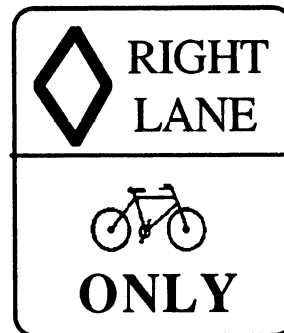
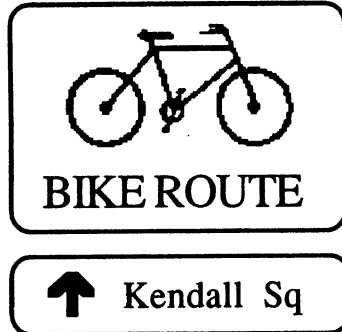
As many of us know, bike theft is a big business in Cambridge. As with the safety issue, the solution lies in a combination of proper facilities and education about using them (e.g., how to lock your bike).

Problem 3. Inadequate Education

A surprising number of bicyclists, motorists, and even police officers are not familiar with the traffic laws as they pertain to bicycles. In all 50 states, bicyclists have the same basic rights and responsibilities as motorists. As spelled out in the Massachusetts General Laws Chapter 85, Section 11B (reproduced in Appendix B), bicyclists have a right to use all public roads (except some limited access highways); they should ride with the flow of traffic and obey all traffic laws; and they can also use sidewalks (with some restrictions). Bicyclists are also required to use a headlight and reflectors after dark. Most bicycles are equipped with reflectors, but few bicyclists use lights, despite the law.

Quite apart from legal considerations, many cyclists are uninformed about practical riding skills, how to ride safely in traffic, or the importance of wearing a helmet². Likewise, many motorists are uninformed about how to share the road safely with bicyclists (e.g., beware of turning right immediately after passing a bicycle -- it may still be alongside on your right!). This lack of education adds significantly to the safety problems of bicyclists using the roadway.

The Solutions -- How to encourage bicycle transportation



1. Establish a bicycle route network.

A draft master plan for a Cambridge bicycle route network is included in Appendix A. This plan marks out routes for bicyclists throughout the city. It connects the major squares, commuter destinations, neighborhoods, and roads and bridges between Cambridge and adjoining communities. Note that all specific recommendations are preliminary and subject to review by the committee based on additional feedback from the community and city departments.

² Approximately 75% of all bicyclist fatalities and serious injuries are head injuries, which rarely occur when a helmet is worn.

Here are some guiding principles for bicycle facilities, which are described in more detail in the master plan:

- All locations must be accessible via the bicycle transportation network.
- Bicycle travel speeds of up to 25 MPH on level ground must be accommodated safely.
- Intersections must accommodate bicyclists safely and conveniently, including bicycle-sensitive vehicle detectors for traffic lights³.
- Pedestrian facilities should be separate from bike paths whenever possible.
- Roadways and paths should both permit and encourage bicyclists to obey the law.
- Bicycle routes must accommodate different levels of bicycling skill, from novice to experienced bicyclist.
- Novice routes and bikepaths must actually be safe for novices as well as perceived as safe.
- Bicycle routes should meet design guidelines established by AASHTO (American Association of State Highway Transportation Officials).
- Bicycle facilities must have community support and acceptance.

A key concept for the Cambridge bicycle route network is to establish "bicycle priority streets." These are residential, secondary through-streets where residents do not desire heavy motor vehicle through-traffic. In these cases the needs of bicyclists and the wishes of residents are the same: light traffic traveling at low speeds. Streets designated as bicycle priority streets could have low speed limits and other means to discourage motor vehicle through-traffic. Posted signs and painted roadway striping should be appropriate for safe bicycle travel and low-speed local motor vehicle use. Five Cambridge streets (e.g. Harvard Street) are initially recommended as bicycle priority streets, and form a partial skeleton for a route network. Details appear in Appendix A, Cambridge Bicycle Route Master Plan.

2. Evaluate and improve existing bicycle parking and create new facilities.

A major advantage of bicycle transportation is door-to-door travel, and an essential element of this advantage is convenient, secure parking facilities. Convenient bicycle parking should be available in all the major squares plus shopping areas, T and commuter rail stations, and employment areas. Bicycle parking should:

- be as close to the actual destination as possible (e.g., at the door);
- allow secure locking of bicycle frame and both wheels;
- be in a highly visible area, rather than hidden where thieves can work;
- be installed such that it can be used safely and as intended;
- when possible be under cover from the weather;
- when possible be within sight of an attendant or guard or inside a reasonably secure building.

Cambridge has done a fair job with bicycle parking, though there is much room for improvement. The Cambridge zoning ordinance requiring a minimum amount of bicycle parking could be better enforced. Existing facilities need to be evaluated (many are deficient in some way) and new bicycle parking created in some areas (e.g., Central

³ Vehicle detectors that are not sensitive to bicycles mean that a traffic signal may *never* turn green for a bicyclist, and are contrary to Massachusetts law. A simple no-cost solution with no disadvantages to motor vehicles exists when installing vehicle detectors, namely laying the magnetic loop detectors in a different pattern ("quadrupole" or "California D-type") under the street. Loops already installed can be marked at their most sensitive spot and the sensitivity of the controller turned up. More technical information is available [6].

Square) Another important place for bicycle parking is at work. Employers can provide secure bicycle parking as one part of a program to promote the use of bicycles for commuting. Other organizations such as the MDC, MBTA, and private developers also need to be involved in bicycle parking improvements as appropriate.

3. Provide education to bicyclists and motorists.

Encouraging bicycle transportation requires not only facilities but information about safe use of those facilities. Bicyclists and motorists alike need education about their rights and responsibilities on the roadway, and bicyclists need information about practical and safe riding. Education can include public service announcements, a pamphlet, a Cambridge bike map, adult and child safety programs, and perhaps a "bicycle safety week."

Several public service announcements have already been developed for Massachusetts in conjunction with the state Bicycle Advisory Board. These could be aired on local cable, along with messages specifically designed for Cambridge.

An educational pamphlet should be produced containing information about the law as it pertains to bicycles, along with guidelines for safe, common-sense bicycling. There are many suitable sources of this information, including "rules of the road" established by the state Bicycle Advisory Board, as well as published guidelines written by committee member John Allen. This pamphlet could be disseminated through bicycle stores, at university registration, community centers, campus police, Cambridge police, etc. It could also be provided to Cambridge residents when they receive their parking stickers or guest parking permits. A Cambridge bicycle map could also include information about traffic laws and riding techniques, as well as locations of parking areas and bicycle shops.

Bicycle Education in Schools

Bicycle programs in public schools contribute to the development of effective and responsible bicycling skills. A comprehensive traffic education program for children would begin in elementary school and would include pedestrian safety, bicycling safety, and driver's education in high school.

Bicycle "rodeos" at schools give children a chance to practice specific skills under the supervision of knowledgeable adults. They promote safe riding practices such as the use of helmets and lights. Rodeos are geared for children and consist almost entirely of active exercises with little classroom-style instruction that would likely bore children. Such events have recently been held in Lexington and Southborough and have attracted high turnout; about 1,000 children participated in the rodeo in Lexington. Instructors with experience in these rallies are interested in putting on more of them.

It is possible, with the cooperation of manufacturers, distributors, and local shops, to provide lights, reflectors, and helmets at reduced cost for children through the public school system, as in Lexington. One possibility is a helmet discount program involving local bicycle stores and schools.

All of the school education initiatives described here have been used successfully in other cities and towns. The "Safe Kids Campaign" assists communities (e.g., Lexington) with educational programs and helmet promotion.

Adult Bicycle Education

Rodeos like those just described for children can also be held for adults, with a modified structure, perhaps involving more instruction. Another way to inform the community about bicycle safety would be to set up a table or booth at major outdoor events and on Sundays along Memorial Drive to pass out information on bicycle and pedestrian safety. Free bike "checkups" could be offered at these events with cooperation from local bike shops or clubs.

Bicycle Education in the Universities

Universities have a stake in bicycling programs because their students constitute a large part of the bicycling population. Universities should be encouraged to promote bicycling and to provide safe, adequate parking for bicycles. University police departments can hand out an educational pamphlet to new students and students registering their bicycles.

Bicycle Education and the Police

The Cambridge Police can play a significant role in bicycle education. Their participation in bicycle rodeos would not only help the children, but would also involve the officers in bicycle safety and promote their relations with young people in the community. Two Cambridge officers are assigned to the schools for various educational purposes, and bicycle education could be one aspect of this program as well. Police Commissioner Anderson has expressed interest in and support for these types of programs and also supports bicycle-awareness training for police officers.

Bicycle Safety Week

A bicycle safety week could provide a focus for the various education programs. Bicycle rodeos and other events could be scheduled during this week. A likely time is the spring, during national transportation week, when "bike to work day" and other commuter mobility events are often held. This could also be a time for police to issue warnings to bicyclists who ride in the most dangerous manner, such as against traffic or without a light at night.

4. Promote bicycling as transportation.

Encouragement of bicycle transportation goes hand-in-hand with facilities and education. Providing safe routes, a pamphlet and map, and educational programs all promote greater use of bicycling. Additional measures could promote bicycle commuting by employees and use of bicycles by city departments.

