

**Staff Corrective Action Plan (CAP) Report Summary to  
The Colorado Public Utilities Commission  
On Regional Transportation District  
Rail Fixed Guideway System CAPs  
For Quarter January 1, 2024 through March 31, 2024**

**SUMMARY OF CAPs**

This quarterly CAP report is being provided to the Commission pursuant to Commission Rule 4 *Code of Colorado Regulations (CCR) 723-7-7347(c)(IV)*.

Under the requirements of Rule 7347(c), any CAPs that meet a risk assessment code of 1A, 2A, 1B, 2B, or 1C are required to be filed formally with the Commission for review and approval before RTD begins its safety risk mitigation activities. Any reported hazards or identified areas for corrective action that do not meet the above-stated risk assessment codes are reviewed and preliminarily approved by Staff with final approval by the Commission through a Commission Decision coming from this report.

New CAPs

During the January to March 2024 timeframe, there were six new CAPs issued.

Four were issued as a result of an accident

- CAP01-01232024 resulted from an accident reported when an LRV derailed over a switch in the Elati yard. A Student Operator was asked to move a four-car consist. While making this move, the operator was asked to allow mechanics to remove one of the cars. The operator threw a switch that the consist was coupled over. When making the move, the LRV derailed causing damage to the hydraulic fitting releasing a small quantity of hydraulic oil on the rails and ties.
- CAP01-01242024 resulted from an accident reported when an LRV derailed on the mainline by the Hampden Hy-rail pad. The LRV began shedding wheel / tire components between Louisiana Pearl Station and University station and the operator noticed performance issues. By the Colorado Station, wheel/tire components were being shed at an increasing rate. Operator contacted Control asking about train issue reports from the previous operators-none reported. Operator continued southbound from Colorado to Yale Station with significant performance issues and just south of Yale Station, experienced catastrophic failure of one wheel/tire assembly; another tire was also affected. There was significant damage to the alignment infrastructure, rolling stock and the wheel structure of the LRV.
- CAP01-02132024 2024 resulted from an accident reported when a contractor, LORAM, was conducting rail grinding on the Consolidated Main Line (CML) flyover on B-Track, going

approximately 4-5 mph, when the rear axle of the tractor unit of the tractor-trailer grinding system shifted resulting in a derailment.

- CAP01-02292024 resulted from an accident reported when a Service and cleaning employee was entering the wash bay with an LRV. The LRV made contact with the arm from the wash machine that wasn't fully retracted causing damage to the LRV.

Two were issued as a result of a reported Hazards

- CAP01-01192024 resulted from a hazard reported when a Maintenance of Way (MOW) crew moving replacement rail sticks via cart system from Bayaud Yard to Southeast Corridor; as the towing vehicle was climbing the Broadway flyover, carts #2 and #3 (three cart system) broke loose from cart #1 that was connected to the towing vehicle. Carts #2 and #3 rolled freely from the flyover back into Broadway station carrying eight rail sticks into the station; the carts stopped near the north high block (ADA ramp) in the station. There were no injuries.
- CAP02-01192024 - When investigating the hazard, video shows an MOW worker standing on the running board outside of the moving hy-rail vehicle.

#### CAPs Reviewed for Closure

Staff has been working with RTD to review documentation and verify the implementation of the existing open CAPs to determine if any have been completed and can be closed.

Staff verified CAP actions through discussion with RTD Safety personnel and reviewing documentation for the following two CAPs.

CAP01-06272023 and CAP01-11082023

The review of the documentation shows that RTD has completed the required elements for these CAP's and they are ready to be closed.

