

CHAPTER 6 REGIONAL TRANSIT SYSTEM

Transit benefits the region's overall travel conditions by helping to reduce single-occupant vehicle (SOV) travel. Public transportation plays a major role in providing travel alternatives, improving personal mobility, alleviating congestion, and improving air quality. In addition, transit benefits our economy. According to the American Public Transportation Association (APTA), the following financial and economic development benefits are derived from transit investments¹:

- Every \$1 invested in public transportation generates approximately \$4 in economic returns;
- Every \$1 billion invested in public transportation supports and creates more than 50,000 jobs;
- Every \$10 million in capital investment in public transportation yields \$30 million in increased business sales; and
- Home values performed 42 percent better on average if they were located near public transportation with high-frequency service.

Public transportation provides access to job opportunities for people of all abilities and from all walks of life. This section of the Regional Transportation Plan (RTP) assesses and analyzes the region's transit assets and needs.

LRTA FIXED ROUTE SERVICE

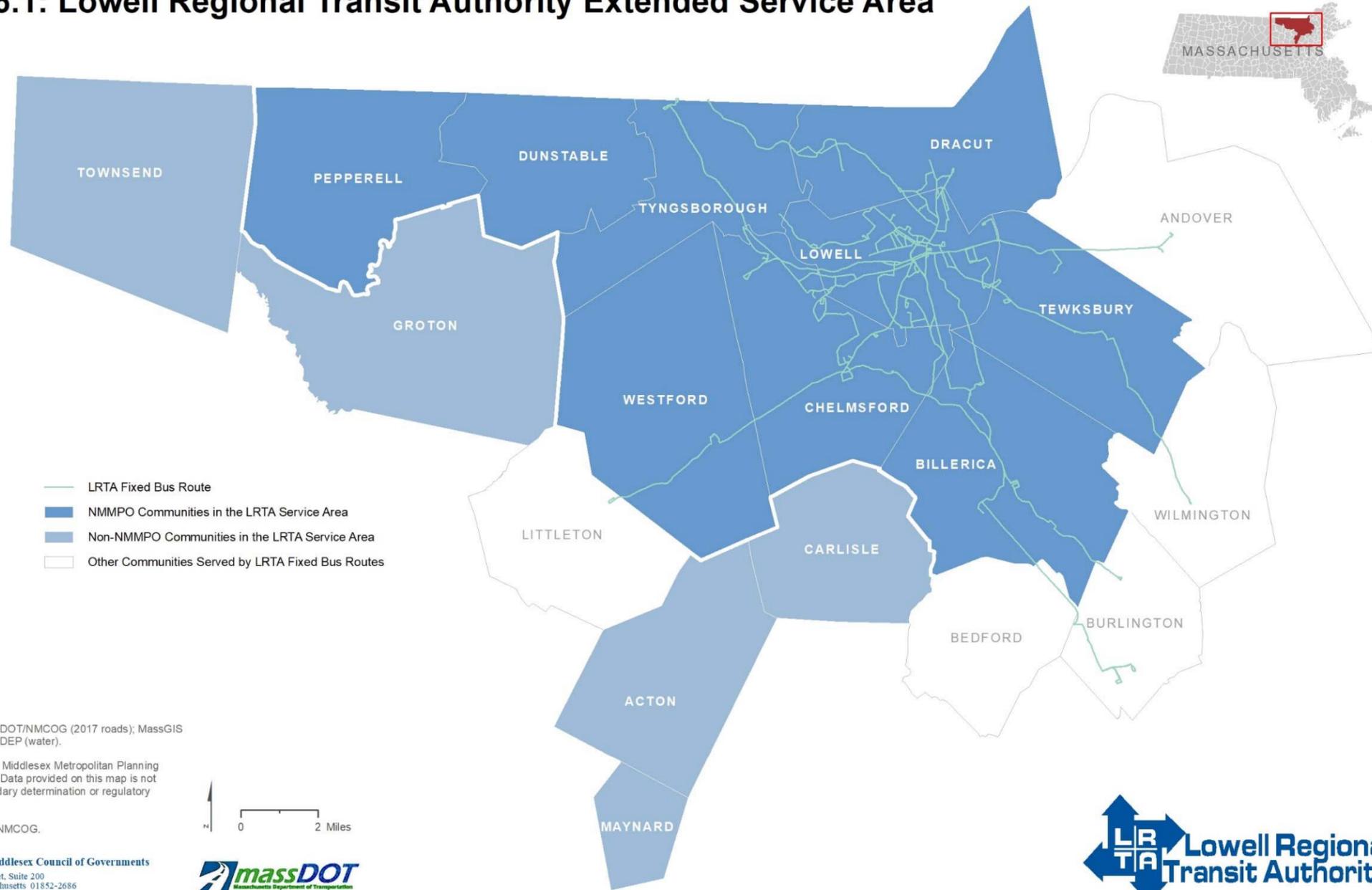
The Lowell Regional Transit Authority (LRTA), through a contractual agreement with Lowell Transportation Management, Inc., provides fixed route bus service for the general public in the City of Lowell and the Towns of Billerica, Chelmsford, Dracut, Tewksbury, Tyngsborough and Westford. All fixed routes originate and end in Lowell. The LRTA service area population is 343,355, according to the 2010 U.S. Census, while the fixed route service area population is 272,225 persons, as depicted in Map 6.1 on the following page.

The Kennedy Bus Transfer Center at the Gallagher Intermodal Center in Lowell is the central hub for the LRTA bus route system. This location allows for easy connections between the LRTA regional bus system, MBTA commuter rail to Boston, Merrimack Valley Transit Authority's (MVTA) Lawrence bus and the Vermont Transit interstate bus service.

¹ <http://www.apta.com/mediacenter/ptbenefits/Pages/default.aspx>

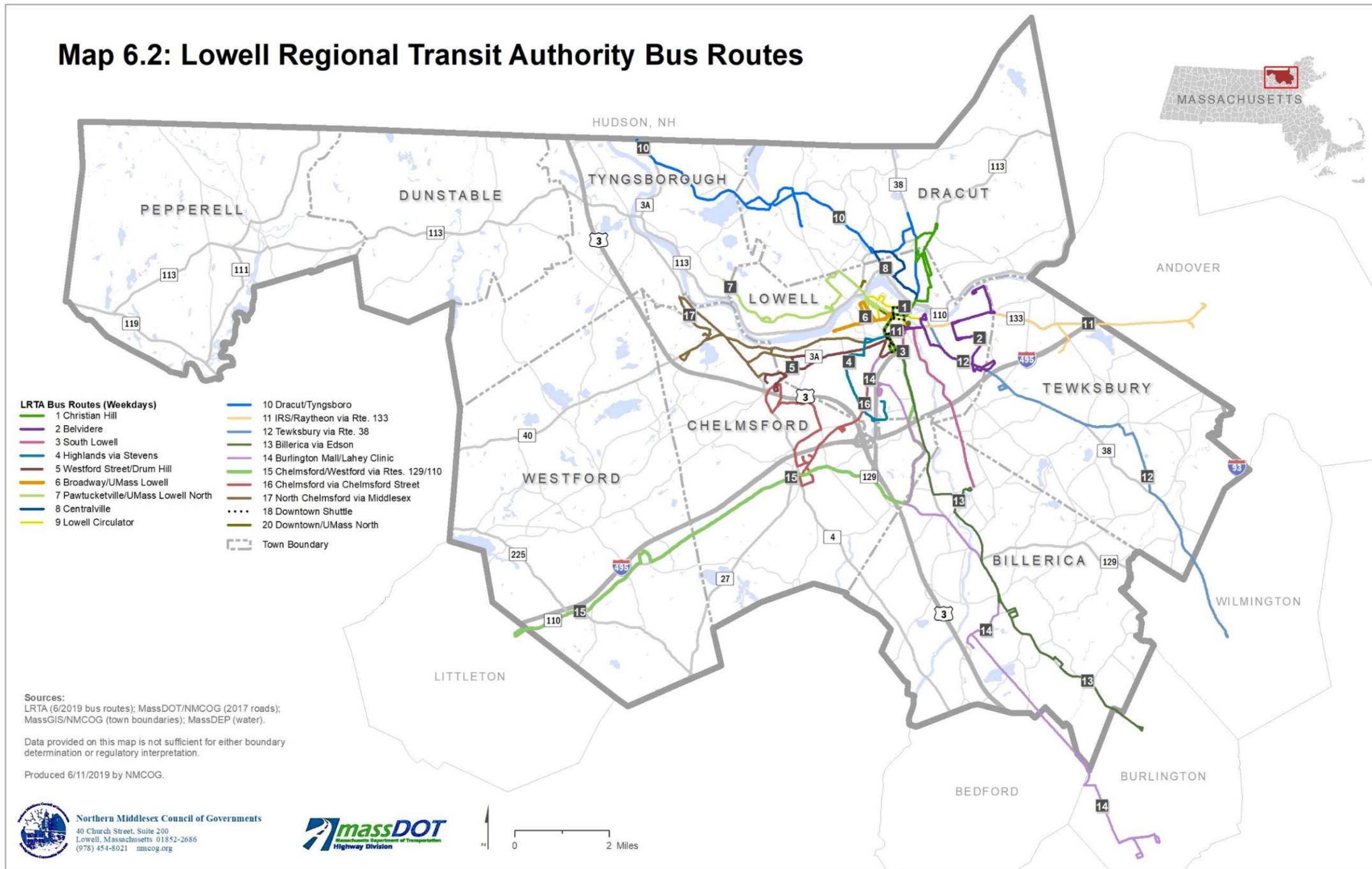
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Map 6.1: Lowell Regional Transit Authority Extended Service Area