Bicycle commuting can be promoted via the city's Commuter Mobility Program. Employers could provide bicycle parking, showers and lockers, and other employee incentives. According to the Harris poll cited earlier, 17 percent of all adults say they would ride their bicycles to work if their offices had adequate shower and storage facilities, and 18 percent say they would bike to work if their employers offered financial or other incentives. Alpha Beta Markets, a discount food chain in California, offers a free mountain bike to any employee willing to commute by bike at least three times a week. Another possibility is to provide classes about bicycle commuting to interested employees. A bicycle commuter matching program could match up novice bicycle commuters with experienced commuters who would help with routes, techniques, and safety.

Mayor Alice Wolf has suggested that bicycles are ideal vehicles for traffic control officers patrolling sidestreets for parking violations. In addition to its intrinsic advantages, this would help increase visibility of bicycle transportation. Ideally provided as an opportunity to interested traffic control officers (rather than a mandate), it could also help "break the ice" and allow greater acceptance of bicycles by municipal employees as a whole.

A longer term possibility is the establishment of a bicycle patrol in the Cambridge Police Department. Bicycles are being used successfully by the MDC police and the MIT campus police, as well as police departments in Providence, Seattle, Portland, Flagstaff, and 80 cities in 26 states [7]. Bicycles allow police to enter parklands and other areas where driving is impossible or impractical. At the same time, they allow a police officer to move much faster than on foot, and very quietly. This quiet mobility permits drug busts and other activities that would be otherwise difficult. Like a foot patrol, a bicycle patrol also allows an officer to stay in better touch with the community, without the insulating barrier of a police car or an intimidating motorcycle.

5. Appoint a full-time bicycle program manager.

Establishing a full-time Cambridge Bicycle Program Manager is essential to an effective bicycle transportation program. The Bicycle Program Manager would spearhead the development of a master plan for bicycle transportation in Cambridge. This plan would include a bicycle route network and numerous educational and promotional programs as discussed in this report. Although some projects would have to wait for a master plan to be completed, some which are immediate priorities could be implemented without delay.

The Bicycle Program Manager would work with numerous city agencies, as well as other cities, state and federal agencies, community groups, schools, and bicycling organizations. The Bicycle Program Manager would coordinate projects for the city which are also cooperative efforts with these various groups. The Bicycle Program Manager would also seek external funding from state, federal, and private sources.

Another key function of a Bicycle Program Manager is to keep track of roadway and development projects and ensure that bicycle transportation is considered. This would have made a big difference, for instance, in the recent development of the Kendall Square area. But even when large projects are not looming, road repaving, reconstruction, and improvement is an almost constant activity, and one which needs an eye toward accommodating bicycle transportation.

6. Establish a permanent bicycle committee.

A permanent bicycle committee or advisory board should be appointed. Knowledgeable members from the community and from relevant city departments would work closely with the Bicycle Program Manager and serve as a resource of ideas, review, and feedback on bicycle-related issues. The committee could also seek input from city departments and community groups, and carry out further research and investigation.

Developments in the city that affect bicycle transportation or that offer opportunities to improve it should be reviewed by the bicycle committee and the Bicycle Program Manager.

Summary

Bicycle transportation could easily become more than 10 percent of the Cambridge transportation mix. It can significantly reduce our urban congestion and pollution while improving the health of Cambridge residents and helping us maintain a desirable livable city. Although bicycling is highly cost-effective compared with other modes of transportation, achieving this will still require commitment on the part of the city to address issues of bicycle safety, parking, education, and promotion. The following recommendations have been made in order to accomplish these things:

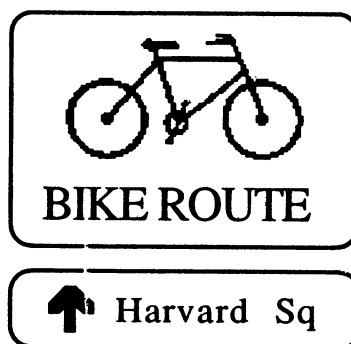
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2. Evaluate and improve existing bicycle parking and create new facilities.
3. Provide education to bicyclists and motorists.
4. Promote bicycling as transportation.
5. Appoint a full-time Bicycle Program Manager.
6. Establish a permanent bicycle committee.

References

- [1] Figures in this paragraph from 1980 census data, Cambridge Community Development Department.
- [2] Wisconsin Department of Transportation, *Transportation Issues and Answers: Choices of Travel to Work*. Summary Report, August 1981, page 1.
- [3] Minnesota Department of Transportation, *Letting Bicycling Work for Minnesota, the Comprehensive State Bicycle Plan*, 11/16/90 draft report (plan B), figure 1.
- [4] Data for European cities listed in this table are from Lowe, Marcia, *Worldwatch Paper 90, The Bicycle: Vehicle for a Small Planet*, Worldwatch Institute, Sept., 1989, p. 32.
- [5] Lowe, Marcia, *Worldwatch Paper 98, Alternatives to the Automobile: Transport for Livable Cities*, Worldwatch Institute, Oct. 1990, pp. 23-25.
- [6] Technical information about bicycle-sensitive traffic signal actuators is available in a \$1.00 pamphlet from Bikecentennial, P.O. Box 8308, Missoula, MT 59807; tel (406)721-1776.
- [7] *Bicycle USA*, magazine of the League of American Wheelmen, Oct/Nov 1991.

Appendix A: Cambridge Bicycle Route Master Plan

A network of effective bicycle routes is essential to a successful bicycle transportation program. A route network must provide convenient access to all parts of Cambridge and connections to adjoining communities. It must satisfy the needs of both novice and experienced cyclists. Routes for novice cyclists must be the most direct routes that are pleasant and safe, even if not *the* most direct. Routes for more experienced cyclists may have heavier auto traffic if more direct, but must still be safe for cyclists accustomed to traffic. Designated routes or paths must earn their use by being more attractive (faster, safer, more pleasant) than the alternatives.



Route network priorities

The following is an approximate list from easier, lower-cost tasks to harder, higher-cost tasks in developing the physical bicycle route network.

Easier, lower-cost

||

1. Posting signs along routes (including destination);
2. Painting of appropriate lane widths to accommodate bicycles;
3. Modify setbacks and other improvements;
4. Install/reinstall bicycle parking as needed;
5. Install bicycle sensitive traffic signal actuators;
6. Redesign signalling or signal timing as needed on bicycle routes;
7. Redesign selected intersections;
8. Repave/reconstruct/widen selected streets;
9. Eliminate selected parking or traffic lane (only when absolutely essential);
10. Establish rail right-of-ways as bicycle paths or "rails with trails"
11. Construct overpasses when no other solution is feasible (e.g. Concord Ave in Fresh Pond area).

||

Harder, higher cost

Recommended priorities for establishing a route network are as follows:

1. Make a commitment to establish a network with access to all parts of Cambridge.
2. Do easier, lower cost items to establish the physical network as soon as possible. This should include posting signs and painting stripes as needed along existing bicycle paths, bicycle priority streets, recommended routes, and heavy traffic routes. It should also include essential improvements for safety or connectivity of the route network (e.g. establish two-way bicycle traffic on Quincy Street).
3. Publish bicycle route map and publicize the network.
4. Implement the harder, higher cost aspects of the network as possible.

The route network can only be properly established with feedback and cooperation of the local community and institutions, particularly Harvard and MIT.

Route network guiding principles

Access: A major advantage of bicycle transportation is door-to-door travel. A bicycle can usually be parked closer to the actual destination than the nearest auto parking space or transit stop. This convenience reduces travel time and makes bicycling competitive with motoring and public transportation despite the often lower travel speed. A route network must provide convenient access to all locations. Note that designation of bicycle routes is no reason to ban bicycling from any but limited access roadways. Any such reduction of access would not only be a serious discouragement, but would also be contrary to Massachusetts General Law.

Travel speed: Bicycle travel speeds between 8 and 25 mph can be expected on a level road, and in fact, most of Cambridge is quite flat. Designated bicycle routes and paths must be designed to accommodate this range of speeds safely. Bicycle transportation often involves higher travel speeds than recreational cycling.

Intersections: Traffic signals and over/underpasses must not disadvantage bicycle routes compared with other routes. Pedestrian-type crossings are acceptable on recreational paths but usually cause too much delay on transportation bicycle routes, although they may occasionally be necessary. Vehicle detectors for traffic lights must be sensitive to bicycles.

Pedestrian conflict: The presence of more than a few pedestrians reduces safe bicycle travel speed to 8 mph or less. Cyclists who ride faster under these conditions risk their own and others' safety. To allow normal bicycle transportation speeds and to reduce bicycle/pedestrian conflict, facilities shared by bicyclists and pedestrians should be avoided in a bicycle transportation network.