Summaries of the 25 CAPs that are either still open or are being recommended for closure are as follows:

<b>CAP Tracking Number</b>	<b>Location</b>	<b>Nature of Event</b>	<b>CAP Action(s)</b>	<b>Initial/ After CAP Risk Assessment Code</b>	<b>CAP Status</b>
CAP09-11132020	PUC Staff / SSO Audit	1) Lack of written process and documentation for Safety Training Matrix and curriculum 2) Lack of a single agency training management system utilizing the Workday training module to document training programs and track training.	1) Continuation of SMS and OSHA-recommended training; 2) Safety will conduct a gap analysis of the safety curriculum and develop a Safety Training Matrix. 3) Meet with each business unit to integrate into their existing training programs. 4) Document and track the agency's Safety Training matrix, curriculum, and program in Workday.	2C/2D	Open
CAP01-10272021	Elati Yard	Distracted operator. Poor visibility style of wash bay doors.	1) Manage risk of distracted operations; specific to yard and facility operations. 2) Applying a high visibility color on shop doors	4E/4E	Open
CAP01-11112021	RTD ISR	RTD does not have a formal process for analyzing equipment inspection and maintenance data as part of the Hazard Identification process and procedures.	Asset management collects and analyzes equipment inspection maintenance data at a high level for certain assets. RTD needs to formalize the process	3D/3E	Open

CAP02-07272022	PUC Staff / SSO Audit	RTD does not currently have processes and procedures or is in the process of developing processes and procedures for parts of the Safety Risk Management Program. RTD needs to provide written documentation of its processes and procedures or add missing information for the parts of the Safety Risk Management Program	Implementation of Operational Risk Management (ORM) will include capturing risk on a risk register. The non-infrastructure management of change process is being implemented in Cority. Once Cority is implemented, the safety hazard identification process (close calls, near misses, and hazards) will capture events. Current reporting is performed in Laserfiche and captures reports that are presented monthly to the Colorado Public Utilities Commission. Develop a process for ensuring high-potential investigations recommendations have been addressed and completed with oversight by the Leadership Safety Committee.	3D/3E	Open
CAP03-07272022	PUC Staff / SSO Audit	RTD does not currently have processes and procedures or is in the process of developing processes and procedures for parts of the Safety Assurance Program. RTD needs to provide written documentation of its processes and procedures or add missing information for the parts of the Safety Assurance Program	-Write into the revision of the ICRC policy how to capture items that examine changes that did not follow the formal ICRC process. Provide training on RTD's Management of Change process. -Note in the PTASP and Light Rail Design Criteria that any new rail lines or vehicles must have the design criteria reviewed to ensure meet or exceed the design criteria. Review existing Light Rail Design Criteria and update sections if needed. -Review/update the ICRC procedure to validate its	3C/3D	Open

			effectiveness and determine if action needs to be taken to correct any deficiencies. -RTD will examine the Federal Transit Administration Safety and Security Certification handbook (2002 version) and the American Public Transportation Association (APTA) guidelines and incorporate those requirements in summary form into the RTD Management of Change procedure. RTD will take an integrated approach to look at what the FTA requires of the PUC and select issues identified and apply them to the Management of Change process		
CAP04-07272022	PUC Staff / SSO Audit	RTD does not currently have a written Safety and Security Certification Review Process	Formalize the Safety Certification process and determine which items require safety certification.	3D/3E	Open
CAP03-09212022 22I-0471R	Sable and Exposition	LRV Derailment	CAP Details contained in Commission Decision No. C23-0160	1C	Open
CAP02-11222022 23I-0047R	19 <sup>th</sup> Street & Stout Street	1) Gaps in internal policies, procedures, and oversight. The Asset Management System and the Safety Management System are relatively new and maturing at different rates throughout the agency. Documentation and	Interim: 1) Utilize ORM assessments as part of the asset information (data) used to make prioritizations for asset renewals 2) Evaluate the downtown rail replacement project, including revising conditional assessments of the remaining sections, to update the prioritization of replacements scheduled 3) Evaluate industry track	1B/3B	Open

