

I-495 Transit Study

Authors

Cathy Buckley Lewis
Heather Ostertog

Geographic Information Systems

Kathy Jacob

Cover Design

Maciej Citowicki

The preparation of this document was supported by Massachusetts Highway Department 3C PL Contracts #35008, #42456, and #48696, and EOT/FTA §5303 Grants MA-80-2016, MA-80-2017, and MA-80-0001.

Central Transportation Planning Staff

Directed by the **Boston Region Metropolitan Planning Organization**. The MPO is composed of state and regional agencies and authorities, and local governments.

October 2007

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Executive Summary

This is a study to develop possible transit services in 11 communities along I-495. The communities include Hudson on the north, Wrentham on the south, and the 9 located in between: Bellingham, Franklin, Holliston, Hopkinton, Marlborough, Medway, Milford, Southborough, and Westborough.

The first task was to identify the area along I-495 to be studied, using journey-to-work and socio-economic data. The result of that task was the identification of the 11 communities mentioned above. The second task was to identify and invite participation from relevant organizations, agencies, and communities in order to form a task force. Minutes from the meetings of that task force are provided as Appendix A. The third task was to review previous studies deemed relevant to this analysis. The 15 studies reviewed are listed in chapter 1 and summarized in Appendix B.

Based on previous studies, it was determined that the most promising transit services would be in areas with higher population and employment densities and a higher proportion of those most in need of public transportation services. More detailed discussion of the transit market is in Appendix C. Population and employment density, as well as the major criteria used to identify those most in need of transit—household income, age (groups between the ages of 15 and 17 inclusive, and over 70), household vehicle ownership, and percentage of residents with disabilities—were mapped for the study area. Journey-to-work data were used to describe the trip patterns of employed residents of the communities as well as those employed within the communities.

Existing transit services were examined. These services include MBTA commuter rail, LIFT (Local Inter Framingham Transit) routes, Boston-oriented services provided by private bus carriers, and The Local Connection (TLC), a demand-responsive system. Ridership and cost data were analyzed for the LIFT and TLC. Two other services outside of the study area, LEXPRESS and Natick Neighborhood Bus, were also examined.

All of the census blocks in the study area were analyzed in terms of the criteria mentioned above (socioeconomic data plus population and employment densities). Scores were assigned to each census block for all of the criteria. Thirty-two census blocks forming nine areas constituted the 25 percent of the census blocks with the highest scores. These nine areas were reviewed, and two were selected for more detailed analysis: Westborough/Southborough and Milford. Possible fixed-route bus services for those communities were designed to serve major residential, employment, and retail areas. The two possible new services were then compared to the characteristics of the LIFT. Alternatives to fixed-route bus services were presented, including flexible-route services, carpooling, vanpooling, and park-and-ride lots.

The final chapter of this report includes estimates of ridership on the possible new routes and a discussion of possible funding sources, institutional barriers to new services, and the effect of land use and development decisions on the transportation system.

I Background

There has been considerable residential and employment growth in the I-495 corridor, with concomitant increases in traffic. Transit alternatives in the area are limited. Several organizations, including the MetroWest Growth Management Committee (MWGMC), the MetroWest/495 Transportation Management Association (TMA), the 495 MetroWest Corridor Partnership, and two subregions of the Metropolitan Area Planning Council (Minuteman Advisory Group on Interlocal Coordination [MAGIC] and SouthWest Advisory Planning Committee [SWAP]), have requested a study to identify possible new transit services.

The Boston Region MPO has been very supportive of suburban transportation, through its funding of studies as well as its programming of funds for new services. This study, which will build on previous ones, is intended to help the MPO identify possible candidates for future service.

The study area was defined using primarily employment and residential data. Shown in Figure 1, it includes 11 communities along I-495: Hudson on the north, Wrentham on the south, and the 9 in between. This report reviews transportation needs between the study area and major centers of population and employment such as Boston, Framingham, and Worcester, as well as trips to other locales and within the study area.

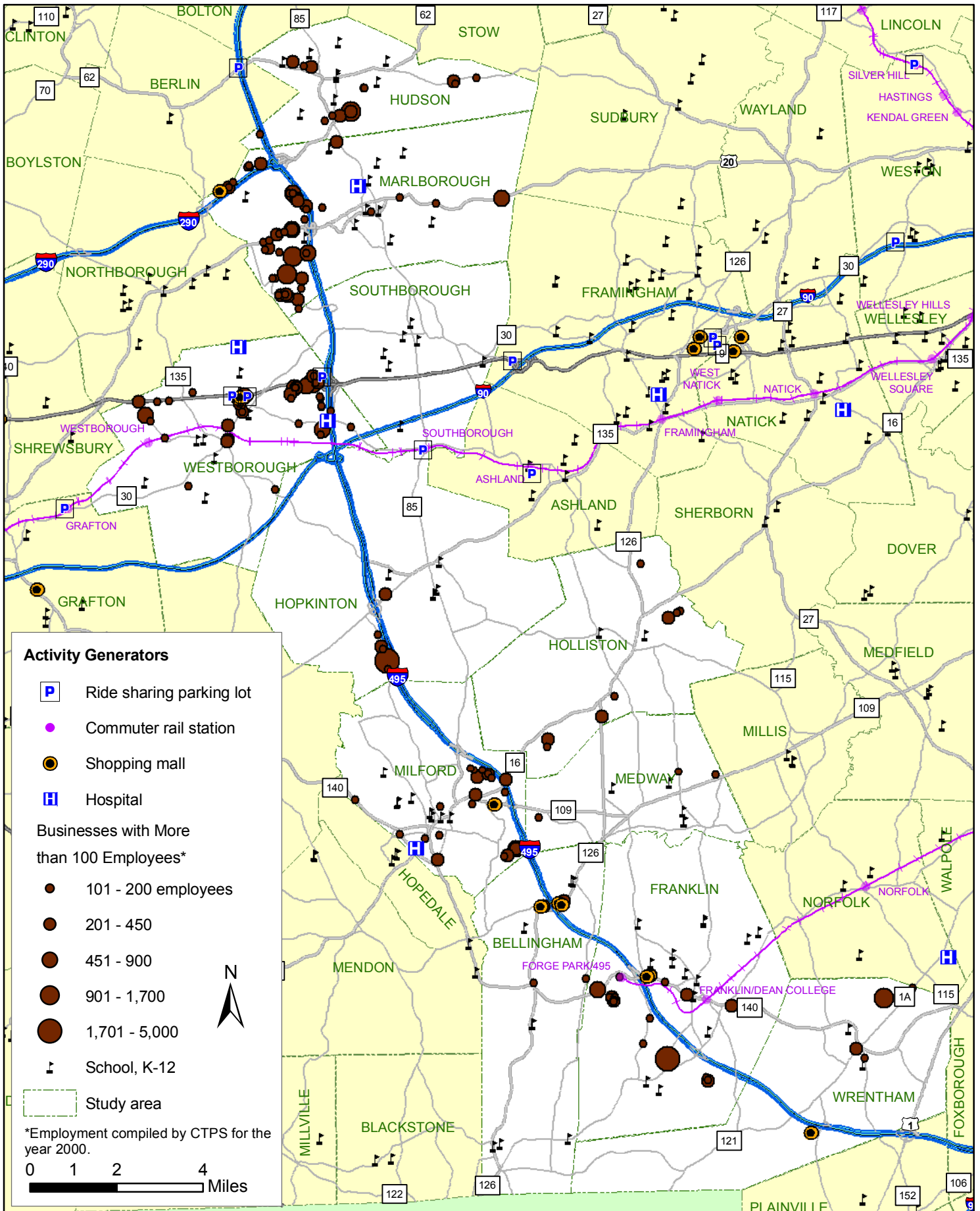
A Community Contacts

A task force provided input to this study. The following agencies, organizations, and municipalities named delegates:¹

- Central Massachusetts Regional Planning Commission
- Executive Office of Transportation
- 495 MetroWest Corridor Partnership
- MAGIC
- Massachusetts Bay Transportation Authority
- Metropolitan Area Planning Council
- MetroWest Chamber of Commerce
- MWGMC
- MetroWest/495 TMA
- SWAP
- Worcester Regional Transit Authority
- Bellingham
- Franklin
- Hopkinton

¹ Invited organizations and municipalities that did not participate: the Corridor Nine Area Chamber of Commerce, the Marlborough Regional Chamber of Commerce, the Transportation Equity Council, the United Chamber of Commerce, and the towns of Holliston, Milford, and Wrentham.

FIGURE 1
Study Area and Activity Generators



Hudson
 Marlborough
 Medway
 Southborough
 Westborough

Members of the General Court also were invited to participate.

The task force met four times. The first meeting occurred at the beginning of the process, just after the study area was defined. Staff presented information on the studies that were being reviewed, data available for analysis, and the overall direction of the study. The second meeting was held after the literature review was completed and the most promising areas for further analysis were defined. The third meeting was held to review the findings to date. The last meeting was held to review the draft report. Minutes of those meetings are in Appendix A.

In addition to meetings of the task force, individual meetings were held with municipal officials and others to obtain information on existing conditions, data on planned developments, and suggestions for public transportation in the area.

B Previous Studies

Given the work already done in this geographic area and the background work done regarding suburban transit, it was agreed that this study should not reinvent the wheel. The following is a list of all known and relevant studies that were reviewed:

1. *Suburban Mobility, Phase II*, CTPS, December 2005
2. *Marlborough Public Transportation Study*, Planners Collaborative, August 2005
3. *Five-Year Transit Service and Capital Plan for the Massachusetts Regional Transit Authorities*, Urbitran, June 2005
4. *Worcester Comprehensive Service Design*, Urbitran, May 2005
5. *EO418 Framingham Study*, MAPC, June 2004
6. *Suburban Transit Opportunities Study*, CTPS, January 2004
7. *Feasibility Study for a Regional Transit Authority*, Multisystems, February 2003
8. *Traffic Congestion in the Southwest Advisory Planning Subregion*, CTPS, October 2002
9. *MAGIC Subregional Area Study: Phases I and II*, CTPS, February 2002, May 2004
10. *MBTA Reverse-Commuting Study*, CTPS, May 2001
11. *Congestion in the MetroWest Area*, CTPS, September 2000
12. *Estimating Demand for MassHighway Park-and-Ride Lots*, CTPS, July 1999
13. *MetroWest TMA Proposed Bus Routes*, CTPS, April 1999
14. *Suburban Public Transportation*, CTPS, August 1998
15. *Central Massachusetts Commuter Rail Feasibility Study*, CTPS, September 1996

Findings pertinent to the present study are referenced within the text of this report. Appendix B contains a summary of the major findings of each of these studies.

C Market

A pivotal question in this study is “Who constitutes the target market for potential new transit services?” The study cited above entitled *Suburban Public Transportation*² indicates that, given population and employment densities and other factors, the transit-dependent will be the main market for suburban transportation services. The term transit-dependent covers a wide range of people. It includes individuals without access to a vehicle. That category in turn includes many groups: those too young to drive, those too old to drive, those with physical disabilities that prevent them from driving, those who live in a household without a motor vehicle, those who live in a household with a motor vehicle that is used by another member of the household, etc.

Households without a motor vehicle include those who cannot afford one and those who can but opt not to purchase one. Members of the latter group are more likely to live in areas that already have good transit access, however. It is a good assumption that households in the study area without cars either cannot afford them or do not have any drivers in the household.

This study, therefore, concentrates on finding those parts of the study area that have the highest concentrations of residents and employees and the largest number of people who are likely to depend on transit. Those areas are then analyzed in terms of existing transit services and places to which people would likely wish to travel.

While the emphasis in this study is on those who depend on transit, there are many who do not but would use transit if it were available and relatively convenient. The issue of who uses transit and factors that affect that decision are discussed further in Appendix C. Two factors that discourage transit use relative to the use of a private vehicle are out-of-pocket cost and travel time. Appendix C also discusses growth in population and employment in the study area relative to the inner metropolitan Boston region since 1970.

² *Suburban Public Transportation*, CTPS, August 1998

II Community Characteristics

To determine the markets for possible transit services, staff examined population, employment, socioeconomic characteristics, and journey-to-work data. The population and employment data tell us where activity is occurring, as travel is related to how many people live and work in a given area. The socioeconomic data provide information on residents' characteristics, some of which are related to the propensity to use transit. The journey-to-work data specify where people are coming from and going to, for work trips only.

A Population and Employment

Table 1 indicates the population for each of the municipalities in the study area, as well as two categories of data related to employment. *Employed residents* are those who live in the community and work anywhere; *jobs within the community* are held by those who live anywhere and work in that community. Someone who lives and works in the same community would be counted in both categories.

Table 1
Population, Number of Employed Residents,
and Jobs, by Community, 2000

Community	Population	Employed Residents	Jobs within Community
Bellingham	15,314	8,460	5,140
Franklin	29,560	14,805	16,750
Holliston	13,801	6,940	5,950
Hopkinton	13,346	6,550	8,370
Hudson	18,113	9,890	8,630
Marlborough	36,255	19,840	33,325
Medway	12,448	6,565	3,145
Milford	26,799	13,725	13,675
Southborough	8,781	4,225	6,335
Westborough	17,997	8,555	22,065
Wrentham	10,554	5,220	5,065
Total	202,968	104,775	128,450

As indicated, slightly more than half of the residents of the study area are employed (104,775 of 202,968). There are almost 25,000 more people who work in the study area (128,450) than who live in the study area and are employed (104,775). This means that on a typical weekday morning, at least 25,000 more trips come into the study area than leave it.

The three communities with the largest populations are Marlborough, Franklin, and Milford. These three communities also have the largest numbers of employed residents. The three communities with the smallest populations, Southborough, Wrentham, and Medway, also are the three with the smallest numbers of employed residents.

The three municipalities with the largest numbers of jobs located in the community are Marlborough, Westborough, and Franklin. The three communities with the smallest numbers of jobs are Medway, Wrentham, and Bellingham. Please note that these figures are from the 2000 U.S. census and do not reflect changes since.

B Socioeconomics

The population and employment data were expressed in densities to help determine the areas within communities that are most promising for transit. Besides population and employment, the following socioeconomic attributes were analyzed: household income, percent of residents with disabilities, household vehicle ownership, and non-driving-age population. These individual criteria were scored and tallied to give an overall rating for each census block.³ Table 2 summarizes how the criteria were scored, and the method is also described in the following paragraphs. This method was based on professional-practice recommendations that are summarized in the literature review in Appendix B. Figure 2 shows the population and employment densities mapped together.

Population Density

Census block groups with 8,000 residents or more per square mile received a score of 2.
 Census block groups with 5,000–8,000 residents per square mile received a score of 1.
 Census block groups with fewer than 5,000 residents per square mile received a score of 0.

The median population density for all census block groups in the study area is 985 people per square mile. The range of medians for census block groups in the study area is from 242 to 12,154.

**Table 2
 Criteria and Scores Used to Rate Census Blocks for Transit Potential**

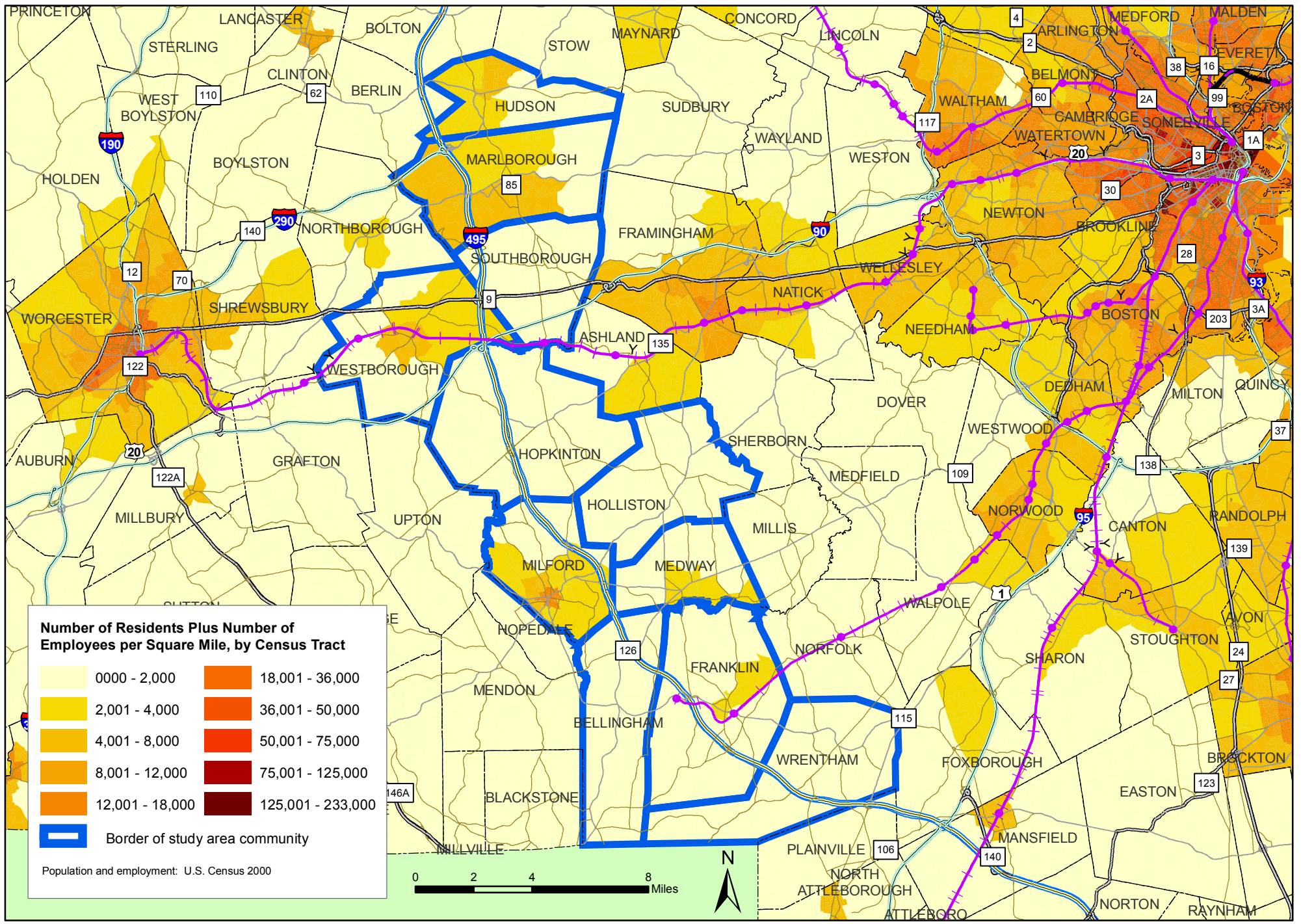
Criteria	Scores	0	1	2	3
Residents per square mile		Fewer than 5,000	5,000–8,000	8,000+	
Employees per square mile		Fewer than 1,500	1,500–3,000	3,000+	
Average household income compared to MPO median income (\$55,800)		More than 100%	75%–100%	50%–75%	Less than 50%
Residents with disabilities		Less than 18%	18%–25%	More than 25%	
Household vehicle ownership		2+	1.5–2	1.5 or less	
Residents aged 15–17 or over 70		Less than 12%	12–15%	More than 15%	

Employment Density

Census block groups with more than 3,000 employees per square mile received a score of 2.
 Census block groups with 1,500–3,000 employees per square mile received a score of 1.

³ The data are from the 2000 U.S. census, CTPS, and MAPC.

FIGURE 2 Population and Employment Density



Census block groups with fewer than 1,500 employees per square mile received a score of 0.

The median employment density in the study area is 623 employees per square mile. The range of medians for census block groups in the study area is from 28 to 7,829.

Household Income⁴

Census block groups with an average household income under \$27,900, which is 50 percent of the MPO median, received a score of 3.

Census block groups with an average household income 50–75 percent of the MPO median (\$27,900–\$41,850) received a score of 2.

