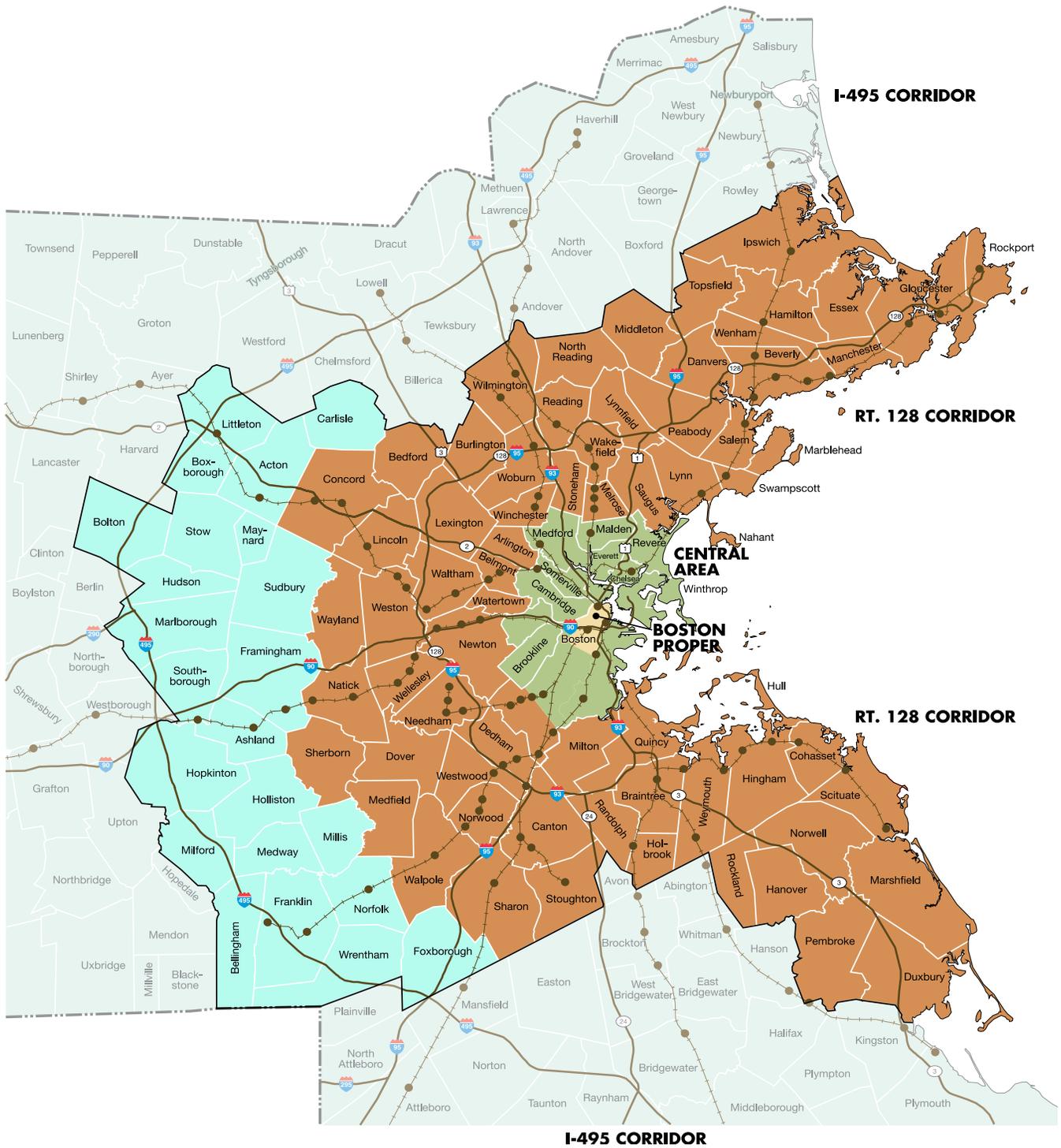




What follows is a compilation of the summaries that appear at the end of each chapter of the draft transportation needs assessment. There is a chapter in the draft needs assessment for each of the six radial corridors, the Central Area, and the circumferential corridors (see Figures S-1 and S-2). More detailed information about the needs and conditions in each corridor and the measures used to identify them can be found in the draft chapters, which are available on the Boston Region Metropolitan Planning Organization's (MPO's) website at www.bostonmpo.org/2035input.

The draft needs assessment is an important component of the Long Range Transportation Plan (LRTP) because the region's transportation needs should be inventoried in order to understand where scarce resources should be applied. The entire region, and each individual corridor and the Central Area, were studied to understand current travel patterns and trends, projected future travel demand, and transportation conditions. This information about the transportation system helps the MPO evaluate its performance relative to their concerns about system preservation, mobility, safety, transportation equity, and the environment. Information from previous and ongoing transportation planning work, including the previous LRTP (JOURNEY TO 2030), the MBTA's Program for Mass Transportation (PMT), the MPO's Congestion Management Process (CMP), transportation equity outreach, MPO studies, MassDOT studies, and other special studies, was used to develop the needs assessment.

FIGURE S-2
CIRCUMFERENTIAL CORRIDORS



SUMMARY OF NORTHEAST CORRIDOR NEEDS

The preceding sections have laid out the existing infrastructure, land use conditions, travel characteristics and patterns, and needs. This section summarizes the most pressing needs in the corridor in light of the MPO's visions established for *Paths to a Sustainable Region* and considering available information describing the needs. Many needs identified in the preceding sections stand out. They are summarized below by passenger travel mode. Freight issues and other issues affecting transportation, such as land use and transportation equity, are also summarized.

The Long Range Transportation Plan envisions a system that is well maintained, has less congestion and fewer accidents on its roadways, offers attractive alternatives to driving, produces very little of the emissions that cause climate change and health problems, offers easy connections between non-motorized modes and transit, efficiently moves freight, and supports development in areas where it already exists as a strategy to encourage alternatives to driving and to preserve open space.

Highway

Paths to a Sustainable Region envisions a highway system that is well maintained, and has less congestion and fewer severe crashes. The Northeast Corridor Needs Assessment reveals the need to maintain the roadways and bridges and address

bottleneck locations. Addressing the identified needs and problems listed below will promote the realization of the vision:

- Of the 293 bridges in the Northeast Corridor, 62 (21%) are considered functionally obsolete (does not meet current traffic demands or highway standards) and 25 (8.5%) are considered structurally deficient (deterioration has reduced the load-carrying capacity of the bridge).
- Highway bottlenecks cause congestion, accidents, and result in higher emissions of pollutants. The express highway and arterial bottleneck locations listed below were identified by at least two of the three methods described in the highway mobility section of this chapter:



- Route 1A from Boston to Danvers
- Route 1 from Chelsea to Danvers
- Route 62 in Danvers and Beverly
- Route 107 in Revere, Lynn, and Salem
- Route 114 from Danvers to Marblehead

- Route 129 in Marblehead, Swampscott, and Lynn
- The top crash locations in the Northeast Corridor were identified by the weighted Equivalent Property Damage Only (EPDO) index, which takes into consideration fatalities, injuries, and property damage. The top crash locations, in order of severity, are:
 - Route 1 at Route 129, Saugus (449)
 - Route 128 at Route 114, Peabody (404)
 - Route 1 at Essex Street, Saugus (289)
 - Route 114 at Route 1, Danvers (283)
 - Route 128 at Endicott Street, Danvers (261)

Transit

Paths to a Sustainable Region envisions a transit system that, like the highway system, is safe and maintained in a state of good repair. However, unlike the highway system the vision for transit calls for more use in order to reduce auto dependency and emissions causing climate change. In addition to projects that will bring the system into a state of good repair, addressing the needs and problems identified below will promote the realization of the vision:

- On the Blue Line, power substation equipment, an outdated signal system, and some parts of the overhead catenary and track and switches, are in need of replacement.
- On the Newburyport/Rockport Line one drawbridge needs upgraded electrical controls. Sections of single track on the trunk and branch lines constrain capacity and cause delay.
- The Lynn bus garage needs several improvements.
- Transit reliability is poor. Only two (Bus Routes 111 and 121) of the 31 bus routes (6%), and neither of the commuter rail lines, meet the MBTA's schedule adherence standards.
- Three bus routes in the Northeast Corridor (Routes 110, 111, and 117) are predicted to experience passenger crowding levels that would trigger the need for additional service or larger, articulated vehicles.
- Two commuter rail stations are not ADA accessible (Prides Crossing and Chelsea).



- The Ipswich and Manchester commuter rail park and ride lots and the Wonderland park and ride lot on the Blue Line are utilized at 85% of their capacity or greater.