		<p>processes need to be developed to address this challenge.</p> <p>2) The rail replacement program is not adequate to maintain a state of good repair within the downtown loop.</p> <p>3) Asset management tracking is done by function and not by asset class.</p> <p>4) Cross-department coordination on rail infrastructure replacement to ensure alignment with and accountability for the Transit Asset Management Plan (TAMP) and Public Transportation Agency Safety Plan (PTASP) is not optimized.</p>	<p>standards, including Federal Railroad Administration (FRA) standards, to determine whether a more robust classification method exists to document wear</p> <p>4) Conduct asset management bypass process training at the asset steward level, including assistant general managers, superintendents, senior managers, and managers</p> <p>Final:</p> <p>1) Develop and implement an Asset Class Strategy (ACS) for light rail infrastructure including all asset types and subtypes</p> <p>2) Enhance asset tracking and evaluation criteria to include areas in the light rail infrastructure that have known accelerated wear, deterioration, or corrosion.</p> <p>3) Evaluate the cross-department coordination procedures for rail infrastructure replacement to ensure alignment and accountability with the approved TAMP and PTASP</p> <p>4) Integrate Operational Risk Management (ORM) and Safety Assurance into the decision-making process for asset renewals.</p>		
<p>CAP01-03112023 23I-0143R</p>	<p>Jeffco Station</p>	<p>LRV Derailment</p>	<p>Interim:</p> <p>1) Update the Fit for Duty checklist to include an attestation from the Supervisor that they performed the check and from the employee that they are fit for duty.</p>	<p>1B</p>	<p>Open</p>

			<p>2) Consider further enhancements to the Fit for Duty process</p> <p>3) Conduct a Fatigue Awareness Campaign, which includes information regarding the hazards of operating a vehicle while taking certain medications</p> <p>Final:</p> <p>1) Include Fatigue Awareness in recertification training biennially.</p> <p>2) Implement a comprehensive Fatigue Risk Management Program (FRMP) similar to the Federal Railroad Administration (FRA) FRMP</p> <p>3) Evaluate the starting time and duration of shifts for service.</p>		
CAP01-03202023	Broadway flyover	Almost a train-on-train collision	<p>Interim:</p> <p>1) Bulletin to Controllers, all Supervisors, and Operators regarding movement through switches during switch inspections. Acknowledged and signed for by all transportation personnel.</p> <p>2) Bulletin to MOW to include a procedural change to switch inspections. Acknowledged and signed for by all MOW personnel.</p> <p>Final:</p> <p>1) Update MOW RWP training to include procedural changes to switch inspections.</p> <p>2) Create a recertification syllabus on movement through switches during</p>	2C	Open

			switch inspections. 3) Operators and Controllers will be trained in RWP.		
CAP1-04062023	County Line and Dry Creek	LRV derailed after going through a switch not lined properly	<p>Interim:</p> <ol style="list-style-type: none"> <li>1) Job briefings will be updated to include details regarding employee roles and responsibilities to verify track alignment if the task is non-routine</li> <li>2) Issue a bulletin to all appropriate staff that all non-powered switches must be lined by hand and verified for each movement by qualified staff</li> <li>3) The spring mechanism at spring and return switches will not be used during special operations or non-routine train movement; all non-powered switches will be hand-lined and verified</li> <li>4) Safety stops will be made in advance of all switches within the block and verification of proper switch alignment, including switch point tight against the stock rail, will be obtained before proceeding over the switch when authorized to proceed past stop signals</li> </ol> <p>Final:</p> <ol style="list-style-type: none"> <li>1) Modify the job briefing form to include a review of hazards associated with the job, such as electrical, equipment, modified procedures, and non-standard operating conditions</li> <li>2) Update SOP 104.5 on</li> </ol>	1C/3C	Open



			<p>switches to include more detailed inspection process on how to visually verify that a switch point is in proper alignment</p> <p>3) Train all appropriate staff on the procedure and refresh training on Light Rail SOP 104.5 and Light Rail Rules 6.1 and 6.2</p> <p>4) Revise training to include for operators to look at each side of the rails when traveling through a switch point for initial training and refresher training</p>		
CAP01-05042023	RTD ISR	Lack of bridge preventative maintenance activities by RTD Capital Programs	<p>Interim:</p> <p>1) Evaluate industry standards for bridge maintenance programs</p> <p>2) Update Bridge Maintenance Manual (BMM) with RTD bridge maintenance strategy, implementation plan, and roles and responsibilities</p> <p>3) Develop resourcing strategy and plan</p> <p>4) Continue bridge maintenance based on defects identified in routine inspections</p> <p>Final:</p> <p>1) Improve method and system to track bridge defects to closure</p> <p>2) Integrate the Operational Risk Management (ORM) process into the bridge management program</p> <p>3) Implement updated bridge maintenance strategy based on updated BMM, resourcing strategy, and roles and responsibilities</p>	3C/3D	Open

