4 PUBLIC TRANSIT

According to 2000 U.S. Census Bureau figures for commuting trips, approximately 15 percent of residents of the Boston Region MPO area commute to work via some form of public transit; this is slightly higher than the transit mode share for 1990 given in the census for that year. Furthermore, 55 percent of all work trips into downtown Boston and 42 percent of all trips destined for downtown are made by transit. In the entire MPO region, however, 6.8 percent of all trips are made by transit; that number is estimated to increase to 7.47 percent by 2025.[1]

Based on the 2000 census figures, approximately 54 percent of the population within the Boston MPO region lives within walking distance of MBTA transit service.[2] This statistic reinforces the importance of promoting public transit use.

This chapter provides performance data on the bus, rapid transit, and commuter rail services that have been collected by CTPS's own Transit Service Planning Group and the MBTA. The data reported in this chapter are taken from service planning efforts of data collection, monitoring, and assessment that support the MBTA's biennial service plans, in addition to the Capital Investment Program, the Program for Mass Transportation, and other ongoing service planning evaluations.

4.1 SYSTEM RIDERSHIP

The MBTA transit system carries approximately 1,090,000 trips on average each weekday.[3] The MBTA rapid transit, light rail, and bus rapid transit systems serve 134 stations on six lines: the Green Line, Blue Line, Orange Line, Red Line, Mattapan High Speed Line, and Silver Line. Average daily weekday ridership on the rapid transit/light rail system is over 630,000: the Green Line, which uses light rail vehicles, carries approximately 183,000 trips per weekday, the Blue Line over 50,000, the Orange Line 174,000, and the Red Line, which is the most heavily utilized, 223,000. Ridership on the Silver Line (bus rapid transit) is over 14,000 trips per weekday. On the bus and trackless trolley system, which serves 44 communities, total ridership is approximately 344,000 trips per weekday. The present MBTA commuter rail network is comprised of 13 radial lines, with 123 stations and 365 miles of track; ridership per weekday is approximately 110,000 passengers. The Attleboro/Stoughton Line is the most heavily used commuter rail line, with an average of 10,300 passengers per weekday. Commuter boat ridership is close to 5,000 per weekday.

In the ten years between 1992 and 2002, the typical daily ridership on the MBTA system increased 9 percent to over one million, mostly due to increases in commuter rail ridership. About one-third of the daily ridership uses buses, approximately 60 percent is on the rapid transit and light rail lines, and 10 percent uses the commuter rail system.

[1] As stated in the *Program for Mass Transportation (PMT),* prepared by the Central Transportation Planning Staff for the Massachusetts Bay Transportation Authority (MBTA), May 2003, p. 2-1. Estimates are based on the travel demand model, 1995 base year.

[2] Walking distance to transit (used to identify the potential transit market area) is defined as the distance of ¾ mile or less from a rail station and ½ mile or less from a bus stop. Population is based on 2000 census.

[3] The ridership figures by transit system that are presented in this paragraph are the Spring 2002 Estimated Daily Boardings from the *2003 Fare Mix Study* (draft), conducted by CTPS for the MBTA. Ridership data are a composite average and are reported as unlinked trips.

4.2 TRANSIT PERFORMANCE MEASURES

The quality of transit services is evaluated using two performance measures: passenger crowding and on-time performance (called *schedule adherence*). The data used for these measures are collected by CTPS through pointchecks and ridechecks for buses, and via station entrance counts for rapid transit and light rail. Conductors perform commuter rail ridership counts, and the contractor who provides the commuter rail service records schedule adherence information. The data collection is conducted for transit service evaluation and other purposes on behalf of the MBTA.

Furthermore, the performance of buses is used in the CMS analysis of roadway corridors, as described in the previous chapter. Buses are part of the general mix of roadway traffic, and they are affected by roadway delays at least as much as, if not more than, private, smaller vehicles are affected. Therefore, poorly operating bus service is probably evidence of roadway congestion. Determining that a corridor has bus mobility problems can support a recommendation that a corridor study be conducted to analyze improvements to the mobility of automobile and transit users.

A description of the performance measures is presented below, along with a discussion of the thresholds for violation of performance standards. These are based on measures and standards used by the MBTA for service planning purposes.[4] Data on Silver Line performance were not available for this report.

