

# 2020 Sustainability Bond Progress Report



MASSACHUSETTS BAY TRANSPORTATION AUTHORITY -  
10 PARK PLAZA, BOSTON, MA 02116

## Introduction

The Massachusetts Bay Transportation Authority (MBTA) issued its second Sustainability Bond in the spring of 2020. The \$45.685 million Sustainability Bond funded more than 50 projects ranging from facility roof replacements to the purchase of hybrid buses.

We highlight five projects in this report: (1) a new fare program designed to make accessing the transportation system more user-friendly and reduce headways; (2) facility roof replacements to increase resiliency of MBTA structural assets; (3) the purchase of 194 hybrid buses cutting consumption of gasoline by \$2.8 million over the lifetime of the vehicles; (4) upgrades to commuter rail locomotives and coaches to improve passenger safety and ADA compliance; and (5) the renovation of a maintenance facility to support a fleet of new Orange Line vehicles.

The use of net proceeds conforms to the MBTA's Sustainability Bond Framework, which categorizes projects into 13 spending priorities (see full list – page 4). The majority of spending (38%) was to improve system **capacity**, followed by **carbon, energy and climate resiliency** (25%) and **pollution prevention** (15%). The MBTA has completed spending on this bond issuance and does not anticipate additional disclosure on bond proceed spend.

The MBTA will continue to look for new ways to measure and track bond proceed spending and project impact as it develops its sustainability bond program. As we refine our reporting and tracking, we welcome any feedback.

Sincerely,

Mary Ann O'Hara, Chief Financial Officer

Patrick Landers, Treasurer

Christina Marin, Deputy Director of Treasury Services and P3 Finance

# MBTA System Overview

The MBTA is the oldest and fifth largest transit system in the country, providing extensive and integrated mass transit services, along with parking facilities for the greater Boston metropolitan region. It serves 176 cities and towns with a service area of 4.8 million residents. More than 1.3 million passengers rely on the MBTA daily, providing approximately 55% of all work trips to and from Boston. In addition to operating on 38 miles of ‘heavy’ rail routes and 26 miles of ‘light’ rail routes; the Authority owns more than 1,000 buses covering 763 miles. The system is supported by 6,000 employees and has a \$2 billion operating budget.



## Background - Sustainability Bond

In September 2017, the MBTA issued the first tax-exempt sustainability bond in the United States. The \$99 million issue financed more than 100 projects within the Authority's capital improvement plan with clear environmental and social benefits. Additionally, the Authority issued \$271 million in sustainability bond anticipation notes to finance its Positive Train Control program, a key safety initiative. The issue was recognized as The Bond Buyer's 2017 Northeast Regional Deal of the Year, and was a finalist for the National Deal of the Year.

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# Deal of the Year 2017 - Northeast: Massachusetts Bay Transportation Authority

December 06, 2017 12:24 PM

*Bond Buyer awarded Northeast Deal of the Year the MBTA in 2017 as the MBTA issued the first ever tax-exempt Sustainability Bond.*

**SUSTAINABILITY BOND PROGRESS REPORT - 2018**  
Massachusetts Bay Transportation Authority  
December 2018

**2019 SUSTAINABILITY BOND PROGRESS REPORT**  
Massachusetts Bay Transportation Authority  
November 2019

Subordinated Sales Tax Bonds 2017 Subseries A-1 (Sustainability Bonds) & Subordinated Sales Tax Bond Anticipation Notes Series 2017 (Sustainability Bonds)

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## Sustainability Bond Framework

Projects are identified and selected for inclusion by an internal Sustainability Committee based on the MBTA's Sustainability Bond Framework. The Framework incorporates guidance from investor groups and the academic community and is consistent with the Sustainability Bond Guidelines ("SBG") established by the International Capital Market Association.

