



Massachusetts Bay Transportation Authority

Green Line Speed Monitoring, Investigation, and Response

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Summary of outstanding Green Line CAPs

Corrective Action Plans (CAPs) related to Green Line overspeed

- **CAP 7640 Item 2:** Green Line Dispatchers will monitor the intervals on the Green Line for close train bunching:
 - Monitoring in coordination with DPU.
 - Items 1, 3-6 have been closed.
- **CAP A15-320:** Green Line Train Protection: Various items related to installation of wayside and carborne equipment, system testing and performance monitoring.
 - Project timeline coordinated between Green Line Transformation, contractors, and MBTA leadership.



Green Line Speed Monitoring



Speed Signs

Nine (9) stationary speed signs located at various points on the Green Line identify the vehicle speed and compare it to the programmed posted speed.



GPS Speed Alerts

On all surface level lines, using **GPS data**, a real time email is sent to all Light Rail Supervisors when a train is traveling more than a set speed threshold.

Continuous Monitoring

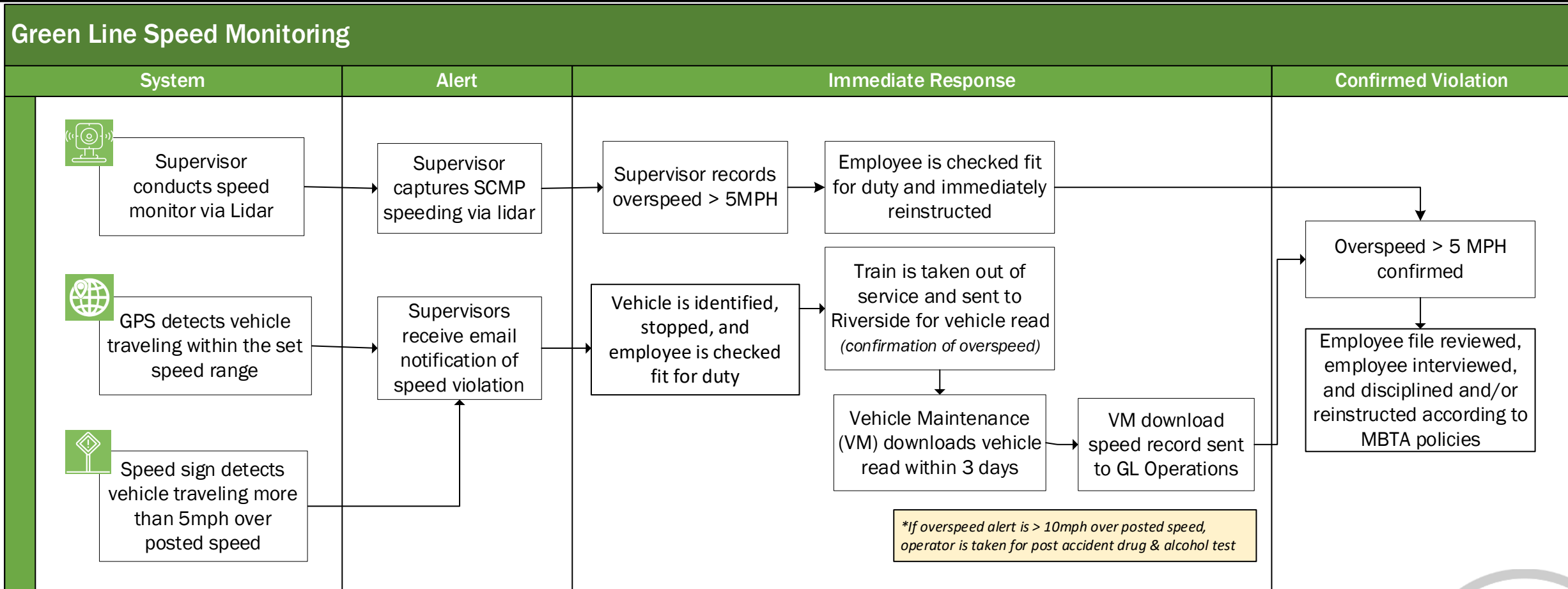


Direct Observation (Lidar)

Light Rail Supervisors perform, on average, **2 in-person speed observations** daily at various points throughout the Green Line using Lidar technology. Safety conducts additional in-person speed observations.