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Map 6.2: Lowell Regional Transit Authority Bus Routes



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The LRTA fixed route system operates twenty bus routes (Map 6.2, page 6-5), with twelve exclusively serving the residents of Lowell. Furthermore, all of the bus routes, including the suburban routes, travel through the City, bringing the total number of bus routes for the overall system to nineteen.

Billerica is served by three bus routes that operate Monday through Saturday (#13, #14, and #03). Chelmsford is also served by three routes that operate Monday through Saturday. Two of those routes (#16 and #17) operate between Chelmsford and Lowell, and the # 15 route travels along Routes 129 and 110 through Chelmsford and Westford, terminating at the Littleton IBM facility. The towns of Tyngsborough and Dracut are served by one connecting bus route that operates Monday through Saturday. Tewksbury is served by two routes, the #11 route, which operates Monday through Friday, and the #12 route, which operates Monday through Saturday.

Service is provided five days a week from 6:00 a.m. to 9:30 p.m., and on Saturdays from 7:00 a.m. to 7:00 p.m. (depending on the route). The LRTA operates a Saturday level bus service on the following five holidays: Martin Luther King Day, Presidents' Day, Patriots' Day, Columbus Day and Veterans' Day. The LRTA does not provide bus service on the following holidays: New Years' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving and Christmas. Additionally, the LRTA was recently awarded a State grant to operate ten bus routes on Sundays for a nine-month trial period beginning on June 16, 2019. Upon completion of the nine-month pilot, the State and LRTA will review the effectiveness of the service to determine whether the Sunday service will be continued.

LRTA RIDERSHIP

Table 6.1 on the following page shows the ridership totals for the LRTA fixed route system for Fiscal Years 2006 through 2018. It is important to note that significant changes to the route system were undertaken prior to FY 2006, when the transit hub was relocated from the Lowell central business district to the Kennedy Center at Gallagher Intermodal Transportation Center. This change made comparisons of ridership prior to 2006 difficult. Since 2006, total ridership has increased by more than 9 percent. Ridership peaked in 2015 at 1,536,250 passengers, but has declined 8.29% over the past three fiscal years. This decline is consistent with trends observed nationally.

Table 6.1: LRTA Fixed Route Ridership (FY 2006-2018)

Fiscal Year	Number of Passengers	% change from previous year
2006	1,297,914	----
2007	1,253,811	-3.37
2008	1,308,482	4.42
2009	1,404,112	7.31
2010	1,338,892	-4.64
2011	1,314,472	-1.82
2012	1,398,381	6.38
2013	1,401,984	0.26
2014	1,496,175	6.72
2015	1,536,250	2.68
2016	1,516,841	-1.26
2017	1,425,640	-6.01
2018	1,411,149	-1.02

Source: Lowell Regional Transit Authority

LRTA VEHICLE FLEET

As of July 1, 2018, the LRTA fixed route bus fleet was comprised of forty-nine (49) vehicles (42 full size buses and 7 minibuses). During afternoon peak hour service, forty-two (42) buses are required to operate service, while the off-peak hours require thirty-three (33) buses. On Saturdays and holidays twenty-two (22) vehicles are required.

The composition of the LRTA bus fleet is detailed in Table 6.2. The LRTA operates five (5) hybrid vehicles, as part of its initiative to become greener and more environmentally responsible. In addition, the LRTA is planning to add twelve to fourteen new fixed route vehicles as part of its ongoing bus fleet replacement program. The LRTA fixed route fleet is 100% accessible to persons with disabilities.

Table 6.2: LRTA Fleet Characteristics

Model Year	Quantity	Make	Length (Feet)	Seating Capacity	Fuel	Average Lifetime (miles)
2005	1	Gillig	30	26	Diesel	351,349
2007	12	Gillig	35	32	Diesel	317,579
2008	6	Gillig	35	32	Diesel	262,174
2008	2	Gillig	35	32	Diesel/ Electric	304,900
2009	2	Gillig	35	32	Diesel/ Electric	247,590
2012	1	Gillig	35	32	Diesel/ Electric	207,631
2013	1	Elkart	25	16	Gasoline	104,766
2015	6	Gillig	29	26	Diesel	113,551
2015	4	Eldorado	25	16	Gasoline	98,186
2015	2	Elkhart	25	16	Gasoline	71,676
2016	12	Gillig	29	26	Diesel	70,797

Source: Lowell Regional Transit Authority (July 1, 2018)

LRTA FARE STRUCTURE

The LRTA fare structure increased for the first time in sixteen (16) years on July 1, 2018. The fare review and increase was prompted by State policy. Fares will be reviewed every two or three years going forward. The current fare structure is outlined below.

Fare Categories:

- *Regular:* Persons 13 through 59 years of age
- *Reduced:* Senior Citizen - 60 years or older with I.D.
- *Reduced:* Disabled - With Statewide Transportation Access Pass (TAP) or a Medicare card
- *Reduced:* Children between 6 and 12 years of age

Bus Fares:

- *Regular:* within one community: \$1.25
- *Reduced:* within one community: \$.60
- *Regular Suburban:* two or more communities: \$1.85
- *Reduced Suburban:* two or more communities: \$.90

Transfers:

- Transfers within one community- regular fare: \$.25
- Transfers within one community- reduced fare: \$.10
- Transfers between two or more communities-regular fare: \$.50
- Transfers between two or more communities-reduced fare: \$.25

LRTA bus passes are valid for unlimited travel on all City and Suburban routes during the term specified on the pass.

Pass System:

- LRTA regular category "Passport": \$44.00 per month
- LRTA reduced category "Gold Pass": \$25.00 per month
- LRTA through high school "Student Pass": \$25.00 per month

ADDRESSING LRTA SYSTEM PERFORMANCE SINCE THE 2016 RTP

The LRTA most recently examined the performance and efficiency of its system through the *2015 Lowell Regional Transit Authority Transit Service Study*. Upon completion of the study, the LRTA has undertaken several improvements that resulted in a positive impact on ridership. It is anticipated that over the next several years, the continued growth in ridership will result in positive performance.

