

# Massachusetts Bay Transportation Authority

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## **FY20-24 Capital Investment Plan**

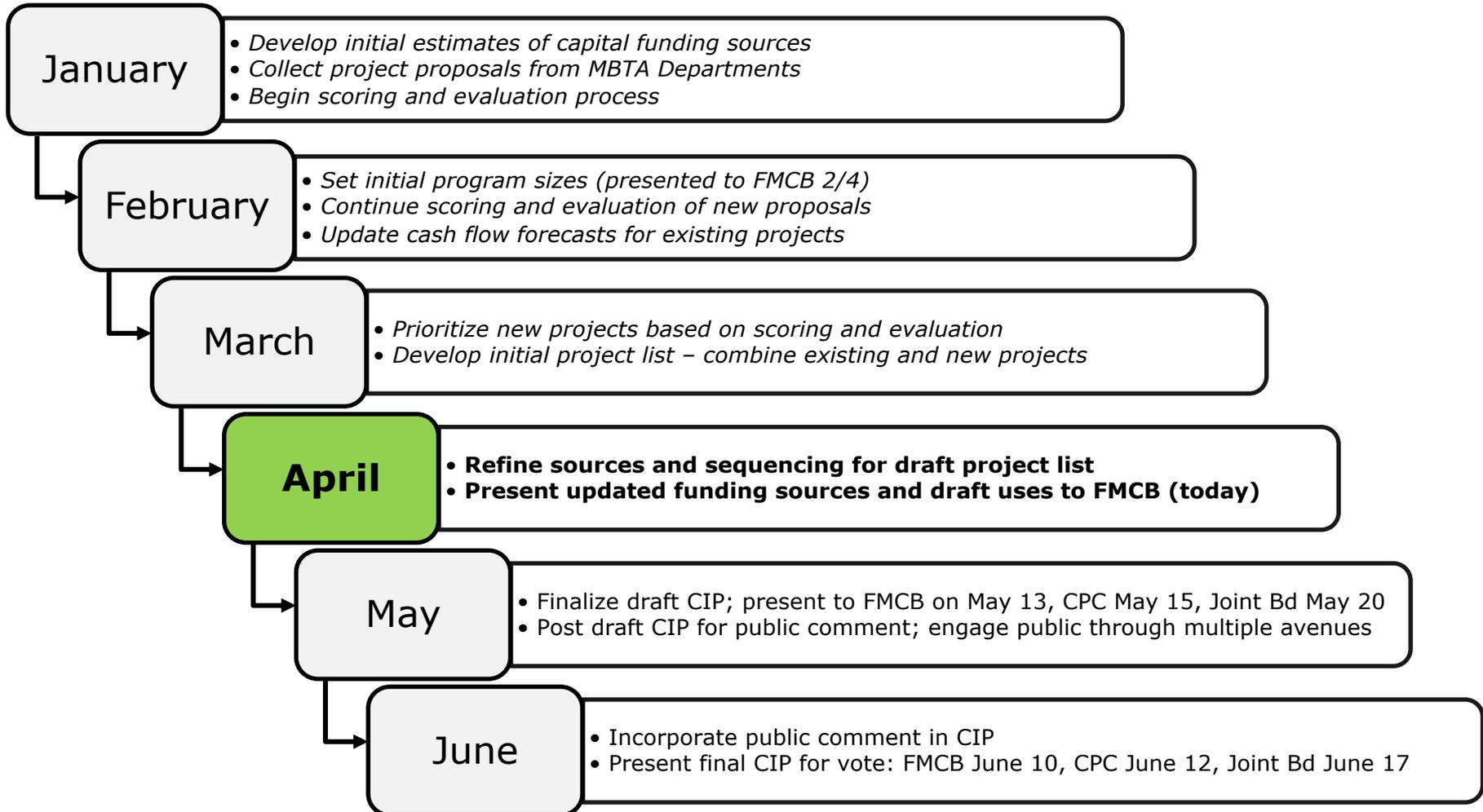
### *Sources and Uses*

**4/9/2019**

**Revised per 4/8 FMCB feedback**



## FY20-24 CIP Process Recap

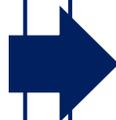




## Next evolution of the MBTA CIP: Continuous improvement

### FY17-21 CIP

- Introduced a new strategic approach to produce a balanced portfolio of projects
- Represented the first fully integrated MassDOT-MBTA CIP
- After years of underinvestment, challenged the agency to spend \$6.6 billion over the five year window



### FY18-22 CIP

- Continued the structure and process introduced the prior year
- Focused on fully funding prior commitments, project readiness, acceleration, and targeted updates
- Expanded ambitious capital spending goals to \$7.4 billion over five years



### FY19-23 CIP

- Aligned priorities with strategic goals and plans
- Issued agency-wide call for projects to identify needs and build pipeline
- Incorporated Transit Asset Management (TAM) data
- Scored all project proposals using PSAC methodology
- Produced \$8 billion plan

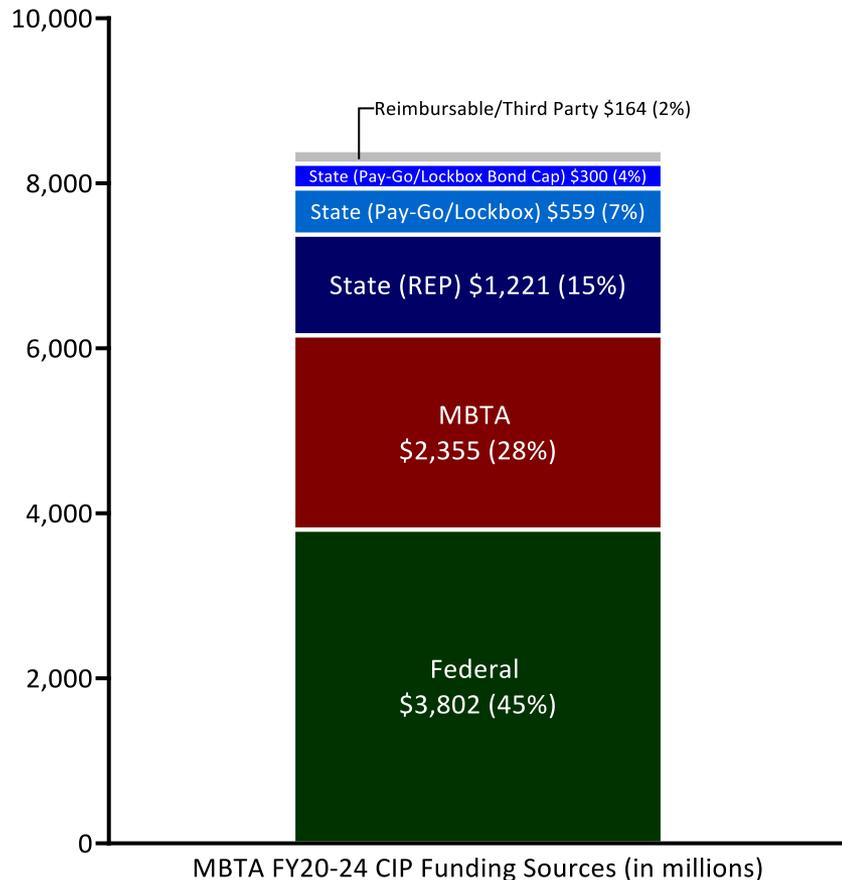


### FY20-24 CIP

- Incorporate **Transit Asset Management (TAM)** Plan data and findings
- Use CIP process to implement first set of **Focus40** "next priorities"
- Leverage **PMIS** for project intake, eval, and prioritization
- Focus on **execution and optimization** of capital program