The Framework evaluates the environmental and social benefits provided by the projects. Environmental considerations include the transition to a low-carbon, climate resilient and sustainable community. Social considerations include access to essential services and affordable infrastructure, critical health and safety improvements, and socioeconomic advancement. The use of proceeds from a sustainability bond should fall into the following categories:

### Environment

*The Massachusetts Bay Transportation Authority is dedicated to providing safe, reliable, world-class public transportation in an environmentally responsible manner.*

**Built environment:** Respecting, protecting and improving the built environment and enhancing the quality of the travel experience;

**Capacity:** Reducing emissions from personal vehicle trips by increasing capacity to carry passengers and increasing the attractiveness of public transit by offering more frequent, reliable, and comfortable service;

**Carbon, energy and climate resilience:** Reducing carbon emissions and preparing for the potential impacts of climate change and extreme weather;

**Natural environment:** Respecting, protecting and enhancing the natural environment and its contribution to the quality of life;

**Noise:** Managing and controlling transport-related noise and vibration;

**Pollution prevention:** Proactively managing activities to minimize and control pollution;

**Resource management:** Using resources (including water) wisely and minimizing waste.

### Social

*The MBTA acknowledges that high quality public transportation and transit-oriented development can produce meaningful social benefits.*

**Affordability:** Balancing our customers' means, particularly low-income riders, with the organization's financial constraints;

**Accessibility:** Operating an inclusive system with facilities designed to accommodate a diverse customer base;

**Availability:** Ensuring that communities within the service area have reasonable, equitable access to the system;

**Equity:** Offsetting social and environmental burdens experienced by populations or communities within the service area and/or striving for an even distribution of benefits and burdens across the diverse modes, customer bases, and service area;

**Safety:** Protecting the well-being of passengers, operators, and the general public;

**Workplace environment:** Maintaining a safe, empowering, and satisfying workplace environment for MBTA and affiliated employees.

## Project Highlights

### *Fare Transformation*



*The contactless “tap and go” system introduced to the MBTA through Fare Transformation will allow for easier fare access, quicker boarding times, and equal access to fare tickets across the MBTA.*

The MBTA is building a new fare collection system that will make paying for transit easier and MBTA services faster. The next generation of fare collection technology will build upon the existing system, while introducing significant improvements like acceptance of mobile wallets (e.g., Apple Pay, Google Pay), contactless credit cards, and enhanced Charlie Cards. The system will also enable more reliable service on buses and the Green Line by introducing all-door boarding, all the time. Finally, the new system will allow fare payments at the MBTA to be seamless across all modes: Bus, subway, ferry, and commuter rail will all be integrated, allowing for possibilities like transfers between commuter rail and subway.

This new system represents the Authority’s response to concerns heard from riders. The new system will:

- Increase ease of access of Charlie Cards by stocking them in all fare vending machines.
- Expand the number of locations where customers can load fares outside of subway stations.
- Simplify the application and administration of reduced fare programs, making it easier for customers to join these programs.
- Address accessibility issues and improve access for low-income, minority and other disadvantaged groups.
- Provide fully reconciled, auditable and accurate revenue deposits and reports.

**Sustainability Bond Proceeds Spent: \$14.25 million**

**Total Project Cost: \$810 million**

## Facility Roof Replacement

To improve the resiliency of MBTA's structural assets, the MBTA replaced roofs at 12 of its facilities, increasing the useful life to 30 years. In many cases, the prior roofs were in failing condition, resulting in interior leaks and leading to potential infrastructure issues.

**Sustainability Bond Proceeds Spent: \$7.3 million**

**Total Project Cost: \$52 million**



*Upper Left: Water damage at an MBTA facility puts technology at risk. Lower photos: Crews work through the night to replace roofs.*

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## Option Order Procurement of 194 New Flyer Hybrid 40' Buses

The 194 new vehicles are expected to reduce overall fleet emissions as well as overall operating costs due to lower fuel consumption. BAE, the manufacturer of the hybrid drive system, has upgraded the lithium ion batteries with a 66% larger capacity and longer life (eight-year life cycle compared to six years currently). Fleet fuel and emission estimates are supplied by BAE and confirmed by project staff. These estimates indicate that over a 14-year life cycle (compared to straight diesel propulsion) there will be a savings of an estimated 2.8 million gallons of fuel, 41,000 tons of greenhouse gases (GHG), and 28 thousand tons of nitrogen oxides (NOx). The vehicles are projected to reduce idle time by 900,000 hours.



