

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

PROCEEDING NO. 18A-0809R

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IN THE MATTER OF THE APPLICATION OF THE CITY OF LOUISVILLE FOR AUTHORITY TO INSTALL 4-QUADRANT RAILROAD GATES WITH FLASHING LIGHTS, BELLS, CONSTANT WARNING TIME CIRCUITRY, AND NEW SIGNAL CABIN, AT TRACKS OWNED BY BNSF RAILWAY COMPANY CROSSING SOUTH BOULDER ROAD, USDOT NO. 244804N, IN BOULDER COUNTY, STATE OF COLORADO.

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**RECOMMENDED DECISION OF  
ADMINISTRATIVE LAW JUDGE  
MELODY MIRBABA  
GRANTING APPLICATION**

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Mailed Date: September 10, 2019

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**I. STATEMENT**

**A. Summary**

1. This Decision recommends that the Public Utilities Commission grant the City of Louisville's (City) above captioned Application.<sup>1</sup> As discussed in detail, the City's proposed changes to the subject crossing are designed to qualify the crossing to become a quiet zone under federal rules. The Decision only addresses the proposed changes to the crossing, and not whether the crossing should be designated or qualifies to be designated as a quiet zone, as that is not within the Commission's jurisdiction.

2. The primary disputes in this proceeding surround the City's proposal to install a four-quadrant gate system at the crossing, maintain simultaneous preemption to coordinate vehicular and rail traffic at the crossing, and whether the City's proposed changes appropriately consider pedestrian safety. The Decision also addresses the City's additional requests for relief and other issues.

3. This Decision summarizes the procedural background, identifies the relevant law, makes factual findings, applies the law to the facts, draws conclusions, and addresses the City's additional requests for relief.

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<sup>1</sup> In reaching this Decision, the Administrative Law Judge has considered all arguments and evidence presented, including those not specifically discussed.

## II. BACKGROUND, RELEVANT LAW, FACTUAL FINDINGS, ANALYSIS, AND CONCLUSIONS

### A. Background

4. This matter concerns the City's Application for Authority to Install 4-Quadrant Railroad Gates with Flashing Lights, Bells, Constant Warning Time Circuitry, and New Signal Cabin at Tracks Owned by BNSF Railway Company Crossing South Boulder Road US DOT No. 244804N, in Boulder County, Colorado (Application). BNSF Railway Company (BNSF) objects the City's Application. The City and BNSF are the only parties to this proceeding.

5. The Administrative Law Judge (ALJ) scheduled this matter for an evidentiary hearing on the Application for June 13 and 14, 2019. Decision No. R19-0352-I. The ALJ called the matter for hearing as noticed. All parties appeared at both days of the hearing and were represented by counsel.

6. The ALJ addressed several preliminary matters before commencing the evidentiary portion of the hearing, starting with recent filings. First, the ALJ granted BNSF's pending Unopposed Motion for Steve Phillips to Testify Telephonically (filed on June 11, 2019). The ALJ also acknowledged and approved the parties' "Stipulation . . . Concerning Constant Warning Time Circuitry" (filed on June 12, 2019) (Stipulation). The Stipulation indicates that the parties agree that the City's Application seeks to upgrade constant warning time circuitry at the crossing, and that BNSF withdraws its objection to the City's Application based on its assertion that the City should install or upgrade constant warning time circuitry. Stipulation at 1-2.

7. Finally, the parties agreed, and the ALJ ordered that the pre-filed electronic versions of the parties' exhibits will be admitted into evidence by administrative notice<sup>2</sup> when those exhibits are offered and admitted during the course of the hearing. Pre-filed electronic exhibits are the exhibits the parties filed, as reflected in the Commission's E-Filing System for this proceeding. Admitting the pre-filed electronic exhibits rather than paper copies of the exhibits best preserves the evidentiary record because the parties' exhibits include numerous photographs, sketches, and diagrams, whose images may lose clarity after being electronically scanned for inclusion in the official administrative record.

8. The parties largely stipulated to the admission of hearing exhibits. During the hearing, the following pre-filed electronic exhibits were admitted into evidence by administrative notice: Hearing Exhibits 1 to 5; Hearing Exhibits 100 to 120; and Hearing Exhibits 123 to 157. Hearing Exhibit 300 was also admitted into evidence without objection.<sup>3</sup> Hearing Exhibit 300 lists each exhibit admitted into evidence by administrative notice, and identifies the specific pre-filed electronic exhibits in the administrative record that are admitted by administrative notice. All exhibits admitted into evidence are referred to as a "Hearing Exhibit" and are listed in Hearing Exhibit 300 with the filing date, the filing party, and the document title in the Commission's E-Filing System.<sup>4</sup>

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<sup>2</sup> The fact noticed is that the pre-filed hearing exhibits admitted into evidence are the pre-filed electronic hearing exhibits in the administrative record for this proceeding as reflected in the Commission's E-Filing System for this proceeding.

<sup>3</sup> Hearing Exhibit 300 is the only exhibit not admitted by administrative notice.

<sup>4</sup> The parties use different title formats for their pre-filed hearing exhibits in the Commission's E-Filing System (e.g., "BNSF Hearing Exhibit 100" and City's "Exhibit 3 – Part 3.1.10 AREMA 2019."). Hearing Exhibit 300 eliminates the potential confusion this inconsistency creates by identifying each exhibit admitted into evidence as a Hearing Exhibit, and directly connecting it to the pre-filed hearing exhibit in the Commission's E-Filing system. For example, Hearing Exhibit 300 identifies Hearing Exhibit 1 as the document titled "Exhibit 1- Curriculum Vitae of Stephanie Anzia, P.E." in the Commission's E-Filing System that the City filed on June 7, 2019 in this proceeding. Hearing Exhibit 300 also includes a description of each admitted hearing exhibit; those descriptions are not factual findings.

9. Ms. Stephanie Anzia, Mr. Timothy March, and Mr. Lawrence Lang testified on behalf of the City. Ms. Amber Stoffels, Mr. Kenneth Rusk, and Mr. Steven Phillips testified on behalf of BNSF. At the close of the hearing, the parties asked, and the ALJ approved an extension of the deadline to file statements of position to June 28, 2019; this deadline was later extended to July 3, 2019. Decision No. R19-0561-I. The parties each timely filed statements of position.

## **B. Relevant Law**

### **1. Jurisdiction and Burden of Proof**

10. The Commission has authority to determine, order, and prescribe the terms and conditions for the construction, installation, operation, maintenance, and warning for the tracks or other facilities of any railroad corporation across any public highway, at, below, or above grade in Colorado. § 40-4-106(2)(a), C.R.S. (2018). The Commission is specifically empowered to regulate, determine, and prescribe the terms and conditions for the installation of signaling systems, “safety appliance devices, or such other means or instrumentalities” as may appear to the Commission to be “reasonable and necessary to the end, intent, and purpose that accidents may be prevented and the safety of the public promoted” at crossings subject to the Commission’s jurisdiction. *Id.* Thus, public safety is integral to the Commission’s decisions when considering changes to a highway-rail crossing.

11. The City, as the proponent of an order, bears the burden of proof by a preponderance of the evidence. §§ 13-25-127(1) and 24-4-205(7), C.R.S.; Rule 1500 of the Commission’s Rules of Practice and Procedure, 4 *Code of Colorado Regulations* (CCR) 723-1. The preponderance standard requires the fact finder to determine whether the existence of a contested fact is more probable than its non-existence. *Swain v. Colorado Department of*

*Revenue*, 717 P.2d 507, 508 (Colo. App. 1985). A party has met this burden of proof when the evidence, on the whole and however slightly, tips in favor of that party. *Schocke v. State, Dep't of Revenue*, 719 P.2d 361, 363 (Colo. App. 1986).

12. Although the preponderance standard applies, the evidence must be substantial. Substantial evidence is such relevant evidence as a reasonable person's mind might accept as adequate to support a conclusion; it must be enough evidence to justify, if the trial were to a jury, a refusal to direct a verdict when the conclusion sought to be drawn from it is one of fact for the jury. *City of Boulder v. Colorado Public Utilities Commission*, 996 P.2d 1270, 1278 (Colo. 2000) (internal citation omitted).

13. Thus, as pertinent here, the City must show by a preponderance of the evidence that its proposed changes to the crossing are reasonable and necessary "to the end, intent, and purpose that accidents may be prevented and the safety of the public promoted." § 40-4-106(2)(a), C.R.S.; see §§ 13-25-127(1), 24-4-205(7), C.R.S.; and Rule 1500, 4 CCR 723-1.

## **2. Commission Rules and Requirements**

14. The railroad and the road authority may seek authority from the Commission to install or modify active or passive warning devices at a public highway-rail crossing. Rule 7203(d) of the Rules Regulating Railroads, Rail Fixed Guideways, Transportation by Rail, and Rail Crossings, 4 CCR 723-7; see also Rule 7001(d) (railroad is any person possessing railroad facilities) and (f) (road authority is an entity that owns or maintains the public highway at the crossing); and Rule 7201(u), (v) and (hh), 4 CCR 723-7.