## FY20-24 CIP Funding Sources: Estimated ~\$8B available for the next five year plan



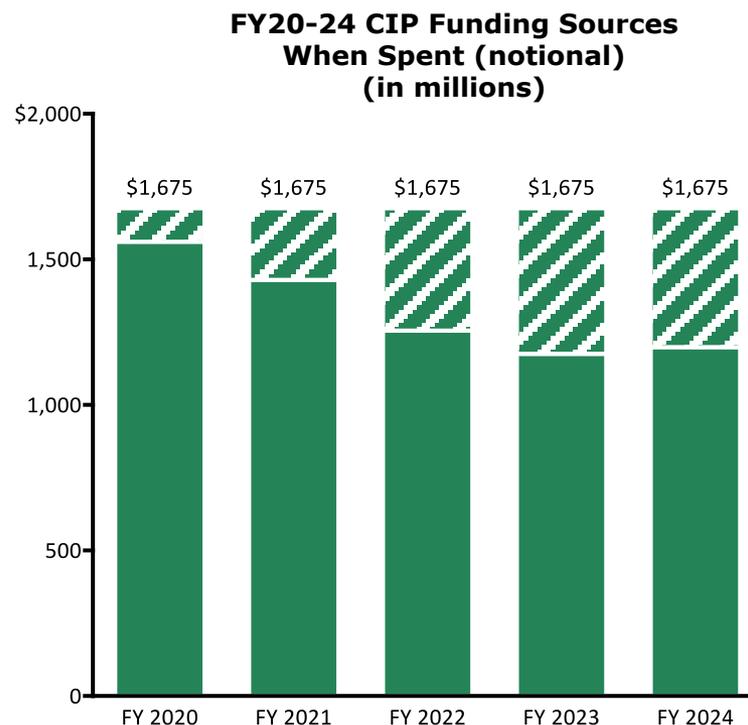
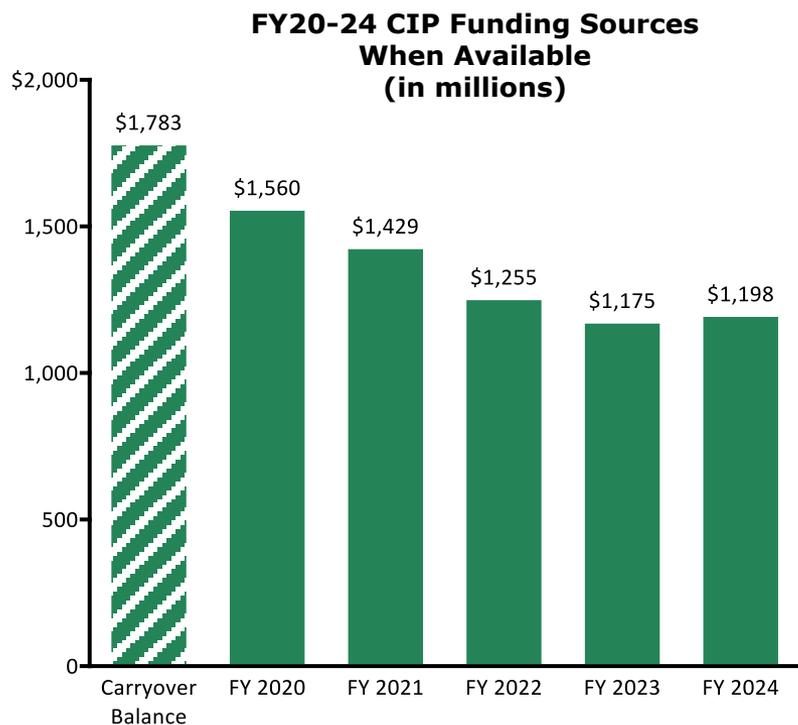
### Sources highlights:

- **Federal** funds continue to be the single largest source of capital for the MBTA
  - GLX Full Funding Grant Agreement: \$996M overall; \$758M in FY20-24
  - FTA Funds: \$2.9B in FY20-24 assumes annual 1.7% increases in formula allotment plus discretionary grants
- **MBTA Bonds**, including Sustainability Bonds, support the 20% match for Federal projects, as well as MBTA-only funded projects
- **State** funds include \$2B in FY20-24:
  - Rail Enhancement Program (REP) special obligation bonds for GLX, Red Line/Orange Line improvements, and other projects
  - Pay-Go/Lockbox for customer-facing projects, including \$60M/year in bond cap and \$90M in appropriated state assistance
- **Other** funding sources include municipal contributions and other reimbursements



## FY20-24 CIP Funding Source Estimate

Combination of funds on-hand at start of FY20 and funds that become available during FY20-24 CIP window could support up to \$1.675B in annual MBTA capital investment





## FY20-24 CIP Funding Sources: Changes from initial estimates

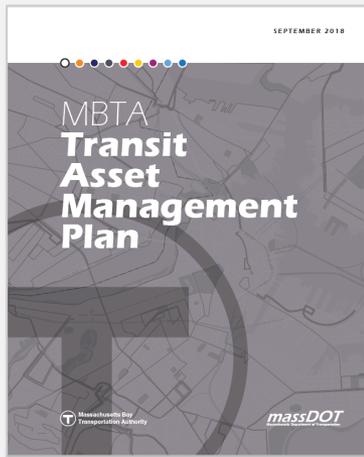
- Changes in funding sources since January estimates mostly attributed to updated cash flow forecasts for existing projects **and FMCB guidance on expansion project development**
- Net increase of \$133 million is primarily a technical adjustment reflecting FY19 projects carrying over into FY20
- Only “new” sources since January estimates are small increase in FTA apportionment and reimbursable funds from EOHED and Amtrak
- **Assumes additional \$25M in MBTA Revenue Bond issuances to support expansion project development**