4.2.1 On-Time Performance (Schedule Adherence)

The MBTA has established schedule-adherence (on-time) performance thresholds for all of its services, as shown in Table 4.1. In the case of bus performance, the CMS analysis uses an on-time performance measures that is based only on arrivals, not departures. Off-time arrivals are defined as any bus trip (those with at least 10-minute headways) that arrives at its terminus more than two minutes earlier, or five or more minutes later, than its scheduled arrival time. A bus route meets the performance standard if 60 percent or more of morning and evening peak-period trips arrive on time; if less than 60 percent of peak-period trips arrive on time, the route is flagged as a mobility concern. This threshold is different from that used by the MBTA for its service planning, because the CMS analysis is designed to link poor bus on-time performance to congested roadway conditions during the peak periods.

Since roadway congestion is generally the primary cause for late arrivals by buses, this measure ties roadway and transit performance together and should lead to corridor studies that benefit both automobile and transit users. In Chapter 3, Table 3.14 shows the congested corridors that have bus routes with schedule adherence and passenger crowding problems.

4.2.2 Passenger Crowding

Passenger crowding is measured in terms of passengers per available seats. A value at or above the established threshold indicates crowded conditions. For purposes of reporting mobility concerns, MBTA thresholds for passenger crowding are used; these thresholds are listed in Table 4.1.

[4] Massachusetts Bay Transportation Authority, *Service Delivery Policy*, September 1996; and *Changes to Service Delivery Policy*, adopted December 2002. Both documents are available at *www.mbta.com/insidethet/serviceplan.asp*. (The 2004 Service Plan was approved by the MBTA Board of Directors in September 2004.)

Table 4.1. Transit Performance Thresholds: Passenger Crowding and On-Time Performance

Where the CMS's performance measure differs from the MBTA-adopted measure, this table also provides the latter.

Service	Peak-Period* Passenger Crowding *No. of passengers per seat*	On-Time Performance
Rapid Transit: Blue Line	2.25	95 percent of all trips operating within 5 minutes of scheduled trip time
Rapid Transit: Orange Line	2.25	95 percent of all trips operating within 5 minutes of scheduled trip time
Rapid Transit: Red Line	2.70	95 percent of all trips operating within 5 minutes of scheduled trip time
Light Rail: Green Line—Central Subway	2.20	95 percent of all service operating with headways of less than 3 minutes
Light Rail: Green Line—Surface	2.20	95 percent of all trips operating within 5 minutes of scheduled trip time
Bus, with headways of 10 minutes or greater	1.40 (AM and PM peak 30 minutes)	*CMS measure:* 60 percent of peak-period trips arriving within 2 minutes early and 5 minutes late *MBTA measure:* 75 percent of all trips departing and arriving at both terminals within 5 minutes late. (Express buses are allowed to arrive early at the destination.)
Bus, with headways of less than 10 minutes	1.40 (AM and PM peak 30 minutes)	*CMS measure:* 60 percent of peak-period trips arriving within 2 minutes early and 5 minutes late *MBTA measure:* 85 percent of all trips having actual headways within 150 percent of scheduled headways
Commuter Rail	1.10	95 percent of all trips departing from and arriving at terminals within 5 minutes of scheduled departure and arrival times
Commuter Boat: Hingham	1.00	95 percent of all trips departing from and arriving at ports within 5 minutes of scheduled departure and arrival times
Commuter Boat: Charlestown, East Boston	1.25	95 percent of all trips departing from and arriving at ports within 5 minutes of scheduled departure and arrival times

* For the measures reported in this document, *peak period* is defined by the MBTA as: morning peak = 7:00 AM–9:00 AM; evening peak = 4:00 PM–6:00 PM. In December 2002, the MBTA adopted a new evening peak period, defined as service from 4:00 PM–6:30 PM.

4.3 RAIL TRANSIT MONITORING RESULTS[5]

4.3.1 On-Time Performance (Schedule Adherence)

Table 4.2 lists the latest available on-time performance findings for rapid transit, light rail, and commuter rail service.