15. Among other requirements, applications to modify or install active or passive warning devices must include a "detailed railroad cost estimate," and schematic diagram of the

crossing warning devices, and must “specifically identify the equipment response time, advanced preemption time, minimum warning time, clearance time, buffer time, and total warning time.” Rule 7204(a)(X)(C) and (D), 4 CCR 723-7.

16. Applications involving pathway crossings must include information on the existing or estimated number of pedestrians and bicycles passing through the pathway crossing each day, and 5 and 20-year projections of the number of pedestrians and bicycles using the pathway crossing. Rule 7204(a)(III), 4 CCR 723-7. These requirements do not apply to applications involving highway-rail crossings which do not encompass a pathway crossing. *See* Rule 7204(a)(I), (II), (III), and (X), 4 CCR 723-7. A pathway crossing refers to the point where pathways (public ways separated from a highway and intended for non-vehicular traffic), are constructed across tracks or railroad facilities, and vice versa. Rule 7201(dd) and (ee), 4 CCR 723-7. Pathways and pathway crossings are not “sidewalks contiguous with, or separated but adjacent to and within 25 feet of highway-rail crossings.” Rule 7201(dd), 4 CCR 723-7.

17. Separate active control devices may be omitted at pathway crossings located within 25 feet of a highway-rail grade crossing equipped with an active traffic control system. Rule 7008(a) (incorporating the Manual on Uniform Traffic Control Devices for Streets and Highways’ (MUTCD) Sections 1A.13, 4L.03, and 8 (2009 Edition)), 4 CCR 723-7; and MUTCD, § 8D.06, ¶ 2.<sup>5</sup>

18. The road authority is responsible for maintaining the public highway while the railroad is responsible for maintaining the highway-rail crossing’s signals and devices for the life

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<sup>5</sup> All citations to the MUTCD in this Decision are to the 2009 Edition.

of the crossing at its own expense. § 40-4-106(2)(b), C.R.S.; Rules 7211(h) and (i), and 7301(a), 4 CCR 723-7.

19. Preemption is the transfer of normal traffic operation to a special control mode of operation to coordinate vehicular and rail traffic. Rule 7008(a); and MUTCD, § 1A.13, ¶ 152. Simultaneous preemption occurs when notice of approaching rail traffic is given to the highway traffic signal controller unit and the railroad warning devices at the same time. Rule 7201(nn), 4 CCR 723-7 and MUTCD, § 1A.13, ¶ 212. Advance preemption occurs when notice of approaching rail traffic is given to the highway traffic signal controller unit before the railroad warning devices are activated. Rule 7201(c), 4 CCR 723-7 and MUTCD, § 1A.13, ¶ 6.

### **3. Federal Railroad Authority's Final Train Horn Rule**

20. The Commission lacks jurisdiction over quiet zone determinations; that is subject to the Federal Railroad Authority's (FRA) purview. 49 U.S.C. 20106; 49 Code of Federal Regulations (CFR) §§ 222.35 and 222.7(a). Nonetheless, because the City's Application seeks to make changes to the crossing to qualify it as a quiet zone under the FRA's final train horn rule,<sup>6</sup> much of the evidence and arguments discuss the rule, and consider the proposed changes' safety implications based on the assumption that if the Application is approved, the crossing will become a quiet zone, per the FRA rule. Thus, it is helpful to outline the rule's relevant provisions.

21. The FRA's train horn rule aims to "provide for safety at public highway-rail grade crossings by requiring locomotives to sound horns at public highway-rail grade crossings except in quiet zones established and maintained in accordance" with 49 CFR Part 222. 49 CFR

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<sup>6</sup> References throughout this Decision to the federal train horn rule or the train horn rule are to 49 CFR Part 222. Hearing Exhibit 123 is a copy of 49 CFR Parts 222 and 229 and appendices.

§ 222.1. Thus, quiet zone crossings are an exception to the general requirement that trains routinely sound their horns at a public highway-rail crossing. *Id.* Train engineers must not routinely sound their horns at quiet zone crossings, but they retain discretion to sound the train horn for emergencies. 49 CFR §§ 222.45 and 222.23. The train horn rule sets minimum requirements for quiet zone designation to ensure public safety in light of the quiet zone mandate that trains no longer routinely sound their horns. 49 CFR § 222.39 (a) and (b). A road authority has two options to create a quiet zone crossing; the first does not require formal FRA review and approval, while the second does. *Id.*

22. As pertinent here, under the first option, a road authority may designate a quiet zone crossing without FRA review and approval when it implements one or more supplementary safety measures at the crossing. 49 CFR § 222.39(a)(1). A supplementary safety measure is a safety system or procedure which the FRA's Associate Administrator determines is an effective substitute for the train horn in preventing highway-rail casualties; approved supplementary safety measures are identified in Appendix A to 49 CFR § 222. 49 CFR § 222.9.

23. The FRA has approved the four-quadrant gate system as a supplementary safety measure. 49 CFR Part 222 Appendix A, ¶ (A)(2). This means the FRA's Associate Administrator has determined that a four-quadrant gate system is an effective substitute for the train horn in preventing highway-rail casualties. *See* 49 CFR § 222.9. A four-quadrant gate system includes gates sufficient to fully block traffic from entering the crossing when the gates are lowered. 49 CFR Part 222 Appendix A, ¶ (A)(2). All approach and exit lanes on both sides of the crossing must have gates to deny vehicles the option of circumventing the normal approach lane gates by going into an opposing traffic lane to enter the crossing. *Id.* at ¶ (A)(2)(a).

24. The FRA assigns a lower effectiveness rate for a four-quadrant gate system with presence detection (for exit gate operation) because drivers “may learn to delay the lowering of the exit gates by driving onto the opposing lane of traffic” and “other motorists at the crossing . . . may also be tempted to take advantage of the raised exit gate by driving around the lowered entrance gates, thus increasing the potential for a crossing collision.” *Id.* at ¶ (A)(2). The FRA notes that the effectiveness rates do not mean that systems without presence detection are inherently safer than those with presence detection, and provides guidance that the specific location should be reviewed to determine whether site-specific circumstances make using presence detection advisable. 49 CFR Part 222 Appendix A, ¶ (A)(2).

25. As pertinent here, the FRA has also approved a system using extended medians bound by non-traversable curbs (raised medians) on both highway approaches to a crossing as a supplementary safety measure. 49 CFR Part 222 Appendix A, ¶ (A)(3). This supplementary safety measure requires entrance gates combined with raised and extended medians on both crossing approaches. Instead of exit gates, the raised and extended medians prevent drivers from circumventing the approach lane entrance gates by moving into oncoming traffic to enter the crossing. *Id.* Raised medians must be at least 6 inches in height and must extend at least 100 feet from the gate arm.<sup>7</sup> 49 CFR § 222.9 and 49 CFR Part 222 Appendix A, ¶ (A)(3)(b).

26. The FRA’s second option for qualifying a crossing as a quiet zone requires an application, which the FRA must review, analyze, and approve. 49 CFR § 222.39 (b). As relevant here, a road authority may apply for approval of a quiet zone that does not meet the standards in § 222.39(a); the application must propose that one or more safety measures be implemented,

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<sup>7</sup> When there is an intersection within 100 feet of the gate, the raised median must extend at least 60 feet from the gate arm under this supplementary safety measure. 49 CFR Part 222 Appendix A, ¶ (A)(3)(b).

which may include alternative safety measures. *Id.* Among many other requirements, the application must demonstrate “through data and analysis that the proposed implementation of these [safety] measures will reduce the Quiet Zone Risk Index to a level at, or below, either the Risk Index With Horns, or the Nationwide Significant Risk Threshold.”<sup>8</sup> *Id.* at § 222.39 (b)(vii). An alternative safety measure is a safety system or procedure that is not a supplementary safety measure which the FRA’s Associate Administrator individually reviews, analyzes, and determines to be an effective substitute for the train horn in preventing highway-rail casualties at specific crossings. *Id.* at § 222.9. Thus, by definition, the FRA has not already determined that alternative safety measures are an effective substitute for the train horn; they must be reviewed, analyzed, and approved on a case-by-case basis. *Id.*; *see also* 49 CFR Part 222 Appendix B.

27. A modified supplementary safety measure does not fully comply with the requirements for a supplementary safety measure, and is a type of alternative safety measure which the FRA must review, analyze, and approve for quiet zone designation. 49 CFR §§ 222.9 and 222.39(b) and 49 CFR Part 222 Appendix B.