Funding Source	January estimate (in millions)	April re-estimate (in millions)	Delta (in millions)
Federal	\$3,689	\$3,802	\$112
MBTA	\$2,370	<b>\$2,355</b>	<b>-\$15</b>
State	\$1,276	\$1,221	-\$55
Pay-Go	\$777	\$859	\$82
Reimbursable/Third Party	\$154	\$164	\$9
<b>Grand Total*</b>	<b>\$8,267</b>	<b>\$8,401</b>	<b>\$133</b>

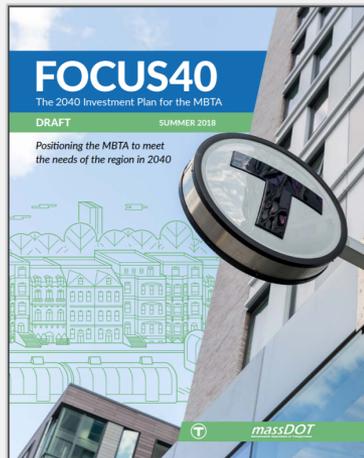
\*note: not all funds are programmed in the same year they become available because of anticipated timing of expenditures, contingency, and other factors (e.g. grant funds awarded in CIP window but spent in outyears)



## FY20-24 CIP Alignment with Strategic Priorities



- Transit asset management supports smarter decision-making to address critical needs and improve service reliability through prioritized capital investments
- Latest asset inventory and condition data used during FY20-24 CIP process to identify capital needs, assess program sizes, and prioritize projects



- FY20-24 CIP begins to implement next priorities identified in Focus40 “we’re planning” tier
- CIP prioritization methodology considered project alignment with Focus40 programs and “priority places”
- Per Focus40 expansion policy principles, CIP will include new program for expansion project development



## Asset Management Priorities in the FY20-24 CIP

CIP Program - Reliability	New or Increased Projects Addressing Asset Management
Track, Signal, and Power	<ul style="list-style-type: none"> <li>✓ <b>Resilient Power Supply</b> – Replacing duct banks and cables at critical locations and systemwide transformers, relays, batteries, circuit breakers, and cable</li> <li>✓ <b>Blue Line Harbor Tunnel Infrastructure Improvements</b> – Rehab and upgrade tunnel infrastructure between Maverick Station and Aquarium Station</li> <li>✓ <b>Mattapan HSL Transformation</b> – Provide SGR and accessibility improvements at stations, power infrastructure improvements and other infrastructure improvements</li> </ul>
Bridge & Tunnel	<ul style="list-style-type: none"> <li>✓ <b>Bridge Repairs and Replacements</b> – Rehab and replace bridges systemwide (e.g., Longfellow Approach, Norfolk Ave)</li> </ul>
Stations	<ul style="list-style-type: none"> <li>✓ <b>Parking Garage Rehabs</b> – Rehab assets with poor condition ratings (Braintree, Quincy Adams, and Alewife)</li> </ul>
Revenue Vehicles	<ul style="list-style-type: none"> <li>✓ <b>Vehicle Overhauls</b> – Conduct overhauls of bus and locomotives at or near their half-life to ensure optimal condition of assets for continued use</li> </ul>
System Upgrades	<ul style="list-style-type: none"> <li>✓ <b>Equipment Replacement</b> – Replace supporting equipment (radios and security cameras)</li> </ul>

CIP Program - Modernization	New or Increased Projects Addressing Asset Management
Green Line Transformation	<ul style="list-style-type: none"> <li>✓ <b>Bridge Modernization</b> – Replace Lechmere Viaduct</li> <li>✓ <b>Green Line Transformation Phase 2: New Fleet and Upgraded Infrastructure</b> – Working to sequence all necessary work to upgrade infrastructure and facilities and introduce new <b>GL Type 10</b> fleet</li> </ul>



## Focus 40 “We’re Planning” Priorities in the FY20-24 CIP

<b>CIP Program - Reliability</b>	<b>Focus40 We’re Planning Priorities</b>
Track, Signal, and Power	<ul style="list-style-type: none"> <li>✓ <b>Resilient Power Supply</b> – Replacing duct banks and cables at critical locations</li> <li>✓ <b>Blue Line Harbor Tunnel Infrastructure Improvements</b> – Rehab and upgrade tunnel infrastructure between Maverick Station and Aquarium Station</li> <li>✓ <b>Mattapan HSL Transformation</b> – Provide SGR and accessibility improvements at stations, power infrastructure improvements and other infrastructure improvements</li> <li>✓ <b>Franklin Double Track &amp; Signal</b> – Add a second track to the Franklin line between Walpole and Norfolk stations</li> </ul>
<b>CIP Program - Modernization</b>	<b>Focus 40 We’re Planning Priorities</b>
Accessibility	<ul style="list-style-type: none"> <li>✓ <b>Vertical Transportation Program</b> – Advancing redundant and replacement elevators through design and construction</li> </ul>
Green Line Transformation	<ul style="list-style-type: none"> <li>✓ <b>PATI Improvements at Surface Green Line Stops</b> – Consolidation and accessibility at GL stations</li> <li>✓ <b>Green Line Transformation Phase 2: New Fleet and Upgraded Infrastructure</b> – Working to sequence all necessary work to upgrade infrastructure and facilities and introduce new <b>GL Type 10</b> fleet</li> </ul>
<b>CIP Program - Expansion</b>	<b>Focus 40 We’re Planning Priorities</b>
Expansion Project Development	<ul style="list-style-type: none"> <li>✓ <b>“Next Priorities” Planning</b> – Advance initial planning work for Next Priorities, including Red-Blue Connector, GLX to Route 16, and Silver Line to Everett.</li> </ul>



## FY20-24 CIP Program Sizes: Reliability (updated 4/4/19)

Primary program size changes:

1. Reallocate projects and funding to Green Line Transformation (GLT) for SGR improvements and initial investments for Type 10 vehicle procurement
2. Adjusting program sizes to reflect updated cash flow forecasts for major projects reaching or nearing completion (e.g. PTC, Red Line/Orange Line, GLX)
3. Additional technical adjustments due to projects carrying forward from FY19 to FY20
4. **Creation of Expansion Project Development program with \$25M initial seed funding**

FY19-23 CIP Programs	FY19-23 Amount (in millions)	FY20-24 Amount (in millions)	Delta from FY19-23 CIP	Comments
Priority 1/Reliability				
Bridge and Tunnel	544	506	(38)	Reallocation to GLT
Facilities	343	370	27	Reallocation; carryover
Revenue Vehicles	1,267	1,045	(222)	Reallocation to GLT
Stations	428	377	(51)	Reallocation to GLT
System Upgrades	245	222	(23)	Reallocation to GLT
Track, Signal and Power	938	765	(173)	Reallocation to GLT
<b>Subtotal, Priority 1/Reliability</b>	<b>\$3,765</b>	<b>\$3,285</b>	<b>(\$480)</b>	