The following summarizes system improvements undertaken since completing the previous RTP:

- **Downtown/ UMass North Service:** In August 2017, the LRTA began operating the #20 Downtown/ UMass North bus route. The route offers direct connections between UMass North Campus, Downtown Lowell and UMass Lowell Inn and Conference Center, and operates on weekdays from 7:15 a.m. to 11:00 a.m. throughout the school year. Available to the general public, the #20 route enables direct connection for those north of the Merrimack River to Downtown Lowell, without having to transfer at the Kennedy Bus Hub.
- **Pilot Sunday Bus Service:** In early 2019, the LRTA was awarded a State grant to begin a nine-month Sunday service pilot. The service will begin on June 16, 2019 with ten bus routes operating between 10:00 a.m. and 6:00 p.m. The new fixed route bus, as well the complementary Road Runner demand response services, will greatly benefit current LRTA customers and will likely increase ridership overall.

Service productivity measures the ridership generated per unit of service through a metric called revenue hours of service. This provides an understanding of the effectiveness of a route or transit network. The LRTA productivity was 16.8 passengers per revenue hour in FY 2014, 17.0 passengers per revenue hour in FY 2015 (LRTA peak ridership year), and 16.6 passengers per revenue hour in FY 2016. FY 2017 and FY 2018 passengers per revenue hour ratio was 15.7. The lower productivity in FY 2016-2018 is attributable to a reduction in ridership, due to the strong economy and the increase in the use of ride-hailing services, such as Uber and Lyft.

Financial performance is often measured by the farebox recovery ratio, which is defined as the ratio of fare revenue to operating cost. Higher ratios indicate higher cost-effectiveness and measure the portion

of operating cost covered by passenger fares. The higher the farebox recovery ratio, the lower the subsidy a route needs to operate, leaving more revenue available to operate more service.

A decline in financial performance follows a decline in service productivity. The LRTA average farebox recovery ratio was 17.2% in FY 2016, and 16.1% in both FY 2017 and 2018. The decrease in farebox recovery correlates with the reduction in ridership in those two fiscal years.

Mechanical failures are used as a measure of how well a transit system is maintaining its equipment. However, the mechanical failures also reflect the age of a transit fleet, i.e. older vehicles break down with greater frequency than do newer vehicles. This information is measured in miles between major mechanical failures.

The LRTA miles between mechanical failures were generally stable from the previous Regional Plan and in line with national regional transit authority (RTA) averages. The LRTA reported miles between major mechanical failures was 62,303 miles in FY 2016, 70,341 miles in FY 2017, and 59,666 miles in FY 2018. These figures represent twenty-one (21) failures in FY 2016, nineteen (19) failures in FY 2017, and twenty-two (22) failures in FY 2018.

LRTA TRANSIT SYSTEM SERVICE PLAN

The Lowell Regional Transit Authority completed a Transit Service Plan in 2015. Several of the regional transit authorities contracted with the consulting firm URS Corporation to assist in developing the plan, which examined the individual bus route alignments and productivity. The completed Plan recommended changes directed at better serving the changing needs of populations within Lowell and the surrounding communities.

The plan proposed changes to six routes, the elimination/consolidation of two routes, and the development of three new bus routes. The proposed route changes are to be phased in over three time periods (phase one: 1 to 2 years; phase two: 3 to 5 years; and phase three: 6 or more years). It is anticipated that the implementation of phase one will be cost neutral. Following a lengthy review of the proposed changes, the LRTA identified eight specific changes that would be beneficial. The following summarizes the recommended changes accepted by the LRTA:

- 01 Christian Hill modification – The route would also travel both inbound and outbound along Beacon Street. (phase one)
- 06 Broadway – Combine 06 and 09 into a single circulator route. This can only be undertaken when the Pawtucket Street Bridge is replaced. (phase one)
- 09 Circulator – Eliminate and combine with the 06 bus route. (phase one)

- 16 Chelmsford Center – Truncate the route at Chelmsford Center and add a new Chelmsford Center to Drum Hill bus route. (phase one)
- 17 North Chelmsford – Split the route into two routes, one covering from Chelmsford Center to Drum Hill and the second traveling from Kennedy Center to Tyngsborough and Pheasant Lane Mall. (phase one)
- 20 Middlesex Street – Route 20 will be created to serve the Middlesex Street corridor in Lowell, which will lose service with the realignment of the Route 17, as described above. Additionally, this route will exist for only phase two and will be eliminated in phase three with the establishment of the Route 19, as described below. (phase two)
- 19 Tyngsborough/Pheasant Lane Mall – Add a new route six days per week (phase two).
- 22 Bedford VA/Middlesex Community College – Add a new route from the Kennedy Center to the Bedford VA. The proposed service would operate six days per week (phase three).

As envisioned, this plan is being implemented as resources become available. Full implementation may take up to fifteen years.

LRTA PARATRANSIT SERVICE

The LRTA service area population, according to the 2010 U.S. Census, was 343,355, of which 53,891 persons were over the age of 60 years. The service area population age 65 and over was 37,167, of which 10,250 persons were considered to have a mobility or self-care limitation. Additionally, nearly 11,000 individuals aged 16-64 reported a similar mobility and/or self-care limitation. It is this client population that the LRTA seeks to serve by providing Demand Response (paratransit) service for its member communities.

Demand Response service is available for those residents over 60 years of age or individuals with disabilities. Through agreements with the private transportation carrier Lowell Transit Management Corp, Inc. (LTA) and community councils on aging, the LRTA currently provides demand response “Road Runner” services for the elderly and disabled in ten communities.

The Lowell Regional Transit Authority has entered into agreements with the Councils on Aging (CoA) in Billerica, Carlisle, Chelmsford, Dracut, Groton, Maynard, Pepperell, Townsend, Tyngsborough and Westford, as well as the Town of Acton, to provide service for elderly and individuals with disabilities residing within these communities. All demand response services offer dial-a-ride and prescheduled transportation on a 24- to 48-hour advanced call basis within specified hours of operation. Currently, the provided services not only operate within each town, service is also provided to contiguous towns. The LRTA’s plans for paratransit expansion call for additional inter-community trips. A large number of the transportation from suburban communities include trips to Lowell. Those towns that do not include

Lowell in their service area (Acton, Groton Pepperell and Townsend) are located in the western section of the LRTA district and gravitate, economically and socially, more to Fitchburg than Lowell. The Lowell-based “Road Runner”, operated by LTM, Inc., is primarily responsible for the America with Disabilities Act (ADA) transportation service. By the Federal statute, the ADA requires transit authorities to provide demand response service, within three-quarter miles of any fixed route bus line, to individuals who are unable to ride on fixed route buses because of a disability. For the LRTA member communities, this area includes all of the City of Lowell as well as significant portions of Billerica, Chelmsford, Dracut, Tyngsborough and Westford. Additionally, portions of the non-member communities of Andover, Bedford, Burlington, Littleton and Wilmington are also included. All trip purposes are accommodated, including medical, nutritional, shopping, recreational, social, and others.

PARATRANSIT VEHICLES

The Lowell Regional Transit Authority contracts for the operation of twenty-two (22) demand response vehicles with Lowell Transit Management Corp, Inc. and seventeen (17) demand response vehicles to the Town of Acton and the Councils on Aging in the communities of Billerica, Carlisle, Chelmsford, Dracut, Groton, Maynard, Pepperell, Townsend, Tyngsborough and Westford. Twelve (12) of these vehicles serve the ADA service area: Billerica, Chelmsford, Dracut, Lowell, Tewksbury, Tyngsborough and Westford. All of the paratransit vehicles are wheelchair lift equipped.