*A new MBTA hybrid bus could cut emissions by an estimated 41,000 tons during its lifetime.*

**Sustainability Bond Proceeds Spent: \$6.78 million**

**Total Project Cost: \$8.2 million**

## *Commuter Rail Locomotive Reliability*

The Commuter Rail Locomotive Reliability project consists of three sub-projects: Material Support for Coaches and Locomotives, Coach/Locomotive Rehabilitation, and Rochester Facility Upgrades. The overall goal of these three projects is to upgrade the interior of locomotives and coaches to ensure safe rides for all commuters as well as to reduce emissions from the locomotives.



*Funding for this project went toward restoring commuter rail locomotives.*

### **Funding for this project consists of the following:**

- Purchase of materials to rehabilitate coaches and commuter rail locomotives.
- Upgrades in lighting, seating, and flooring.
- Repaired body damage, brake damage and HVAC systems to two coaches.
- Installation of an ADA compliant restroom in one of the two coaches.
- Repairs to the main engine, electrical equipment, cab interior, and HVAC unit of a locomotive to ensure safety to all riders.
- Installation of automatic engine start/stop system and a remote vehicle monitoring system to the locomotive.
- Upgrades at the Rochester Facility.

**Sustainability Bond Proceeds Spent: \$1.42 million**

**Total Project Cost: \$10 million**



## *Wellington Yard Complete Upgrade*

The Wellington Maintenance Facility Upgrade consists of the rehabilitation, modernization, and expansion of the current facility in order to support the new Orange Line augmented vehicle fleet.

Wellington Yard and Maintenance Facility is where the MBTA stores and maintains the Orange Line vehicles.

The MBTA installed four new bridge cranes and a vehicle hoist for safer, more efficient vehicle repair work. The roof of the facility was replaced in addition to a new building addition with a catwalk that will support maintenance and storage of the new and expanded Orange Line fleet. The upgrades also included removal of hazardous building materials to improve the safety of the workplace for employees.

The yard and the facility are being constructed in phases so that both can remain in service through construction.



*Wellington Yard is where the Orange Line vehicles are stored and maintained. The Wellington Yard Complete Upgrade will create more space for maintenance to coincide with the rollout of new Orange Line vehicles.*

