

FFYs 2019-2023 Transportation Improvement Program
Table 2: Draft Amendment One Summary: Five-Year MBTA Programming

For Public Review

Project	Proposed Change	Explanation	Overall Changes in Funding in TIP			
			Section/Funding Source	From	To	Difference
Five Year MBTA TIP Summary						
Elevator and Escalator Program	CHANGE FUNDING SOURCE	Elevator and Escalator Program now combined with Stations and Facilities.	5307	\$2,644,350	\$0	(\$2,644,350)
Stations and Facilities Program	CHANGE FUNDING SOURCE	Projects transferred from 5337 to 5307 (Harvard Busway, Iron Horse Park OCC).	5307	\$18,827,713	\$50,383,662	\$31,555,949
Revenue Vehicle Program	DECREASE FUNDING	Funding for the procurement of bi-level coaches and Green Line Train Protection shifted from 5307 to 5337. Funds for Post-FFY23 bus procurement costs not obligated until FFY24.	5307	\$578,097,223	\$429,862,899	(\$148,234,325)
Signals/Systems Upgrade Program	INCREASE COST	Commuter Rail Northside ATC and Green Line Track Upgrades added to 5307 program. Systemwide Radio project deferred from FFY18 to FFY19-23.	5307	\$128,640,000	\$373,346,672	\$244,706,672
Elevator and Escalator Program	CHANGE FUNDING SOURCE	Elevator and Escalator Program now combined with Stations and Facilities.	5337	\$90,362,968	\$0	(\$90,362,968)
Revenue Vehicle Program	CHANGE FUNDING SOURCE	Funding for the procurement of bi-level coaches and Green Line Train Protection moved from 5307 to 5337	5337	\$0	\$118,118,226	\$118,118,226
Bridge and Tunnel Program	DECREASE FUNDING	North Station Draw 1 bridge project to be funded by MBTA bonds (not FTA funds) so removed from TIP.	5337	\$261,156,069	\$118,793,470	(\$142,362,599)

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Project	Proposed Change	Explanation	Section/Funding Source	Overall Changes in Funding in TIP		
				From	To	Difference
Signals/Systems Upgrade Program	INCREASE COST	Added projects (e.g., Alewife Crossing, Red Line Interlockings, Work Cars) and carried forward unobligated FFY18 funds into FFY19.	5337	\$196,966,421	\$379,093,192	\$182,126,771
Stations and Facilities Program	INCREASE COST	Added projects (e.g., Lynn Station & Garage), shifted Elevator work here, and moved Silver Line Gateway from FFY18 to FFY19.	5337	\$178,509,878	\$284,893,177	\$106,383,299
Bus Program	INCREASE COST	Carryover of funds into FFY19 for Harvard Square Busway construction.	5339	\$28,297,582	\$34,835,285	\$6,537,703
Green Line Extension (GLX)	INCREASE COST	\$225M of FFGA funds not obligated in FFY18; carried over to FFY19.	5309	\$446,121,000	\$671,121,000	\$225,000,000
Hingham Ferry Dock Modification	INCREASE FUNDING	Funds not obligated in FFY18; carried over into FFY19.	Other Federal Funds	\$0	\$8,050,000	\$8,050,000
MBTA Catamaran Overhauls	INCREASE FUNDING	Funds not obligated in FFY18; carried over into FFY19.	Other Federal Funds	\$0	\$1,065,828	\$1,065,828
Quincy Center Bus Terminal	INCREASE FUNDING	Funds not obligated in FFY18; carried over into FFY19.	Other Federal Funds	\$0	\$4,273,771	\$4,273,771
			Total	\$ 1,929,623,204	\$ 2,473,837,181	\$ 544,213,978

**FFYs 2019-2023 Transportation Improvement Program
Table 3. Draft Amendment One Summary
MBTA Programming Changes by Year**