PARATRANSIT RIDERSHIP STATISTICS

Table 6.3 below summarizes the passenger trips for LRTA paratransit services in Fiscal Year 2018, during which time forty-four (44) vehicles serving twelve communities made 111,166 trips.

Table 6.3: LRTA Paratransit Operations for FY 2018

Program	Number of Vehicles	Passenger Trips
Lowell Transit Mgt Corp, Inc. (Road Runner)	20	51,867
Town of Acton	2	8,691
Billerica CoA	2	5,263
Carlisle CoA	3	2,067
Chelmsford CoA	3	6,062
Dracut CoA	3	8,486
Groton CoA	2	2,819
Maynard CoA	2	6,737
Pepperell CoA	1	3,418
Townsend CoA	1	2,974
Tyngsborough CoA	2	3,969
Westford CoA	3	8,813
Total	44	111,166

MOBILITY AND AMERICANS WITH DISABILITIES ACT COMPLIANCE

Mobility is largely a function of one's personal lifestyle choices, physical and social limitations, and resources. Most people have an automobile at their disposal but many others depend on public transportation for commuting and other travel. Table 6.4 on the following page shows the number of vehicles per household in each community throughout the region. In the City of Lowell, over fifteen percent (15%) of households have no vehicle and rely on public transportation. The LRTA works with Community Teamwork (the region's ACTION agency), the Councils on Aging, and other social service agencies and providers to tailor transportation services to best meet the needs of the transit dependent population.

Fixed-route and paratransit services offered by both public and private carriers are fully described elsewhere in this document, but a few general points should be made regarding mobility issues. Fixed-route service is obviously limited by its point-to-point nature and linkages with other transportation modes. The LRTA has transitioned from lift-equipped buses to low-floor buses with front access ramps. The advantage is that the bus driver can pull up to a waiting wheelchair passenger, deploy the ramp, and the passenger can simply roll into the bus, saving time and increasing the independence of the disabled passenger.

Table 6.4: Vehicle Availability in the Northern Middlesex Region

Community	Number of Households by Number of Vehicles Available							
	No Vehicle	%	One Vehicle	%	Two Vehicles	%	Three or More Vehicles	%
Billerica	579	2%	3,443	24%	6,550	45%	3,902	27%
Chelmsford	729	2%	3,794	28%	6,178	45%	2,992	22%
Dracut	600	3%	3,060	27%	4,990	44%	2,584	23%
Dunstable	17	5%	122	11%	599	53%	400	35%
Lowell	7,176	2%	15,795	41%	10,987	28%	5,007	13%
Pepperell	135	4%	1,149	26%	1,878	43%	1,184	27%
Tewksbury	512	2%	3,342	29%	5,282	46%	2,431	21%
Tyngsborough	129	4%	1,047	24%	1,880	43%	1,304	30%
Westford	80	2%	1,472	18%	4,767	58%	1,925	23%

Source: U.S. Census, American Community Survey, 2013-2017

As discussed earlier, paratransit service is available and has been used extensively by the elderly and disabled populations of the Northern Middlesex region. The LRTA has received an average of four to six new wheelchair lift-equipped paratransit vehicles each year, helping to maintain a safe, clean and reliable fleet. The LRTA has been in full compliance with the provisions of the Americans with Disabilities

Act (ADA) since January 1996. The LRTA will continue to strive to maintain full accessibility of the public transit system. This will require a regular replacement schedule for all accessible vehicles.

PARATRANSIT SERVICE PROVIDED BY OTHERS

A survey of private transit providers in the Greater Lowell area was conducted by the Northern Middlesex Council of Governments as part of the Coordinated Plan Update. Included in the survey were bus charter companies, taxi companies, and ambulance and wheelchair transportation companies. None of the bus charter companies surveyed handled individuals with disabilities, while all the taxi companies said they occasionally serve individuals with disabilities. The individuals with disabilities, however, must be able to get into the cab from the wheelchair with little or no help from the driver, and the wheelchair must fit into the trunk or in the back seat of the cab.

Several ambulance and wheelchair transportation companies were also contacted as part of the survey. In general, they restrict eligibility to some form of mobility impairment. Most of the companies require a one-day notice, with same day service provided when vehicles are available. About half of the companies restrict the trips to medical purposes only, while others have no restrictions. Most ambulance and wheelchair companies operate at least five days a week, although a limited number operate seven days per week. The per-passenger charge ranges from around \$50 to \$70+ for round-trip service. This price is based upon a minimum Medicare published rate.

COORDINATED HUMAN SERVICES TRANSPORTATION PLAN

The FAST Act requires a five-year review and update of the *Metropolitan Planning Organization's Coordinated Public Transit-Human Services Transportation Plan*, and maintained the requirement that all transit projects be derived from a Coordinated Human Services Transportation Plan in order to receive federal funding. The Plan must be “developed and approved through a process that includes participation by seniors, individuals with disabilities, representatives of public, private and non-profit transportation and human service providers and other members of the public”.

The *NMMPO Coordinated Public Transit-Human Services Transportation Plan* was adopted by the Northern Middlesex Metropolitan Planning Organization (NMMPO) in January 2015. The Plan serves as a framework for improved coordination of transportation services among both public and private providers, in order to enhance transportation services for disadvantaged, disabled and senior populations. The document was developed to meet the federal requirements outlined in FTA Circular 9070.1G for “a locally developed, coordinated human services transportation plan” that includes the following elements:

- “An assessment of available services that identifies current public, private and non-profit providers;
- An assessment of transportation needs for individuals with disabilities and older adults;
- Strategies, activities and/or projects to address identified gaps in current services and needs, as well as opportunities to achieve efficiencies in service delivery; and
- Priorities for implementation based on available resources (from multiple program sources), time, and feasibility for implementing specific strategies and/or activities identified.”

Copies of the *2014 Coordinated Public Transit-Human Services Transportation Plan* are available on the NMCOG website at: www.nmcog.org.

Since 2008, the LRTA has implemented seven service improvements to address service gaps identified in the *Coordinated Public Transit-Human Services Transportation Plans*. The projects have expanded access to service sector employment sites by increasing service days, operating hours or areas served. The following summarizes the improvements already implemented:

- **Holiday Fixed Route Service:** The LRTA, like many regional transit authorities, did not previously offer any service on holidays. In 2008, the LRTA received a Job Access/Reverse Commute (JARC) grant to initiate a “Saturday level” of service on five holidays when many service sector employees are required to work: Martin Luther King Day, Presidents’ Day, Patriots’ Day, Columbus Day and Veterans’ Day. Following the first year, the #15 Chelmsford bus route was included in this program at the request of a group of Chelmsford business employees. Overall, this service has proven to be quite successful.
- **Tewksbury Bus Route 12 Saturday Service:** The #12 Tewksbury route ran on a weekday only schedule. The route ran along Route 38 from Lowell through Tewksbury to the Wilmington town line. Route 38 is a densely developed state road with a large number of retail and service employment opportunities. In 2009, the LRTA was awarded a JARC grant to extend the bus route to the Wilmington MBTA commuter rail station and to operate service on Saturdays. The #12 route expansion has proven to be very successful, growing to one of the busiest bus routes on Saturday. The Saturday service expansion greatly increased access for the disabled within the Town of Tewksbury.
- **Westford Bus Route 15 Extension:** With the help of a 2009 JARC grant, the LRTA extended the #15 bus route along State Route 110, from Chelmsford through Westford to the IBM facility on the Littleton/Westford line. The Route 110 corridor is filled with high tech businesses, retail establishments and service industries. The #15 route has experienced steady growth in ridership since the route extension was implemented. Furthermore, the service expansion greatly increased access for the disabled community within the Town of Westford.