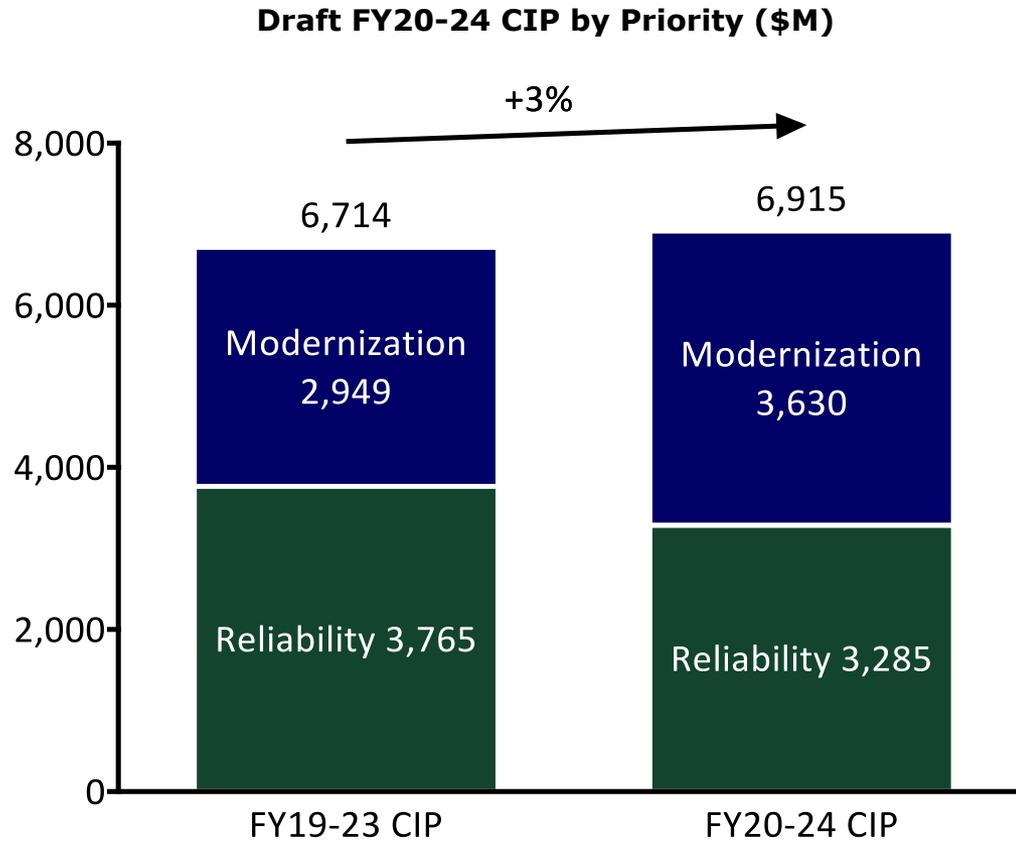


**FY20-24 CIP Program Sizes: Modernization and Expansion (updated 4/9/19)**

FY19-23 CIP Programs	FY19-23 Amount (in millions)	FY20-24 Amount (in millions)	Delta from FY19-23 CIP	Comments
<b>Priority 2/Modernization</b>				
Accessibility	265	246	(19)	Reallocation to GLT
AFC 2.0	169	204	34	Reflects updated AFC 2.0 cash flows
Commuter Rail Safety and Resiliency	630	499	(131)	Reflects completion of PTC
Customer Experience and Tech Improvements	116	155	40	Net increase for BBP/wayfinding
<b>Green Line Transformation</b>	<b>0</b>	<b>915</b>	<b>915</b>	<b>New Program</b>
Process Improvements & Innovation	25	13	(12)	Reflects updated program needs
Red / Orange Line Improvements	1,566	1,535	(31)	Reflects updated RL/OL cash flows
Risk Management and Mitigation	178	63	(115)	Reallocation to GLT for GLTP
<b>Subtotal, Priority 2/Modernization</b>	<b>\$2,949</b>	<b>\$3,630</b>	<b>\$681</b>	
<b>Priority 3/Expansion</b>				
Green Line Extension	1,227	1,317	90	Reflects updated GLX cash flows
Expansion Projects	62	49	(13)	Reflects current project cash flows
<b>Expansion Project Development</b>	<b>-</b>	<b>25</b>	<b>25</b>	<b>New Program</b>
<b>Subtotal, Priority 3/Expansion</b>	<b>\$1,289</b>	<b>\$1,391</b>	<b>\$102</b>	



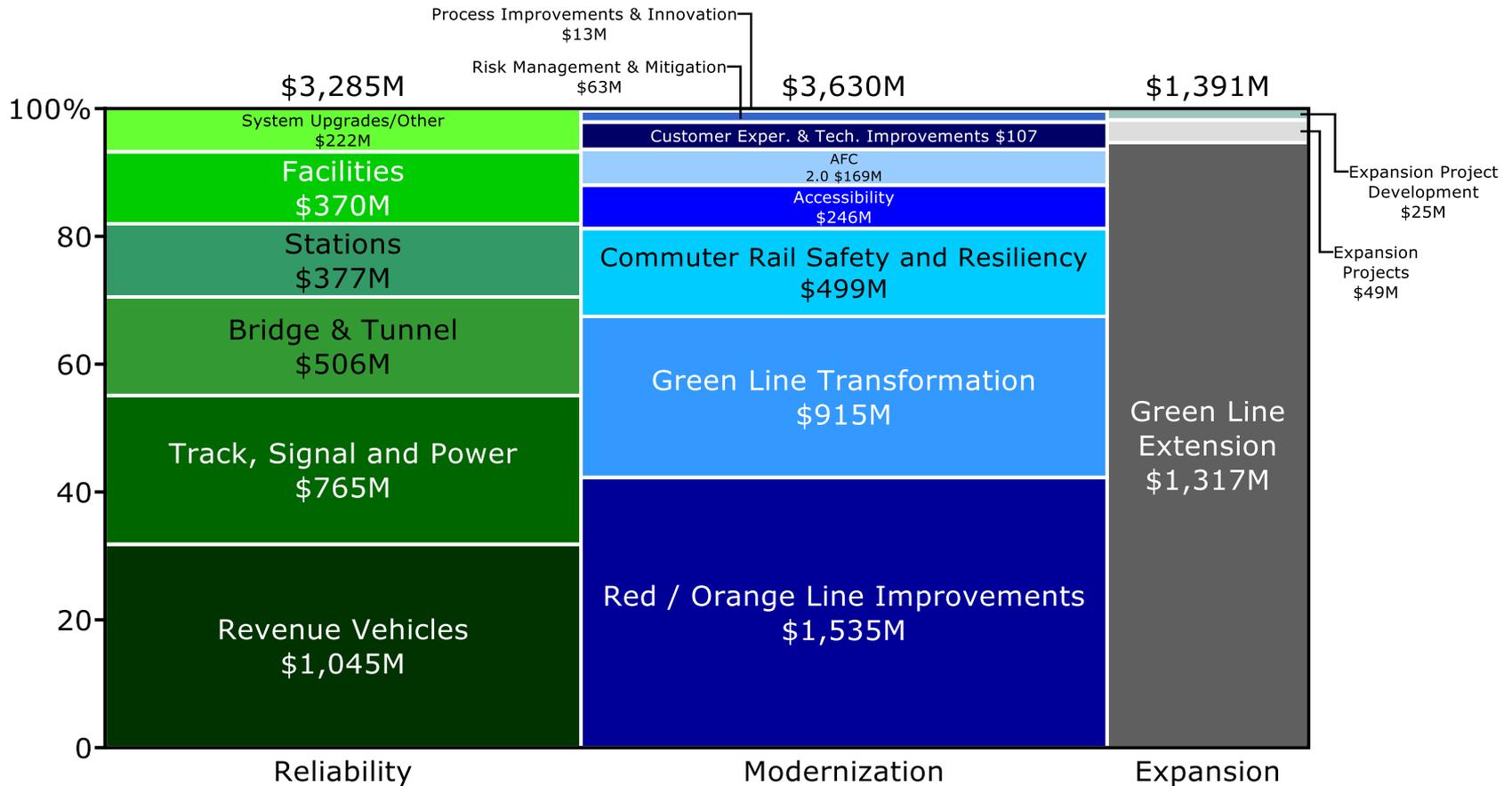
**FY20-24 CIP program sizes reflect \$6.9 billion in State of Good Repair investments**