Table 4.2. On-Time Performance (Schedule Adherence): Rail Transit

Service	Percent of On-Time Peak-Period Trips
Commuter Rail [1]	
Newburyport/Rockport Line	92
Haverhill/Reading Line	92
Lowell Line	97
Fitchburg/South Acton Line	93
Worcester/Framingham Line	89
Needham Line	96
Franklin Line	94
Fairmount Line	97
Providence/Attleboro/Stoughton Line	92
Middleborough/Lakeville Line	94
Plymouth/Kingston Line	94
Rapid Transit [2]	
Blue Line	92
Orange Line	91
Red Line: Ashmont	94
Red Line: Braintree	91
Green Line: Boston College (B)	97
Green Line: Cleveland Circle (C)	82
Green Line: Riverside (D)	80
Green Line: Heath Street (E)	85

Highlighted transit services do not meet performance standard.

1. Commuter rail data from the MBTA, July 2003-June 2004.[6]

2. Rapid transit data from the FY98 Annual Service Plan as published in the 2000 CMS report.

Based on the first year of commuter rail service under a new provider, most MBTA commuter rail lines are not meeting the on-time performance standard but are close. The Lowell commuter rail line, which heads into North Station, met the on-time-performance standard. The other commuter rail lines into North Station came within 3 percentage points of meeting the standard. The Needham and Fairmount commuter rail lines, which head into South Station, met the on-time-performance standard.

[5] These results reflect conditions before the fare increase that was implemented January 3, 2004. Since then there have been many rail service improvements, such as the addition of three weekday trains on the Fitchburg commuter rail line and the use of two-car trains on all Green Line branches until 9:00 PM on weekdays.

[6] The Massachusetts Bay Commuter Railroad Company (MBCR) replaced Amtrak as the operator of MBTA commuter rail service on July 1, 2003.

The other commuter rail lines into South Station came within 6 percentage points of meeting the standard.

These figures demonstrate an improvement over the measures reported in the last CMS report (which were taken from the FY98 Service Plan): based on data collection from the mid-1990s, the commuter rail lines into North Station adhered to schedule 7 percentage points less than the on-time-performance standard, while the commuter rail lines into South Station adhered to their schedules 32 percentage points less than the on-time-performance standard. Current data, as detailed above, show an improvement in on-time performance for the commuter rail lines.

With regard to peak period rapid transit and light rail service, according to data from the mid-1990s, only the Green Line's B branch met the schedule adherence performance standard. None of the other light rail and rapid transit rail lines met the standard. Whereas the Blue, Orange, and Red lines were within 5 percentage points of meeting the standard, the Green Line's C, D, and E branches adhered to their schedules 10 to 15 percentage points less than the on-time-performance standard.

4.3.2 Passenger Crowding

Table 4.3 lists the average passenger crowding findings for all rapid transit, light rail, and commuter rail lines for the peak 30 minutes during a typical weekday.[7]

Table 4.3. Passenger Crowding: Rail Transit (Peak 30 Minutes)[8]

Rail Service	Average Passengers Per Seat	Rail Service	Average Passengers Per Seat
Commuter Rail		***Green Line (Light Rail)***	
Rockport	0.97	Boston College (B)	1.68
Newburyport	0.74	Cleveland Circle (C)	2.05
Haverhill	0.81	Riverside (D)	2.09
Lowell	0.95	Heath Street (E)	1.33
Fitchburg	0.89	Central Subway	1.78
Worcester	0.92	***Red Line***	
Needham	0.86	Mattapan High Speed Line	1.54
Franklin	0.96	Ashmont Branch	1.54
Providence	1.14	Braintree Branch	2.37
Fairmount	0.29	Cambridge	1.76
Middleborough	1.09	***Orange Line***	1.84
Plymouth/Kingston	1.24	***Blue Line***	2.04

Highlighted transit services exceed passenger crowding performance standards.

Two commuter rail lines exceed the threshold for the passenger crowding standard: the Providence/Attleboro and Plymouth/Kingston lines. The passenger-crowding standard threshold was

[7] Commuter rail data is from the memorandum, "Results of Commuter Rail Peak Load Counts," from the Central Transportation Planning Staff to the Massachusetts Bay Transportation Authority, August 4, 2000. Rapid transit lines were comprehensively checked in 1995 and 1997.