Census block groups with an average household income 76–100 percent of the MPO median (\$41,850–\$55,800) received a score of 1.

Census block groups with an average household income over 100 percent of the MPO median (over \$55,800) received a score of 0.

The median household income in the study area is \$66,800. The range of medians for census block groups within the study area is from \$18,173 to \$164,844.

Residents with Disabilities

Census block groups with more than 25 percent residents with disabilities received a score of 2. This represents 10 percent of all census block groups in the study area.

Census block groups with 18–25 percent residents with disabilities received a score of 1. This, plus the above category, is a third of all census block groups in the study area.

Census block groups with less than 18 percent residents with disabilities received a score of 0.

Household Vehicle Ownership

Census block groups with an average of less than 1.5 vehicles per household received a score of 2. This represents 10 percent of census block groups.

Census block groups with an average of 1.5 to 2.0 vehicles per household received a score of 1. This, plus the above category, represents a third of all census block groups in the study area.

Census block groups averaging more than 2.0 vehicles per household received a score of 0.

Non-Driving-Age Population

Census block groups with over 15 percent of residents either between the ages of 15 and 17 or over 70 received a score of 2. This represents 20 percent of all census block groups.

Census block groups with 12–15 percent of residents in these two age groups received a score of 1. This category is 20 percent of all census block groups.

⁴ These income categories reflect the MPO's environmental justice definitions as of when this analysis was done. In September 2006 the definitions were changed from 50 percent and 75 percent of MPO median income to 60 percent and 80 percent, respectively. The income categories used here, therefore, are slightly more inclusive than the present definitions. As income is one of six criteria used here, it is unlikely that the less restrictive definition would affect the outcome.

Census block groups with less than 12 percent of residents in these two age groups received a score of 0.

Which criteria are most important in terms of predicting transit use? To check on whether additional weight given to some criteria would yield new results, two more analyses were performed. The first analysis gave double weight to employment and population density. The results were the same as with the first analysis except two more census block groups were identified in Marlborough. After inspecting the characteristics of these census block groups, they were added. The second analysis gave double weight to the socioeconomic criteria: household income, residents with disabilities, vehicle ownership, and non-driving-age percentages. The results were the same as in the first analysis.

The census block groups in Table 3 are the 25 percent with the highest cumulative scores. They are defined as the groups with the most potential for transit. Figure 3 maps these block groups as well as major employers, shopping centers, and transit services.

Below are descriptions of the census blocks identified above, by community:

Bellingham (443102:5) – This census block group is located in the extreme southwest corner of town. It scored high based on socioeconomic factors. There is bus service in neighboring Woonsocket to Providence and other Rhode Island destinations. There are two commuter rail stations in neighboring Franklin with service to Boston.

Franklin (442101:3–4 and 442200:2) – These three census block groups form a major activity hub. An area with potential is along Route 140 from Forge Park to downtown. Destinations that transit could serve in Franklin might include: Forge Office Park, two MBTA commuter rail stations, Franklin Village Shopping Center, Tri-County Regional Vocational Technical High School, Dean College, downtown Franklin, Franklin High School, and Financial Park on Washington Street.

Holliston (387201:2) – This census block group, which scored high based on socioeconomic factors, is currently served by LIFT service to Framingham.

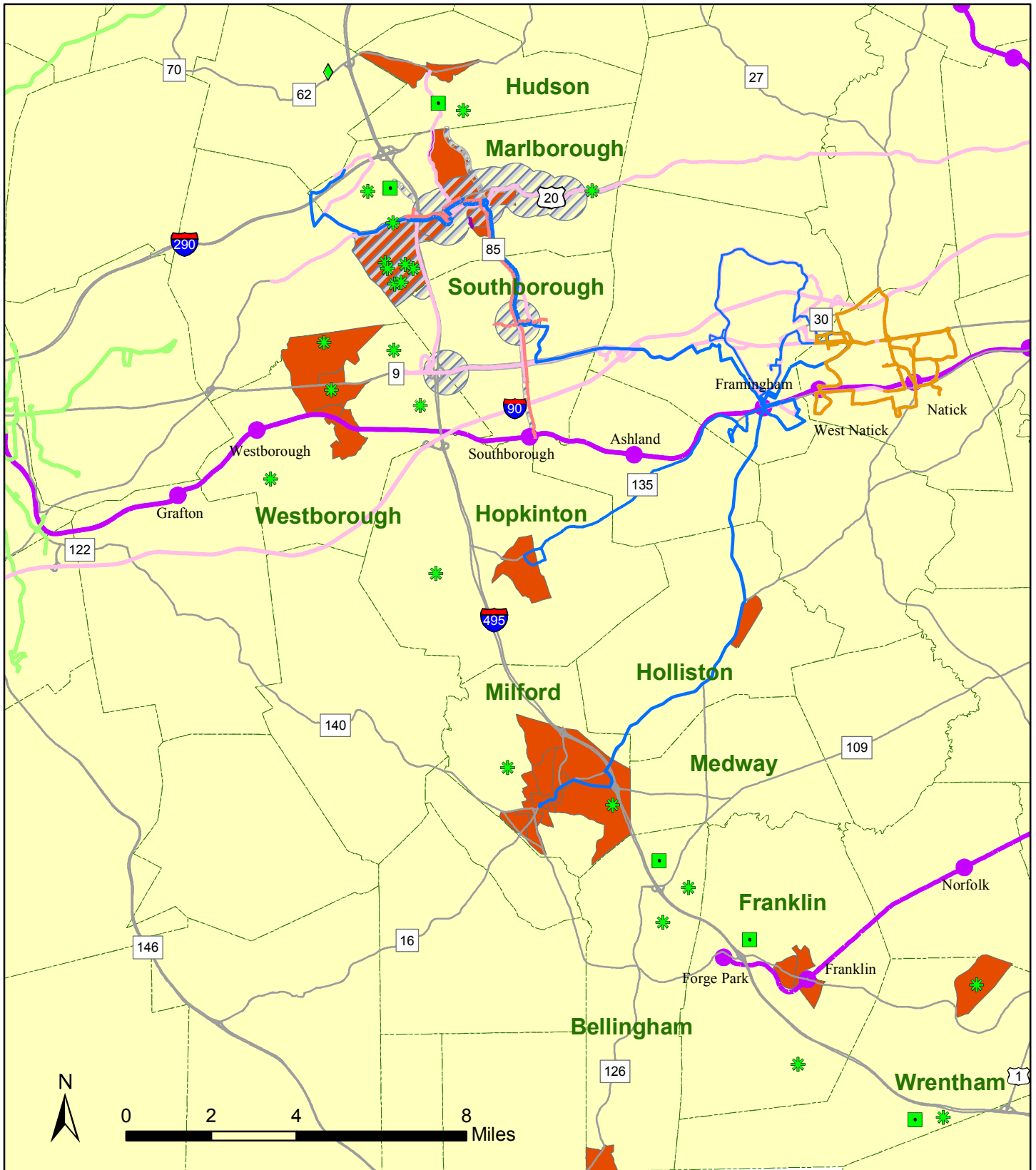
Hudson (322300:2 and 322400:2) – These two census block groups form a major activity hub. Areas in Hudson that could be served include the areas along Routes 62 and 85 covering the following: downtown Hudson, Hudson High School, Hudson Catholic High School, town hall, the library, and the Center at Hudson (a shopping center).














Marlborough (321300:1–3,5–6; 321400:2; 321500:1–2) – These eight census block groups rank high in socioeconomic criteria and form a major activity hub. Currently, the LIFT and The Local Connection serve Marlborough. The areas identified include Routes 20 and 85. Major destinations for transit could include Fidelity, other office parks south of Route 20 and west of I-495, Marlborough Hospital, city hall, Marlborough High School, and Assabet Valley Vocational Technical High School. Marlborough has two distinct areas of need for transit: the area west of I-495 that includes many employment destinations and the area around Routes 20 and 85 that ranks high in socioeconomic factors.

Table 3
Top 25 Percent Scoring Census Block Groups for Highest Transit Potential,
with Scores by Category

Census Tract	Block Group	Municipality	Avg. Vehicles per Household	Employees per Square Mile	Residents per Square Mile	Median Household Income	Percent Residents with Disabilities	Percent Non-Driving-Age	Total
321300	2	Marlborough	2	2	2	3	2	2	13
744300	3	Milford	2	2	2	2	2	1	11
442200	2	Franklin	2	1	1	2	2	2	10
744300	2	Milford	2	1	2	2	1	2	10
744200	2	Milford	2	1	0	2	2	2	9
744300	1	Milford	2	2	1	3	0	1	9
744400	3	Milford	1	2	0	2	2	2	9
321300	3	Marlborough	2	1	0	2	2	1	8
744200	1	Milford	2	0	0	2	2	2	8
744300	4	Milford	1	1	2	1	2	1	8
742200	2	Westborough	2	2	0	1	0	2	7
322400	2	Hudson	2	2	1	1	1	0	7
321300	1	Marlborough	1	1	2	1	2	0	7
742300	1	Westborough	1	1	0	2	1	2	7
742300	5	Westborough	2	1	0	2	0	1	6
441201	5	Wrentham	1	0	0	1	2	2	6
443102	5	Bellingham	1	0	0	1	1	2	5
442101	3	Franklin	1	1	1	1	1	0	5
442101	4	Franklin	2	1	0	1	0	1	5
387201	2	Holliston	1	1	0	0	1	2	5
320101	2	Hopkinton	2	0	0	1	0	2	5
322300	2	Hudson	1	0	0	1	1	2	5
321300	5	Marlborough	1	0	1	0	2	1	5
321300	6	Marlborough	1	1	0	2	1	0	5
321500	1	Marlborough	1	0	0	1	1	2	5
744101	2	Milford	2	0	0	2	1	0	5
744200	3	Milford	1	1	0	1	0	2	5
744200	5	Milford	1	0	0	1	2	1	5
744400	1	Milford	1	0	1	1	0	2	5
742100	9	Westborough	1	0	0	0	2	2	5
321500	2	Marlborough	1	0	1	1	1	0	4
321400	2	Marlborough	0	2	0	0	1	0	3

FIGURE 3
Activity Sites, Transit Services, and the
Top 25 Percent of Census Block Groups in Scoring for Transit Potential



- | | | |
|--|--|--|
|  Major employer (500+ employees) |  Top 25% census block groups in transit potential |  Natick Neighborhood Bus |
|  Major shopping center |  LIFT route |  MBTA commuter rail line |
|  Park-and-ride lot |  Private-carrier bus |  The Local Connection (TLC) |
|  MBTA commuter rail station |  WRTA bus route |  TLC service area |
| | |  Major roadway |

Milford (744101:2; 744200:1–3 and 5; 744300:1–4; 744400: 1 and 3) – These ten census block groups ranked high on socioeconomic factors. Currently the LIFT provides service from Milford to Framingham. Sites along Routes 16 and 140 include the following potential destinations: Granite Industrial Park, Kmart Plaza, Milford Plaza, Quarry Square Plaza, Milford-Bellingham Technical Park, the downtown area, the library, and Milford Hospital.

Westborough (742100:9, 742200:2, 742300:1 and 5) – These four census block groups cover Westborough east of Route 135. The following destinations are included: district courthouse, West Meadow Plaza, town hall, Westborough Shopping Center, Westborough High School, Westborough Executive Park, Technical Park, Business Park, Office Park, Whittier Rehabilitation Hospital, Westborough State Hospital, Massachusetts Technology Collaborative, and Westborough MBTA station.

Wrentham (441201:5) – This census block group ranks high for residents with disabilities and non-driving-age categories because of the presence of a large state hospital and senior housing.

C Journey to Work

The U.S. census journey-to-work data indicate where workers live. Table 4 includes only people who both live and work in the study area. As can be seen, for every one of the 11 study area communities, more of that community’s residents work in that same community than go to work in any other study area community.

Table 5 includes all employed residents of the study area and indicates, by community of residence, their top 10 workplace destinations. As may be seen in the table, even when destination communities outside the study area are included, the largest single destination for employed residents is their own community. The second-most popular workplace destinations for the various origin communities are Boston (for employed residents of Franklin, Hopkinton, Medway, Southborough, and Wrentham), Framingham (Holliston, Marlborough, and Milford), Worcester (Westborough), or an adjacent community (Franklin for Bellingham and Marlborough for Hudson). The third-most popular workplace destinations for the study area communities are Framingham (four communities), Boston and Milford (two communities each), and Franklin, Marlborough, and Norwood (one community each). Boston is the only municipality that is in the top 10 workplace destinations for all study area communities.

Table 6 indicates the top 10 origins of the people who are attracted to work in each study area community. For all but one of the 11 communities, the community itself is the source of the largest share of employees (see the table’s first column of numbers). Only Westborough does not fall in that category: there are more workers in Westborough from Worcester, although Westborough is the second-highest source of employees for itself. The second- and third-highest sources of employees for the study area communities (see the next two columns) are, in all cases except two, either Worcester, Framingham, a study area community, or a non-study-area community adjacent to the workplace community. The two exceptions are Wrentham’s second- and third-highest sources: Attleboro and North Attleborough.

Table 4

Persons Employed and Residing in I-495 Study Area Communities

Place of Residence	Place of Employment											TOTAL
	Bellingham	Franklin	Holliston	Hopkinton	Hudson	Marlboro	Medway	Milford	Southboro	Westboro	Wrentham	
Bellingham	1,385	875	160	55	35	220	155	515	65	140	65	3,739
Franklin	320	3,840	155	200	35	310	235	550	95	170	275	6,313
Holliston	30	75	1,230	95	20	110	45	125	50	135	15	2,009
Hopkinton	10	75	100	1,330	20	345	20	165	105	220	0	2,485
Hudson	0	115	25	65	2,570	1,590	10	45	180	240	0	5,255
Marlborough	15	60	105	205	770	6,225	0	95	285	650	15	9,134
Medway	170	355	200	60	4	140	1,130	295	50	65	0	2,518
Milford	275	650	400	460	50	465	150	4,080	165	345	70	7,274
Southborough	10	25	25	40	35	285	10	65	630	255	0	1,505
Westborough	0	40	60	185	85	630	4	90	260	2,365	0	4,102
Wrentham	90	325	40	15	0	70	15	60	0	45	885	1,555
TOTAL	4,258	13,917	5,485	7,958	8,506	32,761	2,937	12,655	6,210	21,359	4,204	153,481

Source: 2000 Census Transportation Planning Package (CTPP)

Workers over 16 years of age

Table 5

Top 10 Commuting Destinations for Employed Residents, by Community

Place of Residence	Place of Employment and Number of Commuters											
Bellingham	Bellingham 1,385	Franklin 875	Milford 515	Framingham 470	Boston 450	Marlborough 220	Natick 215	Holliston 160	Medfield 160	Medway 155	Other 3,283	TOTAL 7,888
Franklin	Franklin 3,840	Boston 1,455	Milford 550	Framingham 545	Natick 390	Norwood 330	Bellingham 320	Marlborough 310	Needham 280	Wrentham 275	Other 6,070	TOTAL 14,365
Holliston	Holliston 1,230	Framingham 885	Boston 630	Natick 365	Waltham 300	Wellesley 225	Ashland 220	Cambridge 215	Newton 165	Needham 150	Other 2,485	TOTAL 6,870
Hopkinton	Hopkinton 1,330	Boston 785	Framingham 705	Marlborough 345	Cambridge 230	Natick 225	Westborough 220	Waltham 185	Newton 165	Milford 165	Other 2,126	TOTAL 6,481
Hudson	Hudson 2,570	Marlborough 1,590	Framingham 555	Sudbury 275	Waltham 270	Westborough 240	Worcester 230	Natick 200	Boston 185	Concord 185	Other 3,500	TOTAL 9,800
Marlborough	Marlborough 6,225	Framingham 1,770	Boston 925	Hudson 770	Sudbury 770	Westborough 650	Waltham 645	Natick 630	Worcester 610	Cambridge 405	Other 6,328	TOTAL 19,728
Medway	Medway 1,130	Boston 570	Framingham 465	Franklin 355	Natick 310	Milford 295	Holliston 200	Millis 180	Bellingham 170	Norwood 165	Other 2,642	TOTAL 6,482
Milford	Milford 4,080	Framingham 830	Franklin 650	Boston 470	Marlborough 465	Hopkinton 460	Worcester 435	Holliston 400	Westborough 345	Natick 340	Other 5,068	TOTAL 13,543
Southborough	Southborough 630	Boston 480	Framingham 410	Marlborough 285	Worcester 265	Westborough 255	Cambridge 130	Natick 115	Wellesley 110	Waltham 75	Other 1,367	TOTAL 4,122
Westborough	Westborough 2,365	Worcester 895	Marlborough 630	Boston 520	Framingham 520	Northborough 270	Southborough 260	Shrewsbury 235	Natick 200	Hopkinton 185	Other 2,372	TOTAL 8,452
Wrentham	Wrentham 885	Boston 380	Norwood 370	Franklin 325	Foxborough 240	Walpole 200	Norfolk 195	Canton 155	Westwood 120	Mansfield 115	Other 2,004	TOTAL 4,989

Source: 2000 Census Transportation Planning Package (CTPP)

Workers over 16 years of age

Table 6
Top 10 Commuting Origins, by Community

Place of Employment	Place of Residence and Number of Commuters											
Bellingham	Bellingham 1,385	Franklin 320	Milford 275	Blackstone 265	Medway 170	Boston 155	Mendon 140	Uxbridge 110	Wrentham 90	Millville 80	Other 1,268	TOTAL 4,258
Franklin	Franklin 3,840	Bellingham 875	Milford 650	Boston 500	Attleboro 390	Blackstone 380	N. Attleborough 360	Medway 355	Wrentham 325	Norfolk 245	Other 5,997	TOTAL 13,917
Holliston	Holliston 1,230	Milford 400	Framingham 365	Ashland 220	Medway 200	Natick 185	Bellingham 160	Franklin 155	Boston 145	Marlborough 105	Other 2,320	TOTAL 5,485
Hopkinton	Hopkinton 1,330	Milford 460	Framingham 305	Worcester 270	Marlborough 205	Hopedale 205	Franklin 200	Westborough 185	Ashland 160	Boston 150	Other 4,488	TOTAL 7,958
Hudson	Hudson 2,570	Marlborough 770	Worcester 555	Clinton 200	Framingham 170	Leominster 165	Shrewsbury 160	Lowell 150	Fitchburg 150	Stow 145	Other 3,471	TOTAL 8,506
Marlborough	Marlborough 6,225	Worcester 1,965	Hudson 1,590	Shrewsbury 1,050	Framingham 1,005	Boston 775	Northborough 690	Westborough 630	Clinton 595	Leominster 510	Other 17,726	TOTAL 32,761
Medway	Medway 1,130	Franklin 235	Bellingham 155	Milford 150	Millis 90	Boston 50	Quincy 50	Holliston 45	Lowell 40	Blackstone 40	Other 952	TOTAL 2,937
Milford	Milford 4,080	Hopedale 600	Franklin 550	Bellingham 515	Worcester 485	Blackstone 475	Uxbridge 440	Mendon 435	Medway 295	Northbridge 225	Other 4,555	TOTAL 12,655
Southborough	Southborough 630	Worcester 460	Framingham 450	Marlborough 285	Westborough 260	Shrewsbury 240	Hudson 180	Milford 165	Northborough 165	Grafton 145	Other 3,230	TOTAL 6,210
Westborough	Worcester 3,215	Westborough 2,365	Shrewsbury 1,080	Grafton 750	Marlborough 650	Northborough 650	Framingham 515	Millbury 420	Northbridge 380	Milford 345	Other 10,989	TOTAL 21,359
Wrentham	Wrentham 885	N. Attleborough 390	Attleboro 320	Franklin 275	Plainville 225	Taunton 170	Norfolk 160	Foxborough 155	Mansfield 120	Boston 80	Other 1,424	TOTAL 4,204

Source: 2000 Census Transportation Planning Package (CTPP)
Workers over 16 years of age

Table 7 indicates two categories: (1) the percentage of employees in a community that live in that community and (2) the percentage of employees in a given community who do not live in one of the top 10 origin communities (the “other” column in Table 6). For those living in the same community they work in, the range is 38 percent in Medway to 10 percent in Southborough. Put another way, 90 percent of the people working in Southborough come from out of town.

