

REGIONAL TRANSPORTATION PLAN EXECUTIVE SUMMARY

OVERVIEW

The Northern Middlesex Regional Transportation Plan (RTP) identifies the direction for the region's transportation system and serves as the framework for future investment in highways, bridges, public transportation, bicycle and pedestrian paths and trails, and transportation-related air quality improvement projects. The RTP assesses existing and projected transportation system capabilities, needs, and objectives, and includes recommendations to meet these needs through 2040.

The Regional Transportation Plan is one of three federally required certification documents that the Northern Middlesex Metropolitan Planning Organization (NMMPO) must develop and maintain. The other key documents include the Transportation Improvement Program and the Unified Planning Work Program.

The objectives of the RTP are to:

- Determine the current and projected transportation needs of the region's residents, businesses, and institutions over the next nearly 25 years;
- Assess the ability of the existing transportation system to meet these needs; and
- Identify a set of fiscally constrained strategies that best fill the gap between the capabilities of the existing transportation system and current and projected transportation needs.

The RTP was developed with input from residents, businesses, and community organizations. The first round of public involvement meetings were held in March and April 2015 to review and gather input on opportunities and issues facing the region, and to discuss potential transportation alternatives for addressing transportation needs. A second round of public involvement meetings was held in July 2015 to solicit comments on the Draft RTP document.

The RTP is organized as follows:

TRANSPORTATION PLANNING FRAMEWORK: Chapter 1 discusses transportation goals and objectives for the Northern Middlesex region. The goals and objectives reflect the eight major transportation planning factors set forth in Moving Ahead for Progress in the 21st Century (MAP-21), which was enacted in 2012. It also identifies performance measures, or the metrics used to monitor changes in the performance of the regional transportation system in order to gauge progress toward addressing identified needs. The performance measures address the following categories: safety, infrastructure condition, congestion reduction and system reliability, economic vitality, environmental sustainability and livability, and transportation equity and accessibility. Each category is presented in this summary on the following pages.

Goal 1: Safety	
Problem Statement	Crashes result in economic loss from damaged vehicles and goods, personal pain and suffering due to injury, and occasionally the catastrophic loss of life.
Goal	To improve the safety of the transportation system for all users.
Objectives	<p>Support projects, programs, and policies that:</p> <ul style="list-style-type: none"> • Advance safe travel • Reduce the number and severity of crashes for all modes of transportation • Promote use of ITS technology for projects aimed at improving safety at high crash locations
Performance Measures	<p>Roadways</p> <ul style="list-style-type: none"> • Number of crashes (vehicle, bicycle, pedestrian, truck); crashes per million entering vehicles (MEV) • Number of serious injuries (vehicle, bicycle, pedestrian, truck); injuries per million entering vehicles (MEV) • Number of fatalities (vehicle, bicycle, pedestrian, truck); fatalities per million entering vehicles (MEV) <p>Transit</p> <ul style="list-style-type: none"> • Number of preventable transit accidents per 100,000 miles of service • Remain below the benchmark of 1.5 preventable transit accidents per 100,000 miles.
Targets	<p>By 2040:</p> <ul style="list-style-type: none"> • Reduce the number of vehicle, bicycle, and pedestrian injuries and fatalities by 20% compared to 2010-2012 • Remain below the benchmark of 20 preventable transit accidents per 100,000 miles.
Potential Remedies	<ul style="list-style-type: none"> • Evaluate and address high crash locations. • Employ new technologies and design guidance as they evolve. • Increase public safety education. • Devote adequate financial resources to programming safety projects.