For Public Review

Amendment Impacts by Year	2019	2020	2021	2022	2023	Grand Total
5307 - Elevator and Escalator Program	\$ (2,644,350)	\$ -	\$ -	\$ -	\$ -	\$ (2,644,350)
5307 - Revenue Vehicle Program	\$ -	\$ (50,000,000)	\$ 1,320,000	\$ (50,000,000)	\$ (49,554,322)	\$ (148,234,322)
5307 - Signals/Systems Upgrade Program	\$ 109,512,350	\$ 50,000,000	\$ (14,360,000)	\$ 50,000,000	\$ 49,554,322	\$ 244,706,672
5307 - Stations and Facilities Program	\$ 18,515,949	\$ -	\$ 13,040,000	\$ -	\$ -	\$ 31,555,949
5337 - Bridge & Tunnel Program	\$ (33,448,721)		\$ 54,356,873	\$ (80,000,000)	\$ (83,270,751)	\$ (142,362,599)
5337 - Elevator and Escalator Program	\$ -	\$ (27,740,714)	\$ -	\$ -	\$ (62,622,254)	\$ (90,362,968)
5337 - Revenue Vehicle Program	\$ -	\$ -	\$ -	\$ 60,000,000	\$ 58,118,226	\$ 118,118,226
5337 - Signals/Systems Upgrade Program	\$ 50,716,910	\$ 25,893,004	\$ (28,150,925)	\$ 45,893,004	\$ 87,774,778	\$ 182,126,771
5337 - Stations and Facilities Program	\$ 156,634,541	\$ 1,847,709	\$ (26,205,948)	\$ (25,893,004)		\$ 106,383,298
5339 - Bus Program	\$ 6,537,704	\$ -	\$ -	\$ -	\$ -	\$ 6,537,704
5309 - Green Line Extension	\$ 225,000,000	\$ -	\$ -	\$ -	\$ -	\$ 225,000,000
Other Federal - Hingham Ferry Dock Modification	\$ 8,050,000	\$ -	\$ -	\$ -	\$ -	\$ 8,050,000
Other Federal - MBTA Catamaran Overhauls	\$ 1,065,828	\$ -	\$ -	\$ -	\$ -	\$ 1,065,828
Other Federal - Quincy Center Bus Terminal	\$ 4,273,771	\$ -	\$ -	\$ -	\$ -	\$ 4,273,771
Total	\$ 544,213,982	\$ (1)	\$ -	\$ -	\$ (1)	\$ 544,213,980

**FFYs 2019-2023 Transportation Improvement Program
Table 4. Draft Amendment One -
MBTA Project Details for Informational Purposes**