Table 7
Percentages of Workers in Study Area Communities Who Live in That Community and Who Live in Communities Outside Top 10 Origins

Community	Percentage of Workers	
	Working and Living in Community	Working in Community and Not Living in Top 10 Origin Communities
Bellingham	32.5	29.8
Franklin	27.6	43.1
Holliston	15.4	42.3
Hopkinton	16.7	56.4
Hudson	30.2	40.8
Marlborough	19.0	54.1
Medway	38.5	32.4
Milford	32.2	36.0
Southborough	10.1	52.0
Westborough	11.1	51.4
Wrentham	21.1	33.9

Source: 2000 Census Transportation Planning Package (CTPP)

Workers over 16 years of age

The range of “other” communities is from 56 percent for Hopkinton to 30 percent for Bellingham. That is, between almost a third to over half of the workers in each of the study area communities do not live in the top 10 communities supplying workers to that municipality. These numbers indicate the geographic dispersion of workers. This can also be seen by comparing the number in the “other” category in Table 6 to the previous columns. For 9 of the 11 communities, the “other” category is the largest. The two exceptions are Bellingham and Medway, where more workers live in those communities and work there than come from the “other” category.

III Existing Services

The study area is served by commuter rail, fixed-route bus, and flexible services. These are described below and shown in Figure 3 (in chapter II). This chapter concludes with a description of the costs of services that are comparable with what might be instituted in the study area.

A MBTA Commuter Rail

Two MBTA commuter rail lines serve the study area: the Worcester/Framingham and the Franklin. There are two stations on the Worcester/Framingham Line in the study area: Southborough Station, located in MBTA commuter rail zone 6, and Westborough, in zone 7. There are likewise two stations on the Franklin Line in the study area: both Franklin and Forge Park/I-495 Stations are located in MBTA commuter rail zone 6.

A zone 6 monthly pass costs \$223.00; a single one-way fare is \$6.75.⁵ A zone 7 monthly pass costs \$235.00; a single one-way fare is \$7.25. Appendix D includes the schedules of these lines, as well as zone designations.

Worcester/Framingham Line

The Worcester/Framingham Line stations in the study area are in Westborough and Southborough. There are two stations west of the study area: Grafton and Worcester. There are 13 east of the study area: Ashland, Framingham, West Natick, Natick, Wellesley Square, Wellesley Hills, Wellesley Farms, Auburndale, West Newton, Newtonville, Yawkey, Back Bay, and South Station.

Of the 21 daily inbound trips on the line, 10 serve the study area. The rest originate at Framingham Station. Only one of the 10 inbound trains serving the study area makes all stops (the 6:38 AM out of Worcester). One (5:38 PM out of Worcester) skips only the Newton stations (Auburndale, West Newton, Newtonville); one skips only Yawkey Station (10:31 AM out of Worcester); three skip the Newton stations and Yawkey (7:37 AM, 8:16 AM, and 2:00 PM out of Worcester); one skips the Wellesley and Newton stations and Yawkey (7:07 AM out of Worcester); and one skips Natick plus all the Wellesley and Newton stations (6:06 AM out of Worcester).

There are 18 outbound trains, 15 of which serve the study area. Four of these (5:30, 7:15, 8:20, and 10:05 PM departures from South Station) serve all stations on the line. One train (12:05 PM departure from South Station) skips only Yawkey Station. One (9:00 AM departure from South Station) skips only Yawkey and the Newton stations. Three (4:10, 4:58, and 6:05 PM departures from South Station) skip Yawkey, all the Newton and Wellesley stops, and

⁵ Rates effective January 1, 2007.

Natick Station. One train (6:50 AM departure from South Station) skips Yawkey, the Newton stations, two of the Wellesley stations, and Natick.

Franklin Line

The Franklin Line stations in the study area are Forge Park/495, which is the terminal station, and Franklin Station. There are 14 other stations: Norfolk, Walpole, Plimptonville, Windsor Gardens, Norwood Central, Norwood Depot, Islington, Dedham Corporate Center, Endicott, Readville, Hyde Park, Ruggles, Back Bay, and South Station.

Of the 19 daily inbound trains on the line, 16 serve the study area. One of the others originates at Walpole Station; the other two originate at Norwood Central. There is much variation in terms of which stations are included on which runs. Two stations, Plimptonville and Hyde Park, have virtually no service: one inbound and one outbound train stop at the former and no inbound and two outbound trains stop at Hyde Park. The longest inbound running time from Forge Park/I-495 to South Station during the AM peak period is an hour and seven minutes; the shortest is 59 minutes. The shortest inbound trips, 51 minutes, are late at night.

Of the 18 outbound trains from Boston, 15 serve the study area. Only one of these terminates at Franklin Station; the other 14 also serve Forge Park/I-495. During the PM peak period, five of the six trains serve the study area. Four of these (4:10, 5:10, 5:40, and 6:15 PM departures from South Station) serve most stations on the line. One train, the 4:30 PM departure from South Station, skips half the stations, saving about eight minutes for Franklin commuters. Two morning departures from South Station, the 4:00 AM and the 7:50 AM, skip many stops. The midday and evening returns to the study area make most stops.

B Fixed-Route Bus

Fixed-route service is traditional transit service with a set schedule and route. Fixed bus routes in the study area include the LIFT and private-carrier services.

LIFT

The Town of Framingham runs the LIFT (Local Inter Framingham Transit) system, which serves that community as well as seven others: Ashland, Holliston, Hopkinton, Marlborough, Milford, Natick, and Southborough.⁶ Three LIFT routes serve the study area: LIFT 5, LIFT 6, and LIFT 7. Schedules for these services are included in Appendix D.

LIFT 5 provides service from Framingham Common through Ashland to Hopkinton. Most of the route follows highway Route 135. The route passes through Ashland Center, which is about a mile east of the Ashland commuter rail station. The route proceeds west on Route 135 into Hopkinton to the vicinity of highway Route 85. The first run begins outbound in Ashland at 6:00 AM; the last run ends in Hopkinton at 7:00 PM. Headways are an hour and 20 minutes, except for the headway between the first and second runs of the day, which is an hour. There is no weekend service.

⁶ As of July 1, 2007, the MWRTA took over administration of the LIFT system. The MWRTA is in the process of taking over administration of the Natick Neighborhood Bus.

LIFT 6 provides service from Framingham to Ashland, Holliston, and Milford, and then, after returning to Framingham, goes on to locations in Natick. The service begins at 5:45 AM in Milford and provides hourly service until the last run ends in Milford at 7:45 PM. The two-hour route requires two vehicles. There is no weekend service.

LIFT 7 serves Framingham, Southborough, and Marlborough. After a few stops in Framingham, the route proceeds on highway Route 9 to Southborough, where it turns north at White Bagley Road and proceeds through Southborough to Marlborough, going as far as the Solomon Pond Mall. The two-hour round-trip requires two vehicles to facilitate one-hour headways. Service commences at 6:30 AM in Framingham and ends in Framingham at 7:30 PM. There is no weekend service.

Private-Carrier Services

Two private carriers provide limited service for commuters headed into downtown Boston. The Cavalier Coach Company provides one daily round-trip between Marlborough and Boston.⁷ Peter Pan Bus Lines provides two trips from Worcester to Boston in the morning and two back to Worcester in the evening.

C Flexible Services

TLC (The Local Connection) is a demand-responsive service that is administered by the Worcester Regional Transit Authority. In a demand-responsive system, the customer calls ahead (usually 24–48 hours) to schedule the ride. The vehicle picks up and drops off riders anywhere within the service area. TLC's service area includes downtown Marlborough, an area east of there along Route 20, and the southwestern part of the city (west of I-495 and south of Route 20). In Southborough, the service area includes downtown, the commuter rail station, and Routes 9 and 85. TLC will also bring riders to destinations near the intersection of Route 9 and I-495 in Westborough. In addition, TLC will pick up or drop off all residents of Marlborough and Southborough at their homes, whether they are in the service area or not. That is, a resident may request to be picked up at his or her home anywhere in either community, but will only be dropped off in the service area, and a resident may request a ride from the service area to his or her home anywhere in either community.

There are also services provided by individual communities and employers. Some of these are flexible and some a combination of fixed and flexible. An employer, for example, may provide a shuttle to pick up or drop off employees at a train station at regularly scheduled times. That same van would be available for individually arranged trips. Likewise, some municipalities have elder-service vans that make scheduled trips every week for shopping and recreational events. These vans are also available for call-ahead service to provide rides to medical appointments.

D Cost Estimates

The cost and ridership information for some existing suburban transit systems will be used to evaluate possible routes. The calculations are based on documents provided by LIFT, TLC,

⁷ Begun in the fall of 2006, this run replaced service formerly provided by Gulbankian Bus Lines, which went out of business in June 2006. The Gulbankian service had provided two runs and originated in Hudson, not Marlborough.

LEXPRESS, and the Natick Neighborhood Bus.⁸

LIFT, LEXPRESS, and Natick Neighborhood Bus are fixed-route services. In addition to the three LIFT routes described above that serve the study area, the Town of Framingham operates two other LIFT routes: LIFT 2 and LIFT 3 in Framingham. LEXPRESS, administered by the Town of Lexington, operates five routes internal to Lexington and a sixth to the Burlington Mall. The Natick Neighborhood Bus runs a Monday-through-Saturday route plus a weekday route that serves the two Natick commuter rail stations. The latter route serves three inbound trains every morning and meets two outbound trains in the evening.

Table 8 summarizes the characteristics of these three fixed-route services (except for Natick Neighborhood Bus's weekday-only service). Table 9 provides a breakdown of ridership and costs.

The average net cost per hour of operation on the LIFT and LEXPRESS routes ranges approximately from \$28 to \$44. These costs vary by route and service for two reasons. The amount of revenue through fares and pass sales that each route recovers is different. For example, average fares collected on the LIFT routes range from \$1.14 to \$1.61. Also, operating costs for individual routes vary by the number of service hours the route operates. There are two vehicles serving LIFT Routes 5 and 6, for example, raising the annual hours of operation.

Table 8
Characteristics of LIFT, LEXPRESS, and Natick Neighborhood Bus

Service	Days of Operation	Hours of Operation	Route Length (miles)*
LIFT 2	Monday-Friday Saturday	6:30 AM – 7:30 PM 9:30 AM – 5:30 PM	7.8
LIFT 3	Monday-Friday Saturday	6:30 AM – 7:30 PM 9:00 AM – 5:00 PM	7.8
LIFT 5	Monday-Friday	6:30 AM – 7:00 PM	10.1
LIFT 6	Monday-Friday	5:45 AM – 7:45 PM	13.1
LIFT 7	Monday-Friday	6:30 AM – 7:00 PM	19.0
LEXPRESS	Monday-Friday	6:45 AM – 6:35 PM	6.3
Natick Neighborhood Bus	Monday-Friday Saturday	6:00 AM – 6:35 PM 9:15 AM – 4:15 PM	13.9

*These are average distances for LEXPRESS and Natick Neighborhood Bus services.

The units used to represent costs for TLC are different from those used for the fixed transit routes because TLC is demand-responsive and each trip may be of a different length. On average, each TLC trip costs \$12 and carries an average of 2.5 passengers, and the average daily number of riders is 43. In the month of June 2006, TLC ran a total of 940 trips.

⁸ These documents include the *LIFT Public Transit System 2005 Calendar Year Update, Application for Boston Region MPO Suburban Mobility Funding Program - Second Year Funding*, and *LEXPRESS Summaries FY02-FY05*. The Central Massachusetts Regional Planning Commission provided costs for TLC. The costs for the Natick Neighborhood Bus were not obtained.

Table 9
Net Operating Costs for Selected Suburban Transit Services, Eastern Massachusetts

<i>Fixed-Route</i>	Annual Boardings	Annual Hours of Operation	Average Net Cost per Boarding	Average Boardings per Hour	Average Net Cost per Hour of Operation
LIFT 2	43,056	3,972	\$3.25	10.8	\$35.10
LIFT 3	62,112	3,972	\$1.81	15.6	\$28.24
LIFT 5	9,828	3,588	\$16.11	2.7	\$43.50
LIFT 6	31,788	7,176	\$9.71	4.4	\$42.72
LIFT 7	49,704	6,072	\$4.03	8.2	\$33.05
LEXPRESS	n/a	n/a	\$6.29	5.5	\$34.60
Natick Neighborhood Bus	29,310	5,138	n/a	5.7	n/a
<i>Demand-Responsive</i>	Monthly Vehicle-Trips	Average Boardings per Day (Year)	Average Net Cost per Boarding	Average Boardings per Vehicle-Trip	Net Cost per Vehicle-Trip
TLC	940	43 (10,659)	\$4.80	2.5	\$12.00

n/a: Not available

IV Potential Markets

The first part of this chapter describes the selection of geographical areas for further analysis; it is followed by a description of possible specific routes. The third section compares the characteristics of the possible routes with the LIFT routes. The fourth section uses LIFT data to estimate costs and ridership for possible fixed-route services. The next section discusses possible modifications and alternatives to fixed-route service, as well as complementary services. The final three sections discuss funding sources, consider longer-term approaches, and present some concluding remarks.

A Identifying Areas for Further Analysis

Chapter II describes the identification of the census block groups that seem to have the most potential for supporting transit (shown in Table 3 and Figure 3). These areas of most transit potential then were looked at in terms of existing transit services. The aim was to serve as many of the identified census block groups as possible, as well as other major attractors, that are not now served by transit.

Of the identified census block groups, those in Milford and Westborough/Southborough were selected for more detailed analysis. The areas in Bellingham, Franklin, Holliston, Hopkinton, Hudson, Marlborough, and Wrentham with transit potential were not selected for the following reasons. The identified area in Bellingham is next to Woonsocket, Rhode Island, which already has a fixed-route transit network that could be altered to serve the transit needs of the southwest part of Bellingham. LIFT routes already serve Hopkinton and Holliston, and the identified census block areas are fairly small compared to those in Milford and Westborough. LIFT and TLC currently serve the identified census block groups in Marlborough. Hudson could probably better be served by extending the TLC service instead of creating a new one. This would allow connections to Marlborough and, via the LIFT, to Framingham and beyond. The census block groups in Franklin are currently served by MBTA commuter rail service to Boston and points in between via the Franklin station; the identified area is also fairly small. Finally, the Wrentham census block group scored high due especially to two factors: percentage of residents with disabilities and percentage that are not of driving age. These scores probably result from the large state hospital located there. Wrentham likely does not have particularly high transit potential.

B Description of Possible Routes

The possible routes in Westborough/Southborough and Milford were designed to connect to existing transit services; to employment, residential, and retail areas; and to senior centers, schools, and other trip attractions, many of which are identified below. The goal of serving many locations, including connections to existing services, must be balanced with the opposed goal of minimizing route-miles and therefore cost of service. Please note that these are only suggested routes.

Westborough/Southborough

There are many office parks and shopping plazas in Westborough that a transit route could serve, as well as some residential developments, the MBTA commuter rail station, and LIFT 7 in Southborough.

The suggested route is shown in Figure 4. This would be a loop route beginning and ending at state highway Route 9 at the White Bagley Road intersection in Southborough, where it would connect with LIFT 7. The route would head west on Route 9 past I-495 into Westborough and serve the office parks on Friberg Parkway. It would leave Route 9 and continue south on Connector Road, serving the Westborough Business Park. It would head northwest on Flanders Road, passing the Downtown Crossing Shopping Center and the Westborough Health Care Center. It would turn left onto East Main Street, passing the senior center and town hall and the downtown area. From West Main Street it would turn right on West Street and then bear left on Fisher Street, past two schools. It would continue to the Westborough MBTA station and then proceed along Otis Street to Route 9, serving the large apartment complex there. It would proceed east on Route 9, serving the office parks and shopping plazas, and detour to serve the District Court. The route would then return on Route 9 to the connection with LIFT 7.

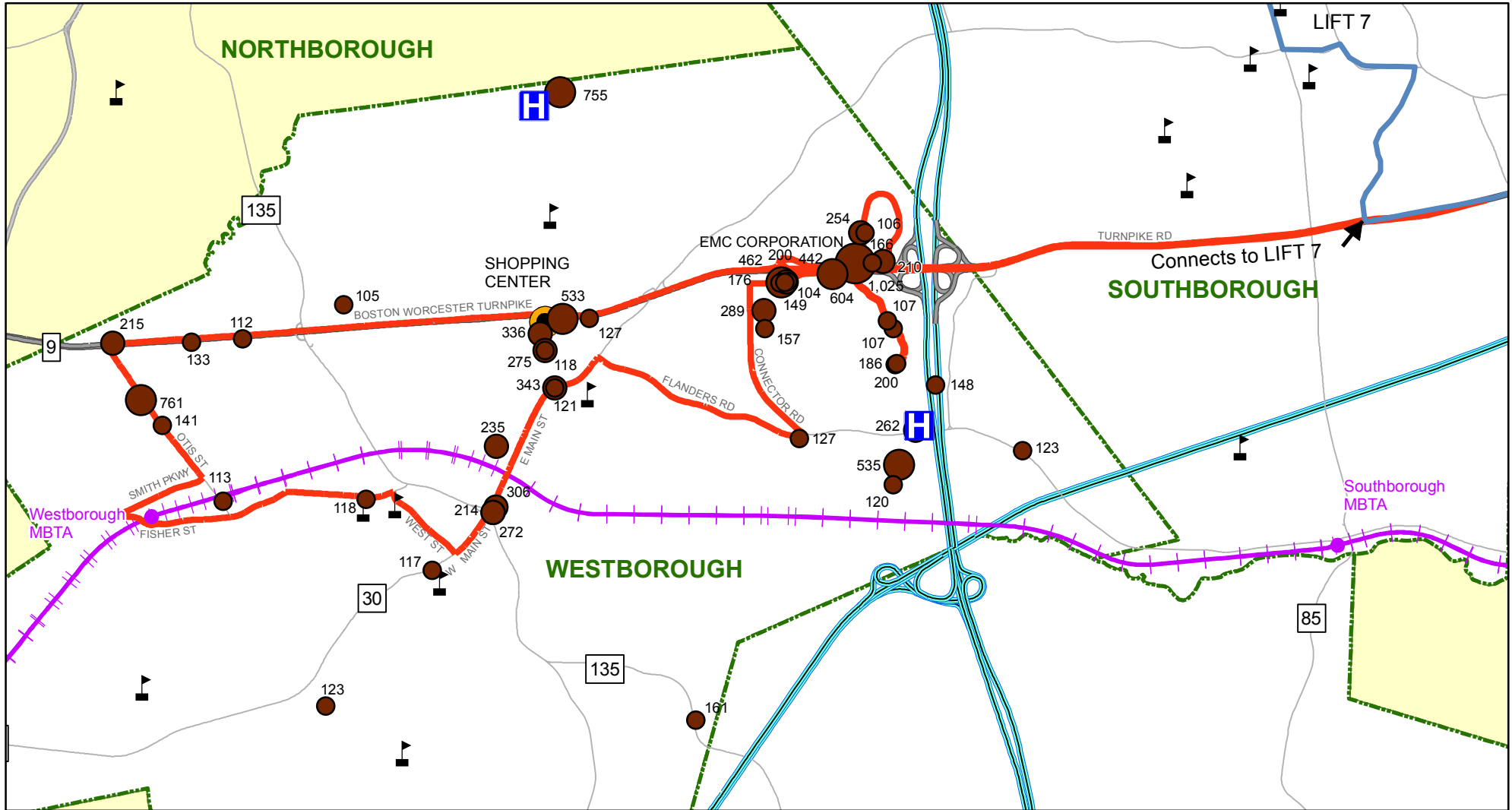
Milford

Figure 5 is a map of a possible Milford route, also a loop. This route would start at the Shadowbrook apartment complex on Purchase Street, then turn west on Fountain Street and continue on to West Fountain Street to serve Milford High School. The route would then turn south on Highland Street, past the Shaw's shopping plaza, the Department of Conservation and Recreation's Casey Pool, and Milford/Whitinsville Hospital. Turning left onto Main Street (state Route 16), the route would pass the post office before turning down South Main Street to serve the Milford Square Plaza, and then turn onto Depot Street and go past the Pheasant Run apartment complex. Turning left on Central Street (via Ship and Jefferson Streets), it would serve the Senior Center, Town Hall, Milford Middle School East, and Milford Catholic Elementary School, and then continue along state Route 16 to state Route 109 (Medway Road), and past Hannaford's, Milford Plaza, and the Kmart plaza. The route would then turn left on Beaver Street and then go west on Route 16 past the Radisson and LIFT Route 6 connection to the Quarry Square Plaza. The route would turn north on Fortune Boulevard (through parking lots), past Target and Lowe's to Dilla Street, and turn north on Purchase Street to the starting point at the Shadowbrook apartment complex.