Goal 2: Roadway Infrastructure Condition/Transit State of Good Repair	
Problem Statement	Aging infrastructure and deterred maintenance impact safety, equipment life, and the economic health of the region and its communities.
Goal	To efficiently manage existing transportation assets and infrastructure
Objectives	<p>Support projects, programs, and policies that:</p> <ul style="list-style-type: none"> • Prioritize projects that maintain and modernize existing capital assets • Improve the condition of bridge structures • Improve pavement conditions on the region’s multi-modal travel network • Promote the use of ITS technologies for infrastructure improvement projects • Promote proper design of infrastructure, including the use of Complete Streets programs <p>For Transit Projects:</p> <ul style="list-style-type: none"> • Maintain and improve service reliability, through regular route and service evaluations, and proper preventative maintenance practices • Maintain and upgrade all transit facilities to a 21st Century condition, including Gallagher Intermodal Center, commuter rail parking garages, Kennedy Bus Hub and operation and maintenance centers • Ensure that the LRTA Bus and Paratransit fleets are safe, accessible and in a state of good repair
Performance Measures	<p>Roadways</p> <ul style="list-style-type: none"> • Percentage of Structurally Deficient and Functionally Obsolete bridges in the region • Percentage of pavements on the Federal aid system in good condition • Percentage of pavement on the Federal aid system in poor condition

	<p>Transit</p> <ul style="list-style-type: none"> • Maintenance cost per revenue hour • Maintenance cost per revenue mile. • Transit vehicle life cycle (average age of fleet, average odometer reading for fleet) • Investment in capital improvements to existing facilities and capital assets
Targets	<p>By 2040:</p> <ul style="list-style-type: none"> • Reduce the percentage of bridges in poor condition by 10% compared to 2010. • Reduce the percentage of pavements on the Federal aid system in poor condition by 10% compared to 2010. • Maintain industry standards for transit vehicle life cycle.
Potential Remedies	<ul style="list-style-type: none"> • Monitor condition of existing infrastructure and identify critical needs. • Prioritize ongoing maintenance to avoid cost of deferment of maintenance activities. • Promote Complete Streets. • Continue to participate in the state’s ITS program.

Goal 3: Congestion Reduction and System Reliability	
Problem Statement	Congestion results in increased travel time, poor air quality, increased greenhouse gas emissions, and frustration on the part of the traveling public.
Goal	To improve travel time and reliability for people and goods
Objectives	<p>Support projects, programs, and policies that:</p> <ul style="list-style-type: none"> • Improve the performance of the existing transportation facilities to reduce congestion • Eliminate critical highway bottlenecks • Increase reliability and on-time performance of the transit system • Increase bicycle parking capacity, pedestrian facilities and access to transit stations in order to encourage mode shift • Improve incident management
Performance Measures	<p>Roadways</p> <ul style="list-style-type: none"> • Average speed • Roadway Segments with severe congestion (poor LOS) • Intersections with severe delay (poor LOS) • Changes in traffic volumes <p>Freight</p> <ul style="list-style-type: none"> • Level of service (LOS) for corridors carrying a large volume of freight traffic (I-495, I-93, Route 3) • Transit • Number of passengers per revenue hour • Number of passengers per revenue mile • Percent utilization of park-and-ride facilities and MBTA parking areas.
Targets	<p>By 2040:</p> <ul style="list-style-type: none"> • Reduce the number of intersections and roadway segments with significant delays by 25%, as compared to 2010. • Eliminate the number of identified bottleneck locations by 20%, compared to 2010. • Increase the number of transit passengers per service hour by 15% compared to 2010. • Maintain and/or exceed the benchmark of 95% of all transit trips performed on time. • Exceed the benchmark of 17 passengers per revenue hour. • Increase the percent utilization of park-and-ride facilities by 10% compared to 2010.
Potential Remedies	<ul style="list-style-type: none"> • Continue monitoring travel conditions throughout the region.

Goal 3: Congestion Reduction and System Reliability

- Assess reliability and on-time performance of transit system on ongoing basis.
- Promote alternative modes of transportation.