Issues to watch:



- Very densely populated parts of Chelsea and Lynn lack rapid transit service.
- By 2030 large growth in intracity trips is projected for Peabody, Beverly and Salem, all of which currently have only partial local transit coverage. Lynn has the highest number of intracity trips, but low transit mode share.
- Higher transit demand resulting from the implementation of the MetroFuture land use plan will require investments to increase capacity.
- Higher density areas in parts of Beverly, Danvers, Marblehead, Revere, and Salem do not have direct access to transit services.

Freight

Paths to a Sustainable Region envisions a transportation system where freight moves efficiently by all modes. Addressing the needs and problems identified below will promote the realization of the vision:

- Route 1 at Route 60 (Mahoney/Bell Circle) was identified in the MassDOT Freight Plan as one of the 12 worst highway freight bottlenecks in Massachusetts.
- The entrance channel to the Port of Boston needs to be dredged to a depth of 50 feet, and the Conley Terminal access channel to 48 feet.
- Dredging is planned for the Port of Gloucester.
- Port areas lack direct connection to freight rail service and limited access highways.
- Preserving sites and developable space for air cargo warehousing and freight forwarding facilities in South Boston and along Route 1 and 1A is a top priority for the air cargo industry. Landside congestion to Logan International Airport is a threat to restrict air freight.

Issue to watch:

- If demand for rail freight increases, tracks carrying that freight in the Northeast Corridor may need to be upgraded to accommodate the industry standard of 286,000 pounds. Currently the capacity is 263,000 pounds. This restriction increases costs for shippers.

- 79% of highway bridges and 83% of railroad bridges do not meet the desired verticle clearance.

Bicycle/Pedestrian

Paths to a Sustainable Region calls for linking bicycle, pedestrian, and transit facilities in a network; increasing the use of sustainable modes; and improving transportation options and accessibility for all modes of transportation. Addressing the needs and problems identified below will promote the realization of the vision:

- There are few on-road or off-road bicycle facilities connecting to Blue Line or commuter rail stations.
- Few roads (approximately 2%) in the Northeast Corridor provide bicycle accommodations.
- About 48% of the non-interstate roads in the Northeast Corridor do not have a sidewalk on at least one side of the roadway.
- The Northeast Corridor lacks a bicycle corridor into Boston Proper. There are limited major bicycle connections for east-west travel.
- Some transit stations have poor pedestrian access.

Transportation Equity

Paths to a Sustainable Region envisions a transportation system that provides affordable transportation options and accessibility to people of all incomes, ages, races, and language backgrounds and does not inequitably burden any particular group. Addressing the needs and problems identified below will promote the realization of the vision:

- Lynn residents lack rapid transit service into Boston Proper, and residents of East Boston and Revere do not have easy access to the Red Line due to the lack of a connection between it and the Blue Line.
- The airport generates traffic congestion in East Boston.
- Transit service is focused on travel to and from Boston, and is inadequate for travel within the corridor.

Issue to watch:

- The transportation system will need to address the needs of the elderly population, which is expected to grow substantially during the time horizon of *Paths to a Sustainable Region*.



Land Use

Paths to a Sustainable Region shares the MetroFuture vision of a region in which new development is focused in developed areas rather than greenfields. Addressing the needs and problems identified below will promote the realization of the vision. Issues to watch include:

- Areas expected to grow the most between now and 2035 are those along the Blue Line and commuter rail lines. Transit capacity may need to increase in order to handle service demands.
- Two major mixed use developments are planned for the corridor - the redevelopment of the Lynn Waterfront (3,500 housing units and 2 million square feet of retail, office, and hotel space expected) and the transit oriented development around Wonderland Station in Revere (750 housing units, 175,000 square feet of commercial and retail space, and a hotel expected).

SUMMARY OF NORTH CORRIDOR NEEDS

The preceding sections have laid out the existing infrastructure, land use conditions, travel characteristics and patterns, and needs. This section summarizes the most pressing needs in the corridor in light of the MPO's visions established for *Paths to a Sustainable Region* and considering available information describing the needs. Many needs identified in the preceding sections stand out. They are summarized below by passenger travel mode. Freight issues and other issues affecting transportation, such as land use and transportation equity, are also summarized.

The Long Range Transportation Plan envisions a system that is well maintained, has less congestion and fewer accidents on its roadways, offers attractive alternatives to driving, produces very little of the emissions that cause climate change and health problems, offers easy connections between non-motorized modes and transit, efficiently moves freight, and supports development in areas where it already exists as a strategy to encourage alternatives to driving and to preserve open space.

Highway

Paths to a Sustainable Region envisions a highway system that is well maintained, and has less congestion and fewer severe crashes. The North Corridor Needs Assessment reveals the need to maintain the roadways and bridges and address bottleneck locations. The identified needs and problems listed below will promote the realization of the vision:



- Of the 253 bridges in the North Corridor, 56 (22%) are considered functionally obsolete (does not meet current traffic demands or highway standards) and 10 (4%) are considered structurally deficient (deterioration has reduced the load-carrying capacity of the bridge).

- Highway bottlenecks cause congestion, accidents, and result in higher emissions of pollutants. The express highway and arterial bottleneck locations listed below were identified by at least two of three methods described in the highway mobility section of this chapter:
 - Interstate 93 between the Leverett Connector and Interstate 95 (Charlestown to Stoneham) and between Route 129 and Atlantic Avenue (Wilmington and Woburn)
 - Interstate 95 between Route 28 and Route 3 (Wakefield to Burlington)
 - Route 1 Tobin Bridge in Chelsea and Boston
 - Route 3 at Interstate 95 in Burlington
 - Route 3A in Burlington and Woburn
 - Route 28 in Medford, Stoneham, Reading, and North Reading
 - Route 38 in Woburn and Wilmington
 - Route 60 in Medford and Malden
 - Route 99 in Everett
 - Route 129 in Wakefield and Reading
- The top crash locations in the North Corridor were identified by the weighted Equivalent Property Damage Only (EPDO) index, which takes into consideration fatalities, injuries, and property damage. The top crash locations, in order of severity, are:
 - Interstate 95 and 93 interchange (Reading) - EDPO of 755
 - Interstate 93 at Montvale Avenue (Woburn) - EDPO of 533
 - Interstate 95 at Route 3 (Burlington) - EDPO of 418
 - Middlesex Turnpike at Interstate 95 (Burlington) - EDPO of 359
 - Interstate 93 at Route 129 (Wilmington) - EDPO of 319



Transit

Paths to a Sustainable Region envisions a transit system that, like the highway system, is safe and maintained in a state of good repair. However, unlike the highway system the vision for transit calls for more use in order to reduce auto dependency and emissions causing climate change. In addition to projects that will bring the system into a state of good repair, addressing the needs and problems identified below will promote the realization of the vision:

- Six bridges on the Haverhill Line and one on the Lowell Line need to be replaced.
- Much of the Haverhill Line is single-track, which limits its capacity.



- New Orange Line cars need to be purchased to replace the current fleet from 1979-1981.
- Transit reliability throughout the North Corridor is poor. Only three of the 33 bus routes (9%), and neither of the commuter rail lines, meet the MBTA's schedule adherence standards.
- Eight commuter rail stations in the corridor are not ADA accessible.
- Six commuter rail station park and ride lots in the corridor and the Woburn express bus lot are utilized at 85% of their capacity or greater. Each Orange Line park and ride lot in the corridor exceeds the 85% utilization rate.

Issues to watch:

- By 2030, bus Route 132 is projected to experience passenger crowding levels that would require additional service or larger, articulated vehicles.
- Higher density areas in parts of Medford, Malden, Woburn, Stoneham, Reading, and Burlington do not have direct access to transit services.
- Higher transit demand resulting from the implementation of the MetroFuture land use plan will require investments to increase capacity.
- Roadways in parts of Medford, Somerville, and Everett are congested, yet the communities have sufficient density and travel into the urban core to support rapid transit service.

Freight

Paths to a Sustainable Region envisions a transportation system where freight moves efficiently by all modes. Addressing the needs and problems identified below will promote the realization of the vision:

- The interchange of Interstates 93 and 95 needs to be improved in order to reduce the number of truck rollover crashes occurring at the location.
- Route 3 at Interstate 95 in Burlington and the interchange of Interstates 93 and 95 were identified in the MassDOT Freight Plan as among the 12 worst highway freight bottlenecks in Massachusetts.

- The Port of Boston needs to be dredged to 45 feet in order to accommodate larger ships.
- 75 percent of highway bridges and 67 percent of railroad bridges do not meet the desired vertical clearance.