[8] Ibid.

nearly reached by the Blue Line, the Braintree branch of the Red Line, and branches C and D of the Green Line.[9]

4.4 BUS TRANSIT MONITORING RESULTS[10]

4.4.1 On-Time Performance (Schedule Adherence)

Table 4.4 lists the bus routes that violate during the morning peak-period the bus schedule adherence threshold of less than 60 percent of trips arriving at the destination on time. Table 4.5 lists bus routes that violate the threshold in the evening peak period. This information comes from ridechecks that were performed between the fall of 1997 and the winter of 2002. Of the morning peak period bus trips, 36 percent arrive more than five minutes late at their destination; in the evening peak period, 39 percent violate this standard.

Appendix B contains maps that highlight the bus routes that do not meet service performance standards. An example of this type of map is shown in Figure 4.1.

[9] The Blue Line stations have been undergoing modernization improvements that will accommodate the operation of six-car trains.

[10] These results reflect conditions before the fare increase that went into effect on January 3, 2004. Since then there have been many bus service improvements, such as the implementation of the Key Routes program, which consists of increasing the schedule frequencies on selected routes to provide rapid-transit-like service.

Table 4.4. Bus Routes That Violate Schedule Adherence in the Morning Peak Period
(page 1 of 2)

Route #	Direction	Description	Percent of Morning Peak Trips with On-Time Arrivals (Inbound / Outbound)
6	Inbound	Boston Marine Ind. Park–Haymarket Sta. via South Sta.	50
7	Inbound	City Pt.–Franklin & Devonshire Sts. via Northern Ave.	25
8	In / Outbound	Harbor Point/UMass–Kenmore Sta.	55 / 58
10	In / Outbound	City Point–Copley Sq. via Andrew Sta.	20 / 22
11	Outbound	City Point–Downtown via Bayview	33
14	In / Outbound	Roslindale Sq.–Dudley Sta.	50 / 50 *
15	Outbound	Kane Sq. or Fields Corner–Ruggles Sta.	42
16	In / Outbound	Forest Hills Sta.–Andrew Sta. or UMass	50 / 57
17	In / Outbound	Fields Corner Sta.–Andrew Sta.	13 / 57
26	Outbound	Ashmont Sta.–Norfolk and Morton Belt Line	13
39	Outbound	Forest Hills Sta.–Back Bay Sta.	54
43	Outbound	Ruggles Sta.–Park and Tremont Sts.	50
44	Outbound	Jackson Sq. Sta.–Ruggles Sta. via Seaver St.	30
46	In / Outbound	Heath St. & S. Huntington Ave.–Dudley Sta.	50 / 25
51	Outbound	Reservoir (Cleveland Circle)–Forest Hills Sta.	40
57	Inbound	Watertown Sq.–Kenmore Sta. via Commonwealth Ave.	55
59	Outbound	Needham Junction–Watertown Sq.	50
60	Inbound	Chestnut Hill–Kenmore Sta. via Cypress St.	50
64	In / Outbound	Oak Sq.–Central Sq., Cambridge, or Kendall/M.I.T.	0 / 50
65	In / Outbound	Brighton Center–Kenmore Sta. via Brookline Ave.	0 / 0
70	Outbound	Cedarwood or N. Waltham–Central Sq., Cambridge	36
86	Inbound	Sullivan Sq. Sta.–Reservoir (Cleveland Circle) via Harvard	14
87	In / Outbound	Arlington Center or Clarendon Hill–Lechmere Sta.	50 / 29
88	In / Outbound	Clarendon Hill–Lechmere Sta. via Highland Ave.	53 / 46
90	Outbound	Davis Sq. to Wellington Sta. via Sullivan Sq.	0
91	Inbound	Sullivan Sq. to Central Sq. via Washington	25
92	In / Outbound	Assembly Sq. Mall–Downtown via Main St.	44 / 11 *
94	In / Outbound	Medford Sq.–Davis Sta.	50 / 40
96	In / Outbound	Medford Sq.–Harvard Sta. via George St.	33 / 50 *
99	Inbound	Upper Highlands–Wellington Sta.	50
104	In / Outbound	Malden Sq.–Sullivan Sq.	56 / 57
116	Inbound	Wonderland Sta.–Maverick Sta. via Revere St.	14
117	In / Outbound	Wonderland Sta.–Maverick Sta. via Beach St.	14 / 57
130	Inbound	Lebanon St., Melrose–Malden Center Sta.	50
136	In / Outbound	Reading Depot–Malden Center Sta.	17 / 0
137	Inbound	Reading Depot–Malden Center Sta. via North Ave.	50
210	Outbound	Quincy Center Sta.–No. Quincy Sta. or Fields Corner Sta. via Hancock St. & Neponset Ave.	20
215	In / Outbound	Quincy Center Sta.–Ashmont Sta. via W. Quincy	50 / 33
220	Outbound	Quincy Center Sta.–Hingham	44
222	Outbound	Quincy Center Sta.–East Weymouth	50
240	In / Outbound	Avon Line or Holbrook/Randolph Commuter Rail Sta.–Ashmont Sta. via Crawford Sq., Randolph	27 / 14
245	In / Outbound	Quincy Center Sta.–Mattapan Sta. via Pleasant St.	33 / 33