C How Possible New Routes Compare with LIFT Routes

Table 10 presents various characteristics of the five LIFT routes. Corresponding available data were calculated for the possible Westborough/Southborough and Milford routes. Characteristics include total route-miles, ridership, nearby residents, employees, and households with incomes less than 75 percent of the Boston Region MPO median. These characteristics are selected because data for them are available and reliable, and are industry-accepted indicators of areas that might support transit.

FIGURE 4
Possible Westborough/Southborough Bus Route and Large Activity Generators



Businesses with more than 100 employees

- 101 - 200
- 201 - 450
- 451 - 900
- 901 - 1,700



Shopping mall



Hospital



School, K-12



Commuter rail station



LIFT 7



Possible route

Employment compiled by CTPS for the year 2000.

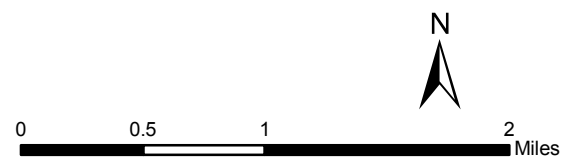


Table 10
Demographics of Existing and Possible Transit Services

	LIFT 2	LIFT 3	LIFT 5	LIFT 6	LIFT 7	LIFT Average ⁹	Possible Routes	
							Westborough	Milford
Total Round-Trip Route-Miles	15.6	15.6	20.2	26.2	38.0	23.1	18.4	10.0
Average Number of Riders per Service-Hour	10.8	15.6	2.7	4.4	8.2	8.3	N/A	N/A
Nearby Residents¹⁰	47,397	54,575	27,955	51,242	48,311	45,896	15,399	26,111
Nearby Residents per Route-Mile	3,038	3,498	1,384	1,956	1,271	2,229	837	2,611
Nearby Employees⁵	37,954	40,404	13,719	22,918	35,906	30,180	22,802	10,967
Nearby Employees per Route-Mile	2,433	2,590	679	875	945	1,504	1,239	1,097
Nearby Households with Incomes Below 75% of MPO Median¹¹	9,877	9,877	7,352	11,491	11,835	10,086	2,550	5,160
Nearby HHs with Incomes Below 75% of MPO Median per Route-Mile	633	633	364	439	311	476	139	516

Round-trip route miles for the LIFT range from 15.6 to 38, with an average of around 23. The number of riders per service-hour averages about 8 and ranges from 2.7 to 15.6. The population, defined as all those residing within one-half mile of the route, varies from about 28,000 to 55,000 residents, averaging about 46,000. The corresponding number of employees varies from about 14,000 to 40,000, and averages 30,180. Per route-mile, the number of nearby residents varies from almost 1,300 to 3,500; the number of nearby employees varies from about 700 to 2,600.

The Boston Region MPO median household income is \$55,800, 75 percent of which is \$41,850. On average, the LIFT routes serve about 10,100 nearby households with an income less than 75 percent of the MPO median; the range is from 7,350 to almost 12,000 households. On average, LIFT routes serve 475 households per route-mile with an income below 75 percent of the

⁹ Average of all LIFT services.

¹⁰ Within one-half mile of the route on either side.

¹¹ Seventy-five percent of the Boston Region MPO median income is \$41,850.

median; the range is from about 300 to over 600.

The total round-trip miles for the Westborough/Southborough route would be about 18. The route would serve about 15,400 nearby residents, almost 850 residents per mile; about 22,800 nearby employees, more than 1,200 employees per mile; and 2,550 households with an income less than 75 percent of the MPO median, about 140 per route-mile.

The total round-trip miles for the Milford route would be 10. This route would serve an area with about 26,100 nearby residents, over 2,600 residents per mile; almost 11,000 nearby employees, nearly 1,100 employees per mile; and 5,160 households with an income less than 75 percent of the MPO median, about 500 per route-mile.

In comparison with the existing LIFT routes, the Westborough/Southborough route would serve more total nearby employees than LIFT 5, about as many as LIFT 6, and significantly more than the possible Milford route. On a per-mile basis, the Westborough/Southborough route has more nearby employees than LIFT Routes 5, 6, and 7 and than the Milford route. All the LIFT routes and the possible Milford route serve much higher numbers of nearby residents and low-income households than does the Westborough/Southborough route.

The Milford route would serve fewer total nearby employees than any of the LIFT routes and than the suggested Westborough/Southborough route. On a per-mile basis, however, it serves more employees than LIFT Routes 5, 6, and 7, and almost as many as the Westborough/Southborough route. The same pattern holds comparing the Milford route to the LIFT for residents, residents per mile, and income statistics. That is, the number of residents and the number of households below 75 percent median income are lower than for any of the LIFT routes, but the per-mile rate is higher than the rates for LIFT Routes 5, 6, and 7, and much higher than that for the Westborough/Southborough route.

There is no simple formula to derive ridership from the employment, resident, and income data. It is true, however, that the two routes with the highest ridership, LIFT 2 and LIFT 3, traverse the areas with the highest densities of residents, employees, and households with an income below 75 percent of the median. The Westborough route has more nearby employees than the three lower-performing LIFT routes; the residential and low-income household densities are far and away the lowest of all the routes. This likely will detract from ridership potential. The Milford route has more residents, employees, and low-income households per mile than LIFT Routes 5, 6, and 7. This is more promising than the Westborough route, suggesting ridership closer to that for LIFT Routes 5, 6, and 7, but below the ridership of LIFT Routes 2 and 3.

D Costs, Ridership, Revenues

Costs, ridership, and revenues from LIFT services will be used to interpolate estimates for the possible Milford and Westborough/Southborough routes. The values used here are taken from Table 9 in chapter III and Table 10 in this chapter.

Three variables from Table 10 will be used to estimate ridership for the two possible routes: residents per mile, employees per mile, and nearby households with incomes below 75 percent of the MPO median per mile. The reader is reminded that these numbers are based on an area

within one-half mile of either side of the route (a one-mile-wide corridor). The values for these three variables for the two possible routes were then compared to the average for the LIFT routes.

It was decided to give triple weight to the household income variable and double weight to the residents-per-mile variable. This recognizes that income is a strong indicator of transportation choice. Likewise, population density is more important than employment density in determining transit ridership. Using this formula yields an estimate of ridership for the Westborough/Southborough route that would be about 40 percent of the LIFT average. The result for the Milford route would be ridership slightly above the LIFT average.¹²

The costs of service as well as ridership per hour for the LIFT routes are found in Table 9. The average net cost per service-hour for the LIFT Routes is \$36.50. This number ranges from \$28.24 per hour (LIFT 3) to \$43.50 per hour (LIFT 5). The average number of riders per hour for these five LIFT routes is 8. If the Westborough/Southborough route were about 40 percent of the LIFT average, then we would expect an average hourly ridership of about 3. The Milford route might attract about 8 riders per hour.

If riders on these new routes paid the average LIFT fare, revenues would be about \$4 per hour for the Westborough/Southborough route and \$11 per hour for the Milford route.¹³ The average cost per hour of LIFT service is about \$55.¹⁴ Please note that this figure does not include costs of marketing the service.

The resultant estimates would be a net operating cost per hour for the Westborough/Southborough route of about \$51: an operating cost of \$55 per hour minus revenue of \$4 per hour. The corresponding cost for the Milford route would be about \$44 per hour: \$55 per hour cost minus revenue of \$11 per hour.

E Other Types of Possible Services

The routes described above for Milford and Westborough/Southborough are examples of what could be done in other communities. As discussed previously, there are many places within the study area that have similar or even higher numbers of people who would be inclined to use transit. A case could be made for intracommunity routes in many municipalities. Service connecting residential, commercial, and retail areas would be especially helpful for the elderly and for youth and any individuals without access to automobiles.

As seen in the journey-to-work discussion in chapter II, there are also large numbers of people who both live and work in each community. This group could also contribute to a strong base for intracommunity service. This would especially be true for commuters who do not have access to an automobile or to free, convenient parking.

¹² If the three chosen variables were weighted equally, the resultant estimates would be about 50 percent of the LIFT average for Westborough/Southborough and about 100 percent for Milford.

¹³ As mentioned in chapter III, the average fares on LIFT routes vary from \$1.14 to \$1.61. An average of these fares is used above.

¹⁴ A more realistic estimate of cost, according to Town of Framingham staff, is \$75 per hour. This figure would better cover the maintenance costs and would result in more reliable service.

Whenever possible, in-town, local services should tie in with existing or new regional services or with other local routes. There is a newly created regional transit authority (RTA) in the MetroWest region. This RTA would be responsible for planning and coordinating new and existing services. This is further discussed below.

Given the population and employment densities, the travel times, and the unserved areas, a more flexible transit service might work better. This would eliminate the need to pick and choose the parts of town to be served. The service could be completely demand responsive (see following subsection) or could have a fixed component.

The Milford and Westborough routes were driven only once, during the midday. The travel time, without allowing for the pickup and discharge of passengers, was about 55 minutes for each route. Given that travel times during peak periods of travel will probably be longer, and given the time required to pick up and discharge passengers, these times clearly are too long for routes that would use one vehicle, run on an hourly schedule, and interconnect with LIFT Route 6 or 7.

One solution would be to use two vehicles. This would require about twice the subsidy of a route served by a single vehicle. Another solution would be to shorten the routes. The Milford route could be shortened in many ways. For example, it could be drawn so as not to serve either the Pheasant Run or Shadowbrook apartment complex. Or it could turn down Congress Street, skipping West Fountain, Highland and Prospect Streets. This would mean no service for the high school, the hospital, and the businesses and residences in between.

The Westborough/Southborough route could skip the Flanders/Connector Roads detour, which would mean no service to the senior center and the Westborough Business Park. Or it could forgo service to the businesses on Friberg Parkway.

Another alternative would be to have route variations throughout the day, where some runs would serve certain residences or businesses, and other runs bypass them.

Even as originally described, these two suggested routes do not serve all the possible sites that are likely to warrant transit. For example, the Westborough/Southborough route does not serve the Whittier Rehabilitation Hospital at the end of Flanders Road nor all the businesses between there and the Flanders Road/Connector Road intersection.

Demand-Responsive Services

In a completely demand-responsive system, a customer simply calls ahead to arrange a pickup location and time, as one would arrange a taxi ride. The eligible area could be the entire community, a portion, or an intercommunity district. The passenger could pay a set fare per ride, say \$2, or a discount of a normal taxi fare, say half-price.

A mixed service could include a fixed route with a catchment area within which the vehicle could divert to pick up and drop off passengers. Passengers would be picked up along the fixed portion of the route or by appointment in the catchment area. There could be designated stops,

or passengers could flag vehicles along the route, as happens on the LIFT. They would be dropped off along the fixed portion of the route or within a catchment area at the request of a passenger. If a service had a fixed-route component, it would follow some type of schedule to allow customers to know when to expect service. A Westborough/Southborough route, for example, could be designed to meet the hourly LIFT service in Southborough and certain trains at the commuter rail station. The Milford service could be designed to always meet the LIFT service, plus have scheduled stops at the high school for participants in after-school activities.

There are many possible variations, not only in terms of types of service, but also types of vehicle, fare structures, hours and days of operation, catchment areas, and institutional arrangements. There could even be different service on different days or during different times of the day. For example, there could be fixed service during peak periods, with scheduled connections to existing transit, and flexible service during the middle of the day. Experimenting with variations could help determine what works best. The hours of operation, for example, or the catchment area could be modified after trying a service for a period of time.

Carpooling, Vanpooling, Park-and-Ride Lots

There are other avenues that have potential to reduce the number of vehicle-trips and vehicle-miles traveled in the study area. As discussed above, the nature of the study area is such that work trips, as well as others, are made from a large number of locations to a large number of locations, or many to many. Good methods to address this type of trip distribution are carpooling, vanpooling, and the provision of park-and-ride lots. The MetroWest Transportation Management Association supports carpooling and vanpooling by providing a Guaranteed Ride Home program. This ensures that if any emergencies arise, the individual will be able to get a taxi or rental car at no personal cost.¹⁵

A previous CTPS memorandum stated that the three most relevant variables when assessing demand for park-and-ride lots in the Boston metropolitan area are the distance from a highway, the number of weekday bus trips to Boston between 5:30 and 8:30 AM that serve the lot, and the availability of commuter rail service in the community or an abutting community.¹⁶ The memorandum stated that the best-case scenario would be a parking lot within a quarter-mile of a highway, served by 5–10 morning-peak-period, weekday bus trips to Boston (or another major employment center), and not located in a community with commuter rail service. A park-and-ride lot can still be successful if the lot at the commuter rail station fills to capacity very early and extra capacity cannot be added.

These criteria leave out two possible categories of users: (1) those not going to Boston and the other communities served by the commuter rail lines, and (2) those who would carpool or vanpool rather than use a bus. A more thorough analysis would need to look at origin and destination data in more detail to ascertain whether there are certain locations that might warrant a park-and-ride lot. For example, a community where a relatively large proportion of residents work in a relatively faraway community might have potential for a successful park-and-ride lot.

¹⁵ Source: <http://www.masscommute.com/tmas/metrow/tmaPrograms.html>

¹⁶ “Estimating Demand for MassHighway Park-and-Ride Lots,” July 28, 1999, memorandum, authored by Alicia Powell Wilson for MassHighway.

If such communities were to be found, the next step would be to see what physical locations might be available for a park-and-ride facility. Potential users of park-and-ride lots also would need to find out about the existence of the lots and how to identify others interested in ridesharing. Information on such services is available through the TMAs and through the statewide MassRIDES program.¹⁷

Figure 1 (in chapter I) indicates the 14 interchanges on I-495 within the study area and the commuter rail stations. Two of these, Interchange 22 connecting with I-90 and Interchange 25 connecting with I-290, do not allow local access and might therefore be less likely candidates for park-and-ride lots. Table 11 indicates the other twelve interchanges, the community in which they are located, connecting roads, and whether there is commuter rail nearby. Although the aforementioned research suggests park-and-ride lots within a half-mile of a major highway, such lots could be located near other roadways with high traffic volumes.

Table 11
Location of I-495 Interchanges within the Study Area and
Availability of Commuter Rail

I-495 Exit	Community	Road	Nearby Commuter Rail Station
14	Wrentham	Route 1	No
15	Wrentham	Route 1A	No
16	Franklin	Hartford Avenue	Franklin
17	Franklin	Route 140	Franklin
18	Bellingham	Route 126	No
19	Milford	Route 109	No
20	Milford	Route 85	No
21	Hopkinton	Main Street	No
23	Westborough	Route 9	Southborough ¹⁸
23C	Marlborough	Simarano Drive	No
24	Marlborough	Route 20	No
26	Hudson	Route 62	No

The aforementioned CTPS memorandum stated that I-495 interchanges 19, 20, and 21 in Milford and Hopkinton warrant further analysis for park-and-ride facilities.

F Funding Sources

Discussed here are potential funding sources from federal, state, and regional government levels and from private sources.

Suburban Mobility Program

The Boston Region MPO funds suburban transit through its Suburban Mobility Program, using federal Congestion Mitigation and Air Quality (CMAQ) funds. The MPO plans to spend

¹⁷ MassRIDES can be reached at 1.888.4COMMUTE or <http://www.commute.com/>.

¹⁸ There is also a commuter rail station in Westborough. It is farther away from the Route 9 interchange than the Southborough station.

\$650,000 annually.¹⁹ The TLC service received these funds. A committee of the MPO reviews applications and makes recommendations for funding to the full board. This program provides 80 percent of necessary funding the first year, 70 percent the second, and 60 percent the third.

Regional Transit Authority

Legislation was passed in 2006 authorizing the formation of new regional transit authorities.²⁰ The MetroWest Growth Management Committee has been working with the MetroWest and Marlborough Chambers of Commerce, the 495 MetroWest Corridor Partnership, and Transaction Associates to encourage interest in a MetroWest RTA. As of October 24, 2007, two study area communities (Holliston and Hopkinton) and six other towns (Ashland, Framingham, Natick, Sherborn, Wayland and Weston) had voted to join.

The new RTA will be eligible for federal funds. These funds are given to the Commonwealth's Executive Office of Transportation and Public Works (EOT) and distributed by that agency to the RTAs statewide. These federal funds are available primarily for capital, not operating, costs. A new RTA would have a staff that would help design and implement new services or help consolidate existing ones. Contractors would provide the services.

The new legislation also allowed communities to join existing RTAs. Four communities at the southern end of the study area, Bellingham, Franklin, Medway, and Wrentham, joined the Greater Attleboro Taunton Regional Transit Authority (GATRA).

MBTA Service

Some of the study area communities are in the MBTA. The MBTA could be requested to provide services directly. This is very unlikely, however, given that there are potential routes in other parts of the T's district that would presumably attract more riders. Given the MBTA's financial situation, adding new service in general is not likely.

There are two programs administered through EOT and the MBTA that fund existing services. The EOT Interdistrict program and the MBTA Suburban Transit program have been level-funded for many years and have not funded any new services since 2000. The EOT program provides funds for LIFT Routes 5, 6, and 7. The MBTA program helps fund LIFT Routes 2 and 3.

Transportation Management Associations

Transportation management associations (TMAs) act as area clearinghouses for information on carpooling, vanpooling, park-and-ride lots, and public and private transit services. They also coordinate services provided by employers in their areas. Many of these services, however, are available only to employees and to those traveling to the employer site. A service provided by the MetroWest TMA, called Guaranteed Ride Home, was mentioned above. *MassRIDES* is a

¹⁹ Source: http://www.bostonmpo.org/bostonmpo/resources/Suburban_Mobility/index.html. The draft federal fiscal year 2008–2011 TIP allocates \$650,000 for each year.

²⁰ General Laws of Massachusetts, Chapter 161B, Transportation Facilities, Highway Systems and Urban Development Plans.

statewide clearinghouse for individuals and businesses interested in information on alternative forms of transportation.

G Longer-Term Approaches

There are some transportation solutions that involve eliminating institutional barriers, such as state border issues and transit systems segregated by types of users. Such barriers are discussed below. The subsequent two sections discuss the transportation implications of land use decisions and consolidation of services.

Institutional Barriers

As mentioned above, the area in Bellingham that looks most promising for transit service is located in the southwestern corner, adjacent to service provided by the Rhode Island Public Transit Authority (RIPTA). According to local officials, there had been a proposal to have the RIPTA provide service to Bellingham. That service did not proceed due to institutional barriers at the state level.

It is recommended that such barriers be examined and removed. Whatever services make most sense for Bellingham, or other communities that border another state, should proceed with a minimization of territorial concerns. Residents of southwest Bellingham are close to retail and employment opportunities in Rhode Island, and many Bellingham users would want to travel to Rhode Island. It would be inconvenient and inefficient to such travelers if both states provided services within their own jurisdictions and required transfers at the state line.

