Central Massachusetts Rail Trail Feasibility Study

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Cover photographs, top to bottom:
1. *Walkway over Bruce Pond, Hudson.*
2. *Looking east to Union Avenue, former Sudbury Station on the right, Lowell-Sudbury junction in foreground.*
3. *View of Great Meadows National Wildlife Refuge, southwest of Central Mass. crossing of Route 20, Wayland.*

Background photo: Central Mass. bridge over Linden Street (Route 60), Waltham.
Photographs by C. Lewis.

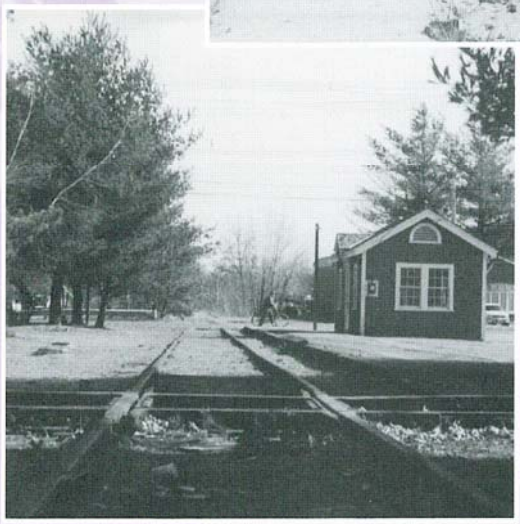
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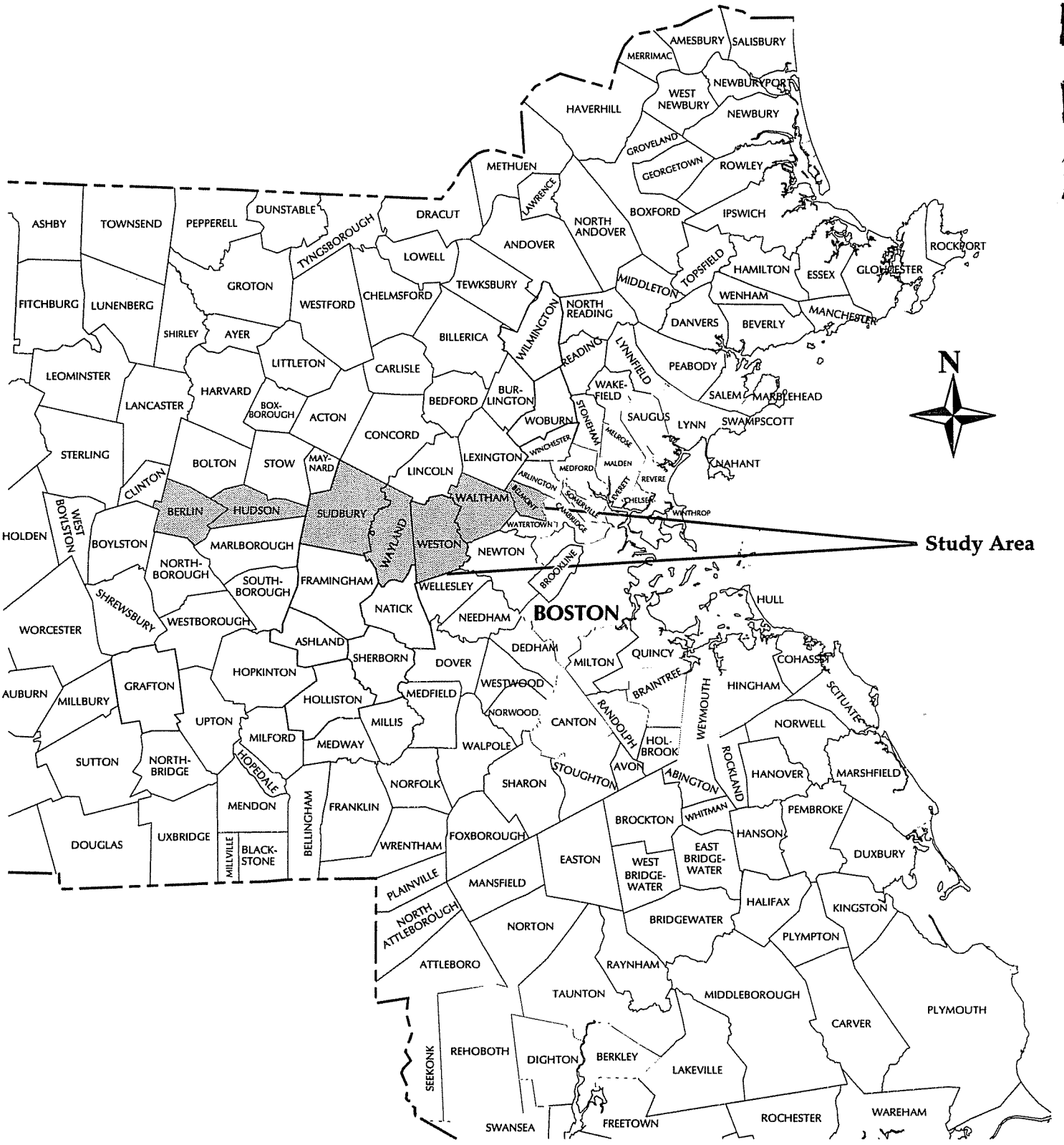

AMESBURY
SALISBURY
MERRIMAC
NEWBURYPORT
WEST NEWBURY
HAVERHILL
NEWBURY
GROVELAND
GEORGETOWN
ROWLEY
METHUEN
LAWRENCE
BOXFORD
IPSWICH
ROCKPORT
ASHBY
TOWNSEND
PEPPERELL
DUNSTABLE
TYNGSBOROUGH
DRACUT
NORTH ANDOVER
ANDOVER
LOWELL
TOPSFIELD
HAMILTON
ESSEX
GLOUCESTER
GROTON
TEWKSBURY
MIDDLETON
WENHAM
MANCHESTER
FITCHBURG
LUNENBERG
WESTFORD
CHELMSFORD
WILMINGTON
NORTH READING
DANVERS
BEVERLY
SHIRLEY
AYER
BILLERICA
READING
LYNNFIELD
PEABODY
LEOMINSTER
LITTLETON
CARLISLE
WAKE-FIELD
SALEM
MARBLEHEAD
HARVARD
BUR-LINGTON
LANCASTER
BOX-BOROUGH
ACTON
BEDFORD
STONEHAM
SAUGUS
LYNN
SWAMPSCOTT
WOBURN
MELROSE
CONCORD
WINCHESTER
STERLING
BOLTON
STOW
MAY-NARD
LEXINGTON
MEDFORD
MALDEN
NAHANT
LINCOLN
ARLINGTON
EVERETT
REVERE
CLINTON
BERLIN
HUDSON
SUDBURY
WALTHAM
BELMONT
SOMERVILLE
CHELSEA
WINTHROP
WEST BOYLSTON
HOLDEN
BOYLSTON
MARLBOROUGH
WAYLAND
WESTON
WATERTOWN
CAMBRIDGE
NEWTON
Study Area
NORTH-BOROUGH
SOUTH-BOROUGH
FRAMINGHAM
BROOKLINE
SHREWSBURY
WESTBOROUGH
NATICK
WELLESLEY
BOSTON
HULL
WORCESTER
NEEDHAM
ASHLAND
SHERBORN
DEDHAM
MILTON
QUINCY
COHASSET
HOPKINTON
DOVER
BRAINTREE
HINGHAM
AUBURN
MILLBURY
GRAFTON
HOLLISTON
MEDFIELD
WESTWOOD
WEYMOUTH
SCITUATE
UPTON
MILLIS
NORWOOD
CANTON
RANDOLPH
HOL-BROOK
NORWELL
MILFORD
MEDWAY
WALPOLE
SUTTON
NORTH-BRIDGE
HOPEDALE
NORFOLK
SHARON
STOUGHTON
AVON
ABINGTON
ROCKLAND
HANOVER
MARSHFIELD
MENDON
FRANKLIN
BROCKTON
WHITMAN
PEMBROKE
DOUGLAS
UXBRIDGE
MILLVILLE
BLACK-STONE
BELLINGHAM
WRENTHAM
FOXBOROUGH
EASTON
WEST BRIDGE-WATER
EAST BRIDGE-WATER
HANSON
DUXBURY
PLAINVILLE
MANSFIELD
HALIFAX
KINGSTON
NORTH ATTLEBOROUGH
NORTON
BRIDGEWATER
PLYMPTON
ATTLEBORO
RAYNHAM
TAUNTON
MIDDLEBOROUGH
CARVER
PLYMOUTH
SEEKONK
REHOBOTH
DIGHTON
BERKLEY
LAKEVILLE
SWANSEA
FREETOWN
ROCHESTER
WAREHAM
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Executive Summary

This is a study to determine if it is feasible to build a trail on the Central Massachusetts (Mass.) Railroad right-of-way. The conclusion of the study is that it is feasible to build this facility.

The Central Mass. right-of-way, located west of Boston, is owned by the Massachusetts Bay Transportation Authority (MBTA) from Beaver Street in Waltham to just east of Coburn Road in Berlin, a length of 23 miles. Originally extending from Boston to Northampton, the rail line carried both passenger and freight service and is now abandoned. The western end in Northampton is owned by the Department of Environmental Management (DEM) and has become the Norwottuck Rail Trail.

This rail trail would be a major asset for the seven communities involved, as well as for surrounding towns. It provides access to many schools, residential, employment, and recreation areas. The Central Mass. right-of-way crosses two other proposed trails: (1) the Assabet River Rail Trail in Hudson and (2) the Lowell-Sudbury Rail Trail in Sudbury. With connections through Belmont, users could reach the Minuteman Commuter Bicycle Path. Work is underway to connect the Minuteman to the Charles River path system.

The Central Mass. Rail Trail would pass near several commuter rail stations on the Fitchburg/Gardner line, including Hastings, Brandeis/Roberts, Waltham, and Waverley. The trail would also pass near the proposed Weston station on the Framingham/Worcester line, as well as provide access to express bus stops of private companies.

The character of the trail varies along the twenty-three mile right-of-way. It is of a more urban character in Waltham and Hudson, passing just north of both downtowns. It is more rural in the other communities, with adjacent land uses varying from sparse residential and commercial to vast open spaces such as the Great Meadows National Wildlife Refuge in Wayland and Sudbury. Some sections of the trail would attract more pedestrians, bicyclists and skaters than other sections. It is apparent that equestrian use would be popular in some of the more rural sections of the trail. The design of the trail would reflect these expected uses.

Preliminary estimates of costs are about $50,000 a year for policing and maintenance. This maintenance and policing cost would be shared among

the seven study area communities and works out to an estimated per capita cost of about $0.35. The estimated design cost is $700,000 to one million dollars; the estimated construction cost is seven to ten million dollars. The design and construction costs are anticipated to be state or a combination of state and federal funds.

The next step is for each community to decide whether or not to support a trail by agreeing to police and maintain it within its boundaries. Lease arrangements would then be established with the right-of-way owner, the MBTA, and applications for design funds would be made.

There is extensive public review by state, regional, and local officials, and citizens in the design stage. It is during the design stage that detailed decisions on the trail are made. The outcome of the design process would be an engineering plan showing the entire proposed trail, including width, sign locations, benches, etc. A detailed construction estimate would be included, although the actual construction cost would be determined when the project is bid. The lowest responsible bidder would be awarded the construction contract.

Introduction

This study of a potential trail on the Central Massachusetts railroad right-of-way (commonly referred to as the Central Mass.) was requested by the seven study-area communities through the Metropolitan Area Planning Council (MAPC) and the Central Massachusetts Regional Planning Commission (CMRPC). The study was funded by the Massachusetts Turnpike Authority (MTA) through its Public Works and Tourism Grant Program. The section of the Central Mass. examined in this study is an abandoned rail line between Berlin and Waltham that is owned by the Massachusetts Bay Transportation Authority (MBTA).

An advisory committee composed of representatives from communities, agencies, and organizations met during this study. The communities through which the proposed trail passes are Berlin, Hudson, Sudbury, Wayland, Weston, Waltham, and Belmont. Communities close to the proposed trail and having an interest in the outcome also appointed representatives (Marlborough and Stow). Agencies that appointed representatives included the Executive Office of Transportation and Construction (EOTC)/Bureau of Transportation Planning and Development (BTP&D), CMRPC, MAPC, and MBTA. The Sudbury Valley Trustees (SVT) also appointed a representative. The following individuals were appointed to the advisory committee:

Berlin	Preston Turner
Hudson	Michael Volk
Sudbury	Dan Buttner
Wayland	Ed Wallner
Weston	Ken Hablow
Waltham	Ron Vokey, Dana Burghdoff
Belmont	Jeffrey Wheeler
Marlborough	Mark Geoffrey
Stow	Roger Duchesneau
EOTC/BTP&D	Josh Lehman
CMRPC	Richard Rydant
MAPC	Joan Blaustein
MBTA	Erik Scheier
SVT	Whitney Beales

Individuals who helped with various aspects of this study include Daniel O'Brien and Leslie Luchonek of the Department of Environmental Management and Sergeant Eric Anderson of the Massachusetts State Police. Input was also received from citizens attending five public meetings, held in October 1996-February 1997 in Wayland (October 9), Waltham (November 6), Sudbury (December 4), Weston (January 30), and Hudson (February 12). It is estimated that over 400 citizens attended these meetings.

Chapter 1 of this report presents background information on the study area, including demographics, travel patterns, public transportation services, and bicycle and pedestrian accident data. Chapter 2 provides information regarding the Central Mass. right-of-way, including history of rail service, description of the right-of-way, details on width, environmental issues, and current uses of the right-of-way. Chapter 3 discusses the proposed trail, including types of users and estimated demand, street crossings, potential destinations, possible Belmont connections, parking, and costs. The final chapter includes recommendations.

This study is the first step towards the construction of a Central Mass. trail. Copies of the study are being sent to state, regional, and local officials and staff in the study area communities. Multiple copies are being sent to area libraries as well.

1 Existing Conditions

This chapter gives background information about the study area, including population and population density, transportation modes used to go to work by area residents, public transportation services, and bicycle and pedestrian accident data. The study area is indicated in Figure 1.

A Demographics

Table 1 indicates the 1990 population of the seven study-area communities. Also included in the table are the land area of each community, its resultant population density, and the number of people who are employed in each town (some of whom may live elsewhere).

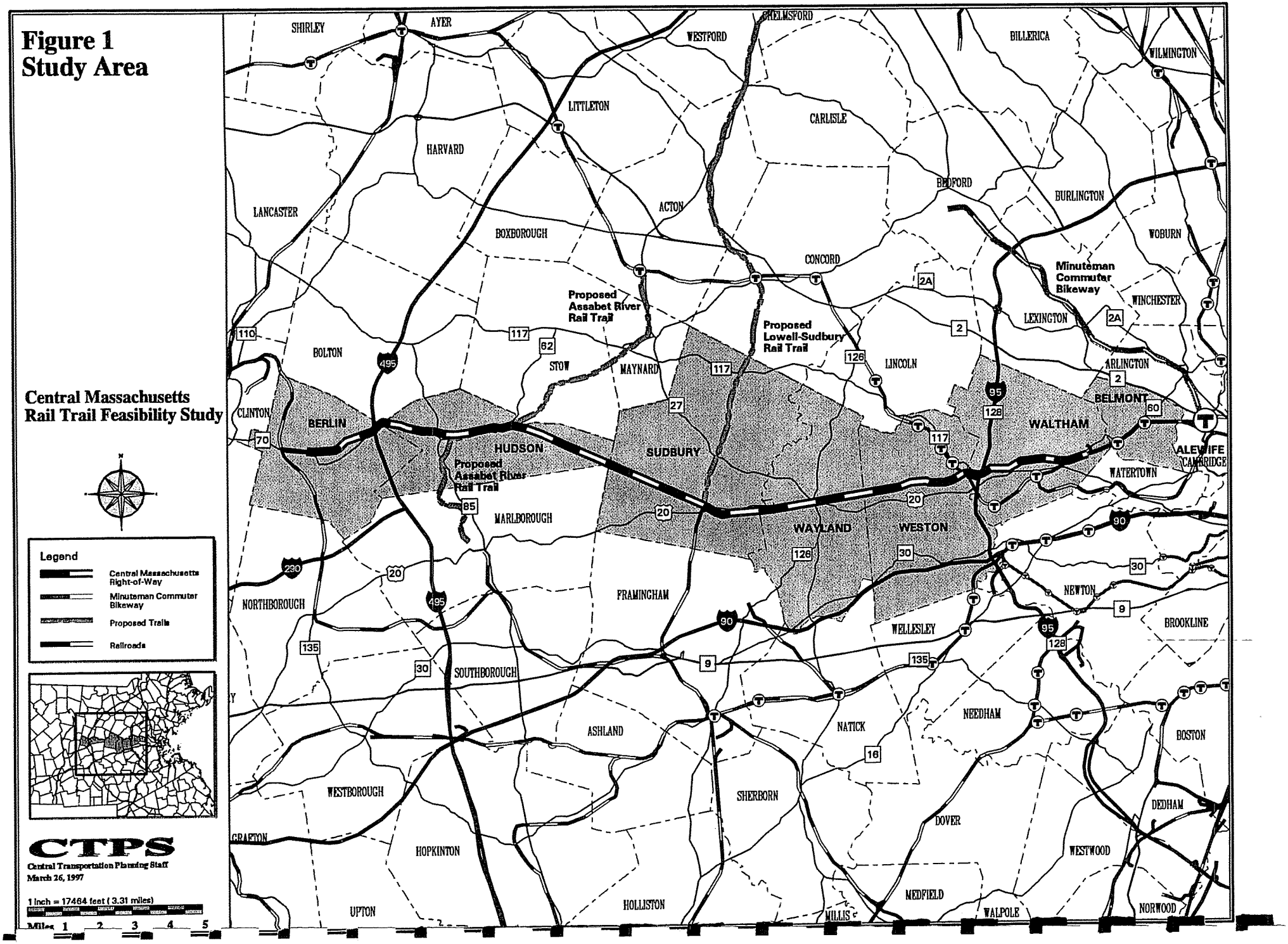
Table 1
Population, Land Area, Population Density, and Employment by Community, 1990

	1990 Population	Land Area (sq. mi.)	Pop. Density	1990 Employment
Berlin	2,293	12.93	177	478
Hudson	17,233	11.50	1,498	9,364
Sudbury	14,358	24.37	589	6,111
Wayland	11,874	15.23	780	8,389
Weston	10,200	17.02	599	8,364
Waltham	57,878	12.70	4,559	57,749
Belmont	24,720	4.66	5,310	7,275
Total	138,556	98.41	1,408	97,730

Source: 1990 U.S. Census

The study area ranges from urban to rural, with the highest population densities in the east towards Boston and the lowest at the western end of the right-of-way. The two most densely populated communities are Belmont and Waltham, with over 4,500 residents per square mile. Hudson has about 1,500 people per square mile, and Sudbury, Wayland, and Weston are all around 600-800 people per square mile. Berlin is by far the most sparsely populated town in the study area, at less than 200 people per square mile.

Figure 1
Study Area



Waltham has by far the largest number of employees, with about 60 percent of the total employment of the study area. The number who live in Waltham is about the same as the number who work there. Only Wayland and Weston have almost as many people who work there as who reside there.

Table 2 indicates the modes of transportation that residents of the study area use for commuting. As can be seen, of the almost 75,000 resident workers, the overwhelming majority drive alone. Almost 7,000, or less than 10 percent, carpool. Less than 5,000 use some type of transit. Interestingly, about the same volume who use transit are walking or bicycling. These numbers underline the fact that workers in the study area are very dependent on the motor vehicle.

Table 2
Transportation Modes Used to Get to Work, by Community, 1990

	All Workers: 16+	Drive Alone	Carpool	Transit*	Bicycle/Walk	Other**
Berlin	1,282	1,062	110	3	26	4
Hudson	9,602	7,956	1,157	56	209	51
Sudbury	7,813	6,629	445	148	140	41
Wayland	6,282	5,223	381	226	96	14
Weston	5,049	3,734	252	331	236	27
Waltham	31,830	22,740	3,425	1,828	3,078	268
Belmont	12,915	9,079	1,198	1,642	446	84
Total	74,773	56,423	6,968	4,234	4,231	489

Source: 1990 U.S. Census
*Includes: bus, streetcar, subway, commuter rail
**Includes: taxi, motorbike, "other"

It should be noted that these census numbers are estimates based on a sample questionnaire. Only workers over 16 years of age are included. All students, including those over 16, are excluded. Inclusion of students would increase the overall bicycle share. These are census data which are collected in early spring, when, according to metropolitan Boston counts, bicycle volumes are about one quarter of the peak volumes. It is not known what the seasonal variations are for pedestrians, but pedestrian volumes are assumed to be less variable than bicycle volumes. Also, the census questionnaire asks for the mode used for the longest part of the trip to work. A trip involving a two-mile bicycle trip to a rail station, a five-mile train trip, and a half-mile walk to the office would be classified as a rail trip.