<p>CAP01-06082023</p>	<p>Elati Yard</p>	<p>LRV derailed when the mechanic made a normal move through a switch in the diverging position.</p>	<p>Interim:                      1) Implement yard safety refresher training that includes proper yard movement for light rail maintenance employees surrounding recent unsafe yard operation events.2) Electro mechanic disciplined in accordance with the CBA</p> <p>Final:                      1) Employees off work more than 30 days will be required to be recertified in LRV Maintenance yard training with a passing score of 100%. 2) Implement yard safety refresher training that includes proper yard movement for light rail transportation employees surrounding recent unsafe yard operation events. 3) LRV Maintenance will update SOP and associated documents to include yard audit operations for proper switch throwing and verifying alignment, speed control and use of electronics while driving an LRV.</p>	<p>2C/2D</p>	<p>Open</p>
<p>CAP01-06272023</p>	<p>Elati Yard</p>	<p>LRV made contact with bridge bar of wash bay door</p>	<p>Interim:                      1) Facility Maintenance to contact the door manufacturer to determine possible solutions to prevent door drift                      2) Retrain operator on incident/accident reporting requirements and Rule 8.8 to ensure roll-up door is in the fully open position prior to entering the bay</p>	<p>3D/4D</p>	<p>Recommended for closure</p>

			<p>3)General Superintendent will issue a bulletin regarding verifying bay doors being fully opened</p> <p>4)Review and update 103.200, Event Investigations, to ensure personnel are aware of the correct steps of scene preservation and investigation including lockout/tagout and red flagging track procedures as they apply to event investigations</p> <p>5) LRV Maintenance will lockout/ tagout any damaged equipment and/or place a cone in the doors of any bays that are out of service</p> <p>Final:</p> <p>1) Light Rail Transportation shall establish and assign dedicated personnel whose duties and responsibilities shall be to maintain yard operations</p> <p>2) Safety department to roll out training on policy and procedure 4001, Event Notification, Reporting and Investigation to Light Rail supervision</p>		
CAP01-08162023	Switch 205A	Train was exiting manual block at SW-205A, switch was misaligned for movement to B-track, instead of continuing NB on A-track. Train continued through crossover and proceeded NB on B-track.	<p>Interim:</p> <p>1) Issue Light Rail Bulletins</p> <p>2) Implement Safety Campaign to have field supervisors ride along to verify operators' understanding of switch alignments</p> <p>3) Assign one primary Controller to oversee complex events, with verbal turnover to prior to taking a</p>	2C/4D	Open

			break  Final: 1) Conduct workload analysis for complex events		
CAP01-08212023	Elati Yard	LRV Operator encountered several system faults in LRV 275 at the Elati Light Rail Yard. The Operator reported this to Control and was instructed to replace it with LRV 225, and when doing so, the LRVs were coupled over a switch, causing the first two cars of the three- car consist to go down separate tracks. Immediate action was taken to halt movement, and on- site mechanics identified coupler damage. Operations were temporarily suspended, an investigation was initiated, and the LRV Maintenance team realigned the trains. The incident resulted in equipment damage but no injuries.	Interim: 1. Orchestrate and distribute a Bulletin regarding not coupling over switches and rulebook updates regarding not coupling over switches to all Operators. 2. Review the rulebook, SOPs and training to ensure written processes are in place to address coupling over switches and update as needed.  Final: 1. Conduct an assessment of the feasibility of yard visual aids and indicators to assist operators in proper switch operations and coupling operations.	4C/4C	Open
CAP01-09292023	RTD Summer 2023 ISR	During an ISR it was discovered that multiple inspection documentation was missing.	Interim • Update all site folders with recent inspection records • Provide electronic access to all FM Managers and Supervisors for inspection records	3D/3E	Open

