



**Massachusetts Bay
Transportation Authority**

Green Line Train Protection System (GLTPS-2) Procurement

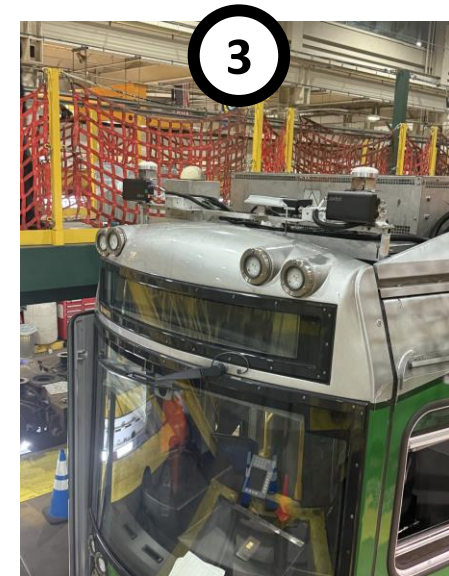
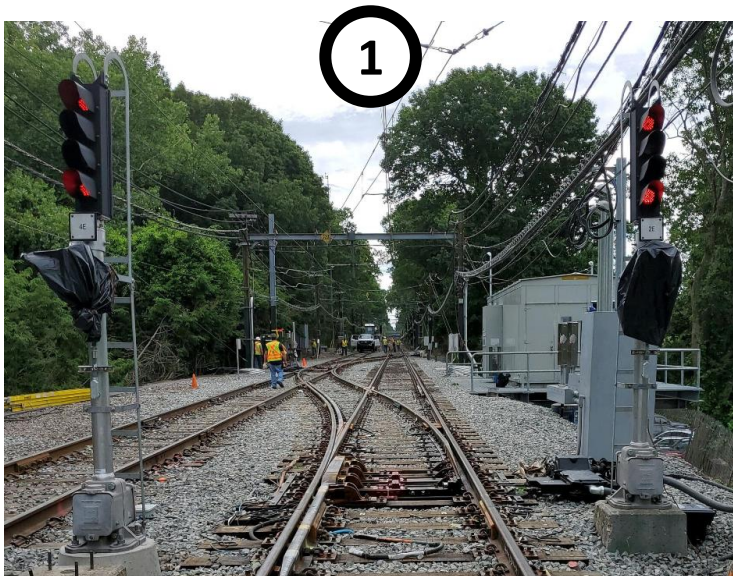
February 25, 2025

William G Wolfgang - Sr Director, Vehicle Engineering

Raymond F Wise - Chief Procurement Officer

GLTPS-2 Scope of Work

- The Green Line Train Protection System (GLTPS-2) shall be a stand-alone, non-vital overlay system with the primary functions:
 1. Stopping Green Line Vehicles before they pass a Red Signal (or other Stop signal).
 2. Speed enforcement of Green Line Vehicles to authorized speed limits.
 3. Preventing train-to-train collisions on all tracks.



The solution will be deployed in 2 phases

Phase 1

Warning System Type 7, Type 8, Type 9

- Audible and visual alarms
- Notifies the operator of an impending train collision and speed violation

Start: March 2025
Complete: December 2025

Phase 2

Custom-Designed Avoidance System Type 9 and Type 10

- Automatically slows or stops trains if warnings ignored
- Includes vehicle propulsion/braking interface
- Includes train localization and speed enforcement
- Includes a signal system interface to identify and prevent red signal overruns

Start: March 2025
Complete: June 2028



Design & Production Readiness Demonstration

Demonstration Area: Medford/Tufts to Haymarket

- Westbound track only
- Above ground between Medford/Tufts and Science Park
 - Piper will deploy GPS-RTK for speed and collision warnings
- Underground between Science Park and Haymarket
 - Piper will deploy UWB (Ultra Wide Band) for speed and collision warnings

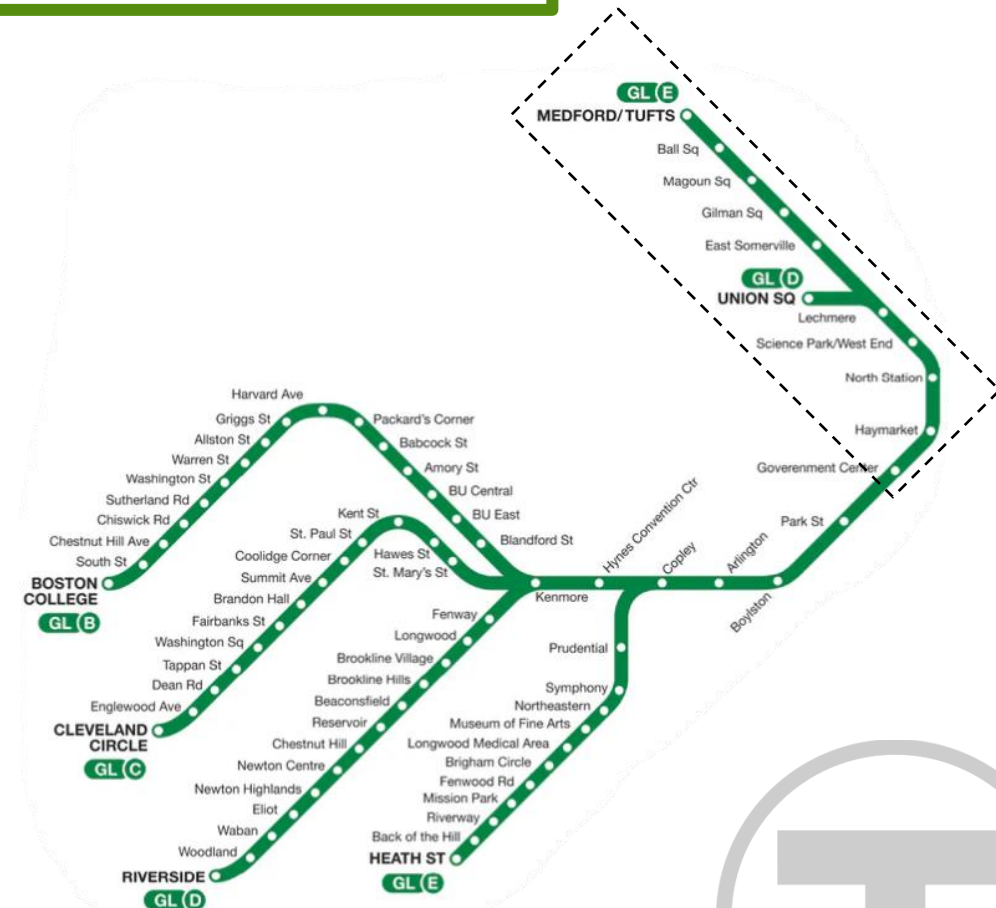
Applicable Vehicles: 1x Type 7, 1x Type 8, 2x Type 9

