

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO

PROCEEDING NO. 13A-0813R

IN THE MATTER OF THE APPLICATION OF THE REGIONAL TRANSPORTATION DISTRICT AND UNION PACIFIC RAILROAD COMPANY FOR AUTHORITY TO ALTER AN AT-GRADE CROSSING AT ULSTER STREET (U.S. DOT # 804638W) IN THE CITY AND COUNTY OF DENVER, STATE OF COLORADO.

**COMMISSION DECISION GRANTING
MOTION IN PART WITH CONDITIONS**

Mailed Date: April 1, 2016
Adopted Date: March 30, 2016

TABLE OF CONTENTS

I. BY THE COMMISSION.....2

 A. Statement.....2

 B. Findings of Fact.....2

 1. Limited Use of Personnel to Aid Bicyclists.....2

 2. Exit Gate Operations.....5

 3. Findings on Exit Gate Operations.....8

 4. Filing of Status Reports.....9

 5. Traffic Signal Layout and Phasing.....10

 6. Signing and Striping.....11

 7. Advanced Preemption Calculations.....12

 C. Conclusions.....12

II. ORDER.....13

 A. The Commission Orders That:.....13

 B. ADOPTED IN COMMISSIONERS’ WEEKLY MEETING March 30, 2016.....15

A. BY THE COMMISSION**1. Statement**

1. This matter comes before the Commission for consideration of a Motion for Permission to Amend Application (Motion) filed by the Regional Transportation District (RTD) on March 11, 2016. RTD requests amendments to its original application regarding: operation of the exit gate management system; roadway design; traffic signal layout and phasing; and, advance preemption calculations at the crossing of Ulster Street, with the Union Pacific Railroad Company (UPRR) Limon Subdivision and the RTD “University of Colorado A-Line” (A-Line), National Inventory No. 804638W, in the City and County of Denver, Colorado. RTD proposes these amendments to the application in order to resolve ongoing issues with the East Corridor Light Rail project, now known as the “University of Colorado A-Line”.

2. Now being fully advised in the matter, we grant the Motion in part with additional requirements and conditions.

2. Findings of Fact**a. Limited Use of Personnel to Aid Bicyclists**

3. RTD indicates that the A-Line is currently scheduled to open April 22, 2016 and that the proposed amendments contained in the Motion may not be implemented by that date. RTD claims that any delay to the A-Line opening could cause adverse economic repercussions to RTD and/or its concessionaire for the EAGLE Project. RTD claims that any delay would deprive the travelling public of the benefits of an “otherwise operation-ready mass transit corridor”¹ including relieving pressure on existing transit corridors for an indeterminate period of time.

¹ Motion at ¶ 12

4. Because it is possible that the amendments proposed herein may not be granted in time to allow for implementation of the proposed exit gate management system by the April 22, 2016 opening date, RTD proposes that it be allowed to temporarily address the issue of potential bicyclist interaction with the crossing exit gates by placing a person at each exit gate. The duty of those personnel would be to assist bicyclists as they leave the active crossing.

5. RTD filed its Motion to make changes to the operations at the Chambers crossing on March 11, 2016; 43 days before it intends to begin revenue service of the A-Line train. RTD's witness Mr. Michael Lapinski testified during the hearing on the Chambers Road crossing that there would be a testing and commissioning period for the commuter rail system, which would occur to validate that all of the systems operate properly. The testing period was described as a period where RTD would verify that all of the crossing equipment activates when intended. Mr. Lapinski testified that once testing was complete, there would be a commissioning period where RTD would run its commuter rail vehicles as if they were in revenue service, but without passengers on board, to prove that the system functions as a fully integrated system.²

6. However, there have been serious operational issues with this corridor since the Phase 4 RTD/UPRR joint crossing cut-overs that started the week of May 18, 2015. RTD was informed by Commission Staff after the first crossing cut-over that the crossing was not in compliance with the Commission's order regarding the exit gate vehicle management system.