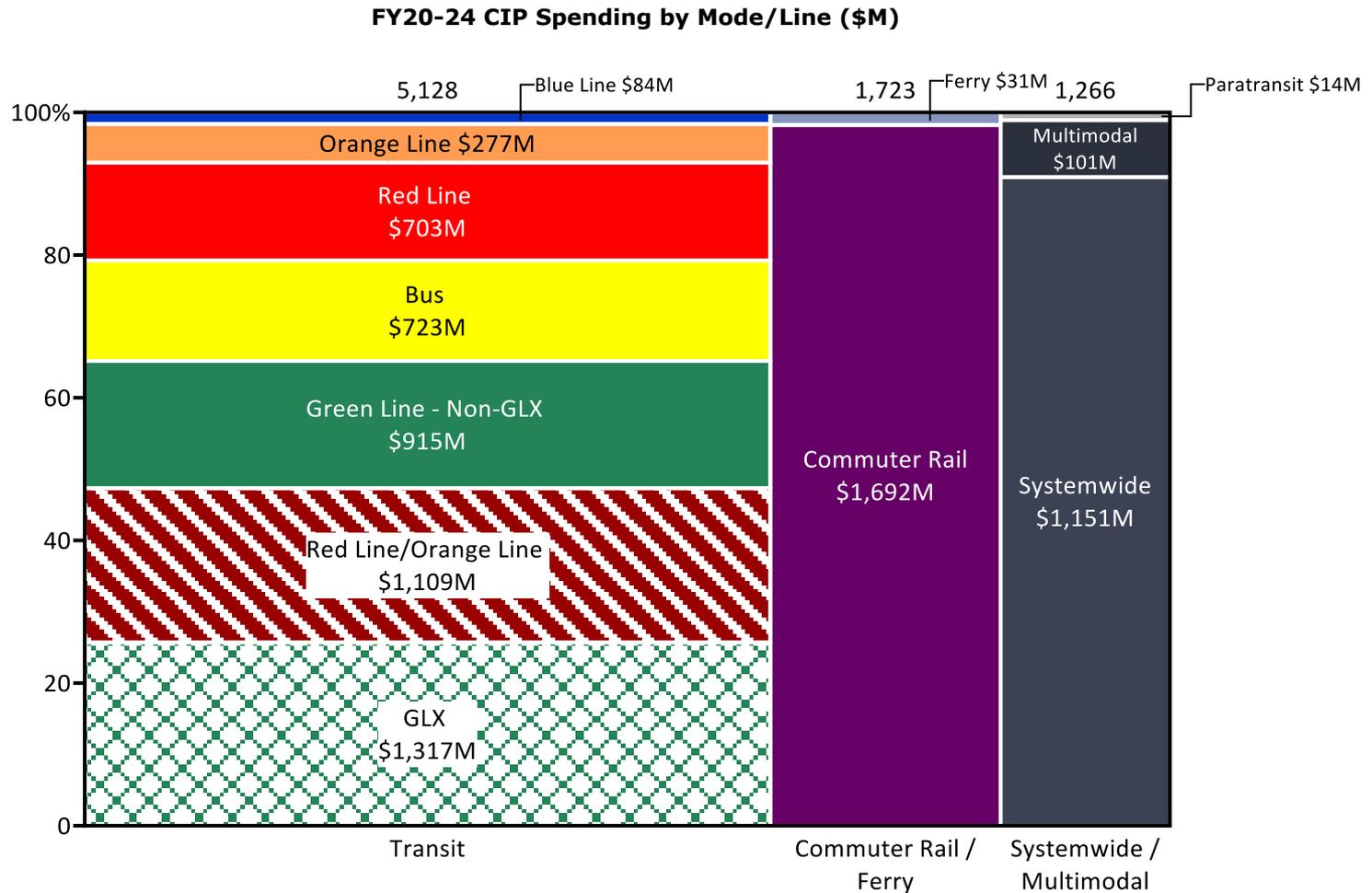
**FY 20-24 CIP programs reflect \$8.3 billion organized by *Priority* and *Program***

**FY20-24 CIP Spending by Priority and Program (\$M)**





## DRAFT FY20-24 CIP investments by Mode/Line (as of 4/1/19)





## Capital Investment Programs: Bridge & Tunnel

### Program Purpose & Need:

- Repairs, reconstructs and replaces MBTA commuter rail and transit bridges and tunnels system-wide.



### FY20-24 Program – \$506M

- FY19-23 program size was \$544M. Variance due to reallocation to Green Line Transformation (GLT).
- Goal of program is to ensure safe, reliable, and resilient operation of bridge and tunnel infrastructure through inspection, repair, and replacement projects.
- This program includes continuation of a rigorous inspection and rating process for bridge inventory and implementation of a tunnel inspection program.
- These inspection and rating programs will allow prioritization of repairs and replacement based on need.

Highlighted Project	Project Budget	FY20-24 Spend
Bridge Bundling Contract	\$132M	\$106M
<i>Design-build contract for six Commuter Rail bridges.</i>		
Gloucester Bridge Replacement	\$84M	\$66M
<i>Complete replacement of this drawbridge, substantial completion scheduled for summer of 2022.</i>		
<u>Longfellow Bridge Approach*</u>	\$114M	\$60M
<i>Repair Longfellow Approach Viaduct, Charles/MGH platforms, and Span 1. Currently in design procurement.</i>		
<u>North Station Draw 1*</u>	\$236M	\$59M
<i>Begin design for this drawbridge replacement to improve reliability for north side CR lines.</i>		

\* Underlined project denotes new or additional funding request.