Program Name	TIP Project Name	Federal Amount	Local Amount	Funding Total	Project Description
5307 - Revenue Vehicle		\$ 429,862,898	\$ 107,465,726	\$ 537,328,624	
	DMA Bus Replacement	\$ 82,690,000	\$ 20,672,500	\$ 103,362,500	Procurement of 60-foot Dual Mode Articulated (DMA) buses to replace the existing fleet of 32 Silver Line Bus Rapid Transit buses and to provide for ridership expansion projected as a result of Silver Line service extension to Chelsea.
	LoNo Bus Procurement	\$ 1,587,191	\$ 396,798	\$ 1,983,989	Additional funds for procurement of Battery Electric 60ft Articulated Buses for operation on the Silver Line. This project was initially awarded with competitive grant funds from the Low or No Emission Vehicle Program.
	MBTA Catamaran Overhauls	\$ 6,716,854	\$ 1,679,213	\$ 8,396,067	Replacement of major systems and refurbishment of seating and other customer facing components on two catamarans (Lightning and Flying Cloud).
	Midlife Overhaul Hybrid 60ft Articulated Buses	\$ 12,702,054	\$ 3,175,514	\$ 15,877,568	Overhaul of 25 hybrid buses, brought into service in 2009 and 2010, to enable optimal reliability through the end of their service life.
	Option Order Procurement of Hybrid 40 ft Buses	\$ 121,628,818	\$ 30,407,205	\$ 152,036,023	Procurement of 40-foot buses with hybrid propulsion to replace Emission Controlled Diesel (ECD) buses that have reached the end of their service life.
	Overhaul of 900 Series Bi-Level Coaches	\$ 53,513,655	\$ 13,378,414	\$ 66,892,069	Overhaul and upgrade of existing systems on commuter rail coaches that were brought into service in 2005 to enable optimal reliability through the end of their service life.
	Procurement of 40ft Battery Electric Buses and Related Infrastructure	\$ 36,647,584	\$ 9,161,896	\$ 45,809,480	Procurement of Battery Electric 40-ft. buses and supporting infrastructure to serve as a pilot for determining bus propulsion technologies for future procurements. (Funded from both 5307 and 5339.)
	Procurement of 40ft Buses	\$ 78,084,175	\$ 19,521,044	\$ 97,605,219	Procurement of 40-foot electric and hybrid buses for replacement of diesel bus fleet.
	Revenue Vehicle Program Allowance	\$ 1,065,828	\$ 266,457	\$ 1,332,285	Additional funds to support revenue vehicle program projects.
	Targeted Reliability Improvements of Red Line Vehicles	\$ 35,226,739	\$ 8,806,685	\$ 44,033,424	Overhaul and upgrade of selected systems on Red Line fleet vehicles to extend service life until planned replacement.
5307 - Signals/Systems Upgrades		\$ 185,917,924	\$ 46,479,479	\$ 232,397,404	
	Green Line - Central Tunnel Interlocking Signals	\$ 8,329,502	\$ 2,082,375	\$ 10,411,877	Replacement of the existing 25 cycle signal system and associated wayside equipment at Government Center, Copley and Park Street Interlockings. Base funding is in executed federal grant.
	Green Line D Branch Track & Signal Replacement	\$ 81,280,362	\$ 20,320,090	\$ 101,600,453	Replacement of track and signal system components on the Highland Branch of the Green Line from Reservoir to Riverside Stations, including replacement of obsolete 25 Hz track circuits with modern solid-state 100 Hz track circuits.
	Green Line Track Upgrade	\$ 96,308,060	\$ 24,077,014	\$ 120,385,074	Replacement of select track components on the Green Line to bring them to a state of good repair.
5307 - Stations and Facilities		\$ 50,383,661	\$ 12,595,916	\$ 62,979,577	
	Charlestown Bus - Seawall Rehab	\$ 8,202,086	\$ 2,050,522	\$ 10,252,608	Rehabilitation of existing seawall to protect bus maintenance facility from future storm and flooding events.
	Commonwealth Ave Stations Access	\$ 13,040,000	\$ 3,260,000	\$ 16,300,000	Addressing accessibility issues along the B branch of the Green Line along Commonwealth Avenue
	Harvard Sq Busway Repairs - Construction	\$ 2,891,993	\$ 722,998	\$ 3,614,991	Rehabilitation of roadway, drainage and catenary infrastructure at the Harvard Square Busway.
	Iron Horse Operations Control Center	\$ 26,249,582	\$ 6,562,396	\$ 32,811,978	Construction of Iron Horse Park Operations Control Center building to provide an updated dispatch facility for Commuter Rail North (CRN) and Pan Am freight and to house the back-up Positive Train Control (PTC) data center.
5307 -Signals/Systems Upgrades		\$ 187,428,750	\$ 46,857,188	\$ 234,285,938	
	ATC Implementation - CR North Side	\$ 187,428,750	\$ 46,857,188	\$ 234,285,938	Design and install automatic train control systems on all MBTA Commuter Rail North Side Lines. Improvements will include increased train traffic capacity and operational reliability on all lines.
5309 - GLX		\$ 671,121,000	\$ 671,121,000	\$ 1,342,242,000	
	Green Line Extension	\$ 671,121,000	\$ 671,121,000	\$ 1,342,242,000	Extension of Green Line light rail service northward to Medford, near Tufts University, and to Union Square in Somerville using a two-branch operation. Service will be operated within existing MBTA Commuter Rail right-of-way.
5337 - Revenue Vehicle		\$ 118,118,226	\$ 29,529,557	\$ 147,647,782	
	Green Line Train Protection	\$ 18,774,095	\$ 4,693,524	\$ 23,467,619	Procurement and installation of on-board and wayside equipment for a train monitoring system to determine allowable train separation, based on speed and location, and to prevent vehicles from passing a red signal.
	Procurement of Bi-Level Coaches	\$ 99,344,131	\$ 24,836,033	\$ 124,180,164	Procurement of bi-level commuter rail coaches to replace existing cars that have exceeded their service life.

