

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.

**COMMISSION DECISION APPROVING RTD
CORRECTIVE ACTION PLANS**

Mailed Date: December 7, 2022
Adopted Date: December 7, 2022

I. BY THE COMMISSION

A. Statement

1. On September 21, 2022, a Regional Transportation District's (RTD) light-rail vehicle derailed at the intersection/crossing of Sable Boulevard and Exposition Avenue in the City of Aurora resulting in the decoupling of the two light-rail vehicles and three injuries requiring transport.

2. RTD filed a copy of the confidential accident with Staff on November 4, 2022, which is currently under review by Staff. RTD also filed its proposed Corrective Action Plans (CAP), confidentiality. RTD filed CAP1-09212022 and CAP2-09212022. Staff has started reviewing the proposed CAPs in relation to the accident investigation report and will bring forth recommendations to the Commission in the coming weeks. There were two proposed items in CAP1-09212022 that needed immediate attention by the Commission, and three remaining items in CAP1-09212022 for which Staff believes

additional information needs to be provided by RTD for the Commission to understand what is being proposed.

3. By Decision No. C22-0721 mailed November 18, 2022, the Commission approved the first two items of CAP1-09212022.

4. By Decision No. C22-0763 mailed November 23, 2022, the Commission ordered the status of the CAP's filed by RTD to be changed from highly confidential to non-confidential.

5. Also on November 23, 2022, RTD filed the additional information requested by the Commission as part of Decision No. C22-0721, consisting of plans showing the proposed sign, how large the sign is proposed to be, where it will be posted, and a review to see if the sign might contribute to any unintended consequences (*e.g.*, sight distance obstruction), and the proposed location of the radar sign relocation in relation to the intersection/crossing.

6. Finally, RTD filed information regarding its safety assurance analysis of the corrective actions previously ordered by the Commission as part of the 2019 corrective action plans.

B. Findings of Fact

7. RTD's CAP1-09212022 has three remaining elements for review and CAP2-09212022 needs review in its entirety.

8. The three remaining elements for CAP1-09212022 include: 1) add additional signage on A Track to warn operators of the Sable Boulevard and Exposition Avenue curve; 2) relocate the radar sign further north to allow more advanced warning to operators; and 3) develop a formal plan for implementation of ATS to be north of the curve on the A Track.

9. At the request of the Commission, RTD filed plans showing location of the proposed signs listed in items 1 and 2 above. These plans are helpful for us to understand the locations and types of signs proposed for the alignment. These items are proposed to be implemented by December 31, 2022.

10. The last element in CAP1-09212022 is to develop a formal plan for implementation of ATS to be installed north of the curve on A Track. RTD proposes to file this plan by June 30, 2023. Once implemented, the Automatic Train Stop would replace the current stop and proceed operations since the ATS installation would stop a train operating outside of the operational parameters.

11. CAP1-09212022 proposes six elements of corrective action. These elements include: 1) Strengthening safety assurance efforts for operator ride checks and ensure appropriate staff supervisory efforts as outlined in the LRT 121-06-Operator Ride Checks process and procedure; 2) Create monthly reports for lagging indicators and determine appropriate leading indicators for quality assurance and radar checks; 3) Evaluation of the on-time performance metric and other metrics that may promote undesired behaviors; 4) Evaluation of the schedule to reduce on-time performance pressure; 5) Light Rail Operations will develop a business case for supervisors' roles and responsibilities in determining appropriate staffing levels; and 6) Evaluate supervisor assignments throughout the system.

12. The hazard analysis performed for CAP2-09212022 describes the hazard as distracted operations. This specific hazard cause is identified as human factors related that has the effect of causing a train derailment, property damage, injuries, and/or fatalities, and causes service disruption. RTD has identified this hazard as a 1C hazard, which is considered serious and undesirable with the severity identified as catastrophic and the probability defined as remote

in the risk assessment matrix found in the State Safety Oversight Program Standard at Rule 4 *Code of Colorado Regulations* (CCR) 723-7-7350(d) of the Rules Regulating Railroads, Rail Fixed Guideways, Transportation by Rail, and Rail Crossings.

13. The six elements identified in CAP2-09212022 are the proposed measures to resolve and/or reduce additional hazards occurring at this location caused by human factor issues.

14. RTD's first proposed corrective action is to strengthen safety assurance efforts for operator ride checks and to ensure appropriate staff supervisory efforts by December 31, 2022. Safety assurance is a process to ensure the implementation effectiveness of the safety risk mitigation measure, in this case processes for operator ride checks. If the safety assurance process, after collection, analysis, and assessment of gathered information shows the risk mitigation measure is not meeting or exceeding the safety objectives of the risk mitigation, RTD would take the available information and work through the safety risk management process again until the risk mitigation solution implemented is effective as shown by the data collected, analyzed, and assessed.