28. When it comes to terminating quiet zone status, the FRA treats quiet zones established through supplementary safety measures and alternative safety measures differently. Specifically, the FRA performs an annual quiet zone risk review for quiet zones established using alternative safety measures; if the FRA determines that the Quiet Zone Risk Index is above the Nationwide Significant Risk Threshold, the quiet zone will terminate within six months. 49 CFR

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<sup>8</sup> The Quiet Zone Risk Index is a measure of the risk to the motoring public reflecting the Crossing Corridor Risk Index for a quiet zone after adjusting to account for increased risk due to the lack of the train horn and reduced risk due to a supplementary safety measure or alternative safety measure. 49 CFR § 222.9. The Risk Index with Horns is the measure of risk to the motoring public when train horns are routinely sounded at every public highway-rail crossing within a quiet zone. *Id.* The Nationwide Significant Risk Threshold is the number reflecting the measure of risk, calculated on a nationwide basis, reflecting the average risk level to the motoring public at public highway-rail crossings equipped with flashing lights and gates, and at which horns are sounded; risk levels above the Nationwide Significant Risk Threshold represent a significant risk of loss of life or serious injury. *Id.*

§ 222.51(a) (1) and (2). In contrast, the FRA does not perform an annual quiet zone risk review for quiet zones established using supplementary safety measures.<sup>9</sup> 49 CFR § 222.51(a)(1). Thus, unlike quiet zones established through supplementary safety measures, quiet zones established using alternative safety measures face an annual risk that the FRA may terminate the quiet zone status. *Id.*

### **C. Factual Findings, Parties' Arguments, Analysis, and Conclusions**

#### **1. City's Application and General Information about the Crossing**

29. As mentioned, the City's proposed changes are part of its efforts to qualify the crossing as a quiet zone under the FRA's train horn rule. Hearing Exhibit 100 at 5.

30. BNSF objects to the City's Application. Generally, BNSF does not consider quiet zone projects a priority, and sees quiet zones as having no benefit to BNSF. 6/13/19 Hg. Tr. at 234: 13-15. In fact, if it were up to BNSF, there would be no quiet zones. *Id.* at 256: 5-7. BNSF prefers the status quo of requiring trains to routinely sound their horns at highway-rail crossings, because it sees the train horn as an important safety measure. *Id.* at 234: 22-25—235:1-7.

31. The Application seeks authority to install a four-quadrant gate system with flashing-light signals, bells, constant warning time circuitry, a new signal cabin, and other minor changes, including a timed exit gate system, moving and replacing signs, and modifying the medians.<sup>10</sup> Hearing Exhibits 100 and 104. The crossing currently includes simultaneous preemption for traffic and railroad coordination at the crossing; the City does not seek to alter this. Hearing Exhibit 100 at 15-16 and Hearing Exhibit 101 at 2. Likewise, the City does not propose changes to the sidewalks at the crossing. Hearing Exhibit 100.

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<sup>9</sup> The FRA may review the status of any quiet zone at its own initiative. 49 CFR § 222.51(c).

<sup>10</sup> The City does not ask the Commission to allocate construction costs to BNSF, so this Decision does not do so. Hearing Exhibit 100 at 6.

32. BNSF objects to the City's proposal to install a four-quadrant gate system and to maintain simultaneous preemption. Second Amended Notice of Intervention of Right (Intervention) and BNSF Statement of Position (BNSF Statement). BNSF has not objected to the proposed timed exit gate system, though this is muddied by BNSF witness testimony and Hearing Exhibits. *See Id.*, and *infra* at ¶¶ 124-125. BNSF withdrew its objection relating to the City's request to upgrade constant warning time circuitry, and has not specifically objected to other aspects of the City's Application, except that it asserts that the City's plans for the crossing do not appropriately consider pedestrian safety. Intervention; BNSF Statement at 22-24; and Stipulation at 1-2.

33. South Boulder Road crosses BNSF's tracks approximately 30 feet east of the signalized intersection with Main Street, in the City of Louisville. Hearing Exhibit 100 at 16 and Hearing Exhibit 104 at 1. South Boulder Road runs east and west; BNSF's tracks (at South Boulder Road) run north and south. Hearing Exhibit 104 at 1. Hearing Exhibit 112 provides a helpful aerial view of the crossing including the South Boulder Road and Main Street signalized intersection. Hearing Exhibit 112 at 1.

34. The posted speed limit for vehicles traveling over the crossing is 35 miles per hour. Hearing Exhibit 100 at 9. The average daily traffic volume of vehicles travelling over the subject crossing is 27,676 vehicles; 3.7 percent of that traffic are trucks. *Id.* No school buses use the crossing. *Id.* Five and twenty-year projections for the average daily traffic volume are 29,190 and 34,245, respectively. *Id.* at 9.

35. The crossing includes a single track; only freight trains use the crossing. Hearing Exhibit 101 at 1. Eight freight trains pass through the crossing between 6:00 a.m. and 6:00 p.m.,

and another eight freight trains pass through the crossing from 6:00 p.m. and 6:00 a.m., for a total of 16 trains per day. *Id.* These trains travel at a maximum speed of 30 miles per hour. *Id.*

36. The FRA has no reports of accidents or incidents involving trains and vehicles or pedestrians. Hearing Exhibit 100 at 4; *see* 49 CFR § 225.11 (railroads must report crossing accidents and incidents; rail equipment accidents and incidents; and death, injury, and occupational illnesses accidents and incidents).

## 2. Four-Quadrant Gate System Versus Three-Quadrant Gate System

37. The crossing currently includes two entrance gates, and medians on both approaches to the crossing. The City proposes to install a four-quadrant gate system, so that both approaches to the crossing will include entrance and exit gates. Hearing Exhibit 104 at 1. The City also proposes to modify the medians on both sides of the crossing to accommodate the additional gates; this construction will result in six-inch medians (*i.e.*, raised medians) on both approaches to the crossing. *Id.* The raised median on the east side of the crossing extends at least 100 feet from the tracks, while the raised median on the west side of the crossing will extend approximately 20 feet. *Id.*

38. With the proposed four-quadrant gate system, the entrance gates are intended to deny drivers access to the crossing from the approach lanes while the exit gates deny drivers the option of moving into opposing traffic to circumvent the entrance gates to access the crossing. *See* 49 CFR Part 222 Appendix A, ¶ (A)(2).

39. The City considered advice from its consultants to reach its decision to pursue a four-quadrant gate design. The City's consultants, (Felsburg Holt and Ullevig), evaluated, provided options, and ultimately designed quiet zone improvements for the subject crossing. 6/13/19 Hg. Tr. at 44: 15-23 and Hearing Exhibit 114 at 1.

40. Ms. Stephanie Anzia is a civil engineer with Felsburg Holt and Ullevig and worked with the City on the subject crossing and quiet zone project. She is a registered professional engineer in the State of Colorado practicing transportation engineering. 6/13/19 Hg. Tr. at 42: 20-24 and Hearing Exhibit 1. She works with local agencies on projects that involve railroads, and specializes in helping communities with crossing improvements, and quiet zone analysis, design, and establishment. 6/13/19 Hg. Tr. at 43: 15-19 and Hearing Exhibit 1. Ms. Anzia has played various roles in quiet zone studies, reviews, design, and establishment involving at least 125 rail crossings in Colorado. Hearing Exhibit 1. She has worked on 20 of the 30 Colorado quiet zones involving approximately 50 individual crossings. 6/13/19 Hg. Tr. at 43: 20-25.

41. In 2014, Ms. Anzia and her firm evaluated the subject crossing for potential quiet zone establishment. *Id.* at 45: 3-7. Ms. Anzia authored a report evaluating the relevant crossing dated February 7, 2014 (2014 report or report).<sup>11</sup> Hearing Exhibit 114. The purpose of the 2014 report was to provide the City with a big picture understanding of where their crossings stood in comparison to the federal train horn rule's requirements for quiet zone establishment, and to provide the City with options to consider and take to its constituency. 6/13/19 Hg. Tr. at 46: 15-25. The 2014 report contains several concept designs for the subject crossing, including a four-quadrant gate concept design, and a three-quadrant gate concept design. Hearing Exhibit 114 at 20 and 22. The 2014 report describes the subject crossing as being an "excellent" candidate for a three-quadrant gate design using a raised median. Hearing Exhibit 114 at 10. The 2014 report also includes a general statement that "[r]aised medians are the lowest cost measure

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<sup>11</sup> The 2014 report does not identify its author, but Ms. Anzia testified that she authored the report. 6/13/10 Hg. Tr. 91: 21-23; *see* Hearing Exhibit 114.

for preventing higher risk behavior of drivers going around the gate arms. Medians should be used wherever possible.” *Id.* at 11. The report draws no conclusions as to whether raised median systems or three-quadrant gate systems are safer options than four-quadrant gate systems. Hearing Exhibit 114.

42. Ms. Anzia worked with the City several years later when the City was ready to move forward with the quiet zone design for the subject crossing. She helped the City review the design options, and chose an option that would meet the FRA’s requirements for a quiet zone and the City’s needs. 6/13/19 Hg. Tr. at 52: 11-25—53:1-6. She explained that the City considered the concept designs from the 2014 report, including the three-quadrant gate design, but ultimately settled on a four-quadrant gate system. *Id.*

43. When choosing the four-quadrant gate system, the City relied on the FRA’s determination that four-quadrant gate systems, as supplementary safety measures, are effective substitutes for the train horn, and that use of such a system qualifies a crossing for a quiet zone designation without formal FRA review and approval. *See* City’s Statement at 7-8. Ms. Anzia agrees with the FRA’s determination that the four-quadrant gate design is safe, and believes that it is appropriate for the subject crossing. 6/13/19 Hg. Tr. at 116: 13-19. Ms. Anzia points to FRA’s extensive efforts in identifying supplementary safety measures, including spending years evaluating potential safety measures to replace the train horn, and engaging in an environmental impact statement process. *Id.* at 48: 9-13.