			<p>Final</p> <ul style="list-style-type: none"> <li>• Formalize procedure to conduct regular review of fire system records</li> </ul>		
CAP01-10292023	Elati Yard	LRV Derailed over switch 23N in Elati Yard. Operator was moving the train from track 17 to track 23. Snow Plow on train struck the rail with minimal damage.	<p>Interim:</p> <ol style="list-style-type: none"> <li>1) A bulletin covering cold weather operations regarding switch operations and the location of switch brooms will be distributed to all operators.</li> <li>2) Cold weather operations campaign will be conducted to address issues that affect train operations when there is snow and ice.</li> </ol> <p>Final</p> <ol style="list-style-type: none"> <li>1) Develop and implement cold weather operations training and recertification training in the yard and on the alignment for operators</li> <li>2) Evaluate the feasibility of installing switch heaters in the Elati yard</li> </ol>	2B/3C	Open
CAP01-11082023	25 <sup>th</sup> Street & Welton Street	LRV inbound from 30 <sup>th</sup> and Downing Station encountered a stationary train at the 25 <sup>th</sup> & Welton Station	<p>Interim</p> <ol style="list-style-type: none"> <li>1) When there are roadway workers, the Division office will change the train orders to have a highlighted area that notes “special instructions.”</li> </ol> <p>Final</p> <ol style="list-style-type: none"> <li>1) Ensure Operator training includes that each student must go through work zones during their training. If there are no work zones, live simulations may be enacted. Documentation of the training and signed acknowledgment of the instructor and trainee must be kept on file.</li> <li>2) Train orders will be</li> </ol>	2C/2D	Recommended for closure

			changed to reflect “special Instructions” for scheduled roadway work. There will be specific instructions on the train orders indicating where the flagger will be located and what directions they must follow e.g., after the flagger allows you to pass through, follow normal signal indications.		
CAP01-01192024	Broadway Station Flyover	Maintenance of Way (MOW) crew moving replacement rail via cart system from Bayaud Yard to Southeast Corridor; as the towing vehicle was climbing the Broadway flyover, carts #2 and #3 (three cart system) broke loose from cart #1 that was connected to the towing vehicle. Carts #2 and #3 rolled freely from the flyover back into Broadway station carrying all rail sticks (eight 40’ sticks) into the station; the carts stopped near the north high block (ADA ramp) in the station.	Interim 1)Tether Rail carts together with load securing chains to prevent a runaway cart and secure rail properly with straps, General Superintendent MOW or designee to work with safety and schedule an initial inspection of the secured rail on the cars prior to use. 2) Write an Internal Work Instruction (IWI) for MOW Track Maintainers and Rail Laborers regarding securing loads and protection against shifting and falling cargo. 3) Provide training to MOW Track Maintainers and Rail Laborers on securing loads. Final Purchase carts designed specifically for hauling rail. (note: long lead times in procuring equipment and potential that carts may need to be built	2C/3C	Open
CAP02-01192024	Broadway Station Flyover	MOW worker standing on the running board outside of the moving hy-rail vehicle.	Interim 1) MOW and LRVM to issue a memo to workforce who operate or work around hy-rail vehicles implementing safety measures around prohibited	3B/3D	Open

			<p>workers from standing on the outside of hy-rail vehicles while they are in motion on rail tracks.</p> <p>Final</p> <p>1) Modify SOP 105.10, hy-rail vehicle operations, to provide clear instructions prohibiting a worker from standing on the outside of a hyj-rail vehicle while in motion to ensure worker safety. Modifications to include JHA with scope of work for non-routine hy-rail operations.</p> <p>2) Modify SOP 103.25, Recovery Vehicle Shuttle Wagon Operation, to provide clear instructions prohibiting a worker from standing on the outside of a hy-rail vehicle while in motion to ensure worker safety.</p>		
CAP01-01232024	Elati Yard	<p>A Student Operator was asked to move a four-car consist. While making this move, the operator was asked to allow mechanics to remove one of the cars. The operator threw the switch that the consist was coupled over. When making the move, the LRV derailed causing damage to the hydraulic fitting releasing a small quantity of hydraulic oil on the rails and ties. There were no injuries.</p>	<p>Final</p> <p>1) Increase on the job training (OJT) to 40 hrs for initial training to include both operations and maintenance personnel for yard training</p> <p>2) Expand assessment from CAP01-08212023 to assess the feasibility of yard visual aids for various scenarios to determine whether adding or improving visual aids will help prevent future derailments.</p> <p>3) Revise Light Rail Standard operating procedure (SOP) 101.1, Radio Procedures, to standardize radio protocol and reduce potential distractions.</p>	3B / 3C	Open