## Capital Investment Programs: Facilities

### Program Purpose & Need:

- Rehabilitates and upgrades maintenance and administrative facilities that support MBTA operations.



### FY20-24 Program – \$370M

- FY19-23 size was \$343M. Variance due to unspent carryover from FY19.
- Execute strategy and begin planning, design and early action priorities for bus maintenance facilities across MBTA network.
- Complete critical climate resiliency projects, including Charlestown Bus Facility Seawall and Fenway Portal Flood Protection projects.
- Advance operational resiliency master plans, including 45 High Street, and Charlestown Campus, Master Plans.
- Begin planning and preliminary design for new Commuter Rail maintenance facility, providing operational resiliency and redundancy for south-side operations.
- Replace deteriorated roofs at twelve facilities across network.
- Invest in bus, light and heavy rail, and commuter rail maintenance facilities to improve safety and reliability.

Highlighted Project	Project Budget	FY20-24 Spend
Bus Maintenance Facilities	\$125M	\$125M
<i>Execute bus facility strategy, including master plan, design and construction, and potential real estate acquisition.</i>		
Facility Roof Replacement	\$52M	\$46M
<i>Scheduled replacement of facility roofs systemwide.</i>		
<u>Iron Horse Pk. Ops. Control Ctr.*</u>	\$44M	\$41M
<i>Redundant control center for Commuter Rail and Pan Am ops. and dispatchers on north-side. Accommodates PTC.</i>		
<u>South-Side Maintenance Facility*</u>	\$20M	\$20M
<i>Planning and design, and potential real estate acquisition, of new CR maintenance facility for south-side operations.</i>		
<u>Charlestown Bus Seawall Rehab*</u>	\$45M	\$19M
<i>Repair of seawall and new community path at bus facility.</i>		

\* Underlined project denotes new or additional funding request.



## Capital Investment Programs: Revenue Vehicles

### Program Purpose & Need:

- Rehabilitates and replaces the MBTA revenue fleet, which includes commuter rail, heavy rail, light rail, bus and ferry units.



### FY20-24 Program – \$1,045M

- FY19-23 program size was \$1,276M. Variance due to reallocation to GLT.
- Execute on-time replacement and overhaul programs for bus fleets, including the Silver Line.
- Begin transition to a zero-emission fleet, starting with a pilot of five battery electric buses arriving in spring 2019.
- Improve service reliability through targeted investments in Red Line, Green Line, Blue Line, and Commuter Rail fleets.

Highlighted Project	Project Budget	FY20-24 Spend
Procurement of 460 40 ft. Buses	\$512M	\$223M
<i>Begin design for a fleet of 40 ft. buses.</i>		
Procurement of 181 Bi-Level CR Coaches	\$595M	\$132M
<i>Begin design of new bi-level Commuter Rail coach fleet.</i>		
Procurement of 194 New Flyer Hybrid 40 ft. Buses	\$144M	\$114M
<i>Procure fleet of new 40 ft. hybrid buses. First bus arrives summer 2019.</i>		
DMA Replacement	\$103M	\$103M
<i>Replace up to 42 sixty-foot buses to support Airport / Seaport and SL3 service. Estimated 24 months to deliver.</i>		



## Capital Investment Programs: Stations

### Program Purpose & Need:

- Rehabilitates and upgrades MBTA stations and parking facilities (e.g., commuter rail, commuter ferry, subway and bus stations).



### FY20-24 Program – \$377M

- FY19-23 size was \$428M. Variance due to reallocation to GLT.
- Complete structural rehabilitation of Braintree and Quincy Adams Garages, complete urgent structural repairs and begin long-term planning of Alewife Garage.
- Continue work on Back Bay Ventilation Improvements, including stair-pressurization, installation of jet fans, and new power and mechanical equipment.
- Complete severe weather and climate resiliency projects, including Courthouse and Aquarium Station remediation.
- Advance accessibility improvements, and begin design of state-of-good repair improvements for Ruggles Station.
- Complete design of Worcester Union Station Improvements, and begin construction on Winchester Center Station.
- Complete improvements to Lynn Station and Parking Garage.
- Initiate comprehensive transit station needs assessment.

Highlighted Project	Project Budget	FY20-24 Spend
<u>Braintree, Quincy Adams Garage*</u>	\$109M	\$73M
<i>Restore garages to SGR, and extend service life by 40 yrs.</i>		
<u>Back Bay Station Ventilation*</u>	\$43M	\$39M
<i>Improve track and platform area ventilation, and repair and upgrade mechanical systems.</i>		
<u>Winchester Center Station*</u>	\$50M	\$39M
<i>Rehabilitate station with new platforms, lighting, accessibility improvements, and passenger amenities.</i>		
<u>Ruggles Station Upgrade*</u>	\$43M	\$23M
<i>Address state-of-good repair deficiencies, including roof.</i>		
Harvard Square Busway Repairs	\$21M	\$19M
<i>Restore roadway, drainage and catenary system to SGR, and improve operability, accessibility, and reliability.</i>		

\* Underlined project denotes new or additional funding request.



## Capital Investment Programs: System Upgrades

### Program Purpose & Need:

- Upgrades a wide range of MBTA systems including communications, security, computer technology, fare collection, asset management and environmental remediation systems. It also rehabilitates non-revenue vehicles and equipment.



### FY20-24 Program – \$222M

- FY19-23 size was \$428M. Variance due to reallocation to GLT. This program has decreased since FY19-23 due to right-sizing and reallocation to other programs
- The goal of this program is to ensure safe, reliable, and resilient operation of non-revenue vehicles, IT systems, and other equipment through replacement and renewal projects
- This program includes implementation of an MBTA enterprise asset management program, systemwide radio upgrades, and improvements to specialized maintenance vehicles.

Highlighted Project	Project Budget	FY20-24 Spend
System-wide Radio	\$70M	\$65M
<i>Replace two-way radio communications system for MBTA Transit Police.</i>		
Vacuum Car Procurement	\$30M	\$28M
<i>Procure right-of-way (ROW) maintenance vehicles.</i>		
Infrastructure Asset Management Phase 1	\$21M	\$21M
<i>Implement an asset management system throughout the entire MBTA organization.</i>		
Non-Revenue Vehicles Program	\$14M	\$16M
<i>Procure equipment and vehicles to support maintenance and winter resiliency.</i>		



## Capital Investment Programs: Track, Signals, and Power

### Program Purpose & Need:

- Rehabilitates, replaces and upgrades track, signal and power assets across the commuter rail and transit system.