Another institutional barrier mentioned above is employer-provided shuttles that are not able to serve people who are not affiliated with the company.

Land Use

Table 12 indicates development potential for each community. These data, referred to as build-out analyses, do not reflect what is expected or what a community is planning, but what ultimately could be developed. Nevertheless, the table indicates that a great deal of land is still available for development.

There is a new major development in Hudson near Interchange 26 on I-495. EMC, located in Hopkinton and Westborough, has indicated plans for expansion and a need for a new interchange on I-495. Traffic congestion will continue to increase on roadways in the study area, both on I-495 and on secondary roads, if new development puts more traffic on area highways than new government policies, transit services, and market forces can remove.

While communities know that development increases traffic, an undesirable effect, there is on the other side the compelling pull to increase the tax base. There is no incentive for an individual community to say no to new development. While communities may make efforts to control the traffic impacts, the municipalities need tax revenues. A new development could

Table 12
Development Potential, by Community

Community	Total Acres²¹	Additional Developable Acres	Additional Developable Acres as Percentage of Total	Potential Additional Residential Lots	Potential Additional Population	Potential Additional Commercial/Industrial Acreage
Bellingham	11,785	4,145	35	1,840	5,097	494
Franklin	17,140	4,519	26	3,995	12,652	258
Holliston	11,990	4,890	41	3,070	8,749	253
Hopkinton	16,832	7,614	45	4,632	12,599	111
Hudson	7,454	2,442	33	1,606	4,095	294
Marlborough	13,388	4,144	31	2,914	7,267	621
Medway	7,442	2,617	35	2,057	5,658	95
Milford	9,446	3,006	32	2,299	5,817	202
Southborough	8,959	1,817	20	1,545	3,909	122
Westborough	13,144	3,244	25	1,755	3,915	275
Wrentham	13,995	6,663	47	3,274	9,260	177
TOTAL	131,575	45,101	34	28,987	79,018	2,904

Source: Build-out data, MAPC.

simply move to the adjacent community, thereby causing the original community potential impacts from traffic without concomitant tax revenues.

Land use decisions, made primarily at the local level, can have major impacts well beyond even adjacent communities. The Metropolitan Area Planning Council, through its MetroFuture project, is addressing this issue at the regional level.²²

Consolidation of Services

Each community in the study area spends substantial sums on public transportation now in the form of school busing. Several communities contacted indicated that their school transportation budgets approach a million dollars annually. Generally, these vehicles are used in the early morning and again in the afternoon to transport students to and from schools, and in the late afternoon and evening for sports and other school-related activities. The vehicles are generally idle in the middle of the day, and most are idle after students are transported home from school in the afternoon. These vehicles could be used to provide other services during those hours. The most likely target population would be the elderly, who could make trips for shopping and socializing during the hours students are in school. These midday periods are indeed the ones in which the elderly are most likely to want their travel needs to be provided for.

Many study area communities also provide transportation services for the elderly, spending between \$20,000 and \$40,000 annually. A consolidation of these services might be an additional

²¹ This represents all the land in the community, not including major bodies of water.

²² See www.mapc.org for further information.

expense for communities that do not provide elderly services, and probably a savings for those who provide these services separately. It is probable that not all school vehicles would be needed for these midday services, so perhaps a subset could be selected with a particular range of users—including the elderly and people with disabilities—in mind. The objective would be to use vehicles that are easier to enter than the standard school bus and accessible to persons with disabilities.

H Conclusion

As stated above, the possible routes that are analyzed in this study were chosen to illustrate the possibilities and the challenges of providing transit service in this corridor. The implementation of any new bus routes should be carried out in conjunction with other services, such as park-and-ride lots and employee shuttles, whenever feasible. Whatever avenues are pursued, they need to complement each other. New bus services, for example, or employee shuttles, could be designed to serve park-and-ride lots as well as commuter rail stations and other major activity centers.

RTAs and communities as well as TMAs and regional planning agencies can implement new bus services or modify existing ones. Municipal officials can work with their community's RTA, if it belongs to one, or can implement services on their own. One source of funding is the Boston Region MPO's Suburban Mobility Program, described in section F of this chapter.²³ MPO staff are able to provide technical assistance to local communities that apply for these funds. Further information about this competitive assistance program is available on the MPO website: www.bostonmpo.org.

As discussed in Appendix C, policies that increase the out-of-pocket cost of single-occupant driving can substantially increase the market for new public transportation services.

²³ The Boston Region MPO will consider funding a service that is partly outside of the MPO region as long as some of the service is within the region.

APPENDIX A

Notes on Task Force Meetings

Notes

I-495 Transit Study Task Force

Tuesday, November 29, 2005
9:30 A.M., 1671 Worcester Road, Framingham

1. Introductions

- Cathy Buckley Lewis, Project Manager, introduced herself and Heather Ostertog. Heather and Cathy are the main staff people assigned to the I-495 Transit Study.
- Everyone introduced himself or herself. See attached sheet for the list of attendees.

2. Review of Work Scope

- Cathy reviewed the seven tasks of the work scope.
- Mary Ellen Blundt asked if the Task Force would receive the specific products from each task when completed. Cathy said the products would be reviewed internally, and then sent to the task force members electronically for comments. The MPO's Transportation Planning and Programming Committee would review a final draft and authorize release of a report available to the public.
- Michael Carroll asked that the entire town of Wrentham be included in the study limits, instead of the limits of the study terminating at the interchange of I-495 and Route 1A. He was told that the entire town is included.
- Al Lima stressed that in Task 5 all existing transit services, along with their funding sources, ought to be cataloged. In addition to the actual transit service being cataloged, the people who use the service should be cataloged as well.
- John Stasik asked that Task 4 not be restricted just to transit, but to all alternatives to single-occupant vehicles.
- Paul Yorkis wanted to include park-and-ride lots, especially near I-495 interchanges, in the study.

3. Literature Review

The following additions were suggested for the literature review:

- John Stasik – MERC yearly analysis.
- Mary MacInnes – “Worcester Comprehensive Service Design” and “Five-Year Transit Service and Capital Plan for the Massachusetts Regional Transit Authorities”
- Paul Yorkis – *Traffic Congestion in the SWAP Subregion*, CTPS.

4. Background Data

- Cathy described the maps on the wall: existing transit service, population and employment density, and activity centers, including employment centers over 100 employees. A handout including data on commuter rail parking lots was distributed.

- The following data will be included in the study analysis: location of and utilization of park-and-ride lots, location of activity centers, population density, employment density, existing transit services, future development information.
- Population data will be analyzed down to the census block level.
- Al Lima asked if we would be interested in anecdotal information from transit service users or would we be doing focus groups. There is no money in the budget for focus groups, but anecdotes are welcome.
- Paul Yorkis said that there is another park-and-ride lot for Norfolk residents serving the Norfolk commuter rail station.
- Mary Ellen Blundt said that TLC serves the Southborough commuter rail station.

5. Other Business

- Products will be emailed.
- Assabet Valley Chamber of Commerce will be contacted to see if they want to be included in the task force.

6. Next Meeting

- Next meeting is scheduled for Tuesday, January 24, 2006, at 9:30 A.M., same location (1671 Worcester Road (Route 9 West), Framingham Office Park).

7. Adjourn

**I-495 Transit Study Task Force Meeting Attendance
Tuesday, November 29, 2005, 9:30 AM**

Task Force Member	Representative and Other Attendees
Bellingham	
Franklin	
Holliston	<i>No representative named</i>
Hopkinton	
Hudson	Michelle Ciccolo
Marlborough	Al Lima
Medway	
Milford	<i>No representative named</i>
Southborough	Vera Kolia
Westborough	Sue Abladian
Wrentham	Michael Carroll
Central Massachusetts RPC	Mary Ellen Blunt
Corridor Nine Area C of C	<i>No representative named</i>
Executive Office of Transportation	Ed Carr
495 MetroWest Corridor Partnership	Adam Ploetz
MAGIC (MAPC)	
Marlborough Regional C of C	<i>No representative named</i>
MBTA	Stephen Woelfel
Metropolitan Area Planning Council	
MetroWest Chamber of Commerce	Ted Welte
MetroWest Growth Management Committee	John Stasik, Margaret Sleeper
MetroWest/495 TMA	Susan Tordella
SWAP (MAPC)	Paul Yorkis
Transportation Equity Council	<i>No representative named</i>
United Chamber of Commerce	<i>No representative named</i>
Worcester Regional Transit Authority	Mary MacInnes
Congress and General Court	
Congressman McGovern's Office	Sean Navin
Senator Karen Spilka's Office	Mary Anne Padien
MPO Staff	Clinton Bench, Cathy Buckley Lewis, Heather Ostertog

Notes

I-495 Transit Study Task Force

Tuesday, January 24, 2006

9:30 A.M., 1671 Worcester Road, Framingham

1. Introductions

- Cathy Buckley Lewis, Project Manager, introduced herself and Heather Ostertog. Heather and Cathy are the main staff people assigned to the I-495 Transit Study.
- Everyone introduced himself or herself. See attached sheet for the list of attendees.

2. Minutes of November 29, 2005

There were no comments on the minutes.

3. Literature Review

Heather gave an overview of the literature review. She categorized the findings into six groups:

1. General demographics and characteristics of communities that can support suburban transit
2. Specific communities in the study area that have those characteristics
3. Trip generators in the study area, including large employers and office parks, as destinations for suburban transit
4. Survey responses of riders on existing suburban transit services.
5. Suburban transit “wish lists” for Hopkinton, Hudson, Marlborough, Southborough, and Westborough
6. Implementation advice and factors for success.

4. Review of Data and Methodology

Cathy described the data and methodology that will be used, on the service and demand sides. For service, the most up-to-date sources for existing service will be used and augmented with information obtained from individual meetings with communities and other parties.

For demand, population will be examined at the block level. Also included will be population forecasts and build-out analyses. For employment, existing sites will be included, as well as developments that are likely in the near future. These data will be compiled from the census data and MAPC and CTPS databases, as well as from the individual meetings.

The two sides will then be superimposed – services with population/employment/ activity locales. Areas that look promising and have no service, as well as services that might be modified, will be identified.

Vera K. wanted to make sure that the Transportation Equity Council information was being used, as it was not listed in the literature survey. Cathy L. told Vera K. that we have copies of the TEC data for all the communities in the study area and that we have reviewed the information. Paul Y. wanted park-and-ride sites included. He mentioned a site in Hudson owned by MassHighway that could be a lot and another with no signage, as well as a lot off Route 109 in Medway. Michelle C. noted that the Hudson Route 62 lot is full every day. He and others wanted “transit” to include vans and carpools, not only buses.

Michelle B. was concerned that the 1996 Marlborough commuter rail study was out of date. Mary Ann P. wanted to make sure this was not only about trips to Boston. Paul Y. asked for copies of the maps.

Barbara L. initiated a discussion of the regulatory side of new developments, with some communities requiring TMA membership or subsidies for transit. Mary M. suggested including a review of the Mass Transit Needs Study. The MERC data was recommended in the form of the Framingham and Marlborough reports.

Paul C. noted that Franklin has two MBTA stations. There are downtown parking issues with the Franklin/Dean College station. Franklin applied to allow GATRA to serve Forge Park Station and was denied. It has been difficult to get the MBTA to discuss issues with the town.

It was suggested that vacant and underutilized buildings be taken into account. EMC has a vacant building. The National Association of Industrial and Office Parks (NIOP) is a good source of information.

5. Other Business

No one had new business.

6. Next Meeting

The next meeting was scheduled for Tuesday, March 21, 2006, at 10:00 A.M., same location: 1671 Worcester Road (Route 9 West), Framingham Office Park.

7. Adjourn

**I-495 Transit Study Task Force Meeting Attendance
Tuesday, January 24, 2006, 9:30 AM**

Task Force Member	Representative and Other Attendees
Bellingham	Mary Chaves
Franklin	Paul Cheli
Hopkinton	Ted Kozak
Hudson	Michelle Ciccolo
Marlborough	Al Lima, Walter Bonin
Medway	
Southborough	Vera Kalias
Westborough	
Wrentham	
Central Massachusetts RPC	Mary Ellen Blunt
Executive Office of Transportation	Ed Carr, Ethan Britland
495 MetroWest Corridor Partnership	Paul F. Matthews, Adam Ploetz
MAGIC (MAPC)	Donald Wheeler
MBTA	<i>No new representative named</i>
Metropolitan Area Planning Council	Barbara Lucas
MetroWest Chamber of Commerce	Ted Welte
MetroWest Growth Management Committee	Donna Jacobs
MetroWest/495 TMA	Michelle Brooks, Susan Tordella
SWAP (MAPC)	Paul Yorkis
Worcester Regional Transit Authority	Mary L. MacInnes
General Court	
Senator Karen Spilka's Office	Mary Anne Padien
MPO Staff	Cathy Buckley Lewis, Heather Ostertog

Notes

I-495 Transit Study Task Force

Tuesday, March 21, 2006
10:00 A.M., 1671 Worcester Road, Framingham

1. Introductions

- Cathy Buckley Lewis, Project Manager, opened the meeting, introducing herself and Heather Ostertog, the main staff people assigned to the I-495 Transit Study.
- Everyone introduced himself or herself. See attached list of attendees.

2. Minutes of January 24, 2005

Ethan needs to be added to the attendance list of the last meeting. All emails of employees at EOT have changed and need to be updated.

3. Memo of Analysis of Census Block Groups for Transit Potential

Heather gave an overview of the memo entitled “Analysis of Census Block Groups for Transit Potential.” She described the six criteria that were used to analyze the census block groups, as well as how the scoring was calculated.

Michelle C. said that there are two major shopping centers in Hudson, on Route 85, along with a new one opening up on Route 62 that should be added to the map.

John S. said that we should use Journey-to-Work data to determine where people are traveling to and from, along with environmental-justice factors. Cathy and Heather explained that we would do that as part of the evaluation of potential routes. Journey-to-Work data, however, is only aggregated at the town level.

Cathy pointed out the significant weight given to socioeconomic factors; even population density is generally a measure of socioeconomics. Mary Ellen concurred that these factors are the most important. Paul C. said that employment data are the most important for this analysis because the congestion in the study area is during work peak periods. Mary Ellen reiterated that these services would support mobility, not congestion relief. Adam supported Mary Ellen’s point.

Paul C. mentioned Silicon Valley, California, where water concerns result in the building of 5-story garages. Here we have 20-acre parking lots. School buses were also mentioned as a transportation service that communities pay for. Yet those dollars are in a separate education budget not related to other community services. In communities where parents pay directly for buses, many opt to drive their children to school instead, thereby contributing to traffic congestion.

W. Bonin mentioned that current zoning laws restrict viable transit. John S. mentioned attempts to affect new development, including requiring TMA membership or subsidizing transit. Framingham, he said, requires 4–5 parking spaces per 10,000 square feet. A reduction in parking is granted for a contribution to the LIFT system.

Paul C. mentioned that employers not providing "flex-time" as a benefit contribute to peak-period congestion in the study area.

Mary Ellen asked Heather and Cathy to look at the effect of free parking versus paid parking for employees.

Paul Y. presented a letter from SWAP requesting a study of the viability of a location in Franklin for a park-and-ride lot.

Ethan Britland recommended including paratransit services in the study area along with the existing transit services. He also recommended using the model to predict Journey-to-Work data.

4. List of Top Employers in Study Area

A list of all known employers with over 100 employees in the study area was distributed. Task force members looked it over and indicated changes. An updated list of employers is attached.

5. Next Steps

The Task Force asked Heather and Cathy to include a list of Smart Growth and Smart Policy recommendations for reducing congestion, as discussed during the meeting. Cathy indicated that data from the LIFT and TLC would be used to help estimate demand and costs for potential new services. Findings will be sent via technical memoranda to task force members for review. A draft committee report, incorporating comments to date, then will be sent to members for review. At that point, a final task force meeting will be scheduled.

6. Other Business

There was no other business.

7. Adjourn

**I-495 Transit Study Task Force Meeting Attendance
Tuesday, March 21, 2006, 10:00 AM**

Task Force Member	Representative(s)
Bellingham	Mary Chaves
Franklin	Paul Cheli
Hopkinton	Ted Kozak
Hudson	Michelle Ciccolo
Marlborough	Walter Bonin
Medway	
Milford	
Southborough	
Westborough	Sue Abladian
Wrentham	
Central Massachusetts RPC	Mary Ellen Blunt
Executive Office of Transportation	Ed Carr, Ethan Britland
495 MetroWest Corridor Partnership	Adam Ploetz
MAGIC (MAPC)	Donald Wheeler
MBTA	
Metropolitan Area Planning Council	Wendy Ingram
MetroWest Chamber of Commerce	
MetroWest Growth Management Committee	Margaret Sleeper, John Stasik
MetroWest/495 TMA	Michelle Brooks, Susan Tordella
SWAP (MAPC)	Paul Yorkis
Worcester Regional Transit Authority	
General Court	
Senator Karen Spilka's Office	Mary Anne Padien
MPO Staff	Cathy Buckley Lewis, Heather Ostertog

Notes

I-495 Transit Study Task Force

Tuesday, April 24, 2007

9:30 A.M., 1671 Worcester Road, Framingham

Cathy Buckley Lewis, Project Manager, opened the meeting and gave a brief overview of the findings of the I-495 Transit Study. She then asked for any comments.

Mary Ellen Blunt: An issue, which the study cannot solve, is that there really is no long-term stable funding. Note in the report that federal funds are not available for operating costs except for ADA and preventive maintenance. The question remains, what is society willing to pay?

Paul Matthews: Update information on new RTA and on GATRA activity. LIFT cost data may be out of date – don't have to update, just note date of numbers.

Paul Yorkis: Communities are joining GATRA at no local cost. Medway planning a shuttle bus to begin September 4. The destination is the Dean College/Downtown Franklin MBTA train station. The first six months will possibly be free.

CBL noted that, after approval by the Transportation Planning and Programming Committee, copies of the final report will be sent to each community in the study area. Request made to send a copy to the MassHighway District Office.

Clinton Bench: Phase III of the Suburban Transit Study is now underway. In response to a question, he said that CTPS does service planning for the T, under contract. Discussion of what role Boston Region MPO staff might play in providing support to MetroWest RTA.

Ethan Britland: Noted CMAQ (Congestion Mitigation and Air Quality) funds. Jim Gallagher said CMAQ money already well spoken for within Boston MPO. Ethan noted that a project deemed more deserving could bump others in line waiting for those funds. Clinton mentioned Suburban Mobility funds, currently \$750,000 per year, and Transportation Demand Funds, at \$250,000 per year.

Jim Gallagher: Send requests for UPWP projects soon. Draft list of projects will go out in June.

EB said the comparison of the study area to the core area should be highlighted more in the report. (Data are in Appendix C).

Mary Anne Padien questioned whether Table 7 (% of workers from within the community and % from other than top 10) included Framingham. Yes, as a destination of study area residents, and as an origin of study area workers.

CBL asked members to get comments on draft in by Monday, April 30.

**I-495 Transit Study Task Force Meeting Attendance
Tuesday, April 24, 2007, 9:30 AM**

Task Force Member	Representative(s)
Bellingham	
Franklin	
Hopkinton	
Hudson	Michelle Ciccolo
Marlborough	Walter Bonin
Medway	
Southborough	
Westborough	
Wrentham	
Central Massachusetts RPC	Mary Ellen Blunt
Executive Office of Transportation	Ethan Britland
I-495 Arc of Innovation	Paul Matthews, Adam Ploetz
MAGIC (MAPC)	
MBTA	
Metropolitan Area Planning Council	Jim Gallagher
MetroWest Chamber of Commerce	
MetroWest Growth Management Committee	Donna Jacobs
MetroWest/495 TMA	Michelle Brooks, Susan Tordella
SWAP (MAPC)	Paul Yorkis
Worcester Regional Transit Authority	
General Court	
Senator Karen Spilka's Office	Mary Anne Padien
MPO Staff	Cathy Buckley Lewis, Clinton Bench

APPENDIX B

Summary of Previous Studies

Summary of Previous Studies

The documents below were reviewed for this I-495 transit study. They are listed in chronological order, with the most recent first.