			4)Train employees who utilize the radio on the revised radio procedure - employees will sign off on the training		
CAP01-01242024	Mainline - Hampden Hy-rail pad	An LRV derailed on the mainline by the Hampden Hy-rail pad. The LRV began shedding wheel / tire components between Louisiana Pearl Station and University station and the operator noticed performance issues. By Colorado Station, wheel/tire components were being shed at an increasing rate. Operator contacted Control asking about train issue reports from the previous operators- none reported. Operator continued southbound from Colorado to Yale Station with significant performance issues and just south of Yale Station, experienced catastrophic failure of one wheel/tire assembly; another tire was also affected. There were no injuries. There was	Interim 1) Maintenance - Third party Metallurgical testing to determine if tire was defective. 2) Control/Maintenance - create a standardized SOP/Internal Work Instruction for Controllers to use when Operators report mechanical issues in service 3) Operations - Reinforce Stop Work authority/Good Faith Safety Challenge; Operators ability to stop without authorization from control when potential unsafe conditions may be present Final 1) Maintenance - Modify RTD tire truing process standard, train, and communicate to affected employees; Pending metallurgical analysis report, tire condemning standard will be reviewed. 2) Maintenance - Create and/or update SOP or Internal Work Instructions on LRV tire truing process and wheel lathe machines to be utilized; to include training and communication. Performed Service documented on wheel lathe, consistent, and repeatable. 3) Maintenance - Create standardized procurement process for tires and	2C/3D	Open



		significant damage to alignment infrastructure, rolling stock and the wheel structure of the LRV.	<p>accompanying hardware to maintaining proper par levels; Tire procurement process, new tires on hand, par levels, procedure for restocking</p> <p>4) Operations/MOW Maintain increased MOW windows of maintenance (e.g., May 2024 Run board adjustments); MOW increase rail grinding to the system as needed</p>		
CAP01-02132024	CML Flyover	A contractor, LORAM, was conducting rail grinding on the Consolidated Main Line (CML) flyover on B-Track, going approximately 4-5 mph, when the rear axle of the tractor unit of the tractor-trailer grinding system shifted resulting in a derailment. There were no injuries.	<p>Final</p> <p>1) MOW will supply the contractors with information (e.g., drawings, layout, descriptions) of the job scope and will have the contractor confirm in writing that they have the appropriate equipment to perform the service.</p> <p>2) MOW will request driver certifications, experience (e.g., length of service performing the requested duties and CDL qualifications) from the contractor</p> <p>3) MOW will require contractor to perform equipment inspections prior to each shift and provide documentation to RTD.</p>	3B/3C	Open

CAP01-02292024	Elati Yard	A Servicing and cleaning employee was entering the wash bay from track 1. The LRV made contact with the arm from the wash machine that wasn't fully retracted causing damage to the LRV. There were no injuries, tows or police response.	<p>Interim</p> <p>1) Update SOP 102.16 Wash Bay Safety to state employees must ensure the wash bay is clear of debris in the dynamic envelope. This will be reviewed with all service and cleaning and operations personnel documented by signatures.</p> <p>2) Service and cleaning supervisors will perform an inspection of the wash bays at the beginning of each shift to ensure it is clear of debris and in good operating condition with daily inspections documented.</p> <p>Final</p> <p>1) Review processes and procedures for Facility Management work orders, create a tracking process to follow through to completion and also elevate the work order level when a safety issue is involved.</p> <p>2) Repair the wash bay brush mechanisms so that they are stabilized to emulate the wash bay 14 mechanism.</p>	4D/5E	Open
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**CONCLUSION**

The six new CAPs: CAP01-01192024 ,CAP02-01192024, CAP01-01232024, CAP01-01242024, CAP01-02132024 and CAP01-02292024 submitted by RTD have been reviewed by Staff and have been completed in accordance with the requirements of Rule 7347. Staff recommends the Commission give final approval including monitoring to closure.

Based on Staff’s review of required documentation of CAP activities for: CAP01-06272023 and CAP01-11082023 Staff recommends the Commission close the two CAPs.