### FY20-24 Program – \$765M

- FY19-23 program size was \$938M, variance is due to reallocation to Green Line Transformation.
- The goal of this program is to prevent and mitigate speed restrictions and other disruptive delays, modernize signal technology, and improve resiliency of the power system.
- This program also supports installation of multiple tracks to deliver Focus40 priorities for Commuter Rail.

Highlighted Project	Project Budget	FY20-24 Spend
<u>BL Harbor Tunnel Infrastructure*</u>	\$82M	\$71M
<i>Replace track, signals, and power infrastructure between Aquarium and Maverick. Currently in design.</i>		
<u>Mattapan High Speed Line Transformation*</u>	\$118M	\$60M
<i>Modernization of the Mattapan Line, including planning, design, and construction. Currently in planning.</i>		
North Station Terminal Signal	\$45M	\$43M
<i>Improvements to the signal infrastructure at North Sta. which will improve reliability of North Side CR service.</i>		
Power Systems Resiliency Program	\$35M	\$35M
<i>System-wide program to improve condition and reduce the vulnerability of the power grid.</i>		

\* Underlined project denotes new or additional funding request.



## Capital Investment Programs: Accessibility

### Program Purpose & Need:

- Improves accessibility at MBTA commuter rail, subway and bus stations. This program is necessary to meet the goals of the Authority's Plan for Accessible Transit Infrastructure ("PATI").



### FY20-24 Program – \$246M

- Advance elevator program to design and construct replacement and redundant vertical transportation at multiple locations systemwide.
- Complete construction of Downtown Crossing Phase 1 elevators and begin planning for Phase 2
- Complete design for Natick Center Commuter Rail Station.
- Make necessary upgrades to Forest Hills Orange Line Station.
- Construct new elevators at Oak Grove Orange Line Station.
- Advance design accessibility improvements at Newton Commuter Rail stations (Auburndale, Newtonville, and West Newton).

Highlighted Project	Project Budget	FY20-24 Spend
Elevator Program	\$138M	\$50M
<i>New redundant elevators and replacement of existing elevators at stations across the transit and CR system.</i>		
<u>Elevator Program - Design*</u>	\$57M	\$48M
<i>Initiate design for replacement and redundant elevators at multiple locations.</i>		
<u>Natick Center Station Accessibility*</u>	\$42M	\$41M
<i>Upgraded commuter rail station with high-level platforms, elevators, sloped walkways and stairways.</i>		
Bus Route Safety and Service Improvements	\$12M	\$8M
<i>Remove access barriers at high-priority bus stops.</i>		

\* Underlined project denotes new or additional funding request.



## Capital Investment Programs: AFC 2.0

### Program Purpose & Need:

- Implement a new reliable and convenient fare payment and collection system, integrated across all modes, to replace CharlieCards/Tickets and their supporting hardware and software.



### FY20-24 Program – \$204M

- Install new hardware, including subway gates, vehicle and platform readers, and station and streetscape fare vending machines
- Setup a new back office system, including new payment processing systems and robust information security management
- Introduce new fare media options to allow for more payment flexibility (e.g., a better fare card, mobile devices and contactless credit cards)
- Vastly expanded point-of-sale locations and channels to reach more riders

Highlighted Project	Project Budget	FY20-24 Spend
AFC 2.0	\$455M	\$204M
<i>Implement a new reliable and convenient fare payment and collection system.</i>		



## Capital Investment Programs: CR Safety & Resiliency

### Program Purpose & Need:

- Improve the safety and resiliency of the Commuter Rail (CR) network, including the implementation of Positive Train Control.



### FY20-24 Program – \$499M

- Fully implement Positive Train Control creating resiliency and redundancy throughout the system
- Install Automatic Train Control on the North Side Commuter Rail Lines
- Install additional gas fired hot air snow heaters at critical switch locations to help with winter weather resiliency.

Highlighted Project	Project Budget	FY20-24 Spend
ATC on North Side CR Lines	\$279M	\$256M
<i>Install Automatic Train Control (ATC) on north-side lines.</i>		
CR Positive Train Control	\$466M	\$192M
<i>Install and implement Positive Train Control (PTC).</i>		
<u>CR Fiber Optic Cable Network Resiliency*</u>	\$39M	\$29M
<i>Install redundant fiber optic cable buried along the ROW.</i>		
<u>CR- System-wide Tree Removal*</u>	\$29M	\$13M
<i>Conduct ongoing tree removal along the ROW.</i>		

\* Underlined project denotes new or additional funding request.



## Capital Investment Programs: Customer Experience & Technology Improvements

### Program Purpose & Need:

- Modernize the system and enhance customers' experience.



### FY20-24 Program – \$155M

- Implement Systemwide Wayfinding Improvements program, starting with wayfinding, lighting, and station brightening.
- Support Better Bus Project through targeted capital investments in partnership with cities and towns.
- Complete Park Street Wayfinding and Station Improvements project.
- Implement customer technology projects to improve real-time information, such as bus tracking, train arrival times, and trip planning.

Highlighted Project	Project Budget	FY20-24 Spend
System-wide Wayfinding Improvements	\$70M	\$70M
<i>Wayfinding, Lighting, and station brightening.</i>		
<u>Better Bus Project – Priority Corridors*</u>	\$9M	\$9M
<i>Funding to support the building of bus transit priority infrastructure in the top 40 routes.</i>		
T Digital Service	\$8M	\$2M
<i>Establish team empowered to target digital needs across the MBTA.</i>		
Exclusive Bus Lanes	\$2M	\$1M
<i>Design and construction of dedicated bus lanes.</i>		

\* Underlined project denotes new or additional funding request.



## Capital Investment Programs: Green Line Transformation

### Program Purpose & Need:

- Green Line Transformation (GLT) improves the quality of service on the Green Line through fleet modernization and infrastructure/facilities upgrades, as well as improved capacity, accessibility and state-of-the-art technology.



### FY20-24 Program – \$915M

- Investments in critical projects that offer holistic improvements to the Green Line or that are required for the delivery of the Type 10 vehicles.
- Projects aim to enhance regional mobility, improve operational efficiency and safety with more modern technology or that improve customer experience by reducing delays, wait time, speed restrictions and headway spacing.
- Procurement of GL Type 10 vehicles, 100% low floor light rail vehicle to allow level boarding and increased capacity.
- Green Line #8 Car Reliability Improvements, GL#7 Car Midlife Overhaul.
- Reconstruct Newton Highlands Green Line Station with high-level platforms and accessible paths of travel.
- Implement Symphony Station improvements.