Table 4.4. Bus Routes That Violate Schedule Adherence in the Morning Peak Period
(page 2 of 2)

Route #	Direction	Description	Percent of Morning Peak Trips with On-Time Arrivals (Inbound / Outbound)	
326	In / Outbound	W. Medford–Haymarket Sta. via I-93	0 / 50	
350	In / Outbound	N. Burlington–Alewife Sta. via Burlington Mall	29 / 20	
411	Inbound	Malden Center Sta.–Revere/Jack Satter House via Northgate Mall	0	
439	Inbound	Central Sq., Lynn–Bass Point, Nahant	17	*
441	In / Outbound	Marblehead–Haymarket via Paradise Road & Central Sq., Lynn	50 / 50	*
442	Outbound	Marblehead–Haymarket via Humphrey St.	0	*
449	In / Outbound	Marblehead–Downtown Crossing via Humphrey St.	50 / 0	*
450	In / Outbound	Salem Depot–Boston via Highland & Western Ave.	11 / 50	*
455	Outbound	Salem Depot–Haymarket via Loring Ave.	0	*
458	Inbound	Salem Center–Danvers Sq. via Liberty Tree Mall	50	*
500	Inbound	Express Riverside–Downtown via Mass. Turnpike	36	
505	Inbound	Express Central Sq., Waltham–Downtown Boston	47	
553	In / Outbound	Roberts–Newton Corner or Downtown Boston via Mass. Turnpike	25 / 50	
558	Inbound	Auburndale–Downtown Boston via Newton Corner & Mass. Turnpike	0	
CT1	Outbound	(CT1) Central Sq. (Cambridge)–Boston Medical Center via M.I.T.	50	

* Weekday peak-period service changes have been implemented on these routes since 2002.

Definitions

Morning Peak Period = 7:00–9:00 AM.
On-Time Arrivals = Arrivals within 2 minutes ahead of scheduled time and within 5 minutes after scheduled time.

Table 4.5. Bus Routes That Violate Schedule Adherence in the Evening Peak Period
(page 1 of 2)

