GLTPS | GREEN LINE TRAIN PROTECTION SYSTEM

A CAPITAL TRANSFORMATION PROJECT

Quarter 4 Review (October - December 2022) and Lookahead

The **Green Line Train Protection System (GLTPS)** combines vehicle and wayside equipment, that work together to avoid train-on-train collisions, add red light signal protection, and incorporate speed enforcement. The project has four overlapping phases which are all currently underway, starting with **Phase 1 Equipment Design** which integrates new technology into the legacy system. **Phase 2 Vehicle Installation** is currently underway at GLX Maintenance Facility in Somerville where the Pilot vehicle 3708 installation is ongoing. **Phase 3 Wayside Installation** used the scheduled B, C, & E Branch full access closures in June, July, and August of 2022 for equipment installation. D-Branch installation was from Fenway to Riverside which included three surges that began on September 24, 2022 and ran until October 28, 2022. **Phase 4 Operational Integration** is where MBTA personnel will receive information and training on the new GLTPS system.

GLTPS by the Numbers

0% | 10% | 20% | 30% | **38%** | 50% | 60% | 70% | 80% | 90% | 100%

PHASE 1	PHASE 2	PHASE 3	PHASE 4
70% Complete	**12% Complete**	**19% Complete**	**11% Complete**
Equipment Design & Validation	*Vehicle Installation*	*Wayside Installation*	*Operational Integration*

Pre-Acceleration Completion December 2024

PHASE 1A	PHASE 1B	PHASE 2	PHASE 3	PHASE 4
July 2022	***December 2023***	***November 2024***	***May 2025***	***June 2025***
Wayside Equipment Design Substantially Complete	*Vehicle Equipment Design Substantially Complete*	*Vehicle Installation Complete*	*Wayside Installation Complete*	*Operational Integration Complete*

Prepared by Capital Transformation
Massachusetts Bay Transportation Authority (MBTA)

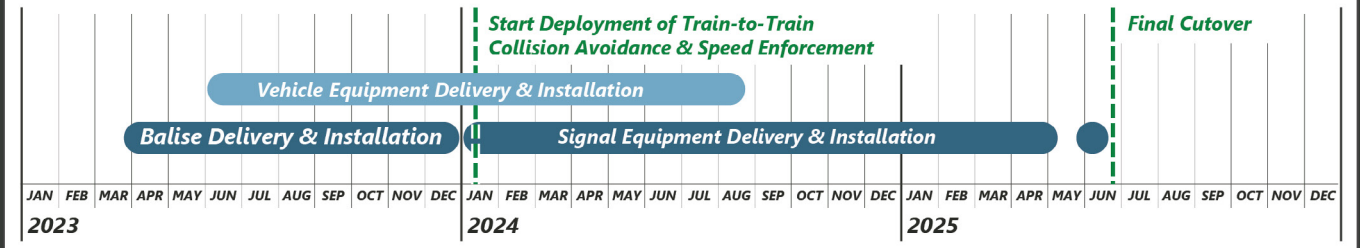
Schedule Update

To our disappointment, the System Integrator notified the MBTA in November that there will be an approximately 18-month delay in the complete installation of the GLTPS from December 2023 to June 2025 due to setbacks with the integration design and material procurement.

The MBTA has been working closely with the Systems Integrator since being notified of the delay to find creative options to deploy certain layers of the system to improve the level of safety on the Green Line in advance of the delayed date of the complete installation.

The below Mitigation Strategy shows the advance deployment of partial functionality of the system with Train-to-Train Collision Avoidance & Speed Enforcement, starting in January 2024, before the entire system with the added Red Light Protection is installed and cutover by June 2025.

Mitigation Strategy:

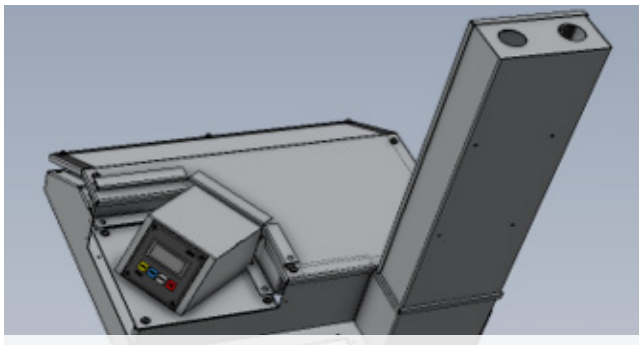


Activity This Past Quarter

Equipment Design & Validation

- **MBTA supported the System Integrator's Task Force** for their new management team in Braunschweig Germany for the month of October, understanding project scope and assessing project status. Subsequent workshops were facilitated to evaluate options for mitigating that delay including advancing partial functionality with Collision Avoidance & Speed Enforcement. This would be deployed earlier than the entire system installation needed for the added Red-Light Protection.
- **Design efforts have continued,** and vehicle design is moving from the Type 7 to the Type 8 legacy fleet. Equipment functionality will remain the same across all three fleets but the integration of the components and how they are installed will vary across the different vehicle types. The Type 8 cab enclosure pictured will house the operator interface, collision avoidance camera, radio control unit, terminal boards, and other control electronics.

Stadler Signaling (formerly BBR) Headquarters Braunschweig, Germany



Type 8 cab equipment enclosure conceptual design

Vehicle Installation

- **A 'swing test' was performed on 3708** multiple times through the widest & tightest turns on the system to validate harness lengths for those running behind the articulation panels. This test confirms the correct length to keep the harnesses from being damaged by the articulation sliding panels during extreme turns in both directions.
- **40 newly manufactured speed sensor housings** are being assembled in Harleysville, PA. These 40 housings will allow the existing housings that only accommodate 1 speed sensor to be shipped & modified to accept a 2nd speed sensor required for the GLTPS functionality.

Harnesses mounted on Pilot 3708

Speed sensor housings

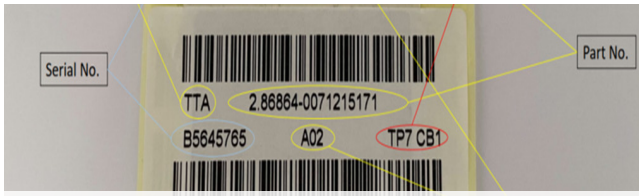
Wayside Installation

- **D-Branch installation occurred** during the three full access outages that started on September 24, 2022. Planned installation included 159 balises and 68 radio upgrade antennas over 93 different signal locations from Fenway to Riverside.

GLTPS equipment installation during D Branch surge

Operational Integration

- **Operational Readiness Committee** continues to meet and discuss the needed decisions and planning for future operation and maintenance of the new assets, including how equipment will be tagged and barcoded for future asset management. Pictured are examples of the bar code and QR code labels which will come on new Vehicle & Wayside equipment.



Asset management barcode

Lookahead For Next Month

Continue working closely with the Systems Integrator on mitigation strategies to ensure the safe and rapid implementation of safety features and operationalize them as soon as possible

Equipment Design & Validation

- Review documentation for Type 7 Final Design and First Article Inspections
- Review Type 8 prototype enclosure manufacturing

Wayside Installation

- Update Safety Compliance Assessment for all wayside installation scenarios
- Continue production of wayside kits for planned 2023 installation

Vehicle Installation

- Continue Type 7 pilot integration on car 3708 and abatement
- Continue abatement of installation areas on the 3600 series cars

Operational Integration

- Finalize training video storyboard for stakeholder review
- Review revised Operations and Maintenance manuals