

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO**

PROCEEDING NO. 22I-0471R

IN THE MATTER OF THE REGIONAL TRANSPORTATION DISTRICT’S CORRECTIVE ACTION PLAN REGARDING THE SABLE BOULEVARD AND EXPOSITION AVENUE DERAILMENT, RULE 4 CCR 723-7-7347

**REGIONAL TRANSPORTATION DISTRICT’S
NOTICE OF CORRECTIVE ACTIONS COMPLETED**

The Regional Transportation District (“RTD”), by and through its undersigned counsel, respectfully provides its Notice of Corrective Actions Completed for CAP01-09212022, CAP02-09212022, and CAP03-09212022 for the September 21, 2022, light rail vehicle derailment at the Sable Boulevard and Exposition Avenue intersection crossing (“Accident”) as follows:

I. INTRODUCTION

1. RTD submitted its report of investigation for the Accident and proposed Corrective Action Plans (“CAPs”) on November 4, 2022. The investigation found that the most probable and contributing causes of the Accident were:

- Excessive speed
- Inattention by the operator and failure to operate the train in accordance with established rules
- Alignment configuration differences contributed to inattentiveness
- Safety Management System training and oversight immaturity

2. The Commission partially approved CAP01-09212022 effective November 18, 2022 (Decision No. C22-0721), fully approved CAP01-09212022 and CAP02-09212022 effective

December 7, 2022 (Decision No. C22-0786), and approved CAP03-09212022 effective March 8, 2023 (Decision No. C23-0160).

3. On January 20, April 19, and July 12, 2023, RTD met with PUC staff to review documentation reflecting RTD's completion of the corrective actions covered by this notice. Documentation related to completion of these corrective actions is attached hereto. Additional supporting documentation was reviewed with PUC staff and is available for inspection by the Commission.

II. CAP01-09212022

4. This CAP addresses four corrective measures that were completed prior to service restoration on the closed segment of the R Line on November 29, 2022, and one corrective measure requiring a formal plan for implementation of Automatic Train Stop ("ATS"). RTD filed additional information requested by the Commission on three corrective measures on November 23, 2022 (including traffic control diagram, striping and signal plans, photograph of new speed sign and diagram of radar sign location). As described below, RTD hereby provides its notice of completion of all corrective actions consistent with all implementation deadlines and respectfully requests that the Commission approve the closure of CAP01-09212022.

A. Stop and Proceed (Completed November 28, 2022)

5. RTD implemented an interim condition whereby operators are required to stop and proceed before entering into the crossing at the intersection of Sable Boulevard and Exposition Avenue, and the train-traffic signaling interface was coordinated with the City of Aurora.

B. Reduced Speed (Completed November 28, 2022)

6. The speed on approach to the curve at Sable Boulevard and Exposition Avenue was reduced from 35 MPH to 25 MPH.

C. Additional Signage (Completed November 28, 2022)

7. Additional signage with the reduced speed limit was installed on the right-of-way approaching the curve.

D. Relocation of Radar Sign (Completed November 28, 2022)

8. A radar sign was relocated approximately 100 feet farther north of the curve to allow more advance warning and increased visibility.

E. Automatic Train Stop (ATS) Implementation Plan (Completed June 16, 2023)

9. RTD retained a consultant to evaluate conditions and provide a proposed plan to implement and install ATS north of the curve on the R Line approaching the East Exposition Avenue and South Sable Boulevard intersection. **Attachment 1, HNTB Final R-Line ATS Report and Exhibits.** ATS is intended to automatically apply brakes on a train prior to the intersection in certain overspeed situations. RTD is taking steps to implement the plan, including ensuring it is included with budget. The estimated time to implement and install the ATS is approximately one year, and the estimated cost is approximately \$876,000.

III. CAP02-09212022

10. The Commission approved six corrective actions and the corresponding implementation schedule for this CAP that focuses on the human factors that caused the Accident. As described below, RTD hereby provides its notice of completion of all six corrective actions consistent with all implementation deadlines and respectfully requests that the Commission approve the closure of CAP02- 09212022.

A. Safety Assurance for Operator Ride Checks (Completed December 31, 2022)

10. This CAP addressed strengthening safety assurance efforts for operator ride checks and appropriate supervisory efforts. The Internal Work Instruction (“IWI”) for Operator Ride Checks

was published on December 30, 2022. **Attachment 2, IWI LRT 22-06, Operator Ride Checks.** This IWI was updated and republished on March 30, 2023. This IWI was reviewed with field supervisors and acknowledgement signatures were captured as a part of the review.

B. Monthly Radar Checks Quality Assurance Report (Completed March 31, 2023)

11. This CAP included the creation of a monthly report for lagging indicators to allow for the determination of leading indicators for quality assurance and radar checks. **Attachment 3, Speed Check Data Tracking- Leading and Lagging Indicators.** The monthly report has been modified to include tracking of speed checks completed and violations noted during speed checks. **Attachment 4, Sample Monthly Report.** These lagging indicators would allow for in depth analysis to determine locations where additional oversight can address behavior. Additionally, the evaluation of on-time performance mentioned below can identify specific locations or routes as well as other trends where schedule modifications may be needed. The following leading indicators are determined: percentage of unobserved speed checks of total speed checks and number of supervisor-operator coaching engagements. Speed checks can deter speeding and influence behavior changes. Unobserved speed checks provide fair observations that are less likely to be biased or influenced by selective operator behaviors. Coaching employees establishes baseline knowledge and competencies. This will allow for enhancing knowledge and skill level of employees, therefore reducing the number of incidents.