7. The Commission is aware that during the testing period, numerous safety issues have occurred and continue to occur. These issues include: crossings activated despite the absence of trains activating the crossing; crossings failing to activate with a high-speed commuter rail vehicle approaching and traveling through crossings; commuter rail vehicles entering crossings before exit gates have fully descended; blank-out signs that are illuminated

² Proceeding No. 12A-900R, February 11, 2013 Hearing Transcript, Volume No. 1, at p. 43, ll. 11-22.

when they should not be; blank-out signs that are not illuminated when they should be; and, traffic signals entering into a flash condition due to failure to receive exit gate down indications. Once a traffic signal is in a flash condition, it becomes a four-way stop and is no longer capable of being preempted in order to clear vehicles that may be queued in the crossing.

8. Further, it has come to our attention that RTD has begun construction on the crossing prior to receiving Commission approval as is required pursuant to § 40-4-106, C.R.S.

9. RTD's project management team, General Manager, Board Chair, and its concessionaire were informed by this Commission on November 3, 2015 of the ongoing safety issues with crossings that operate unreliably and continually fail in their operations and the need to correct those issues as soon as possible. To date, RTD and its concessionaire have failed to establish sustainable resolutions to the identified safety problems that continue to put public health and safety at the crossings at risk.

10. For these A-Line corridors that are operation-ready, RTD shall certify in writing to the Commission that the crossing is complete and operational in conformance with the approved design and operational parameters of the crossing. The Commission hereby requires a certification letter to be filed with the Commission no later than April 8, 2016 to allow time for the field demonstration and a report to the Commission.

11. As set forth in the Motion, for the crossing that is not certified, RTD will be required to post personnel at this crossing 24 hours a day, 7 days a week that will immediately handle all safety issues occurring at the crossing. Personnel will include railroad signal personnel to immediately address inconsistent and improper crossing signal operations; personnel able to immediately address and reset traffic signals that have entered into a flash condition; and an appropriately equipped flagger as defined by the Federal Railroad

Administration (FRA) on both sides of the crossing to flag all vehicles and pedestrians through the crossing when it is determined to be safe, and to keep all vehicles and pedestrians from entering the crossing if it is not safe to do so. Appropriate communications will be required to be established between these field personnel and the commuter rail control center so that trains can be timely stopped, or appropriate slow orders placed on commuter rail operations at the crossing to mitigate any crossing operation issues. These personnel will be posted at the crossing until such time as RTD certifies in writing to the Commission that the crossing is complete, operational, and in conformance with the approved design and operational parameters of the crossing. RTD will be further required to demonstrate the proper completion and operation to the Commission.

12. Once RTD is able to demonstrate to Commission Staff that the crossing is complete and operates correctly, consistently, and safely, RTD will be required to make a filing with the Commission that details the corrective action taken and certifies that the crossing meets appropriate standards. Upon approval of the filing, the Commission, will issue a Decision that releases RTD from its obligation to employ crossing personnel as described above.

b. Exit Gate Operations

13. In order to resolve the crossing issues, RTD seeks to change the operations of the exit gates from the previously requested exit gate management system consisting of a dynamic exit gate vehicle detection system to an interim condition fixed minimum delay and dynamic exit gate loop detection system as described by RTD in its Motion.

14. RTD proposes to add a timed exit gate delay of 14 seconds after the activation of the flashing lights and bells at the crossing. Once the flashing lights and bells activate at the crossing, the exit gates would be held up for 14 seconds after crossing activation. This timed exit

gate delay is intended to provide time for certain types of vehicles, such as bicycles, which are unable to be detected by the existing installed exit gate management system to exit the crossing before being trapped in the crossing by the exit gates. After the expiration of the timed exit gate delay, the already installed detection loops would take over and would hold the exit gate in the upright position until any additional detected vehicles have passed through the crossing before allowing the exit gates to descend to close off the crossing to all vehicles. The current exit gate management system designed and installed by RTD is not capable of detecting all types of vehicles.³

15. According to RTD, following implementation of the timed exit gate delay, it proposes to commission and pay for a traffic engineer's study of the timed minimum delay as implemented in the field to evaluate the safety and appropriateness of the delay under field conditions.

16. RTD maintains that this technology will allow it to reliably detect bicycles between gates and to enable a full dynamic exit gate operating mode. However, no such technology has been accepted by the FRA. RTD states that it intends to monitor and encourage development of such technology, and once it becomes reasonably available, to fund and develop a Product Safety Plan and testing procedure, and to apply to the FRA for approval to use such technology. RTD proposes that it submit status reports at six month intervals concerning any available technology, and the Product Safety Plan process.