Issue to watch:

- If demand for rail freight increases, tracks carrying that freight in the North Corridor may need to be upgraded to accommodate the industry standard of 286,000 pounds. Currently the capacity is 263,000 pounds. This restriction increases costs for shippers.

Bicycle/Pedestrian

Paths to a Sustainable Region calls for linking bicycle, pedestrian, and transit facilities in a network; increasing the use of sustainable modes; and improving transportation options and accessibility for all modes of transportation. Addressing the needs and problems identified below will promote the realization of the vision:

- There are no on-road bicycle facilities connecting to Orange Line or commuter rail stations.
- Few roads (less than 1%) in the North Corridor provide bicycle accommodations.
- About 45% of the non-interstate roads in the North Corridor do not have a sidewalk on at least one side of the roadway.
- The North Corridor lacks a bicycle corridor into Boston Proper. There are no major bicycle connections for east-west travel.



Transportation Equity

Paths to a Sustainable Region envisions a transportation system that provides affordable transportation options and accessibility to people of all incomes, ages, races, and language backgrounds and does not inequitably burden any particular group. Addressing the needs and problems identified below will promote the realization of the vision:

- Late evening and early morning transit service is needed by many low income workers.
- Circumferential transit is needed for people living in the North Corridor and working in points west of Boston Proper, such as Cambridge.
- The transit system is difficult to navigate for people who speak languages other than English.

Issue to watch:

- The transportation system will need to address the needs of the elderly population, which is expected to grow substantially during the time horizon of *Paths to a Sustainable Region*.

Land Use

Paths to a Sustainable Region shares the MetroFuture vision of a region in which new development is focused in developed areas rather than greenfields. Addressing the needs and problems identified below will promote the realization of the vision. Issues to watch include:

- Areas expected to grow the most between now and 2035 are those along the Orange Line and commuter rail lines. Transit capacity will need to increase in order to handle service demands.
- The Lowell Junction development proposed at the confluence of three MPOs (Wilmington in the Boston Region, Tewksbury in Northern Middlesex, and Andover in Merrimack Valley) may generate more than 160,000 auto commuting miles per day.

SUMMARY OF NORTHWEST CORRIDOR NEEDS

The preceding sections have laid out the existing infrastructure, land use conditions, travel characteristics and patterns, and needs. This section summarizes the most pressing needs in the corridor in light of the MPO's visions established for *Paths to a Sustainable Region* and considering available information describing the needs. Many needs identified in the preceding sections stand out. They are summarized below by passenger travel mode. Freight issues and other issues affecting transportation, such as land use and transportation equity, are also summarized.

The Long Range Transportation Plan envisions a system that is well maintained, has less congestion and fewer accidents on its roadways, offers attractive alternatives to driving, produces very little of the emissions that cause climate change and health problems, offers easy connections between non-motorized modes and transit, efficiently moves freight, and supports development in areas where it already exists as a strategy to encourage alternatives to driving and to preserve open space.

Highway

Paths to a Sustainable Region envisions a highway system that is well maintained, and has less congestion and fewer severe crashes. The Northwest Corridor Needs Assessment reveals the need to maintain the roadways and bridges and address bottleneck locations. Addressing the identified needs and problems listed below will promote the realization of the vision:

- Of the 292 bridges in the Northwest Corridor, 77 (26%) are considered functionally obsolete (does not meet current traffic demands or highway standards) and 22 (7.5%) are considered structurally deficient (deterioration has reduced the load-carrying capacity of the bridge).

- Highway bottlenecks cause congestion, accidents, and result in higher emissions of pollutants. The express highway and arterial bottleneck locations listed below were identified by at least two of the three methods described in the highway mobility section of this chapter:

- Interstate 93 in Somerville
- Interstate 95 in Lexington and Waltham
- Route 2/Alewife Brook Parkway/ Fresh Pond Parkway in Cambridge
- Route 2/2A in Concord
- Route 2A in Cambridge and Arlington
- Route 62/4/225 in Concord, Bedford, and Lexington
- Route 16 in Somerville, Cambridge, and Watertown
- Route 28 in Somerville
- Route 60 in Arlington, Belmont, and Waltham
- Route 119 in Concord and Acton



- The top crash locations in the Northwest Corridor were identified by the weighted Equivalent Property Damage Only (EPDO) index, which takes into consideration fatalities, injuries, and property damage. The top crash locations, in order of severity, are:
 - Interstate 95 at Route 4 (Bedford Street), Lexington (364)
 - Interstate 93 at Route 28 (Fellsway), Somerville (335)
 - Interstate 95 at Route 2, Lexington (304)
 - Interstate 95 at Route 20, Waltham (294)
 - Lexington Street and Trapelo Road, Waltham (185)

Transit

Paths to a Sustainable Region envisions a transit system that, like the highway system, is safe and maintained in a state of good repair. However, unlike the highway system the vision for transit calls for more use in order to reduce auto dependency and emissions causing climate change. In addition to projects that will bring the system into a state of good repair, addressing the needs and problems identified below will promote the realization of the vision:

- Service on the Fitchburg Line currently faces frequent delays, increasing travel times. Eight bridges on the line are currently rated as structurally deficient, and 18.4 miles of rail are in need of replacement. (Federal stimulus funds were granted for some of these improvements.)
- On the Red Line, power cables, emergency lighting systems, and track components are in need of replacement at some locations. Seventy-four cars built in 1969 need to be replaced.
- Transit reliability throughout the Northwest Corridor is poor. Only three of the 41 bus routes (7.3%) meet the MBTA's schedule adherence standards. The Fitchburg Line fails to meet the schedule adherence standard for commuter rail.



- Eleven commuter rail stations on the Fitchburg Line are not ADA accessible.
- The Ayer, Concord, South Acton, and Waltham commuter rail station park and ride lots are utilized at 85% of their capacity or greater. The Alewife (Red Line) and Lechmere (Green Line) rapid transit station park and ride lots also exceed the 85% utilization rate.
- Thirteen bus routes (1, 47, 62, 66, 67, 68, 71, 73, 77, 86, 87, 89, and 554) in the Northwest Corridor are predicted to have crowding levels in 2030 that would require additional service or larger, articulated vehicles.

Issues to watch:

- Higher transit demand resulting from the implementation of the MetroFuture land use plan will require investments to increase capacity.
- Densely developed areas in Somerville currently generate high trip volumes to Cambridge and Boston. In addition, trip volumes between Somerville and Cambridge are projected to increase substantially. Taken together, these expose a gap in rapid transit service in this corridor.
- Outside of the inner core communities of Cambridge and Somerville, Acton, Concord, and Westford show the largest projected growth in intracity travel by 2030. Waltham has a low transit mode share (2.6% of all trips) given the existing level of bus and rail service.
- Higher density areas in parts of Belmont, Lincoln, Maynard, Waltham, and Watertown do not have direct access to transit services.

Freight

Paths to a Sustainable Region envisions a transportation system where freight moves efficiently by all modes.

Issues to watch:

- Three locations in the West Corridor were identified by the MassDOT Freight Plan as among the 12 worst highway freight bottlenecks in Massachusetts: Interstate 290 at Interstate 495 in Marlborough, Interstate 90 at Interstate 495 in Hopkinton, and Interstate 95 at Route 9 in Wellesley.
- As demand for rail freight increases, tracks carrying that freight in the Northwest Corridor may need to be upgraded to accommodate the industry standard of 286,000 pounds. Currently the capacity is 263,000 pounds. This restriction increases costs for shippers.
- 81% of highway bridges and 79% of railroad bridges do not meet the desired vertical clearance.



Bicycle/Pedestrian

Paths to a Sustainable Region calls for linking bicycle, pedestrian, and transit facilities in a network; increasing the use of sustainable modes; and improving transportation options and accessibility for all modes of transportation. Addressing the needs and problems identified below will promote the realization of the vision:

- There is poor bicycle access to most of the Fitchburg Line commuter rail stations.
- Few roads (less than 3%) in the Northwest Corridor provide bicycle accommodations.
- There is poor pedestrian access to some of the Fitchburg Line commuter rail stations.
- About 54% of the centerline miles on non-interstate roads in the Northwest Corridor do not have a sidewalk on at least one side of the roadway.
- The Northwest Corridor bicycle network has few on-road or off-road bicycle accommodations for circumferential travel.

Transportation Equity

Paths to a Sustainable Region envisions a transportation system that provides affordable transportation options and accessibility to people of all incomes, ages, races, and

language backgrounds and does not inequitably burden any particular group. Addressing the needs and problems identified below will promote the realization of the vision:

- Union Square in Somerville lacks rapid transit service.
- Late evening and early morning transit service is needed by many low income workers.
- Transit service to parts of Waltham is not sufficient.
- Many streets are dangerous for pedestrians and bicyclists.