**Sustainability Bond Proceeds Spent: \$1.27 million**

**Total Project Cost: \$51 million**

## Additional Projects

Project Name	MBTA Sustainability Priority Satisfied	Total Bond Proceeds Spent
<p><b>WOLLASTON STATION / QUINCY CENTER GARAGE DEMOLITION</b>            This project consists of a \$36 million transformation to rebuild Wollaston Station. Upgrade includes three new elevators, two new escalators, two additional stairways, and accessible bathrooms. To make room for new developments, including new parking, the MBTA demolished the existing Quincy Center Garage structure. This project also includes major improvements to energy efficiency.</p>	<p>Accessibility, Equity, Energy Efficiency</p>	<p>\$3,083,991</p>
<p><b>PARKING LOT PAVING - ON-CALL</b>            This project consists of on-call paving throughout the MBTA system. The MBTA is the owner of the largest number of off-street paid parking spaces in New England with 100 parking lots and 44,000 spaces. This project also results in improvements to storm water management.</p>	<p>Capacity, Natural Environment</p>	<p>\$2,382,299</p>
<p><b>GREEN LINE TRAIN PROTECTION</b>            Reduce the risk of red signal violations and train-to-train collisions on the Green Line and prevent overspeed derailments and unsafe intrusions into work zones.</p>	<p>Safety</p>	<p>\$1,522,357</p>
<p><b>GREEN LINE TYPE 10 LIGHT RAIL FLEET REPLACEMENT</b>            Type 10 cars will be ADA compliant with a low central floor, and will help increase peak core capacity of the central subway by 15%.</p>	<p>Capacity, Accessibility</p>	<p>\$1,257,525</p>
<p><b>NORTH STATION DRAWBRIDGE REPLACEMENT</b>            Replaces two 80-year-old drawbridges outside of the MBTA's busy North Station - a current chokepoint - which will enable the MBTA to use more tracks and improve service on the northern commuter lines. A major part of the project is climate resiliency upgrades.</p>	<p>Capacity, Safety, Resiliency</p>	<p>\$928,879</p>
<p><b>BACK BAY STATION VENTILATION</b>            Making air quality improvements at Back Bay station, which serves 18,000 riders a day by pressurizing two stairwells between the track and concourse levels to prevent exhaust fumes from rising to the concourse, and installing jet fans in the tunnel to draw fresh air to the platform.</p>	<p>Pollution Prevention</p>	<p>\$848,603</p>
<p><b>OVERHAUL OF NEOPLAN 60' DMA BUSES</b>            This project extends the useful life of 32 hybrid buses, which were specifically designed to meet the unique service demands of operating a trolley in bus mode in the zero-emissions tunnel to Logan Airport.</p>	<p>Accessibility, Energy Efficiency, Noise, Pollution Prevention</p>	<p>\$729,543</p>
<p><b>TUNNEL REPAIRS ON-CALL</b>            Develops plans and specifications for On-Call tunnel repairs for all mainline tunnels in the MBTA system. This contract also develops plans and specifications for repairs necessary for the Orange Line (Chinatown to Haymarket Stations).</p>	<p>Resiliency</p>	<p>\$725,675</p>
<p><b>UPGRADE HVAC &amp; EXHAUST SYSTEMS AT WIDETT CIRCLE</b>            The maintenance facility caught fire in 2016 damaging the HVAC and Exhaust systems. The facility has had no working HVAC system and the Exhaust system needs to be updated. This project will upgrade both the HVAC and Exhaust systems.</p>	<p>Pollution Prevention</p>	<p>\$704,588</p>

Project Name	MBTA Sustainability Priority Satisfied	Total Bond Proceeds Spent
<b>OVERHAUL OF 155 OPTION NEW FLYER BUSES</b> Recondition 155 diesel buses to improve mileage and efficiency.	Energy Efficiency, Accessibility, Noise, Pollution Prevention	\$636,456
<b>BRAINTREE AND QUINCY ADAMS GARAGE REHAB</b> Upgrades at both garages to bring to a state of good repair including new accessible elevator, new stairways throughout the garages, new bicycle storage, new canopies, new emergency power generator and transformer, and installation of a new pedestrian bridge, among other improvements. A major part of the project is the climate resiliency upgrades.	Safety, Equity, Accessibility, Resiliency	\$620,930
<b>RUGGLES STATION UPGRADE</b> This project addresses longstanding commuter rail capacity needs at Ruggles Station by adding an additional platform. This will allow a greater number of inbound trains to stop at the station.	Capacity, Safety, Resiliency	\$595,333
<b>SILVER LINE GATEWAY - PHASE 2</b> Phase 2 consists of the construction of the Chelsea Commuter Rail Station with two 800-ft new high level platforms, canopies, upgrades to the railroad signal systems and signal prioritization at three grade crossings. Other work includes the decommissioning of the existing Chelsea Commuter Rail Station.	Accessibility, Pollution Prevention, Capacity	\$520,731
<b>LOCOMOTIVE OVERHAUL</b> This project funds the procurement and/or rehabilitation of commuter rail locomotives and coaches, including top-deck and midlife overhaul work and other upgrades to vehicles.	Capacity, Pollution, Prevention	\$469,637
<b>BRIDGE BUILDING CONTRACT</b> This project funds the design-build for six commuter rail bridges.	Capacity, Pollution, Prevention	\$425,050
<b>HARVARD SQUARE BUSWAY REPAIRS</b> Rehabilitation of roadway, drainage and catenary infrastructure at the Harvard Square Busway.	Pollution Prevention, Energy Efficiency	\$406,650
<b>GLOUCESTER DRAWBRIDGE REPLACEMENT</b> The Gloucester Drawbridge, which carries the Rockport Line over the Annisquam River, is being replaced to improve safety and reliability.	Capacity, Resiliency, Pollution Prevention, Natural Environment	\$376,092
<b>OAK GROVE STATION VERTICAL TRANSPORTATION</b> This project consists of constructing three new elevators and replacing one existing elevator, making them accessible both before and after the fare gates. This will also provide additional elevator service to the Orange Line platform.	Accessibility	\$334,935
<b>ACCESSIBILITY IMPROVEMENTS</b> The MBTA makes various accessibility improvements across its system.	Accessibility	\$332,941