Speed Monitoring as part of Safety Rules Compliance Program (SRCP)

Operations Speed Alert Investigation Process



GPS & Speed Sign monitoring systems only flag possible violations. The train must be inspected to ensure the speedometer is working properly and the vehicle download confirms the overspeed. When an overspeed is confirmed, employees are instructed and/or issued discipline according to their record and MBTA policies.

Alerts & Violations December 2022*

MONITORING SYSTEM	TOTAL ALERTS**	CONFIRMED OVERSPEED BELOW < 5 MPH	INCOMPLETE INVESTIGATION* *	CONFIRMED VIOLATIONS > 5 MPH OVER POSTED SPEED	RESPONSE TO CONFIRMED VIOLATIONS
Speed Signs	12	5 (42%)	7 (58%)	0 (0%)	<ul style="list-style-type: none"> No confirmed violations during this time period
GPS (Geofence Data)	9	3 (33%)	3 (33%)	3 (33%)	<ul style="list-style-type: none"> Two employees suspended and received reinstruction One recent event still under investigation
Direct Observation (Lidar) – Green Line Operations	183 <i>Observations</i>	15 (8%)	—	0 (0%)	<ul style="list-style-type: none"> No confirmed violations during this time period
Direct Observation (Lidar) – Safety	77 <i>Observations</i>	13 (17%)	—	0 (0%)	<ul style="list-style-type: none"> No confirmed violations during this time period

For the last month, based on continuous monitoring (Speed Signs & Geofencing data):

- 2 employees were suspended and re-instructed.
- Another 8 employees received a note to their employee file and 2 employees received re-instructed based on patterns, regardless of confirmation of violation.

*12/1/22 to 1/1/23

**Excluding false alerts & Mattapan Line (3 alerts)

***Incomplete investigation due to confirmation of vehicle speeding to be inconclusive, typically via download process..

Monitoring & Investigating: Challenges & Improvements

Challenges

- Process for verifying overspeed is time consuming and requires significant coordination between multiple departments:
 - Confirming violation **requires** a vehicle download
 - Vehicle download must occur within 3 days of event
 - Vehicle download can only be performed at Riverside
- Tracking system still requires manual monitoring and data entry as overspeeds are investigated
- False alerts create noise in data (28 over last 6 months)
- The Mattapan Trolleys do not have the ability to download speeds and, therefore, verify violation

Improvements

- Created **centralized tracking system** for speed alerts:
 - Allows for **real-time tracking** by Green Line Supervisors
 - Sends **automated weekly and monthly summaries** to track trends, confirm vehicle downloads secured, and any violations are addressed
 - Flags **employees with >3 alerts** (confirmed and unconfirmed) within the last 12 months
- **Weekly coordination** meetings between Vehicle Maintenance and Rail Ops to review downloads, procedures, and confirm downloads complete



Next Steps

Hired Director of Administration and Business Processes for Rail Operations to help:

- Improve coordination between Green Line Ops and Green Line Maintenance to ensure all overspeed alerts result in vehicle download
- Monitor process and system to provide reinstruction to all employees with >3 alerts (confirmed and unconfirmed) within the last 12 months
- Use tracker to identify other speed alert patterns and issue reinstruction to employees as needed

Diversify Lidar observation process and update reporting requirements to:

- Expand performance of plain-clothes observations to supplement uniformed observations
- Document and analyze any differences in effectiveness of plain-clothes vs. uniformed observations

Developed as part of CAP 7640, continued actions to decrease chance of train-on-train collision through proper train spacing include:

- Green Line dispatchers make routine announcements reminding operators of proper spacing
- Inspectors monitor train intervals for close bunching
- Safety Department increased frequency of LIDAR observations compared to historic levels



Thank you.