44. The City also chose the four-quadrant gate system because it wanted an option which would result in a permanent designation as a quiet zone, and one that could be implemented within a known timeline. *Id.* at 52: 25—53:1-4. As a supplementary safety measure, the four-quadrant gate system is preapproved for quiet zone designation, and is a more

permanent measure as compared to quiet zones established through an alternative safety measure. *Id.*; 49 CFR § 222.39 (a) and (b) and 49 CFR Part 222 Appendices A and B. The City was concerned that using an alternative safety measure (such as a three-quadrant gate design) may only temporarily result in a quiet zone designation since the FRA may terminate the measure if there is an incident at the crossing. 6/13/19 Hg. Tr. at 53: 3-4 and at 91: 10-14.

45. BNSF argues that a three-quadrant gate design is better and more reliable and should be used instead of a four-quadrant gate design. BNSF Statement at 17-20. A three-quadrant gate design includes entrance gates at both approaches, an exit gate on one side, and a raised and extended median on the other side (rather than another exit gate quadrant). Hearing Exhibit 132 at 9. The three-quadrant gate system is a combination of two supplementary safety measures, to wit, a four-quadrant gate system and a raised and extended median system. 49 CFR Part 222 Appendix A, ¶¶ (A)(2) and (3); Hearing Exhibit 114 at 10; *see supra* at ¶¶ 23-25. As a result, the three-quadrant gate system is a type of alternative safety measure (*i.e.*, modified supplementary safety measure). 49 CFR Part 222 Appendices A and B.

46. Ms. Amber Stoffels is BNSF's Manager of Public Projects and has worked for BNSF since 2012. She is the main point of contact for public agencies who work with BNSF on projects that involve the company. 6/13/19 Hg. Tr. at 232: 1-4. Her territory includes Colorado, New Mexico, and Wyoming. Ms. Stoffels has a bachelor of science in civil engineering.

47. Ms. Stoffels explained that BNSF objects to the four-quadrant gate system because BNSF believes such systems increase safety risk to BNSF employees who must work in the roadway to maintain the gates. *Id.* at 248: 8-16 and at 265: 12-16. This appears based on an assumption that because a four-quadrant gate system includes additional gates, that employees will spend more time on the road maintaining the gates. *Id.* Ms. Stoffels and BNSF offered no

other facts or data to support the conclusion that maintaining four-quadrant gate systems increases safety risk to its employees. Ms. Stoffels also testified that she is unaware of any incidents at Colorado quiet zone crossings. *Id.* at 264: 22-25.

48. Mr. Kenneth Rusk is a principal at the railroad consulting firm of Kenneth Rusk & Associates, LLC. He is a railroad consultant that BNSF hired to provide opinions on issues in this proceeding, including the City's proposal to install a four-quadrant gate system. Hearing Exhibits 120 and 132. Mr. Rusk has worked in various roles in the railroad industry for approximately 44 years. For example, he spent a number of years in various capacities in railroad construction and maintenance, was a railroad specialist with the Illinois Commerce Commission, and worked for the FRA as a track inspector where he continued for 21 years in various roles. Hearing Exhibit 120. As it pertains to grade-crossing safety, Mr. Rusk's work at the FRA involved managing a regional safety division for several years. 6/14/19 Hg. Tr. at 48: 13-25—49: 1-4. As a part of that, he worked with crossing managers to oversee grade-crossing quiet zone development within the region, providing guidance and recommendations to headquarters to approve grade-crossing quiet zones. *Id.* at 49: 8-15. Mr. Rusk was never involved with the FRA's approval process for alternative safety measures when he was employed there. *Id.* at 129: 5-12. Since retiring from the FRA, Mr. Rusk consults with the railroad industry and others involved with railroads mainly on engineering matters, track maintenance, railroad employee safety, and helping railroads apply "Articles 213 and 214" (FRA regulations). *Id.* at 49: 16-24.

49. Mr. Rusk testified that four-quadrant gate systems are active-warning devices that may confuse drivers if they are in the crossing when the exit gate comes down, and that drivers may become trapped in the crossing. *Id.* at 70: 17-25—71: 1-2; *see* Hearing Exhibit 132 at 9. He believes that exit gates are uncommon, which may confuse drivers. He testified that he has seen

instances where a driver froze and stayed in the crossing, not realizing that they could break through the gates to exit. *Id.* at 71: 3-7. He provided a single example of such a situation that occurred sometime in the 1990s, involving a four-quadrant gate that was not in a quiet zone. *Id.* at 141: 2-15.

50. Mr. Rusk agrees that the FRA has determined that supplementary safety measures are good safety measures. *Id.* at 78: 11-12; *see also id.* at 126: 7-15. He also agrees that a four-quadrant gate system, as a supplementary safety measure, is a safe way to eliminate the train horn at crossings under Part 222 of the FRA's train horn rule. *Id.* at 127: 6-10; *see* 49 CFR Part 222. Finally, he agrees that the City's proposed changes comply with Part 222 of the FRA's train horn rule. *Id.* at 162: 18-23. But, Mr. Rusk prefers the three-quadrant gate system for the subject crossing, for the reasons discussed below. *Id.* at 127: 10-14.

51. Mr. Rusk opined that the City should consider alternative safety measures that would produce a safe crossing environment in a cost effective manner, and not just look at the FRA's pre-approved supplementary safety measures. Hearing Exhibit 132 at 26.<sup>12</sup> He believes that a three-quadrant gate design with a raised median provides a passive, permanent, and reliable safety measure. 6/14/19 Hg. Tr. at 65: 3-23 and 66: 8-20. Mr. Rusk sees the three-quadrant gate system as a more reliable safety measure than a four-quadrant gate system because it depends more on raised medians (than on gates). *Id.* at 66: 8-20.

52. Mr. Rusk is aware that the crossing will include a raised median on the east side of the crossing. Hearing Exhibit 132 at 9. In his view, the raised median makes the exit gate on that side of the crossing redundant. 6/14/19 Hg. Tr. at 128: 3-20.

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<sup>12</sup> Mr. Rusk produced two expert reports in this matter; the first is Hearing Exhibit 119 and the second is Hearing Exhibit 132. Mr. Rusk clarified that Hearing Exhibit 132, "Supplement 1 to Report of Kenneth Rusk" replaces Hearing Exhibit 119. 6/14/19 Hg. Tr. at 161: 21-25.

53. BNSF also objects to the proposed four-quadrant gate system based on the costs to maintain such a system, which it must bear. BNSF Statement at 19-20. Mr. Phillips testified on behalf of BNSF about four-quadrant gate systems. Mr. Phillips is BNSF's Assistant Director of Signal Design and has worked for BNSF for 23 years. He has worked in BNSF's signal department during his entire tenure at BNSF, starting on the signal crew, moving to signal maintenance, then to the engineering office as a planner. Mr. Phillips's Department handles all the train signals and highway grade crossing signals, crossing upgrades, new crossing installations, quiet zones, and preemption issues for BNSF. 6/14/19 Hg. Tr. at 278: 8-14 and at 279: 6-12.

54. Mr. Phillips testified that exit gate maintenance doubles maintenance costs as compared to maintenance costs of a normal crossing. 6/13/19 Hg. Tr. at 288: 16-17. He was uncertain about the actual maintenance costs for exit gates, but "guessed" that annually, maintenance on exit gates is \$12,000. *Id.* at 288:16-25—289: 1-4. He also testified that more gates increase the possibility that the exit gates will be knocked down or off, and that it takes more time to replace damaged or failing exit gates. *Id.* at 285: 6-15 and at 287: 11-17. Mr. Phillips and BSNF did not provide information indicating how often gates are struck by vehicles or otherwise damaged at its crossings (including exit gates), or other facts or data indicating a higher frequency of exit gates being struck as opposed to crossings without exit gates.

55. The evidence was undisputed that the proposed four-quadrant gate system is a supplementary safety measure under the FRA's train horn rule. 6/14/19 Hg. Tr. at 78: 11-12; and 49 CFR Part 222 Appendix A, ¶ (A)(2). It is also undisputed that four-quadrant gate systems are

a safe way to eliminate the train horn at crossings under Part 222 of the FRA's train horn rule. 6/14/19 Hg. Tr. at 127: 6-10.

56. The ALJ finds the FRA's decision that a four-quadrant gate system is an effective substitute to replace the train horn in preventing casualties to be credible and highly compelling evidence that the proposed four-quadrant gate system is a reasonable and necessary measure to serve the purpose of preventing accidents and promoting public safety, particularly in a quiet zone. *See* 49 CFR § 222.9. Indeed, the FRA studied potential safety measures that could be an effective substitute for the train horn for years before identifying supplementary safety measures. 6/13/19 Hg. Tr. 48: 9-13. This makes the FRA's choice to approve the four-quadrant gate system as a supplementary safety measure particularly reliable and credible evidence that such systems serve to prevent accidents and promote the public safety. What is more, the four-quadrant gate system has remained undisturbed as a supplementary safety measure since the FRA's train horn rule became effective in 2006. 49 CFR Part 222 Appendix A, ¶ (A)(2).