Highlighted Project	Project Budget	FY20-24 Spend
<u>GL Type 10 Fleet Replacement*</u>	\$1,300M	\$207M
<i>Replacement of up to 170 vehicles to replace existing GL Type 7 and 8 Fleets.</i>		
GL Central Tunnel Track and Signal Replacement	\$132M	\$124M
<i>Bring track, signal infrastructure into state of good repair.</i>		
<u>Lechmere Viaduct Rehab Project*</u>	\$55M	\$55M
<i>Rehab and strengthening of the historic Lechmere Viaduct bridge structure to eliminate speed and operational constraints.</i>		
<u>Comm. Ave Station Access*</u>	\$30M	\$29M
<i>Accessibility station improvements along the B Branch.</i>		

\* Underlined project denotes new or additional funding request.



## Capital Investment Programs: Process Improvements & Innovation

### Program Purpose & Need:

- Investments in innovations that enhance productivity or quality of MBTA services and capital programs.



### FY20-24 Program – \$13M

- Implement Project Management Information System (PMIS) to more effectively manage capital program.
- Redesign business processes for financial management system to support upgrade to latest software.
- Implement Lean strategy improvements at facilities and within the capital program.

Highlighted Project	Project Budget	FY20-24 Spend
FMIS Upgrade and Business Process Re-Design	\$10M	\$6M
<i>Business process redesign to support software upgrade.</i>		
PMIS Implementation	\$12M	\$5M
<i>Further develop Project Management Information System (PMIS) to effectively manage capital program.</i>		
Commuter Rail Vision	\$3M	\$1M
<i>Identify cost-effective strategies to transform CR system.</i>		
Lean Strategy Implementation	\$0.3M	\$0.3M
<i>Implementation at facilities and within capital program.</i>		



## Capital Investment Programs: Red / Orange Line Improvements

### Program Purpose & Need:

- The set of vehicle and infrastructure investments needed to fully modernize the fleet and achieve the service goal of three minute headways on the Red Line and three and a half minute headways on the Orange Line.



### FY20-24 Program – \$1,535M

- Replace entire Red and Orange Line fleets with 404 new vehicles.
- Modernize signals system on Red and Orange Line.
- Upgrade Cabot and Wellington facilities to accommodate new fleet.
- Complete Orange Line Test Track, Red Line Test Track, and Wellington Yard Track 38/39 improvement projects.

Highlighted Project	Project Budget	FY20-24 Spend
RL/OL Infra. Improvements	\$470M	\$284M
<i>Investments to support storage, testing, and maintenance of new vehicles.</i>		
Signal Program – R/O Line	\$268M	\$254M
<i>New digital signal infrastructure to support new RL and OL vehicles.</i>		
Cabot Yard Complete Upgrade	\$135M	135M
<i>Maintenance facility improvements to support new RL vehicles.</i>		
Wellington Yard Upgrade	\$100M	\$100M
<i>Complete yard rebuild, including maintenance facility improvements to prepare for new OL vehicles.</i>		



## Capital Investment Programs: Risk Management & Mitigation

### Program Purpose & Need:

- Implements risk management initiatives as well as proactive efforts to improve workplace safety and system security.



### FY20-24 Program – \$63M

- Support OSHA implementation with priority capital investments in MBTA facilities.
- Upgrade access control and security cameras systemwide.
- Conduct climate change resiliency vulnerability assessments and begin implementing recommendations at highest-risk locations system-wide.

Highlighted Project	Project Budget	FY20-24 Spend
OHS Program Development and Implementation	\$22M	\$21M
<i>Development and implementation of OHS program to achieve highest practical level of safety for the MBTA.</i>		
OHS PPE and Infrastructure Improvements	\$19M	\$17M
<i>System-wide facility upgrade and material procurement to comply with OSHA requirements.</i>		
System-wide Security Upgrades	\$18M	\$15M
<i>Ten discrete security projects to enhance the safety of employees and riders system-wide.</i>		



## Capital Investment Programs: Expansion Projects

### Program Purpose & Need:

- Deliver targeted capital investment projects to expand the existing transit or commuter rail system.



### FY20-24 Program – \$49M

- Targeted expansions in order to improve access to transit, including the Silver Line to Chelsea.
- Construct new multimodal Chelsea Commuter Rail Station.
- Support early action items for South Coast Rail.

Highlighted Project	Project Budget	FY20-24 Spend
Silver Line Gateway – Phase 2	\$34M	\$34M
<i>Construction of the Chelsea CR station with two new high-level platforms, canopies, signal system upgrades and signal prioritization.</i>		
South Coast Rail Expansion	\$42M	\$9M
<i>Expansion of Commuter Rail service to southeastern Massachusetts.</i>		



## Capital Investment Programs: Expansion Project Development

### Program Purpose & Need:

- Support planning and design for expansion projects identified as "Next Priorities" within Focus40.



### FY20-24 Program – \$25M

- The advancement of project development efforts, which may include environmental permitting, project feasibility, conceptual design, alternatives analysis or project design for a potential range of MBTA expansion or Rail Vision projects.
- Potential projects include:
  - Red-Blue Connector
  - Green Line Extension to Route 16
  - Bus Rapid Transit through Everett
  - Rail Vision Projects

Highlighted Projects	Project Budget	FY20-24 Spend
<u>Red-Blue Connector*</u>	\$15M	TBD
<i>Advance preliminary engineering and environmental review through MEPA/NEPA approval for the extension of the Blue Line from Bowdoin to Charles MGH stations</i>		
<u>Green Line Extension to Rt. 16*</u>	\$9M	TBD
<i>Update and complete Final Environmental Impact Report for further extension of the Green Line to Mystic Valley Parkway in Medford</i>		
<u>BRT through Everett*</u>	\$1M	TBD
<i>Conduct initial feasibility analysis and conceptual design for extension of Silver Line service to Everett</i>		

\* Underlined project denotes new or additional funding request.



## Capital Investment Programs: Green Line Extension

### Program Purpose & Need:

- Open both branches of the new Green Line service, and a new vehicle maintenance facility, prior to the end of 2021.
- Satisfy environmental commitments promised under Central Artery Tunnel Project.



### FY20-24 Program – \$1,317M

- Upgrade vehicles; commission 24 Green Line Type 9 vehicles.
- Improve infrastructure on new Green Line branch on existing Lowell Commuter Rail tracks, from Lechmere to Medford and on existing Fitchburg Commuter Rail tracks, from Lechmere to Union Square in Somerville.
- Build a new vehicle storage and maintenance facility.
- Relocate Lechmere Station in Cambridge to allow for extension of the line.
- Add 7 new Green Line stations.

Highlighted Project	Project Budget	FY20-24 Spend
Green Line Extension	\$2,118M	\$1,239M
<i>Extension of the northern end of the GL in Somerville and Medford.</i>		
GL Extension Vehicles	\$170M	\$77M
<i>Type 9 vehicles to support new service on the GL.</i>		



## Next Steps

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- Incorporate FMCB feedback on priorities and programs
- Continue refining sources/uses, cash flows, and project sequencing
- Prepare for May FMCB and Joint Board votes to release draft CIP for public comment