Project Name	MBTA Sustainability Priority Satisfied	Total Bond Proceeds Spent
<b>FENWAY PORTAL FLOOD PROTECTION</b> This project involves the construction of flood control measures at the entrance to the Green Line subway tunnel adjacent to Fenway station. Large steel doors installed at the entrance to the Green Line tunnel will protect the subway from potential future flooding.	Resiliency	\$241,165
<b>IRON HORSE OPERATIONS CONTROL CENTER</b> Construction of a new energy efficient building for operations dispatch of the north side commuter rail trains.	Energy Efficiency, Safety	\$226,808
<b>HARVARD / CENTRAL ELEVATOR</b> Design of elevator replacements in Harvard and Central square.	Accessibility	\$194,110
<b>SIGNAL PROGRAM - RED/ORANGE</b> Updating signal systems on the red and orange line to improve frequency of trains.	Capacity	\$193,633
<b>UNDERGROUND STORAGE TANKS</b> This project includes the design and construction required to remove, permanently close, or replace existing underground storage tanks.	Resource Management, Pollution Prevention	\$170,523
<b>COMMUTER RAIL MISC. EQUIPMENT (WINTER RESILIENCY)</b> Upgrades to commuter rail equipment that improve winter resiliency.	Availability, Safety	\$103,540
<b>VARIOUS REMEDIATION PROJECTS</b> This program funds a remediation program targeted at addresses long term and historic environmental issues, such as soil and groundwater contamination, that are the function of decades of use of MBTA properties for industrial and railroad activities.	Resiliency, Pollution Prevention, Natural Resources	\$99,423
<b>EMERGENCY BRIDGE REPAIR</b> This project funds the design and remediation of selected bridges that are of immediate concern throughout the MBTA.	Safety, Resiliency	\$92,755
<b>MERRIMACK RIVER BRIDGE</b> The bridge, which currently carries Haverhill commuter rail trains, freight trains, and Amtrak trains, required bearing work, steel repairs, and timber deck replacement.	Capacity, Resiliency	\$90,779
<b>FITCHBURG LINE SMALL STARTS - TRACK/SIGNAL/STATIONS</b> Improvements to the Commuter Rail Fitchburg Line, including installing double track, construction of high-level platforms for better accessibility, replacement and updating of grade crossing warning system, construction of new and modified interlocking, transfer of the Waltham Tower to MBTA Control Center, and bridge repair and replacement.	Capacity	\$71,077
<b>ALEWIFE STATION VERTICAL TRANS. IMPROV.</b> Work consists of providing a comprehensive elevator modernization for three (3) obsolete elevators at Alewife station, to include removal and replacement of the elevators, systems modifications to the elevator machine rooms, and various other improvements to the mechanical, electrical, security and plumbing systems in proximity to these areas.	Accessibility	\$67,130

Project Name	MBTA Sustainability Priority Satisfied	Total Bond Proceeds Spent
<b>SHORELINE AND SAUGUS BRIDGES</b> Full replacements of the 100-year-old Saugus drawbridge on the Newburyport/Rockport line and the Shoreline bridge on the Franklin line.	Capacity, Resiliency, Pollution Prevention, Natural Environment	\$62,284
<b>TUNNEL EMERGENCY VENTILATION PROGRAM</b> Emergency Tunnel Ventilation Program consisting of inventory, inspection, monitoring, design and construction to improve emergency ventilation of the MBTA transit tunnel system.	Pollution Prevention	\$59,176
Miscellaneous Projects under \$50,000		\$434,007
	<b>TOTAL</b>	<b>\$50,000,000</b>

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