Rules of the road: Bicyclists are required to obey the traffic laws (Mass. Gen. Laws Chapter 85 section 11B). Therefore every street, bikepath, or other facility should *permit* bicyclists to obey the traffic laws. Examples of things to avoid are two-way bikelanes on one side of the street and magnetic traffic signal actuators that do not turn the light green for bicycles. Facilities can also *encourage* bicyclists to obey the traffic laws. Clear striping and signage, for example, educates bicyclists as to where they can ride safely and encourages them to do so. Without this guidance, many bicyclists will ride in a way that they *perceive* is safer, even if it violates traffic laws.

Bicycling skill and safety: A facility that is safe for one bicyclist is not safe for another. Many experienced adult cyclists ride safely and confidently on major streets, and prefer them for parts of transportation trips because they are direct and fast. They behave like motor vehicles, albeit slow moving ones (typically 14-20 mph). Most children and inexperienced adult cyclists can not ride with safety on major streets (and in fact have an accident rate five to seven times as great wherever they ride). They behave more like pedestrians, and travel at lower speeds. A successful bicycle transportation network must accommodate cyclists of all skills safely, with access to all parts of the city for novice cyclists, and more direct routes for experienced cyclists.

Actual and perceived safety: To a novice cyclist, a safe place to ride is a place without cars. To an experienced cyclist, an appropriately designed roadway shared with cars can be safe. In a largely non-cycling society, most of the public is in the "novice cyclist" category. So there is strong public pressure to "create safe places to ride", meaning places without cars. This well meaning interest sometimes leads to construction of bicycle lanes or paths that are impractical or unsafe. The New York City bikelanes were torn out in 1980 after only a few months because of numerous safety issues. Routes must *actually be safe* for novice cyclists as well as *perceived as safe* by this class of riders.

Design standards: Established design guidelines and traffic engineering principles should be used in each situation to create a safe design, whether it be one sharing a roadway or a separated path. Important guidelines are published by AASHTO (American Association of State Highway and Transportation Officials), and by states and cities with bicycle programs, e.g. Florida, Oregon, Seattle, Eugene, Vancouver, and others (see Appendix C: bibliography).

Community acceptance: Bicycle facilities must have the acceptance of the community, which should be involved in the planning process. The facilities constructed should reflect overall community goals and desires.

Route types and key to Cambridge route map

The accompanying map indicates a preliminary network of bicycle routes for Cambridge. Additions and refinements will result from further study and community input. Four kinds of routes are designated on the map: bicycle paths, bicycle priority streets, recommended routes, and heavy traffic routes (for experienced cyclists). Potential routes and dangerous routes/intersections are also shown.

Bicycle paths: These are ways completely separated from roadways. In a dense urban area like Cambridge, there are a limited number of places to put a bicycle path (railroad right-of-way, riverbank). Particular attention must be made to bicycle-pedestrian conflict, safe intersection design, and night-time safety.

Bicycle priority streets: This is a key concept for a Cambridge bicycle route network. These are residential, secondary streets which are through routes but where residents do not desire heavy through motor traffic. In these cases the needs of bicyclists and the wishes of residents are the same: light traffic traveling at low speeds. Discouragement of through motor traffic can often be accomplished simply by posting as a bicycle priority street with a low speed limit. In some cases it may be necessary to use additional measures to discourage through motor traffic (while encouraging bicycle traffic). This can be accomplished with modified signal timing or

with barrier or diverter type intersections such as small traffic circles, bollard-type barriers, or diagonal barriers with a bicycle pass-through. This maintains motor vehicle access for residents, deliveries, and municipal services, while discouraging through motor traffic and encouraging through bicycle traffic. This approach has been used in cities such as Seattle, Palo Alto, and Berkeley, and appears to work well for both residents and bicyclists.

Five Cambridge streets are initially recommended as bicycle priority streets, and form a partial skeleton for a route network:

1. Harvard Street for access between Harvard and Kendall Squares;
2. Oxford Street from Harvard to Porter Square;
3. Garden Street between the Common and Fresh Pond;
4. Franklin/Green street one-way pair, as a direct route connecting Harvard Square with Central Square, Cambridgeport, MIT, and the Harvard Bridge;
5. Magazine Street, connecting Central Square with the Charles River bikepath.



A possible sign for a bicycle priority street:

Recommended routes: These are streets that, with only minor improvements, are suitable for bicycling due to their relatively low traffic volume and/or suitable lane widths or other conditions. The intent is that recommended routes be suitable for relatively inexperienced cyclists. Motor traffic volumes and speeds should be kept low on these streets. Some recommended routes may later be designated as bicycle priority streets.

Heavy traffic routes: These are more direct routes with heavier traffic and/or narrow widths or other less favorable conditions, but still suitable for bicycling on by experienced cyclists who are accustomed to riding in traffic. In some cases connections can only be made via heavy traffic routes and these areas need particular attention over the long run to make the network more bicycle-friendly. Heavy traffic routes which are particularly important as network connectors are sometimes marked as dangerous routes/intersections (see below).

Potential routes: These are potential bicycle paths, bicycle priority streets, or recommended routes which are currently not built or unusable due to one-way restrictions or other prohibitions.

Dangerous routes/intersections: These are streets or intersections which carry bicycle traffic and are particularly dangerous. These areas badly need rethinking and reworking to create safe bicycle access.

Cambridge route network details

The committee discussed numerous routes in and through Cambridge. A number of field trips were taken to examine particular areas and their suitability or potential for cycling. The following lists some examples of the areas discussed or examined. It is by all means not exhaustive. Each route or area below is given a number, and each recommendation for that route/area is designated by letter, so that each can be uniquely identified. Certain technical details such as individual curb cuts or the like may not be discussed here unless they apply to a large area. Those technical details are instead listed in a separate report. Larger technical specifics such as dangerous intersections are discussed here.

All specific recommendations are preliminary and subject to review by the committee based on additional feedback from the community and city departments.

1. Charles River bikepaths:

- a. Numerous paving improvements are needed including grading so that water flows off, providing a smooth surface and removing frost heaves, and upgrading to standard AASHTO width or greater.
- b. Wherever possible, a separate path for pedestrians should be provided and both paths clearly marked.
- c. Informational signs are needed giving rules for safe use for the paths.
- d. Some park benches and other fixtures (signs, bike racks) need to be moved back from the path. Sitters' legs and other obstructions should be a minimum of one foot (and preferably two feet or more) from the edge of the path.
- e. Regular maintenance should include plowing in winter and clearing sand in spring.
- f. Intersection and crossing improvements are needed at most or all bridges. Separate signal phases or over/underpasses are needed at crossings of Western Ave., Harvard bridge, Museum of Science bridge. At some of these major intersections (e.g. Western Ave.), there is literally no time to cross when motor traffic is not entering the intersection.
- g. Greater width and better surface is needed at the metal grate on the path under the Longfellow bridge.
- h. Better access to the path is needed. A signal or overpass to cross Memorial Drive at Hawthorne/Ash Streets would make this important connection much safer. Ramps for the Weeks Footbridge would better connect the paths on both sides of the River. DeWolfe Street is another important connection to the path (and the footbridge), but is a one-way street. Ideally DeWolfe Street would be two-way for bicycles, though implementation of this requires further study.
- i. Places where a driveway or access road crosses the path need improvement. At the very least, speed bumps and signs should warn motorists to reduce speed and yield to bicycles and pedestrians on the path.
- j. A significant section of Memorial Drive in the area of MIT has an extremely wide median area. This median is not used as parkland and is an obstacle to the occasional pedestrian trying to cross. In the long term, this median could be significantly narrowed (leaving

enough width for grass and some trees), and the roadway closest to the river moved toward the new, narrower median. This would create considerable new parkland right along the river, where it is actually *used* as parkland, as well as providing sufficient new width for separated bicycle and pedestrian paths.

In areas where the median is temporarily eliminated or narrowed, reasonable compromises can be made to provide continuity of the path and park. The motor vehicle underpass at Mass. Ave., for instance, occupies the median area. But to the river side of the underpass approaching Mass. Ave. are three traffic lanes and one parking lane. One or two of the traffic lanes could be eliminated since they are underutilized and all traffic in those lanes must turn right onto the Harvard Bridge. A few parking spaces could also be eliminated in this short distance to provide width for the river park and path.