Table 3 indicates both the number and percentage of resident workers over the age of 16 who bicycle and walk to work. The percentage of those who

walk to work is between 1.3 percent and 4.7 percent, except in Waltham, where 9.2 percent of the residents walk to work. In each community, many more people walk than bicycle to work. The percentage bicycling to work varies from zero in Weston[1] to 0.62 in Waltham and 0.63 in Belmont.

Table 3
Number and Percentage Bicycling and Walking to Work, by Community, 1990

	Bicycling		Walking	
	#	%	#	%
Berlin	2	0.16	24	1.9
Hudson	18	0.19	191	2.0
Sudbury	6	0.01	134	1.7
Wayland	16	0.25	80	1.3
Weston	0	0.00	236	4.7
Waltham	140	0.62	2,938	9.2
Belmont	81	0.63	365	2.8
Total/Average	263	0.27	3,968	3.4

Source: 1990 U.S. Census Journey-to-Work Data

It is clear that the Waltham and Belmont portions of the proposed trail would be more heavily used for commuting purposes than the other sections, due to the population density, the concentration of employment, and the number of people who already walk or bicycle to work.

The fact that few people bicycle to work does not mean that a trail in this area would not be used. This trail would be expected to attract many bicyclists, walkers, and skaters. Furthermore, one of the reasons people do not bicycle to work is that many people fear sharing the street system with motor vehicles. It is expected that if this trail were built, there would not only be commuters using it to reach their workplace or transit connection, but others who, by using the trail for other purposes, would become more experienced bicyclists and more apt to venture onto the streets for utilitarian trips.

The fact that few people bicycle to work could mean many things. First, many roads in communities such as Weston, Wayland, and Sudbury are narrow, winding, and heavily used by motorists. Data collected in this study indicate that motorists often exceed speed limits, increasing the potential for accidents.[2] While there are many people who do bicycle exclusively on the

[1] There are probably people in Weston who bicycle to work. Either none of them received the longer form of the census, or none of them bicycled to work the day they filled in the questionnaire.

[2] Actual motor-vehicle speeds were measured at many intersections along the right-of-way. Results are shown in Table E-1.

road system, many others find our transportation system daunting without an automobile.

B Public Transportation

One way that a Central Mass. trail could be used would be to provide access to public transportation. The MBTA and two private carriers serve the study area. MBTA service is provided on the Fitchburg/South Acton commuter rail line, trackless trolley, and express and local bus services. Public transportation service by community is as follows:

Berlin: There is no public transit.

Hudson: There is private-carrier bus service to Boston. Gulbankian Bus Lines has three round-trips that leave from the library and go into Boston, weekdays only. Bicycles are not allowed on the buses.

Sudbury: A Cavalier bus makes two stops on Route 20 in Sudbury. The one daily round-trip leaves at about 7:10 A.M. and returns around 6:20 P.M. Bicycles may be allowed in the luggage compartment, if there is room, at the discretion of the driver.

Wayland: The same Cavalier bus makes one stop in Wayland on Route 20 (about 7:15 A.M. heading to Boston and returning about 6:15 P.M.).

Weston: The Fitchburg/South Acton commuter rail line has two stops in Weston: Kendall Green and (limited service) Hastings. The commuter rail runs about every 45 minutes during peak periods and every two hours during midday and evening hours. There is limited service on weekends and holidays. A Cavalier bus is scheduled to stop at the old Weston Library at 7:25 A.M. and to return at 6:05 P.M.

Waltham: The Fitchburg/South Acton commuter rail line has two stops in Waltham: Waltham (Central Square) and Brandeis/Roberts. The frequency of stops is higher in Waltham than in Weston. There are also express MBTA buses from Central Square to Boston. There is local MBTA bus service that leaves Central Square and goes to Waverley, Waltham Highlands, and Newton Corner.

Belmont: The Fitchburg/South Acton commuter rail line makes two stops in Belmont: Waverley and Belmont Center. There is no express bus from Belmont, but there are a number of local routes. There are two MBTA bus routes from Belmont Center to Harvard Square in Cambridge, as well as frequent trolley service from Waverley to Harvard Square. There is also bus service from Waverley to Central Square in Waltham.

Bicycles are allowed during off-peak hours on all commuter rail lines, provided the bicyclist has obtained a permit from the MBTA. This permit allows bicycle access on all inbound commuter rail trains after the morning peak and on all outbound trains except during the evening peak. Bicycles are allowed on three rapid transit lines (no access on the Green Line) on weekdays between 10:00 A.M. and 2:00 P.M., and after 7:30 P.M., and all day Saturdays and Sundays. There is no bicycle access on MBTA buses.

C Accident Data

Accident data discussed here include crashes that have occurred between motor vehicles and either bicyclists or pedestrians. These accidents have occurred on the road system, on sidewalks, or in parking lots. There are two primary reasons to include these data in this study. The first reason is to determine whether there are high-accident locations that would be affected by the construction of a Central Mass. trail. (The construction of the Central Mass. rail trail would result in some bicycle and pedestrian trips switching to the trail from the local roads.) The second reason is to provide an overview so that elected officials and staff and citizens can use this information for their community planning.

The accident data discussed in this report were obtained from MassHighway, which in turn obtained the data from the Massachusetts Registry of Motor Vehicles. These 1988 through 1991 data are the most recent that have bicycle and pedestrian accidents separate from crashes involving motor vehicles only. The data are limited in two important ways. First, for many of the reported accidents there is not complete information, especially regarding location. Second, many accidents are not reported, especially bicycle accidents that involve falls but do not involve impact with a motor vehicle.

Table 4 shows the number of bicycle and pedestrian accidents over the four year period, by community, and the rate per thousand residents. The largest number of bicycle as well as pedestrian accidents occurs in Waltham. The total 107 bicycle accidents in Waltham is more than twice that in Belmont, more than three times that in Hudson, five times that in Sudbury and in Wayland, and ten times that in Weston. With respect to population, Waltham has the highest accident rate involving bicycles, at 1.84 accidents per thousand residents. Hudson and Belmont are close behind with 1.68 and 1.62, respectively. Wayland, Sudbury, and Weston had 1.43, 1.18, and 0.98, respectively. Berlin was the lowest, at 0.44 bicycle accidents per 1,000 residents.

In regard to pedestrian accidents, Waltham had 163, with Belmont at a distant second with 30. Hudson had 19 pedestrian accidents and Weston, Wayland, and Sudbury had 13, 8, and 7, respectively. In Berlin there was only one bicycle accident and zero pedestrian accidents. In the entire study area, for these four years, there were 7 pedestrian fatalities and 1 bicycle fatality.

Table 4
Number of Bicycle and Pedestrian Accidents, by Community, per One Thousand Residents, 1988-1991 Inclusive

	1990 Population	# Bicycle Accidents	Bicycle Accidents per 1,000	# Pedestrian Accidents	Pedestrian Accidents per 1,000	Fatalities	
						Bicycle	Pedestrian
Berlin	2,293	1	0.44	0	0.00	0	0
Hudson	17,233	29	1.68	19	1.10	1	2
Sudbury	14,358	17	1.18	7	0.49	0	0
Wayland	11,874	17	1.43	8	0.67	0	0
Weston	10,200	10	0.98	13	1.27	0	0
Waltham	57,878	107	1.84	163	2.82	0	3
Belmont	24,720	40	1.62	30	1.21	0	2
Total	138,556	221	1.60	240	1.73	1	7
Massachusetts	6,016,425	5,761	0.96	10,632	1.77	34	376

Sources: 1990 U.S. Census (population); Mass. Registry of Motor Vehicles (accidents).

There is not enough information to determine why certain communities have higher rates of accidents than others. Possible explanations are higher levels of motor-vehicle traffic and more walking and bicycling. "Exposure rates," which take these volumes into account and indicate the number of accidents per given level of traffic, are not determined for this study. If available, they would highlight areas that have particularly high numbers of accidents due to factors other than high levels of traffic. These other factors include, but are not limited to, excessive speed, disregard of traffic controls, lack of space for pedestrians and bicyclists, and poor sight distance.

To determine specific areas where accidents were concentrated, the accidents for the years 1988 through 1991 were mapped by community. These are shown in Appendix A. The reader is reminded that many accidents are not shown on the maps because insufficient information was provided in the accident report regarding location.

There were no at-grade crossings of the Central Mass. right-of-way that had a high number of accidents. There are two areas with high numbers of accidents where diversion of trips to the Central Mass. might have a beneficial effect. These are in Hudson and in Waltham. There are many accidents along Main Street in Hudson and on Main Street in Waltham. These roads are both close to and parallel with the Central Mass. Counts taken in Lexington after the Minuteman was built found that bicycle volumes were much lower on Massachusetts Avenue than they had been before the bikeway was there, implying that many bicycle trips had been diverted to the bikeway.

2 The Central Mass. Right-of-Way

This chapter includes a brief history of rail service, followed by a physical description of the corridor including adjacent land use and the width of the right-of-way. The chapter ends with a discussion of environmental issues and current uses.

A History of Rail Service

In 1869, the Massachusetts Central Railroad began construction of the Central Mass. line. Service began between Hudson and Boston in 1881, and a year later was extended west through Berlin and Clinton to Holden. In 1887, the line reached its maximum length, extending from Boston to Northampton.[3] As a result of corporate mergers and leases, by 1900 the Central Mass. had become part of the Boston & Maine Railroad.

Passenger service on the Central Mass. peaked in 1903 with fourteen round trips per day. A series of cutbacks on passenger service ensued. By 1958, the outer limit of passenger service was cut back to Hudson and frequency was reduced to two round-trips a day. By 1959, service was reduced to a single round-trip per day, and by 1965, service only went as far west as South Sudbury. In 1968, passenger counts averaged 77 riders a day (weekday inbound). In 1971, passenger service ended, due to deteriorating tracks, low ridership, and budgetary constraints. An experimental increase of frequency to four round-trips per day in the final weeks failed to attract substantial numbers of additional passengers.

The majority of freight service ended by 1981. A number of industrial parks and lumber yards kept freight service open as late as 1994 in parts of Waltham.

The idea of reinstituting rail service on the Central Mass. has been brought up many times. Studies, including one completed last year, indicate that such service is not feasible at the present time due to low ridership and high capital and operating costs.[4] The MBTA Planning Department, however, recently expressed interest in studying the possibility of a dedicated busway facility on the Central Mass.

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[3] The western end of the right-of-way, between Amherst and Northampton, has been converted to the Norwottuck Rail Trail, a DEM facility.

[4] CTPS, Central Mass. Commuter Rail Feasibility Study, December 1996.

B Description of the Right-of-Way

The following is a physical description of the right-of-way.

Berlin

MBTA ownership of the right-of-way begins just east of Coburn Road. Heading east, the embankment is quite high and the right-of-way remains clear. Between the Highland Street and Sawyer Hill Road intersections (at-grade), the right-of-way runs on a high embankment over a stream valley, then passes through an opening cut through rock.

East of Sawyer Hill Road, the right-of-way passes on an intact embankment through the southern part of Hog Swamp, an extensive partly wooded and partly open wetland. West of I-495 is a commuter parking lot on the north side of Route 62, adjacent to the Central Mass. At I-495, there are two underpasses (for the north and south barrels of I-495), both about 20 feet wide, in good condition, and adequate for a trail. The right-of-way passes over a small stream that runs along the median of I-495.

Hudson

Proceeding into Hudson, the right-of-way is clear for two hundred yards and then becomes overgrown with brush. There are a few houses to the north that are close to the right-of-way. Further east a contractor has used much of the right-of-way for storing large piles of rubble, trucks, and heavy machinery. Still further east, a trucking company is using the right-of-way to park trucks and store dumpsters. East of Central Street, houses to the south are very close. A large warehouse is to the north.

Through the center of town, the right-of-way is unobstructed. Just west of Felton Street, part of the right-of-way has been paved for church parking. There is a section between Manning Street and Church Street where the walkway over Bruce Pond has been maintained for pedestrian use (top photo on cover). This bridge provides one of the most beautiful views on the corridor. Sections between Priest Street and Cox Street have been cleared recently by volunteer crews. The bridge over the Assabet River is in good condition. There is a culvert east of Cox Street and a high embankment.

The Marlborough Branch rail line merges with the Central Mass. just west of Wilkins Street. The Wilkins Street bridge has been removed and the Chestnut Street tunnel is filled. The eastern part of Hudson is very picturesque, in particular the bridge that goes over the Fort Meadow Brook. A cement company is very close to both sides of the right-of-way just west of the Main Street crossing.

Sudbury

Entering Sudbury, the right-of-way is very clear. To the north is posted federal land (an old Army base). Further east, conservation land abuts the right-of-way, with signs prohibiting motorized vehicles. The first bridge over Hop Brook in Sudbury affords spectacular views of wetlands and meadows. Just across the Dutton Road intersection a new housing development is under construction. The right-of-way is passable to Union Avenue. The Lowell-Sudbury line crosses the Central Mass. at the former South Sudbury Station just before Union Avenue (see middle photo on cover). The section that parallels Station Road is quite overgrown.

At the Route 20 intersection there is a handcar shed that has been maintained by the Sudbury Valley Trustees and serves as a picturesque remnant of the Central Mass. line. Here, Hop Brook parallels the right-of-way for a few hundred feet. The right-of-way passes below Landham Road (which used to be the location of East Sudbury Station) under a large overpass. For the next mile, the right-of-way is very overgrown. Just before the Wayland town line, power lines begin to run along the right-of-way and do so through Wayland, Weston, and into Waltham.

Wayland

Upon entering Wayland the right-of-way enters the Great Meadows National Wildlife Refuge (see bottom photo on cover). It passes through the vast scenic area on an intact embankment. There is a wide bridge over the Sudbury River. After crossing to the north side of Route 20, the right-of-way runs along the former Raytheon site. Just before Route 27 is the former Wayland Station, now owned by the town. After crossing Routes 27 and 126, the corridor is wide and there are indications of substantial use by walkers, runners, mountain bicyclists, and equestrians.

Weston

The right-of-way in Weston remains open for the first couple of miles. It goes under Concord Road and then becomes impassable due to trees and brush. The Conant Road intersection was filled in during a bridge reconstruction and is surrounded by extremely dense brush. Further east to Church Street, the right-of-way is very wide and unobstructed. East of Church Street, wood chips on the tracks and a worn path indicate significant use of the right-of-way. Further east there is a new development on the north side of the right-of-way. To the south is a steep embankment that abuts land belonging to a sand and gravel company. Before entering Waltham, the right-of-way crosses the Fitchburg commuter rail line on a wide, high bridge.

Waltham

After the Fitchburg commuter rail bridge, the right-of-way enters the City of Waltham. There is a fenced-in gravel pit to the south and an abandoned office building to the north. Further east, the right-of-way goes through an auto-parts yard. The bridge over Route 128 (I-95) is intact. After the first two intersections in Waltham, the right-of-way is impassable for a short distance. The right-of-way then opens up with abutters to the south and condominiums on a hill to the north. There is a very high chain-link fence on the south side that separates an office building from the right-of-way. Further east, the right-of-way passes through an apartment complex, in the middle of which is a spectacular view of Lyman Pond. There are high bridges over Beaver Brook and over Route 60 (Linden Street), then a high embankment. For the next 200 feet, Beaver Brook winds back and forth beneath the right-of-way under three culverts and bridges while the Fitchburg commuter rail parallels the right-of-way on the south. The two corridors merge near the Beaver Street intersection. MBTA ownership ends at Beaver Street in Waltham.

Belmont

A private company bought the right-of-way from Beaver Street to the Belmont border. The Central Mass. originally extended through Belmont and into Cambridge and Boston, parallel to the Fitchburg line. It appears that the right-of-way is wide enough to allow a trail. Such construction would require either purchase of private sections or easements from private owners. A section east of Belmont Center, from Brighton Street to Alewife Station, is owned by the MDC.

There are extremely short sections of the right-of-way in Bolton, Stow and Marlborough. If a trail is built, these sections would be taken care of by the adjacent communities. That is, rather than Bolton maintaining a slice of the trail, Berlin and Hudson would jointly decide where their respective segments meet. Likewise, Hudson would take the extra feet in Stow and the Marlborough section would be handled by Hudson and/or Sudbury.

C <u>Right-of-Way Width</u>

According to the American Association of State Highway and Transportation Officials (AASHTO), the preferred width for a trail is 12 feet. In addition to this, another 3 feet on each side is recommended for clearance, yielding a total width of 18 feet.

As a whole, the Central Mass. line has ample space for a trail; a high percentage of the right-of-way is more than 80 feet wide.

From Coburn Road in Berlin to the Hudson line, the right-of-way is at least 80 feet wide. There are a few short sections just west of Highland Road where the right-of-way juts out to over 200 feet (each about one hundred feet long).

At the Hudson-Berlin line, the right-of-way is about 80 feet wide. A few hundred yards west of the Central Street intersection in Hudson, it briefly widens in two places to 130 and 190 feet. East of Central Street (downtown Hudson), the right-of-way varies in width from 100 feet to 40 feet, with a high percentage between 65 and 40 feet. From Tower Street east to the Sudbury line, the right-of-way fluctuates between 70 and 85 feet, with the majority around 80 feet wide.

Continuing into Sudbury at about 80 feet, the right-of-way crosses Hop Brook on a small bridge. The 80-foot-width is maintained through most of Sudbury, with a few short 60-foot sections. The right-of-way width going under Landham Road is about 40 feet.

The right-of-way is 80 feet wide as it enters Wayland and crosses the Sudbury River. Near Wayland center, just west of the fork at Routes 27 and 126, the right-of-way narrows to 25 feet for about one hundred feet.

Entering Weston, the right-of-way is about 80 feet wide. It narrows to about 60 feet on the east side of Conant Street. Within fifty yards, it broadens back out to about 80 feet. East of Church Street there are significant portions of the right-of-way that are 115 to 120 feet wide.

In Waltham the right-of-way decreases back to about 80 feet, with a couple of areas that flare out to about 100 feet. It fluctuates quite a bit between 60 and 80 feet. On the east side of Lexington Street, the right-of-way is 20 feet wide and gradually widens to 60 feet over a length of five hundred feet. The right-of-way then fluctuates between 60 and 80 feet, ending at Beaver Street with a width of about 70 feet.

D Environmental Issues

According to Federal Highway Administration (FHWA) regulations, bicycle facilities are categorical exemptions, which means they are exempt from requiring environmental impact statements. They are subject to the provisions of the Massachusetts Environmental Policy Act (MEPA). All of the provisions of this act would be followed during the design and construction phases, with oversight by the local conservation commissions. (A brief listing of potential regulatory permits and approvals is found in Appendix B.)

The noise levels from the trail would be minimal, as no motor vehicles would be allowed (police and other service vehicles excepted). The

overall air quality effect would be positive because the trail is expected to eliminate some motor vehicle trips, especially short trips or so-called "cold starts," which on a per mile basis contribute disproportionately to air quality degradation.

To assess flood plain issues, Flood Insurance Rate Maps were obtained from the Department of Environmental Management, Office of Water Resources. These maps divide land into three categories: Zone C (areas of minimal flooding), Zone B (areas between limits of 500-year flood and 100-year flood), and Zone A (areas of 100-year flood).

Zone C is considered land not subject to floods. Zone B would be considered land subject to flooding in extreme circumstances and are given a 0.2 to 1.0 percent chance of flooding in a given year.[5] Zone A is land given a 1.0 percent chance of flooding in a given year.

Over 80 percent of the right-of-way passes through Zone C land and is not of concern in terms of flooding. Seven percent is in or adjacent to Zone B land and 11 percent is in or adjacent to Zone A land. Locations and lengths of Zone A and B segments are indicated in Appendix B (Tables B-2 and B-3). In some cases, the right-of-way embankment is high and wide enough that trail construction would have no impact on the adjacent lands that are zoned A or B. It might also be assumed that the original rail-bed embankment was designed and constructed to avoid flood hazard.

Requirements for these areas would be worked out in the design phase, through orders of conditions issued by the local conservation commissions. Possibilities include compensatory storage (for increases in fill), a narrowing of the trail, or alternative construction methods.

E Current Uses

The MBTA has neither posted "No Trespassing" signs nor in any known way attempted to prohibit trespassing on the right-of-way. Present uses include hiking, mountain biking, snowmobiling, and horseback riding. In addition, there are encroachments and occasional instances of dumping.

A number of businesses have leased portions of the right-of-way from the MBTA. Some of the leases are very minor (water pipes and transmission lines), while others are more significant. Some of the notable leases include a trucking company's parking and storage facility, a parking lot for a bank, and a driveway crossing for a cement company. All leases have a thirty-day

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[5] Zone B also includes: certain areas subject to 100-year flooding with depths of less than one foot or where the contributing drainage area is less than one square mile; areas protected by levies from the base flood.

termination clause. It is possible that, if a trail is built, the MBTA would continue leases that are compatible with trail construction.

The Boston Edison Company has erected power lines along 7.2 miles of the right-of-way between eastern Sudbury and Waltham. The company has a permanent easement for this use, originally acquired in 1951 from the Boston and Maine Corporation and extended in 1984 with the MBTA takeover of the line. According to Boston Edison, it mows and clears vegetation every three to five years to maintain access to its facilities.