- **Tyngsborough Holiday Service:** In order to address the lack of access to seasonal employment opportunities, the LRTA was awarded a 2010 JARC grant to run seasonal service along State Route 3A and Middlesex Road in Tyngsborough, to the southern end of the Pheasant Lane Mall, which lies within Massachusetts adjacent to the New Hampshire border. The route not only reaches job opportunities along the corridor and at the mall, it also connects with the Nashua Transit system, enabling access to the entire Nashua area. The route has proven to be one of the most successful services offered by the LRTA.
- **Expanded Saturday Service:** The LRTA expanded Saturday service in January 2013. The service change increased the number of individual bus trips by 53, by running hourly headways on routes that had previously had 90- to 120-minute headways. As a direct result of this service improvement, the Saturday LRTA ridership has increased by approximately 80%.
- **Expanded Weekday Service Hours:** The LRTA received a JARC grant to extend service hours on fourteen of the eighteen bus routes. The service, which began in August 2013, enabled greater connectivity between the suburban routes and the Lowell city routes. Since this service expansion was implemented, the LRTA has seen an overall increase in ridership throughout the system, and is currently reviewing the successes of each route separately.
- **Westford Bus Route 15 Saturday Service:** In April 2014, the LRTA began operating the #15 Westford bus route on Saturdays, enabling access to the bustling State Route 110 area. As a result, Saturday service is now available to all of the LRTA fixed route service area communities, increasing access to the disabled community.
- **Sunday Bus Service:** The LRTA received a Massachusetts State grant to establish a nine-month pilot Sunday service in the LRTA region. The service will begin on June 16, 2019 and will operate from 10:00 a.m. to approximately 6:00 p.m. on ten of the nineteen LRTA bus routes. A review of the effectiveness of the service will be undertaken to determine whether the service will be extended beyond the pilot period.

PRIVATE AND NON-PROFIT TRANSPORTATION SERVICES

In addition to the public fixed route service, the Lowell Regional Transit Authority provides in the Northern Middlesex Region, there are several private carriers operating charter, rental and other special bus services, as well as taxi service and ride share services. A number of non-profit entities also provide transportation services within the region. A list of these private and non-profit providers is provided in Table 6.5.

Table 6.5: Private and Non-Profit Transportation Providers Operating in LRTA Service Area

Transportation Providers	Address	Telephone
Bus Line Providers		
First Student Bus	Ward Way, North Chelmsford	(978) 251-4901
Boston Express	7 Langdon Street, Concord, NH	(603) 845-1999
Tewksbury Transit, Inc.	555 Whipple Road, Tewksbury	(978) 851-9863
Vermont Transit	101 Thorndike Street, Lowell	(978) 459-7101
A&F Bus Company, Inc.	16 Wyman Road, Billerica	(978) 663-8145
Bedford Charter Service	11 Railroad Avenue, Bedford	(978) 257-9524
Fiore Bus Service	3 Plank Street, Billerica	(978) 667-1114
Dunbar Bus Company	33 Middlesex Road, Tyngsborough	(978) 649-7401
Plaza Transportation	410 Woburn Street, Tewksbury	(978) 459-9600
Buckingham Bus Company	40 Station Avenue, Groton	(978) 448-6057
Dee Bus Service, Inc.	30 Town Farm Road, Westford	(978) 392-8639
Lessard Bus Company, Inc.	210 D.W. Highway, Nashua, NH	(978) 897-1244
North Reading Transit	55 Hampshire Road, Methuen, MA	(978) 681-4100
Trombly Motor Coach	1480 Broadway Road, Dracut	(978) 937-3422
Taxi Service		
Yellow Cab	50 Payne Street, Lowell	(978) 458-6861
Wilmington Taxi	253 Woburn Street, Wilmington	(978) 658-3859
A&M Taxi	1326 Merrimack Ave, Dracut	(978) 944-0674
Luna Cab Company	11 White Street, Lowell	(978) 421-6321
A-1 Taxi	18 Chambers Street, Lowell	(978) 970-2909
J&N Taxi	115 Congress Street, Lowell	(978) 454-5661
Lowell Cab Company	310 Merrimack Street, Lowell	(978) 441-0011
Carib Tour Taxi	239 Lincoln Street, Lowell	(978) 458-1155
Checker Taxi	35 Maple Street, Lowell	(978) 441-9700
Planet Coach	Billerica	(781) 249-5565
Apollo Cab	30 Corporate Drive, Burlington	(781) 350-5561
Non-Profit Organizations		
Community Teamwork, Inc.	155 Merrimack Street, Lowell	(978) 459-0551
Elder Services of the Merrimack Valley	280 Merrimack Street, Lawrence	(978) 683-7747
Cambodian Mutual Assistance Association	465 School Street, Lowell	(978) 454-6400
Coalition for a Better Acre	517 Moody Street, Lowell	(978) 970-0600
Ride Share Services		
Uber	Uber.com	
Lyft	Lyft.com	

LRTA MAINTENANCE NEEDS

The maintenance needs of the LRTA are primarily in the area of capital facilities and equipment. The Transit Authority maintains the following facilities: the Charles A. Gallagher Intermodal Transportation Center, the Hale Street Operations Center for its fixed route buses, and the North Billerica Commuter Rail Station. The cost of maintaining the three facilities was approximately \$690,400 in FY 2019. Individually, Gallagher Intermodal Transportation Center, including the Kennedy Bus Transfer Center, maintenance cost was \$310,680 (35%), the Hale Street Operations Center was \$241,640 (35%) and the North Billerica Commuter Rail Station maintenance cost was approximately \$138,080 (20%).

The annual maintenance of the Charles A. Gallagher Intermodal Transportation Center is projected to cost approximately \$1,063,000 annually by the year 2030 and \$1,573,000 by 2040. The Hale Street Operations Center is projected to cost approximately \$478,000 annually by the year 2030 and \$708,000 by 2040. While the North Billerica Commuter Rail Station is projected to be approximately \$372,000 by 2030 and \$315,000 by 2040. These cost projections are based upon a 4% annual inflation rate.

Additionally, the Transit Authority must bear the cost of vehicle maintenance. The current cost of maintaining the fixed route bus fleet is approximately \$938,000 annually. Paratransit vehicle maintenance costs are \$235,000 annually. The LRTA currently owns forty-two (42) heavy-duty buses and eight (8) Minibuses (cut-a-ways) in the fixed-route bus fleet. The useful life of heavy-duty motor buses is defined under FTA Standard 9030-112 as twelve (12) years or 500,000 miles. The useful life of a Minibus is the same as a Paratransit vehicle at seven (7) years or 150,000 miles.

The replacement of both fixed-route and paratransit vehicles is an ongoing activity for the Lowell Regional Transit Authority. Vehicle maintenance will increase over time with annual vehicle maintenance reaching roughly \$1,806,000 by 2030, and increasing to \$2,673,000 by the year 2040.

Future fixed-route and paratransit vehicle acquisitions will be costly. If purchases are made on a strict schedule under the FTA useful life standards, roughly eighteen (18) full-sized buses and five (5) minibuses would require replacing every five (5) years. Fixed-route vehicle replacements between the years 2020 and 2030 could total nearly \$9,500,000 for twelve (12) new heavy-duty diesel, two (2) new heavy-duty Hybrid and six (6) new light-duty vehicles. Vehicle replacements of the twelve (12) heavy duty and ten (10) light duty vehicles between 2030 and 2040 could be an additional \$14,553,000. An ambitious replacement schedule for paratransit vehicles would mean the replacement of four (4) vehicles per year between the years 2020 and 2040, costing \$8,160,000, assuming a 4% inflation factor per year as outlined in Table 6.6.