**FFYs 2019-2023 Transportation Improvement Program
Table 4. Draft Amendment One -
MBTA Project Details for Informational Purposes**

Program Name	TIP Project Name	Federal Amount	Local Amount	Funding Total	Project Description
5337 - Bridge and Tunnel		\$ 118,793,470	\$ 29,698,367	\$ 148,491,836	
	Bridges - Design	\$ 6,412,886	\$ 1,603,221	\$ 8,016,107	Design for high priority bridge repairs system wide.
	Emergency Bridge Repair	\$ 1,232,459	\$ 308,115	\$ 1,540,574	Repairs to bridges system wide, based on asset condition as determined by system wide inspections.
	Rehabilitation of Six Bridges	\$ 73,360,000	\$ 18,340,000	\$ 91,700,000	Replacement of 6 commuter rail bridges: Lynn Fells Parkway in Melrose (Haverhill Line); Parker Street in Lawrence (Haverhill Line); Commercial Street in Lynn (Newburyport/Rockport Line); Bacon Street in Wellesley (Worcester Line); Intervale Road in Weston (Worcester Line); and High Line Bridge in Somerville (Lowell Line).
	System-wide Bridge Inspection	\$ 10,296,000	\$ 2,574,000	\$ 12,870,000	Inspection of bridge assets system wide for determination of asset condition ratings and subsequent prioritization and scoping for repairs to select bridges.
	System-wide Bridge Inspection and Emergency Bridge Repair Design	\$ 9,815,252	\$ 2,453,813	\$ 12,269,065	Inspection of bridge assets system wide for determination of asset condition ratings and subsequent prioritization and scoping for repairs to select bridges.
	Tunnel Inspection System wide	\$ 8,880,000	\$ 2,220,000	\$ 11,100,000	Inspection to assess condition of transit tunnels system wide.
	Tunnel Rehab	\$ 8,796,873	\$ 2,199,218	\$ 10,996,091	Repair and rehabilitation of transit tunnels system wide.
5337 - Signals/Systems Upgrades		\$ 379,093,192	\$ 94,773,298	\$ 473,866,490	
	Alewife Crossing Improvements	\$ 10,073,531	\$ 2,518,383	\$ 12,591,914	As part of the Red/Orange Line Infrastructure Improvement Program, this project will involve the upgrade of track switches at Alewife Station and associated retrofits to accomodate these new components.
	Green Line - Central Tunnel Interlocking Signals	\$ 41,480,585	\$ 10,370,146	\$ 51,850,731	Replacement of the existing 25 cycle signal system and associated wayside equipment at Government Center, Copley and Park Street Interlockings. Base funding is in executed federal grant.
	Infrastructure Asset Management	\$ 12,000,000	\$ 3,000,000	\$ 15,000,000	Collection of infrastructure based asset data in order to update MBTA asset management databases, and manage asset and life cycle/risk management practices.
	North Station Terminal Signal Improvements	\$ 24,800,000	\$ 6,200,000	\$ 31,000,000	Upgrades to the commuter rail signal/communication system in the North Station area required for more efficient phasing of future track alignments, including support for the future Draw 1 Bridge Replacement Project.
	Red Line Interlocking Upgrades	\$ 9,600,000	\$ 2,400,000	\$ 12,000,000	Replacement of existing interlocking signal components on the Red Line to bring the assets to a state of good repair.
	Signal Program - Red/Orange Line	\$ 194,339,076	\$ 48,584,769	\$ 242,923,844	Various signal upgrades and improvements along both the Red and Orange Lines
	System-Wide Radio	\$ 55,440,000	\$ 13,860,000	\$ 69,300,000	Replacement of existing radio system for MBTA Police to support critical two-way communication for MBTA Transit Police and to support a secure and Interoperable Radio System.
	Vehicle Maintenance Software Upgrade and Business Process Update	\$ 4,160,000	\$ 1,040,000	\$ 5,200,000	Upgrade of vehicle maintenance planning software and related business processes to integrate all existing maintenance databases & systems into one centralized management system to improve Accountability, Transparency and Compliance system wide.
	Work Car Procurement	\$ 27,200,000	\$ 6,800,000	\$ 34,000,000	Procurement of non-revenue maintenance vehicles to support rail operation reliability and maintaining assets in a state of good repair.
5337 - Stations and Facilities		\$ 284,893,176	\$ 71,223,295	\$ 356,116,471	
	Downtown Crossing ADA Elevators Ph 2	\$ 5,926,390	\$ 1,481,598	\$ 7,407,988	Construction of two new redundant elevators, in order to improve accessibility and to provide for future elevator maintenance without rendering the station temporarily inaccessible.