The electric and magnetic field (EMF) reading of this power line is the third lowest in the Boston Edison system.[6] It has a maximum reading of 20 milligauss (mG) within the right-of-way. Fifty feet from the south side of the right-of-way the EMF reading is 3.8 mG, and 0.7 mG on the north side. The allowable state standard is 85 mG at the edge of a right-of-way.

There has been concern for many years that EMF's can harm people. The National Research Council (NRC) completed a study last year which concluded, "The findings to date do not support claims that electromagnetic fields are harmful to a person's health."[7] The NRC study examined over 500 studies done since 1979.

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[6] Information provided by Boston Edison letter; December 30, 1996.

[7] Charles F. Stevens, Chair, Committee on the Possible Effects of Electromagnetic Fields on Biologic Systems, study sponsored by U.S. Department of Energy.

3 Proposed Rail Trail

This chapter examines various aspects of using the right-of-way as a trail. It discusses types and numbers of users, at-grade crossings, potential connections provided by a trail, possible Belmont connections, parking alternatives, and costs.

A Users

Mode of Travel

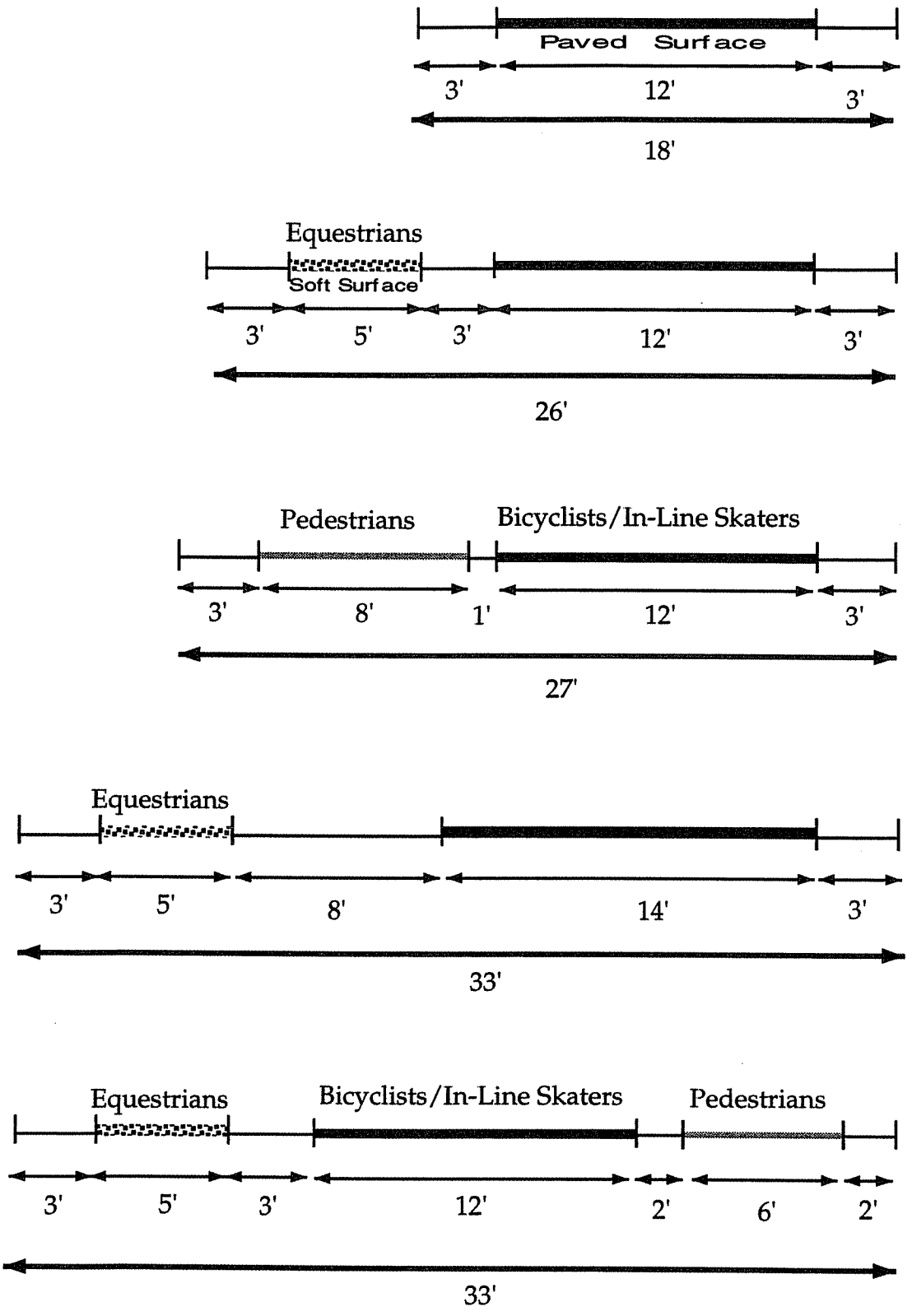
Like other rail trails, the Central Mass. would be open to all non-motorized users (and to motorized wheelchairs). Bicyclists, walkers, skaters, joggers, and people pushing baby carriages are common users of multi-use trails.

Comments at the public meetings indicated that there is some equestrian use on the existing right-of-way and that there is a desire to maintain that use if a trail is built. (See Appendix C for attendance figures and minutes of the public meetings.) The major area of present equestrian use is between Route 27 in Wayland and Gun Club Lane in Weston. Gun Club Lane provides access to an area known as the Weston trails, popular for horseback riding. Equestrians also use the right-of-way from the east side of Conant Road to east of Church Street (but not as far as the bridge going over the Fitchburg commuter rail line). It is assumed that if the Conant Road bridge is opened, the entire stretch from Routes 27 and 126 to east of Church Street would be of interest to equestrians. There is also interest in equestrian access in Berlin. There may be other areas of interest to riders that could come up during the design process. There would also need to be consideration given to points where equestrians might cross the rail trail to access adjacent bridle paths.

There is some flexibility as to how the trail could be designed in terms of users. For example, an equestrian trail makes little sense in areas where it probably would not be used, such as Waltham. There are some areas where high pedestrian use might call for a separate section for walkers and joggers. This could be a hard-packed surface. Figure 2 shows a few possible cross sections to accommodate a variety of users.

If the trail is constructed, individual communities decide whether or not to plow. The three Minuteman Commuter Bikeway communities have all opted not to plow and thereby leave the path available to snowshoers and cross-country skiers.

Figure 2
Possible Rail Trail Cross-Sections



Trip Purpose

Users can be characterized not only by travel mode, but by trip purpose. Commuters would be on the trail on weekdays, usually during regular commuter hours. School children would use the trail to get to and from school, to and from organized activities, and for a variety of purposes. Retirees, stay-at-home parents, and those with flexible work hours may use it from mid-morning to mid-afternoon, when other users are at work and school. Such midday users might be getting doctor-prescribed exercise, running errands, visiting friends, or simply getting some fresh air.

Whatever the trip purpose, the travel mode, or the time of travel, one thing trail users would have in common is the use of human-powered transport. Reasons for this choice are many. At the societal level, these modes conserve energy, are non-polluting, and are renewable. At the individual level, they are healthy, inexpensive, and fun, and can be the quickest way to get from one place to another.

Estimated Demand

The request was made at several of the public meetings to present an idea of how many would use the Central Mass. rail trail. It is very difficult to accurately estimate the demand for a rail trail. There have been years and years of experience estimating the usage of highways and transit systems, and even those predictions can be quite far from the mark. There is no widely accepted method for estimating future demand for trails. In this section, four different methods are utilized to derive estimates for a Central Mass. rail trail.

-- *Minuteman Counts*

A facility for which we have actual counts is the Minuteman Commuter Bikeway. One way to estimate use of the proposed Central Mass. is to compare the populations served by the Minuteman and by the Central Mass. The Minuteman counts then can be adjusted to reflect the differences in populations served. The details used to derive estimates using this method are included in Appendix D.

The results of this method yield the following weekday totals: Berlin - 700; Hudson - 1,200; Sudbury - 1,100; Wayland - 1,000; Weston - 1,000; Waltham - 2,600; Belmont - 1,400. The weekend/holiday estimates would be as follows: Berlin - 1,500; Hudson - 2,600; Sudbury - 2,300; Wayland - 2,100; Weston - 2,000; Waltham - 5,400; Belmont - 3,000.

-- *Before/After Counts*

Another way to estimate use of a trail would be to compare before/after counts from the Minuteman corridor to before counts in the Central Mass.

corridor. Counts done in the Minuteman corridor in September 1980 yielded a peak-hour count of 220 bicyclists.[8] This would translate to an all-day count of about 2,200. A count done in the Central Mass. corridor in October 1996 yielded a peak-hour volume of 30 bicyclists.[9] Increasing this count by 20 percent to compensate for seasonal variations (September to October) yields a peak-hour count of 36.[10] This count would translate to about 360 daily bicyclists. Both the Minuteman and Central Mass. counts include four locations, spaced along the length of the corridor. The Minuteman corridor count (2,200) is about six times higher than the Central Mass. corridor count (360).

-- *Work Trips*

The number of people in the two corridors who bicycle or walk to work also can be compared. In the Minuteman corridor, of the 142,840 resident workers, 18,623, or 13.0 percent, walk to work. Those who bicycle to work number 2,604, or 1.8 percent of the work force. In the Central Mass. communities (breakdown shown in Table 3), 3,968, or 3.4 percent, walk to work and 263, or 0.3 percent, bicycle to work. The ratio of the percentage of walkers in the two corridors is 13.0 percent to 3.4 percent, or 3.8 times higher in the Minuteman corridor. The ratio of bicyclists is 1.8 percent to 0.3 percent, or 6.0 times higher in the Minuteman corridor. It is important to note that these numbers were collected in 1990, several years before the Minuteman Commuter Bikeway was completed.

For bicyclists, the ratio of six-to-one for comparing the Minuteman to the Central Mass. came up using these latter two methods. Using these two methods would yield lower totals than those indicated using the first method. No before/after counts of pedestrians are available. The ratio of about four-to-one (Minuteman to Central Mass.) is yielded for walkers from the journey-to-work data.

-- *Norwottuck Counts*

Counts were done on the Norwottuck Rail Trail, at the western end of the Central Mass. right-of-way in Northampton, by the Pioneer Valley Planning Commission. Those counts, collected by a mechanical counter, indicate weekday two-way volumes of about 700 bicyclists and weekend volumes of 1,900. The Norwottuck joins Amherst, Hadley and Northampton, which have a combined population of about 69,000. This is

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[8]This number includes 68 bicyclists at the Alewife end, 79 at Arlington Center, 49 at Massachusetts Avenue and Marrett Road in Lexington, and 24 at Hartwell Avenue and Routes 4-225 in Bedford.

[9]This number includes 18 at Routes 20 and 117 in Waltham, 4 at Routes 20 and 27/126 in Wayland, 4 at Route 20 and Concord Road in Sudbury, and 4 at Route 62 and Pleasant Street in Berlin.

[10]Based on bicycle counts done in the Boston metropolitan area since 1975.

one half of the Central Mass. study area population. If the Norwottuck numbers are multiplied by two, an average daily estimate of 1,400 and an average weekend/holiday estimate of 3,800 result for the Central Mass.

The estimates presented above for the Central Mass. are best guesses, based on available data. Qualitatively, it is reasonable to expect the Central Mass. to attract more than the Norwottuck and less than the Minuteman. How much more and how much less are difficult to predict.

B At-Grade Crossings

A major advantage of an off-road trail is that it provides a place for users to travel that is separate from motor vehicles. Trail users share road space with motor vehicles only at the road crossings. On the Central Mass. right-of-way, bridges and tunnels further reduce interaction between trail users and motor vehicles. It is essential that the at-grade intersections be designed as safely as possible, keeping in mind the need to minimize the impact on roadway traffic flow. Figure 3 indicates the location of bridges and at-grade crossings.

Table 5 indicates the number of at-grade crossings on the proposed Central Mass. trail and on existing rail trails in Massachusetts. These are intersections with paved roads used by motor vehicles. Not included in these counts are driveways or trail crossings.

Table 5
Comparison of Rate of Occurrence of At-Grade Intersections on Central Mass. and on Major Massachusetts Rail Trails

	Length (mi.)	At-Grade Intersections	Miles per At-Grade Crossing
Cape Cod Rail Trail	25	25	1.0
Minuteman	11	17	0.7
Norwottuck	8	8	1.0
Central Mass.	23	36	0.6

As indicated, the Central Mass. is similar to the Minuteman, both of which have higher crossing densities than the Norwottuck (Northampton-Amherst) or Cape Cod rail trails. Both of the latter trails are in more rural parts of Massachusetts.

The average distance between intersections in the corridor is six tenths of a mile, although the intersections are not evenly spaced along the right-of-way, as indicated in Table 6.

Table 6
Number of At-Grade Intersections,
Number per Mile, by Community

	# At-Grade Intersections	Number of Trail Miles	Average Miles between Intersections
Berlin	3	1.9	0.6
Hudson	14	6.7	0.5
Sudbury	5	4.5	0.8
Wayland	5	3.0	0.5
Weston	0	2.9	2.9
Waltham	9	4.2	0.5
Total	36	23.2	0.6

In downtown Hudson and Waltham, for example, there are at-grade intersections only a block apart. In some of the more rural sections of Hudson, Sudbury, and Wayland, there are sections of the right-of-way that extend over a mile between intersections. There are no at-grade crossings in Weston; trail users could travel between Stow Street in Waltham and Plain Road in Wayland, a distance of 3.8 miles, without encountering an intersection.

A rail trail allows a user to decrease the number of at-grade intersections required for a given trip. For example, one possible on-road route from Berlin to Belmont would require going through about 145 at-grade intersections.[11] The rail trail would reduce this by 75 percent to 36 at-grade crossings.

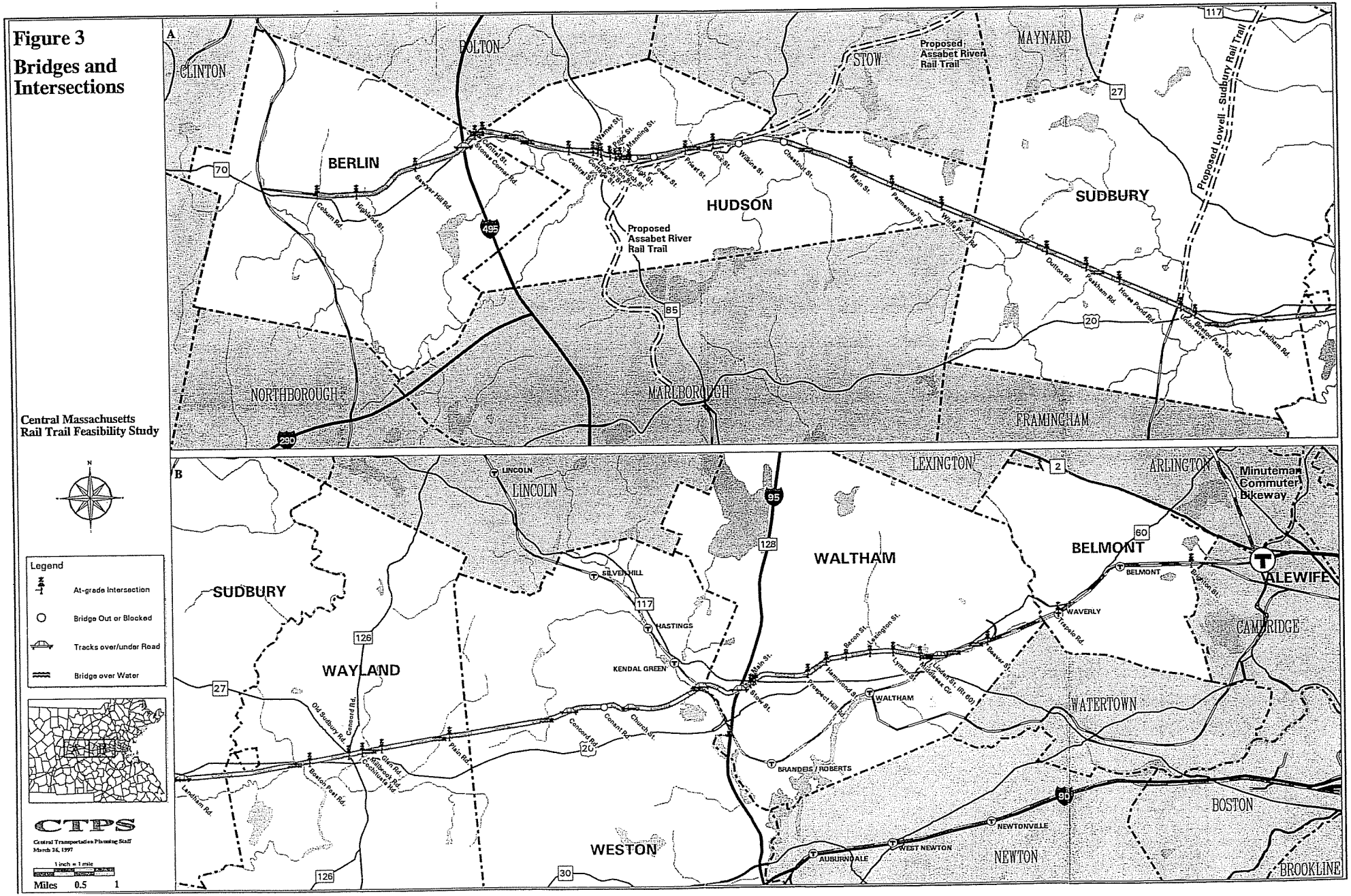
If one adds to the 36 at-grade crossings the 11 bridges and tunnels, one still arrives at a number much lower than 145. The presence of a railroad right-of-way in and of itself discourages crossings. That is, once the railroad is in place a road crossing must be a bridge or tunnel, which are expensive, or an at-grade crossing, which requires road users to stop for trains. As a result, a railroad becomes a de facto barrier to crossings.

Important factors that must be considered in designing at-grade crossings are traffic volume, sight distance, speed of traffic, gaps in traffic, width of intersection, and angle of crossing. These factors pertain to both the roadway and the trail.

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[11] From Berlin, follow Route 62 east into Hudson; go left on Main Street and right on Hudson Road, to Route 27 in Sudbury. Follow 27 south into Wayland; go east on Route 20 (Boston Post Road) into Weston and Waltham. Bear left onto Route 60 (Linden Street); bear right onto Waverley Oaks. There are many possible routes between Berlin and Belmont. This one was selected as a fairly direct one, using major roads that would be relatively easy to follow. More minor streets would likely have more intersections.

Figure 3
Bridges and Intersections



Central Massachusetts Rail Trail Feasibility Study

Low roadway volumes allow trail users to cross more easily and frequently. Very high roadway volumes can also be advantageous in that cars in slow-moving traffic are more willing to let others cross in front of them. Traffic counts were done on at-grade crossings of the Central Mass. and are shown in Figure 4 and listed in Table E-2.

Sight distance refers to the distance the trail user or roadway user is from the intersection when it is sighted. Fast-moving traffic clearly needs greater sight distances than slow-moving traffic. Trail users also need adequate warning of an upcoming intersection. The width of an intersection and the trail's angle of crossing determine the distance over which the trail user will be exposed to potential conflicts.

Information on traffic volumes, speed limits, and observed speeds is included in Appendix E. All of these factors would be considered in designing trail crossings.

C Potential Destinations

A rail trail can be used for commuting and for other trips with specific destinations. The number who would use a trail for these types of trips is affected by how close the various destinations are to the trail. This section indicates travel generators located near the Central Mass. right-of-way. These locations are indicated in Figure 5.

Use of the trail will also be affected by how many people live close to it. Those living on or near the trail would be more likely to use it than those who have to travel on the local road system, especially if the roads are perceived as unsafe.

At the regional level, a Central Mass. trail would provide direct connections to two other proposed trails, the Assabet River Rail Trail in Hudson and the Lowell-Sudbury in Sudbury (actual junction shown in middle photo of cover). The Central Mass. also provides a needed link in the Bay Circuit Trail, from Wayland Center to the Nobscot Boy Scout Reservation in Sudbury. Efforts to establish this walking trail are being led by the Sudbury Valley Trustees and the Bay Circuit Alliance.

Berlin

The Central Mass. line passes through the middle of Berlin. The center of town, with the library and town buildings, is located a quarter mile south of the right-of-way. Memorial School, on Linden Street, is also south of the right-of-way, about one half mile. The town common with tennis courts and a variety of recreational fields, is located one half mile south, between South and Pleasant streets.

Hudson

The right-of-way passes one block north of Hudson Center and its commercial activities. There are also a number of schools, all within very close proximity to the right-of-way. From west to east they are as follows: the Carmela A. Farley School, Christ the King School, Hudson Catholic High School, St. Michael's Grammar School, and Joseph L. Mulready School.

A number of parks and fields are also adjacent to the right-of-way, including Moulton Field, Farina Field, Liberty Park, and Cherry Street playground. The crossing at Church Street allows ready access to the Senior Citizens Center, Hudson Post Office, Boys and Girls Club, the town hall, and to the remainder of downtown Hudson.