1. *Suburban Mobility, Phase II*, CTPS, December 2005
2. *Marlborough Public Transportation Study*, Planners Collaborative, Aug. 2005
3. *Five-Year Transit Service and Capital Plan for the Massachusetts Regional Transit Authorities*, Urbitran, June 2005
4. *Worcester Comprehensive Service Design*, Urbitran, May 2005
5. *EO418 Framingham Study*, MAPC, June 2004
6. *Suburban Transit Opportunities Study*, CTPS, January 2004
7. *Feasibility Study for a Regional Transit Authority*, Multisystems, February 2003
8. *Traffic Congestion in the Southwest Advisory Planning Subregion*, CTPS, October 2002
9. *MAGIC Subregional Area Study – Phases I and II*, CTPS, February 2002; May 2004
10. *MBTA Reverse Commuting Study*, CTPS, May 2001
11. *Congestion in the MetroWest Area*, CTPS, September 2000
12. *Estimating Demand for MassHighway Park-and-Ride Lots*, CTPS, July 1999
13. *MetroWest TMA Proposed Bus Routes*, CTPS, April 1999
14. *Suburban Public Transportation*, CTPS, August 1998
15. *Central Massachusetts Commuter Rail Feasibility Study*, CTPS, September 1996

Below are summaries of those portions of the above studies that were deemed relevant to the present project.

1. *Suburban Mobility, Phase II*, CTPS, December 2005

- Census tracts located in the I-495 transit study area that showed potential for future transit services, based on socioeconomic factors, were located in Franklin, Marlborough, and Milford.

2. *Marlborough Public Transportation Marketing, Planners Collaborative Inc.*, August 2005

Recommendations for Meeting Unmet Public Transportation Demand

- **Transit Coordinator** – City of Marlborough should work with Metro-West communities to designate a Coordinator for Public Transit service to coordinate all local, fixed-route, and Boston-bound commuting services.
- **Ensure Stable Funding through Leadership** – Identify stable funding and work collaboratively with local paratransit and local/commuter bus service.
- **Improved Service Coordination** – Upgrade the existing bus stop on Bolton Street at Route 20 into a transit center, establish a brokerage of local services in coordination with surrounding communities, explore opportunities for providing more frequent LIFT service, and work with the MBTA to improve schedule and fare coordination for service from Marlborough Center to Boston.

3. Five-Year Transit Service and Capital Plan for the Massachusetts Regional Transit Authorities, Urbitran, June 2005

- Report provided details on recommended strategies for all Massachusetts regional transit authorities

4. Worcester Comprehensive Service Design, Urbitran, May 2005

Selected Items from Marketing Plan for the Worcester Regional Transit Authority (WRTA)

- Community outreach through housing associations, ethnic groups, religious organizations, educational facilities, and neighborhood groups
- Implementation of school pass program
- Targeting temporary employment agencies

Socioeconomic Characteristics

- Notable high-density census blocks without WRTA services include central Marlborough and a small pocket in Westborough.
- Westborough and Marlborough have census tracts with “higher” population densities
- Zero-car households make up a significant (15%–30%) portion of the population in Marlborough
- Wealthiest households are found in Southborough and western Westborough, with median household incomes over \$100,000

Selected Major Employers Not Served by WRTA

- EMC Corporation in Hopkinton, with 5,500 employees
- PFPC Inc. in Westborough, with 1,500 employees
- Milford-Whitinsville Regional Hospital in Milford, with 1,300 employees
- AstraZeneca in Westborough, with 950 employees
- Suburban Staffing in Westborough, with 832 employees
- Waters Corporation in Milford, with 800 employees
- Verizon Communications in Marlborough, with 723 employees
- Pinkerton Corporation in Westborough, with 600 employees
- UMASS Memorial-Marlborough Hospital in Marlborough, with 568 employees
- New England Center for Children in Southborough, with 550 employees
- Solectron Massachusetts in Westborough, with 535 employees

Selected Places to Add to WRTA System Based on Customer Survey Responses

- Solomon Pond Mall
- Downtown Marlborough
- Downtown Framingham
- I-495/Route 9 Industrial Parks
- Westborough Station

Activity Centers That Warrant Consideration for WRTA Service

- Employers with 400+ employees on one site
- Shopping centers with 60,000+ square feet of leased retail space

- Colleges and post-secondary schools with 1,000+ enrolled students
- Hospitals and nursing homes with 100+ beds
- Social service centers and government agencies that serve 100+ clients a day

5. Town of Framingham - Community Development Plan, Executive Order 418, MAPC, June 2004

Transportation Action Recommendations to the Town of Framingham

- Explore options to re-route LIFT service to provide better access to additional job sites on Route 9 and increase service hours to provide better access to jobs on existing LIFT routes
- Work with the MBTA to lower one-stop commuter rail fares to improve access to jobs in Ashland and Natick and support reverse-commute efforts in order to provide better access to jobs in downtown Ashland
- Continue efforts to develop rail trails and other non-SOV modes
- Continue planning efforts on the Route 126 train crossing to alleviate downtown bottleneck
- Support downtown development (Route 126/135 crossing), access to transit, and congestion reduction

6. Suburban Transit Opportunities Study, CTPS, January 2004

Successful Suburban Transit: Common Attributes of Success

- Focus the transit service on activity hubs: “People” hubs (such as employment or shopping centers) or “transit” hubs such as a commuter rail station
- Aggressive marketing: targeted, customer/consumer-focused service, specialized or niche markets (i.e., elderly or commuters) are critical
- Linkage to larger services: provide connections to established transit systems
- Ensure cost-effectiveness: emphasis on smaller vehicles for demand-responsive or flex-route-type systems
- Involve transit planners in the land use planning process as early as possible
- Transit-oriented development
- Think like a business
- Customer service
- Have a mission statement
- Reliability
- Image – Clean vehicles, tables on the vehicles, free newspapers, possibly free coffee and donuts one day a month
- Net cost per passenger-trip after the first year of operation should be between \$2.00 and \$5.00.

Employer Shuttle Success

- Public/private partnerships
- Community support
- Effective marketing
- Geographic conditions – employer located close to transit and congested roadways

- Employer support obtained during the initial planning process

Findings of the Suburban Transit Service Passenger Survey – General-Purpose Systems

- Surveys taken on the following transit services: Beverly Shopper’s Shuttle, Burlington B Line, Dedham Bus, Natick Neighborhood, and Framingham LIFT system (except the discontinued LIFT #4)
- 90% of passengers reported trip origins and 93% reported destinations in municipalities served by their route
- Low levels of transfers between suburban services and MBTA rail or bus routes can be attributed at least in part to lack of schedule coordination and the need to walk some distance from stops to the transfer point
- Trip purposes: 41% home-based-work; 27% home-based-shopping; 15% home-based-other
- Reasons for using the service: 51% – only transportation available; 43% – convenience; 19% – inexpensive way to travel
- Age of riders: 6% under 17 years old; 26% over 65 years old
- Household income of riders: 56% under \$20K; 4% over \$80K
- How riders learned of service: 41% from friends and family; 39% from seeing a vehicle on the route; 6% from newspapers; 3% from the Internet

Findings of the Suburban Transit Service Passenger Survey – Feeder Systems

- Surveys taken on the following transit services: Route 128 Business Council’s Alewife and Needham shuttles, Neponset Valley TMA’s Rail Link #2, MetroWest/495 TMA’s Southborough Rail Link, Peabody Transit Commuter Shuttle, Clock Tower Place Shuttle, and the discontinued LIFT #4.
- 90% of outbound AM riders transferred from commuter rail, rapid transit, or an MBTA bus. The remaining 10% accessed the feeder service by walking, biking, or being dropped off.
- 41% of outbound AM riders started their trip in Boston, 12% started their trip in Cambridge, and 9% started their trip in Somerville.
- 97% of outbound AM passengers were going from home to work
- Reasons why outbound AM passengers use the service: 49% – “only transportation available”; 17% – “convenience”; 17% – “avoid traffic/driving”
- Age of riders: 34% are between 18 and 24 years old, and 42% are between 25 and 34 years old
- Household income of riders: 42% above \$80K; 70% above \$40K; 9% under \$20K
- How riders learned of service: 82% through employers

Summary and Conclusions regarding Specific Services

- 128 Business Council’s Alewife Shuttle
 - Shuttles can work well in areas with heavily congested roadways
 - Work with area developers early in the process
- The Burlington Bus B Line
 - Long, one-way loop routes succeed in bringing bus service to within a reasonable walking distance of most origins or destinations in one town, at the expense of travel times. Therefore they generally attract riders with no other mode of transportation available or those who do not use travel time as a deciding factor.

- Use marked stops
- Coordinate stops with other transit services
- Natick Neighborhood Bus
 - Seek to maximize ridership by including segments of the population other than the transit dependent
 - Avoid inadvertently "branding" the service (i.e., for the elderly or for the economically disadvantaged)
 - Utilize "shared town resources" (i.e., may be able to share town maintenance lots, etc.)
 - Buses must be on time
 - Utilize the smallest vehicle possible
 - Revenue - seek contributions and offer advertising on the bus
 - Have a consistent, electronic means of storing and retrieving data

Other Findings and Recommendations

Define the purpose of the suburban transit system

- Human services
- Congestion reduction

Massachusetts has many small, compact town centers that provide clusters of commuter destinations.

Subscription bus service can succeed when there is a need for more parking at a commuter rail station but the construction of more parking is infeasible.

Flex-route, demand-response, employer-shuttle, and feeder systems have shown the ability to effectively compete for small markets in suburban environments.

When predicting the market for potential services, it is important to consider the characteristics of the specific routes under consideration rather than relying on generalities.

Charts Presenting Recommended Processes and Techniques

Detailed Mission Analysis

Analysis Step	Aspects	Examples
Demographics: Identify market to be served based on the mission statement.	Who are the customers? Where do they live? How many are there?	Seniors, commuters, transit-dependent, expected number of riders
Identify the nature of travel.	Why, when, where are they traveling?	Trip purpose: medical, shopping, recreation, school, work, etc.
Identify the destinations.	Focus on hubs (activity centers)	Hospitals, malls, transfer points, office parks, etc.

Course of Action Development

Step	Action	Description
Identify capacity needs.	How many seats and trips are needed?	Type of vehicle; frequency of service
Calculate costs and budget.	Capital, operational, maintenance, overhead, marketing, etc.	Develop budget.
Identify funding sources.	Government funding, corporate partnerships, fare box	List detailed sources and amounts of funding, and whether guaranteed.
Develop course of action (COA).	Identify the type of service appropriate for the market and budget. Create two or three detailed plans.	Circulator, demand-responsive, employer shuttle, bus, mini-bus, van
Analyze COAs	Model or “war game” them.	Run through iterations to show how system would operate, and the cost.
Choose COA and present to decision makers.	Choose COA that best meets the goals and customers’ needs. Present COA to stakeholders for comments/approval.	Choice will often be budget vs. public need.

Marketing Techniques or Items

Priority	Technique or Item	Description
Must have	Ride schedules and route maps; clearly marked bus stops; employer/business outreach; working relationships with land developers; brand image.	Distribute schedules and maps widely; ensure that stops are well-marked and present attractive high-quality appearance; contact local businesses to seek partnerships.
When Available	Display vital information on town website; attend community events.	Display routes, schedules, contact numbers; maintain a high level of visibility and service.
If budget allows	Newspaper/media advertising; agency-specific website; wrapped vehicles; Rider Appreciation Day	Agency having its own Web presence is helpful; paint buses in noticeable ways, which can be used for advertising for sponsors; provide free rides and gifts promoting the service.

7. Feasibility Study for a Regional Transit Authority, Multisystems for EOTC, February 2003

Several sources of data were used to identify potential transit markets in the MetroWest communities, including:

- 1990 and 2000 census data

- 1990 and 2000 employment data from the Massachusetts Division of Employment and Training
- 1995 trip productions and attractions from the CTPS regional travel demand model for work trips and all trips
- 1995 employment data from the CTPS model
- 2000 employment data estimates from the CMRPC regional travel model
- 1990 journey-to-work data updated with year 2000 employment data
- Interviews with providers of existing transportation services
- Discussions with MetroWest community leaders about transit needs and employment locations
- Information on employers and planned development from the MAPC and the MetroWest Growth Management Committee, and the Marlborough, MetroWest, and Worcester Chambers of Commerce

Maps Produced

- Town demographics
- Employment density
- Locations of major employers in the area
- Most densely developed areas

Work Trip Observations in the MetroWest Area

- On average, 60% of the work trips that leave each MetroWest community are attracted to locations outside the MetroWest area.
- Most “other home-based trips” (from home to places other than work) in Framingham, Natick, Westborough, Marlborough, and Hudson remain within the community. Most of the trips that leave the community are attracted to areas outside of MetroWest. Adjacent communities, Boston, and Cambridge continue to be important destinations for trips from MetroWest cities and towns.
- The largest flows of all home-based trips that are produced in MetroWest communities and are attracted to locations within MetroWest are between Framingham and Natick, from Marlborough and Ashland to Framingham, and from Marlborough to Hudson.
- Framingham, Natick, and Marlborough attract the highest number of work trips, followed by Hudson and Westborough.
- Only 1% to 2% of all home-based, nonwork trips attracted to MetroWest come from Boston and surrounding communities. Around 30% come from other suburban communities or Worcester.
- With respect to other home-based trips, Framingham, Natick, and Marlborough attracted the highest numbers, followed by Westborough and Hudson.
- More of the trips attracted to each MetroWest community come from other cities and towns than from within the community. This also applies to work trips.
- The number of nonwork trips attracted to MetroWest communities from Boston is about four times higher than work trips.
- A conclusion of all these observations is that trip-making to and from the MetroWest area is highly spread out. These trip patterns are a great challenge to serve effectively with transit.

Types of Trips for Which Transit Service Would Be a Reasonable Option in the MetroWest Region

- Local trips of all types, but especially work, shopping, and medical trips, particularly in communities outside of Framingham and Natick
- Intertown trips, especially trips from other communities to Framingham, Natick, and Marlborough
- Reverse-commute trips from Boston and other locations
- Boston-bound commuters from MetroWest cities and towns

Types of Riders Who Might Use Transit

- MetroWest residents who work in MetroWest employment centers, particularly those located in Framingham, Natick, Marlborough, Hudson, and Westborough
- Reverse commuters
- Seniors, persons with disabilities, teenagers, individuals without access to a car, and other residents who choose not to drive or do not have the option of driving. These individuals are concentrated mainly in Framingham, Natick, Marlborough, and Hudson.
- Residents in communities that receive LIFT service (outside of Framingham and Natick) who are not able to use an accessible, fixed-route system due to a disability

Transportation Service Needs and Concerns Identified by MetroWest Community Representatives

- Ashland – to nearby major employers, such as TJX, for employees during the day, for seniors, and service to and from rail stations
- Framingham – connections between downtown Natick and Framingham along Route 135, maintenance of midday LIFT service, more direct service to 9/90 Corporate Center and Framingham Technology Park, more frequent LIFT service, Framingham shopping shuttle, Saturday LIFT service, service to Framingham State College, service along Route 9, and service to and from rail stations
- Hopkinton – shopping, health care, employment, and recreation trips along I-495 and Route 9; to hospitals in Milford, Framingham, and Marlborough; service to Senior Center, to and from rail stations, and to major employers (i.e., EMC)
- Hudson – out-of-town service to Natick Mall, Marlborough shopping and health care locations; service to vocational and parochial schools; local circulator service to downtown, shopping, and health care facilities; service for people with disabilities and for teenagers; and additional service for seniors
- Marlborough – increased level of service and access to Worcester for seniors; service to employers in the I-495 corridor; work trip options for teenagers; and service to and from rail stations
- Natick – service to employers (Apple Hill, TJX, Staples, Boston Scientific, 9/90 Corporate Center), connections to Marlborough and I-495 corridor, and remedy inadequate parking at Natick Center and West Natick rail stations
- Southborough – service for reverse commuters (EMC), service for seniors, and reduce congestion
- Westborough – more routes and destinations (including out-of-town locations) for senior transportation, service along I-495 corridor, intertown service, and service to and from rail stations and EMC

8. Traffic Congestion in the SouthWest Advisory Planning Subregion, CTPS, October 2002

- Bellingham, Franklin, Holliston, Hopkinton, Medway, and Wrentham are not affiliated with a regional transit authority.
- Milford is affiliated with the MBTA and is served by the Franklin Line.
- LIFT service, operated by the Town of Framingham, provides service from Milford to shopping on Route 9, Framingham Technology Center, local medical centers, and Framingham town center. Two other LIFT routes serve Hopkinton and Holliston.
- No shuttle bus systems operate in the SWAP region. The formation of shuttle bus systems could serve transit stations and park-and-ride lots for commuters going to major and medium employment centers. The availability of ample free parking at major employment centers is a major limiting factor to the success of such a service.

Locations for Potential Park-and-Ride Lots in the SWAP Region

- Milford at I-495 Exit 19
- Milford at I-495 Exit 20
- Hopkinton at I-495 Exit 21

Existing Industrial and Office Parks in the SWAP Region

- Industrial Road Office Park – Industrial Road, Wrentham
- Cushing Drive Industrial Park – Cushing Drive, Wrentham
- Wrentham Village Premium Outlet – 1 Premium Outlet Boulevard, Wrentham
- New England Industrial Park – Bartzak Drive, Holliston
- Lowland Industrial Park – Lowland Street and Jeffrey Avenue, Holliston
- Hopping Brook Industrial Park – Hopping Brook Road, Holliston
- South Street Industrial Park – South Street, Hopkinton
- Granite Industrial Business Park – Fortune Boulevard, Milford
- Bear Hill Industrial Area – Maple and Beaver Streets, Milford
- Forge Park Industrial Area – Forge Parkway, Franklin
- Grove Street Corridor – Grove Street, Franklin
- Bellingham Corporate Park – Constitution Boulevard, Bellingham
- Central/Depot Street Industrial Area – Central and Depot Streets, Milford
- Summer Street Industrial Area – Summer Street, Milford

9. MAGIC Subregional Area Study, Phases I and II, CTPS, February 2002, May 2004

- In the MAGIC subregion, suburban transit potential lies with employers that need to provide transportation for their employees because of parking constraints and recruitment of clerical or maintenance staff.
- MAGIC representatives are interested in the expansion of park-and-ride opportunities; a new train station in Littleton at Route 2 and I-495; and advancement of bikeways.

Characteristics of Successful Nontraditional Commuter Rail Access Alternatives

- Operation on the local level – initiation by town managers or by a committee set up exclusively for this purpose
- Strong local support and commitment – support by citizens, local businesses, and town interests

- Station location convenient for patrons – the most successful feeders operate to and from train stations that are located within business or activity areas
- Service that is limited to a narrow radius around the station, ideally no more than a mile. It is essential that the feeder service is reliable in arriving at the train station on time and is coordinated with the train schedule. One-way trip times should be no more than 10–15 minutes. If the shuttle is serving a single lot, the lot should be within a 15–minute trip time.
- Commuter willingness to pay premium fares for premium services – find a niche market tailored to individual commuters
- Potential for combining with other services – use a town-owned vehicle that is used for other purposes during off-peak, noncommuting hours

Types of Parking Lots That Can Be Used for Satellite Commuter Rail Parking

- Churches and synagogues that do not offer day care or school-related activities
- Shopping plazas with supermarkets
- Country clubs and golf courses
- Fraternal organizations such as the Elks, Knights of Columbus, etc.
- “Big-box” retail stores
- Movie theaters
- The best candidates for satellite parking areas are sites that have surplus parking capacity and are located within a quarter mile of a station.