Issue to watch:

- The elderly population is expected to grow substantially between now and 2035. Meeting their mobility needs will be an important issue to address during this time period.

Land Use

Paths to a Sustainable Region shares the MetroFuture vision of a region in which new development is focused in developed areas rather than greenfields. Addressing the needs and problems identified below will promote the realization of the vision. Issues to watch include:

- Areas expected to grow the most between now and 2035 are those along the Red and Orange Lines, the planned Green Line extension, and the Inner Core communities of Cambridge, Somerville, Arlington, and Watertown. Transit capacity may need to increase in order to handle service demands.
- The largest developments planned in the corridor are located in Somerville along the planned Green Line extension and at Assembly Square. The proposed development of Assembly Square would create up to 2,100 housing units and more than 2.5 million square feet of commercial and office space.

SUMMARY OF WEST CORRIDOR NEEDS

The preceding sections have laid out the existing infrastructure, land use conditions, travel characteristics and patterns, and needs. This section summarizes the most pressing needs in the corridor in light of the MPO's visions established for *Paths to a Sustainable Region* and considering available information describing the needs. Many needs identified in the preceding sections stand out. They are summarized below by passenger travel mode. Freight issues and other issues affecting transportation, such as land use and transportation equity, are also summarized.

The Long Range Transportation Plan envisions a system that is well maintained, has less congestion and fewer accidents on its roadways, offers attractive alternatives to driving, produces very little of the emissions that cause climate change and health problems, offers easy connections between non-motorized modes and transit, efficiently moves freight, and supports development in areas where it already exists as a strategy to encourage alternatives to driving and to preserve open space.

Highway

Paths to a Sustainable Region envisions a highway system that is well maintained, and has less congestion and fewer severe crashes. The West Corridor Needs Assessment reveals the need to maintain the roadways and bridges and address bottleneck locations. The identified needs and problems listed below will promote the realization of the vision:

- Of the 472 bridges in the West Corridor, 142 (30%) are considered functionally obsolete (does not meet current traffic demands or highway standards) and 50 (11%) are considered structurally deficient (deterioration has reduced the load-carrying capacity of the bridge).
- Highway bottlenecks cause congestion, accidents, and result in higher emissions of pollutants. The express highway and arterial bottleneck locations listed below were identified by at least two of the three methods described in the highway mobility section of this chapter:
 - Interstate 90 between Newton and Framingham
 - Interstate 95 between Dedham and Weston
 - Route 9 between Boston and Southborough
 - Route 16 in Newton, Wellesley, and Hopkinton
 - Route 20 from Marlborough to Weston
 - Route 30 in Boston, Newton, and Framingham
 - Route 126 in Framingham and Holliston
 - Route 135 between Needham and Hopkinton
 - Storrow Drive/Soldiers Field Road in Boston
- The top crash locations in the North Corridor were identified by the weighted Equivalent Property Damage Only (EPDO) index, which takes into consideration fatalities, injuries, and property damage. The top crash locations, in order of severity, are:
 - Route 9 at Route 27, Natick (346)
 - Route 9 at Route 30, Framingham (272)
 - Interstate 90 at Interstate 95, Weston (239)



- Interstate 95 at Route 9, Wellesley (224)
- Route 126 at Route 135, Framingham (209)

Transit

Paths to a Sustainable Region envisions a transit system that, like the highway system, is safe and maintained in a state of good repair. However, unlike the highway system the vision for transit calls for more use in order to reduce auto dependency and emissions causing climate change. In addition to projects that will bring the system into a state of good repair, addressing the needs and problems identified below will promote the realization of the vision:

- One bridge on the Needham Line and one bridge on the D Branch of the Green Line are rated as structurally deficient.



- On the Green Line, power substations and power transmission and distribution lines at several locations are in need of upgrading or replacement. Tie replacement is needed on the B and C Branches and the signal system needs to be replaced on the D Branch. At-grade crossings of streets need to be reconstructed or rehabilitated at 37 locations on the surface branches.
- The Green Line Central Subway is currently operating at capacity, constraining the ability of the system to meet growth in demand for service within the West Corridor.

- Transit reliability throughout the West Corridor is poor. None of the 41 bus routes or three commuter rail lines meet the MBTA's schedule adherence standards.
- By 2030, modeling projections suggest that four bus routes in the West Corridor (Routes 64, 65, 66, and 503) may have passenger-crowding levels that would trigger the need for additional service.
- Seven commuter rail stations and 27 Green Line stations in the corridor are not ADA accessible.
- Five commuter rail stations and three Green Line D Branch station park and ride lots in the corridor are utilized at 85% of their capacity or greater.

Issues to watch:

- Higher transit demand resulting from the implementation of the MetroFuture land use plan will require investments to increase capacity. Harvard and Boston

Universities are planning major development adjacent to the Worcester commuter rail line.

- The tracks on which the Framingham/Worcester Line operates are owned by CSX Transportation, which runs freight service and controls train dispatching for both freight and commuter rail. On-time performance has been problematic on this line, primarily due to conflicts with freight service and lack of MBTA control over dispatching on the line. This should improve when MassDOT takes control of the tracks.
- The Fenway/Longwood Medical and Academic Area is both a prominent tourist/cultural destination and a growing center for employment in the Boston region. Congestion of the transportation system in this area constrains growth and economic development potential.
- Higher density areas in parts of Brookline, Newton, Needham, Framingham, Marlborough, and Hudson do not have direct access to MBTA transit services, however, Framingham, Natick, and Marlborough are served by the MetroWest Regional Transit Authority (MWRTA).

Freight

Paths to a Sustainable Region envisions a transportation system where freight moves efficiently by all modes. Addressing the needs and problems identified below will promote the realization of the vision:

- The interchange of Interstate 495, Interstate 290, and Route 85 in Marlborough needs to be improved in order to reduce the number of truck rollover crashes occurring at the location.

Issues to watch:

- CSX plans to move its terminal facility from Allston to Worcester, which will change some regional trucking patterns.
- As demand for rail freight increases, branch lines carrying freight in the West Corridor may need to be upgraded to accommodate the industry standard of 286,000 pounds. Currently the capacity is 263,000 pounds. This restriction increases costs for shippers.
- 88% of highway bridges and 91% of railroad bridges do not meet the desired vertical clearance.



Bicycle/Pedestrian

Paths to a Sustainable Region calls for linking bicycle, pedestrian, and transit facilities in a network; increasing the use of sustainable modes; and improving transportation options and accessibility for all modes of transportation. Addressing the needs and problems identified below will promote the realization of the vision:

- There are no on-road bicycle facilities connecting to some Green Line and most Worcester Line stations.
- Few roads (less than 2%) in the West Corridor provide bicycle accommodations.
- About 53% of the non-interstate roads in the West Corridor do not have a sidewalk on at least one side of the roadway.
- The West Corridor lacks major bicycle connections for circumferential travel.

Transportation Equity

Paths to a Sustainable Region envisions a transportation system that provides affordable transportation options and accessibility to people of all incomes, ages, races, and language backgrounds and does not inequitably burden any particular group.

Issues to watch:

- The transportation system will need to address the needs of the elderly population, which is expected to grow substantially during the time horizon of *Paths to a Sustainable Region*.
- The elderly population is expected to grow substantially between now and 2035. Meeting their mobility needs will be an important issue to address during this time period.

Land Use

Paths to a Sustainable Region shares the MetroFuture vision of a region in which new development is focused in developed areas rather than greenfields. Addressing the needs and problems identified below will promote the realization of the vision.

Issues to watch include:

- Areas expected to grow the most between now and 2035 are those along the Green Line branches and commuter rail lines. Transit capacity may need to increase in order to handle service demands.
- The three largest residential developments planned in the corridor are the redevelopment of the Weston Nurseries (1,000 units), the Jefferson at Ashland development near Ashland Station (500 units), and a high rise in Natick (407 units). The largest planned commercial developments include the Hopping Brook Business Park in Holliston, the development of a new EMC campus in Southborough and Westborough, the Weston Nurseries, and the Framingham Tech Park.

SUMMARY OF SOUTHWEST CORRIDOR NEEDS

The preceding sections have laid out the existing infrastructure, land use conditions, travel characteristics and patterns, and needs. This section summarizes the most pressing needs in the corridor in light of the MPO's visions established for *Paths to a Sustainable Region* and considering available information describing the needs. Many needs identified in the preceding sections stand out. They are summarized below by passenger travel mode. Freight issues and other issues affecting transportation, such as land use and transportation equity, are also summarized.