	Elevator Program Multiple Location Design	\$ 23,540,714	\$ 5,885,178	\$ 29,425,892	Design for the installation of new redundant elevators and the replacement of existing elevators system wide.
	Forest Hills Improvement Project	\$ 14,089,763	\$ 3,522,441	\$ 17,612,204	Improvements at Forest Hills Station on the Orange Line and Needham Commuter Rail Line to comply with ADA and Massachusetts Architectural Access Board (MAAB) accessibility standards. Work will also include infrastructure and other improvements (e.g., wayfinding signage, installation of tactile platform edges).
	Lynn Station & Parking Garage Improvements Ph 2	\$ 26,477,132	\$ 6,619,283	\$ 33,096,415	This second phase of the station and parking garage improvement project at Lynn Station will include extensive rehabilitation efforts including, reconstruction of the existing commuter rail platform, upgrade of mechanical and electrical systems at the station, and structural repairs and code compliance retrofits to the garage. Phase I of this project addressed immediate repair needs.
	Natick Center Station Accessibility Project	\$ 1,760,506	\$ 440,126	\$ 2,200,632	Accessibility improvements at the Natick Center commuter rail station on the Framingham/Worcester Line.
	Newton Commuter Rail Accessibility Study	\$ 16,511,947	\$ 4,127,987	\$ 20,639,934	For a conceptual design and operational analysis study of the Newton commuter rail stations, with additional funding for various accessibility and infrastructure improvements.
	Newton Highlands Green Line Station Accessibility Project	\$ 10,636,354	\$ 2,659,089	\$ 13,295,443	Improvements at Newton Highlands station on the D branch of the Green Line to comply with ADA and Massachusetts Architectural Access Board (MAAB) accessibility standards.
	Oak Grove Station Vertical Transportation Improvements	\$ 28,232,566	\$ 7,058,142	\$ 35,290,708	Retrofit of the existing Oak Grove station on the Orange Line to bring it into full compliance with ADA standards, including the replacement of existing elevators, construction of two new elevators, various parking and path of travel upgrades.
	Old South Meeting House Leak Repairs	\$ 1,108,000	\$ 277,000	\$ 1,385,000	Remediation of leaks along the wall of the Old South Meeting House resulting from the construction of an entrance to State Street Station
	Park Street Station Wayfinding Improvements	\$ 9,013,235	\$ 2,253,309	\$ 11,266,544	Replacement of existing signage with updated ADA-compliant standard graphics at the lobby, Green Line platform, Red Line platform and Winter Street concourse as well as related architecture improvements such as lighting and illuminated exit signs.
	Priority Replacement and Redundant Elevator Program	\$ 51,286,504	\$ 12,821,626	\$ 64,108,130	Installation of new redundant elevators and the replacement of existing elevators at various stations, in order to mitigate degradation of station elevators and to maintain station accessibility during elevator maintenance.
	Silver Line Gateway - Ph 2	\$ 23,956,800	\$ 5,989,200	\$ 29,946,000	Includes the building of a new commuter rail station adjacent to the new Chelsea Bus Rapid Transit (BRT) Station located at the Mystic Mall, as well as decommissioning of the existing Chelsea Commuter Rail Station and signal prioritization.
	South Attleboro Station Improvements	\$ 920,000	\$ 230,000	\$ 1,150,000	Needs assessment and design services associated with accessibility, structural, parking and multi-modal facility improvements for the South Attleboro commuter rail station.
	Symphony Station Improvements	\$ 30,615,840	\$ 7,653,960	\$ 38,269,801	Upgrades to the existing Symphony Station on the Green Line in order to provide a modern, accessible, code-compliant facility.
	Winchester Center Station	\$ 27,697,425	\$ 6,924,356	\$ 34,621,781	Renovation and accessibility improvements to Winchester Center Station on the Lowell and Haverhill commuter rail lines.
	Green Line Transformation Project Management Support	\$ 13,120,000	\$ 3,280,000	\$ 16,400,000	Program management support and oversight for reliability, accessibility, and capacity improvements for the Green Line.