Sudbury

The right-of-way traverses two miles of wilderness/conservation land with few intersections in the western section of Sudbury. The Curtis Middle School is about a half mile from the Peakham Road and Horse Pond Road intersections. The Sudbury Crossing shopping plaza is about two blocks from the Union Street intersection. About 100 yards north of the right-of-way is the Goodnow Library. There are also a number of shops nearby at Mill Village. There is a health and fitness center at the Wayland line.

Wayland

In Wayland, the right-of-way enters Great Meadows National Wildlife Refuge, Wayland's major open-space area. The Sudbury River, very popular for fishing, also crosses there. On the south side of Route 20 there is a shopping plaza. At the intersection of Routes 27 and 126 is the Wayland Public Library. Also, on the south side of Route 20, at the intersection of Routes 20 and 27, is the town hall. Just beyond the library is the Mill Pond Parcel, a popular fishing and skating facility. Further east and to the north is the Claypit Hill School.

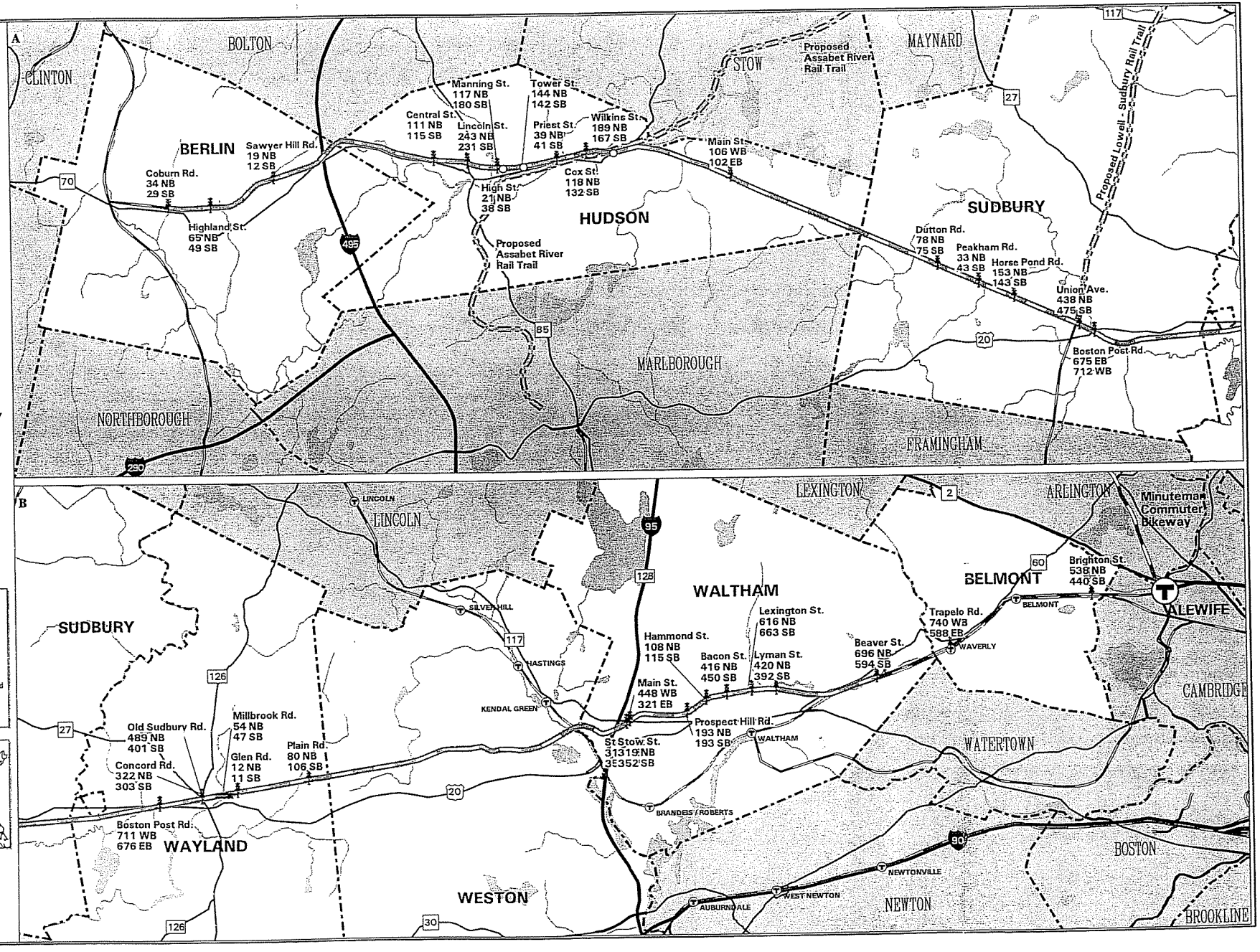
Weston

There are no at-grade intersections in Weston. Just south of the right-of-way is Weston Center, with the town hall, parks, and stores and shops. There is also a network of nature trails in Weston that cross the right-of-way. Regis College is a little over a mile to the south. The Weston Public Library and Weston's three elementary schools are all less than a mile to the south. There is senior citizen housing on School Street south of the right-of-way. Most of the land adjacent to the right-of-way is rural/residential.

Figure 4

Motor - Vehicle Traffic Volumes, One Hour, Midday Saturday

Central Massachusetts Rail Trail Feasibility Study



Waltham

The right-of-way enters Waltham just after crossing the Fitchburg commuter rail line. There is an abandoned industrial site on both sides of the right-of-way and an auto parts yard just west of the Route 128 (I-95) crossing. The right-of-way bisects a private company and then passes by Prospect Hill Park, 252 acres of open land. Further east is Drake Playground on the western end of Leary Field, followed by a shopping area, the police and fire stations, and, further east, the Lyman Estate and the Lyman Pond Athletic Field of Bentley College. Lowell Playground is about a half mile south of the right-of-way. Warren Field and the Beaver Brook Reservation are further east and close to the right-of-way.

Schools in the area include Banks Elementary School, the Vocational High School, and Plympton Elementary School. Near Lowell Playground is the Bright Elementary School and further east is the Fitzgerald Elementary School.

Belmont

Belmont is a densely developed inner suburban community with the highest population density in the study area. In Belmont there are a number of schools and recreation sites in close proximity to the former right-of-way. The Beaver Brook Reservation is to the north and the Butler School is to the south. There is also a town field south of the line. Coming into Belmont Center, the former right-of-way passes near the town hall, library, a playground and pool, the Wellington School, and an athletic field. To the east is Belmont High School and Clay Pit Pond.

D Belmont Connection

The MBTA-owned portion of the Central Mass. ends at Beaver Street in Waltham. The town of Belmont requested to be part of this study, in the hopes that a connection could be made through Belmont to Alewife Station in Cambridge, thereby connecting to the Minuteman Commuter Bikeway. The Central Mass. at one time did extend through Belmont.

East of Beaver Street, in Waltham, the former Central Mass. right-of-way is privately owned and occupied by an industrial building and driveway. The right-of-way beyond this development is privately owned (by the same company) to the Belmont line. To build the trail beyond Beaver Street to Belmont would require an easement from the private owner.

It may be possible to continue the trail through Belmont as a primarily off-road facility. This would require the trail to be built within the Fitchburg right-of-way, which is an active rail line. There appears to be room on the embankment north of the Fitchburg line to build a trail almost to Waverley

Station. East of Waverley, it might be possible to place a trail by cutting into the embankment south of the tracks and then proceeding to the town yards. The end of Pearson Road backs up to the town yards and could serve as an on-road section of the trail. On the other side of Clark Street, the trail could return to the town-owned embankment adjacent to the Fitchburg line, or take an on-road route on Royal Road.

If cutting a trail into the embankment east of Waverley Station proved to be infeasible, then an on-road route using White Street, Grant Avenue, and B or C Street could substitute. From there, one could pass through the town yards to Pearson Road.

At Belmont Center, the underpass for Concord Avenue could be used to get back to the north side of the tracks. East of Belmont Center, the trail could return to the privately owned right-of-way (north of the Fitchburg line) to Brighton Street. Another alternative is to use town-owned land south of and parallel to the Fitchburg line. The connection to the south side could be via a new tunnel, built at Alexander Avenue off Channing Road. Users then could reach Brighton Street via Hittinger Street.

Across Brighton Street, the Metropolitan District Commission (MDC) owns a section leading to Alewife which is slated for construction as part of a 1997 MassHighway contract.

A major question is whether it might be possible to build a facility above the waiting platform at Waverley Station that would not interfere with railroad operations. This would allow trail users to avoid crossing Trapelo Road in an area with high traffic volumes and many turning vehicles. If this proves infeasible or too costly, an at-grade crossing could be worked out in conjunction with the existing traffic signals.

E Parking

An issue brought up in public meetings is where those who drive to the trail will park. Very little weekday demand for trail parking is expected. Even on weekends, it is expected that most users would reach the trail either by bicycling or walking or by public transit. For those who would drive, it is hoped that existing facilities can be used to minimize the need to build new parking facilities.

Parking on streets that intersect the right-of-way is often not a viable option. The only areas where on-street parking is an option is in the downtown areas of Belmont, Waltham, Weston, and Hudson, and many of these are metered or otherwise time-limited, except on Sundays.

There are existing public and private lots near and adjacent to the right-of-way that may be willing to share their parking facilities on weekends. An

estimate of the number of these parking lot spaces are indicated in Table 7. It must be remembered that these are potential spaces. If the trail goes forward, then the owners of these lots could be asked about accommodating trail users. Clearly some of the lots would be available on Sundays but not Saturdays.

Table 7
Estimated Number of Parking Spaces
Within One-half Mile of the Right-of-Way

	Number of Spaces	
	Public	Private
Berlin	50	--
Hudson	50	100
Sudbury	--	100
Wayland	100	250
Weston	25	50
Waltham	350	550
Belmont	700	600
Total	1,275	1,650

In Berlin, there is a town-owned carpool lot between Route 62 and the right-of-way west of I-495. This lot has 50 spaces and would be ideal for weekend trail users. In Hudson, there are several stores, businesses, schools, and churches that might be willing to share their parking facilities with trail users. There is also on-street parking on Main Street, which runs parallel to the right-of-way, and on some side streets.

In Sudbury, west of the landfill, on the south side of Route 20, is the former site of the Linde Air Products Company. This site has been abandoned and could provide a large parking facility near a very picturesque section of the trail easily accessible from Route 20. There are other commercial and office sites that might be available, as well.

In Wayland, there is an abandoned Raytheon plant where the right-of-way crosses Route 20. This large site on the north side of Route 20 and immediately adjacent to the right-of-way also has a driveway from Route 27. Even if the site becomes occupied, it might be possible for part of the lot to be used by weekend trail users. Old Wayland Station, which stands at the intersection of Routes 126 and 27, has a large parking lot. The gift shop business there is closed in the summer, which would be the time of peak trail use.

In Weston Center, there is limited on-street parking on Boston Post Road, which runs parallel to the right-of-way. Waltham has some on-street parking on Main Street, and there are some businesses with parking lots that

may be willing to share on weekends. There is limited on-street parking as well as municipal lots in Belmont. The high school is a good site for summer and all-year weekend use.

As occurs on other trails, most users would bicycle, skate, or walk to the trail, not drive. Given population densities, most of those who do drive will be coming from the east and looking for spaces in Belmont and Waltham. A survey of users of the Norwottuck Rail Trail found that, on average, there were four people per vehicle that were driven to the trail. This is a very high vehicle occupancy rate; fewer cars and fewer parking spaces are required.

Where to allow trail users to park is a community decision. The provision of additional parking for trail users is not a requirement. If there are commercial or residential areas where a town does not wish trail parking to occur, those streets could be posted for limited or no parking. Likewise, any private driveways or roads that users might want to park on would need to be posted to inform people either that parking is not permitted or is time-limited.

If a trail is built, then a trail map could be made to inform users of the location of parking, as well as public transit connections and points of interest.

F Cost

If the trail is built, it would be the responsibility of each town to maintain and police it. The town would be responsible for policing, maintenance, and liability, as is the case for town-owned facilities such as streets, sidewalks, parks, playgrounds, etc. To obtain information on such costs, police, fire/rescue, and public works departments in Bedford, Lexington, and Arlington were asked about the costs associated with the Minuteman Commuter Bikeway. Design and construction costs are discussed in the concluding section of this chapter.

The local responsibility for operating the trail would begin once construction is completed.

Policing/Safety

The police departments in Bedford, Lexington, and Arlington were contacted to determine costs of servicing the Minuteman Commuter Bikeway.

-- *Bedford*

According to Officer McNeany of the Bedford Police Department, the bikeway is patrolled on summer weekends an average of four hours a day.

There have been very few problems; an occasional snowmobile or dirt bike has been reported on the trail. There have been no increases in the police budget attributed to the Minuteman. If an incident requires an ambulance, the individual is billed. Emergency calls from the Minuteman have been minimal, about 5 a year.[12]

-- *Lexington*

In the town of Lexington, bicycles were purchased for police patrol of the Minuteman Bikeway. The bicycle officers are scheduled to patrol the bikeway 150 hours, from March to November. The staff cost is about $4,500.

Patrolling on bicycles has spread to other areas in Lexington. Talking about police bicycle patrols, Lexington Police Chief Casey stated, "It's a great way to bridge the gap between the people and the police. You see people talking to bicycle police officers on the bikeway and around town. How many times do you see someone holding a conversation with an officer in a police cruiser?" Chief Casey also added, "Success breeds success. People using the bikeway police it themselves. It has not been a significant drain on the responsibilities of the staff."[13]

Fire Chief John Quinlan estimated that there were about 60 incidents in the past two years that required medical response. Most of the incidents were scrapes and bruises but a few were more serious. He added that no additional personnel have been hired as a result of the bikeway. Also, incidents that require emergency response do not cost the town money. When an ambulance is sent out to a person in need, the individual is charged, not the town.[14]

-- *Arlington*

In Arlington, no specifics could be obtained on the cost of policing. The trail is policed routinely within patrols, as are the roads in town. A police officer travels the trail as part of his/her normal beat. Four bicycles and two motorcycles are available for trail patrols. There was no tally of hours spent on the trail and therefore no cost estimates. There were no additions to the police budget as a result of the Minuteman.

The Planning Director in Arlington indicated that the Minuteman Commuter Bikeway is a positive from a security point of view. Before the path was built, the MBTA had jurisdiction of the right-of-way, although no

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[12] Lieutenant Dick Albany, 2-24-97.
[13]Interview with Chief Casey, Lexington Police Department, 1-7-97.
[14]Chief John Quinlan, 2-21-97.

presence. The construction of the path allowed local jurisdiction and made police patrolling much easier.[15]

Maintenance

Maintenance of the Minuteman includes mowing the three-foot shoulders a few times a year, sweeping the trail a few times a year, cleaning up fallen leaves and branches, and restriping the center line once every few years. There have been a few instances where the pavement needed patching and some erosion on the embankment needed to be controlled.

No specifics could be obtained from the towns of Bedford or Arlington, other than that there were no increases in the budget as a result of the Minuteman.

In the town of Lexington, according to the "Division Report & Costs for FY96," the amount of money spent last year on the Minuteman Commuter Bikeway was $6,690, or 0.08% of the Department of Public Work's annual budget (excluding water and sewer maintenance). The annual maintenance cost per mile was about $1,220. There were no departmental budget increases due to the Minuteman.

Total Local Costs

Specific costs attributed to maintenance of the Minuteman come from Lexington. Both Bedford and Lexington had specifics on hours of police patrols assigned to the Minuteman: 8 hours a week during summer months in Bedford, 6 hours a week for about half the year in Lexington. The per mile cost in Lexington for both policing and maintenance is $2,040.[16]

A community may choose to provide more or less policing and maintenance than Lexington does. If a community, for example, provided policing and maintenance at the same levels as Lexington (and at the same costs per hour), the following community costs would be encumbered: Berlin - $3,900; Hudson - $13,700; Sudbury - $9,200; Wayland - $6,100; Weston - $5,900; Waltham - $8,600.[17] It should be noted that the actual cost will be determined by the local community. It is anticipated that after many years, the communities would apply for state/federal funds to reconstruct the path.

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[15] Conversation with Alan McClennan, January 7, 1997.

[16] $4,500 (policing) plus $6,690 (maintenance), divided by 5.5 miles.

[17] Numbers obtained by multiplying Lexington's cost per mile ($2,040) by the mileage of the Central Mass. in each community. For mileages, see Table 6.

Design and Construction

Assuming $250,000[18] per mile, the construction of a twelve-foot-wide, paved path along the 23-mile right-of-way would cost about $6,000,000; this includes such things as signing and pavement markings at intersections, but not all of the possible costs. Additional costs would be special treatments at some of the 37 at-grade crossings, including traffic signals or even newly constructed grade separations. These special intersection treatments could cost on the order of hundreds of thousands of dollars for a bridge or tunnel. Another unknown is how much would be needed to improve the existing bridges, replace missing bridges, and to open up the three filled bridges. There are also many unknowns in regard to how the connection through Belmont will be done. Fencing would be necessary along some embankments, on all bridges, and to protect the privacy of some abutters. Finally, detailed engineering would be necessary to determine the cost of any new culverts and drainage systems. It is likely that the total construction cost would be in the range of $7,000,000 to $10,000,000.

A general rule of thumb is that design costs for a project are about 10 percent of construction costs. If the above construction estimate is valid, then a design cost of about $700,000 to $1,000,000 is implied.[19]

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[18] The $250,000-per-mile cost is based on recent costs of trail construction in Massachusetts. The Minuteman Bikeway, built from 1992 to 1993, cost approximately $190,000 per mile. This included bridge work and intersection treatments.

[19] The cost of this feasibility study was about $30,000. It was provided by the Massachusetts Turnpike Authority through its Public Works and Tourism Grant Program. This program is "for the support of local public works and tourism projects carried out for the benefit of cities and towns west of state highway Route 128 that are along or contiguous to the Massachusetts Turnpike." (St. 1995, Chapter 102, Section 22; 730 CMR X.00.) Issues that are mentioned in this phase would receive much more detailed attention in the design phase.

4 Recommendations

Constructing a rail trail on the Central Mass. right-of-way is feasible. The trail could be built on the MBTA-owned section from Berlin to Waltham. Connections could be made into Belmont to connect to the MBTA's Alewife Station and thereby to the Minuteman Commuter Bikeway.

Grade Crossings

The main design concern on the trail would be at-grade crossings. All trail users would probably be required to stop at all intersections, except perhaps where trail traffic is heavier than road traffic. Some additional traffic controls on the motor vehicle traffic ought to be considered. Traffic control would need to be designed on an intersection-by-intersection basis. There is the tendency in our culture to minimize motor vehicle delays at the expense of the time and convenience of pedestrians and other nonmotorized users. It is important to remember that our children and our elderly are disproportionate segments of nonmotorized users.

The communities would need to focus during the design stage on safety issues. Discussions would need to be held with local police departments, with town engineers and planners, and with community groups to gather information and to help ensure the safety of the future users of the trail. The engineering issues that would be covered in the design phase include traffic control devices and geometrics. The actual design of intersections would need to comply with guidance provided by the American Association of State Highway and Transportation Officials (AASHTO) and with the Manual on Uniform Traffic Control Devices (MUTCD).

Enforcement

The planning for safety would need to go beyond engineering issues to include enforcement and education. Selected spot enforcement of speed limits at cross streets could help reduce speeding. Also, the presence of safety personnel during periods of heavy use or at times when use by schoolchildren is particularly high is recommended. The assignment of police to the trail would be handled by each local department.

Education

Education is important for both motorists who will cross the trail and for trail users. Parents, perhaps through parent-teacher organizations, would need to be told that this trail, although separated from traffic for most of its length, does have intersections that require their children to be cautious. The fact that the trail would be "separated" from traffic may give some people, especially those who have had no experience using trails, the false idea that it is appropriate for use by youngsters, as well as some novice adults, who have insufficient experience with traffic. These less experienced cyclists must learn to stop at all cross streets and proceed only when safe to do so.

Environment

The design contractors, through the Massachusetts Environmental Policy Act (MEPA) process, would work closely with local conservation commissions and other concerned citizens to ensure that environmental impacts are minimized. Issues to be addressed would include the clearing of trees, the design of the trail through flood plain areas, and the construction of parking spaces (if any).

Local Jurisdiction

While no formal arrangements have been made, the local communities would most likely be the entities responsible for trail maintenance and policing. The trail would be part of the community's overall responsibility, much as occurs when a new street is added. Community-based organizations were formed along the Minuteman Bikeway to take on some general maintenance and to provide a forum for discussion of issues. Such organizations could be formed in each community to help local officials. On the Norwottuck Rail Trail, many businesses have signed on to the "Adopt-a-Trail" program, and there is a waiting list.

The next formal steps toward construction are an application for design funds and community leases with the MBTA for use of the right-of-way. These leases would spell out commitments for policing and maintaining the proposed trail. These arrangements are necessary to allow the release of design funds. (A copy of a lease allowing use of the Lexington Branch for the Minuteman is included in Appendix F.)

