



Massachusetts Bay Transportation Authority

Commuter Rail Bi-Level Coach Procurement and
Engineering and Program Management Services

Fiscal and Management Control Board

September 23, 2019

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Overview

Commuter rail passenger service is impacted by necessary single-level coach retirements, increased service demands, and future expansion.

- **260 single-level coaches** are scheduled for retirement.
 - **181 bi-level coaches** needed for equivalent seating capacity.
- Recent studies have shown a **continuing increase in Commuter Rail ridership**, which will be further impacted by the addition of South Coast Rail and multiple MassDOT highway projects being scheduled in the near future.
- Procurement quantities of **over 200 coaches** are projected in order to support expected increases in ridership in the near term.
- The MBTA has determined that satisfying the immediate need for new coaches will be best accomplished through a **sole-source contract with Hyundai-Rotem (HR) for 80 coaches**.
 - These 80 coaches will provide immediate relief for the delayed retirement of the MBB fleet, which has been evaluated as needing replacement as soon as possible. This includes 31 Control Trailer Coaches and 31 Blind Trailer Coaches.
 - This also includes 2 decommissioned bi-levels and the 16 additional bi-level coaches required for the implementation of South Coast Rail.
- The remaining 180 single-level coaches along with the additional capacity needs will be followed by a **competitively bid procurement for up to 200 bi-level coaches**.
 - The condition of these coaches is less critical than the MBB fleet.
- This procurement does not preclude procuring alternate vehicle types at a later date.



Background

- The Commuter Rail Bi-Level Coach procurement will replace the current 260 single-level coaches (Pullman, MBB, Bombardier) that are overdue for retirement.
 - The current single-level fleet has seating capacities ranging from 94-122 seats.
- Bi-Level coaches are being procured to improve reliability and increase current capacity.
 - The Authority's bi-level fleet has seating capacities ranging from 173-185 seats.
 - South Coast Rail requires 16 additional bi-level coaches by 2023.



Reliability Impact: Single-Level Coaches

- Single-level coaches have provided over 30 years of passenger service for the Commuter Rail. The degradation of these aging coaches continues to provide challenges to the Commuter Rail maintenance department:
 - Increased maintenance costs
 - Decreased reliability, adversely impacting daily coach availability
 - Increased component obsolescence

| Road Numbers | Qty ¹ | Seats per Car | Total Seats | Age (years) | Since Overhaul (years) | Scheduled Retirement ² |
|--------------|------------------|---------------|-------------|-------------|------------------------|-----------------------------------|
| 200s | 53 | 114 | 6,042 | 40 | 22 | 2020 |
| 1500s | 31 | 94 | 2,914 | 32 | N/A | 2013 |
| 500s | 31 | 96 | 2,976 | 32 | N/A | 2013 |
| 300s | 40 | 127 | 5,080 | 32 | N/A | 2015 |
| 600s | 53 | 122 | 6,466 | 30 | N/A | 2020 |
| 1600s | 52 | 122 | 6,344 | 30 | N/A | 2020 |

- The single-level fleet will continue to age and result in reduced reliability, increased cost of maintenance and operations and will result in decreased availability for service needs.



Vehicle Replacement Phases

Phase 1A

EPMS support of a sole-source procurement of 80 Bi-Level coaches from HR which will yield the following benefits: limited design review, supervision of production and accelerated vehicle level testing, streamlined commissioning, and warranty support

- Institute lessons learned from previous contract
- FRA Compliant
- Limited design impact
- Guaranteed compatibility with the existing fleet
- Reduced requirements for training of transportation & maintenance staff
- Expedited delivery of pilot & production coaches (receive first 16 units needed for South Coast Rail by December 2022)

Phase 1

EPMS support in preparation for an additional Bi-Level Coach Procurement

- Prepare and issue a Request For Proposals/Technical Specification for up to 200 Bi-Level Commuter Rail coaches including options
- Provide bid support through supplier selection, including Request For Clarification responses, Addenda, technical evaluation, and participation in supplier interviews
- Prepare final selection documentation for presentation to MBTA senior management in support of Notice To Proceed

Phase 2

EPMS support (post-NTP) of additional Bi-Level coach procurement

- Complete design and drawing reviews
- First Article Inspections (FAIs)
- Pilot coach qualification, testing, and inspection of vehicle systems
- In-plant supervision of production and vehicle level testing
- Local vehicle commissioning support
- Manuals and Training Curriculum approval
- Warranty and reliability support



New Award: Program Support

Vehicle Engineering requests the award of Contract No. V61PS05 – Engineering and Program Management Services for the Commuter Rail Bi-Level Coach Procurement.