57. BNSF's arguments and evidence that a three-quadrant gate system should be used instead of a four-quadrant gate system are unpersuasive. It is undisputed that the three-quadrant gate system is not a FRA-approved supplementary safety measure, and instead, is a type of alternative safety measure. Hearing Exhibit 132 at 9; Hearing Exhibit 114 at 9; 49 CFR Part 222 Appendices A and B. Before alternative safety measures may be used to designate a quiet zone, the FRA must first receive an application, perform a case-by-case analysis and review, and approve the safety measure for use at the specific crossing. 49 CFR § 222.39 (b). The FRA requires the application to demonstrate "through data and analysis" that the three-quadrant gate system "will reduce the Quiet Zone Risk Index to a level at, or below, either the Risk Index With Horns, or the Nationwide Significant Risk Threshold." *Id.* at § 222.39 (b)(vii). No such data and

analysis was presented. Although the Commission lacks authority to determine whether a three-quadrant gate system would qualify the crossing as a quiet zone under FRA's rules, this type of data and analysis would have been useful to evaluate the safety of the three-quadrant gate system that BNSF proposes.

58. The FRA's relative treatment of such systems suggests that the FRA favors the four-quadrant gate system over the three-quadrant gate system as an effective and more permanent substitute for the train horn. For example, by definition, the FRA has not determined that alternative safety measures, such as the three-quadrant gate system, are an effective substitute for the train horn in preventing casualties. *Id.* at § 222.9. And, while the FRA annually reviews all quiet zone crossings established using alternative safety measures, it does not do the same for those established using supplementary safety measures such as the four-quadrant exit gate system. *Id.* at § 222.51(a) (1) and (2) and 49 CFR Part 222 Appendices A and B. This credible and persuasive evidence further tips the scale in favor of the City's proposed four-quadrant gate system as a reasonable and necessary measure to serve the purpose of preventing accidents and promoting public safety.

59. BNSF describes raised medians used in three-quadrant gate systems as more reliable, effective, and permanent safety measures than a system using exit gates. 6/14/19 Hg. Tr. at 65: 3-23 and 66: 8-20. But, the City's proposal encompasses the essential features of a three-quadrant gate system because it includes a raised and extended median on the east side of the crossing. Hearing Exhibit 104 at 1; and *see supra* at ¶ 37. BNSF counters that the raised and extended median renders an exit gate quadrant redundant. *See* 6/14/19 Hg. Tr. at 128: 3-20. The ALJ sees this differently. The raised and extended median offers a redundancy which enhances safety at the crossing.

60. BNSF points to witness testimony that three-quadrant gate systems are better than four-quadrant gate systems because exit gates can fail, and may be struck and damaged by vehicles, while raised medians do not present this vulnerability. Statement at 17-18. BNSF failed to provide any facts or data as to the failure rate of exit gates and frequency that exit gates are struck or damaged by vehicles, even though it is required to report equipment accidents and incidents to the FRA. 49 CFR § 225.11(a)(2). Nevertheless, the proposed changes include a raised and extended median offering redundancy if one exit gate quadrant is struck or fails, while the three-quadrant gate system offers no such safety redundancy.

61. The ALJ finds Mr. Rusk's testimony that drivers may be confused by exit gates and become trapped in the crossing unpersuasive. In support of his conclusion, Mr. Rusk pointed to a single instance of anecdotal evidence which occurred in the 1990s, and provided only a cursory description of that incident. 6/14/19 Hg. Tr. at 70: 24-25—71: 1-7, at 139:13-25—141: 1-15; and Hearing Exhibit 132 at 9. The ALJ does not find this to be reliable or credible evidence that exit gates may confuse drivers and cause them to be trapped in crossings. BNSF provided no credible evidence that exit gates increase the risk of accidents or incidents at crossings, even though BNSF is required to report accidents and incidents to the FRA. 49 CFR § 225.11.

62. BNSF also asserts that four-quadrant gate systems increase safety risk to its employees who maintain the gates. BNSF provided no facts or data tending to show an increased risk of injury or harm to its employees resulting from work to maintain a four-quadrant gate system. In fact, BNSF provided no data at all about injuries to its employees while maintaining any gates at its crossings even though it is required to report incidents and accidents to the FRA. 49 CFR § 225.11(a)(3).

63. For the foregoing reasons and authorities, the ALJ concludes that the City met its burden to show by a preponderance of the evidence that the proposed four-quadrant gate system is a reasonable and necessary measure to serve the intent and purpose of preventing accidents and promoting public safety at the crossing. *See* § 40-4-104(2)(a), C.R.S.

### 3. Simultaneous Preemption Versus Advance Preemption

64. The purpose of railroad preemption is to ensure that vehicular traffic is cleared from the tracks and that no additional traffic is directed toward the tracks while the train is approaching or present. At issue here is whether simultaneous or advance preemption should be used at the subject traffic signals and crossing. City's Statement at 10-12 and BNSF Statement at 20-22. The main distinction between the two is timing. With simultaneous preemption, the traffic signal activates simultaneous with the crossing warning devices to clear traffic from the tracks and ensure that no additional traffic is directed to the tracks. *Supra* at ¶ 19. With advance preemption, the traffic signal activates sometime before the crossing warning devices activate. Under both systems, preemption is triggered when the traffic signal controller receives notice from the railroad that rail traffic is approaching. *Id.* The City wants to maintain simultaneous preemption and BNSF urges that it should be changed to advance preemption.

65. As relevant here, two signalized intersections are subject to railroad preemption for the crossing: South Boulder Road's intersection with Main Street and South Boulder Road's intersection with Centennial Drive. Hearing Exhibit 107 and Hearing Exhibit 112 at 2. Preemption is better understood when considering those intersections' locations in relation to the crossing.<sup>13</sup> When heading east on South Boulder Road, the Main Street signalized intersection is

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<sup>13</sup> Page 2 of Hearing Exhibit 112 provides a helpful aerial view of both intersections and the crossing.

approximately 95 feet before the entrance to the tracks. Hearing Exhibits 104 and 147.<sup>14</sup> When heading west on South Boulder Road, the Main Street signalized intersection is approximately 30 feet after the tracks. *Id.* Continuing west on South Boulder Road after the Main Street intersection, the next closest signalized intersection is at Centennial Drive. Hearing Exhibit 112 at 2. The Centennial Drive signalized intersection with South Boulder Road is approximately 355 feet from the tracks. Hearing Exhibits 104 and 147.

66. The City seeks to remove and replace multiple signs on both sides of the crossing at South Boulder Road informing vehicular traffic where to stop, and warning drivers not to stop on the tracks. Hearing Exhibit 104 at 2. Specifically, the City will install new “Stop Here on Red” signs at the stop line in the westbound direction to the crossing, and will install new “Do Not Stop on Tracks” signs in both approaches to the crossing. *Id.*

67. Traffic at both of the relevant intersections are coordinated from a single traffic signal controller, and are interconnected. 6/13/19 Hg. Tr. at 125: 18-25—126: 1-2. This means that traffic signals at both intersections are synchronized. Synchronizing the traffic signals avoids backups which may prevent traffic clearance over the crossing during preemption. *Id.* at 126: 3-16. The traffic signals are programmed with a preset sequencing that changes when railroad preemption is activated based on the specific preemption program.

68. At the crossing, under simultaneous preemption, when the railroad triggers preemption, it provides at least the minimum 20 seconds’ warning time before a train arrives at

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<sup>14</sup> Hearing Exhibits 104 and 147 are a diagram of the crossing and photos of the area from which distances between the crossing and the relevant signalized intersections can be measured. The referenced figures are approximations based on such measurements.

the subject crossing.<sup>15</sup> Hearing Exhibit 156 at 29. BNSF has not proposed a total warning time for advance preemption.

69. Mr. Timothy March explained the traffic signal preemption phasing at the crossing. He's the City's consultant on signal and system design, and has been involved with the traffic signal phasing and timing for the subject crossing for years. When the traffic signal receives the railroad's preemption call, it enters into three intervals. During the first interval, (track clearance interval), the traffic signals activate to clear traffic over the tracks and to prevent traffic queuing at the tracks. 6/13/19 Hg. Tr. at 127: 16-25; *see* Hearing Exhibit 107.<sup>16</sup> During the second interval, (hold or dwell interval), the traffic approaching the crossing is held (with a red light), and all non-conflicting traffic is allowed to move around the crossing. 6/13/19 Hg. Tr. at 127: 25—128: 1-2 and at 152: 21-25. The final interval, (the exit interval), is triggered at the end of preemption. During this interval, the traffic signal prioritizes the traffic that has been held during preemption, then goes back to normal traffic operations. *Id.* at 153: 21-25—154: 1-4.

70. Generally, advance preemption holds all the traffic heading toward the crossing (as discussed above) for a longer period than simultaneous preemption. That is because the railroad preemption phasing starts earlier under advance preemption, resulting in the hold or dwell interval lasting longer than it would under simultaneous preemption.