As the owner of the right-of-way, the MBTA could decide to build a trail. While the MBTA would work with the local communities, it would not require local permission. The MBTA, however, is interested in focusing its resources on providing public transportation; but it is amenable to the use of its rights-of-way for trails if it has no other present use for the corridors and if other responsible entities assume liability, maintenance, and policing. The most suitable entities for this task are the local communities.

Likewise, MassHighway is supportive of trail projects and has funded the design and construction of the major trails in Massachusetts. MassHighway, however, would not commit design and construction money to a project unless right-of-way issues, including maintenance and policing responsibilities, had been spelled out.

If this project proceeds, then many years would lapse before a trail would be in place. The design phase would take between one and two years, as would the construction. Allowing for time spent securing funds and awarding contracts, it would be a minimum of five years before a trail could be in place.

APPENDICES

A Bicycle-Pedestrian Accidents

B Environmental Issues

C Public Meetings

D Estimated Demand

E Information about Crossings

F Sample Lease

Appendix A

Bicycle-Pedestrian Accidents

Bicycle-Pedestrian Accidents

The following is a description of bicycle and pedestrian accidents at the community level. Accidents are mapped in Figures A-1 through A-7.

In some cases, no accident concentrations will be seen. In other cases, specific intersections or roads will be the location of many accidents. The location of accidents may be a reflection of volumes of pedestrian and bicycle traffic more than an indication of hazardous conditions. An intersection with a large number of accidents may be as safe from a traffic design point of view as another with no accidents: one is a location where many bicyclists and pedestrians travel; the other is one where little such traffic occurs. Likewise, lack of accidents cannot be taken as a measure of safety. Perceived hazardous conditions might discourage bicycling and walking almost entirely in a given area, resulting in few or no accidents.

A more detailed, community-wide study could determine if additional measures need to be taken to reduce these accident rates. It would be determined what type of measures -- special signs, targeted police enforcement, traffic control design changes -- would be most effective. These types of analysis are best performed by a local bicycle committee and local staff.

Berlin

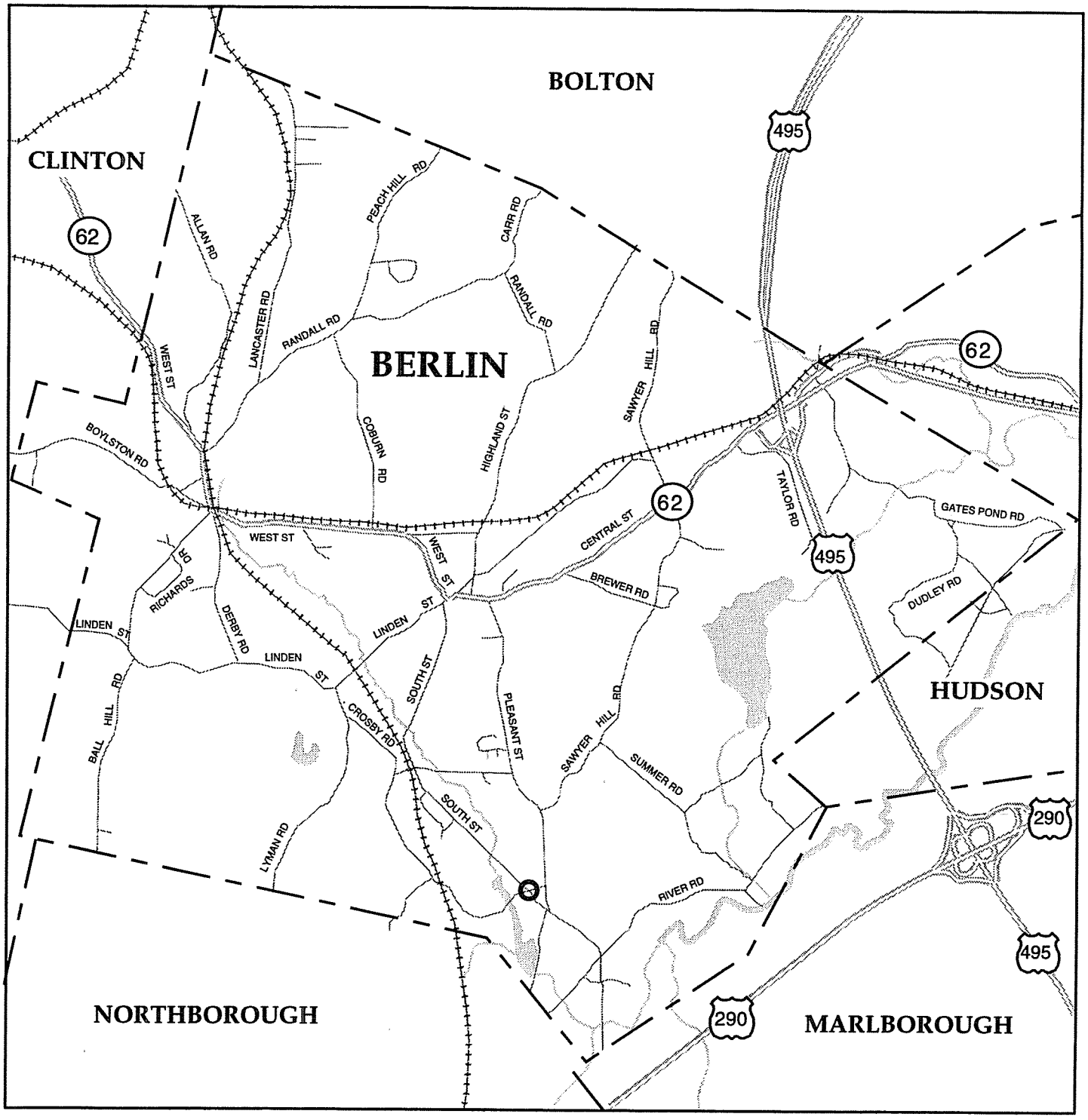
In Berlin (see figure A-1), there was one accident involving a bicyclist at the intersection of South Street and Crosby Road. There were no reported accidents involving pedestrians between the years 1988 and 1991.

Hudson

As can be seen in Figure A-2, the majority of the accidents occurring in Hudson were in the center of town, with the highest concentration of accidents on Main Street. The Central Mass. line would likely divert many pedestrians and bicyclists from the Main Street corridor.

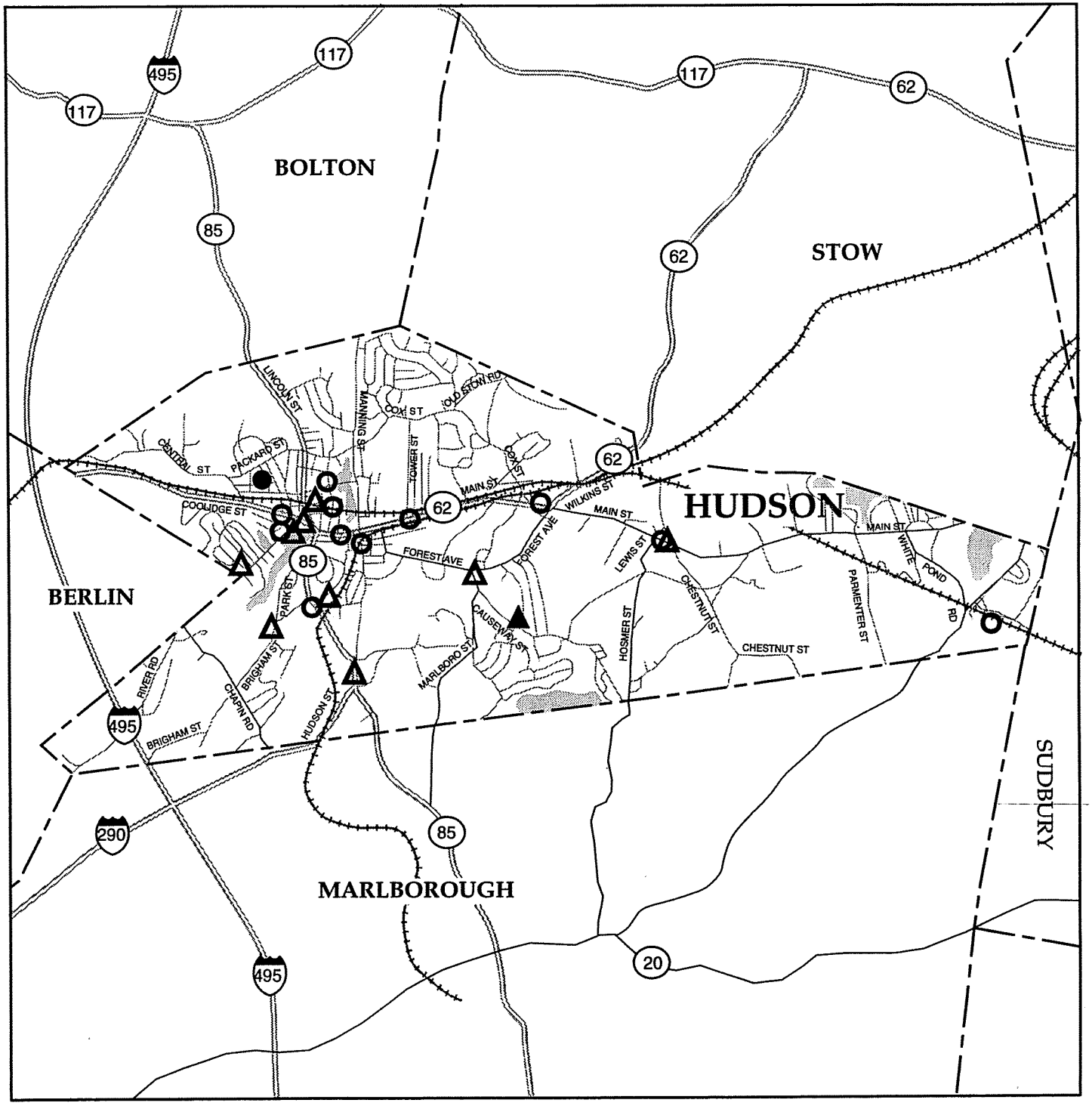
The 19 pedestrian accidents were more spread out than the 29 bicycle accidents. Ten of them were mapped. Two pedestrian accidents occurred on Main Street; one in the center of town, and the other further east at Lewis Street. Two others occurred near the rotary in the center of town, two on Route 85, one on Brigham Street, one at the intersection of Forest Avenue and Marlboro Street, and one on River Street at the Berlin line. Two fatal accidents occurred: one on Causeway Street between Marlboro Street and Robinson Road, the other at an unknown location.

FIGURE A-1
Locations of Collisions of Motor Vehicles with Bicyclists and Pedestrians, Berlin 1988-1991



Source: Registry of Motor Vehicles data, processed by Massachusetts Highway Department

FIGURE A-2
Locations of Collisions of Motor Vehicles with Bicyclists and Pedestrians, Hudson, 1988-1991



Source: Registry of Motor Vehicles data, processed by Massachusetts Highway Department

Of the 29 bicycle accidents, 12 were mapped. With the exception of an accident at the Main Street and Lewis Street intersection and one on the right-of-way east of White Pond Road, the bicycle accidents were concentrated around the center of town. The one bicycle fatality occurred at the intersection of Blaine Street and Howe Street.

Sudbury

As Figure A-3 shows, the two roads where most of the accidents occurred were Concord Road and Route 20. There were no fatal accidents in Sudbury between 1988 and 1991.

Of the 7 pedestrian accidents, only 3 could be mapped; these 3 occurred in South Sudbury. One was on Route 27 just before the Wayland town line, one at the intersection of Union Avenue and Route 20, and one at the intersection of Woodside and Alta roads.

Of the 17 bicycle accidents, 11 were mapped. There were 5 bicycle accidents on Route 20. There were 3 on Concord Road, and 1 each on Union Avenue, on Haynes Road, and at the Candy Hill/Plympton Road intersection.

Wayland

Wayland had 25 accidents in the study time period. All of them occurred around the perimeter of the town (see figure A-4).

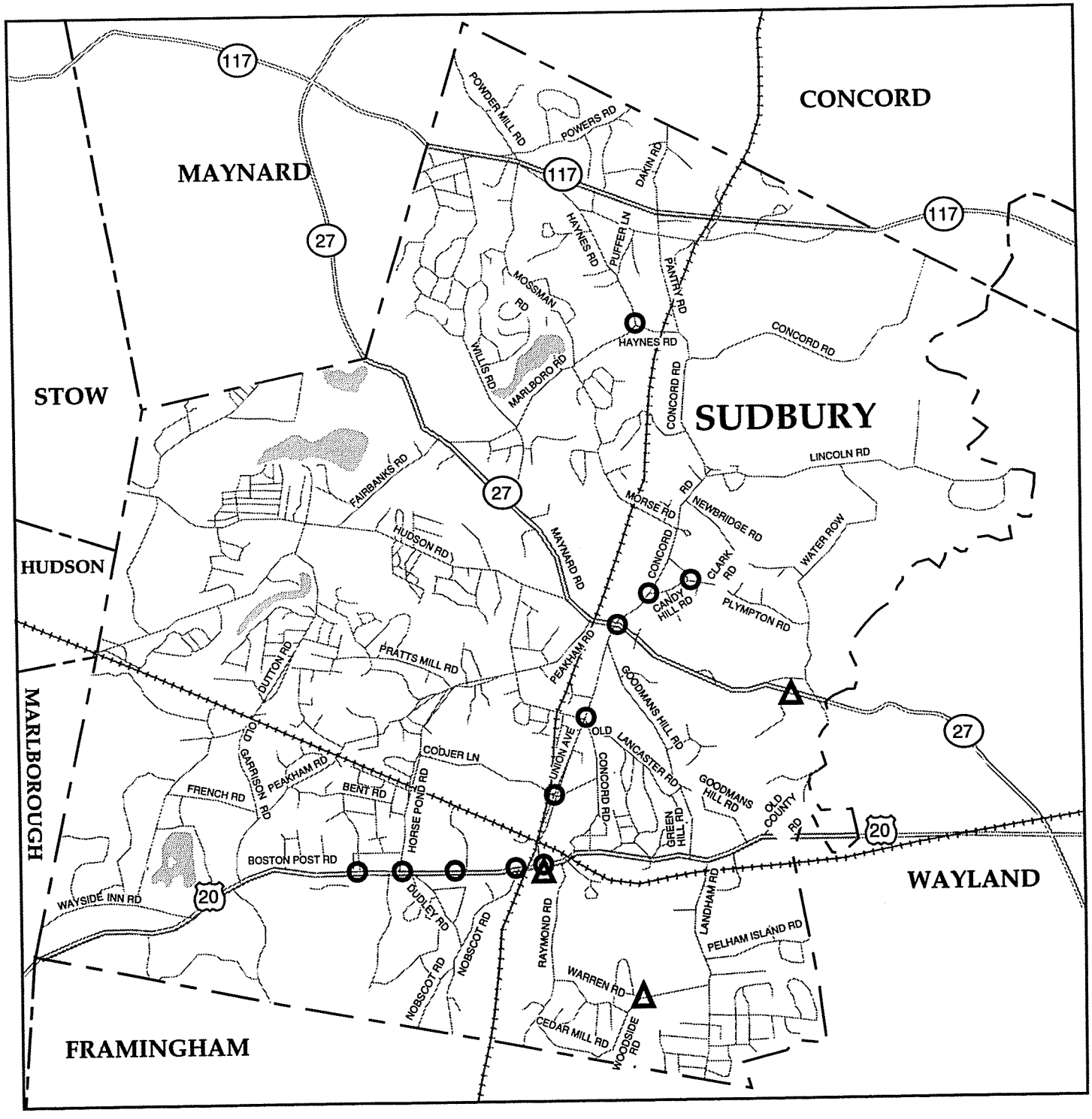
Three of the 8 pedestrian accidents were mapped. One occurred on Route 20 at the Plain Road intersection. Two were on Route 30: one at Rice Road and another east of the Route 27 intersection.

Of the 17 bicycle accidents, 8 were mapped. Two were on Route 126 south of Stonebridge Road, 2 on West Plain Street, 2 on Winter Street (1 at the intersection of Route 30), 1 at the Rice Road/Route 30 intersection, and 1 on Route 20 at the Weston line.

Weston

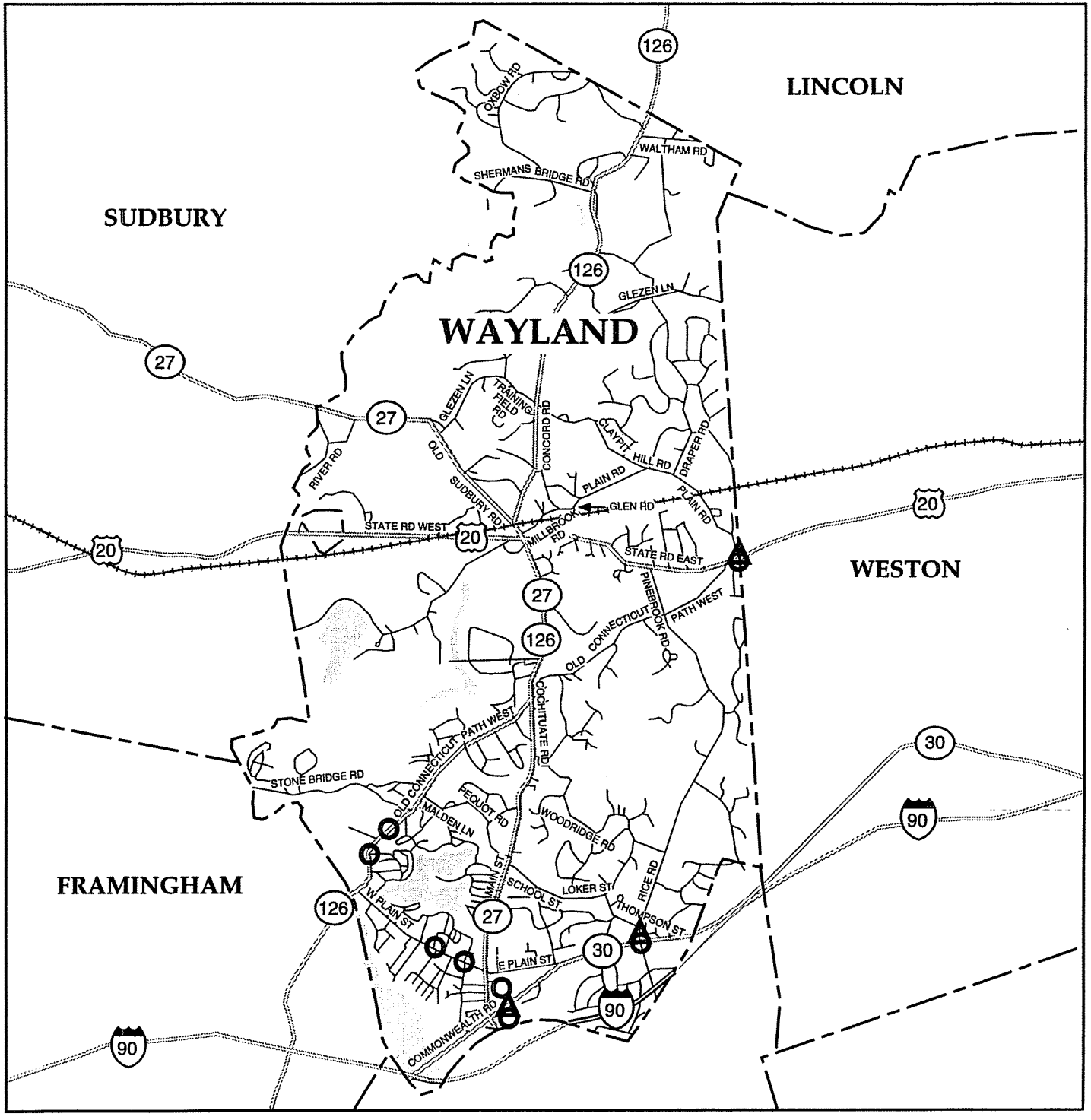
Of the 10 bicycle accidents in Weston, 9 were mapped in Figure A-5, as were 7 of the 13 pedestrian accidents. Most of the accidents reported in Weston occurred on the south side of town. Three accidents involving pedestrians occurred on Route 30, 1 at the intersection of Route 117 and Church Street, another on Route 20 on the Wayland line, 1 south of where River Road splits into Summer Street and South Street, and 1 at the end of Wildflower Lane.