The Long Range Transportation Plan envisions a system that is well maintained, has less congestion and fewer accidents on its roadways, offers attractive alternatives to driving, produces very little of the emissions that cause climate change and health problems, offers easy connections between non-motorized modes and transit, efficiently moves freight, and supports development in areas where it already exists as a strategy to encourage alternatives to driving and to preserve open space.

Highway

Paths to a Sustainable Region envisions a highway system that is well maintained, and has less congestion and fewer severe crashes. The Southwest Corridor Needs Assessment reveals the need to maintain the roadways and bridges and address bottleneck locations. The identified needs and problems listed below will promote the realization of the vision:

- Of the 378 bridges in the Southwest Corridor, 79 (21%) are considered functionally obsolete (does not meet current traffic demands or highway standards) and 18 (5%) are considered structurally deficient (deterioration has reduced the load-carrying capacity of the bridge).
- Highway bottlenecks cause congestion, accidents, and result in higher emissions of pollutants. The express highway and arterial bottleneck locations listed below were identified by at least two of the three methods described in the highway mobility section of this chapter:
 - I-95/I-93 in Dedham, Westwood and Canton
 - I-95 in Canton and Norwood
 - Route 1/VFW Parkway (various segments in Boston Dedham, Norwood, and Westwood)
 - Route 27 between Depot Street and Canton Street in Sharon
 - Route 109 in Dedham, Westwood, Medfield, and Milford
 - Route 126 in Bellingham
 - Route 138 between Stoughton Center and the I-93 interchange in Canton
 - Route 139 from the route 24 interchange to the Turnpike Street intersection in Stoughton



- Route 140 between Wrentham and Franklin
- Route 203/Jamaicaway between Willow Pond Road and the Forest Hills Rotary and at the Route 9 ramps in Boston
- The top crash locations in the Southwest Corridor were identified by the weighted Equivalent Property Damage Only (EPDO) index, which takes into consideration fatalities, injuries, and property damage. The top crash locations, in order of severity, are:
 - Interstate 93 at Route 138 (Washington Street), Canton (309)

- Route 139 (Lindelof Avenue) at Route 24, Stoughton (218)
- Route 1 at Everett Street, Norwood (203)
- Washington Street and Central Street, Stoughton (180)
- Route 1 at Dean Street, Norwood (179)

Transit

Paths to a Sustainable Region envisions a transit system that, like the highway system, is safe and maintained in a state of good repair. However, unlike the highway system the vision for transit calls for more use in order to reduce auto dependency and emissions causing climate change. In addition to projects that will bring the system into a state of good repair, addressing the needs and problems identified below will promote the realization of the vision:

- New Orange Line cars need to be purchased to replace the current fleet from 1979-1981.
- On the Silver Line Washington Street, the CNG vehicle fleet needs a mid-life overhaul.
- Two bridges on the Providence/Stoughton Line are rated as structurally deficient.
- Transit reliability throughout the Southwest Corridor is poor. Only four of the 39 bus routes (10%), and one of the four commuter rail lines (Fairmount), meet the MBTA's schedule adherence standards.
- Seven commuter rail stations in the corridor are not ADA accessible.
- Very densely populated areas in Boston served by MBTA bus Routes 23 and 28 do not have frequent rapid transit access within a reasonable walking distance. Travel times on these routes are long and unreliable.

- Many of the commuter rail trains that pass through Ruggles Station cannot stop there because one of the three tracks does not have a platform.
- The capacity of the Franklin, Stoughton, and Needham Lines are constrained by single tracks.
- Milford is a regional employment center, yet transit access is limited.
- Twelve bus routes (15, 19, 21, 22, 28, 37, 40, 43, 47, 66, CT1, and CT3) in the Southwest Corridor are predicted to have crowding levels in 2030 that would require additional service.
- Four commuter rail station park and ride lots in the corridor and the Forest Hills lot on the Orange Line are utilized at 85% of their capacity or greater.
- Higher density areas in parts of Dedham, Norwood, and Milford do not have direct access to MBTA transit services, but Milford is served by the MetroWest Regional Transit Authority (MWRTA).



Issues to watch:

- Higher transit demand resulting from the implementation of the MetroFuture land use plan will require investments to increase capacity.
- Bus Route 39 is the most heavily used route in a busy corridor.
- Large economic development projects are planned near Gillette Stadium in Foxborough.

Freight

Paths to a Sustainable Region envisions a transportation system where freight moves efficiently by all modes. Addressing the needs and problems identified below will promote the realization of the vision:

Issue to watch:

- As demand for rail freight increases, tracks carrying that freight in the Southwest Corridor may need to be upgraded to accommodate the industry standard of 286,000 pounds. Currently the capacity is 263,000 pounds. This restriction increases costs for shippers.
- 77% of highway bridges and 88% of railroad bridges do not meet the desired vertical clearance.

Bicycle/Pedestrian

Paths to a Sustainable Region calls for linking bicycle, pedestrian, and transit facilities in a network; increasing the use of sustainable modes; and improving transportation options and accessibility for all modes of transportation. Addressing the needs and problems identified below will promote the realization of the vision:



- There are no on-road bicycle facilities connecting to commuter rail stations.
- Few roads (less than 2%) in the Southwest Corridor provide bicycle accommodations.
- About 57% of the non-interstate roads in the Southwest Corridor do not have a sidewalk on at least one side of the roadway.
- The Southwest Corridor lacks major bicycle connections for circumferential - Central Area travel.

Transportation Equity

Paths to a Sustainable Region envisions a transportation system that provides affordable transportation options and accessibility to people of all incomes, ages, races, and language backgrounds and does not inequitably burden any particular group. Addressing the needs and problems identified below will promote the realization of the vision:

- Traffic calming and complete streets design principles will create a safer environment for pedestrians and bicyclists.
- Better circumferential transit is needed.
- Densely populated areas in Roxbury and Jamaica Plain lack access to rapid transit within a reasonable walking distance.
- Several bus routes in the Southwest Corridor operate at slow speeds.
- The MBTA's Arborway Yard in Jamaica Plain is an eyesore.
- Transit service is limited in Milford and the Hyde Park neighborhood of Boston.
- Commuter rail fares and overnight idling of locomotives are a burden on Hyde Park.
- The elderly population is expected to grow substantially between now and 2035. Meeting their mobility needs will be an important issue to address during this time period.

Land Use

Paths to a Sustainable Region shares the MetroFuture vision of a region in which new development is focused in developed areas rather than greenfields. Addressing the needs and problems identified below will promote the realization of the vision. Issues to watch include:

- Areas expected to grow the most between now and 2035 are those along the commuter rail lines. Transit capacity may need to increase in order to handle service demands.
- The largest development planned in the corridor is Westwood Station with 1,000 housing units, 1 million square feet of retail space, 1.5 million square feet of office space, and two hotels.
- Auto dependency in the corridor is high. The average household owns 2.0 autos and drives 68.6 miles per day, well above the regional average of 46.7 miles.

SUMMARY OF SOUTHEAST CORRIDOR NEEDS

The preceding sections have laid out the existing infrastructure, land use conditions, travel characteristics and patterns, and needs. This section summarizes the most pressing needs in the corridor in light of the MPO's visions established for *Paths to a Sustainable Region* and considering available information describing the needs. Many needs identified in the preceding sections stand out. They are summarized below by passenger travel mode. Freight issues and other issues affecting transportation, such as land use and transportation equity, are also summarized.

The Long Range Transportation Plan envisions a system that is well maintained, has less congestion and fewer accidents on its roadways, offers attractive alternatives to driving, produces very little of the emissions that cause climate change and health problems, offers easy connections between non-motorized modes and transit, efficiently moves freight, and supports development in areas where it already exists as a strategy to encourage alternatives to driving and to preserve open space.