2. Harvard Square to Kendall Square via Harvard Street:

- Begin at the intersection of Oxford and Kirkland Streets.
- Travel on the path toward Harvard Yard.
 - a. Harvard should be included in discussion of this area, since Harvard supplies many of the area's bicyclists and pedestrians, some of whom are entering or exiting Harvard Yard (where bicycling is not permitted). This area is heavily used by bicyclists as an important connector, and alternatives are poor or nonexistent.
 - Turn left just before Harvard Yard; ride on brick path to Broadway and Quincy.
 - Turn right onto Quincy Street and follow to Quincy and Harvard Streets.
 - b. Quincy Street should include a one-way bikelane on the right side from Harvard Street to Broadway. Bicyclists already use Quincy Street extensively in both directions (illegally in one of those directions) since it is such an important connector. A bikelane would accommodate the direction that is currently illegal on this one-way street. This can be accomplished easily on Quincy Street because it already has adequate width, parking only on one side, and almost no cross traffic from driveways, etc. The traffic signals at Quincy and Broadway could be modified to accommodate (bicycle) traffic entering from Quincy Street, just the same as if it were auto traffic. To minimize the effect on auto traffic, a bicycle sensitive signal actuator could be installed in the bicycle lane as it approaches Broadway. Note that bicycle traffic entering from Quincy Street can go straight, turn right onto Broadway, or turn left onto the brick path along Harvard Yard. It is important that the signals and signage assure the safety of each of these alternatives. Specifically, all motor traffic must be stopped from entering Quincy Street when a bicycle is turning left onto the brick path.
 - Turn left onto Harvard Street and proceed to Harvard and Prospect.
 - c. Harvard Street should be designated a bicycle priority street. It is already a lightly travelled residential street. Between Quincy and Prospect Streets, few changes are needed besides signage and making traffic signal actuators (e.g. at Inman Street) bicycle sensitive. If further discouragement of through traffic or speeding is needed, a diverter such as a small traffic circle could be installed on this section.
 - Cross Prospect and continue on Harvard Street.
 - d. This section of Harvard Street is one-way, with parking on both sides. It should be two-way for bicycles and designated as a bicycle priority street all the way to Portland Street. This can be accomplished by making it two-way for autos as well, but installing a

diverter or barrier to autos to keep the speeds low and strongly discourage through traffic. In the longer term, elimination of parking on one side would greatly improve this situation, but that is obviously a sensitive community issue to be discussed with the community.

- Turn left on Moore Street and travel one block to Broadway.
- e. Moore Street is used rather than Portland to avoid the left turn from Harvard onto Portland. In the reverse direction, turn left from Broadway onto Portland and then right onto Harvard Street (assuming it is a two-way bicycle priority street).
- Turn right on Broadway; follow it through Kendall Square to Longfellow Bridge.
- f. Broadway is a "heavily trafficked route", but there is no good alternative to Kendall Square. Unfortunately much of this section of Broadway has two traffic lanes in each direction which are too narrow for car/bike sharing (no wide curb lane). In some places good potential exists for widening. A long term eye toward improvement is needed for this section of Broadway.

3. Harvard Square to MIT via Franklin/Green Street pair:

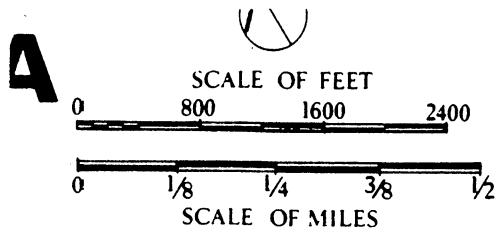
- Begin at the intersection of Oxford and Kirkland Streets.
- Travel on the path toward Harvard Yard.
- Turn left just before Harvard Yard; ride on brick path to Broadway and Quincy.
- Turn right onto Quincy Street and follow to Quincy and Harvard Streets.
- Up to this point the route coincides with Harvard Square to MIT via Harvard Street and the same recommendations (2a and 2b) apply.
- Proceed across Mass. Ave. onto Bow Street. (Route differs in other direction due to one-way streets.)
- a. This intersection (Mass. Ave with Quincy/Harvard/Bow Streets needs study for potential safety improvements for bicycle traffic.
- Continue across Mt. Auburn Street to DeWolfe Street.
- Follow DeWolfe to Copperwithe St (just before Memorial Drive).
- b. Besides being part of this route, DeWolfe Street is also an important connection to the Charles River bikepath and the Weeks footbridge, particularly since there is a safe crossing of Memorial Drive. Unfortunately DeWolfe is a one-way street. Ideally it should be two-way for bicycles. Further study is needed of the best way to accomplish this.
- Turn left on Copperwithe, follow to end at Banks Street.
- Cross Banks Street and continue on Surrey Street to Putnam Ave.
- Cross Putnam Ave. and continue on Franklin Street.
- c. Both the intersections of Copperwithe/Banks/Surrey and Surrey/Putnam/Franklin need further study for potential safety improvements for bicyclists.
- d. Franklin Street, along with Green Street in the other direction, should be designated as bicycle priority streets, with low speed limits and physical diverters such as small traffic circles if needed to discourage speeding and through traffic.

- e. The intersections of Franklin Street (and Green Street) with Western Ave, River Street, and Prospect Street should be studied for safety improvements for bicyclists.
 - f. Much of Franklin Street needs repaving.
 - Proceed on Franklin Street to the end at Landsdowne Street.
 - Turn left at Landsdowne Street.
 - Turn right on Cross Street.
 - Turn left on Albany Street.
 - Turn right on Massachusetts Avenue.
 - g. The extra turns are taken to avoid as much of Mass. Ave. as possible. Some of these streets need resurfacing (e.g. Albany) or minor improvements such as signage.
 - h. Massachusetts Avenue is a major motor vehicle thoroughfare which passes through MIT before reaching the Harvard Bridge. Unfortunately this section is not particularly bicycle-friendly. This section of Mass. Ave. needs considerable study and discussion with MIT to determine appropriate improvements for bicycle safety. It is already heavily used by bicyclists and is a necessary connector.
 - In the other direction, take Mass. Ave. to Albany.
 - Left on Albany.
 - Right on Cross.
 - Right on Landsdowne.
 - Left on Green Street.
 - i. Green Street, along with Franklin Street in the other direction, should be designated as bicycle priority streets, with low speed limits and physical diverters such as small traffic circles if needed to discourage speeding and through traffic.
 - Continue on Green Street to Putnam Ave.
 - Right on Putnam Ave.
 - Cross Mass. Ave. and proceed on Trowbridge Street to Harvard St.
 - Left on Harvard Street.
 - Right on Quincy Street.
 - j. Quincy Street is currently one-way against this direction. It would need a bike lane to permit traffic legally in this direction. See item 2b.
 - Turn left onto the brick path at Quincy Street and Broadway.
 - k. The traffic signals at this intersection must be modified to safely accommodate the bike lane safely. This route is already used extensively (though illegally) by bicyclists because it is such an essential connector. See item 2b.
4. Harvard Square to Porter Square via Oxford Street:
- a. Oxford Street is another prime candidate for a bicycle priority street. It connects well (via paths and Quincy Street) with Harvard Street and Franklin/Green Streets, also recommended bicycle priority streets. Oxford Street needs to be signed as a bicycle priority street with a low speed limit. It likely needs a traffic diverter such as a small traffic circle to discourage speeding and through traffic.

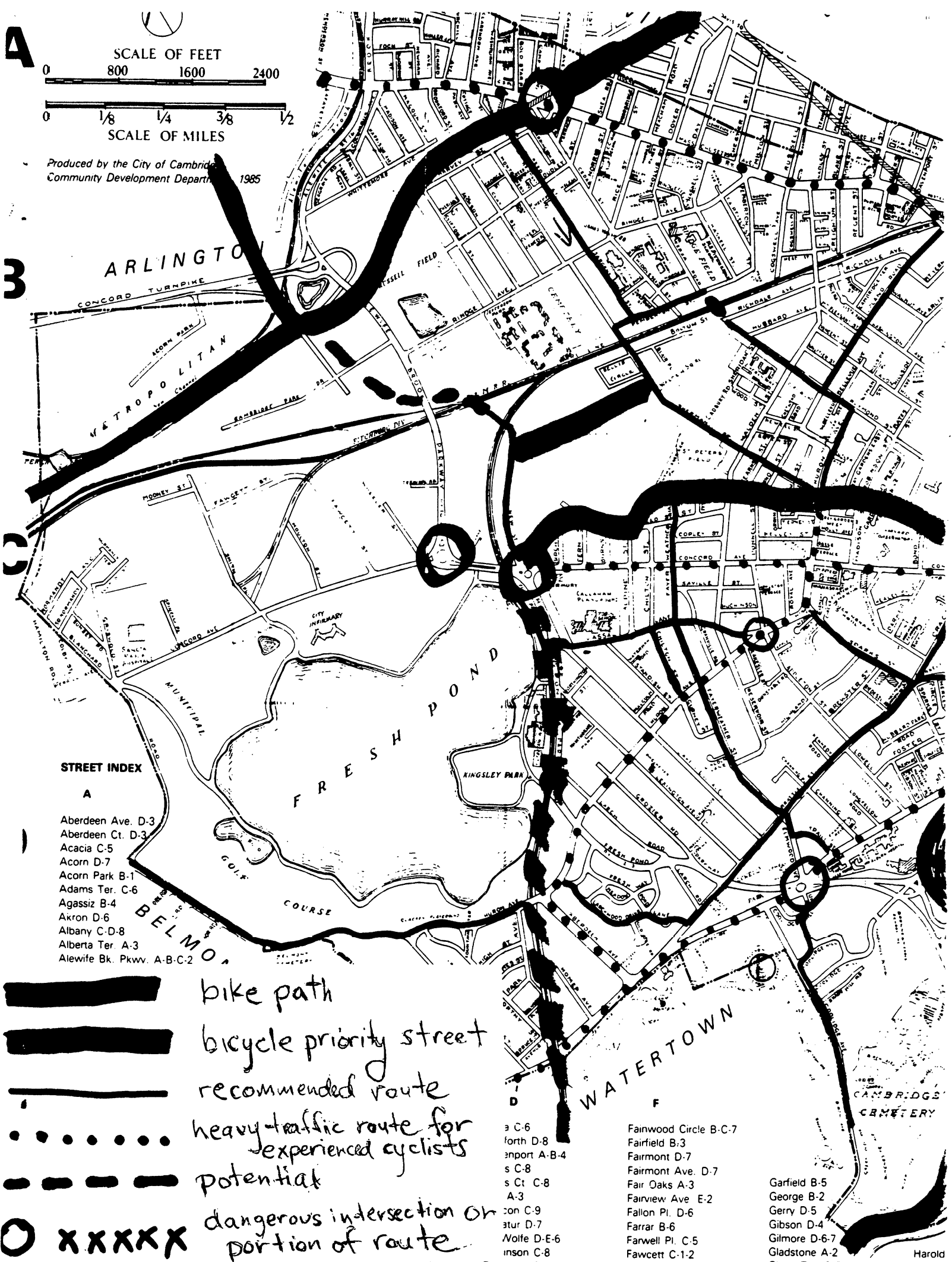
- Note the next three items are technically not in Cambridge, but greatly affect bicycle connections from Oxford Street Cambridge to Porter Square Cambridge via a small piece of Somerville, as well as connections between Cambridge and Somerville. Hopefully Somerville (and other communities adjoining Cambridge) will entertain ideas for improving bicycle connections and perhaps even initiate bicycle programs of their own.
- b. (Somerville) The intersection of Oxford Street and Beacon Street Somerville needs to be examined for safety improvements for bicycles.
- c. (Somerville) The intersection of Oxford/Beacon Streets with Somerville Avenue is dangerous for bicycles, pedestrians, and motor vehicles alike. The most likely solution appears to be installation of a traffic signal.
- d. (Somerville) Mossland Street in Somerville is an important connector between Elm Street Somerville and several other routes including Oxford Street Cambridge, Beacon Street Somerville (to Inman Square Cambridge), and Somerville Ave. Mossland Street is currently one-way with parking on both sides but is heavily used by bicyclists in both directions (one illegally) because of its importance as a connector. A resident of Mossland Street complained of the wrong-way bicyclists using the sidewalk (although they are technically legal if they yield to pedestrians). She also mentioned that Mossland is heavily used for parking for the Porter Square area. It might be in the interests of both residents and bicyclists to eliminate parking on one side and establish a bike lane similar to that described for Quincy Street (see item 2b for a description).