FIGURE A-3
Locations of Collisions of Motor Vehicles with Bicyclists and Pedestrians, Sudbury, 1988-1991



Source: Registry of Motor Vehicles data, processed by Massachusetts Highway Department

FIGURE A-4
Locations of Collisions of Motor Vehicles with Bicyclists and Pedestrians, Wayland, 1988-1991



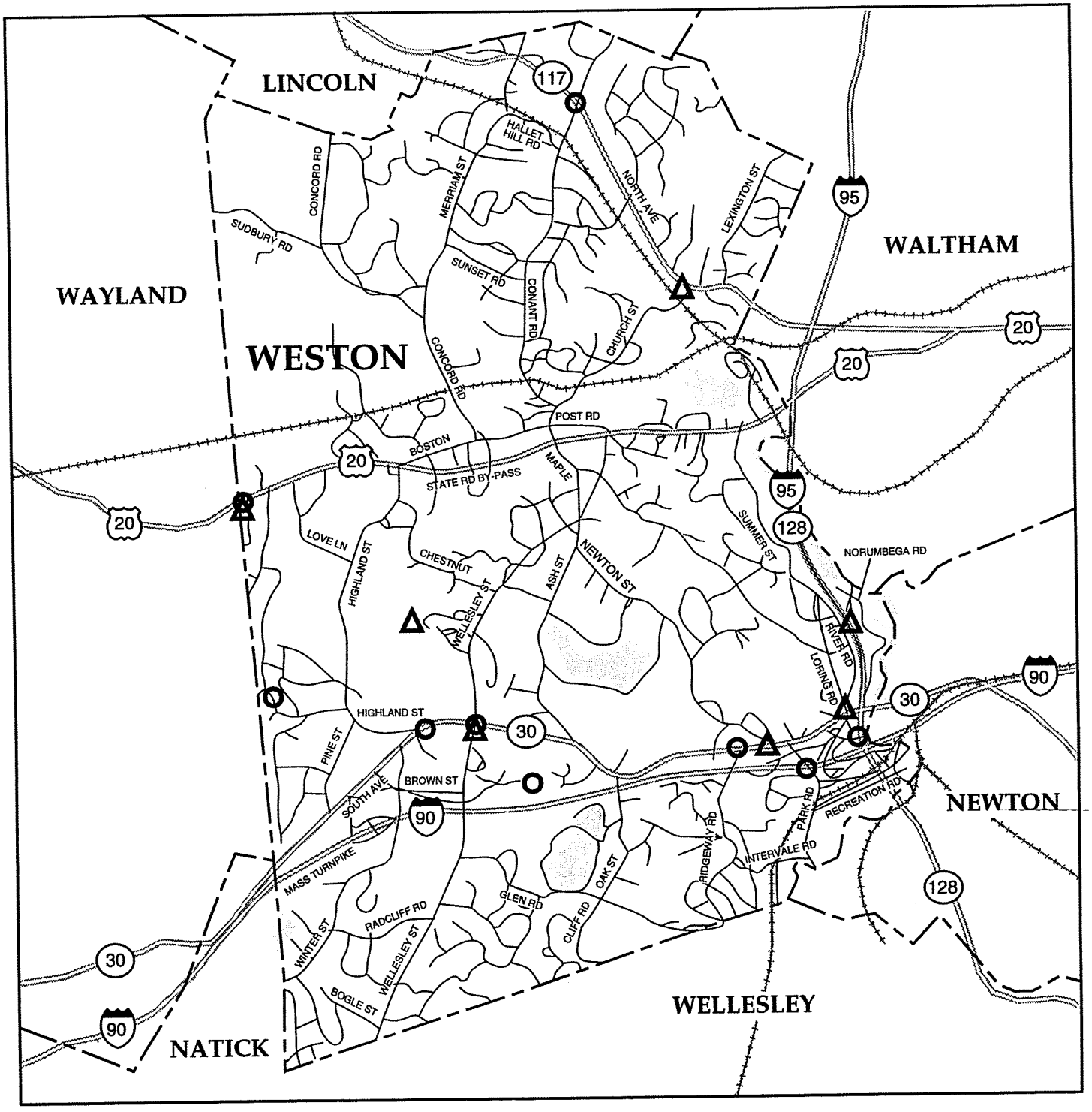
N

LEGEND

- Bicycle Accident
- Bicycle Fatality
- Pedestrian Accident
- Pedestrian Fatality

Source: Registry of Motor Vehicles data, processed by Massachusetts Highway Department

FIGURE A-5
Locations of Collisions of Motor Vehicles with Bicyclists and Pedestrians, Weston, 1988-1991



N

LEGEND

- Bicycle Accident
- Bicycle Fatality
- Pedestrian Accident
- Pedestrian Fatality

Source: Registry of Motor Vehicles data, processed by Massachusetts Highway Department

There were 3 bicycle accidents on Route 30. There was one accident at each of the following locations: Westerly Road, Weston Middle School, Route 20 at the Wayland line, Park Road, the intersection of Conant Road and Route 117, and near I-90 at the Newton line.

Waltham

Waltham had 107 bicycle accidents, of which about 80 percent were mapped (see Figure A-6), and 163 pedestrian accidents, of which about 50 percent were mapped. The accident concentrations in Waltham were in the center of the city on Main Street and on Moody Street. The Central Mass. right-of-way parallels Main Street.

A majority of the accidents on Main Street occurred on the west side of Lexington Street. There is an even distribution of pedestrian accidents throughout the city. There were 3 fatal pedestrian accidents (only one is shown on the map, on Main Street just west of Lyman Road).

The location of bicycle accidents is similar to that of the pedestrian accidents: a cluster in the center and a scattering on the outskirts of the city. There were no reported fatal accidents involving bicyclists in the 1988-1991 time period.

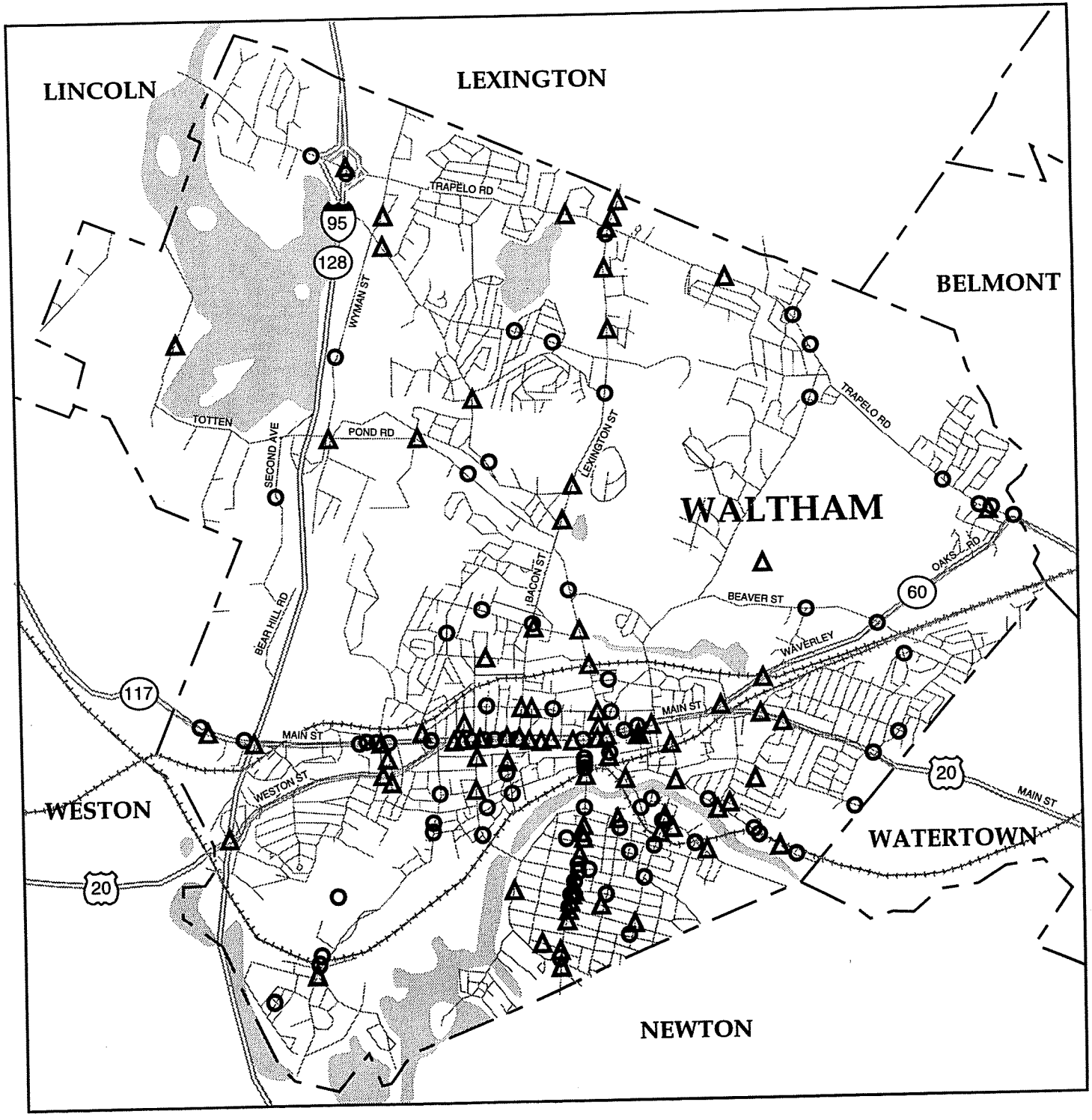
Belmont

As can be seen in Figure A-7, there were 40 bicycle accidents in Belmont, of which 26 were mapped, and 30 pedestrian accidents, of which 23 were mapped. Most of the bicycle and pedestrian accidents took place on Belmont Street, which is the border between Belmont and Watertown. There were also many on Trapelo Road.

There were 2 fatal pedestrian accidents, both on Trapelo Road: one at Belmont Street and the other at Beech Street. The rest of the pedestrian accidents were mostly on these two roads, with a few in the center of town and a couple in the northern section of town.

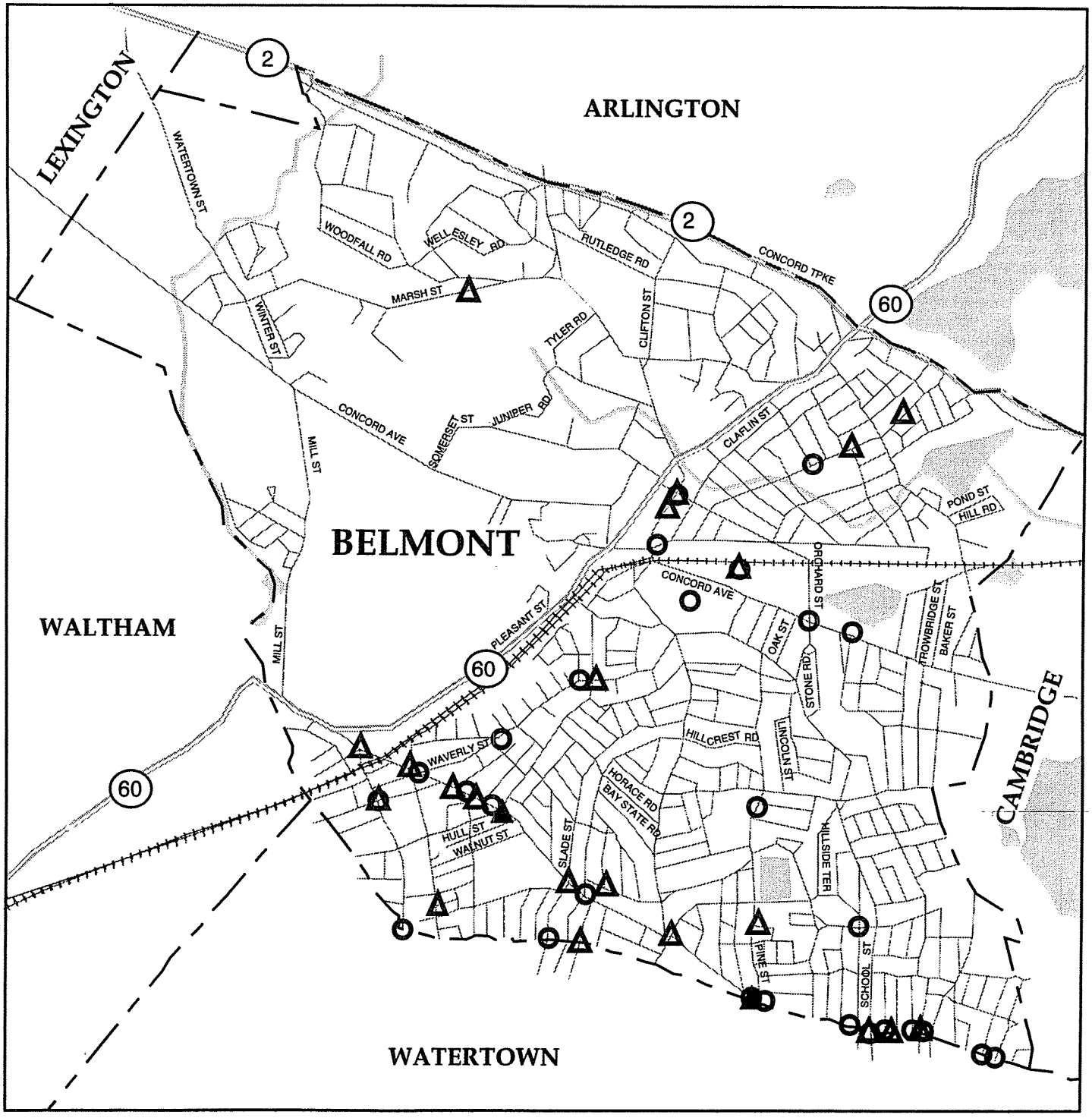
The distribution of bicycle accidents was similar to that of the pedestrian accidents. There were no bicyclist fatalities.

FIGURE A-6
Locations of Collisions of Motor Vehicles with Bicyclists and Pedestrians, Waltham 1988-1991



Source: Registry of Motor Vehicles data, processed by Massachusetts Highway Department

FIGURE A-7
Locations of Collisions of Motor Vehicles with Bicyclists and Pedestrians, Belmont, 1988-1991



Source: Registry of Motor Vehicles data, processed by Massachusetts Highway Department

Appendix B

Environmental Issues

Regulatory Permits and Approvals

The following reviews are likely to be required for the construction of a trail. This is a summary of a list developed and provided by the Department of Environmental Management.

Federal

US Army Corps of Engineers, Section 404

Area: Culverts, and/or repairing the walls banking the streams leading to and from the culverts.

State Executive Office of Environmental Affairs (EOEA)

Division of Environmental Protection (DEP)

A) Division of Waterways, Chapter 91

Area:
1) Maintenance or replacement of any fill or structures not previously licensed.
2) Any river on which public funds have been expended.

B) Division of Water Pollution, Water Quality Certification

Area: Discharge of pollutants into the waters of the Commonwealth. (Mass. General Laws, Chapter 131, Section 40.)

Massachusetts Environmental Policy Act (MEPA) Unit, Environmental Notification Form

Area: Construction project over $500,000.

Local

Conservation Commission, Notice of Intent

Area: Filling and altering wetlands.
(Guidelines are now being developed for the Rivers Protection Act.)

Table B-1
Flood Zones on the Right-of-Way

	Length (ft.)	Percent of Trail
Zone C	100,226	82
Zone B	8,100	7
Zone A	14,170	11
Total	122,496	100

Table B-2
Flood Plain: Zone A

	Location	Length (ft.)
Berlin	None	
Hudson	Hog Brook	1,000
	Bruce Pond	350
	Assabet River	700
	600 ft. east of Wilkins Rd.	60
	Fort Meadow Brook	300
Sudbury	Hop Brook	400
	Dudley Brook	400
	Hop Brook South of Route 20	500
	Sudbury River	600
Wayland	Sudbury River	4,500
	Mill Brook	200
	Hayward Brook	800
Weston	Cherry Brook	600
	Stony Brook	60
Waltham	Lyman Pond outlet dam	100
	Linden St. --> Beaver St.	3,600
		14,170

Table B-3
Zone B

	Location (west terminus)	Length (ft.)
Berlin	600 ft. west of Highland Rd.	200
	50 ft. east of Sawyer Hill Rd.	900
	1,900 ft. east of Sawyer Hill Rd.	900
Hudson	300 ft. east of Cox St.	1,000
Sudbury	Union Ave. --> Route 20	1,200
	2,000 ft. west of Landham Rd.	1,400
Wayland	Route 20	1,600
	700 ft. east of Plain Rd.	900
Weston	None	
Waltham	None	
		8,100

In some areas, the right-of-way is near Zone A and B flood plain:

- West of Priest Street, Hudson, 1,000 feet of Zone A, north side of right-of-way
- 500 ft. west of White Pond Road, Hudson, right-of-way splits 900-foot Zone A section but is in Zone C
- West of Concord Road, Weston, 500 feet of Zone A, south side of right-of-way
- Between Concord Road and Conant Road, Weston, areas of Zone A to the north and Zone B to the south
- East of Lyman Pond, Waltham, right-of-way divides a Zone A flood plain

Appendix C

Public Meetings

Public Meetings

Five public meetings were held. The original intention was to have only two or three, as is usually done for this type of study. The additional meetings were scheduled for two main reasons: (1) the high level of interest shown in the project and (2) the fact that attendance at the individual meetings was strongly affected by where the meeting was held. That is, it was found from the sign-in sheets (see Table C) that a large portion of the attendees came from the specific community where the meeting was held. It was decided that having two or three regional meetings might not attract many people who would only attend a meeting in their own community.

Table C
Geographic Origin of those Attending Central Mass. Rail Trail Public Information Meetings*

Public	Central Mass. Communities							Other Communities			
Meetings	Berlin	Hudson	Sudbury	Wayland	Weston	Waltham	Belmont	West	Central	East	**Total**
Oct. 3 Wayland	3	1	9	**23**	7	6	3	4	5	4	**65**
Nov. 6 Waltham		1	4	7	7	**55**	**4**	1	4	13	**96**
Dec. 4 Sudbury	1	2	**44**	8	3	2	1	9	5	4	**79**
Jan. 30 Weston			4	15	**74**	3		1	3	8	**108**
Feb. 12 Hudson	**6**	**6**		1	1		1	7	2	3	**27**
Totals	10	10	61	54	92	66	9	22	19	32	**375**

**These totals are based on sign-in sheets. Based on head counts done at these meetings, it is estimated that 20 to 40 percent of those in attendance did not sign in.*

The publicity for these meetings was done by advisory committee members. They sent press releases to local papers, contacted people directly, and in some cases distributed flyers.

Following are the minutes of these public meetings. The minutes were written by Dana Burghdoff, of the Waltham Planning Department, and reviewed by CTPS and members of the advisory committee.

Central Mass. Rail-to-Trail Feasibility Study

PUBLIC MEETING #1
Wayland Town Hall
10/3/96

Cathy Buckley Lewis of the Central Transportation Planning Staff (CTPS) explained the purpose of the Central Mass. feasibility study, which is to determine whether the existing railroad right-of-way can be converted to a recreational bicycle/pedestrian trail. She also introduced the regional Advisory Committee, which is made up of representatives from each of the seven Central Mass. communities (Belmont, Waltham, Weston, Wayland, Sudbury, Hudson, Berlin).

Cathy explained two maps of the Central Mass. communities. The first map showed the location of bicycle and pedestrian accidents for 1988-1991. The second map showed the Central Mass. branch, and Cathy asked that people write on the map to give suggestions or express concerns about the right-of-way.

Cathy estimated that a draft of the feasibility study report would be available by March 1997. The feasibility study will consider the physical impediments to constructing a trail: sight distances at intersections, traffic volume, bridge conditions, drainage/water issues, etc. Then a preliminary cost estimate will be prepared, based on a general 12' paved path, with 3' of shoulder on either side. If other widths or surfaces are desired, they can be incorporated into the design.

If the report is positive, the next step is for the communities to decide to request state funds for a design contract. The Boards of Selectmen and City Council for each community would have to vote for the request. The State will not pay for design without local support. The design would probably take 18-24 months.

The next step is for the communities to request funds for a construction contract. The construction would be executed by the Mass. Highway Department. The construction would probably take two construction seasons.

The likely time frame for completion of the trail would be 6-8 years.

Discussion *(Most answers given by Cathy Buckley Lewis of CTPS)*

Q: People currently ride their horses along the right-of-way from Wayland to Weston. I am concerned that equestrians would not be able to use the trail if it is paved.

A: It is possible for an adjacent path to be constructed for horse riders. It is a local decision.

Q: Where do people currently ride their horses along the right-of-way?

Audience: In Weston, Wayland, and Sudbury.

Comment: Accommodating horses should not be a problem, since a horse trail would only require about 3 feet in width, and the right-of-way is 40-80 feet wide.

Q: Would the trail have to be paved?
A: Since the Mass. Highway Department would probably construct the trail, it is likely that it would be paved, so that the greatest variety of users could enjoy it (people with wheelchairs, strollers, etc.) Again, it would be a local decision.

Q: Are paved trails more dangerous than unpaved?
A: Not necessarily. They are often considered more fun, depending on the user.

Q: Would the trail be used as a cross-country ski trail in the winter, or be plowed?
A: It is a local decision whether to plow the trail in the winter. The Minuteman Trail is not plowed, and is used as a ski trail.

Q: How would the trail be policed and maintained?
A: The communities would be responsible for policing and maintenance. The MBTA would require in the lease agreement that the communities do so.

Q: How will snowmobiles be policed?
A: All motorized vehicles would be prohibited from using the trail, except for motorized wheelchairs. Again, policing would be a local responsibility.

Q: Is the MBTA likely to support a trail use?
A: Since the MBTA owns the right-of-way, their support was necessary to conduct this feasibility study. MBTA support would become official with lease agreements with each community. Lease agreements for trail use would not necessarily preclude the MBTA from reinstating rail service in the future. However, the recent commuter train feasibility study reports that rail service is not a feasible option.