10. MBTA Reverse Commuting Study, CTPS, May 2001

- The best ridership potential for connecting service in the I-495 corridor appears to be from Southborough Station to employment areas in Marlborough.
- Even with additional reverse-commuting trips on commuter rail, few Boston and Cambridge residents would take advantage of service to suburban locations that are more than a 30-minute train ride from downtown terminals.

Challenges to Increasing the Number of Reverse Commuters on Commuter Rail

- At the Boston end, most residential areas are beyond walking distance from commuter rail stations, therefore requiring the use of one or more connecting services for access.
- At the suburban end, most work sites are beyond walking distance of the stations, therefore requiring the provision of connecting van or bus service.
- Local TMAs or individual employers are better suited than the MBTA for providing suburban connections.
- Even if a major employment site is close to a rail station, it may be impossible to offer service that includes convenient arrival and departure times for a large number of workers.
- The existing commuter rail fleet is heavily utilized during peak commuting hours in the peak direction, not the reverse-commute direction. Reverse-commute trains are mostly available to provide service for inconvenient times for work.
- Revising the schedule to allow the operation of reverse-commuting trips at more useful times would force some peak-direction trips to be changed to less convenient times for the peak-period direction.

- If new equipment is acquired for reverse commuting, it would be underutilized and would impose a problem with storing capacity.
- Furthermore, adding reverse-commute trips would affect peak-period trains where there is single-track operation.

11. Congestion in the MetroWest Area, CTPS, September 2000

Most Successful Application of Employer Shuttle Services

- Coordination of public transit services and schedules with privately operated vans and buses
- Strong institutional and financial support from employers
- Effective marketing program for shuttle services
- When the geography is right, frequent commuter-rail or express-bus service in a congested highway corridor; a seamless, low-cost transfer to a shuttle bus; and a direct route to major employment concentrations within a 20-minute (maximum) bus ride
- Ride-sharing initiatives, including carpooling, vanpooling, and shuttle connections to nearby rail stations and long-distance bus stops, offer much better trip-reduction possibilities than do new transit services, for most MetroWest employer locations.

Other Suggestions

- Shuttles from commuter rail stations to downtown centers, office parks, and colleges
- Shuttles from middle and high schools to jobs for teens, school activities (i.e., sometimes fields for after-school sports are not at the school)
- Service to hospitals, nursing homes, low-income housing, apartment complexes, libraries, shopping centers, parks, town offices, and park-and-ride lots
- Service to/from Riverside, Alewife, and Forest Hills Stations
- Reverse-commute service from Franklin and Southborough commuter rail stations

12. Estimating Demand for MassHighway Park-and-Ride Lots, CTPS, July 1999

The Three Most Relevant Variables When Assessing Demand for a Park-and-Ride Lot in Massachusetts

- Distance from a highway
- Number of weekday bus trips to Boston between 5:30 and 8:30 AM
- Commuter rail availability in the community or an abutting community

Guidelines for Locating New Park-and-Ride Lots

- Lots should be located in communities that do not have competing commuter rail service.
- If a community has commuter rail service or service in an abutting community, a park-and-ride lot can be considered if the rail parking lot/garage reaches capacity very early in the weekday AM peak period and it is not possible to expand capacity at commuter rail lot.
- Park-and-ride lots should have bus service to Boston or another major employment centers.
- Lots should be located close to a radial highway or to a circumferential highway that is relatively close to the intersection of a radial highway.

- Lots should be located so as not to overlap the market areas of other lots

13. MetroWest TMA Proposed Bus Routes, CTPS, April 1999

Improve Transit Service Incrementally through the Following Strategies

- Additional support to existing LIFT services through the available funding channels
- Intensive efforts at vanpool marketing and coordination, through the TMA
- Continued operation and expansion of the employer-sponsored van shuttles to and from the Route 9 park-and-ride lot

14. Suburban Public Transportation, CTPS, August 1998

Characteristics of an Environment to Make Fixed-Route Public Transportation Successful

- Density
- Good walking environments
- Mix of land uses

Minimum Densities to Support Fixed-Route Transit Service

Service	Residential Density	Size of Employment Center
1 bus/hour	4–6 dwelling units/acre	20–32k employees
1 bus/30 minutes	7–8 dwelling units/acre	32–80k employees
1 bus/10 minutes	15 dwelling units/acre	80–200k employees

Walking is a part of almost every transit trip. People want their walking trips to be safe and interesting, separated from traffic, with other people around, with well-lit and well-maintained sidewalks and streets, and with safe places to cross the street.

Mixed land use is important because many trips are actually trip chains: a series of trip purposes linked together.

In areas that do not have the requisite density or provide a suitable walking environment, and do not have a mix of land uses, traditional fixed-route transit service will not be attractive to people with other options and so will carry primarily the transit-dependent.

Having travel demand in both directions greatly improves the cost-efficiency of the service.

Carpools and vanpools may have a greater chance of being successful than a traditional fixed-route transit service and sometimes serve as a “precursor” to bus service.

Requirements for success:

- Large number of jobs in an employment center
- Dense travel corridor
- Park-and-ride facilities with easy access from the road network
- Sufficient distribution mechanisms
- Some advantage of taking transit over driving alone

Increased transit service could have a significant positive impact on mobility in the suburbs. The growth in the number of senior citizens throughout the region and the increased need for low-income inner-city residents to be able to reach suburban jobs both argue in favor of expanded service.

Employers, TMAs, and local officials know best what new services are needed.

Cooperation among employers, and between employers and their employees, could make transportation options more viable. The worse congestion gets, the more likely it will be that such cooperation will increase.

15. *Central Massachusetts Commuter Rail Feasibility Study, CTPS, September 1996*

A central Massachusetts commuter rail expansion to I-495 in Berlin, Main Street at Kane Industrial Drive in Hudson, or South Sudbury would be feasible from an operations standpoint, but would produce limited benefits for the cost involved. At current (1996) levels, 1,300 riders in each direction would ride trains to or from the I-495 expansion area. Of these, 580 would be former auto drivers or passengers. The remainder would be diverted from other transit services.

APPENDIX C

Market for Suburban Transit

Market for Suburban Transit

Two reasons that one might advocate for transit are to reduce traffic congestion and to provide mobility. The emphasis in this study is on the latter. Those who now drive and would divert to transit are likely to be too small a group to have a significant impact on traffic congestion in the area. This appendix discusses why this is likely to be the case.

Suburban transit provides a vital service in providing mobility to those who need it. According to the Suburban Transit Service Passenger Survey, 51% of the riders surveyed had no other transportation options.²⁴ People who will constitute the primary market for transit include, for example, the elderly who have lived in the study area a long time and now find themselves unable to drive. It includes people with low incomes who have found housing they can afford but who do not own automobiles. It includes people too young to drive: teenagers who need to get to jobs and to get home from school events. It includes individuals with disabilities.

Cost to the Individual

An important consideration when an individual makes a choice of what travel mode to use is the cost, in terms of time and money. Trip times using transit are usually longer than those made in private motor vehicles. The transit trip maker must take time to reach the station or stop, wait for the transit vehicle, be on a vehicle that makes stops along the way for other patrons, and then disembark and take time to reach the final destination. Transit trip time can compete with motor-vehicle time under some circumstances. The best transit scenario is one where the patron can reach the transit service quickly, where there is a stop very close to the patron's final destination, where there are few stops along the way, and where the trip is made on a separate right-of-way (rail or high-occupancy-vehicle lane) that bypasses a congested highway corridor.

The out-of-pocket cost for a transit trip is the fare and possibly a parking fee. For a motor-vehicle trip, it is the cost of gasoline, tolls, and parking. According to figures from the American Automobile Association (AAA), the marginal cost to drive a vehicle, even including maintenance costs, is less than \$0.20 per mile, while the capital cost is twice that.²⁵

A Franklin resident working in Boston, for example, could drive 30 miles (the shortest distance) each way for an approximate cost of \$12 per day, or about \$250 per month. This is comparable to a zone 6 monthly pass, which costs \$223. If the motorist drove a longer but presumably faster route using limited-access highways, including a toll facility, the cost would be higher.

While the above considerations apply to both urban and suburban areas, parking is a factor that is significantly different in these two areas. Parking costs can vary from nothing (not needed, free,

²⁴ *Suburban Public Transportation*, CTPS, August 1998.

²⁵ According to AAA, the capital cost of a car is about \$0.40 per mile. This includes purchase or lease expenses, taxes, and insurance, and assumes 15,000 annual miles driven. Gasoline would have to cost about \$9.00 per gallon for the marginal cost per mile to equal the fixed cost per mile (still assuming 15,000 miles driven per year).

or paid for by another party) to over \$20 per day. Those who work in suburbia usually pay nothing for parking. Most working in dense urban areas do not receive free parking.²⁶

Area Factors Affecting Transit Use

The above discussion concerned decisions made at the individual level. Suburban areas present a greater challenge than cities in capturing transit trips. One factor is parking, as mentioned above, which is not only more often free in suburbia, but also more plentiful than in urban areas. Another factor is how compact buildings are in an area and therefore how much a motor vehicle would be needed. Using a work trip as an example, other places one wishes to go besides the work place (day care, restaurants, drug stores) are more likely to be within walking (or bicycling) distance in cities than in suburbs.

A final factor is the relative density of residents and employees. The 11 communities composing the study area encompass 352 square miles. That same area, juxtaposed over the densest part of the commonwealth, would cover Boston, Cambridge, Brookline, Somerville, and 17 other communities. Table C-1 compares the population of that metropolitan core area with the study area for 1970, 1980, 1990, and 2000. Figure C1 shows the populations in the study area and in the Boston core area.

Table C-1
Comparison of Populations of the Inner Metropolitan Area of the Boston Region and the Study Area, for the Years 1970, 1980, 1990, and 2000

	Land Area (sq. miles)	Population			
		1970	1980	1990	2000
Inner metro area	352	1,671,479	1,520,946	1,521,440	1,562,669
Study area	352	146,864	158,507	173,188	202,968
Ratio: inner metro/study area	-	11.4	9.6	8.9	7.7

The population in the study area grew by 38% from 1970 to 2000; the inner metropolitan population fell almost 7%. The ratio of people living in the inner core to those living in the study area declined by almost 50% from 1970 to 2000, and has probably declined further since. Nevertheless, in 2000, there were still, on average, almost eight times as many residents per acre in the inner metropolitan area as in the study area.

Table C-2 and Figure C-2 indicate employment comparisons. The comparative change in employment is even more dramatic. Employment in the study area grew by 275 percent during those same 30 years, while jobs in the inner core grew by 31 percent. In 1970, there were 22 jobs in the core area for every job in the study area. By 2000, that ratio was less than 8 to 1.

²⁶ Many urban residents have to pay for parking where they live. This expense is one factor that leads some to forego private automobile ownership altogether, using Zipcar or conventional rental vehicles as needed.

FIGURE C-1
Comparison of Population between Study Area and Metropolitan Boston Core

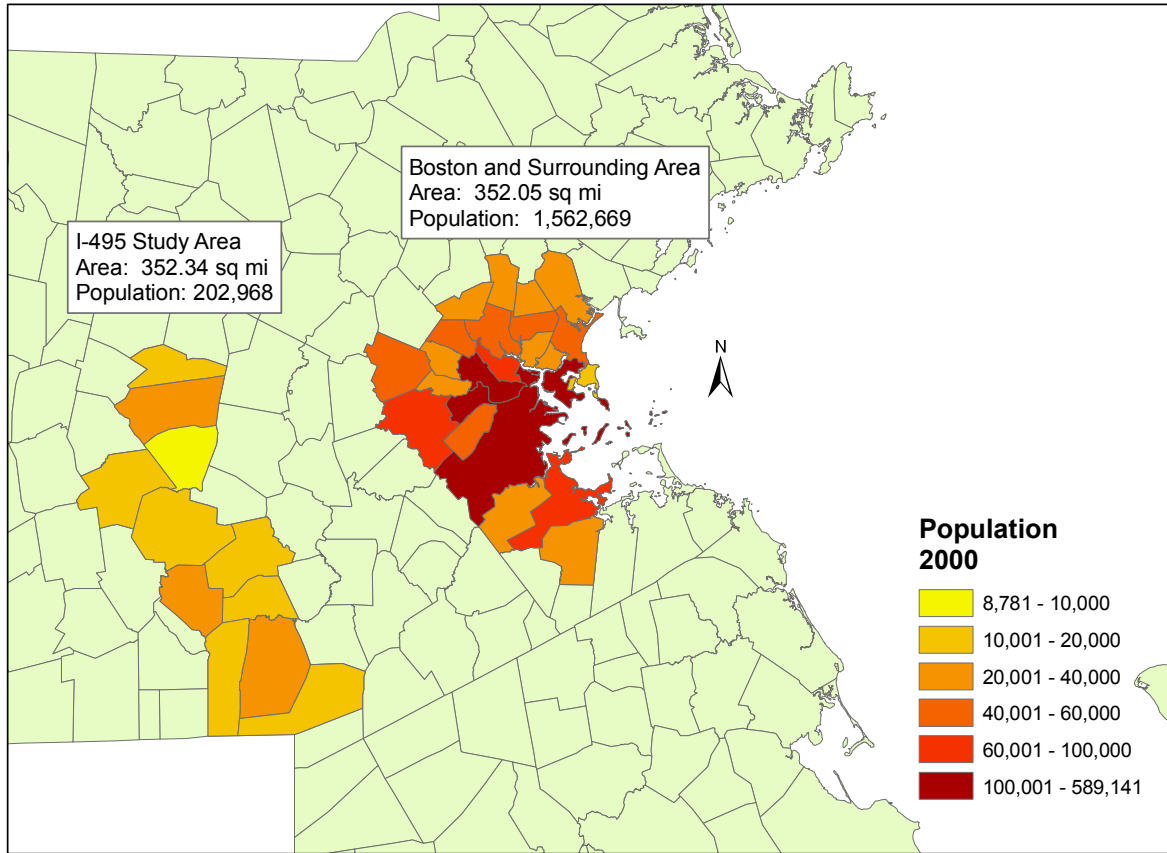


FIGURE C-2
Comparison of Employment between Study Area and Metropolitan Boston Core

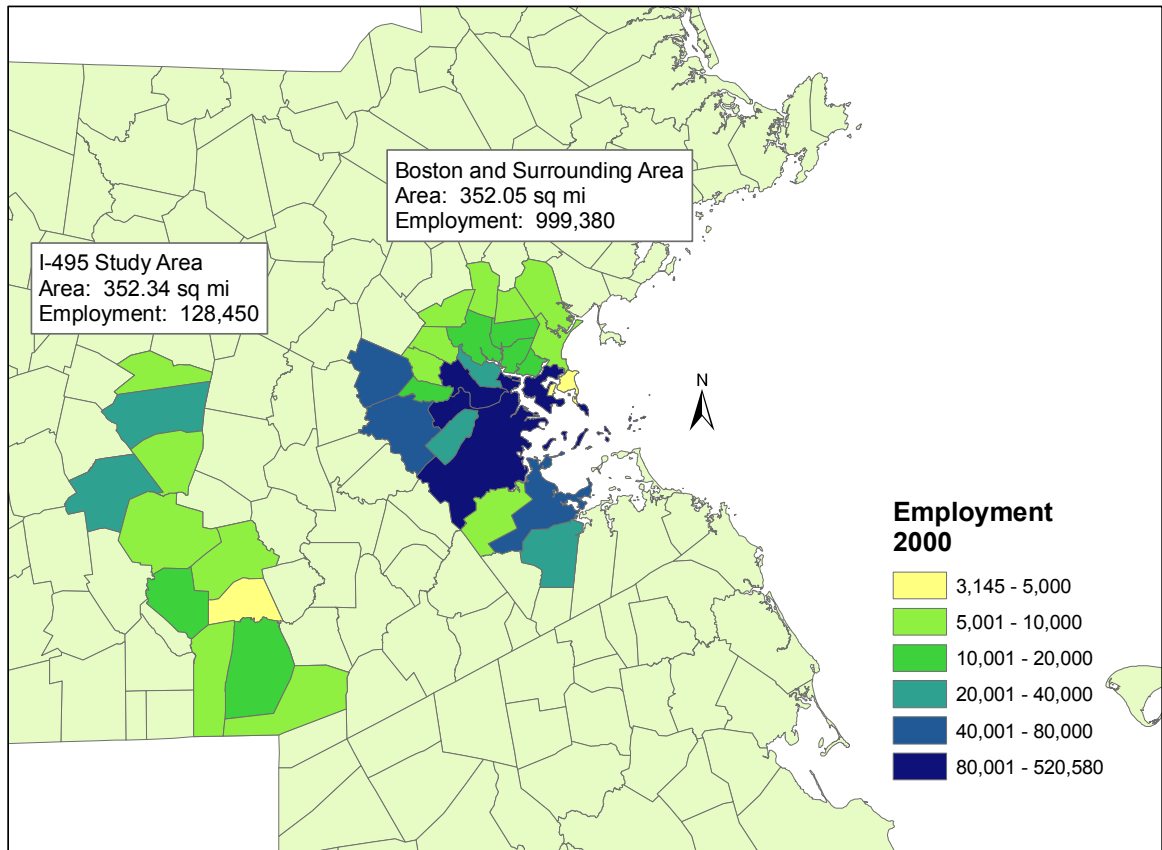


Table C-2
Comparison of Employment in the Inner Metropolitan Area of the Boston Region and the Study Area, for the Years 1970, 1980, 1990, and 2000

	Land Area (sq. miles)	Employment			
		1970	1980	1990	2000
Inner metro area	352	763,304	866,771	971,000	999,380
Study area	352	34,173	56,848	97,160	128,450
Ratio: inner metro/study area	-	22.3	15.2	10.0	7.8

According to year 2030 projections developed by MAPC, population in the inner metropolitan area is forecast to grow 6.6% from 2000. The study area population is forecast to grow 18.8% during those 30 years.²⁷ This results in a population ratio between the inner metropolitan area and the study area of 6.9. For 2030 employment, the inner metropolitan area is forecast to see a 12.8 % increase; the estimated growth for the study area is 14.0%.²⁸ This yields a 7.7 ratio of the inner metropolitan area to the study area.

While jobs and residents continue to come into the study area, bus routes in the inner metropolitan area, on average, have eight times as many people who live or work within walking distance than would be the case in the study area. This does not mean that transit is not viable in the suburbs. It does mean that suburban routes would not be able to run as frequently as those in more densely packed areas, or would require higher subsidies.

Suburban transit service can be attractive to many motorists, if it is reliable and efficient. Also, the higher that out-of-pocket driving costs are, the more competitive and desirable transit becomes. Higher gasoline prices (either through taxes or market forces), higher tolls, tolls on more highways, and the elimination of free parking would increase the cost of driving. Other available measures are congestion tolling; more park-and-ride lots; high-occupancy-vehicle lanes for carpools, vanpools, and buses; and free or subsidized transit passes.

²⁷ The 2030 forecasts of population are 1,666,490 for the inner metropolitan area and 241,217 for the study area.

²⁸ The 2030 forecasts for employment are 1,127,353 for the inner metropolitan area and 146,494 for the study area.