Route #	Direction	Description	Percent of Morning Peak Trips with On-Time Arrivals (Inbound / Outbound)
1	Inbound	Harvard/Holyoke Gate–Dudley Sta. via Mass Ave.	47
3	Inbound	Boston Marine Industrial Park–Chinatown	33
6	In / Outbound	Boston Marine Industrial Park–South Sta./Haymarket	0 / 50
7	Inbound	City Point–Franklin & Devonshire Sts. via Northern Ave.	42 *
8	In / Outbound	Harbor Point/UMass–Kenmore Sta.	58 / 33
10	Inbound	City Point–Copley Sq. via Andrew Sta.	33
11	Outbound	City Point–Downtown via Bayview	50
15	In / Outbound	Kane Sq. or Fields Corner–Ruggles Sta.	50 / 50
16	In / Outbound	Forest Hills Sta.–Andrew Sta. or UMass	14 / 50
17	In / Outbound	Fields Corner–Andrew Sta.	40 / 11
18	Outbound	Ashmont Sta.–Andrew Sta. via Dorchester Ave.	33
19	In / Outbound	Fields Corner Sta.–Ruggles Sta. via Grove Hall & Dudley	50 / 0
21	In / Outbound	Ashmont Sta.–Forest Hills Sta.	10 / 11
23	In / Outbound	Ashmont Sta.–Ruggles Sta. via Washington St.	56 / 59
24	Outbound	Wakefield Ave. & Truman Parkway–Mattapan or Ashmont Sta. via River St.	50
29	Outbound	Mattapan Sta.–Jackson Sq. Sta. via Seaver St.	38
30	Outbound	Mattapan Sta.–Forest Hills Sta. via Cummins Hwy.	0
31	Inbound	Mattapan Sta.–Forest Hills Sta. via Morton St.	53
34	Outbound	Dedham Line–Forest Hills Sta. via Washington St.	57
35	In / Outbound	Dedham Mall to Forest Hills Sta. via Belgrade Ave.	25 / 50
36	Outbound	Charles River Loop or V.A. Hospital–Forest Hills Sta.	50
39	Outbound	Forest Hills Sta.–Back Bay Sta.	56
40	Inbound	Georgetowne–Forest Hills Sta.	50
42	Inbound	Forest Hills Sta.–Ruggles Sta. via Washington St.	43
44	Inbound	Jackson Sq. Sta.–Ruggles Sta. via Seaver St.	40
50	Inbound	Cleary Sq.–Forest Hills Sta. via Roslindale Sq.	17
55	In / Outbound	Jersey & Queensberry Sts.–Copley Sq. or Park Street	50 / 0
57	Outbound	Watertown Sq.–Kenmore Sta. via Commonwealth Ave.	56
64	Outbound	Oak Sq.–Central Sq., Cambridge or Kendall/M.I.T.	17
65	In / Outbound	Brighton Center–Kenmore Sta. via Brookline Ave.	0 / 0
66	Outbound	Harvard–Dudley w/ layover at Union Sq.	25
70	In / Outbound	Cedarwood or N. Waltham–Central Sq., Cambridge	40 / 33
86	In / Outbound	Sullivan Sq. Sta.–Reservoir (Cleveland Cir.) via Harvard	50 / 33
87	Outbound	Arlington Center or Clarendon Hill–Lechmere Sta.	13
88	Outbound	Clarendon Hill–Lechmere Sta. via Highland Ave.	50
94	Outbound	Medford Sq.–Davis Sq. Sta.	50
99	Outbound	Upper Highlands–Wellington Sta.	50
106	In / Outbound	Lebanon St., Malden–Wellington Sta.	50 / 17
116	In / Outbound	Wonderland Sta.–Maverick Sta. via Revere St.	0 / 0
117	In / Outbound	Wonderland Sta.–Maverick Sta. via Beach St.	17 / 33
119	Inbound	Northgate–Beachmont Sta.	50
121	In / Outbound	Wood Island Sta.–Maverick Sta. via Lexington St.	20 / 40
131	Outbound	Melrose Highlands–Malden Center Sta.	50

Table 4.5. Bus Routes That Violate Schedule Adherence in the Evening Peak Period
(page 2 of 2)

Route #	Direction	Description	Percent of Morning Peak Trips with On-Time Arrivals (Inbound / Outbound)	
136	Outbound	Reading Depot–Malden Center Sta.	0	
137	In / Outbound	Reading Depot–Malden Center Sta. via North Ave.	50 / 0	
214	Inbound	Quincy Center Sta.–Germantown via Sea St.	50	
217	In / Outbound	Wollaston Beach–Ashmont Sta. via Beale St.	0 / 0	
220	In / Outbound	Quincy Center Sta.–Hingham	50 / 33	
225	Inbound	Quincy Center Sta. to Weymouth Landing	25	
230	In / Outbound	Quincy Center Sta.–Brockton TL via Holbrook	50 / 33	
236	Outbound	Quincy Center Sta.–South Shore Plaza	0	
238	In / Outbound	Quincy Center Sta.–Holbrook/Randolph Commuter Rail Sta. via Crawford Sq., Randolph	25 / 50	
240	In / Outbound	Avon Line or Holbrook/Randolph Commuter Rail Sta.–Ashmont Sta. via Crawford Sq., Randolph	57 / 33	
245	Outbound	Quincy Center Sta.–Mattapan Sta. via Pleasant St.	50	
411	In / Outbound	Malden Center Sta.–Revere/Jack Satter House via Northgate Mall	0 / 0	
428	Outbound	Oaklandvale–Haymarket via Cliftondale Sq.	50	
429	Outbound	Central Sq., Lynn–Linden Sq.	0	
441	In / Outbound	Marblehead–Haymarket via Paradise Road & Central Sq., Lynn	50 / 0	
448	Outbound	Marblehead–Downtown Crossing via Paradise Rd.	0	*
449	Outbound	Marblehead–Downtown Crossing via Humphrey St.	50	*
450	In / Outbound	Salem Depot–Boston via Highland & Western Ave.	0 / 36	
451	Inbound	N. Beverly–Salem Depot via Cabot St. or Sohier Rd.	50	
459	In / Outbound	Salem Center–Downtown via Shetland Park & Central Sq. Lynn	0 / 50	
468	Outbound	Salem Center–Essex Agricultural School via Liberty Tree Mall	0	
500	Inbound	Express Riverside–Downtown via Mass. Turnpike	50	
505	Inbound	Express Central Sq., Waltham–Downtown Boston	50	
553	Outbound	Roberts–Newton Corner or Downtown Boston via Mass. Turnpike	50	
556	Outbound	Waltham Highlands–Downtown Boston via Mass Pike	0	
CT1	Inbound	Central Sq. (Cambridge)–Boston Medical Ctr. via M.I.T.	38	*
CT3	Inbound	Beth Israel Hosp.–Andrew Sta. via Boston Medical Ctr.	17	
CT3	Outbound	Andrew Sta.–Logan Airport	50	