Significant data has been compiled for many of the following routes or areas. These descriptions can be filled in pending subsequent work by the committee.

5. MIT to BU bridge via Albany/Vassar Street pair:
6. BU bridge and Charles River bikepath to Central Square via Magazine Street:
7. Porter Square to Arlington:
8. Alewife/Fresh Pond to Harvard Square via Garden Street:
9. Brattle Street:
10. Alewife area:
11. Harvard Square area and Cambridge Common:
12. Portland Street connecting Central Square/MIT to Somerville Avenue:
13. BU to MIT via unused railroad bridge and right-of way, also connecting Charles River Bikepath on both sides of the river and potentially going to Mass Ave or beyond:
14. Bike path along nearly-abandoned Watertown branch rail from Fresh Pond area to Watertown:
15. Alewife Brook Parkway area:
16. East Cambridge area:
17. Bike path from Alewife to Davis Square Somerville.



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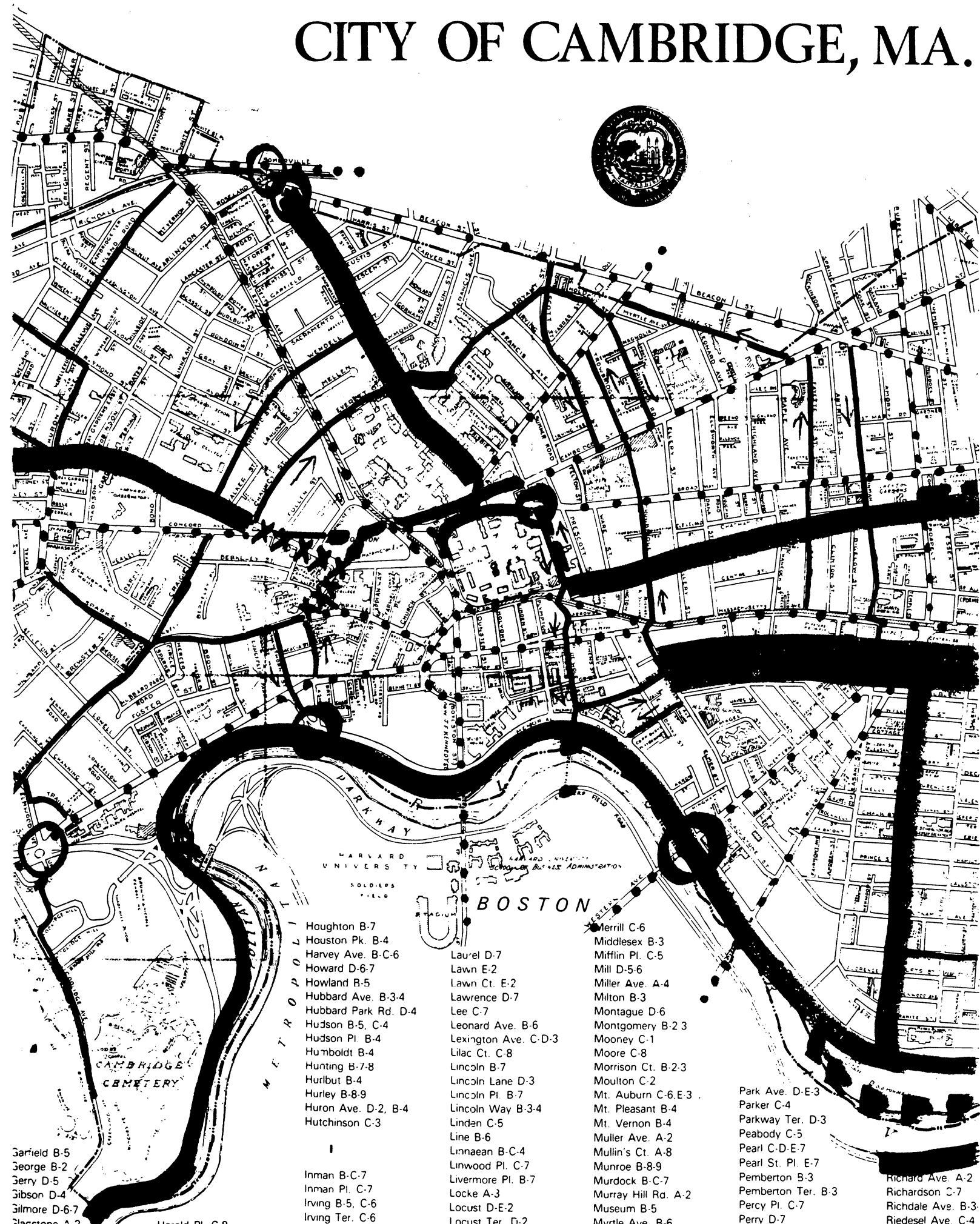
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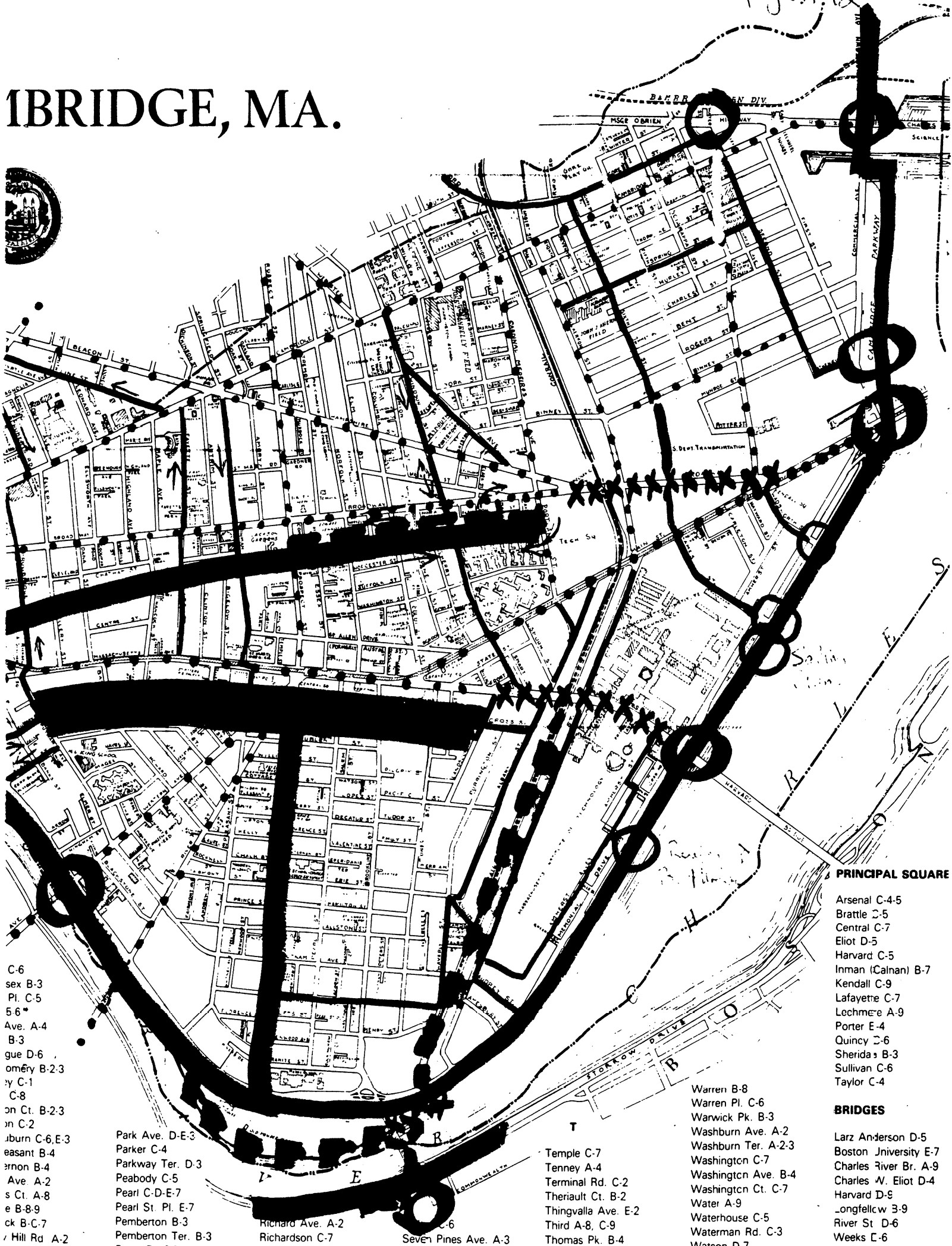
CAMBRIDGE CEMETERY