Goal 4: Economic Vitality

Problem Statement	An inefficient, unsafe, and unreliable transportation system is detrimental to the economic vitality of the region.
Goal	Ensure that the transportation network supports economic development needs and accommodates future economic growth
Objectives	<p>Support projects, programs, and policies that:</p> <ul style="list-style-type: none"> • Advance corridor and community development and redevelopment opportunities to improve the region's economy and enhance quality of life • Prioritize transportation investments that serve targeted development sites • Advance strategies to support connections between key employment origins and destination • Expand transit service to regional employment markets that are either underserved or not currently served • Improve bicycle and pedestrian access to employment, educational, health, and recreational opportunities • Connect multi-family and affordable housing with employment and educational opportunities
Performance Measures	<ul style="list-style-type: none"> • Number of new businesses formed • Number of Affordable Housing facilities served by transit • New jobs created • Number of new transit routes to serve employment centers, health care facilities, and educational facilities • Percentage of population and places of employment within ¼ mile of transit station
Targets	<ul style="list-style-type: none"> • Increase percentage of population and places of employment within ¼ mile of transit station by 5% as compared to 2010 • Increase percentage of population and places of employment within ½ mile of bicycle facilities by 15% as compared to 2010
Potential Remedies	<ul style="list-style-type: none"> • Coordinate economic development projects and transportation infrastructure needs on ongoing basis. • Work to connect employment sites, educational institutions, and health facilities with the region's neighborhoods.

Goal 5: Environmental Sustainability and Livability

Problem Statement	Transportation impacts the environment by producing air pollution (including greenhouse gases), creating runoff that affects soils and drinking water, consuming land, and by generating noise and visual impacts.
Goal	To minimize and mitigate the impacts of the transportation system on the environment, including air quality, water quality, wildlife habitat, and climate change

Goal 5: Environmental Sustainability and Livability

<p>Objectives</p>	<p>Support projects, programs, and policies that:</p> <ul style="list-style-type: none"> • Encourage mode shift and reduce VMT • Provide multimodal, active transportation options that improve public health and reduce air pollution. • Maintain national ambient air quality standards • Create a connected network of bicycle and pedestrian facilities by expanding existing facilities and closing gaps • Promote the use of alternative fuel vehicles, such as compressed natural gas (CNG), electric and hybrid electric • Provide additional electric vehicle charging facilities • Protect critical transportation infrastructure from the affects of climate change • Promote sustainable design principles that minimize the region’s carbon footprint • Consider sensitive environmental resources, such as wetlands and wildlife habitat, in planning and designing transportation improvements • Address stormwater runoff and flooding concerns
<p>Performance Measures</p>	<p>Roadways</p> <ul style="list-style-type: none"> • On-road mobile source emissions (carbon dioxide, nitrogen oxides, volatile organic compounds, greenhouse gases). • Number of projects implemented that benefit air quality • Number of stormwater improvement projects implemented by local communities and MassDOT <p>Transit</p> <ul style="list-style-type: none"> • Transit fleet mix (alternative fueling technologies) • Regional vehicle fleet mix • Number of electric vehicle charging stations added <p>Active Transportation</p> <ul style="list-style-type: none"> • Bicycle mode share • Pedestrian mode share • Miles of bike lanes and sharrows • Miles of off-road trails • Miles of sidewalk
<p>Targets</p>	<p>By 2040:</p> <ul style="list-style-type: none"> • Maintain attainment status for Carbon Monoxide and other pollutants • Reduce transportation-related carbon dioxide emissions below 1990 levels by 25% as compared to 2010. • Increase electric or compressed natural gas (CNG) transit fleet by 15% as compared to 2010. • Double bicycling and walking mode share as compared to 2010. • Increase miles of bike lanes and sharrows by 25% as compared to 2010. • Increase miles of sidewalks and trails by 15% as compared to 2010. • Increase the number of electric vehicle charging stations by 20%
<p>Potential Remedies</p>	<ul style="list-style-type: none"> • Ensure that transportation construction projects are adequately mitigated. • Promote alternative modes of transportation. • Work to protect critical infrastructure from impacts of climate change.