Q: Didn't the commuter train issue prompt the trail study?
A: No. The trail study has been discussed for years. Some abutters may support the trail to thwart commuter rail use. But many simply support the trail for itself.

Q: How can I volunteer to help the trail go forward?
A: Since there are not many active committees in the Central Mass. communities, as there were in the Assabet trail communities, you should put your energy into coalition building.

1. Talk to John Stasik, Chairman of the MetroWest Growth Management-Bicycle Subcommittee. His group has begun meeting to help coordinate coalitions in each MetroWest community. The MetroWest number is (508) 651-7350.
2. Talk to your Central Mass. Advisory Committee representative.
3. Talk to the Bicycle Coalition of Massachusetts. They have members in most communities.

Q: Will the railroad tracks be removed?
A: Yes. The tracks would be removed for the trail. Also, the MBTA could not reuse the tracks, since they are in bad shape.

Q: Could the trail be built in stages, if certain towns, like Weston, don't want the trail?
A: Yes, the trail could be built in segments.

Q: What is the cost/mile?
A: The Minuteman cost $2,100,000 for 11 miles of trail. A very preliminary cost estimate for the Central Mass. trail is $5-6,000,000, which would be paid for with state/federal money.

Q: What are the typical concerns of the opposition?
A: In Lexington, people were concerned about theft, since their backyards were abutting the trail. National and local studies show that those problems have not materialized. There is also fear of something new, since the rail line has been abandoned so long.

Q: People using the Minuteman Trail often park illegally, creating traffic jams. How will you handle parking for the Central Mass. line?
A: The Minuteman Trail is an incredibly popular trail. The Central Mass. trail would not be as crowded as the Minuteman. Parking provisions and enforcement is controlled locally. Suggestions regarding parking/traffic should be made to your local representative of the Advisory Committee, and they will be included in the feasibility study.

Q: How much clear cutting will there be?
A: Given a 12-foot path with 3-foot shoulders, there would be at least 18 feet of clear cutting. I do not know how much extra cutting would be necessary during the construction process. The communities and their Conservation Commissions would decide if they are willing to accommodate extra trails (e.g. for horses), which would require additional cutting.

Q: Are mixed use trails dangerous?
A: The Minuteman Trail is a mixed use trail. According to the Bedford Chief of Police, there have been no accidents reported to the police.

Comment: (Jerry VanHook, Lexington Friends of the Minuteman Trail)
Width is an important criteria in determining safety. Multiple types of users can coexist. Also, there has been no increase in crime along the right-of-way. The trail is straight, wide open, and well used.

Q: How would the trail affect property values?
A: I do not have any hard data. Other trail studies have shown a 2-5% increase in property values. Many sellers will advertise their proximity to a trail. There is practically no graffiti or vandalism to deter buyers.

Q: Could parking and bicycle parking be incorporated into the request for State funding?
A: It is a question of cost. A lot of things are possible.

Q: Who do we call if we have design suggestions?
A: Call your Advisory Committee representative or me.

Q: How can we protect adjacent trails leading into conservation lands?
A: It is up to the owners of the conservation lands.

Q: Where is the terminus of the trail in Berlin?
A: Berlin Center

Q: Would a vote for the trail come before Town Meeting?
A: No, only a local referendum would be needed from the Board of Selectmen or City Council, assuming local funds are not used.

Q: Are there environmental benefits of the trail?
A: It is likely that there would be air quality benefits, since people might use the trail instead of their cars. An air quality study is not currently part of the feasibility study, but I will consider it.

Cathy asked that people contact her at (617) 973-7118 to provide information that might be useful to the study.

(Meeting then broke up into informal group discussions.)

Central Mass. Rail-to-Trail Feasibility Study

PUBLIC MEETING #2
Waltham Government Center
11/6/96

Before the meeting, Andy Greene of the Waltham Bicycle Committee showed a 10-minute video from the Rails-to-Trails Conservancy, which documented the experience of other rail-to-trail projects and included interviews with those involved. Cathy Buckley Lewis of the Central Transportation Planning Staff (CTPS) opened the meeting and explained the purpose of the Central Mass. feasibility study, which is to determine whether the existing railroad right-of-way can be converted to a recreational bicycle/pedestrian trail. Cathy showed slides of the Central Mass. right-of-way in Waltham and other trails.

Discussion *(Most answers given by Cathy Buckley Lewis of CTPS unless noted)*

Q: If one town turns down the trail idea, is the trail still viable?
A: Yes. It is likely that the trail could be built in sections.

Q: How can Weston police the trail with such a small police force? Lexington and Arlington have much larger police forces.
A: The addition of a three mile trail in Weston is a marginal increase to the road network that Weston already polices.

Q: When will the abutters be notified? How much weight will be given to their opinions?
A: Abutter notification is up to the individual towns. You should contact your town's Advisory Committee representative for input. Your concerns will be addressed by your community in its decision to support the trail or not.

Q: Is it safe to have a trail next to an active railroad line, as proposed for parts of Belmont?
A: Yes, with the proper barriers.

Q: Will the power lines that run along sections of the right-of-way have to be moved?
A: No, there are no plans to move the power lines.

Q: Is the Minuteman Bikeway plowed? *(The Minuteman Bikeway begins at the Alewife T Station in Cambridge, and continues west through Arlington, Lexington, and Bedford.)*
A: No, the Minuteman Bikeway is not plowed in the winter.

Q: Will parking facilities be considered?
A: Parking was brought up at the last public meeting also. We will consider parking.

Comment: Before the Minuteman Bikeway existed, there was a lot of vandalism along the right-of-way. Now the vandalism has gone way down. It is practically nonexistent. I agree that you should look into parking for the Central Mass. trail.

(former Lexington Bicycle Advisory Committee member)

Q: What is the cost/mile of maintenance of the Minuteman Bikeway?
A: The Town of Arlington has not allocated any additional funds for the maintenance or policing of the Bikeway. The Town mows along the side of the trail four or five times a year, and recently restriped the center line of the trail. The trail is self-policing. (Arlington Planning Director)

Q: Will the trail increase property values?
A: Studies have shown an increase of 2-5% in property values. Nearness to the Minuteman Bikeway is mentioned as a positive in real estate listings in the area.

Q: Where will the trail end (or begin) in Berlin?
A: Where MBTA ownership ends east of Coburn Road.

Q: Can we hear comments from Minuteman abutters?
A: I am not an abutter, but I have spoken with many abutters. All of the abutters had concerns before the trail was built. Now most of them seem happy with the trail. (former Lexington Bicycle Advisory Committee member)

Comment: I am an abutter to the Minuteman Bikeway. My wife and I sold our house in Belmont and moved to Arlington to be near the Bikeway. (Arlington Planning Director)

Comment: There is a motorcycle patrol in Waltham that could police the trail.

Comment: The City of Waltham has police officers on bicycles who would also police the trail in Waltham. (Waltham Planning Director)

Comment: People should just use common sense on the trail.

Comment: Common sense doesn't always exist.

Q: Weston has worked very hard to conserve its woodlands. They contain endangered species and wetlands. Also, the railroad tracks are up on embankments in some places. How much clearing will there be? How much of an environmental impact?
A: The construction of a trail is considered to have a very minimal impact, especially when compared to the usage of the right-of-way for a train. Also, the Conservation Commissions in each town would have to approve any construction plans.

Comment: During construction of the Minuteman Bikeway, the embankments were not touched. They were wide enough to support the trail. (Arlington Planning Director)

Comment: I suggest that you use white striping on the trail and reflective tape on any gates

for nighttime use. I also suggest installation of signs to let you know where you are on the trail, and call boxes for emergencies.

Comment: I think the trail would be a big improvement over dirt bikes that currently use the right-of-way. (Hudson resident)

Comment: We were not informed of the possible use of Channing Road as a connection to the Central Mass. trail. The trail connection would then be in our front yards.

Q: How can we get involved in the trail project?
A: Get together with other interested people and form a group.

Comment: I appreciate the work being done for the trail project. (Wayland resident)

Comment: We need to coordinate a group for the trail. Let's meet up front after the meeting.

People then began discussing the project in smaller groups.

Approximately 100 people attended the meeting.

Central Mass. Rail-to-Trail Feasibility Study

PUBLIC MEETING #3
Sudbury Town Hall
12/4/96

Cathy Buckley Lewis of the Central Transportation Planning Staff (CTPS) opened the meeting and explained the purpose of the Central Mass. feasibility study, which is to determine whether the existing railroad right-of-way can physically be converted to a recreational bicycle/ pedestrian trail. Cathy showed slides of the Central Mass. right-of-way and other trails.

If the trail is found to be feasible, the next step is design. Each community would enter into lease agreements with the MBTA, which owns the right-of-way. The communities would then apply to the Mass. Highway Department for design funds and then construction funds. MassHighway would require that each town agree to police and maintain the trail.

Discussion *(Most answers given by Cathy Buckley Lewis of CTPS unless noted)*

Q: Is the feasibility study likely to be positive?
A: Physically, conversion to a trail is straightforward. The right-of-way is publicly owned and wide enough for a trail. It is a question of cost.

Q: Were you involved in the Minuteman Bikeway feasibility study? What happened?
A: The Minuteman is a rail-trail that begins at the Alewife T Station in Cambridge, and runs through Arlington, Lexington, and Bedford. I was involved in the study in the late 1970s. We ran into some opposition in Lexington. People were worried about the unknown. Politically it was also a problem at the State level. The trail was finally opened in 1992. The Dr. Paul Dudley White Trail was dedicated in the early 1970s. We also have the Cape Cod Trail and Norwottuck Trail. Most probably, this project would be like the Minuteman: built by MassHighway and leased to the communities by the MBTA.

Comment: I work for Mitre Corp. in Bedford. I use the Minuteman Bikeway, and have visited other trails. I have a nice vision of what could happen here. Interest in the trails come slow here because there isn't a nucleus of small trails like there were in Bedford. This trail could also help ameliorate the traffic problem.

Q: Would equestrians be allowed to use the trail?
A: There is room along the right-of-way for a parallel trail. It is something to be considered.

Q: Would the trail be wide enough for emergency vehicles?
A: Yes.

Q: Would the towns be liable for accidents along the trail?
A: Liability would be the same as for town roads.

Comment: There is experience on the Old Dominion Trail of equestrians and bicyclists using the same right-of-way.

Q: How is town support rallied for the trail?
A: It is up to the towns. The Boards of Selectmen or the Mayor/City Council will have to support the trail. For the Minuteman process, the Lexington Board of Selectmen held a hearing.

Comment: (Lexington Friends of the Minuteman) No extra police officers were needed for the Minuteman Bikeway. The officers like the duty, because it gives them a chance to interact with people, to get out of their cars. The maintenance costs are minimal. They sweep the path twice a year, and there is no lighting or snow plowing. Lexington DPW handles minor repairs, and I don't hear any complaints.

Comment: (Lexington Friends of the Minuteman and abutter) We have volunteers who help clean and maintain the trail. Also, the trail helps bring people to our commercial areas. It's nice to bring people out into the country. The trail encourages a sense of community.

Q: Has there been any midnight revelry or dumping?
A: Vandalism has not been a problem. There was dumping before the trail went in. There was a murder that some tried to blame on the trail.

Comment: Kids used to throw rocks onto cars from the overpass, but now with so many people on the trail, that activity has stopped. Also property values along the trail have either remained stable or gone up.

Comment: (Cathy Buckley Lewis) There was a study in Seattle showing that property values along trails went up 2-5%.

Q: How long will the project take?
A: Minimum of 5 years.

Q: Are any barriers, such as fencing and landscaping, being considered in the study?
A: There is no set policy by MHD. They would be included as necessary in the design phase. There are houses that probably would warrant barriers.

Q: Could trains run on the right-of-way again? I would rather have roaring rollerbladers than a train.
A: Yes, trains could run again, but not for the time being. MBTA will not give up their right to run trains on the right-of-way, but it is not currently feasible to do so.

Q: How many trail users would there be?
A: It's unknown. There will be fewer users than on the Minuteman. The traffic will be very different on either end of the trail, heavier at the Belmont-Waltham end.

Comment: The Minuteman is heavily used because there are so few trails available. We should be building as many as we can.

Q: How is the funding competition for ISTEA funds?
A: I don't know. I feel optimistic about funding availability, either from ISTEA or the State, because of the historical support for bike trails. Also, trails are cheap compared to highways.

Q: If one town doesn't want the trail, is it still viable?
A: Yes, it's viable. Trails as short as ½ mile have been funded.

Q: Will there be any emergency telephones along the trail?
A: I don't know, but it could definitely be considered.

Q: Are there ever snowmobiles on the Minuteman during the winter?
A: During the first year there were, then they gave up.

Comment: There are cross-country skiers on the trail, which is nice.

Comment: (Member of Rails-to-Trails Conservancy, resident of Sudbury, works in Lexington) There are several trails throughout the region. I hope the experience with the existing rail-trails will help ameliorate concerns.

Comment: (Lincoln resident) We're very slow and conservative in New England. I am a trail advocate because I like to walk. I don't own a bike. The trail is a win/win. It is a healthy option, like a continuous park. Do mothers with children and abutters use these trails?

Comment: (RTC member) Yes, there is very mixed usage.

Comment: (Cathy Buckley Lewis) During commuting hours, 35-40% of the users are bicyclists, 30% are rollerbladers, and the rest are walkers or joggers.

Q: What kind of response have you received in the other towns?
A: The first public meeting was in Wayland in October, and the second meeting was in Waltham in November. People at both meetings were generally supportive. There were a few concerns. The phone calls I have received have been supportive.

Comment: This meeting seems more positive than the Wayland meeting.

Q: What is the biggest obstacle to the trail?
A: Political opposition.

Q: What is your sense of the project?
A: At first, there was not a lot of citizen involvement as there has been for other projects.

But the Central Mass. trail is the most talked about project that I've been involved with, even more so than the Minuteman.

Comment: (Sudbury Valley Trustees representative) We are strong boosters of this project, which is uncommon for our group, since we normally just support conservation projects. We looked at how many conservation lands would be connected by the trail, and it is very exciting. The trail would also be a good link for the Bay Circuit Trail, which would connect the North Shore to Duxbury.

Q: Rollerbladers and bikers might be in conflict on the trail. I know we are still on a learning curve. Is there any discussion of design to correct conflict?

A: We have discussed having a trail wider than the standard 12 feet. The right-of-way is wide enough for a wider trail, but it is a trade off for some who don't want a lot of paving. The trail could be wider in some sections, and narrower in others. The trail could also be split, so that each direction is separated.

Comment: (Stow resident) I have been on several bike paths, and the Minuteman is a very good trail. I would suggest though that the guardrails be moved back so that people resting on them aren't in the way of people using the trail. Also, on a Rhode Island trail, the pedestrians travel in the opposite direction of bikers and rollerbladers, which seems to help avoid conflicts.

Comment: That idea was considered for the Minuteman, but was turned down as possibly dangerous. No people have been run down on the Minuteman. A wider path would help avoid conflicts. The Minuteman was narrowed from 12' to 10' in sensitive areas, which is too narrow.

Q: How has the Cape Cod Trail dealt with conflicts?

A: They haven't.

Comment: The problem is pedestrians that walk two or three abreast.

Q: What is the next step?

A: The feasibility study will be done in March 1997. Then the Boards of Selectmen and City Council must vote to proceed. The towns would enter into lease agreements with the MBTA, and then collectively apply to MassHighway for design funds. For the Minuteman Bikeway, the Department of Environmental Management oversaw the design. The design will take 1-1 ½ years. There will be lots of public discussion. The Conservation Commissions would have to issues Orders of Conditions. Then the towns would collectively apply for construction funds. Construction would take 1 ½ -2 years.

Q: After the study, is it up to each town to get the votes from the boards?

A: Yes. It is likely there would be one big design contract and one big construction contract for all the communities involved.

Q: Does the project have to be on the TIP in order to receive ISTEA funding?
A: Yes, when the feasibility study is completed.

Q: Is a Town Meeting necessary?
A: No, I don't think so.

Comment: I want to encourage equestrian use. A separate bridle path would be wonderful. There are lots of equestrian groups to draw on for information for design.

Comment: (Joan Blaustein, MAPC) There is a movement by rollerblading groups to educate rollerbladers on etiquette. Also, the Central Mass. trail would connect to the Assabet River Trail.

Q: What will the permitting process be?
A: An Environmental Impact Report (EIR) was waived for the Minuteman Bikeway.

Q: Is there any indication of the need for an EIR for the Central Mass. trail?
A: Not yet.

Comment: (Lexington Friends of the Minuteman) It is really the responsibility of users to control their speeds in congested areas. It is the liability of people overtaking others to announce their intention to pass. We're opposed to bikers and rollerbladers traveling in groups.

Comment: You'll find that bikers go faster during commuting hours. Most commuters use bells or call out when they are passing.

Comment: (resident of Sudbury) My kids love to ride their bikes, but they can't do it here now. It's not safe. The Central Mass. trail would be a great resource for kids.

Central Mass. Rail-to-Trail Feasibility Study

PUBLIC MEETING #4
Weston Middle School
1/30/97

Cathy Buckley Lewis of the Central Transportation Planning Staff (CTPS) opened the meeting and explained the purpose of the Central Mass. feasibility study, which is to determine whether the existing railroad right-of-way can physically be converted to a recreational bicycle/ pedestrian trail. Cathy showed slides of the Central Mass. right-of-way and other trails.

The study will look at the physical issues regarding conversion to a trail: intersections, right-of-way width, embankments, etc. If the trail is found to be feasible, the next step is design. Following the model of the Minuteman Bikeway, each community would enter into lease agreements with the MBTA, which owns the right-of-way. The communities would then apply to MassHighway for design funds and then construction funds. MassHighway would require that each town agree to police and maintain the trail.

Discussion *(Most answers given by Cathy Buckley Lewis of CTPS unless noted)*
C = Comment Q = Question A = Answer

C: I have been an abutter of the rail line for 48 years. I am guardedly in favor of the project, but I am concerned about the number of users and access since the trail would go through rural wooded areas.

Q: How many users would there be? I received an inflammatory letter that said that the Minuteman Bikeway has 10,000 users per day. I am in favor of the project for safety reasons. Weston has very few sidewalks and it is dangerous to ride bikes with children.

A: The Minuteman Bikeway is the most popular rail-trail in the country. I don't expect the same number of users for this trail.

C: Opening up the right-of-way will be an invitation for everybody to use it, including the bad guys. Motorcyclists already use it. We don't need any more trails.

C: I am a middle school student, and I think the trail is a great idea. The roads are not safe to ride on.

C: The neighborhood would be impacted by the trail. People like the serenity. That's why they move to Weston. Try to imagine living on the right-of-way. We have vandalism and motorbikes. I think it was very interesting that the slides did not show the homes along the right-of-way.

C: What's more frightening are the campers under the bridge.

C: (Bob Sawyer - Lexington Friends of the Minuteman) I would like to invite the abutters to visit the Minuteman Bikeway. The Lexington abutters had a lot of the same concerns that you do. Some of the Lexington abutters put up fences when the trail first opened, but now they have put in gates so they can access the trail.

C: If this trail is built, it will be policed. Many of the existing problems on the right-of-way will go away.

Q: Who pays for the trail? I'm against our taxes going to pay for it.
A: The trail design and construction would most likely be paid for with state or federal funds. The policing and maintenance of the trail would be paid for by the towns.

C: I am a middle school student, and I think it's worth spending taxes for kids' safety. There's no place to in-line skate or bicycle in town. Also, the motorbikes won't use the trail when built.

Q: How is parking being handled?
A: It would be nice to avoid building parking lots. Private companies might allow use of their lots on the weekends. There won't be a lot of detail on parking at this stage.

C: Given the number of people who use the right-of-way now, and that the area is listed in tour books, I am concerned about the lack of parking and public access. Gun Club Lane is already impacted by cars parking on it. Also, I am concerned since the trail would go through wetlands, and there is already road flooding. I do not think that crime and vandalism will increase, however.

Q: Will there be a town meeting?
A: It is up to the town. Legally all that is required to request design funds (the next step) is a vote by the Board of Selectmen or City Council.

Q: How are kids going to get to the path? They would have to ride on the windy roads.
A: You bring up a good point. This trail is part of a larger effort to improve bicycle and pedestrian safety on streets as well as off-street. John Stasik, recently elected State Representative from Framingham, is chairing a group that has put out the MetroWest Bicycle Map and is trying to get a bicycle committee formed in each town.

Q: Given the increasing amount of traffic and lack of parking in and around Boston, you should keep open the option for using the right-of-way for public transportation.
A: The MBTA will keep that option open in their leases with the towns.

C: I think parking has to be considered in the study. Should have no-parking zones by people's houses.

Q: I want to know the costs of policing and maintenance.
A: I am getting info from the Minuteman Bikeway and will put the numbers in the study.

C: I am a Weston resident and have a daughter in Lexington who was one of the abutters to put a gate in her fence for access to the Minuteman. I think a trail would be a great addition to the community. Parking has to be solved. Properties along the Minuteman are safer, and people on the path are family people. We should keep an open mind.