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Program Name	TIP Project Name	Federal Amount	Local Amount	Funding Total	Project Description
5339 - Bus Program		\$ 34,835,286	\$ 8,708,822	\$ 43,544,108	
	Harvard Sq Busway Repairs - Construction	\$ 12,100,674	\$ 3,025,169	\$ 15,125,843	Rehabilitation of roadway, drainage and catenary infrastructure at the Harvard Square Busway.
	Procurement of 40ft Battery Electric Buses and Related Infrastructure	\$ 5,683,653	\$ 1,420,913	\$ 7,104,566	Procurement of Battery Electric 40-ft. buses and supporting infrastructure to serve as a pilot for determining bus propulsion technologies for future procurements. (Funded from both 5307 and 5339.)
	Procurement of 40ft Buses	\$ 17,050,959	\$ 4,262,740	\$ 21,313,699	Procurement of 40-foot electric and hybrid buses for replacement of diesel bus fleet.
Other Federal - Other		\$ 395,389,599	\$ 98,847,400	\$ 494,236,999	
	Hingham Ferry Dock Modification	\$ 8,050,000	\$ 2,012,500	\$ 10,062,500	Construction of a new, full accessible ferry dock at the Hingham Ferry Terminal located at Hewitts Cove in the Weymouth Back River in Hingham, MA.
	MBTA Catamaran Overhauls	\$ 1,065,828	\$ 266,457	\$ 1,332,285	Replacement of major systems and refurbishment of seating and other customer facing components on two catamarans (Lightning and Flying Cloud).
	Positive Train Control (PTC) - RRIF/TIFIA Financing	\$ 382,000,000	\$ 95,500,000	\$ 477,500,000	Installation of software and hardware to monitor and control train movements in order to prevent train-to-train collisions, over-speed train derailments, movement through a misaligned switch, and uncontrolled movement through a work zone. Completion of this project will bring the MBTA Commuter Rail System into compliance with federal Positive Train Control mandate.
	Quincy Center Bus Terminal	\$ 4,273,771	\$ 1,068,443	\$ 5,342,214	Construction of a new Quincy Center Bus Terminal and related intermodal enhancements.
Grand Total		\$ 2,855,837,182	\$ 1,217,300,048	\$ 4,073,137,229	

Note: Project budgets and descriptions are preliminary and are provided for informational purposes only. Budget and project scope may evolve as the design phase progresses. Based on project schedule and funding availability, there may be a need to shift projects between funding programs (e.g., from 5337 to 5307).