* Weekday peak-period service changes have been implemented on these routes since 2002.

Definitions

Evening Peak Period = 4:00–6:00 PM.

On-Time Arrivals = Arrivals within 2 minutes ahead of scheduled time and within 5 minutes after scheduled time.

4.4.2 Passenger Crowding

Listed in Tables 4.6 and 4.7 are the bus routes that exceed the passenger crowding (or *load*) threshold: 1.4 or more passengers per seat during the peak 30-minute period for the morning or evening. All morning buses that exceed the threshold operate in the inbound direction, while all but one of the evening buses that exceed the threshold are outbound buses. These are the expected results, due to the directionality of commuting. Five percent of morning peak-period bus trips and four percent of evening peak-period bus trips exceed the threshold, thus violating the passenger crowding standard.[11]

Appendix B contains maps that highlight the bus routes that do not meet service performance standards. An example of this type of map is shown in Figure 4.1.

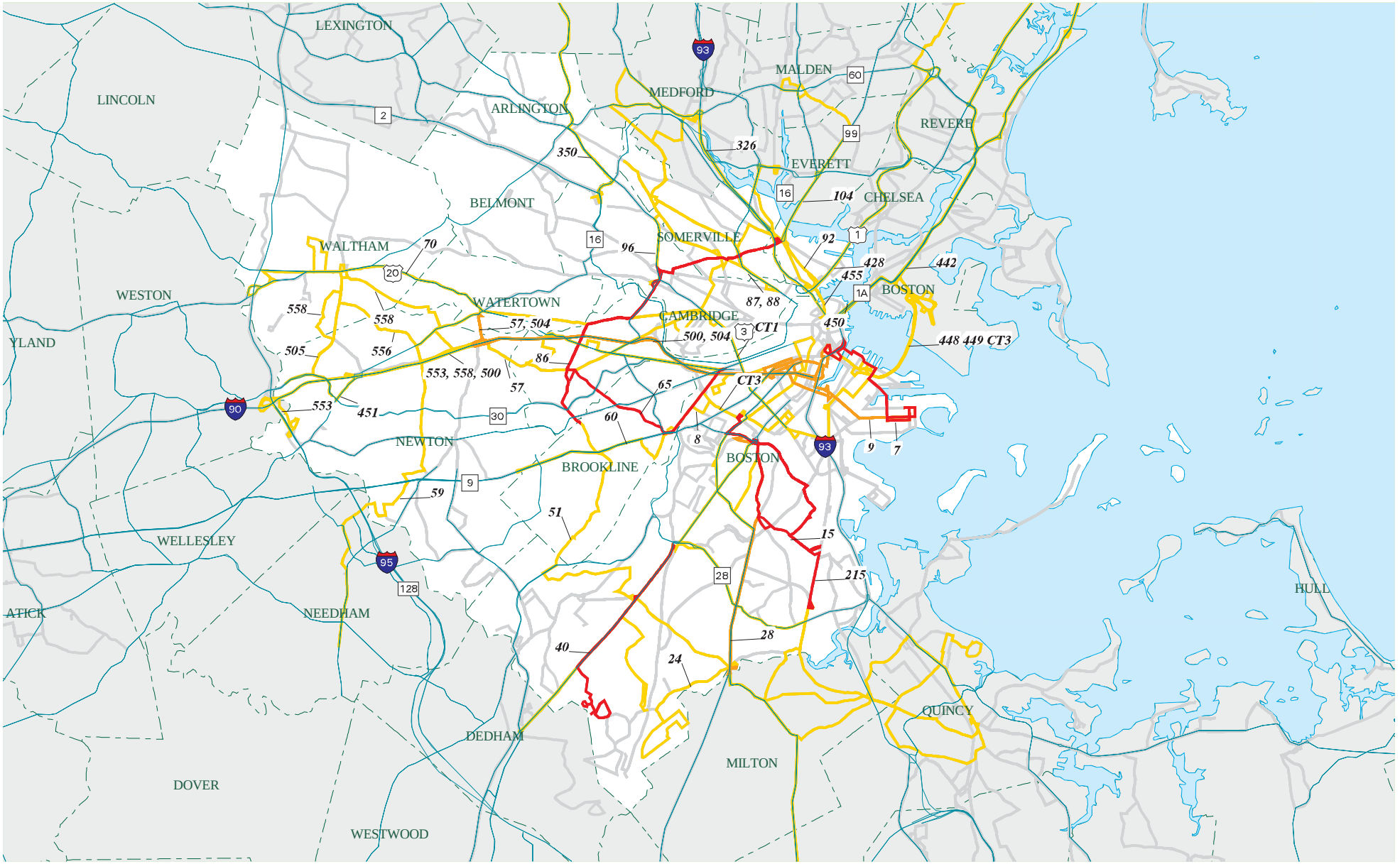
Table 4.6. Bus Routes That Violate Passenger Crowding Standard, Peak 30 Minutes in the Morning Peak Period

Route #	Direction	Description	Avg. Psgrs. per Seat in Peak 30 Min.
9	Inbound	City Point–Copley Sq. via Broadway Sta.	1.49
19	Inbound	Fields Corner Sta.–Ruggles Sta. via Grove Hall & Dudley	1.43
40	Inbound	Georgetowne–Forest Hills Sta.	1.40
65	Inbound	Brighton Center–Kenmore Sta. via Brookline Ave.	1.65