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STATE BUREAU OF ADMINISTRATION

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Appendix B: Selected Massachusetts Bicycle Laws**Chapter 85, Section 11B****PUBLIC WAYS AND WORKS****85 § 11B****§ 11B. Bicycles; operation and equipment; regulations; federal product safety standards, effect; races; violations; penalties**

Every person operating a bicycle upon a way, as defined in section one of chapter ninety, shall have the right to use all public ways in the commonwealth except limited access or express state highways where signs specifically prohibiting bicycles have been posted, and shall be subject to the traffic laws and regulations of the commonwealth and the special regulations contained in this section, except that: (1) the bicycle operator may keep to the right when passing a motor vehicle which is moving in the travel lane of the way, (2) the bicycle operator shall signal by either hand his intention to stop or turn, and (3) bicycles may be ridden on sidewalks outside business districts when necessary in the interest of safety, unless otherwise directed by local ordinance. A person operating a bicycle on the sidewalk shall yield the right of way to pedestrians and give an audible signal before overtaking and passing any pedestrian.

Operators of bicycles shall be subject to the following regulations:

(1) The operator shall ride single file on any way except when passing.

(2) The operator shall not ride other than upon or astride a permanent and regular seat attached to the bicycle. The operator shall not carry another person on said bicycle, except on a baby seat attached to the bicycle, provided that such seat is equipped with a harness to hold the person securely in the seat and that protection is provided against the feet of said person hitting the spokes of the wheel of the bicycle.

(3) The operator shall give an audible warning whenever necessary to insure safe operation of the bicycle; provided, however, the use of a siren or whistle is prohibited.

(4) The operator shall park his bicycle upon a way or a sidewalk in such a manner as not to obstruct vehicular or pedestrian traffic.

(5) The operator shall not permit the bicycle to be drawn by any other moving vehicle. The operator shall not tow any other vehicle or person, except that bicycle trailers properly attached to the bicycle which allow for firm control and braking may be used.

(6) The operator shall not carry any package, bundle or article except in or on a basket, rack, trailer or other device designed for such purposes. The operator shall keep at least one hand upon the handlebars at all times.

(7) Every bicycle operated upon a way shall be equipped with a braking system to enable the operator to bring the bicycle traveling at a speed of fifteen miles per hour to a smooth, safe stop within thirty feet on a dry, clean, hard, level surface.

(8) During the period from one-half hour after sunset to one-half hour before sunrise, the operator shall display to the front of his bicycle a lamp emitting a white light visible from a distance of at least five hundred feet, and to the rear of said bicycle either a lamp emitting a red light, or a red reflector visible for not less than six hundred feet when directly in front of lawful lower beams of headlamps on a motor vehicle. A generator powered lamp which emits light only when the bicycle is moving shall meet the requirements of this clause.

(9) During the period from one-half hour after sunset to one-half hour before sunrise, the operator shall display on each pedal of his bicycle a reflector, or around each of his ankles reflective material visible from the front and rear for a distance of six hundred feet, and reflectors or reflective material, either on said bicycle or on the person of the operator, visible on each side for a distance of six hundred feet, when directly in front of lawful lower beams of headlamps of a motor vehicle. This clause shall not prohibit a bicycle or its operator to be equipped with lights or reflectors in addition to those required by clauses (8) and (9).

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(10) No bicycle shall be operated upon a way with handlebars so raised that the operator's hands are above his shoulders while gripping them. Any alteration to extend the fork of a bicycle from the original design and construction of the bicycle manufacturer is prohibited.

(11) The operator of a bicycle shall report any accident involving either personal injury or property damage in excess of one hundred dollars, or both, to the police department in the city or town in which the accident occurred.

Any federal product safety standards relating to bicycles which are more stringent than the requirements of clauses (7) through (10), inclusive, shall supersede said requirements.

Competitive bicycle races may be held on public ways, provided that such races are sponsored by or in cooperation with recognized bicycle organizations and, provided further, that the sponsoring organization shall have obtained the approval of the appropriate police department or departments. Special regulations regarding the movement of bicycles during such races, or in training for races, including, but not limited to, permission to ride abreast, may be established by agreement between the police department and the sponsoring organization.

Violations of any provision of this section shall be punished by a fine of not more than twenty dollars. The parent or guardian of any person under age eighteen shall not authorize or knowingly permit any such person to violate any of the provisions of this section. A bicycle operated by a person under the age of eighteen in violation of this section may be impounded by the police department, or in a town which has no police department, by the selectmen, for a period not to exceed fifteen days. A violation of any provision of this section by a minor under the age of eighteen shall not affect any civil right or liability nor shall such violation be considered a criminal offense.

Added by St.1961, c. 518, § 4. Amended by St.1962, c. 346; St.1971, c. 484; St.1973, c. 806, § 2; St.1983, c. 274.

90E § 1

PUBLIC WAYS AND WORKS

CHAPTER 90E. BIKEWAYS

Section
1. Definitions.

Section
2. Rules, regulations and plans; bikeways program; participation.
3. Funding; expenditures; federal funds.

Chapter 90E of the General Laws was added by St.1977, c. 356, § 13.

§ 1. Definitions

Wherever used in this chapter, unless the context otherwise requires, the following words or terms shall have the following meanings:—

“Bicycle”, a two-wheel nonmotor-powered vehicle.

“Bike path”, a route for the exclusive use of bicycles separated by grade or other physical barrier from motor traffic.

“Bike lane”, a lane on a street restricted to bicycles and so designated by means of painted lines, pavement coloring or other appropriate markings.

“Bike route”, a roadway shared by both bicycles and other forms of transportation designated by the means of signs or pavement markings.

“Bikeway”, bike paths, bike lanes and bike routes.

“Bicycle parking facility”, any facility for the temporary storage of bicycles which allows the frame and both wheels of the bicycle to be locked so as to minimize the risk of theft and vandalism.

“Department”, the department of public works.

“Commissioner”, the commissioner of public works.

Added by St.1977, c. 356, § 13.

<p>Historical Note 1977 Enactment. St.1977, c. 356, § 13, an emergency act, adding this chapter, consisting of</p>	<p>this section and §§ 2 and 3, was approved June 29, 1977.</p>
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§ 2. Rules, regulations and plans; bikeways program; participation

The commissioner shall promulgate such rules, regulations, plans, proposals, and procedures as are necessary and appropriate to the construction and maintenance of bikeways and bicycle parking facilities.

Such rules, regulations, plans, proposals and procedures shall take into consideration potential users in high density employment areas, bicycle accident locations, connections to other modes of transportation, special signs, markings necessary for the benefit of cyclists and motorists, bicycle parking facilities at points of public interest and provisions to insure safe, smooth, direct continuous bikeways.

The commissioner shall designate the bureau of transportation planning and development in the department as the principal source for the planning of bikeways in the commonwealth.

The commissioner shall establish, with the advice and assistance of the bicycle advisory board, established by section eleven A of chapter twenty-one A, a bikeways program which shall include, but not be limited to: surveys, safety measures, demonstration projects, research, education, utilization of existing streets and walkways, provisions of bikeways to and from schools affording a minimum of hazard from automobiles, provision of comfort stations and weather shelters, provision of facilities in connection with commuter railroads to facilitate the use of bicycles by commuters in traveling to and from the railroad stations, the use of abandoned rights of way for bicycle paths; the development of commuter and recreational trails; provision of bicycle transportation facilities roadways, bridges and airports; the development of a coordinated program for bicycles

PUBLIC WAYS AND WORKS**90E § 3**

and motor vehicles; the development of bicycle amenities such as assigned parking facilities; bicycle routes, paths and trails; bicycle sensitive traffic light actuation; and bicycle transportation as a commuter activity and promulgation of standards, security measures and regulations for the registration and use of bicycles.