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<sup>15</sup> It is possible that simultaneous preemption at the crossing includes additional warning time. BNSF was required to provide complete information relating timing at the crossing, but did not do so. *See* Decision No. R19-0352-I (requiring BNSF to provide design or diagram and to identify the equipment response time, advance preemption time, minimum warning time, clearance time, buffer time, and total warning time for the crossing.).

<sup>16</sup> Hearing Exhibit 107 is a traffic phasing diagram for the relevant intersections. Within that diagram, "OLP" stands for overlap. 6/13/19 Hg. Tr. at 144: 9-18. On Hearing Exhibit 107, overlaps are identified with a coordinated phase; each phase directs the action of overlaps that are connected to it (*e.g.*, if a phase is red, its overlap is red). *Id.*

71. Mr. Larry Lang is the City's transportation engineer consultant, and is working on the City's quiet zone project for the subject crossing; he advised the City on traffic and railroad coordination, preemption, and pedestrian safety at the crossing. Mr. Lang is a senior transportation engineer with Felsburg Holt and Ullevig, a registered professional engineer in Colorado, and a certified Professional Traffic Operations Engineer. 6/13/19 Hg. Tr. at 157: 13-25. Mr. Lang describes himself as a roadway traffic engineer. *Id.* at 214: 23-35. He does transportation engineering and design; he has been a transportation engineer for 27 years and specializes in designing traffic control devices for roadways, traffic signal design, railroad preemption, and designing traffic signing and pavement markings. *Id.* at 158: 1-17. He has worked on projects involving railroad preemption for approximately 13 years. *Id.* at 158: 20-22. He has also worked on projects involving pedestrian treatment at highway-rail crossings in Colorado approximately half a dozen times. *Id.* at 197: 6-14.

72. Mr. Lang explained that advance preemption is appropriate for traffic and rail coordination when vehicles back up or queue over the railroad crossing. *Id.* at 161: 5-11. Doing so alleviates the queues. *Id.*

73. Mr. Lang observed the subject crossing and traffic on several occasions during peak time. *Id.* at 183: 6-18. He did so to determine where vehicles actually stop, as opposed to where they are supposed to stop, in relation to the distance from the tracks. *Id.* at 183: 1-5; *see also id.* at 210: 4-12. He also reviewed the geometry of the intersections, and traffic operations to determine their regular functioning when different lights are triggered. *Id.* at 183: 1-5; and at 209: 16-25. All of this gave Mr. Lang a practical understanding of the traffic flow and queuing in relation to the crossing, as well as a real-world picture of the intersections' operation in relation to the crossing.

74. Under the current configuration, the crossing is in the footprint of the Main Street intersection (*i.e.*, in the area of the intersection itself). *Id.* at 210: 20-22; *see* Hearing Exhibit 112 at 1. Mr. Lang observed eastbound traffic on South Boulder Road queue away from the crossing, not over it. *Id.* at 209: 7-11. Vehicles stopped at the crossing and intersection where they are supposed to stop.<sup>17</sup> *See Id.* at 182: 15-25—183: 1-5. For example, vehicles heading westbound on South Boulder Road toward the crossing, did not stop or queue over the crossing. *Id.* at 209: 5-11. These observations lead Mr. Lang to conclude that vehicles do not queue over the crossing, and as a result, advance preemption is not appropriate. *Id.* at 209: 12-15. Mr. Lang also considered whether there have been reported incidents or accidents at the crossing, which may be an indication of queuing over the crossing. *Id.* at 211:16-25—212:1-2. The FRA has no reports of accidents or incidents at the crossing. Hearing Exhibit 100 at 4. Mr. Lang was also concerned that because advance preemption adds delay, this may negatively impact drivers' behavior (*e.g.*, run a red light, or race across the tracks when the railroad warning devices begin.). 6/13/19 Hg. Tr. at 162: 7-16. Based on all of this, Mr. Lang concluded that the City should maintain simultaneous preemption at the crossing.

75. Aerial photographs of the crossing provide helpful information on where vehicles may queue when approaching the crossing from all directions, and confirm Mr. Lang's observations as to the geometry of the crossing and relevant intersections. Hearing Exhibit 112 at 2 and Hearing Exhibit 147 at 1. With the exception of westbound vehicles on South Boulder Road, all other approaches only allow for queuing away from or parallel to the crossing, and not over it. *Id.* Westbound vehicles on South Boulder Road may queue over the crossing if they do

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<sup>17</sup> Mr. Lang later explained that the stop line (*i.e.*, the place vehicles should stop) in the westbound direction on South Boulder Road is east of the crossing. 6/13/19 Hg. Tr. at 211: 6-8. This is confirmed by photographs of the crossing. Hearing Exhibit 148 at 7.

not stop where they should—at the crossing’s stop line. *Id.* But, as mentioned, Mr. Lang did not observe queueing over the crossing, and instead observed vehicles stopping where they should (*i.e.*, the stop line). 6/13/19 Hg. Tr. at 182: 15-25—183:1-5 and at 209: 5-11; *see also Id.* at 210: 4-12.

76. Mr. Phillips testified on behalf of BNSF in opposition to the City’s proposal to continue using simultaneous preemption at the crossing. Mr. Phillips is not a traffic engineer; he does not design traffic signals or traffic signal phasing. 6/14/19 Hg. Tr. at 7: 4-10.

77. Mr. Phillips explained that it’s BNSF’s policy that only advance preemption be used at crossings in quiet zones. 6/13/19 Hg. Tr. at 301: 11-14. He has not been to the subject crossing, and therefore has not observed the crossing’s operation or geometry. 6/14/19 Hg. Tr. at 9: 4-8. He believes that advance preemption should be used to prevent queuing on the tracks. *Id.* at 8: 10-13. Mr. Phillips agrees that each crossing should be assessed to determine if vehicles are queuing over the crossing, but he did no such assessment here. *Id.* at 8: 6-21 and at 9: 4-8. When asked if he was aware of any queuing that causes traffic to back up on the tracks, he testified that he relied on BNSF’s consultants, who assessed the crossing in 2011. He testified, “[b]ut I’m going on the report and what consultants witnessed while they were out there.” *Id.* at 8: 22-25—9: 1-9. BNSF’s consultants, Campbell Technology Corporation (CTC) issued a report in June 2011 (CTC report). Hearing Exhibit 111.

78. Mr. Phillips referred to CTC’s finding that traffic “had the potential” to back up on the tracks. 6/14/19 Hg. Tr. at 8: 25—9: 1-3. As discussed below, the CTC report does not indicate that its authors observed traffic queuing on the tracks. Hearing Exhibit 111. Mr. Phillips never spoke to CTC about the report or its conclusions. 6/14/19 Hg. Tr. at 22: 1-6. No one from CTC testified at the hearing.

79. CTC inspected the subject crossing in May 2011 after an FRA Safety Advisory recommended this be done at least once every 12 months. Hearing Exhibit 111 at 3. The CTC report discusses the existing traffic control signal and preemption operation, and makes recommendations for improvements. *Id.* at 3. The CTC report does not identify who authored it. Hearing Exhibit 111. Therefore, the report provides no information on its author's background or qualifications.<sup>18</sup> *Id.*

80. The CTC report recommends that the City study existing preemption at the crossing and consider implementing advance preemption, but it does not provide suggested advance preemption timing and calculations.<sup>19</sup> *Id.* at 15. The CTC report concludes that simultaneous preemption does not allow enough time for a stopped design vehicle to receive a green light, start moving, and clear the crossing before gates descend. Hearing Exhibit 111 at 15. The CTC report does not explain how it reached this conclusion.

81. The CTC report relied on the following information in making its assessment, including: a 65-foot tractor trailer design vehicle, a clear storage distance of 19 feet, minimum track clearance distance of 29 feet, and a 6-second green time for the track clearance interval. Hearing Exhibit 111 at 4-5 and 8. Nearly all of these figures are different from the data in the City's Application. *Compare* Hearing Exhibit 111 at 4-5 to Hearing Exhibit 100 at 16-17. The record lacks evidence addressing how the difference in these figures may impact CTC's assessment.

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<sup>18</sup> Mr. Phillips testified that he believes a traffic engineer or engineers authored the report because he believes that CTC is comprised of traffic engineers and that the traffic engineers at CTC author these types of reports. 6/14/19 Hg. Tr. at 36: 12-25—37:1-21.

<sup>19</sup> Mr. Phillips testified that BNSF relies on its consultants to do the appropriate preemption calculations and that a lot goes into calculating the appropriate preemption time. 6/13/19 Hg. Tr. at 300: 1-12 and at 301: 14-18.

82. BNSF also points to another consultant's (RailPros) conclusions in support of advance preemption. BNSF Statement at 10. RailPros became involved with the City's plans to modify the crossing because BNSF required the City to hire a third party consultant to review the City's plans before BNSF would provide an estimate and design for the City's proposed changes. 6/13/19 Hg. Tr. at 61: 19-25—63:1-4. The City was required to choose from a list of BNSF-approved consultants. *Id.* at 63: 15-22. It chose RailPros. *Id.*; see Hearing Exhibit 153.