15. RTD's proposed second corrective action is to create a monthly report for lagging indicators and determine appropriate leading indicators for quality assurance and radar checks. Lagging indicators collect and analyze data that is observable and/or measurable based on a change or changes that have taken place. An example of this would be observing and collecting data of operator compliance with the stop and proceed operations. Leading indicators are measurable data collected and analyzed that can be used to predict changes in operations and/or operator behavior. This RTD corrective action proposes to determine leading indicators that can

provide assurance of quality of operations and radar checks of operators. RTD proposes to have this report created by March 31, 2023.

16. RTD's proposed third corrective action is to evaluate the on-time performance metric and other metrics that may promote undesired behaviors. For example, if an operator is arriving late at stations compared to the published times, that operator may speed up between stations to get back on schedule. RTD proposes completing these evaluations by March 31, 2023.

17. RTD's proposed fourth corrective action is to evaluate schedules to reduce on-time performance pressures. As discussed above, schedules may not allow enough time for operators to move from station to station and the operating speeds for the corridor and could be contributing to one-time performance pressures. RTD proposes completing these evaluations also by March 31, 2023.

18. RTD's proposed fifth and sixth corrective actions are for Light Rail Operations to develop a business case for supervisor's roles and responsibilities in determining appropriate staffing levels and evaluating supervisor assignments throughout the system. Field supervisors currently provide oversight of operators and operations throughout the RTD Light Rail system. Supervisors perform radar checks of operators to measure if operations are within the required speeds. Supervisors also perform efficiency checks of operators to measure if operations are occurring as required by the rules and procedures developed by RTD. RTD proposes to complete the business case development and supervisor assignment evaluation by March 31, 2023.

C. Analysis

19. As was the determination in the previous derailment that occurred at the Sable Boulevard/Exposition Avenue intersection/crossing, the cause of the accident can be contributed to human factors of overspeed into the curve and operator distraction. We previously approved corrective actions that were to address the human factors issues that caused the accident. As a result of the 2019 derailment, RTD established monthly campaigns for field supervisors to complete in addition to daily information about speed, station, policy, and safety checks. RTD piloted efficiency testing of its operators, which based on the CAP's developed for the 2022 derailment have moved beyond the pilot stage and into on ongoing oversight of operators.

20. The proposed corrective actions outlined in CAP1-09212022 also look to address the human factors identified by implementing a stop and proceed operation requiring operators to stop at the Sable Boulevard/Exposition Avenue intersection/crossing prior to entering the crossing, reducing speed along the alignment so operators are able to reduce speed prior to the stop and the intersection/crossing, adding advance warning signage to show a right-turn that includes the 10 miles per hour speed limit through the crossing, and relocating the radar sign further north of the intersection/crossing to provided operators speed related information so operators can reduce speed prior to stopping at the intersection/crossing. These four items are proposed to occur prior to the end of the year.

21. The fifth element of CAP1-9212022 requires RTD to develop a formal plan for implementation of ATS prior to the intersection/crossing that would automatically stop the train before it enters the crossing if the train is moving too fast. The ATS system would ultimately replace the interim stop and proceed operations.

22. The proposed corrective actions outlined in CAP2-09212022 look to analyze changes in operations that increase oversight of operators by field supervisors and that look at the existing schedule to see if it may be contributing to the undesirable behavior of operations. These identified corrective actions will influence operators to correct operator behavior by actions not directly in control by the operators.

D. Conclusion

23. We will approve RTD's proposed CAP's. We will continue our review of the accident report and also review the safety assurance analysis of the previous corrective actions and may require further CAPs for this derailment.

24. We will require RTD to file copies of the analyses including the formal plan for implementation of ATS, the monthly report with lagging indicators and the determination of appropriate leading indicators for quality assurance and radar checks with explanation of how the leading indicators were developed and why RTD believes these leading indicators will contribute to understanding and quality assurance for operations, and the evaluations of the on-time performance metrics and other metrics, and the review of the schedule to determine if the performance pressure may be promoting undesired operator behavior by the target dates outlined in the CAPs.

II. ORDER

A. The Commission Orders That:

1. The corrective action plans (CAP's), CAP1-09212022 and CAP2-09212022 are approved.

2. The Regional Transportation District (RTD) is required to file copies of the analyses including the formal plan for implementation of ATS, the monthly report with lagging indicators and the determination of appropriate leading indicators for quality assurance and radar checks with explanation of how the leading indicators were developed and why RTD believes these leading indicators will contribute to understanding and quality assurance for operations, and the evaluations of the on-time performance metrics and other metrics, and the review of the schedule to determine if the performance pressure may be promoting undesired operator behavior by the target dates outlined in the CAPs.

3. This Decision is effective on its Mailed Date.

(S E A L)



ATTEST: A TRUE COPY

A handwritten signature in cursive script, appearing to read "G. Harris Adams".

G. Harris Adams,
Interim Director

THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

ERIC BLANK

JOHN GAVAN

MEGAN M. GILMAN

Commissioners