Highway

Paths to a Sustainable Region envisions a highway system that is well maintained, and has less congestion and fewer severe crashes. The Southeast Corridor Needs Assessment reveals the need to maintain the roadways and bridges and address bottleneck locations. The identified needs and problems listed below will promote the realization of the vision:

- Of the 375 bridges in the Southeast Corridor, 72 (19%) are considered functionally obsolete (does not meet current traffic demands or highway standards) and 16 (4%) are considered structurally deficient (deterioration has reduced the load-carrying capacity of the bridge).
- Highway bottlenecks cause congestion, accidents, and result in higher emissions of pollutants. The express highway and arterial bottleneck locations listed below were identified by at least two of the three methods described in the highway



mobility section of this chapter:

- I-93 Southeast Expressway from the Braintree split to the I-90 interchange (Braintree, Quincy, Milton)
 - I-93/Rte. 1 from Ponkapoag to the I-93/ Southeast Expressway/Braintree split (Milton, Braintree)
 - Route 3 from the Braintree split to Marshfield
 - Route 24 from Mazzeo Drive to I-93 ramps (Randolph)
 - Route 3A from the I-93/Southeast Expressway interchange to Hingham
- Route 18 in Weymouth
 - Route 28 from the I-93/Route 1 interchange to Avon
 - Route 37 from the I-93 interchange to the intersection with Route 139
 - Route 203/Morton Street/Gallivan Boulevard from Route 28/Blue Hill Avenue to I-93
- The top crash locations in the Southeast Corridor were identified by the weighted Equivalent Property Damage Only (EPDO) index, which takes into consideration fatalities, injuries, and property damage. The top crash locations, in order of severity, are:
 - Interstate 93 at Granite Street, Braintree (795)
 - Interstate 93 at Columbia Road, Boston (697)
 - Interstate 93 at Granite Avenue, Milton (615)
 - Route 3 at Route 18, Weymouth (489)
 - Interstate 93 near the ramps to Furnace Brook Parkway, Quincy (460)

Transit

Paths to a Sustainable Region envisions a transit system that, like the highway system, is safe and maintained in a state of good repair. However, unlike the highway system the vision for transit calls for more use in order to reduce auto dependency and emissions causing climate change. In addition to projects that will bring the system into a state of good repair, addressing the needs and problems identified below will promote the realization of the vision:

- Twelve bridges on the Fairmount Line are currently rated as structurally deficient. Work has commenced on some of these.

- On the Red Line, upgrades to portions of the track, power, and signal systems are needed and cars must be purchased so the 1969 fleet can be retired. The Cabot maintenance facility is in need of renovations.
- New vehicles are needed to replace the PCC cars on the Mattapan High Speed Line.
- The Cabot and Quincy bus garages need some repairs and upgrades.
- Transit reliability throughout the Southeast Corridor is poor. Only three of the 3 local bus routes (9%), and one (Fairmount) of four commuter rail lines, meet the MBTA's schedule adherence standards.
- Wollaston Station on the Red Line and Valley Road Station on the Mattapan High Speed Line are not ADA accessible.
- Three bus routes (19, 22, and 28) in the Southeast Corridor are predicted to have crowding levels in 2030 that would require additional service.
- One commuter rail station and four Red Line station park and ride lots in the corridor are utilized at greater than 85%.
- By 2030, ridership demand on the Middleborough/Lakeville Line is projected to exceed capacity if six-car trains are still in use then.
- Very densely populated areas in Boston served by MBTA bus Routes 23 and 28 do not have frequent rapid transit access within a reasonable walking distance.
- Capacity enhancements on the Old Colony Lines are limited by sections of single track.
- Higher density areas in parts of Weymouth, Randolph, and Rockand do not have direct access to transit services.



Issues to watch:

- Higher transit demand resulting from the implementation of the MetroFuture land use plan will require investments to increase capacity.
- By 2030 the largest growth in intratown trips is projected for Weymouth and Hingham, which currently have limited existing transit services and, therefore, very low transit mode shares.

Freight

Paths to a Sustainable Region envisions a transportation system where freight moves efficiently by all modes. Addressing the needs and problems identified below will promote the realization of the vision:

- Route 24 at Interstate 93 and Interstate 93 southbound at Routes 3 and 128 (the Braintree Split) were identified in the MassDOT Freight Plan as among the 12 worst highway freight bottlenecks in Massachusetts.



- The entrance channel to the Port of Boston needs to be dredged to a depth of 50 feet, and the Conley Terminal access channel dredged to 48 feet.
- Overweight truck routes serving the Port of Boston will improve the efficiency of freight operations.
- The Port of Boston lacks direct access to highway and rail facilities.
- 79% of highway bridges and 79% of railroad bridges do not meet the desired vertical clearance.

Issue to watch:

- As demand for rail freight increases, tracks carrying that freight in the Southeast Corridor may need to be upgraded to accommodate the industry standard of 286,000 pounds. Currently the capacity is 263,000 pounds. This restriction increases costs for shippers.

Bicycle/Pedestrian

Paths to a Sustainable Region calls for linking bicycle, pedestrian, and transit facilities in a network; increasing the use of sustainable modes; and improving transportation options and accessibility for all modes of transportation. Addressing the needs and problems identified below will promote the realization of the vision:

- There are few on-road or off-road bicycle facilities connecting to Red Line or commuter rail stations.
- Few roads (approximately 2%) in the Southeast Corridor provide bicycle accommodations.
- About 58% of the non-interstate roads in the Southeast Corridor do not have a sidewalk on at least one side of the roadway.
- The Southeast Corridor lacks a bicycle corridor into Boston Proper. There are limited major bicycle connections for circumferential travel.

Transportation Equity

Paths to a Sustainable Region envisions a transportation system that provides affordable transportation options and accessibility to people of all incomes, ages, races, and language backgrounds and does not inequitably burden any particular group. Addressing the needs and problems identified below will promote the realization of the vision:

- Traffic calming and complete streets design principles will create a safer environment for pedestrians and bicyclists.
- Better circumferential transit and a connection between the Red and Blue Lines are needed.
- Buses in parts of Dorchester are crowded and operate at slow speeds.
- Bicycling infrastructure is lacking throughout Quincy and buses do not run frequently enough.
- Parts of Randolph lack transit service.

Issue to watch:

- The elderly population is expected to grow substantially between now and 2035. Meeting their mobility needs will be an important issue to address during this time period.



Land Use

Paths to a Sustainable Region shares the MetroFuture vision of a region in which new development is focused in developed areas rather than greenfields. Addressing the needs and problems identified below will promote the realization of the vision. Issues to watch include:

- Areas expected to grow the most between now and 2035 are those along the Red Line and commuter rail lines. Transit capacity may need to increase in order to handle service demands.
- The largest developments planned in the corridor are SouthField (2 million square feet of commercial, office, and industrial space, and 3,800 housing units), and the Quincy Center redevelopment (1.3 million square feet of retail, office, and hotel uses, and 800 housing units). Other large projects include a 1,000-unit mixed use development at the Fore River Shipyard, and buildout of Enterprise Park in Marshfield.

SUMMARY OF CENTRAL AREA NEEDS

The preceding sections have laid out the existing infrastructure, land use conditions, travel characteristics and patterns, and needs. This section summarizes the most pressing needs in the corridor in light of the MPO's visions established for *Paths to a Sustainable Region* and considering available information describing the needs. Many needs identified in the preceding sections stand out. They are summarized below by passenger travel mode. Freight issues and other issues affecting transportation, such as land use and transportation equity, are also summarized.

The Long Range Transportation Plan envisions a system that is well maintained, has less congestion and fewer accidents on its roadways, offers attractive alternatives to driving, produces very little of the emissions that cause climate change and health problems, offers easy connections between non-motorized modes and transit, efficiently moves freight, and supports development in areas where it already exists as a strategy to encourage alternatives to driving and to preserve open space.

Highway

Paths to a Sustainable Region envisions a highway system that is well maintained, and has less congestion and fewer severe crashes. The Central Area Needs Assessment reveals the need to maintain the roadways and bridges and address bottleneck locations. The identified needs and problems listed below will promote the realization of the vision:

- Of the 622 bridges in the Central Area, 153 (25%) are considered functionally obsolete (does not meet current traffic demands or highway standards) and 67 (11 %) are considered structurally deficient (deterioration has reduced the load-carrying capacity of the bridge).
- Highway bottlenecks cause congestion, accidents, and result in higher emissions of pollutants. The express highway and arterial bottleneck locations listed below were identified by at least two of the three methods described in the highway mobility section of this chapter:



- Interstate 93/Southeast Expressway between Milton and Medford
- Route 1A in Boston and Revere
- Route 1 in Boston and Chelsea
- Route 9 in Boston and Brookline
- Route 99 in Everett
- Route 203 Jamaica Way, Morton Street, and Gallivan Blvd in Boston
- Alewife Brook Parkway in Cambridge
- Storrow Drive/Soldiers Field Road in Boston

- The top crash locations in the Central Area were identified by the weighted Equivalent Property Damage Only (EPDO) index, which takes into consideration fatalities, injuries, and property damage. The top crash locations, in order of severity, are:
 - Interstate 93 at Columbia Road, Boston (697)
 - Interstate 93 at Neponset Avenue and Gallivan Boulevard, Boston (450)
 - Interstate 93 near ramp to Route 3A, Boston (388)
 - North Washington Street at Interstate 93 (Ramp to Sumner Tunnel), Boston (357)
 - Interstate 93 at Route 28 (Fellsway), Somerville (335)

Transit

Paths to a Sustainable Region envisions a transit system that, like the highway system, is safe and maintained in a state of good repair. However, unlike the highway system the vision for transit calls for more use in order to reduce auto dependency and emissions causing climate change. In addition to projects that will bring the system into a state of good repair, addressing the needs and problems identified below will promote the realization of the vision:

Infrastructure Needs/Problems:

- On the Blue, Green, and Orange Lines, power substation equipment at several locations needs to be upgraded or replaced. Signal systems on the Blue and Green Line need to be upgraded or replaced. Parts of the third rail, and the concrete support pedestals, need to be replaced on the Orange Line.
- On the Green Line, tie replacement is needed on the B and C branches and at-grade crossings of streets need to be reconstructed or rehabilitated at 37 locations.
- On the Blue Line, the overhead catenary system and track and switches at some locations need to be replaced.
- On the Orange Line, upgrades are needed at all north-side Orange Line stations to improve passenger areas.
- On the Red Line, power cables, emergency lighting systems, and track components are in need of replacement at some locations.