83. As a part of the third party review, BNSF required the City to complete a preemption calculation form, address the third party consultant's comments, and provide BNSF the completed documentation. *Id.* at 63: 4-6. On June 27, 2019, the City provided BNSF the required documentation and requested that BNSF provide an estimate and design for its proposed changes to the crossing. *Id.* at 62: 20-25—63: 1-14; Hearing Exhibit 153 at 2-9, and Hearing Exhibit 134 at 35.<sup>20</sup>

84. RailPros's comments on the City's plans for the crossing do not include analysis or discussion. Hearing Exhibit 153 at 10-22. The comments are cursory, and in some instances, are not completely visible. Hearing Exhibit 153, at 13 and 15. As it relates to advance preemption, RailPros's comments state, "[m]any agencies prefer to transition the traffic signal to track clearance green through advance preemption for more consistent motorist messaging. Explain preference/expected benefit." *Id.* at 18. In addition, RailPros asks the City to "consider requesting advance preemption to facilitate ROW transfer to track clearance green prior to RR Flashers activating" *Id.* at 20. The City complied with both comments by explaining its preference for simultaneous preemption and considering advance preemption. Hearing

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<sup>20</sup> Pages 2 through 9 in Hearing Exhibit 153 includes the required form (updated in response to RailPros's comments), and the City's written response to RailPros's comments. Pages 10 through 22 include RailPros's comments to the City.

Exhibit 153 at 7-9. In any event, RailPros did not provide information explaining either of its comments, or how it reached the recommendation to consider advance preemption. *See* Hearing Exhibit 153 at 10-22; *see* 6/13/19 Hg. Tr. at 225: 11-21.

85. BNSF asserts that advance preemption is the industry standard for any urban crossing. BNSF Statement at 20. In support, BNSF points to Mr. Phillips's testimony that advance preemption is used almost all of the time across BNSF's systems. *Id.*, citing, 6/13/19 Hg. Tr. at 302: 8-17. This testimony is based on BNSF's policy that advance preemption be used at quiet zones interconnected with traffic signals. 6/13/19 Hg. Tr. at 302: 8-17. BNSF also relies on comments in the American Railway Engineering and Maintenance-of-Way Association (AREMA) that "advance preemption should be considered" with four-quadrant gates connected to a traffic signal. BNSF Statement at 21, citing Hearing Exhibit 3 at 6, ¶ 4. BNSF also points to an Institute of Transportation Engineers' (ITE) report stating that many locations with simultaneous preemption do not have enough delay time. *Id.* at 21, citing Hearing Exhibit 155 at 43. That same ITE report also encourages an analysis of the railroad and traffic control system and warning times "to determine if the use of advance preemption is beneficial." Hearing Exhibit 155 at 43.

86. The ALJ finds the evidence in support of simultaneous preemption credible and persuasive. The City's expert observed the subject crossing and traffic on several occasions during peak time; studied the actual operations at the crossing; analyzed the potential for traffic queuing in relation to the geometry of the relevant intersections and crossing; and considered the appropriate preemption for the crossing in light of the specific preemption phasing for traffic at the crossing. *See supra* at ¶¶ 71-74. The City's expert explained his recommendation to maintain simultaneous preemption, including how he reached his recommendation. *Id.* Notably, Mr. Lang

observed that vehicles do not queue over the crossing, and, based on his analysis and observations, concluded that there is no queuing issue at the crossing. *Supra* at ¶ 74. The City's plans include installing multiple signs that will remind drivers where to stop, and warn drivers not to stop on the tracks. Hearing Exhibit 104 at 2. The evidence was undisputed that simultaneous preemption has operated well and appropriately for years, which is supported by the fact that the FRA has no reports of accidents or incidents for the subject crossing. *Id.*; and Hearing Exhibit 100 at 4.

87. Much of BNSF's evidence in support of advance preemption lacks necessary information to establish its reliability. To start, the CTC report does not identify its authors, or their qualifications. This stands in stark contrast to the City's evidence. More importantly, it fails to provide the basis for its conclusions. For example, the CTC report does not explain the basis for its conclusion that simultaneous preemption does not allow enough time for a stopped design vehicle to receive a green light, start moving, and clear the crossing before gates descend. *See* Hearing Exhibit 111 at 15. What is more, this conclusion appears to assume that westbound vehicles on South Boulder Road that are stopped before the entrance to the crossing (*i.e.*, vehicles stopped for a red light at the stop line) will be permitted to enter the crossing when railroad preemption begins. This contradicts the City's credible evidence describing the particular railroad preemption operation at the crossing to clear traffic *on the tracks* and prevent conflicting traffic from entering the crossing. 6/13/19 Hg. Tr. at 152: 13-25 and Hearing Exhibit 107. The report's conclusion about simultaneous preemption suggests that its authors did not account for the actual preemption operation at the intersections and crossing. This highlights the lack of key evidence explaining CTC's conclusions.

88. The CTC report does not indicate whether its authors considered: the geometry of the intersections and crossing; the traffic signal and crossing's operation; the manner in which traffic actually queues at the crossing; and that the two relevant intersections are interconnected through the same traffic controller unit. Nor does it indicate whether its authors observed traffic queuing over the crossing, or number of times they observed the crossing, or whether they performed calculations which support the report's conclusions. No one from CTC testified to explain the methodology used to reach the conclusions, or any of the gaps in information.

89. The CTC report's reliability is also questionable because it relies on figures that are inconsistent with the City's data. *Compare* Hearing Exhibit 111 at 4-5 to Hearing Exhibit 100 at 16-17; *see supra* at ¶ 81. No evidence was offered to explain the impact of these differences on CTC's conclusions. Even if the CTC report could be relied upon, its ultimate recommendation is merely that the City study the crossing and intersection, and consider advance preemption. Hearing Exhibit 111 at 15. The evidence demonstrated that the City did just this. *Supra* at ¶¶ 71-74.

90. The evidence concerning RailPros's involvement with the crossing is even less helpful. RailPros asks the City to explain its preference for simultaneous preemption, and to consider advance preemption. Hearing Exhibit 153, at 13 and 15. The City complied. Hearing Exhibit 153 at 7-9. Even if RailPros's comments are construed as a recommendation to use advance preemption, the record lacks evidence explaining RailPros's conclusions and the methodology used to reach them. For example, the record lacks information as to whether RailPros performed a field review; observed traffic signal and railroad operations at the crossing; considered the geometry of the crossing; considered or observed traffic queuing over the

crossing; or performed any calculations to reach its conclusions. Hearing Exhibit 153. No one from RailPros testified to explain the significant gaps in information.

91. The ALJ rejects BNSF's argument that advance preemption is the industry standard for urban crossings. In support, BNSF relies on its own policy that advance preemption be used at quiet zone crossings. *Supra* at ¶ 85. BNSF's policy does not establish an industry standard. BNSF's reliance on AREMA and an ITE report to establish an industry standard is misplaced; the cited provisions merely suggest that advance preemption be considered. *Id.* The ALJ finds that this is insufficient evidence to establish an industry standard to use advance preemption. BNSF's argument also disregards guidance in the same ITE report it cites that the specific railroad and traffic control system and warning times be analyzed to determine if advance preemption is beneficial. Hearing Exhibit 155 at 43; and *see* BNSF Statement at 20-21. As discussed, the City's expert considered the specific location, and whether advance preemption would be beneficial; he concluded it would not. *Supra* at ¶¶ 71-74.

92. For the foregoing reasons, the ALJ finds that the City demonstrated by a preponderance of the evidence that simultaneous preemption at the subject crossing and intersections are reasonable and necessary measures to serve the intent and purpose of preventing accidents and promoting public safety at the crossing. *See* § 40-4-104(2)(a), C.R.S.

#### **4. Pedestrian Treatment at the Crossing**

93. The City does not seek to make changes to the pedestrian treatment at the crossing; BNSF questions this because the City did not perform a pedestrian count or study.

94. The crossing includes detached sidewalks and bicycle lanes in both directions on South Boulder Road. 6/13/19 Hg. Tr. at 115: 14-16; *see* Hearing Exhibit 113 at 4 and Hearing Exhibit 112 at 1. The sidewalks are within 25 feet of the crossing. 6/13/19 Hg. Tr. at 119: 18-24

and at 168: 6-8; and Hearing Exhibit 5 at 1. On the north side of South Boulder Road, leading to the crossing, a portion of the sidewalk includes a three-bar metal channelization fence that funnels pedestrians in a straight line on the sidewalk. Hearing Exhibit 148 at 3 and Hearing Exhibit 104 at 1. The sidewalks at the crossings do not include any other gates or other barriers. Hearing Exhibit 113 at 4.

95. The City's plans include multiple visual and audio active warning devices to warn of an oncoming train. Specifically, the City proposes to replace the current entrance gates, and add exit gates, bells, and flashing-light signals on both sides of the crossing. Hearing Exhibits 100, 104 at 1, and 157 at 6. The gates and flashing-light signals will be visible from all sidewalk approaches to the crossing. *Id.*; Hearing Exhibit 5, *see also* Hearing Exhibit 113 at 29, and 6/13/19 Hg. Tr. at 168: 10-18. The audible bell devices on each approach to the crossing will warn pedestrians on sidewalks of an approaching train. Hearing Exhibits 5, 100, and 157 at 6. Bicyclists using the sidewalk will encounter the same warning devices as pedestrians, and those using the bicycle lanes on the street will have the same visual and audio active warning devices as vehicles.