Goal 6: Transportation Equity and Accessibility

<p>Problem Statement</p>	<p>Transportation barriers have unfair impacts on disadvantaged and underrepresented communities as well as individuals with disabilities.</p>
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Goal	To provide fair and equal transportation access and service quality to all communities and neighborhoods regardless of income, race or LEP status.
Objectives	<p>Support projects, programs, and policies that:</p> <ul style="list-style-type: none"> • Maximize benefits and minimize burdens of transportation investments for low-income and minority neighborhoods • Meet non-traditional transportation and transit-dependent needs of the region's population, including those of the elderly and persons with disabilities • Ensure that low-income, minority and Non-English speaking neighborhoods have ample opportunities to participate in the transportation planning process and share in the decision-making process
Performance Measures	<ul style="list-style-type: none"> • Monitor transportation projects and investments (number of projects and dollars of investment) to ensure that low income and minority neighborhoods share equally in the benefits and burdens • Monitor transit improvement projects to ensure that low income and minority neighborhoods receive equitable service levels and equipment
Targets	<p>By 2040:</p> <ul style="list-style-type: none"> • Provide long-term documentation demonstrating that low income, minority and Non-English speaking neighborhoods share equally the benefits and burdens of transportation improvements and investments
Potential Remedies	<ul style="list-style-type: none"> • Continue to actively engage minority and low income neighborhoods. • Review and expand the regional public participation process. • Continually monitor changes in demographics.

Chapter 2 describes the public participation process used to develop the RTP. Public meetings, a survey, and social media were used to gather input from residents on the transportation needs and opportunities in the region. Chapter 3 highlights the role of the NMMPO in transportation policy, planning, and investment decision making, including the organizational structure and current members of the NMMPO.

CURRENT TRANSPORTATION SYSTEM: Chapter 4 discusses the existing and projected demographic and economic conditions along with land use and commuting patterns in the region. Chapters 5 through 8 provide an overview of the regional transportation system by mode, including highways and bridges, public transportation, bicycling and walking. Intelligent Transportation Systems (ITS) initiatives across the region are also discussed.

Chapter 9 provides information on transportation safety and security considerations in the region. The congestion management process is presented in Chapter 10, as a means to provide practical tools to identify and implement strategies that improve the mobility of people and freight. This chapter emphasizes coordinated corridor-level and region-wide solutions that address existing and future sources of congestion that result in excess travel delays.

EMERGING OPPORTUNITIES AND ISSUES IN TRANSPORTATION PLANNING: Chapters 11 through 14 address a number of emerging transportation planning topics that will require further investigation and analysis over the next 25 years. The issues are as follows:

- **Freight Movement:** Opportunities and challenges related to improving freight transportation by truck and rail are discussed.
- **Economic Development:** An overview of regionally significant development projects and related transportation infrastructure is presented.

- **Environmental Sustainability and Livability:** A preliminary analysis of the potential environmental impacts associated with the projects contained in the RTP is provided.
- **Transportation Equity and Accessibility:** An assessment of the region’s environmental justice population and an analysis of the environmental justice impacts of the projects in the RTP are provided.

FUTURE OF TRANSPORTATION: Federal requirements mandate that the RTP include a financial plan that demonstrates how the recommendations can be implemented based on system-level estimates of costs and reasonably expected revenues. Chapter 15 presents plan recommendations to address existing and future needs which can be implemented using the financial resources that are reasonably expected to be available through 2040. The recommendations will lead to the projects and programs that best address regional transportation needs, while focusing on the preservation and maintenance of the transportation system. The anticipated costs of implementing transportation projects and programs, and the federal revenues that can be reasonably expected to be available over the period covered by the RTP, are noted in Chapter 16. The following tables (broken into 5 year increments) provide a glimpse into the recommendations of the RTP and an example of its financial constraint for both highway and transit projects. The projects recommended in the RTP must be within expected targets available to the Northern Middlesex MPO for programming.

RTP Highway Project Recommendations (2016–2020)