17. On March 24, 2016, UPRR filed a response to the Motion. While UPRR does not oppose or contest the granting of the Motion, UPRR points out certain design flaws for RTD's

³ Section 42-1-102(112), C.R.S., defines "vehicle" to mean, "a device that is capable of moving itself, or of being moved from place to place upon wheels or endless tracks. 'Vehicle' includes, without limitation, a bicycle, electrical assisted bicycle, or [electric personal assistive mobility device], but does not include a wheelchair, off-highway vehicle, snowmobile, farm tractor, or implement of husbandry designed primarily or exclusively for use and used in agricultural operations or any device moved exclusively over stationary rails or tracks or designed to move primarily through the air."

proposal for exit gate timing to accommodate slower moving vehicles such as bicycles. UPRR notes that the design does not currently meet UPRR, American Railway Engineering and Maintenance-of-Way Association (AREMA), American Association of State Highway Transportation Officials, or FRA design standards. UPRR comments that the design proposes to revise the installed FRA-accepted exit gate timing system design that does comply with UPRR design standards and has been successfully implemented on high speed rail corridors in Illinois and California without the technology to detect non-motor vehicle traffic such as bicycles. UPRR further notes that the RTD design does not have an official FRA statement that the fixed delay in exit gate descent will not be an activation failure; nor is the design supported by any data showing bicycle traffic at any of the given crossings has the need for such fixed exit gate delay in descent. Finally, UPRR notes that RTD's design has not yet been the subject of a field traffic engineering study.

18. UPRR acknowledges that RTD has proposed to perform a traffic engineering study to assess the timed exit gate delay and provides recommendations as to how such a study should be conducted. UPRR also acknowledges that the exit gate timing proposed in the Motion satisfies the Commission Order of September 20, 2013⁴ with respect to exit gate vehicle detection for both northbound and southbound traffic at the crossing.

19. UPRR reserves the right to adjust the exit gate timing in the event the FRA determines that any of the exit gate timing is or may constitute an activation failure. UPRR also reserves the right to provide information and data to all parties of record, and the Commission, regarding exit gate issues and technology at any time, including at the proposed scheduled updates. Additionally, UPRR reserves the right to review the study findings of the RTD –

⁴ Decision No. C13-1163 issued September 30, 2013 in this proceeding.

commissioned traffic engineer and propose immediate recommendations to all parties of record and the Commission consistent with those findings.

c. Findings on Exit Gate Operations

20. While we acknowledge UPRR's concern with the implementation of the timed exit gate delay in this matter, we do not believe that FRA would determine a timed exit gate operation as an activation failure given that Appendix A Part 222 – *Approved Supplementary Safety Measures* to the FRA train horn rule, Section 8C.06 of the 2009 *Manual on Uniform Traffic Control Devices* Section, and Part 3.3.10 of the AREMA Communication and Signals Manual discusses and allows for the use of a timed exit gate delay at four-quadrant gate crossings.

21. We agree with UPRR's assertion that this matter has not yet been the subject of a field traffic engineering study although the Commission dealt with a very similar situation with the timed exit gates on the RTD West Corridor.

22. As to UPRR's comments regarding implementation of four-quadrant gates without the ability to detect bicycles in Illinois and California, we note that these four-quadrant gate systems are being implemented in Colorado where statute defines vehicles as including bicycles. We cannot speak to the laws of Illinois or California as to whether bicycles are treated as vehicles as they are in Colorado.

23. UPRR reserves its right to adjust the exit gate timing in the event the FRA determines that any of the exit gate timing may constitute an activation failure. Based on our previous discussion that FRA allows such timed exit gate delay, we do not believe that FRA would find an activation failure if the crossing works as authorized by this Commission, with such a required exit gate delay. Consequently, UPRR will not be authorized to make any

changes to any exit gate delay once implemented without approval from this Commission for such a change. The remainder of the issues for which UPRR reserves rights will be addressed through the Commission's proposed mechanism for managing further issues regarding the exit gates on this corridor.