- The Wellington (Orange Line) and Cabot (Red Line) maintenance facilities, and the Charlestown and Cabot bus garages, need renovations.
- The 1979-1981 fleet of Orange Line cars, Red Line cars dating to 1969, and the 1940s era PCC cars on the Mattapan High Speed Line are in need of replacement.
- On the Silver Line Washington Street, the CNG vehicle fleet needs a mid-life overhaul.
- The Green Line Central Subway is currently operating at capacity, constraining the ability of the system to meet growth in demand for service. By 2030 ridership demand on the Green Line's surface branches, as well as in the Central Subway, is projected to exceed capacity if two-car trains are still in use.
- On the commuter rail system, 12 bridges on the Fairmount Line are currently rated as structurally deficient. Work has commenced on some of these.



- Many of the commuter rail trains that pass through Ruggles Station cannot stop there, because one of the three tracks does not have a platform.
- Track capacity at South Station limits service expansion. MassDOT has received \$32.5 million from the Federal Railroad Administration for planning and environmental review of South Station expansion.
- Twelve percent of all bus routes providing service in the Central Area fail the MBTA's vehicle load standard. On the rapid transit system, crowding is particularly acute on the Green Line's B, C, and D branches, which all fail the MBTA's vehicle load standard.
- 87percent of all bus routes providing service in the Central Area fail their schedule adherence standard. With the exception of the Fairmount Line, none of the commuter rail lines passed the schedule adherence standard.
- Nine rapid transit station park and ride lots are utilized at 85% of their capacity or greater.
- Two commuter rail stations and 23 rapid transit stations in the corridor are not ADA accessible.

Service Gaps and Issues to Watch:

- Although the MBTA currently operates some circumferential bus connections

between rapid transit spokes, buses must compete with cars on increasingly congested urban streets, reducing the appeal of these services. More frequent, rapid, and through-routed connections would greatly enhance circumferential mobility, particularly between important Central Area activity centers.

- Transit travel to the business districts in Cambridge—especially near Kendall and Harvard Squares—is currently difficult for East Boston and North Shore residents. Cambridge residents do not have direct rapid transit access to the northern part of the financial district near State and Aquarium Stations on the Blue Line.
- Densely developed areas in Somerville currently generate high trip volumes to Cambridge and Boston. In addition, trip volumes between Somerville and Cambridge are projected to increase substantially.
- Very densely populated areas in Chelsea, Everett, and Medford, which currently generate significant numbers of trips into the urban core, do not have frequent rapid transit access within a reasonable walking distance.
- Currently, travel by MBTA between the Back Bay, Roxbury, Fenway, Brookline, and Newton to Logan Airport, the Boston Convention and Exhibition Center, and the rapidly developing South Boston Waterfront is a “three-seat ride.”
- The lack of a direct connection between North and South Stations makes many types of trips cumbersome using transit. North-side commuter rail users need better direct access to the Back Bay (and the Ruggles area and Longwood Medical and Academic Area). Commuters on the south-side lines currently must transfer to travel via rapid transit from South Station to Government Center and areas further north in Boston.
- By 2030 projected growth in demand on 25 bus routes may cause crowding levels that would require additional service. These are Routes 1, 15, 19, 21, 22, 28, 37, 40, 43, 47, 64, 65, 66, 68, 71, 73, 77, 86, 87, 89, 110, 111, 117, CT1, and CT3.
- Bus Routes 39 and 57 are heavily used routes in busy corridors.
- Very densely populated areas of Roxbury and Dorchester lack direct rapid transit service to Boston Proper. They are currently served by MBTA bus Routes 23 and 28, which are long and unreliable, and terminate at Ruggles Station. MassDOT is currently conducting the Roxbury/Dorchester/Mattapan Study that will look at issues along this corridor.
- Traffic congestion around Alewife Station increases the running times and reduces the reliability of bus routes that serve the station.
- The Orange Line is currently overcrowded during peak hours between Downtown Crossing and North Station.
- A major commercial and residential development at Assembly Square could create burdens for an already congested area highway system.

- Harvard and Boston Universities are planning major development adjacent to the Worcester commuter rail line.
- Higher transit demand resulting from the implementation of the MetroFuture land use plan will require investments to increase capacity.
- The tracks on which the Framingham/Worcester Line operates are owned by CSX Transportation, which runs freight service and controls train dispatching for both freight and commuter rail. On-time performance has been problematic on this line, primarily due to conflicts with freight service and lack of MBTA control over dispatching on the line.
- The Fenway/Longwood Medical and Academic Area is both a prominent tourist/cultural destination and a growing center for employment in the Boston region. Congestion of the transportation system in this area constrains growth and economic development potential.

Freight

Paths to a Sustainable Region envisions a transportation system where freight moves efficiently by all modes. Addressing the needs and problems identified below will promote the realization of the vision:

- The entrance channel to the Port of Boston needs to be dredged to a depth of 50 feet, and the Conley Terminal access channel to 48 feet. Additionally, the Chelsea River Channel needs to be dredged to a depth of 40 feet to provide better freight access.
- Upgrading the truck routes serving the Port of Boston to handle overweight trucks would improve the efficiency of freight operations.
- The Port of Boston lacks direct access to highway and rail facilities.
- Preserving sites and developable space for air cargo warehousing and freight forwarding facilities in South Boston and along Route 1 and 1A is a top priority for the air cargo industry. Landside congestion to Logan International Airport is a threat to restrict air freight.

Issue to watch:

- CSX plans to move its terminal facility from Allston to Worcester, which will change some regional trucking patterns.
- As demand for rail freight increases, rail lines carrying freight in the Central Area may need to be upgraded to accommodate the industry standard of 286,000 pounds. Currently the capacity is 263,000 pounds. This restriction increases costs for shippers.
- 92% of highway bridges and 91% of railroad bridges do not meet the desired vertical clearance.

Bicycle/Pedestrian

Paths to a Sustainable Region calls for linking bicycle, pedestrian, and transit facilities in a network; increasing the use of sustainable modes; and improving transportation options and accessibility for all modes of transportation. Addressing the needs and problems identified below will promote the realization of the vision:

- There are no on-road bicycle facilities connecting to stations on the north side of the Orange Line or the south side of the Red Line.
- Few roads (about 4%) in the Central Area provide bicycle accommodations.
- About 15% of the non-interstate roads in the Central Area do not have a sidewalk on at least one side of the roadway.
- The Central Area lacks major bicycle connections for circumferential travel.

Transportation Equity

Paths to a Sustainable Region envisions a transportation system that provides affordable transportation options and accessibility to people of all incomes, ages, races, and language backgrounds and does not inequitably burden any particular group.

Issue to watch:

- Traffic calming and complete streets design principles will create a safer environment for pedestrians and bicyclists.
- Better circumferential transit and a connection between the Red and Blue Lines are needed.
- The transportation system will need to address the needs of the elderly population, which is expected to grow substantially during the time horizon of *Paths to a Sustainable Region*.
- Densely populated areas, such as parts of Roxbury, Jamaica Plain, Somerville, Chelsea, Medford, and Everett, lack access to rapid transit within a reasonable walking distance.
- Several bus routes in the Central Area operate at slow speeds.
- The MBTA's Arborway Yard in Jamaica Plain is an eyesore and incompatible with the surrounding community.
- Travel and transport to and from the airport generates traffic congestion in East Boston.
- Late evening and early morning transit service is needed by many low income workers.



- The transit system is difficult to navigate for people who speak languages other than English.