Table 6.6: LRTA Vehicle Replacement Needs (assumed 4% inflation per year)

Category	Vehicle Type	2020-2024	2025-2029	2030-2034	2035-2040
Fleet Replacement Expense	42 Fixed Route, Heavy Duty Buses and 7 Fixed Route, Light Duty Buses	\$8,200,750	\$10,195,210	\$14,946,520	11,571,640
	Paratransit Fleet (Minibuses @ \$65,000 each)	\$1,725,000	\$1,780,000	\$2,170,000	\$3,230,000
Vehicle Maintenance Expense	Fixed Route Buses	\$6,222,000	\$6,428,000	\$7,821,000	\$11,653,000
	Paratransit Vehicles	\$1,559,000	\$1,611,000	\$1,959,000	\$2,920,000

Source: LRTA

LRTA TRANSIT ASSET MANAGEMENT PLAN

In 2018, the LRTA developed a Transit Asset Management Plan (TAM Plan) which was adopted by the NMMPO in January of 2019. As a recipient of Federal Transit Administration funds, the LRTA is required to develop and maintain a Transit Asset Management Plan per FTA's Final Rule at 49 CFR Part 625. A Transit Asset Management (TAM) plan is a business model that uses asset condition as a guide for managing capital assets and prioritizing funding in order to achieve or maintain transit systems in a State of Good Repair (SGR).

The preparation of the TAM Plan was based on identifying the transit assets which the LRTA owns and for which it has direct capital responsibility, and to address the performance measures included in the Final Rule that relate to these identified assets. The completed TAM Plan was required by September 30, 2018. The LRTA is considered a Tier II Transit Provider as defined in the Final Rule. Tier II is defined as follows:

“Tier II Provider: Means a recipient that owns, operates, or manages (1) one hundred (100) or fewer vehicles in revenue service during peak regular service across all non-rail fixed route modes or in any one non-fixed route mode, (2) a subrecipient under the 5311 Rural Area Formula Program, (3) or any American Indian tribe.”

The benefits of implementing a TAM plan include:

- Improved transparency and accountability for safety, maintenance, asset use, and funding investments;
- Optimized capital investment and maintenance decisions;
- Data-driven maintenance decisions; and
- System safety & performance outcomes.

The consequences of an asset not being in a SGR include:

- Safety risks (Accidents per 100,000 revenue miles);
- Decreased system reliability (On-time performance);
- Higher maintenance costs; and/or
- Lower system performance (Missed runs due to breakdown).

Transit Asset Management (TAM) Policy

The purpose of the LRTA TAM plan is to provide: (1) Implementation actions that offer enabling support and direction for the management of transit assets across all asset classes and services; and (2) Direction and expectations for asset class owners and department managers regarding lifecycle management planning and processes.

The LRTA has developed the processes within the TAM plan to aid in: (1) Assessment of the current condition of capital assets; (2) determine what the condition and performance of its assets should be (if they are not currently in a State of Good Repair); (3) identify the unacceptable risks, including safety risks, in continuing to use an asset that is not in a State of Good Repair; and (4) deciding how to best balance and prioritize reasonably anticipated funds (revenues from all sources) towards improving asset condition and achieving a sufficient level of performance within those means.

LRTA Agency Overview

The LRTA provides both fixed route bus and on demand and paratransit public transportation services to approximately 1.6 million passengers annually. The LRTA's core inventory of capital assets includes:

- Service fleet:
 - 50 Fixed Route buses;
 - 47 Paratransit service vehicles;
- Passenger and parking facilities:
 - Intermodal passenger center and bus hub;
 - Passenger parking garage adjacent to the Intermodal center;
- Administrative and maintenance facilities:
 - Centrally-located administration facility;
 - Fixed Route operations/vehicle storage/refueling & maintenance facility; and
 - Paratransit operations/vehicle storage/refueling & maintenance facility.

Service is provided Monday through Friday from 5:30 AM to 9:30 PM, and on Saturdays from 7:00 AM to 7:00 PM. The operating climate conditions in the service area may have SGR impacts on revenue vehicles during the winter and summer months. On average, the risk is present for four to five months

out of the year for both cold/snowy winter weather conditions and high-heat/summer weather conditions.

The LRTA has maintained an asset management approach for fleet replacement and facility maintenance, replacing vehicles that have meet their State/Federal useful life requirements and making facility upgrades and repairs as needs arise and funding becomes available. The 2018 TAM Plan will further aid the LRTA in assessing the condition of its existing assets and determining its needs over time to maintain the system in a state of good repair. The TAM Plan Performance Measures are listed in Chapter 1 (Table 1.4) of this document.

MBTA COMMUTER RAIL

Commuter rail transportation has long provided an important link between the Greater Lowell communities and Greater Boston. Ridership has fluctuated over the years, but for many travelers commuter rail remains an efficient, convenient, and inexpensive alternative to private transportation. The following sections provide an overview of the commuter rail service offered in the Greater Lowell area, includes information on commuter rail fare structure, and provides a history of changes in service features that have affected ridership over the years.

Present commuter rail service between Gallagher Terminal in Lowell and North Station in Boston consists of twenty-one (21) daily inbound trains leaving on the half-hour between 5:35 A.M. and 9:15 A.M., and departing hourly after that time, with the last train to Boston leaving the station at 10:35 P.M.

Rail service to Lowell from North Station also consists of twenty-one (21) daily outbound trains operating between the hours of 5:45 A.M. and 12:10 A.M., with half-hour service during the evening "rush hour". In addition to the station in Lowell, the MBTA trains stop at North Billerica, Wilmington, Anderson/Woburn, Mishawum, Winchester, Wedgemere and West Medford. Weekend and holiday rail service consists of eight (8) trains daily, both inbound and outbound, serving the same stations as weekday service. The ticket office at Gallagher Terminal sells one-way, round-trip and multiple-ride tickets, as well as monthly rail passes.

MBTA RAIL VISION

The MBTA in conjunction with MassDOT Planning has undertaken a study of its existing Commuter Rail System to identify strategies to cost effectively transform the system into one that better supports improved mobility and economic competitiveness. Beginning in 2018, the MBTA evaluated costs, ridership potential and operational feasibility of alternatives to develop a vision for the future of Commuter Rail. In 2019, conversations with the public, both riders and non riders, were held to inform

that vision. As a result of surveys and public meetings, proposals for alternatives were developed looking into how the system could reduce overall travel times, increase frequency of service and improve connectivity. The Rail Vision Committee is evaluating the costs and benefits of seven alternatives:

1. **Optimizing the current system** – Focus is on improving the current system by providing predictable, frequent service;
2. **Regional Rail to Key Stations (Diesel)** – high frequency service to Key Stations including Lowell on Diesel Locomotives;
3. **Regional Rail to Key Stations (Electric)** – High frequency service to Key Stations including Lowell on Electrified System using self-powered electric trains that operate more like subway trains;
4. **Urban Rail (Diesel)** – High frequency service to inner core stations using diesel multiple units (similar to subway). Service to outer stations would be equal to or better than current levels;
5. **Urban Rail (Electric)** – High frequency service to inner core stations using electric multiple units;
6. **Full Transformation** – This alternative uses electric multiple units to provide service every 15 minutes to key stations and inner core stations all day and to other stations during peak travel times; and
7. **Hybrid System** – This alternative provides varying levels of service throughout the network depending on needs of each area.

With Commuter rail service along the Lowell line, the Northern Middlesex region would benefit greatly from increased service frequency to the region. More information on the MBTA Rail Vision can be found here: <https://www.mbta.com/projects/rail-vision>.

MBTA COMMUTER RAIL FARE STRUCTURE

For the purpose of making fares equitable, the MBTA divides each of its commuter rail lines into "zones". Travel to or between zones is assessed according to the number of zones traversed by the commuter. When considering commuter rail fares, one should note that MBTA conductors add a \$1.00 (non-peak hour) and \$2.00 (peak hour) surcharge to tickets purchased on board the train, when tickets are available for purchase at the boarding station. All fares described below do not include this surcharge.