C. Evaluation of On-Time Performance Metric (Completed March 31, 2023)

12. This CAP is an evaluation of the on-time performance metric and other metrics that may promote undesired behaviors. **Attachment 5, Sample On-time Performance Report.** On-time performance relative to the RTD published schedule is impacted by many variables such as construction, police activity, etc. On-time performance is defined as a train that is more than five

minutes late arriving or departing one minute early from a station. **Attachment 6, Transit Service Policies & Standards (July 19, 2016)**. On-time performance metrics, including arrival and departure times, are compiled monthly and evaluated quarterly. RTD has taken a coaching approach when on-time performance is not met.

D. Evaluation of Schedule (Completed March 31, 2023)

13. This CAP included an evaluation of schedules to reduce on-time performance pressures. Following a review of on-time performance data, including scheduled operating speed (average speed/scheduled time), adjustments were made to the R Line schedule to accommodate layover time safety related modifications to operations. **Attachment 7, R Line Schedule Adjustments Memo**. The evaluation of the schedule was completed based on RTD policies and procedures, which aim to evaluate lines/routes to identify needed service improvements.

E. Staffing Levels Business Case (Completed March 31, 2023)

14. RTD evaluated the roles and responsibilities of Light Rail Supervisors, staffing levels, shifts, and distribution of supervisors to provide coverage across four light rail work assignment areas (Downtown Loop, East Corridor, West Corridor, Southwest/East Corridor). **Attachment 8, Additional LRT Field Supervisors Memo**. There are currently two lead field supervisors and 21 field supervisors. Staffing levels and supervisor assignments often depend on the number of supervisors on a shift, which varies due to paid time off, Family Medical Leave, and other types of leave and extended absences. Without sufficient field supervisors on a shift, work assignment areas are condensed to areas with the highest level of activity, such as the downtown area, thus leaving outer areas of the system unsupervised. Finally, lead field supervisors have administrative responsibilities (e.g., reviewing accident and incident reports, drafting standard operating

procedures, and maintaining the currency of the Rail Operations Rulebook) in addition to monitoring field supervisors' work across the system.

15. The business case analysis recommends increased staffing levels with an additional 14 field supervisors and three lead field supervisors to increase coverage across the system and reduce the span of control. Assignments would be made across five areas (Downtown Loop, East Corridor, West Corridor, Southwest Corridor, East Corridor). Four of the field supervisors would be designated as Accident Investigation Supervisors and have primary responsibility to investigate hazards and accidents.

F. Supervisor Assignment Evaluation (Completed March 31, 2023)

16. RTD performed an initial in-house evaluation of Light Rail Field Supervisor responsibilities, which resulted in the above referenced business case. The evaluation includes analysis of current responsibilities.

17. RTD also retained a consultant to assess Light Rail Field Supervisor roles, responsibilities, and assignments. **Attachment 9, North Highland Light Rail Field Supervisor Assessment.** The first phase of this assessment included discovery and analysis of RTD's current organizational structure, supervisor roles and responsibilities, as well as an external benchmarking analysis of comparable transit systems to identify how other agencies approach staffing and coverage. The second phase included recommendations for future state design and implementation roadmap where staffing is commensurate with workload.

IV. CAP03-09212022

18. This CAP addresses RTD's investigation of the inability to recover in-cab video footage from one light rail vehicle (LRV) involved in the Accident. That investigation found that the most probable and contributing causes for the lack of footage were:

- Inadequate procedures for removal and installation of hard disc drive (“HDD”) into digital video recorder (“DVR”), as well as information retrieval from the HDD
- Inadequate employee training on data retrieval for HDDs
- Failure to check and monitor that LRV surveillance equipment is functional

Other contributing causes identified were:

- Reliability due to the useful life of the camera and HDD
- Potential tampering with the system

19. The Commission has approved seven corrective actions and the corresponding implementation schedule. RTD provides its notice of completion by March 31, 2023 of the interim corrective action related to conducting an LRV Operator Education Campaign. RTD will file notice of completion of the remaining corrective actions consistent with the approved implementation schedule deadlines.

LRV Operator Education Campaign (Completed by March 31, 2023)

20. To address potential employee tampering with the LRV camera system, RTD conducted an education campaign to remind employees of the mandatory operation of in-cab cameras, the responsibility to ensure that cameras are not obstructed or disabled, and the disciplinary consequences up to and including termination for obstructing or tampering with onboard cameras. A bulletin was issued to all LRV operators on December 30, 2022. **Attachment 10, TR-22-05, Bulletin Onboard Cameras.** This bulletin was reviewed with all active operators and supervisors obtained signed acknowledgements from operators, controllers, training instructors, and field supervisors. Supervisors will obtain acknowledgements from operators on leave upon their return to service.

V. CONCLUSION

21. RTD remains committed to continuous assessment of and improvement in its safety management system and LRV operations and to completing all outstanding CAPs. RTD hereby provides notice of completion of all five corrective actions by all approved deadlines and respectfully requests that the Commission approve the closure of CAP01-09212022. RTD hereby provides its notice of completion of all six corrective actions by all approved deadlines and respectfully requests that the Commission approve the closure of CAP02-09212022. Notice of completion of the remaining corrective actions for CAP03-09212022 will be filed with the Commission consistent with the approved implementation schedule for each.

Respectfully submitted this 27th day of July 2023.

Regional Transportation District

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