Community	Project Type/ Project ID #	Project Description	Year of Expenditure Cost*
Bedford/Billerica	29492	Middlesex Turnpike Improvements	\$1,000,000
Billerica	608181	Allen Rd Phase II Route 3A intersection	\$3,037,133
Billerica	601426	Reconstruction of Allen Rd (year 2)	\$2,976,437
Billerica	602945	Middlesex Canal Phase I	\$3,694,123
Chelmsford	607401	Traffic Signal Installation at Rte. 110 and I-495	\$1,219,400
Chelmsford	607421	Traffic Signal installation at I-495 and Rte. 4	\$799,497
Chelmsford	Intersection	Improvements to the intersection of Billerica Rd. (Rt. 129) and Riverneck Rd.	\$2,089,367
Dracut	Roadway Reconstruction	Nashua Rd. Improvements between Lakeview Avenue and Tyngsborough Town Line	\$2,313,835
Dunstable	Reconstruction	Route 113 Retaining Wall Phase II Reconstruction	\$787,405
Lowell	606189	Improvement to 4 intersections of Rt. 38	\$2,745,600
Lowell	604694	Intersection improvements at Gorham St. and the Lowell Connector	\$1,560,000
Lowell	605966	Resurfacing of VFW Highway (plus phase II of Pawtucket Falls Overlook Project)	\$6,219,200
Lowell	607752	Intersection improvements at VFW and Aiken and Rte 113 and Mammoth	\$996,067
Tewksbury	Corridor	Route 38 roadway and intersection Improvements Phase I	\$2,339,717
Westford	607251	Intersection improvements to Rte 110 and Tadmuck Rd	\$3,271,140

Community	Project Type/ Project ID #	Project Description	Year of Expenditure Cost*
Westford	608036	Traffic Signal Installation and Intersection Improvements at Rte 40 and Oak Hill Rd	\$1,456,000
Westford	608037	Traffic Signal Installation and Intersection Improvements at Rte 40 and Dunstable Rd	\$1,730,560
Estimated Costs			\$38,432,568
Regional Target			\$40,185,801
Difference			\$1,753,233

* Year of expenditure include a 4% annual cost increase to account for inflation

RTP Highway Project Recommendations (2021-2025)

Community	Project Type	Project Description	Year of Expenditure Cost*
Billerica	Off Rd Multi-use Trail	Yankee Doodle Bike Path, Design and Construction	\$7,187,012
Billerica	Roadway Reconstruction	Reconstruction of Route 3A from Floyd St to River Rd	\$6,579,659
Billerica	Intersection	Intersection Improvements to Boston Rd/ Glad Valley Dr/ Lexington Rd	\$1,423,312
Chelmsford	Pedestrian Walkway	Brook Walk Pathway in Chelmsford Center	\$6,404,903
Chelmsford	Safety and traffic improvements	Traffic and Safety improvements along Steadman St/Golden Cove Road	\$1,897,979
Chelmsford	Intersection	Intersection improvements at Concord Rd/ Parker Rd/ and Boston Rd	\$1,423,312
Dracut	Intersection	Intersection improvements at Lakeview Avenue and Mammoth Rd. - Signal upgrades and reconfiguration of approaches	\$2,846,624
Dracut	Intersection	Intersection Improvements at Route 113 (Pleasant St) at Route 38 (Bridge St.) and Aiken Avenue	\$1,915,997
Lowell	Intersection	Westford St. and Wilder St. Intersection Improvements	\$426,994
Lowell	Signalization	Installation of Traffic Signals at I -495 Ramps at Woburn St.	\$2,134,968
Westford	Roadway Reconstruction	Main Street roadway reconstruction between Depot Street and Tadmuck Rd.	\$3,421,423
Estimated Costs			\$41,715,467
Regional Target			\$42,298,641
Difference			\$583,174
* Year of expenditure include a 4% annual cost increase to account for inflation			

RTP Highway Project Recommendations (2026-2030)