86	Inbound	Sullivan Sq. Sta.–Reservoir (Cleveland Circle) via Harvard	1.50
116	Inbound	Wonderland Sta.–Maverick Sta. via Revere St.	1.58
504	Inbound	Express Watertown Sq.–Downtown Boston via Mass Pike	1.45

Table 4.7. Bus Routes That Violate Passenger Crowding Standard, Peak 30 Minutes in the Evening Peak Period

Route #	Direction	Description	Avg. Psgrs. per Seat in Peak 30 Min.
7	Outbound	City Point–Franklin & Devonshire Sts. via Northern Ave.	1.52
15	Outbound	Kane Sq. or Fields Corner–Ruggles Sta.	1.40
28	Outbound	Mattapan Sta.–Ruggles Sta. via Dudley Sta.	1.55
111	Outbound	Woodlawn–Haymarket Sta. via Mystic River/Tobin Bridge	1.44
116	Outbound	Wonderland Sta.–Maverick Sta. via Revere St.	1.74
117	Inbound	Wonderland Sta.–Maverick Sta. via Beach St.	1.53
117	Outbound	Wonderland Sta.–Maverick Sta. via Beach St.	1.68

[11] As mentioned earlier, the results for rapid transit service are based on data from the mid- to late 1990s; for the bus system, data is from the late 1990s to the early 2000s. The MBTA, as part of the implementation of its system preservation goals, has taken steps to improve adherence to passenger crowding and on-time performance standards.



BOSTON MPO
Congestion Management System
CTPS

- Schedule adherence standard is not met
- Passenger crowding standard is not met
- Neither standard is met
- Both standards are met
- CMS roadway

Data as of 2002

FIGURE 4.1
Bus Route Performance:
Peak Period Mobility Concerns
Inner Core: Middle