24. We find that in light of the inability of the exit gate vehicle management system designed and installed by RTD for this project to detect all vehicles that use this crossing, a timed exit gate delay is the appropriate solution. We also find that the methodology used to determine the amount of time necessary to delay the start of descent of exit gates at the crossing is appropriate. RTD is permitted to delay the start of the descent of the exit gates for a minimum of 12 seconds from the start of the activation of the flashing lights and bells at the crossing.

d. Filing of Status Reports

25. The City and County of Denver (Denver) filed a response to the Motion requesting that RTD provide Denver with a) copies of the "status reports" concerning any available technology and the Product Safety Plan process mentioned in the Motions, b) a copy of the "engineer's study" of the interim fixed minimum delay as implemented in the field to evaluate the safety and appropriateness of the delay under the field conditions, and c) information regarding the "appropriate person" to be located at the exit gate for assistance as referenced.

26. To the extent that RTD proposes to conduct a study of the timed exit gate delay implementation, it is free to do so. However, no further changes to the exit gate operations will be permitted in this proceeding. Any changes that RTD may wish to propose in the future will require a new application with the Commission.

27. Regarding RTD's proposal to submit status reports at six-month intervals concerning any available technology and the Product Safety Plan process, any study of any type of technology and testing of such technology will require a separate filing with the Commission in a separate miscellaneous proceeding to determine appropriate testing locations and types of technology to be tested. The miscellaneous proceeding will serve as a repository for RTD to file status updates and research and testing results, as well as any other reports or materials the Commission deems appropriate to fully apprise it of the testing methodologies and of the efficacy of the technology tested. This process will address some of UPRR's and Denver's comments made in response to the Motion. We open a miscellaneous proceeding for this matter to include the railroads and local government agencies involved with crossings on the EAGLE project. These entities include RTD, UPRR, BNSF Railway Company, the City of Aurora, the Denver, Adams County, the City of Arvada, the City of Wheat Ridge, and the City of Westminster.

e. Traffic Signal Layout and Phasing

28. RTD also proposes to make several changes to the traffic signal at the subject crossing including revisions to the traffic signal phasing, and changing traffic signal heads at specific locations at the traffic signal.

29. RTD proposes to change the phasing of the traffic signal plan so that the pre-signal indications do not change to green until the downstream signal indication is green as well and requests flexibility to alter the traffic signal phasing to improve intersection operations.

30. In reviewing the phasing originally approved for this crossing, the safety critical elements are the track clearance phase to clear off any vehicles that may remain on the tracks and a phase in the signal that turns the pre-signal red while allowing enough green time at the

intersection to clear vehicles from the track area during every signal cycle. As long as these two elements are contained within the revised phasing, we will allow flexibility in altering the traffic signal phasing to allow the opportunity to improve intersection operations after the corridor has opened for revenue service. We require that Staff of the Commission be included in this process to monitor operations and ensure that no crossing safety issues are created during this process. The final phasing plan shall be filed with the Commission once operations are finalized.

31. RTD proposes to replace the programmable signal heads located on the pre-signal with standard traffic signal heads and to replace the standard traffic signal heads mounted on the side of poles at the intersection with programmable heads.

32. The Commission finds that while not a safety issue, the programmable signal heads on the pre-signal have since been found to be unnecessary and that replacing the standard traffic signal heads with programmable traffic signal heads at the side of pole locations will provide a more consistent display of information to drivers.

33. Consequently, we will permit the replacement of the traffic signal heads. Based on field observations by Commission Staff, we do not believe that there is a safety issue if the traffic signal heads are not changed until after the A-Line is in operation.

f. Signing and Striping

34. RTD proposes to move advance warning signs to line up with pavement markings, and remove an R4-7 “Keep Right” sign from the median and paint the median nose yellow for northbound Ulster Street. This location of this sign blocks the flashing lights at the crossing. Crossbucks and number of tracks signs are also added to the pedestrian flashing light facilities. However, field visits by Commission Staff and a review of Google Earth aerial and

street view photos of the crossing reveal that many of the proposed changes have already been completed prior to Commission authorization.