Community	Project Type	Project Description	Year of Expenditure Cost*
Chelmsford	Sidewalks	Installation/Improvement of Sidewalks on Billerica Road (Rt. 129)	\$1,316,074
Chelmsford	Roadway Reconstruction	Reconstruct Westford Street	\$1,308,536
Chelmsford/ Lowell	Safety and Traffic improvements	Safety and traffic flow improvements on Drum Hill Rd./Wood St.	\$3,078,908
Dracut	Signals	Traffic signalization at Loon Hill Rd. and Broadway Rd.	\$3,386,799
Dracut	Intersection	Intersection improvements at Pleasant St. and Lakeview Ave.	\$2,771,017
Dracut	Intersection	Signal and intersection improvements at Rte. 113 (Pleasant St.) at Hildreth St.	\$1,539,454
Lowell	Signals	Upgrade hardware/interconnect signals throughout the CBD	\$9,236,724
Lowell	Signals	Dutton St. Corridor coordination	\$108,057
Lowell	Intersection	Central St./Middlesex St., Appleton /Gorham, Central /Church St. Intersection improvements	\$108,057
Lowell/ Tewksbury/ Billerica	Corridor Improvements	Roadway improvements along Woburn St./Billerica Ave. including sidewalks and pavement markings 1.75 miles	\$2,960,489
Pepperell	Roadway Reconstruction	Route 113 (Townsend St.) Roadway reconstruction	\$4,995,221
Pepperell	Safety and Traffic improvements	Traffic and Safety Improvements in Railroad Square	\$3,463,353
Tewksbury	Corridor Improvements	Route 38 roadway and intersection Improvements Phase III	\$4,502,359
Tewksbury	Corridor Improvements	Route 38 roadway and intersection Improvements Phase II	\$3,202,064
Tewksbury	Intersection	Route 133 at River Rd. Intersection signalization and reconstruction	\$1,039,006
Tyngsborough	Corridor Improvements	Sherburne Avenue Improvements	\$4,618,362
Westford	Westford Town Center	Westford Town Center Improvements	\$3,330,147
Westford	Intersection	Rte. 225/Carlisle Rd. intersection Improvements	\$1,800,944
Estimated Costs			\$52,765,570
Regional Target			\$52,856,555
Difference			\$90,985

* Year of expenditure include 4% annual cost increase

RTP Highway Project Recommendations (2031-2035)

Community	Project Type	Project Description	Year of Expenditure Cost*
Chelmsford	Road Corridor	Traffic and Safety improvements along Littleton Road	\$2,025,817
Chelmsford	Vinal Square	Vinal Square streetscape Improvements	\$936,491
Chelmsford	Bridge	Meadowbrook Rd. culvert over Stony Brook	\$2,766,019
Dracut	Intersection	Pine Valley and Mammoth Rd. Intersection improvements	\$1,418,072
Dracut	Intersection	Mammoth Rd. at Passaconway Dr. Intersection improvements	\$1,363,530
Dracut	Intersection	Improve safety at the intersection of Salem Rd. and Rt. 113	\$779,160
Dracut	Intersection	Intersection improvements at Hildreth St. and Old Rd.	\$1,053,425
Dunstable	Sidewalks	Main Street Pathway Project	\$973,950
Lowell	Intersection	Pawtucket St. at School St. Intersection improvements	\$3,038,725
Lowell	Intersection	Riverside St. at University Ave. Intersection improvements	\$2,106,849
Lowell	Bridge	Broadway St. Bridge Modifications	\$1,947,900
Lowell	Intersection	Hamilton Canal District Offsite Improvements	\$1,843,493
Lowell	Signals	Merrimack St. Corridor Signal coordination	\$202,582
Tewksbury	Intersection	Salem St. at South St. Intersection improvements	\$2,106,849
Westford	Roadway Reconstruction	Bridge St. Roadway and drainage reconstruction	\$1,872,981
Westford	Roadway Widening	Route 110 Roadway Widening	\$7,491,925
Westford	Roadway Reconstruction	Boston Rd. Roadway Reconstruction	\$6,320,548
Westford	Intersection	Westford Schools Intersection Improvements	\$4,213,698
Westford	Roadway Reconstruction	Plain Rd. from Oak Hill Rd. to Moore Rd. Reconstruction with new sidewalks	\$4,213,698
Westford	Bridge	Rte. 40 improvements - Keyes Culvert	\$3,476,301
Westford	Roadway Reconstruction	Forge Village Rd. roadway and drainage reconstruction (Graniteville to Flagg Rd.)	\$3,160,274
Westford	Intersection	Plain Rd./Depot St. Intersection Improvements	\$2,106,849
Westford	Intersection	Rte. 225/Griffin Rd. Intersection Improvements	\$2,106,849
Westford	Intersection	Abbot Rd./Town Farm Rd. Intersection Improvements	\$1,264,110
Westford	Signal	Rte. 27 and Rte. 225 Intersection Signal Upgrade	\$1,012,908
Estimated Costs			\$59,803,003
Regional Target			\$59,850,863
Difference			\$47,860
* Year of expenditure include 4% annual cost increase			