The commissioner shall promulgate such rules, regulations and procedures, including public hearings, as are necessary and appropriate to provide the following parties the timely opportunity to participate in the development of bikeway proposals, plans, programs and projects of the department, as defined by the commissioner, and to view and comment thereon:

(a) state, regional and local agencies and authorities, including without limitation, regional planning agencies, affected by said proposals, plans, programs and projects;

(b) elected officials from cities and towns affected by said proposals, plans, programs and projects;

(c) other public and private organizations, groups and persons who are affected by, and who have provided the commissioner with reasonable notice in writing of their desire to participate in the development of said proposals, plans, programs and projects.

In this section, the words "timely opportunity" shall mean sufficiently early in the planning process to permit comments to be considered prior to the final development of or commitment to any such proposal, plan, program or project, at each stage of development.

Added by St.1977, c. 356, § 18. Amended by St.1986, c. 707, § 2; St.1987, c. 465, § 21.

Historical Note**1986 Legislation**

St.1986, c. 707, § 2, approved Jan. 7, 1987, rewrote the paragraph relating to the bikeways program, which prior thereto read:

"For purposes of this act, 'bikeways program' shall include, but not be limited to: surveys, safety measures, demonstration projects, research, education, utilization of existing streets and walkways, provision of bikeways to and from schools affording a minimum of hazard from automobiles, provision of comfort stations

and weather shelters; provision of facilities in connection with commuter railroads to facilitate the use of bicycles by commuters in traveling to and from the railroad stations, and promulgation of standards, security measures and regulations for the registration and use of bicycles."

1987 Legislation

St.1987, c. 465, § 21, an emergency act, approved Nov. 8, 1987, in the first sentence of the fourth paragraph substituted "advice" for "advice".

§ 3. Funding; expenditures; federal funds

The commissioner shall expend for the purpose of assisting counties, cities and towns to construct bikeways for commuter or recreational use, and for the construction of unique regional bikeways and bicycle parking facilities, such funds as are appropriated or authorized by the general court for such purpose, and payment shall be made to the county or city or town upon application to the commissioner on the basis of criteria established by him.

Funds made available for the construction of bikeways shall be expended as follows:

(a) Seventy-five per cent of the costs for bikeways, the balance of the costs to be borne by the city or town in which said bikeways are located.

(b) Fifty per cent for the cost of constructing a bicycle parking facility at or adjacent to a mass transit facility, the balance of the costs to be borne by the city or town where said bicycle parking facility is to be constructed.

(c) One hundred per cent for the cost of unique regional bikeways and bicycle parking facilities, as determined by the commissioner.

The department is hereby authorized and directed to take all steps necessary to obtain federal funds that may be available for the construction of bikeways and said funds shall be credited to the Federal Highway Construction Program Fund.

Added by St.1977, c. 356, § 18. Amended by St.1977, c. 920, § 17.

Appendix C: Bibliography

The following is a partial list of bicycle-related policy, planning, and facilities design documents. Additional documents in these areas and in bicycle safety, education, commuting, enforcement, etc. can be found by contacting national organizations such as Bicycle Federation of America, Bikecentennial, and the League of American Wheelmen, or by contacting federal, state, or city bicycle coordinators.

American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle facilities*, AASHTO, Washington, DC, August 1991.

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City of Seattle. "Executive Summary of Comprehensive Bicycling Policy", Seattle Engineering Department.

City of Scottsdale. *Design Procedures and Criteria: Section 8 Bikeways and Horse Trails*, Scottsdale, AZ 1984.

City of Vancouver, Engineering Department. *Vancouver Comprehensive Bicycle Plan*, July 1988.

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- Replogle, Michael. *Bicycles and Public Transportation: New Links to Suburban Transit Markets*, Institute for Transportation Development Policy, Washington D.C. 1984.
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- "Traffic Control for Bicyclists", part IX of *Traffic Control Devices Handbook*, U.S. Government Printing Office, Washington D.C.
- U.S. DOT. "Bicycle Transportation for Energy Conservation", U.S. Department of Transportation, April, 1980.
- U.S. EPA. *Bicycling and Air Quality Information Document*, U.S. Environmental Protection Agency, September 1979.
- Wisconsin DOT. *Transportation Issues and Answers: Choice of Travel to Work, Summary Report*, Division of Planning and Budget, Wisconsin DOT, Madison, Wisconsin August 1981.

Appendix D: Range, Cargo, and Weather Considerations

Range: Few people other than serious bicycling enthusiasts would think of hopping on a bicycle and riding 40 or 50 miles. Yet, just about anyone who can walk for 10 or 15 minutes can bicycle two miles or more in the same amount of time, and with less effort expended. Similarly, a five mile bicycle ride under average conditions might take 25 to 35 minutes, again at a very easy pace without raising a sweat. A reasonable limit of bicycle transportation for most people is somewhere in this 2 to 5 mile range, making a wide range of urban destinations available with trips times comparable to auto travel. Experienced bicyclists or more athletically inclined individuals can go much farther at a considerably faster pace.

Cargo: Bicycles generally make poor carriers for TV sets, air conditioners, furniture, or other large or heavy objects. A briefcase or parcel is a more appropriate and manageable cargo. A wide variety of carrying bags designed for bicycle handlebars are available, as well as panniers (saddlebags) and baskets for the rear. Some of these are designed specifically for carrying bags of groceries. These accessories make the bicycle into a modern pack horse, with considerably more capacity than hand-carrying and suitable for a wide range of urban errands.

Weather: Bicycling in a cold, driving rain is not much fun, and most people will opt for another mode of transportation under these conditions. Bicycling is obviously ideal in warm, fair conditions. In between these extremes is a wide range of temperature and precipitation. By dressing like cross-country skiers in winter, cyclists can stay comfortable under most conditions, including extreme cold or snow. Other people may choose to be only "fair-weather" cyclists. Precipitation is generally more inhibiting than temperature, but a large range of individual preference largely dictates what conditions are suitable for bicycling.



OFFICE OF THE MAYOR

CITY HALL, CAMBRIDGE, MASSACHUSETTS 02139

(617) 349-4321

Fax (617) 349-4287

Alice K. Wolf
Mayor

20

October 28, 1991

MAYOR WOLF

WHEREAS: The Mayor's Bicycle Committee and its facilitator, Cara Seiderman, have spent several months looking into ways of encouraging and improving bicycling as an alternative means of transportation, and researching the impediments to bicycling in Cambridge; and

WHEREAS: Increased bicycling could significantly reduce automobile traffic, and increased education about bicycling would improve safety for pedestrians, drivers, and bicyclists alike; now be it

and specific recommend.
ations

RESOLVED: That this City Council accepts the report/ of the Mayor's Bicycle Committee and commends the members on their fine work; and be it further

ORDERED: That this City Council refers the Mayor's Bicycle Committee's report to the City Manager for report back on the ~~feasibility of implementing~~ ^{the} recommendations; and be it further

ORDERED: That the City Manager be and hereby is requested to implement recommendation number six, which calls for the formation of a permanent bicycle advisory committee.

C. Dushan c/c accepts the recommends - specifically
C. Coy
MS
14
v/v

BICYCLE PLAN SUPPORTERS

<u>NAME</u>	<u>ADDRESS</u>
Mira Brown	351 Broadway 02139
Michael Janson	18 BOND ST.
DICK HARTER	16 ARLINGTON ST 02140
Jean Levitt	48 Concord Ave 02138
Doug Mink	CFA CFA, 60 Garden St Cambr. 02138
Fred Small	80 Aberdeen Ave. 02138
John Hall	2301 MASS, Ave. 02140
John Hall	111 Hampshire ST 02139
Don McConall	8 ADAMS TERRACE 02138
Richard Jan	190-1 Alchem
Chris Jan	53 Lawn St. J.P.
Helen Brank	44 Bowdoin St. 02138
Bill Taylor	62 Day St, J.P. 02130
Alana Pudley	53 Lawn St., Roxb. 02100
Katharine F. Wall	7 Arlington St. #45 Comb 02146
CHRIS HAYES (MIT)	8 BIGELOW ST CAMB
CHARLES SOWERS	351 BROADWAY, Camb 02139
Stefan Treue	4 Stinson Ct, 02139
Susan Johnson	4 Stinson Ct 02139
Sally MacGillivray	64 Frost St., 02140
Peter Grace	21 Allen St, Som. 02143
Maggie Stanley	36 Stone Ave Som. 02143

NAME

ADDRESS

MALCOLM KAUFMAN

18 Dudley #3 02140

Cathy J Ellis

881 Mass Ave #11 02139

EVE GUSFAR

29 RINGGATE ST. 02140

Sabrina Birner

8 Chatham #2 02139

Pierre Godek

12 Clinton Street 02139

John Allen

7 University Park 02154

Cindy Rubel

9 Chauncy St 02138

Will PECK

37 Concord Av. 02138

Douglas Kline

16 Mellen St. Apt. #3 Cambridge 02138

James Wallie

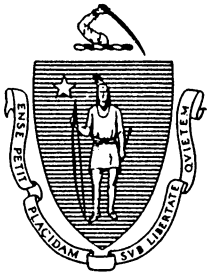
109 Larch Rd Cambridge 02138

JOHN McDERMOTT

MASS Y MAG FAMILY CAMB. MA.