Commuter rail service fares have seen significant changes over the years. In February 1981, the cost of a one-way ticket from Lowell-Boston was \$2.25, while a 12-ride ticket cost \$22.50. A calendar monthly rail pass offering unlimited rail service with access to MBTA Rapid Transit cost \$68.00. By December 1982, the MBTA had revised its zone structure and Lowell became a Zone 6 station, resulting in a fare increase. Fare increases were moderate between 1982 and 2011, however, in July 2012, a significant fare increase

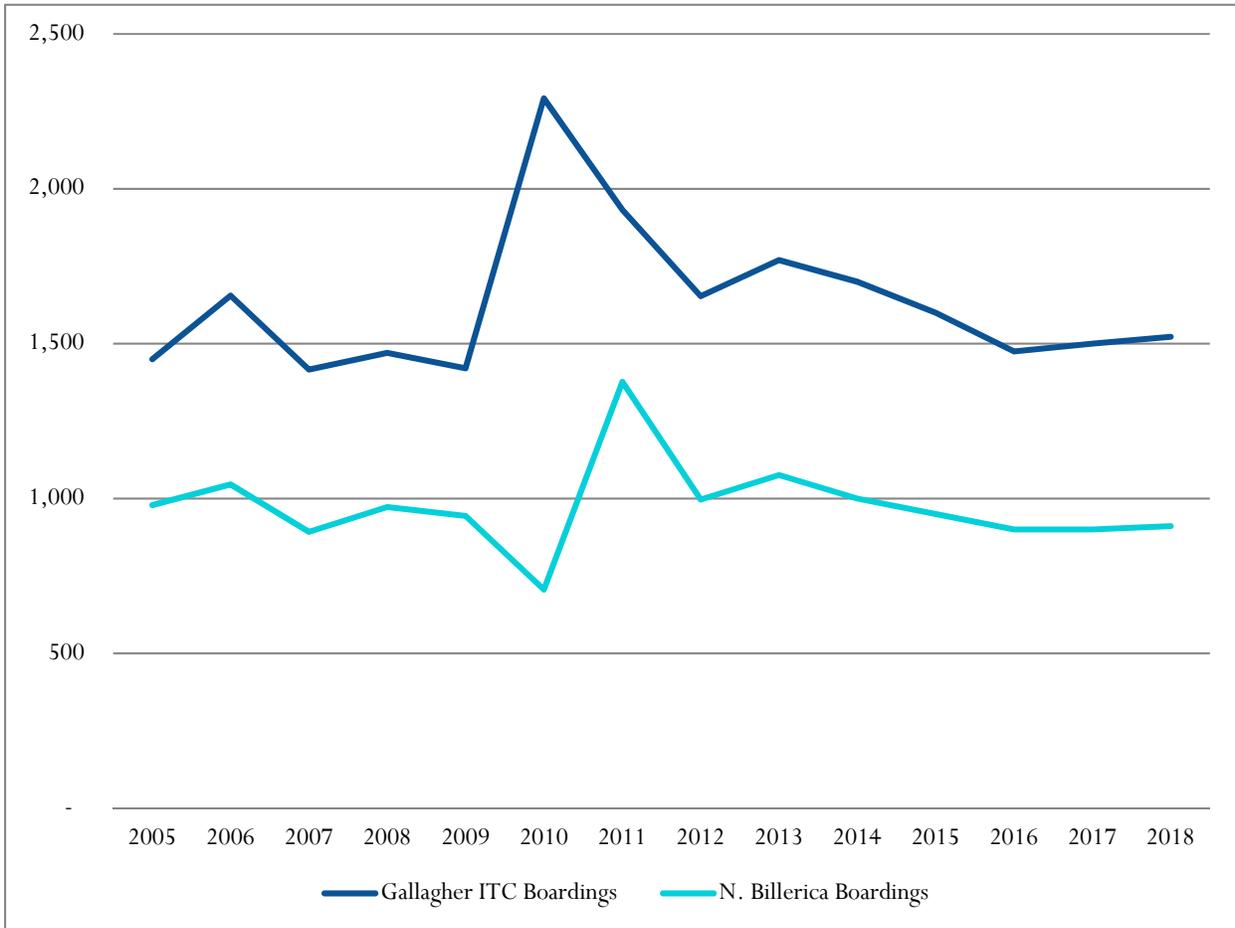
of approximately 40% was implemented for commuter rail. Presently, the cost of a one-way ticket from Lowell to Boston is \$9.25. The calendar monthly pass costs \$289 for unlimited monthly service. A 10-ride ticket for Zone 6 can be purchased for \$92.50.

The cost of commuter rail service between North Billerica and Boston has followed much the same pattern. Between 1981 and 1982, the cost of a one-way ticket to Boston was \$2.00. By December 1982, it had increased to \$2.25, as North Billerica became a Zone 5 rather than a Zone 4 station. Likewise, the cost of the 12-ride ticket increased from \$20.00 to \$24.75 and the calendar monthly pass increased from \$61.00 to \$74.00. Currently, the MBTA fare for a one-way ticket between North Billerica and Boston is \$8.50, the 10-ride ticket is \$85.00 and the monthly pass is \$265.00.

MBTA COMMUTER RAIL RIDERSHIP

The opening of the Kennedy Bus Hub at Gallagher Terminal in August 2005 ended the use of all surface parking lots, aside from several van spaces for individuals with disabilities. As a result, the Gallagher Intermodal Center currently contains garage-parking capacity of 955 spaces (Gallagher 1 – 330 spaces, Gallagher 2 – 231 spaces and Rourke – 394 spaces). Commuter rail ridership on the Lowell-Boston line has been affected over the past few years by various external factors. Figure 6.1 on the following page provides ridership statistics from 2005 to 2018. Inbound boardings at Gallagher Terminal increased to an all-time high of 1,778 in spring 2006, while ridership increased to its peak of 1,256 at North Billerica station in the fall of 2006. Ridership declined due to an economic downturn to an average of approximately 1,350 inbound boardings at Lowell and 800 inbound boardings at North Billerica in 2010. Commuter rail ridership has not rebounded from the 2006 peak. In 2018, there were 911 daily boardings at North Billerica station and 1,522 daily boardings in Lowell, as shown in Figure 6.1 on the following page.

Figure 6.1: MBTA Commuter Rail Service Daily Inbound Ridership (2005-2018)



PROPOSED NEW HAMPSHIRE CAPITAL CORRIDOR COMMUTER RAIL EXTENSION

In March 1999, the Nashua Regional Planning Commission (NRPC) commissioned a study to examine the feasibility of extending commuter rail service on the MBTA’s Lowell line to the southern New Hampshire region. This study focused on an incremental approach to restoring service along a 30.4-mile section of the former B&M New Hampshire mainline rail corridor between Lowell and Manchester, NH. The last regularly scheduled commuter rail service to Nashua and Manchester was operated in June 1967. A 13-month demonstration project offered a limited schedule of service in 1980 and 1981. The former double track mainline corridor has been reduced to a single-track route with passing sidings, except for a 3.5-mile segment between Lowell Station and Chelmsford Wye.

As proposed, rail service would connect southern and central New Hampshire locations with the current terminus of MBTA operations in Lowell and with the most northerly terminus located in Concord, NH. Early in 2013, the New Hampshire Department of Transportation (NHDOT), working in concert with Massachusetts, completed the Capitol Corridor Alternatives Analysis with support and funding from the Federal Railroad Administration (FRA) and Federal Transit Administration (FTA). The Study evaluated rail and bus options for improving connectivity in the corridor by leveraging existing transportation infrastructure and integrating transportation and land use planning.