- Selection Committee unanimously selected WSP USA Inc. as the most qualified candidate
- Estimated 10-year contract from Notice to Proceed (NTP)
- WSP USA Inc. has provided support to the MBTA on previous commuter rail coach procurement contracts over the last three decades and maintains a broad and deep team of technical, management, and procurement experts
- Timeline to Date:
 - Request for Qualification Issued: January 25, 2019
 - Request for Proposals Received: March 8, 2019
 - Interviews with Qualified Teams: April 12, 2019
 - Notification of Selection: May 8, 2019
 - Negotiations with Selected Team: May - June 2019
- The scope of work includes specification and RFP development, supplier selection, design, qualification, commissioning, warranty, and integration of the new Commuter Rail Bi-Level coaches into the existing fleet



Rationale for Sole Source Procurement

- **Immediate Need:**

- Expedite replacement of oldest, unreliable, aging fleet
- System expansion scheduled for 2023 – South Coast Rail
- No other vehicles available sooner

- **Data-Driven Decision:**

- Ridership increased by 21.2% between 2012 and 2018
- Planned highway construction projects mean increased demand
- Replacing single level with bi-levels increases seating capacity
- Cost of overhauling existing 20 MBB single level coaches is \$33.05M with limited life service life extension of 5-7 years



Rationale for Sole Source Procurement

- **Due Diligence Conducted in the Vehicle Manufacturing Industry:**
 - Issued RFI
 - Collected industry feedback from Car Builders/Suppliers
 - Conducted Car Builder Interviews
 - Evaluated current procurements from other Authorities, including availability of options
- **Parallel Activities for a follow-on Procurement for additional Coaches**
 - New specification development (in process)
 - RFP expected to be issued in Fall 2019
 - Estimated contract award in Fall 2020
 - Pilot vehicle anticipated delivery in Summer 2024
 - Production vehicles anticipated delivery in Spring 2025



Rationale for Sole Source Procurement

- **Justification:**

- In the public interest to avoid delay of a traditional procurement
- All non-federal funds
- Satisfies the expected increase in ridership
- Only manufacturer currently capable of delivering a bi-level coach to our specification
- Price offered is fair and reasonable
- Minimal operating and maintenance training required
- Meets all FRA requirements
- Standardizes vehicle configuration with legacy bi-levels
- Production line availability
- Reduce Professional Services costs



Hyundai-Rotem 80 Bi-Level Coaches

Expedited Delivery of Pilot & Production Coaches

- Targeted qualification testing of new systems only (PTC, LED lighting, etc.)
- Assembly of all vehicles will be in South Korea to expedite delivery of coaches
 - HR has committed to utilizing significant US content in the fabrication of these vehicles:
 - 49% for Control Trailer Coaches (CTC)
 - 47% for Blind Trailer Coaches (BTC)
- Delivery of first 16 units needed for South Coast Rail by December 2022
 - **All 80 coaches delivered by summer 2024**
 - With the standard procurement process, pilot coaches would not be received until summer 2024
- Will allow the replacement of 62 MBB coaches that were originally scheduled for retirement in 2013 (per the MBTA Railroad Operations Equipment Asset Inventory May 2012 draft)



Hyundai-Rotem 80 Bi-Level Coaches

- **Improvements include:**
 - Positive Train Control (PTC)
 - LED lighting
 - Pilot upgrades
 - Vendor product improvements
- **Benefits of bi-level coaches:**
 - Most efficient way to add capacity
 - Compatible with current fleet and infrastructure
 - Ease of maintenance/experienced workforce
 - Does not preclude procurement of different vehicles/technology
- **Benefits of near reproduction of current bi-level fleet include:**
 - Reduced risks due to familiarization with proven manufacturing and engineering design
 - Minimal operating and maintenance training required
 - Latest procurement (FC-668) met all FRA requirements
 - Minimal design impact
 - Guaranteed compatibility with the existing fleet
 - Final testing and acceptance of completed production coaches will be performed on MBTA property