C: My niece lives in Arlington and loves the Minuteman Bikeway. I also have relatives in Rhode Island, and they love the bike trail down there too.

C: I use the right-of-way all the time. It shouldn't be changed. Leave the woodlands alone. We should look into improving the sidewalks before spending money on the trail.

C: I am on the Department of Public Works Committee. We need detailed info on parking and restrooms in the study.

C: Perhaps a trail fee could cover the maintenance and policing costs.

Q: How much support for the trail do we need? There will never be 100% in favor.
A: It's up to the individual towns. In Lexington, many were strongly opposed to the Minuteman, more were in favor. The Board of Selectmen voted in favor of the project.

C: If you don't hot-top the trail, then people won't drive to use it, and you'll get rid of the parking problem.

C: Stonedust surfacing should be a compromise.

C: We should open up the beautiful areas for others to enjoy.

C: I've heard the concerns of abutters regarding property values and crime. Realtors in Seattle, where there is a similar trail, say that property values have gone up, and crime has not increased.

C: You should think about the character of each town when designing the trail.

Q: Do we need this trail?
A: It's subjective. The idea has been around for years.

C: I have found in other parks that unpaved trails are safer because predatory groups don't use them. Also, people would camp out along the paved trails and start fires. I'm afraid of campers making fires along the trail.

Q: What is the next step?
A: The next step is for each of the communities to agree to police and maintain the trail and then request design funds from the State.

Q: Do you have any hard data on the costs?

A: We are getting the data, and it will be in the study.

C: (Jerry VanHook, Lexington Friends of the Minuteman) I recently spoke with the Lexington Police Chief to get data on policing the Minuteman Bikeway. Lexington has two bicycles which are used by officers for policing the Bikeway. For 1997, the Police are planning to police the trail with four shifts per week for the busiest six months of the year. There is occasionally some trash along the trail, but our Friends group cleans it up. The Police Chief says that there is no more crime along the trail than any other place in Lexington. The trail does not generate or attract crime.

C: (Weston Selectman Mullin) This meeting is pivotal. We don't have a policy on the trail yet. We encourage you to communicate with us. We need to know about the Town's liability, parking, and the costs of maintenance and policing. The Weston Police Chief says there will be minimal costs to police the trail, but we need more data. Also, ISTEA funds and the Paulsen Bill have helped make money available for bicycle projects.

C: (Senator Susan Fargo) I am here to listen to the issues and provide any information I can. Please feel free to contact me.

Central Mass. Rail-to-Trail Feasibility Study

PUBLIC MEETING #5
Hudson Public Library
2/12/97

Cathy Buckley Lewis of the Central Transportation Planning Staff (CTPS) opened the meeting and explained the purpose of the Central Mass. feasibility study, which is to determine whether the existing railroad right-of-way can physically be converted to a recreational bicycle/ pedestrian trail. Cathy showed slides of the Central Mass. right-of-way and other trails. She also showed a map of eastern Massachusetts, highlighting the possible trail connections between the Central Mass. and other existing or proposed trails.

The study will look at the physical issues regarding conversion to a trail: intersections, right-of-way width, embankments, etc. If the trail is found to be feasible, the next step is design. Following the model of the Minuteman Bikeway, each community would enter into lease agreements with the MBTA, which owns the right-of-way. The communities would then apply to MassHighway for design funds and then construction funds. MassHighway would require that each town agree to police and maintain the trail.

Discussion *(Most answers given by Cathy Buckley Lewis of CTPS unless noted)*
C = Comment Q = Question A = Answer

Q: I've heard that portions of the right-of-way have been privatized. Is that true?
A: The MBTA owns the entire right-of-way from Beaver Street in Waltham to just east of Coburn Road in Berlin.

Q: Will users fees be charged?
A: No, I wouldn't expect that.

Q: How will this be financed?
A: I will include the local policing and maintenance costs of the Minuteman Bikeway in the Feasibility Study. Arlington, for example, did not add any staff for policing or maintenance. Maintenance includes mowing the shoulders of the trail about twice a year. The towns have opted not to plow, to allow for cross-country skiing. State and/or federal funds will be used for design and construction.

Q: How wide will the trail be?
A: The standard trail is 12 feet wide, with three-foot shoulders on either side. There could also be a separate equestrian trail.

Q: What is the width of the right-of-way?
A: It is mostly 40-80 feet wide. It narrows to 20 feet in a small section in Waltham, and

expands to over 100 feet near Church Street in Weston. The usable width depends on the embankments.

Q: What will be done to protect the abutters? I already have people on three-wheelers and snowmobiles trespassing on my land in Berlin and Weston.

A: Fencing and/or landscaping are options. That will be decided on a case-by-case basis during the design.

C: In Lexington, the three-wheelers and snowmobilers disappeared once the right-of-way was paved. It becomes more civilized once the trail is built and used.

C: I am a former Berlin resident, and now live in Clinton. The western end of the trail has a different character from the eastern end. The western end abuts a lot of open space. You should consider allowing snowmobiles on the right-of-way.

A: Snowmobiles won't be legal on the trail, but it is up to the towns to enforce it. If many people in town wanted to use snowmobiles, and no one complained, then the local police would probably not enforce it.

C: There is a lot of equestrian use in Weston. There are five places where equestrian trails cross the right-of-way. You should consider a grade separation for these crossings.

A: The usage of the trails would not justify an expensive grade separation.

Q: Will the MBTA reactivate the rail line?

A: Not for the time being. A feasibility study was completed recently that determined it is not feasible to restore rail service at this time.

Q: Will there be a lease with the MBTA?

A: Yes. It will be a 30-day lease, which is the MBTA's standard lease. Even though the lease is short, the MBTA would not endorse the trail feasibility study if they were planning to restore rail service any time soon. Likewise, the MBTA wants to maintain its long-term options.

Q: How much does the lease cost?

A: Arlington, Lexington, and Bedford each pay $1 per year for the Minuteman lease.

Q: Will there be problems where the trail goes through wetlands?

A: The Minuteman goes through wetlands. In some places, the right-of-way is wet on either side of the embankment. As long as the embankment does not need to be widened for the trail, then the wetlands would not be impacted. The local Conservation Commissions will review the design of the project and decide what will be allowed, such as filling and creation of compensatory wetland storage.

C: (Jerry VanHook, Lexington) There were no wetland impacts in Lexington where the existing grade is used.

Q: Can you be more specific about the state or federal funding?
A: Every two years, state funds can be set aside in the Transportation Bond Bill. Congress may reauthorize federal transportation funds this year, which can be applied for on a competitive basis for rail-trail projects. The project will cost between $5-10 million.

Q: Will there be restrooms along the trail?
A: On another trail, restrooms are included as long as the town is willing to maintain them.

Q: Is there parking for the trail? Will any be put in?
A: We would want to minimize the construction of new parking spaces. Advisory Committee members are researching the number of both private and public parking spaces that might by available to weekend trail users.

C: (Michael Volk, Hudson) There is a carpool lot in Berlin that is the same size as parking lots that were created for the Norwottuck Rail-Trail. It should be sufficient.

Q: Who is liable for the trail?
A: The towns would be liable, as they are for streets and sidewalks.

C: (Jerry VanHook, Lexington) There has been one suit against Lexington in the past four years. That suit is for $500 by a bicyclist who fell trying to avoid a bump in the pavement.

Q: Will this project go before Town Meeting?
A: Not necessarily. For the project to go forward, the Boards of Selectmen and City Council have to vote in favor. It is up to each community whether to go to town meeting.

C: (Preston Turner, Berlin) This trail project will go before Town Meeting in Berlin.

C: (Michael Volk, Hudson) This will probably not go before Town Meeting in Hudson. I spoke with the Executive Assistant for the Town, who feels that there is enough support in the Town that the Board of Selectmen will vote in favor of the project.

Appendix D

Estimated Demand

Estimated Demand Using Minuteman Counts

The counts used for the demand estimate were administered by CTPS and collected by CTPS staff and by volunteers. Volunteers included members of the Bicycle Coalition of Massachusetts, as well as students from Lexington. The most recent counts, collected in 1995, will be used. Counts were done on weekends and holidays as well as weekdays. The weekday counts were done in the late afternoon peak period, when counts were expected to be highest. Counts were done along the length of the bikeway, as use varied significantly from the Bedford end to the Cambridge/Somerville end.

Peak-hour weekday counts at four points along the Minuteman were selected. The counts were 110 at South Street in Bedford, 138 at Bedford Street in Lexington, 180 at Maple Street and 194 at Mill Street, both in Arlington. Based on bicycle counts collected in the Boston area since 1975, these peak hour counts are estimated to be about 10 percent of daily use. The weekday volumes would therefore be 1,110 at South Street, 1,380 at Bedford Street, 1,800 at Maple Street, and 1,940 at Mill Street.

Weekend and holiday counts are available for South Street in Bedford (138 for the highest hourly count, 966 from 10 AM to 5 PM), Merriam Street in Lexington (398 hourly count), Woburn Street in Lexington (452 hourly volume) and Spy Pond in Arlington (358 hourly volume). It is estimated that all-day volumes are probably close to ten times the hourly counts. If this is true, the all day counts would be: South Street - 1,380, Merriam Street - 3,980, Woburn Street - 4,520, and Spy Pond - 3,580. All of the counts, both weekday and weekend, were taken on days considered very favorable for bicycling - sunny, warm, no forecast of rain.

At this point, the populations and/or population densities could be used to factor the Minuteman volumes to predict Central Mass. volumes. It is not clear how to do that, however, because the volumes on the Minuteman are not directly related to population or population density. One method would be to take an average for the Minuteman, simply by adding the volumes at the various points along it, and factoring that average to arrive at Central Mass. estimates. The factor could be a combination of the overall populations served by the two facilities and the population share of a particular community along the Central Mass.

The average volumes for the Minuteman are about 1,600 for weekdays and 3,400 for weekends and holidays.[20] The overall population ratio of the two corridors is 138,556 (Central Mass., from Table 1) divided by 172,606

[20]Weekday is the average of the four weekday counts: 1,110 at South Street, 1,380 at Bedford Street, 1,800 at Maple Street, and 1,940 at Mill Street. The weekend-holiday volume is an average of 1,380 at South Street, 3,980 at Merriam Street, 4,520 at Woburn Street, and 3,580 at Spy Pond.

(Minuteman),[21] or 0.80. This would yield for the Central Mass. an average weekday volume of 1,280 and an average weekend/holiday volume of 2,720. If we distribute the volumes along the Central Mass. based half on a common volume throughout and half on population share, the results would be as shown in the text of this report (Chapter 3). [22]

[21] The 1990 populations of the Minuteman communities were the following: Arlington - 44,630, Lexington - 28,974, and Bedford - 12,996. The Minuteman connects to Cambridge and to Davis Square in Somerville via the Linear Park. These are direct off-road connections. It was decided to add only half of the Cambridge and Somerville populations, to be on the conservative side. The 1990 populations for these communities were 95,802 (Cambridge) and 76,210 (Somerville).

[22] That is, each community along the right-of-way was assigned half of the average volume as a base. Added to that was a share of the other half based on population share. Berlin, for example has 2 percent of the population along the corridor. The weekday average count of 1,280 is halved to yield 640. To that 640 is added 2 percent of the remaining 640, multiplied by seven for the seven shares along the corridor. The result for Berlin is 640 plus (0.02*7*640) = 730. The same method is then applied to the other six communities.

Appendix E

Information About Crossings

Table E-1

Speed Limit, Average Observed Speed, and Highest Observed Speed of Motor Vehicles on Streets Crossing the Right-of-Way at Grade (m.p.h.)

Intersection	Northbound			Southbound		
	Speed Limit	Avg. Obs. Speed	High. Obs. Speed	Speed Limit	Avg. Obs. Speed	High. Obs. Speed
Beaver St.	30	**	**	30	**	**
Linden St.	Bridge			Bridge		
Lyman St.	30	34	38	30	33	40
Lexington St.	30	29	34	30	26	34
Bacon St.	30	31	35	30	32	43
Hammond St.	30	27	31	30	24	35
Prospect Hill Rd.	30	30	40	30	32	41
Main St.	30	38	41	30	31	42
Stow St.	30	33	36	30	34	37
Route 128	Bridge			Bridge		
Church St.	Bridge			Bridge		
Conant Rd.	Filled-in Bridge			Filled-in Bridge		
Concord Rd.	Bridge			Bridge		
Plain Rd.	25	32	40	25	28	38
Glen Rd.	30	30	32	30	29	*
Millbrook Rd.	30	35	*	30	27	30
Old Sudbury Rd.	25	31	37	25	38	49
Boston Post Rd.	35	37	42	35	47	52
Landham Rd.	Bridge			Bridge		
Boston Post Rd.	35	30	33	30	30	38
Union Av.	30	35	43	30	36	42
Horse Pond Rd.	30	36	41	30	38	43
Peakham Rd.	30	27	35	30	32	39
Dutton Rd.	25	29	37	25	35	37
White Pond Rd.	25	*	*	25	30	35
Parmenter Rd.	25	38	42	25	26	31
Main St.	40	39	48	40	36	41
Chestnut St.	Filled-in Bridge			Filled-in Bridge		
Wilkins St.	Bridge out			Bridge out		
Cox St.	30	32	42	30	38	41
Priest St.	30	18	*	30	36	40
Tower St.	Bridge out			Bridge out		
High St.	Filled-in Bridge			Filled-in Bridge		
Manning St.	30	31	39	30	31	35
Church St.	30	29	35	n/a	n/a	n/a
Pope St.	30	21	24	n/a	n/a	n/a
Felton St.	30	29	*	n/a	n/a	n/a
Lincoln St.	30	32	41	30	33	38
Warner St.	30	**	**	30	**	**
Cottage St.	30	**	**	30	**	**
Central St.	30	26	27	30	26	41
Central St.	30	34	*	30	39	*
Stones Corner Rd.	30	**	**	30	**	**
Route 495	Bridge			Bridge		
Sawyer Hill Rd.	30	37	*	30	37	*
Highland St.	30	*	*	30	34	40

Data collected by CTPS. Speed data collected using equipment supplied by the Massachusetts State Police.

**Not sufficient data collected to determine average observed and/or highest observed speed.*

***No speed data collected.*

Table E-2
Two-Way Motor Vehicle Traffic Volumes, Selected Road Crossings

Intersection	Community	Volume (hourly)
Boston Post Rd. (Rt. 20)	Sudbury	1,507
Boston Post Rd. (Rt. 20)	Wayland	1,387
Trapelo Rd.	Belmont	1,328
Beaver St.	Waltham	1,290
Lexington St.	Waltham	1,279
Brighton St.	Belmont	978
Union Av.	Sudbury	912
Old Sudbury Rd. (Rt. 27)	Wayland	890
Bacon St.	Waltham	866
Lyman St.	Waltham	812
Main St.	Waltham	769
Stow St.	Waltham	671
Concord Rd.	Wayland	625
Lincoln St. (Rt. 85)	Hudson	474
Prospect Hill Rd.	Waltham	386
Wilkins St. (Rt. 62)	Hudson	356
Manning St.	Hudson	297
Horse Pond Rd.	Sudbury	296
Tower St.	Hudson	286
Cox St.	Hudson	250
Central St.	Hudson	226
Hammond St.	Waltham	223
Plain Rd.	Wayland	186
Dutton Rd.	Sudbury	153
Highland St.	Berlin	114
Millbrook Rd.	Wayland	104
Priest St.	Hudson	80
Peakham Rd.	Sudbury	76
Coburn Rd.	Berlin	63
High St.	Hudson	59
Sawyer Hill Rd	Berlin	31
Glen Rd.	Wayland	23

All traffic volumes were collected on Saturdays, sometime between 11:00 AM and 3:00 PM. Each intersection was counted for a period of an hour and a half. The volumes in this table are the hourly averages of those 90 minute counts. Data were collected by advisory committee members and volunteers.

Table E-3
Bridges

	Railroad Over Road	Railroad Over Water	Railroad Under Road	Total Bridges
Berlin		1	1	2
Hudson	2	4	2*	8
Sudbury		3	1	4
Wayland		3		3
Weston	1	4	3*	8
Waltham	2	4		6
Total	5	19	7	31

*One bridge in Weston (Conant Street) and two in Hudson (High and Chestnut Streets) are filled in, blocking the right-of-way.

Appendix F

Sample Lease

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

LICENSE AGREEMENT - LEXINGTON BRANCH SEGMENT

TOWN OF ARLINGTON

1. Parties/ Premises

Subject to prior authorization from appropriate regulatory authority to remove the rail, ties and track appurtenances of a railroad now or formerly subject to the provisions of the Interstate Commerce Act (49 USC, Section 10101 et. seq.), MASSACHUSETTS BAY TRANSPORTATION AUTHORITY, a body politic and corporate and a political subdivision of the Commonwealth of Massachusetts, with a usual place of business at Ten Park Plaza, Boston, Massachusetts 02116 ("MBTA"), does hereby agree to license the TOWN OF ARLINGTON, a Town established under Massachusetts law with a mailing address at Town Hall, Arlington, MA 02174 ("Arlington") and Arlington hereby agrees to accept such license, subject to the terms and conditions hereof, in the right and privilege to use a segment in Arlington of the line of railroad of MBTA known as the Lexington Branch, approximately 3.58 miles in length, extending between Milepost 4.91 at the Cambridge/Arlington boundary line and Milepost 8.32 at the Arlington/Lexington boundary line (the line segment).

2. Term

The foregoing license shall commence upon a date stated in a notice not less than thirty (30) days and not more than sixty (60) days from the date of such notice stating that the prior authorization described hereinabove has been received, but subject to the prior approval by MBTA of construction within the premises as hereinafter described, and shall continue unless and until MBTA shall give notice to Arlington that it intends and elects to terminate the within license on a date stated in such notice sixty (60) or more days from the date of such notice on the grounds that the line segment is required by MBTA for mass transit extension or that regulations or orders of appropriate regulatory authority require such termination.

3. Use of Licensed Premises — Arlington agrees that it will use the line segment as a "bikeway", a way established for the passage of bicycles without motive power.

4. Construction

(1) (a) The within agreement shall become effective as a grant by MBTA and acceptance by Arlington of license when Arlington has caused construction of a bikeway within the premises to be completed and accepted by the Chief Engineer of Railroad Operations of MBTA (C.E.R.O.) in writing as completed in accordance with plans for such construction previously approved by C.E.R.O. Construction of such bikeway and the plans and approvals thereof shall include removal of rails, ties, track and track appurtenances from the premises and the storage thereof at a location within Massachusetts as designated by C.E.R.O.

(b) No construction shall be done in the line segment without the prior written approval by C.E.R.O. to plans submitted to MBTA by Arlington. Arlington may be required to remove any construction not so approved.

5. Maintenance

Arlington shall at all times maintain the line segment in good and safe condition and appearance, free from rubbish and obstructions. During the license term, MBTA shall have no responsibility whatsoever for maintenance repair, or the condition of the line segment and Arlington agrees that it will occupy the premises at its own expense and risk.

6. Condition of Line Segment

MBTA hereby expressly disclaims any warranties of any nature, express or implied, as to the line segment, and any other warranties of any nature, express, implied or otherwise, except as expressly set forth herein. Lessee accepts the line segment "as is".

7. Indemnification of MBTA

Arlington shall indemnify and save MBTA harmless from and against any and all loss, costs, damage and expense (including reasonable attorneys' expenses and fees), causes of action, suits, claims, demands or judgments of any nature whatsoever that may be imposed upon or incurred by or asserted against MBTA by reason of any of the following occurrences during the term of this License:

(a) any accident, injury to, or death of any person or any damage to property occurring on the line segment or any part thereof; or

(b) any use, nonuse, condition, or occupation by Arlington of the line segment or any part thereof; or

(c) any failure of Arlington to perform or comply with any of the terms hereof or of any contracts, agreements or restrictions, statutes, laws, ordinances or regulations affecting the line segment or any part thereof or the ownership, occupancy or use thereof.

8. Security
Arlington shall provide security and fire protection in the line segment during the term hereof. Arlington shall not be required to provide lighting in the premises.

9. Bridge Maintenance
Arlington shall maintain the surfaces of any and all over-passes or bridges, if any, over the line segment which MBTA was required to maintain prior to the date of the within license, including, without limiting, general cleanliness and appearance and alterations required for use as part of the bikeway. MBTA shall maintain the structural integrity of all such overpasses or bridges. MBTA reserves the right to withdraw any overpass or bridge from use under the within license if, in its sole determination, it determines that such overpass or bridge is unsafe.

10. MBTA agrees to apprise Arlington of any statutes, laws, enactments or regulations which do or may affect Arlington in the undertakings which it has assumed under this license.

IN WITNESS WHEREOF, the parties hereto, each for itself its successors and assigns, have caused these presents to be executed by its officers, thereunto duly authorized on the day of , 1987.

MASSACHUSETTS BAY
TRANSPORTATION AUTHORITY

James F. O'Leary
General Manager

APPROVED AS TO FORM:

Walter B. Prince
General Counsel

TOWN OF ARLINGTON

By
Title: Donald R. Marquis
Town Manager

APPROVED AS TO FORM:

John F. Maher
Town Counsel