The study results indicated extensive positive economic development impacts of expanding passenger rail including new jobs, commercial and residential real estate growth, and millions of dollars in reinvested worker earnings. According to the analysis, the Manchester Regional Rail alternative serving two stations in Nashua, one in downtown Manchester and one at the Manchester-Boston Regional Airport, would offer the greatest economic benefit with moderate construction investment. This alternative would draw an average of 668,000 weekday riders annually, with the potential to generate more than 3,600 new residential units and nearly two million square feet of commercial space supporting 5,600 permanent jobs by the year 2030.

In 2001 the Town of Chelmsford held a public meeting to gauge the level of support for constructing a new commuter rail station in North Chelmsford should New Hampshire decide to extend service from Lowell. The Chelmsford Board of Selectmen voted to pursue the development of a new station in the North Chelmsford area if the project moves forward.

The MBTA and CTPS completed a feasibility study in 2002 that identified two preferred locations for such a station and assessed the potential demand for each location. The locations include the North Chelmsford Auto Parts site north of Vinal Square and the industrial complex at the end of Wotton Street in North Chelmsford. The cost of construction was estimated at \$3.7 million for a 400-car lot and \$4.9 million for a 725-car lot. This issue was revisited when the town completed its most recent Master Plan in 2010. The Master Plan recommends that the Town continue to participate in the planning for the project, assuming that the traffic impacts of a new commuter rail station can be successfully mitigated. A traffic study performed by NMCOG in 2013 evaluated the impacts of a commuter rail station on the Wotton Street site and outlined the mitigation measures that would be needed should the project go forward.

In 2014, the NHDOT released [a detailed analysis](#) of proposed options for bringing rail to the NH Capitol Corridor. The preferred first step is to extend the existing Boston-Lowell commuter rail line to Nashua and Manchester. A future project would eventually extend the line to Concord. The Manchester Regional Commuter Rail line, as it is now known, would run eight (8) round trips between Manchester and Boston and seventeen (17) to Nashua. The total cost estimate for the project in 2014 was \$246

million. The scope of the project would include replacing the tracks, building sidings, construction of stations and crossings, and upgrading bridges. Construction is expected to take four years. Four years ago, the MBTA was willing to provide the train cars and a locomotive, and waive the fees for the track rights given the benefits to traffic on both the Route 3 and I-93 corridors, and the traffic reduction would help lower greenhouse gas emissions by 25 percent.

The next step for this project is the completion of the project development and engineering phases, which include the environmental assessment, engineering plans, the creation of a detailed financial plan, and drafting potential third-party agreements with the MBTA. This work would be funded by the State of New Hampshire using FTA funds.

The City of Nashua has been very actively pursuing passenger rail for many years. In addition to advocating for the NH Capitol Corridor Rail project, the City has been in talks with the [Boston Surface Railroad Company](#) that is purposing to run a train from Bedford, NH, at the Manchester Airport to Worcester, MA, and Providence, RI. Commuters would be able to transfer at the Lowell rail station to the Boston line.

I-93 TRANSIT INVESTMENT STUDY

The I-93 Transit Investment Study was initiated in 2006 to outline a long-term vision for transit investments that will accommodate future travel demand in the I-93 corridor from Boston to Manchester, New Hampshire. These improvements included rail, bus, and ride-sharing alternatives. The Transit Investment Study focused on two options for commuter service in the I-93 corridor: reactivation of rail service on the Manchester and Lawrence (M&L) right-of-way, and express bus service on the shoulder of I-93 (BOS).

Average daily traffic has grown steadily in the I-93 corridor. Historic trends revealed a 5 percent annual growth rate in average daily traffic for the segment north of the metropolitan Boston area. The heaviest traffic volumes along I-93 occur in southbound traffic in the morning peak period and northbound in the evening peak period. Peak hour traffic volumes reflect the commuter orientation of the corridor.

The bus on shoulder option was the primary alternative evaluated for cost and feasibility. This



Image 6.1: Example of Bus on Shoulder Service

alternative was ultimately estimated to cost \$88 million, with a relatively short time period required to phase in implementation. The M&L rail alternative was estimated at \$197 million and would require converting an existing bike trail back to rail usage. The bus on shoulder alternative, however, would be politically difficult to implement in Massachusetts in the near horizon.

In New Hampshire, approximately 60 percent of the traffic flow is southbound in the morning peak hour, and northbound in the evening peak

hour. Analysis of the monthly variations in average daily traffic along the I-93 corridor indicates that the summer season has the highest traffic volume on a daily basis. August is the peak month with an average daily traffic volume of 77,500 vehicles per day.

In Massachusetts, during the morning and evening commuter periods, traffic speeds are reduced due to traffic congestion on I-93, and heavy exiting and entering volumes at some of the interchanges. In the southbound direction during the morning peak period, recurrent congestion occurs at Exit 45 (River Road in Andover), Exit 44 (I-495 in Andover) and Exit 42 (Dascomb Road in Tewksbury). Congestion is even heavier at these locations during the northbound evening commute.

PUBLIC TRANSPORTATION ISSUES AND OPPORTUNITIES

As discussed in Chapter 2, many comments were received during the public outreach process relative to LRTA bus service and the needs of the traveling public. The following section summarizes the main concerns and issues expressed throughout the outreach process.

- Sunday Service:** One of the most frequent requests that the LRTA receives is for transportation services on Sundays. Beginning June 16, 2019, the LRTA will operate 10 routes on Sundays through a State-funded nine-month pilot. Evaluations of ridership demand and effectiveness of the Sunday service will be on-going throughout the nine months of the trial. If the service was effective and the LRTA can secure additional funding, the Sunday service would be extended beyond the term of the pilot project.

- **Extension of Service Times:** Over the last several years, the LRTA has added several early and late hour trips to all key routes. When financial resources are available to implement additional hours, the LRTA will do so.
- **LRTA/UMass Lowell Coordination of Bus Service and Scheduling:** The LRTA and UMass Lowell have continued to coordinate transit services. In August 2017, the LRTA established the #20 Downtown/UMass North Route. LRTA operated service is available to UMass students, faculty and the general public from 7:45 a.m. to 11:45 a.m., and the University operates service for UMass students and faculty from noon into the evening. Additionally, the LRTA has rerouted the #7 and #9 bus routes to service the University Crossing bus hub. In combination with these bus routings, the LRTA has enabled the fareboxes to accept the UMass Lowell student ID cards for payment, and the University reimburses the transit authority at the end of each month.
- **Enhance LRTA/MBTA Coordination of Buses and Commuter Rail:** LRTA regularly reviews the MBTA schedules and adjusts the bus service to facilitate easier transfers between the two transit agencies. In addition, during peak travel hours, the LRTA will hold buses up to five minutes to meet inbound afternoon trains when there are commuter rail delays.
- **Additional service to Burlington Mall:** The LRTA currently provides bus service to the Burlington Mall via the #14 bus route. Burlington Mall service operates on a one-hour frequency six days per week. Several participants at the public input sessions would like to see increased headways and service provided on Sundays. The LRTA is studying the potential extension of the #13 Billerica Route south on Route 3A to connect with the #14 at the Burlington Mall. The proposal, identified in the Middlesex 3 Transportation Study, would provide ½ hour headways and would enable customers on the Middlesex Turnpike corridor to take a single-seat ride to the Route 3A corridor, and vice versa.
- **Full Service to Middlesex Road in Tyngsborough:** A seasonal bus route currently serves the Pheasant Lane Mall, located at the north end of Middlesex Road, on Saturdays between Thanksgiving and January 15th. The public and Tyngsborough representatives felt strongly that service should be provided six days per week on a year-round basis. The expanded bus route is included in the LRTA Transit Service Plan for future implementation.