Total Project Budget

- The proposed total project budget is **\$345,186,459** with the following line items:

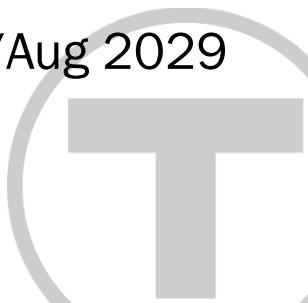
| Line Item | Budget |
|--|---------------|
| Vehicle procurement | \$278,589,000 |
| Professional services | \$8,303,289 |
| Force account | \$5,415,984 |
| Project administration | \$6,318,648 |
| Indirect | \$7,823,088 |
| Unallocated contingency (material & project) | \$38,736,450 |

- This procurement will be **100% state funded** by additional funds from Administration & Finance.



Project Timeline

- Board awards Contract V61PS05 and FC-712 for EPMS and procurement Sep 2019 (Today)
- Notice to Proceed for sole source procurement of 80 coaches Oct 2019
- RFP for additional bi-level coaches anticipated release Nov 2019
- Award of procurement of up to 100 coaches Nov 2020
- 80 coach fleet delivery start/end Sep 2022/ Jun 2024
- 100 coach fleet delivery start/end Jul 2024/ Jun 2027
- 50 coach fleet delivery start/end – Option 1 Jun 2027/ Jul 2028
- 50 coach fleet delivery start/end – Option 2 Jul 2028/ Aug 2029



Request of the Fiscal Management and Control Board

VOTE #1: Vehicle Engineering requests that the Fiscal and Management Control Board authorize the General Manager, or his designee, to award and execute MBTA Contract No. V61PS05 Commuter Rail Bi-Level Coach Procurement Engineering and Program Management Services to a team led by WSP USA Inc., in close cooperation with Keville Enterprises, Inc. and VP Engineering, Inc., for a total amount not to exceed **\$41,074,188** with an estimated ten-year period of performance.

VOTE #2: Vehicle Engineering requests that the Fiscal and Management Control Board authorize the General Manager, or his designee, to award and execute MBTA Contract No. FC-712 Commuter Rail Bi-Level Coach Procurement with Hyundai-Rotem for a not to exceed amount of **\$278,589,000**.



Appendix



Background: Commuter Rail Fleet Roster

| Manufacturer | Road Numbers | Qty | Seats per Car | Total Seats | Age (years) |
|---------------------|--------------|-----|---------------|-------------|-------------|
| Control Cars | | | | | |
| MBB* | 1500s | 31 | 94 | 2,914 | 32 |
| Bombardier* | 1600s | 52 | 122 | 6,344 | 30 |
| Kawasaki | 1700s | 24 | 175 | 4,200 | 29 |
| Hyundai-Rotem | 1800s | 28 | 173 | 4,844 | 6 |

| Manufacturer | Road Numbers | Qty | Seats per Car | Total Seats | Age (years) |
|---------------------|--------------|-----|---------------|-------------|-------------|
| Blind Cars | | | | | |
| Pullman* | 200s | 53 | 114 | 6,042 | 24 |
| Bombardier* | 300s | 40 | 127 | 5,080 | 32 |
| MBB* | 500s | 31 | 96 | 2,976 | 32 |
| Bombardier* | 600s | 53 | 122 | 6,466 | 30 |
| Kawasaki - base | 700s | 50 | 185 | 9,250 | 29 |
| Kawasaki - option 1 | 700s | 17 | 182 | 3,094 | 22 |
| Kawasaki - option 2 | 700s | 15 | 182 | 2,730 | 17 |
| Hyundai-Rotem | 800s | 47 | 179 | 8,413 | 6 |
| Kawasaki | 900s | 33 | 178 | 5,874 | 14 |

Pullman Coaches were originally built in 1978-1979 but were rebuilt in 1995-96.

* = single-level coaches