APPENDIX D

Service Schedules

MBTA Commuter Rail

Worcester/Framingham

Franklin

LIFT

Table 1 Worcester/Framingham Line Weekday Schedule, Inbound

Worcester	Grafton	West-borough	South-borough	Ashland	Framing-ham	West Natick	Natick	Wellesley Square	Wellesley Hills	Wellesley Farms	Auburn-dale	West Newton	Newton-ville	Yawkey	Back Bay	South Station
					6:05 AM	6:09 AM	6:14 AM	6:19 AM	6:22 AM	6:25 AM	6:29 AM	6:32 AM	6:35 AM	6:42 AM	6:48 AM	6:54 AM
6:06 AM	6:18 AM	6:23 AM	6:32 AM	6:36 AM	6:44 AM	6:48 AM								7:10 AM	7:16 AM	7:21 AM
					7:00 AM	7:04 AM	7:09 AM	7:14 AM	7:18 AM	7:21 AM	7:25 AM	7:28 AM	7:31 AM	7:37 AM	7:44 AM	7:49 AM
6:38 AM	6:50 AM	6:55 AM	7:04 AM	7:08 AM	7:18 AM	7:22 AM	7:27 AM	7:32 AM	7:36 AM	7:39 AM	7:43 AM	7:46 AM	7:50 AM	7:56 AM	8:03 AM	8:08 AM
7:07 AM	7:19 AM	7:24 AM	7:33 AM	7:37 AM	7:47 AM	7:51 AM	7:56 AM								8:18 AM	8:23 AM
					8:00 AM	8:04 AM	8:09 AM	8:14 AM	8:17 AM	8:20 AM	8:24 AM	8:28 AM	8:32 AM	8:38 AM	8:45 AM	8:50 AM
7:37 AM	7:49 AM	7:54 AM	8:03 AM	8:07 AM	8:15 AM	8:19 AM	8:24 AM	8:33 AM	8:36 AM						8:54 AM	8:59 AM
					8:30 AM	8:34 AM	8:39 AM	8:44 AM	8:47 AM	8:50 AM	8:54 AM	8:58 AM	9:01 AM		9:13 AM	9:18 AM
8:16 AM	8:28 AM	8:33 AM	8:42 AM	8:46 AM	8:54 AM	8:58 AM	9:03 AM	9:08 AM	9:12 AM	9:15 AM					9:33 AM	9:38 AM
10:31 AM	10:43 AM	10:47 AM	10:56 AM	11:00 AM	11:08 AM	11:13 AM	11:18 AM	11:22 AM	11:25 AM	11:28 AM	11:31 AM	11:34 AM	11:37 AM		11:51 AM	11:56 AM
					12:15 PM	12:18 PM	12:23 PM	12:27 PM	12:30 PM	12:33 PM	12:36 PM	12:39 PM	12:42 PM	12:50 PM	12:57 PM	1:02 PM
					2:00 PM	2:03 PM	2:08 PM	2:12 PM	2:15 PM	2:18 PM	2:21 PM	2:24 PM	2:27 PM	2:35 PM	2:41 PM	2:47 PM
2:00 PM	2:12 PM	2:16 PM	2:25 PM	2:29 PM	2:37 PM	2:40 PM	2:45 PM	2:49 PM	2:52 PM	2:55 PM					3:15 PM	3:20 PM
					3:45 PM	3:49 PM	3:53 PM	3:57 PM	4:00 PM	4:03 PM	4:06 PM	4:09 PM	4:12 PM		4:27 PM	4:32 PM
					5:30 PM	5:33 PM	5:38 PM	5:44 PM	5:48 PM	5:51 PM				6:05 PM	6:12 PM	6:17 PM
5:38 PM	5:50 PM	5:54 PM	6:03 PM	6:07 PM	6:15 PM	6:18 PM	6:23 PM	6:27 PM	6:30 PM	6:33 PM				6:47 PM	6:54 PM	6:59 PM
					6:38 PM	6:42 PM	6:47 PM	6:52 PM	6:55 PM	6:58 PM					7:18 PM	7:23 PM
					7:30 PM	7:34 PM	7:39 PM	7:44 PM	7:47 PM	7:50 PM					8:05 PM	8:10 PM
7:40 PM	7:52 PM	7:56 PM	8:05 PM	8:09 PM	8:15 PM										8:48 PM	8:53 PM
11:40 PM	11:52 PM	11:56 PM	12:05 PM	12:09 PM	12:15 PM	12:18 PM	12:21 F	12:24 PM	12:27 F	12:30 F	12:33 F	12:36 PM	12:39 F		12:50 PM	12:55 PM
					12:30 PM										1:00 AM	1:05 AM

Table 2 Worcester/Framingham Line Weekday Schedule, Outbound

South Station	Back Bay	Yawkey	Newton-ville	West Newton	Auburn-dale	Wellesley Farms	Wellesley Hills	Wellesley Square	Natick	West Natick	Framing-ham	Ashland	South-borough	West-borough	Grafton	Worcester
5:10 AM	5:15 AM										5:50 AM					
6:50 AM	6:55 AM							7:15 AM		7:21 AM	7:25 AM	7:30 AM	7:34 AM	7:43 AM	7:47 AM	8:01 AM
7:05 AM	7:10 AM						7:28 AM	7:32 AM	7:37 AM	7:41 AM	7:45 AM					
7:35 AM	7:40 AM						7:59 AM	8:03 AM	8:08 AM	8:12 AM	8:17 AM					
9:00 AM	9:05 AM					9:21 AM	9:24 AM	9:28 AM	9:33 AM	9:37 AM	9:41 AM	9:46 AM	9:50 AM	9:59 AM	10:03 AM	10:17 AM
11:00 AM	11:05	11:08 AM	11:18 AM	11:21 AM	11:24 AM	11:28 AM	11:31 AM	11:34 AM	11:39 AM	11:43 AM	11:47 AM					
12:05 PM	12:10		12:21 PM	12:24 PM	12:27 PM	12:31 PM	12:34 PM	12:37 PM	12:42 PM	12:46 PM	12:50 PM	12:55 PM	12:59 PM	1:08 PM	1:12 PM	1:26 PM
1:05 PM	1:10 PM		1:21 PM	1:24 PM	1:27 PM	1:31 PM	1:34 PM	1:37 PM	1:42 PM	1:46 PM	1:50 PM					
2:40 PM	2:45 PM		2:56 PM	2:59 PM	3:02 PM	3:06 PM	3:09 PM	3:12 PM	3:17 PM	3:21 PM	3:25 PM					
4:10 PM	4:15 PM									4:40 PM	4:45 PM	4:51 PM	4:55 PM	5:04 PM	5:09 PM	5:23 PM
4:30 PM	4:35 PM	4:38 PM	4:48 PM	4:51 PM	4:55 PM	4:59 PM	5:03 PM	5:07 PM	5:12 PM	5:16 PM	5:20 PM					
4:58 PM	5:03 PM									5:28 PM	5:33 PM	5:39 PM	5:43 PM	5:52 PM	5:57 PM	6:11 PM
5:05 PM	5:10 PM	5:13 PM	5:24 PM	5:27 PM	5:30 PM	5:34 PM	5:37 PM	5:40 PM	5:45 PM	5:50 PM	5:55 PM					
5:30 PM	5:35 PM	5:38 PM	5:49 PM	5:52 PM	5:56 PM	6:00 PM	6:04 PM	6:08 PM	6:13 PM	6:17 PM	6:21 PM	6:27 PM	6:31 PM	6:40 PM	6:45 PM	6:59 PM
6:05 PM	6:10 PM									6:35 PM	6:40 PM	6:46 PM	6:50 PM	6:59 PM	7:04 PM	7:18 PM
6:20 PM	6:25 PM	6:28 PM	6:36 PM	6:39 PM	6:44 PM	6:48 PM	6:52 PM	6:56 PM	7:01 PM	7:05 PM	7:10 PM					
7:15 PM	7:20 PM	7:23 PM	7:32 PM	7:35 PM	7:39 PM	7:43 PM	7:46 PM	7:50 PM	7:55 PM	8:00 PM	8:04 PM	8:09 PM	8:13 PM	8:22 PM	8:26 PM	8:40 PM
8:20 PM	8:25 PM	8:28 PM	8:38 PM	8:41 PM	8:43 PM	8:47 PM	8:50 PM	8:53 PM	8:58 PM	9:03 PM	9:07 PM	9:12 PM	9:16 PM	9:25 PM	9:29 PM	9:43 PM
10:05 PM	10:10	10:13 PM	10:23 PM	10:26 PM	10:28 PM	10:32 PM	10:35 PM	10:38 PM	10:43 PM	10:48 PM	10:52 PM	10:57 PM	11:01 PM	11:10 PM	11:14 PM	11:28 PM
11:25 PM	11:30	11:33 PM	11:43 PM	11:46 PM	11:48 PM	11:52 PM	11:55 PM	11:58 PM	12:03 AM	12:08 AM	12:12 AM					

Table 3 Franklin Line Weekday Schedule, Inbound

Forge Park	Franklin	Norfolk	Walpole	Plimptonville	Windsor Gardens	Norwood Central	Norwood Depot	Islington	Dedham Corp	Endicott	Readville	Hyde Park	Ruggles	Back Bay	South Station
5:15 AM	5:22 AM	5:29 AM	5:35 AM		5:39 AM	5:43 AM	5:46 AM	5:49 AM	5:52 AM	5:55 AM	6:00 AM				6:20 AM
5:45 AM	5:52 AM	5:59 AM	6:05 AM		6:09 AM	6:13 AM	6:16 AM	6:19 AM	6:22 AM	6:26 AM	6:29 AM			6:43 AM	6:48 AM
6:15 AM	6:22 AM	6:29 AM	6:35 AM		6:39 AM	6:43 AM			6:48 AM				7:00 AM	7:04 AM	7:09 AM
6:35 AM	6:42 AM	6:49 AM	6:55 AM	6:58 AM	7:01 AM	7:05 AM	7:08 AM	7:11 AM	7:14 AM	7:18 AM	7:21 AM		7:32 AM	7:36 AM	7:41 AM
7:00 AM	7:07 AM	7:14 AM	7:21 AM		7:25 AM	7:30 AM			7:37 AM				7:50 AM	7:54 AM	7:59 AM
			7:52 AM		7:56 AM	8:00 AM	8:03 AM	8:06 AM	8:09 AM	8:13 AM	8:17 AM			8:32 AM	8:37 AM
7:45 AM	7:52 AM	7:59 AM	8:05 AM			8:12 AM	8:15 AM	8:18 AM	8:21 AM	8:25 AM	8:29 AM		8:42 AM	8:47 AM	8:52 AM
						8:46 AM	8:48 AM	8:51 AM	8:53 AM	8:55 AM	9:00 AM				9:23 AM
9:03 AM	9:10 AM	9:17 AM	9:24 AM		9:29 AM	9:33 AM	9:35 AM	9:39 AM	9:42 AM	9:44 AM	9:47 AM		9:59 AM	10:03 AM	10:08 AM
10:45 AM	10:52 AM	10:59 AM	11:06 AM		11:11 AM	11:15 AM	11:17 AM	11:21 AM	11:24 AM	11:26 AM	11:29 AM		11:39 AM	11:43 AM	11:48 AM
12:05 PM	12:12 PM	12:19 PM	12:26 PM		12:31 PM	12:35 PM	12:37 PM	12:41 PM	12:44 PM	12:46 PM	12:49 PM		12:57 PM	1:01 PM	1:06 PM
2:00 PM	2:07 PM	2:14 PM	2:21 PM		2:26 PM	2:30 PM	2:32 PM	2:36 PM	2:39 PM	2:41 PM	2:44 PM			2:55 PM	3:00 PM
4:01 PM	4:08 PM	4:15 PM	4:21 PM		4:25 PM	4:29 PM	4:31 PM	4:34 PM	4:37 PM	4:40 PM	4:43 PM				5:02 PM
						5:35 PM			5:40 PM						6:04 PM
5:27 PM	5:34 PM	5:42 PM	5:54 PM			6:01 PM		6:05 PM	6:08 PM	6:10 PM					6:35 PM
7:40 PM	7:47 PM	7:53 PM	8:00 PM			8:07 PM			8:16 PM		8:22 PM				8:41 PM
8:50 PM	8:57 PM	9:03 PM	9:09 PM			9:16 PM	9:18 PM	9:22 PM	9:25 PM	9:27 PM				9:40 PM	9:45 PM
10:15 PM	10:22 PM		10:33 PM			10:39 PM			10:44 PM					11:01 PM	11:06 PM
11:50 PM	11:57 PM		12:08 AM			12:14 AM			12:19 AM					12:36 AM	12:41 AM

Table 4 Franklin Line Weekday Schedule, Outbound

South Station	Back Bay	Ruggles	Hyde Park	Readville	Endicott	Dedham Corp	Islington	Norwood Depot	Norwood Central	Windsor Gardens	Plimptonville	Walpole	Norfolk	Franklin	Forge Park
4:00 AM									4:22 AM			4:28 AM		4:40 AM	4:50 AM
7:05 AM				7:25 AM		7:27 AM		7:32 AM	7:36 AM			7:42 AM			
7:50 AM						8:11 AM			8:16 AM	8:20 AM		8:24 AM	8:31 AM	8:38 AM	8:45 AM
7:55 AM					8:15 AM	8:17 AM	8:20 AM	8:23 AM	8:26 AM						
9:10 AM	9:15 AM			9:27 AM	9:30 AM	9:32 AM		9:36 AM	9:39 AM	9:43 AM		9:47 AM	9:55 AM	9:58 AM	10:07 AM
10:50 AM	10:55 AM			11:05 AM	11:08 AM	11:10 AM	11:13 AM	11:16 AM	11:19 AM	11:23 AM		11:28 AM	11:34 AM	11:42 AM	11:49 AM
12:45 PM	12:50 PM	12:53 PM		1:03 PM	1:06 PM	1:08 PM	1:11 PM	1:14 PM	1:17 PM	1:21 PM		1:26 PM	1:32 PM	1:40 PM	1:47 PM
2:45 PM	2:50 PM	2:53 PM		3:03 PM	3:06 PM	3:09 PM	3:11 PM	3:15 PM	3:18 PM	3:22 PM		3:26 PM	3:33 PM	3:41 PM	3:51 PM
4:10 PM	4:15 PM	4:19 PM		4:29 PM	4:33 PM	4:36 PM	4:39 PM	4:42 PM	4:46 PM	4:50 PM		4:55 PM	5:02 PM	5:10 PM	5:17 PM
4:30 PM				4:53 PM					5:01 PM	5:04 PM		5:08 PM	5:14 PM	5:22 PM	
4:50 PM	4:55 PM	4:59 PM	5:07 PM	5:10 PM	5:14 PM	5:16 PM	5:19 PM	5:22 PM	5:25 PM						
5:10 PM	5:15 PM	5:19 PM				5:33 PM		5:38 PM	5:41 PM	5:44 PM	5:48 PM	5:52 PM	6:00 PM	6:08 PM	6:15 PM
5:40 PM	5:45 PM	5:49 PM	5:57 PM	6:00 PM	6:04 PM	6:08 PM	6:10 PM	6:13 PM	6:16 PM	6:20 PM		6:26 PM	6:33 PM	6:40 PM	6:47 PM
6:15 PM	6:20 PM	6:24 PM		6:32 PM	6:36 PM	6:39 PM	6:42 PM	6:45 PM	6:48 PM	6:52 PM		6:57 PM	7:05 PM	7:13 PM	7:20 PM
7:35 PM	7:40 PM	7:43 PM		7:53 PM	7:56 PM	7:59 PM	8:02 PM	8:05 PM	8:08 PM	8:12 PM		8:17 PM	8:25 PM	8:33 PM	8:40 PM
8:50 PM	8:55 PM	8:58 PM		9:08 PM	9:12 PM	9:14 PM	9:17 PM	9:20 PM	9:23 PM	9:27 PM		9:31 PM	9:38 PM	9:46 PM	9:53 PM
10:35 PM	10:40 PM	10:43 PM	10:51	10:54 PM	10:59 PM	11:01 PM	11:04 PM	11:07 PM	11:09 PM	11:13 PM		11:17 PM	11:24 PM	11:32 PM	11:39 PM
11:50 PM	11:55 PM	11:58 PM		12:08 AM	12:11 AM	12:13 AM	12:16 AM	12:19 AM	12:21 AM	12:25 AM		12:29 AM	12:36 AM	12:44 AM	12:51 AM

LIFT 2 • FRAMINGHAM



[[click to enlarge map](#)]

LIFT 2 SCHEDULES:

[Weekday Morning Schedule](#)

[Weekday Afternoon / Evening Schedule](#)

[Saturday Schedule](#)

LIFT 2 has scheduled stops at the following FRAMINGHAM locations:

- Concord/Howard Streets
- MetroWest Medical Center
- Framingham Center (FSC)
- Framingham Green
- Maynard Rd./Pleasant Street
- Vernon Street/Edgell Road
- Nobscot
- Pinefield
- Super Stop & Shop
- Target/Whittier Street
- Shoppers World East
- Sherwood Plaza
- Shoppers World Shelter
- Kohls
- Beacon Street
- Rose Kennedy Lane

LIFT 2 also stops at following NATICK location:

- Natick Mall / Filene's

LIFT 2 passengers may transfer to other LIFTs in Downtown Framingham or transfer to Natick Neighborhood Bus.

LIFT 3 • FRAMINGHAM



[[click to enlarge map](#)]

LIFT 3 SCHEDULES:

[Weekday Morning Schedule](#)

[Weekday Afternoon / Evening Schedule](#)

[Saturday Schedule](#)

LIFT 3 has scheduled stops at the following FRAMINGHAM locations:

- Concord/Howard Streets
- MassBay Community College
- Rose Kennedy Lane
- Beacon Street
- Kohls
- Shoppers World East
- Target/Whittier
- Super Stop & Shop
- Old Conn. Path/Speen Street
- Concord/A Streets
- Pinefield, Water Street
- Nobscot
- Village Green
- Main/High Streets
- Danforth Museum
- MetroWest Medical Center
- Callahan Senior Center
- Downtown Common

LIFT 3 also stops at following NATICK locations:

- Sherwood Plaza
- Natick Mall, Filene's

LIFT 5 • FRAMINGHAM • ASHLAND • HOPKINTON



[[click to enlarge map](#)]

LIFT 5 SCHEDULES:

[Weekday Morning Schedule](#)

[Weekday Afternoon / Evening Schedule](#)

(* no Saturday service)

LIFT 5 has scheduled stops at the following FRAMINGHAM locations:

- Downtown Common
- MBTA Station
- Winthrop and Mellen Streets
- Bethany Health Care Center

LIFT 5 also stops at following ASHLAND locations:

- Downtown Ashland
- Ashland High School

LIFT 5 also stops at following HOPKINTON location:

- Colella's Supermarket

LIFT 6 • FRAMINGHAM • ASHLAND • HOLLISTON • MILFORD • NATICK



[[click to enlarge map](#)]

LIFT 6 SCHEDULES:

[Weekday Morning Schedule](#)

[Weekday Afternoon / Evening Schedule](#)

(* no Saturday service)

LIFT 6 has scheduled stops at the following FRAMINGHAM locations:

- Downtown Common
- Beaver Park

LIFT 6 also stops at following ASHLAND locations:

- Market Basket
- Shaw's Supermarket

LIFT 6 also stops at following HOLLISTON locations:

- Town Hall
- Mission Springs

LIFT 6 also stops at following MILFORD locations:

- K-Mart/Radison Hotel
- Park and Ride
- Town Hall

LIFT 7 • FRAMINGHAM • SOUTHBOROUGH • MARLBOROUGH



[[click to enlarge map](#)]

LIFT 7 SCHEDULES:

[Weekday Morning Schedule](#)

[Weekday Afternoon / Evening Schedule](#)

(* no Saturday service)

LIFT 7 has scheduled stops at the following FRAMINGHAM locations:

- Staples Drive
- Rt 9 East Park & Ride
- Stop and Shop
- Framingham State College
- Danforth Museum
- Downtown Common
- Concord/Howard Bus Shelter
- Framingham Center
- Rt 9/California Ave

LIFT 7 also stops at following MARLBOROUGH locations:

- Solomon Pond Mall
- Ames Street/Route 20
- Route 20/Felton Street
- Lincoln/Pleasant
- Marlborough City Hall/Rt 85

LIFT 7 also stops at following SOUTHBOROUGH locations:

- Route 85/Route 30
- Route 30/Boston Road
- Boston Road/White Bagley Road
- White Bagley Road/Route 9