35. We will allow the removal of the “Keep Right” sign as it creates a safety issue in that the sign is blocking the active warning devices at the crossing and additional signing and striping changes.

g. Advanced Preemption Calculations

36. RTD provides revised advance preemption calculations for the crossing to update the input values to reflect the as-built geometry. RTD states that the advance preemption time calculation has not changed significantly and does not require a redesign of the systems equipment.

37. We have reviewed the advance preemption timing changes. The railroad signal design includes 25 seconds of minimum warning time where the advance preemption calculations use 20 seconds of minimum warning time for the calculations. The advance warning time calculated decreases by one second from the original calculations. We do not see a need to change the advance warning time at this crossing from the 32 seconds originally applied for and previously ordered.

3. Conclusions

38. The Commission has jurisdiction in this matter under §§ 40-4-106(2)(a) and (3) (a), C.R.S.

39. The Motion filed by RTD is unopposed. Therefore, based on the Findings of Fact, we find good cause exists and the requirements of public safety are met by granting the Motion in part consistent with the discussion above.

B. ORDER**1. The Commission Orders That:**

1. The Motion for Permission to Amend Application filed by the Regional Transportation District (RTD) on March 11, 2016, requesting amendments to its original application regarding operation of the exit gate management system, roadway design, traffic signal layout and phasing, and advance preemption calculations at the crossing of Ulster Street with the UPRR Limon Subdivision and the RTD "University of Colorado A-Line", National Inventory No. 804638W, in the City and County of Denver, Colorado is granted in part with additional requirements and requirements for additional filings consistent with the above discussion.

2. RTD and UPRR are required to implement a timed exit gate delay of 14 seconds at the subject crossing.

3. RTD is required to file its letter of completion certifying that the subject crossing is complete and operational in compliance with the Commission's requirements for this crossing with the understanding that the approved traffic signal controller change, traffic signal head changes and phasing changes will not occur until after April 22, 2016, and is required to schedule field demonstrations with Commission Staff for Staff to verify that all elements of the crossing are complete and that the crossings are operating as designed and ordered. This certification letter will be filed with the Commission by April 8, 2016 to allow time for the field demonstration and a report to the Commission.

4. If RTD is unable to certify safe, complete and correct crossing operations in writing by April 8, 2016, RTD will be required to post personnel at this crossing 24 hours per day that can immediately handle all safety issues occurring at the crossing. Personnel will include

railroad signal personnel to immediately address inconsistent and improper crossing signal operations, personnel able to immediately address and reset traffic signals that have entered into a flash condition, and appropriately equipped flaggers as defined by the Federal Railroad Administration on both sides of the crossing to flag all vehicles and pedestrians through the crossing when safe or to keep all vehicles and pedestrians from entering the crossing if it is not safe to do so when safety issues are occurring with crossing signal operations. Communications will need to be established between these field personnel and the commuter rail control center so that trains can be stopped in time as necessary or appropriate slow orders placed on commuter rail operations at the crossing if necessary to mitigate crossing operation issues. These personnel will be posted at the crossing until such time as RTD certifies in writing to the Commission that the crossing is complete and operational in conformance with the approved design and operational parameters of the crossing and is able to demonstrate the completion and proper operation to the Commission

5. RTD is required to scheduled field demonstrations with Commission Staff for Staff to verify that all elements of the crossing are complete and that the crossings are operating as designed and ordered.

6. The Commission will open a miscellaneous proceeding that will include all railroads and local government agencies affected by crossings that are part of the EAGLE project. This proceeding will be used to file any further reports on the four-quadrant gate operations, monitoring and development of technologies to reliably detect bicycles between gates to enable full dynamic exit gate operating modes in the future, development of testing procedures, determination of crossing locations to test the proposed technologies, the Product

Safety Plan, and any other issues that need to be address with the exit gate vehicle detection system issue.

7. The 20-day period provided for in § 40-6-114, C.R.S., within which to file applications for rehearing, reargument, or reconsideration, begins on the first day following the effective date of this Decision.

8. The Commission retains jurisdiction to enter further decisions as necessary.

9. This Decision is effective on its Mailed Date.

**2. ADOPTED IN COMMISSIONERS' WEEKLY MEETING
March 30, 2016.**

(S E A L)



ATTEST: A TRUE COPY

Doug Dean,
Director

THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF COLORADO

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Commissioners