- Tests will occur with a Type 7-8 consist and Type 9-9 consist

Status:

- GPS-RTK Base Station has been deployed to Riverside Yard
- UWB Anchors have been deployed to central tunnel
- Vehicles have been temporarily equipped with onboard system
- Preliminary Design documents have been submitted
- Preliminary Safety certification documents have been submitted

Start: October 2024
Complete: March 2025



Piper's System Summary

- Radio communication-based system utilizing carborne and wayside equipment to determine train position to:
 - Enforce operating speed listed in the MBTA database
 - Provide train-to-train communication and redundant LiDAR technology to detect impending collisions
 - Determine status of upcoming signal to prevent red signal overruns



Piper's equipment: LiDAR, Master Control Unit, Train Positioning Antenna



Procurement Timeline

Date	Action
June 2024	RFP # 80F-24 posted on COMMBUYS (June 7) Advertisements through <i>Railway Age</i> and <i>Progressive Railroading</i> Direct communication with 4 potential bidders Virtual Pre-Bid Conference conducted with 12 suppliers attending (5+ with relevant solutions)
July 2024	Bid Q&A period concludes with 57 questions from five (5) companies received and answered
August 2024	Bid period closes (August 27) 1 bid received from Piper Networks, Inc.
September 2024	Piper's bid is evaluated by the Technical Evaluation Team
October 2024	Executive team recommends Piper progress to "Design & Production Readiness" phase. Performs Survey of existing vehicles and wayside for demonstration
November 2024	Best and Final Offer (BAFO) sought from Piper Networks, Inc. Decision made to accelerate timing and expand scope of "Design & Production Readiness" phase
December 2024	Installation of wayside anchors and power supplies for demonstration phase
February 2025	Preparation of 4 vehicles for demonstration testing

Commercial Summary

- Negotiated Price: \$112,529,564 includes:
 - Phase 1 Carborne Equipment and installation on Type 7, 8, 9, & 10 vehicles
 - Phase 2 Design and Validation on Type 9 & 10 vehicles
 - Phase 2 Carborne Equipment on Type 9 & 20 - Type 10 vehicles
 - Phase 1 and 2 Wayside equipment (“Anchors, Signal Interface Equipment”)
- Office of Diversity and Civil Rights assigned a 7% DBE goal, which Piper has agreed to meet
- Payments sequenced to align with delivery and acceptance of system with milestone payments at many points including:
 - Carborne design validated, installed, and accepted
 - Wayside design validated, equipment delivered and accepted
 - Training program completed
 - Performance Monitoring & Operational Tuning completed
 - Completion of 4-year warranty period



Total Project Budget

The proposed total project budget is **\$219,103,608** with the following line items:

GLTPS 2	Budget
Professional Services	\$ 16,015,471
Construction and Material Procurement PIPER	\$ 112,529,564
Construction Wayside	\$ 32,696,678
Force Account	\$ 33,713,624
Project Administration	\$ 18,883,996
Unallocated Contingency	\$ 5,264,275
Total Project Budget	\$ 219,103,608



Summary

Seeking approval by the MBTA Board of Directors for:

- Award of RFP 80F-24 Green Line Train Protection System contract to Piper Networks, Inc. subject to successful “Design & Production Readiness Demonstration” for \$112,529,564 .
- Piper will manufacture, furnish all labor, management, materials, tools, services, parts, data, systems, equipment, other items and incidentals which are necessary to complete the Work including additional functionality described in RFP 80F-24.
- Piper will perform Carborne installation work and support integration with wayside equipment.
- Final testing and acceptance will be performed on MBTA property.



Request of the MBTA Board of Directors

To authorize the General Manager/CEO of the Massachusetts Bay Transportation Authority to award RFP 80F-24 Green Line Train Protection System contract to Piper Networks, Inc. to manufacture, furnish all labor, management, materials, tools, services, parts, data, systems, equipment, other items and incidentals which are necessary to complete the Work including additional functionality described in RFP 80F-24 for the Green Line Train Protection System Specification VE-24-056, for a total delivered amount not to exceed \$112,529,564 and to execute any necessary or ancillary documents in the name of and on behalf of the MBTA to effectuate this Agreement.