Celia Pastore

127 Sutherland Rd Apt D. Brookline



THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE DEPARTMENT
GOVERNOR'S HIGHWAY SAFETY BUREAU
100 CAMBRIDGE STREET, ROOM 2104
BOSTON, MASSACHUSETTS
02202

NANCY J. LUTHER
DIRECTOR

October 28, 1991

TELEPHONE
(617) 727-5074

Mayor Alice Wolf
Cambridge City Council
Cambridge, Massachusetts

Dear Mayor Wolf and Council Members:

I would like to take this opportunity to support and applaud the efforts of the Mayor's office and the Cambridge City Council relative to the promotion of safe bicycle transportation.

The Governor's Highway Safety Bureau has long been a proponent of bicycles as a viable alternative to automobiles for efficient and cost effective transportation. Certainly the establishment of a bicycle route network would alleviate congestion as well as the hazards that accompany automobile commuting.

The Bureau is please to act as a resource for this endeavor and will assist Cambridge any way possible that will allow the recommendations to become reality.

Thank you.

Yours truly,

A handwritten signature in black ink, appearing to read "Thomas M. McGovern".

Thomas M. McGovern
Program Manager

TMM/gw



Buckle up Massachusetts
Make it a Habit
for Life.



William F. Weld
Governor

Thomas C. Rapone
Secretary

The Commonwealth of Massachusetts

Executive Office of Public Safety

One Ashburton Place

Boston, Massachusetts 02108

(617) 727-7775

October 28, 1991

Mayor Alice Wolf
Cambridge City Hall
795 Massachusetts Avenue
Cambridge, Massachusetts 02139

Dear Mayor Wolf,

I applaud the thoroughness of the work and proposed recommendations outlined in the Bicycle Committees Initial Report.

I have three reasons for being personally interested in the development of a bicycle route network: (1) I am an avid cyclist and a member of the Charles River Wheelmen; (2) I am a resident of Cambridge, and (3) I am committed to enhancing public safety in the Commonwealth.

As you move forward with your plans, let me know how I can be helpful.

Sincerely,

A handwritten signature in black ink that reads "Priscilla H. Douglas". The signature is fluid and cursive, with a large, sweeping flourish at the end.

Priscilla H. Douglas
Assistant Secretary of Public Safety

PHD/dg



William F. Weld
Governor

Thomas C. Rapone
Secretary

The Commonwealth of Massachusetts

Executive Office of Public Safety

One Ashburton Place

Boston, Massachusetts 02108

(617) 727-7775

October 28, 1991

Mayor Alice Wolf and
Cambridge City Council
795 Massachusetts Avenue
Cambridge, Massachusetts 02139

Dear Mayor and City Council,

The Executive Office of Public Safety strongly endorses the development of a bicycle route network not only in Cambridge but throughout the Commonwealth of Massachusetts. We encourage and promote bicycle safety through the Governor's Highway Safety Bureau.

If our office can be of assistance as you move forward with your plans, contact our bicycle safety coordinator Beth Blanchette at (617) 727-5074.

Sincerely yours,

A handwritten signature in black ink, appearing to read "T.C. Rapone". The signature is fluid and cursive, with a large initial "T" and "C" and a long, sweeping tail.

Thomas C. Rapone
Secretary of Public Safety

TCR/dg

JOSEPH P. KENNEDY II
8TH DISTRICT, MASSACHUSETTS

COMMITTEE ON BANKING,
FINANCE AND URBAN AFFAIRS

SUBCOMMITTEES:

HOUSING AND COMMUNITY DEVELOPMENT
FINANCIAL INSTITUTIONS SUPERVISION,
REGULATION AND INSURANCE
INTERNATIONAL DEVELOPMENT
INSTITUTIONS AND FINANCE

COMMITTEE ON VETERANS' AFFAIRS

SUBCOMMITTEES:

HOSPITALS AND HEALTH CARE
EDUCATION, TRAINING AND EMPLOYMENT

SELECT COMMITTEE ON AGING

SUBCOMMITTEE ON HUMAN SERVICES



1208 LONGWORTH BUILDING
WASHINGTON, DC 20515
(202) 225-5111

SUITE 605, THE SCHRAFFT CENTER
529 MAIN STREET
CHARLESTOWN, MA 02129
(617) 242-0200

Congress of the United States
House of Representatives
Washington, DC 20515

October 25, 1991

The Honorable
Alice Wolf
Mayor of Cambridge
City Hall
Cambridge, Massachusetts 02139

Dear Mayor Wolf:

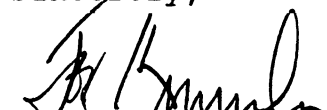
I would like to take this opportunity to commend you for your initiative in establishing a Bicycle Committee for the City of Cambridge.

The need for a more diverse and modern transportation system has never been greater - nor has it ever been more possible. Over half of all U.S. workers live within five miles of work, yet barely six percent of those bicycle or walk to work. Recent studies indicate that this number would jump to twenty percent if city, state and federal governments would work together to create conditions that are both safe and easily accessible for bicyclists and pedestrians.

The Mayor's Bicycle Committee report is thoughtful and important. I admire its comprehensive scope of the problems addressed. The report initiates an important step of making Cambridge more bicycle friendly and I respectfully urge its adoption.

As I continue to work in Congress to advocate more federal monies for bicycle and pedestrian use, it is heartening to know that Cambridge is working towards helping to make bicycling a more effective and safe mode of transportation.

Sincerely,


Joseph P. Kennedy II
MEMBER OF CONGRESS

JPK:js

October 25, 1991

The Honorable Alice K. Wolf
Mayor of Cambridge
City Hall
795 Massachusetts Avenue
Cambridge, MA 02139

Re: Cambridge Bicycle Committee Report

Dear Mayor Wolf:

The Massachusetts Bicycle Advisory Board offers this testimony in support of the initial report prepared by the City of Cambridge Mayor's Bicycle Committee. The state board was created by the legislature to advise agencies and to prepare drafts of legislation on all aspects of bicycling. We are attaching for your information a copy of our 1989 bicycling report to the state legislature.


If implemented, many of the recommendations in the two reports would go a long way toward improving conditions for bicycling in Cambridge and across Massachusetts. For example, a Cambridge Bicycle Coordinator to review road construction and mass transit projects would ensure that bicycle compatibility is considered in all planned transportation projects. Bicycle-compatible improvements are generally of low cost and high benefit to members of the community.


Improvements for bicycles rarely happen by accident. Cities such as San Diego and Seattle have bicycle coordinators in city government and active citizen advisory committees and advocacy groups. The report prepared by your Bicycle Committee is a comprehensive document that will help the City of Cambridge to promote both bicyclist safety and transportation alternatives.

Bicycle industry data points out that bicycling transportation and commuting are on the rise. Figures from the Bicycle Institute of America show that 90 million people rode bicycles in the U.S. in 1990. Bicycle commuting is estimated to increase 20 percent in 1991. If bicycle use is to continue to grow through the 1990's, safer road conditions for bicycling must be provided.

We endorse the initial report of the Cambridge Bicycle Committee and thank you for the opportunity to provide this testimony.

Sincerely,


Daniel O'Brien
Co-chairperson


Elizabeth Shultis
Co-chairperson



City of Cambridge

22.

IN CITY COUNCIL

October 28, 1991

MAYOR WOLF

WHEREAS: The Mayor's Bicycle Committee and its facilitator, Cara Seiderman, have spent several months looking into ways of encouraging and improving bicycling as an alternative means of transportation, and researching the impediments to bicycling in Cambridge; and

WHEREAS: Increased bicycling could significantly reduce automobile traffic, and increased education about bicycling would improve safety for pedestrians, drivers, and bicyclists alike; now therefore be it

RESOLVED: That this City Council accepts the report and specific recommendations of the Mayor's Bicycle Committee and commends the members of their fine work; and be it further

RESOLVED: That this City Council refers the Mayor's Bicycle Committee's report to the City Manager for report back on the implementation of the recommendations; and be it further

RESOLVED: That the City Manager be and hereby is requested to implement recommendation number six, which calls for the formation of a permanent bicycle advisory committee.

In City Council October 28, 1991.

Adopted by the affirmative vote of nine members.

Attest:- Joseph E. Connarton, City Clerk.

A true copy; *Joseph E. Connarton*

ATTEST:-

Joseph E. Connarton, City Clerk

NON-CONSENT ORDER # 22

Mayor Wolf re: acceptance of the
Mayor's Bicycle Committee's Report.

S-1136

In City Council,

October 28, 1991