Land Use

Paths to a Sustainable Region shares the MetroFuture vision of a region in which new development is focused in developed areas rather than greenfields. Addressing the needs and problems identified below will promote the realization of the vision. Issues to watch include:



- Areas expected to grow the most between now and 2035 are South Boston, Cambridge, and Somerville. Transit may need to increase in order to handle service demands.
- The largest planned developments in the corridor are in Cambridge, Somerville, and South Boston. North Point in Cambridge and Assembly Square in Somerville could bring more than 3,000 housing units to the area. Development planned on 100 acres in South Boston is anticipated to produce an additional 2,376 housing units and 2.8 million square feet of office and retail space.
- Corridor-wide, auto ownership and average household mileage are markedly lower than the regional averages, at 1.1 autos per household and 29 miles per household per day.
- 46% of commuting trips in the Central Area are accomplished by non-auto modes of travel.

SUMMARY OF CIRCUMFERENTIAL CORRIDOR NEEDS

The preceding sections have laid out the existing infrastructure, land use conditions, travel characteristics and patterns, and needs. This section summarizes the most pressing needs in the corridor in light of the MPO's visions established for *Paths to a Sustainable Region* and considering available information describing the needs. Several needs identified in the preceding sections stand out. They are summarized below by passenger travel mode. Freight issues and other issues affecting transportation, such as land use and transportation equity, are also summarized.

The Long Range Transportation Plan envisions a system that is well maintained, has less congestion and fewer accidents on its roadways, offers attractive alternatives to driving, produces very little of the emissions that cause climate change and health problems, offers easy connections between non-motorized modes and transit, efficiently moves freight, and supports development in areas where it already exists as

a strategy to encourage alternatives to driving and to preserve open space.

Highway

Paths to a Sustainable Region envisions a highway system that is well maintained, and has less congestion and fewer severe crashes. The Needs Assessment of the Circumferential Corridors reveals the need to maintain the roadways and address bottleneck locations. The identified needs and problems listed below will promote the realization of the vision:

Highway bottlenecks cause congestion, accidents, and result in higher emissions of pollutants. The bottleneck locations on the Route 128 Corridor are listed below. There are no locations on Interstate 495 in the Boston Region MPO area where both the travel speed index and volume-to-capacity ratio warrant inclusion in this list.

Route 128/Interstate 93

- Northbound from Interstate 95 to the Braintree Split (Canton, Milton, Randolph, and Braintree)
- Southbound from the Braintree Split to Route 24 (Braintree and Randolph)

Route 128/ Interstate 95

- Northbound from Interstate 93 to Rte. 109 (Dedham, Canton, Westwood)
- Northbound from Lexington/Burlington town line to Route 3A (Burlington)
- At the Route 9 interchange (Wellesley)
- Southbound between North Ave. & Interstate 93 (Wakefield, Reading)
- Southbound from Rte. 2 to Totten Pond Road (Lexington, Waltham)
- Southbound from Route 16 to Highland Avenue (Newton and Needham)
- Southbound from Rte. 135 to Interstate 95 (Dedham, Canton)
- The top crash locations for the Route 128 Corridor and the Interstate 495 Corridor were identified by the weighted Equivalent Property Damage Only (EPDO) index, which takes into consideration fatalities, injuries, and property damage.



The locations with the highest EPDO values (shown in parentheses below) on the Route 128 Corridor are:

- Route 128/Interstate 93 (northbound) at Granite Street (northbound), Braintree (795)

- Route 128/Interstate 95(northbound) at Interstate 93 (northbound), Reading (755)
- Route 128/Interstate 95 (northbound) at Route 3 (northbound), Burlington (418)
- Route 128 (northbound) at Route 114 (eastbound), Peabody (404)
- Route 128/Interstate 95 (northbound) at Route 4 (northbound), Lexington (364)

The locations with the highest EPDO values (shown in parentheses below) on the Interstate 495 Corridor are:

- Interstate 90 (eastbound) at Interstate 495 (southbound), Hopkinton and Westborough (220)
- Interstate 90 (eastbound) at Interstate 495 (northbound), Hopkinton and Westborough (195)
- Interstate 495 (northbound) ramp to Interstate 290 (westbound), Marlborough (182)
- Route 2 (eastbound) at Interstate 495 (northbound), Littleton (171)
- South Street, Route 1A (northbound) ramp to Interstate 495 (southbound), Wrentham (170)

Transit

Paths to a Sustainable Region envisions a transit system that, like the highway system, is safe and maintained in a state of good repair. However, unlike the highway system the vision for transit calls for more use in order to reduce auto dependency and emissions causing climate change. In addition to projects that will bring the system into a state of good repair, addressing the needs and problems identified below will promote the realization of the vision:

- Transit reliability throughout the Circumferential Corridor is poor. All of the 22 bus routes fail the MBTA's schedule adherence standard.
- There are strong activity centers in adjacent radial corridors that are not currently connected by transit.

Issues to watch:

- Higher transit demand resulting from the implementation of the MetroFuture land use plan will require investments to increase capacity.
- A study of the potential for circumferential transit in the inner-suburban area identified the following opportunities for fixed-route or flexible transit service between:
 - Malden, Medford, Arlington, Belmont, Watertown, and Waltham
 - Waltham, Lexington, Burlington, and Woburn

- Wakefield, Stoneham, Reading, and Woburn
- Lynn, Saugus, Melrose, Stoneham, and Woburn
- Quincy, Braintree, Randolph, and Canton
- Dedham, Needham, and Wellesley
- Waltham, Newton, and Wellesley

Freight

Paths to a Sustainable Region envisions a transportation system where freight moves efficiently by all modes. Addressing the needs and problems identified below will promote the realization of the vision:

- The interchange of Interstates 93 and 95 in Woburn, and the interchange of Interstates 290 and 495 in Marlborough, need to be improved in order to reduce the number of truck rollover crashes.
- Seven of the 12 worst highway freight bottlenecks in Massachusetts are located along the Interstate 495 or Interstate 95/Route 128 Corridors.
- There are no truck rest stops along the important freight corridor along Interstate 495 from the MPO border at Westford to Interstate 90, and continuing along Interstate 90 to Sturbridge.
- Freight moving from the CSX Boston Line to the South Coast must cross the Northeast Rail Corridor, which limits the movement of freight.

Issue to watch:

- As demand for rail freight increases, tracks carrying that freight in the Circumferential Corridors may need to be upgraded to accommodate the industry standard of 286,000 pounds. Currently the capacity is 263,000 pounds. This restriction increases costs for shippers.

Bicycle/Pedestrian

Paths to a Sustainable Region calls for linking bicycle, pedestrian, and transit facilities in a network; increasing the use of sustainable modes; and improving transportation options and accessibility for all modes of transportation. Addressing the needs and problems identified below will promote the realization of the vision:

- Currently, there are no major bicycle paths that provide circumferential travel routes.

Land Use

Paths to a Sustainable Region shares the MetroFuture vision of a region in which new development is focused in developed areas rather than greenfields. Addressing the needs and problems identified below will promote the realization of the vision. Issues to watch include:

Route 128 Corridor

- Much of the future population growth in the 128 Corridor is anticipated to occur in the Weymouth/Hingham area on the South Shore and in the Lynn/Danvers/Peabody area on the North Shore.
- Some of the largest employment generating projects in the planning stages is Southfield in Weymouth, Westwood Station in Westwood, Quincy Center in Quincy, and Waterfront in Lynn. These four developments are projected to add 10,159 jobs within the Route 128 Corridor by the year 2035
- 7.8% of commuting trips in the Route 128 Corridor are accomplished by non-auto modes of travel.
- Auto ownership and average household mileage are higher than the regional averages, at 1.7 autos per household and 53 miles per household per day in the Route 128 Corridor.

I-495 Corridor

- Large residential projects planned in the corridor include the Weston Nurseries/Legacy Farms project in Hopkinton and Jefferson at Ashland in Ashland, which are projected to add 845 units through the year 2035.
- Much of the future population growth in the Interstate 495 Corridor is anticipated to occur in the communities of Ashland, Holliston, Hopkinton, and Milford.
- Among the largest employment generating projects planned for the corridor are the Framingham Biologics Center in Framingham, Genzyme in Framingham, and Highland Commons in Hudson. These three projects are expected to add an additional 1,300 jobs in the near term. Additionally, projects such as EMC Corp. in Southborough, Crossroads Corporate Center in Framingham, and Hopping Brook Business park in Holliston are projected to add 3,980 jobs within corridor by 2035.
- 6.4% of commuting trips in the Interstate 495 Corridor are accomplished by non-auto modes of travel.
- Corridor-wide, auto ownership and average household mileage are much higher than the regional averages, at 2.0 autos per household and 71 miles per household per day.