RTP Highway Project Recommendations (2036-2040)

Community	Project Name	Project Description	Year of Expenditure Cost*
Chelmsford	Chelmsford Center	Bicycle and Pedestrian safety improvements in Chelmsford Center	\$422,945
Chelmsford	Senior Center Sidewalks	Sidewalks in North Chelmsford at the Senior Center	\$740,600
Chelmsford	Maple St Sidewalks	Sidewalks on Maple St. at the Byam school	\$478,541
Dracut	Intersection	Intersection improvements at Primrose Hill Rd. and New Boston Rd.	\$985,886
Dracut	Intersection	Intersection improvements at Crosby Rd., Cross Rd. and Colburn Rd.	\$710,976
Lowell	Intersection	Father Morrissette Blvd. and Cabot St. intersection improvements	\$710,976
Tewksbury	Lowell Junction	Lowell Junction Interchange Construction on I-93	\$60,387,354
Estimated Costs			\$64,437,277
Regional Target			\$64,476,378
Difference			\$39,101
* Year of expenditure include 4% annual cost increase			

Transit Capital Project Recommendations (2016-2040)

Description	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040
Replacement of Fixed Route Buses	\$5,520,000	\$6,716,000	\$8,172,000	\$9,942,000	\$10,190,550
Paratransit	\$1,679,000	\$1,950,000	\$2,257,000	\$2,616,000	\$2,642,160
Support Vehicles	\$198,000	\$241,000	\$293,000	\$356,000	\$356,000
Preventive Maintenance	\$14,244,000	\$17,330,000	\$21,084,000	\$25,653,000	\$26,294,325
Gallagher Parking Garage Upgrades	\$551,000	\$573,000	\$596,000	\$620,000	\$635,500
100 Hale Street Maintenance Facility Upgrades	\$250,000	\$430,000	\$447,000	\$465,000	\$476,625
Robert B. Kennedy Intermodal Center Upgrade and maintenance	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000
Robert Maguire Facility	\$276,000	\$287,000	\$289,000	\$310,000	\$317,750
Spare parts, equipment and miscellaneous	\$560,000	\$681,000	\$829,000	\$1,009,000	\$1,034,225
Fareboxes and communications	\$500,000	\$500,000	\$500,000	\$750,000	\$768,750
Total	\$24,028,000	\$28,958,000	\$34,717,000	\$41,971,000	\$42,965,885

Transit Operations Improvement Recommendations

Description	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040
Realign Rte 01	Implementation Cost Neutral	No Additional Cost	No Additional Cost	No Additional Cost	No Additional Cost
Realign Rte 02	Implementation Cost Neutral	No Additional Cost	No Additional Cost	No Additional Cost	No Additional Cost
Combine Rte 03 and Rte 15	Implementation Cost Neutral	No Additional Cost	No Additional Cost	No Additional Cost	No Additional Cost
Combine Rte 06 and Rte 09 and Realign (Begins in 2021)		Implantation Cost Neutral	No Additional Cost	No Additional Cost	No Additional Cost
Realign Rte 16 and Rte 17	Implementation Cost Neutral	No Additional Cost	No Additional Cost	No Additional Cost	No Additional Cost
Establish Rte 20	Implementation Cost Neutral	No Additional Cost	No Additional Cost	No Additional Cost	No Additional Cost

Transit Operation Improvements without an Identified Funding Source

Description	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040
Initiate Sunday Bus Service (Begins in 2021)	NA	\$6,100,000	\$7,413,000	\$9,019,000	\$10,972,000
Initiate Route 19: Middlesex Road, Tyngsborough & Discontinue Rte 20 (Begins in 2021)	NA	\$305,000	\$371,000	\$451,000	\$549,000