96. The South Boulder Road crossing is within several blocks of schools, residential housing, and other services (*e.g.*, market and gas station). Hearing Exhibit 112 at 2-3. The City has experienced population growth. *See* Hearing Exhibit 132 at 19. The City plans to construct additional walking trails connecting to South Boulder Road, and the City's school district encourages students to bike or walk to school. Hearing Exhibit 135 at 38, and Hearing Exhibit 150.

97. Ms. Anzia and her co-consultant, Mr. Lang worked with the City to consider and address BNSF concerns about pedestrians at the crossing. Hearing Exhibit 5. Ms. Anzia

explained that the City did not perform a pedestrian count for its Application because a pedestrian count is not required by Commission Rules. *See* Hearing Exhibit 100 at 9. She explained that pedestrian counts are only required for proposed changes to a pathway crossing; since this crossing does not include a pathway crossing, pedestrian counts are not required and were not performed. 6/13/19 Hg. Tr. at 118: 5-25—120: 3.

98. Ms. Anzia and Mr. Lang reviewed and analyzed the conditions at the crossing; reviewed and considered the MUTCD and the Railroad-Highway Grade Crossing Handbook for guidance on pedestrian treatment; considered whether there are any known safety issues at the crossing involving pedestrians; and reviewed potential optional pedestrian treatments for the crossing. Hearing Exhibit 5; 6/13/19 Hg. Tr. at 107: 12-17, at 167: 6-25—168: 1-9, and at 171: 22-25.

99. They found that the FRA has no reports of accidents at the crossing and there are no known pedestrian safety issues at the crossing. 6/13/19 Hg. Tr. at 107: 24-25—108:1. Ms. Anzia and Mr. Lang determined that the MUTCD does not require any more pedestrian treatment than what currently exists at the crossing. Hearing Exhibit 5 at 1 and 6/13/19 Hg. Tr. at 109: 6-12. They concluded that because the crossing will have active warning devices (flashing light-signals, gates, and bells), and the sidewalk is within 25 feet of the crossing, the MUTCD does not require additional pedestrian warning devices. 6/13/19 Hg. Tr. at 167: 19-25—168: 1-9; Hearing Exhibit 5 and Hearing Exhibit 156 at 42.

100. Mr. Lang also considered optional pedestrian treatments for the crossing. He supports adding an audible bell device to supplement the one already installed on the north side of the roadway and a “LOOK” sign along each sidewalk approach assuming there is available right-of-way on the outside edge of each sidewalk. Hearing Exhibit 5 at 2. The City proposes to

install multiple audible bells, consistent with Mr. Lang's recommendation. Hearing Exhibit 100 at 5 and *see* Hearing Exhibit 157 at 6. The evidence was unclear as to whether the sidewalks have available right-of-way for "LOOK" sign, but the City's proposal does not include adding such a sign. Hearing Exhibit 100.

101. Mr. Lang evaluated more substantial pedestrian features, such as swing gates and Z-barriers. Z-barriers are mazes that funnel pedestrians in a Z shape so that they turn in opposite directions as they go through the maze. *See e.g.*, Hearing Exhibit 139 at 3-4 (photo of Z-barrier). Mr. Lang does not support installing swing gates or Z-barriers for several reasons. 6/13/19 Hg. Tr. at 173: 2-7.

102. He relies on the MUTCD, which does not require Z-barriers, manual swing gates, or automatic gates for sidewalk crossings, nor does it identify a specific volume of pedestrian traffic that would require such devices. Hearing Exhibit 5 at 2. Mr. Lang also determined that Z-barriers are not intended for single-track freight facilities where the direction of an approaching train can vary (as here). *Id.* He explained that the MUTCD's and the Railroad-Highway Grade Crossing Handbook's diagrams show that Z-barriers are used to require pedestrians to turn so they are oriented to face an oncoming train when they exit the barrier. 6/13/19 Hg. Tr. at 176: 8-21 and Hearing Exhibit 5 at 2. He concluded Z-barriers are typically installed at high speed light rail or commuter rail systems with frequent train arrivals, high pedestrian station activity, and locations where trains consistently come from a specific direction so that pedestrians exit to face an oncoming train. Hearing Exhibit 5 at 2. He is concerned that using a Z-barrier here may orient pedestrians to exit with their backs to an oncoming train because the freight trains that use the subject crossing can approach from either direction. *See* 6/13/19 Hg. Tr. at 176: 19-24. And, unlike commuter or light rail stations, this crossing sees a

maximum of 16 freight trains per day, travelling at a slower speed of 30 miles per hour. Hearing Exhibit 100 at 5.

103. He also does not recommend Z-barriers and swing gates because they may pose a hazard since they must be installed in the clear zone of the roadway.<sup>21</sup> *Id.* at 173: 17-20. A clear zone is an area of the roadway where roadside elements should be minimized because they may present hazards to vehicles driving in the clear zone. *Id.* at 173:17-25—174: 1-5 and Hearing Exhibit 5 at 2. As a roadway traffic engineer, Mr. Lang looks to minimize elements installed in the roadside to reduce safety risks associated with roadway hazards, including possible vehicle collisions with the elements (such as a Z-barrier or swing gate). 6/13/19 Hg. Tr. at 214: 23-25—215: 1-5. He explained that only those items that are absolutely necessary should be installed in the clear zone of the roadway. *Id.* at 215: 2-5.

104. BNSF takes issue with the City's decision not to perform a pedestrian count at the crossing. BNSF Statement at 15. Ms. Stoffels testified that BNSF believes that the City should have done a pedestrian count at the crossing to identify the appropriate pedestrian treatment for the crossing. 6/13/19 Hg. Tr. at 253: 16-20. She could not say whether a specific pedestrian treatment should be used at the crossing, but believes that treatments should be considered. *Id.* at 254: 24-25—255:1-3. Ms. Stoffels believes that it is important to do a pedestrian study of current and future pedestrian use because the area has grown in recent years, and quiet zones are permanent. *Id.* at 250:14-23.

105. BNSF's consultant, Mr. Rusk, considered the City's approach to pedestrian treatment at the crossing and provided his opinion. Hearing Exhibit 132. He concluded that the

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<sup>21</sup> The clear zone for the crossing is 16 feet, and is measured from the edge of the travel lane, which includes the bicycle lane on South Boulder Road. 6/13/19 Hg. Tr. at 174: 8-10 and at 215: 18-24

City's Application does not "address pedestrian traffic that crosses at the South Boulder Road crossing that would be affected by the elimination of the train horns . . . ." *Id.* at 18. He believes that pedestrians within quiet zones may not receive safety benefits comparable to motorists. *Id.* at 19. He explained that supplementary safety measures such as gates and flashing lights are mostly focused on motorists and that he does not believe that pedestrians are going to pay any more attention to those warning devices in the future. 6/14/19 Hg. Tr. at 113: 5-9.

106. Mr. Rusk concluded that pedestrians may not be sufficiently alerted to an approaching train without a train horn. Hearing Exhibit 132 at 19. In support, he points to potential pedestrian distraction due to cell phones, headsets, or group conversations. *Id.* He also testified that, "[y]ou don't know what a pedestrian is going to do, what their mind-set is at the time, how many times they've crossed it." 6/14/19 Hg. Tr. at 136: 15-17. He explained that a pedestrian's mindset and experience at the crossing will factor into their behavior, and that pedestrians simply do not always do what they should. *Id.* at 136: 15-17 and at 137: 15-22.

107. Mr. Rusk visited the crossing on or about April 6, 2019.<sup>22</sup> *Id.* at 154: 8-14. While there, he did an informal pedestrian count for approximately one hour. *Id.* at 96: 2-10. He included bicycle traffic in this count. *Id.* at 96: 13-14. He observed 24 pedestrians and 30 bicyclists traverse the crossing, but he also stated that he may have transposed those numbers. *Id.* at 96: 19-25—97: 1-2. He noted that children made up about 30 percent of this traffic, and that some pedestrians carried shopping bags. *Id.* at 97: 22-23 and at 98: 6-15. He believes people carrying shopping bags walked to a local market, as he observed two people with shopping bags coming and going in each direction. *Id.* at 98: 8-15. He observed one train pass through the

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<sup>22</sup> It's unclear exactly when Mr. Rusk visited the crossing. He testified that it was on a weekday (6/14/19 Hg. Tr. at 95: 17-19), but he also testified that he was there on April 6, 2019, which was a Saturday. *Id.* at 154:8-14.

crossing. *Id.* at 154: 22-25. He believes that one pedestrian was present when the train approached, that the pedestrian walked down the railroad's right-of-way when the train approached, then crossed the tracks after the train passed. *Id.* at 155: 1-12. The pedestrian did not cross the tracks at the railroad crossing at South Boulder Road. *Id.* at 156: 18-23.

108. Mr. Rusk has never performed a formal pedestrian count, and though he testified that a formal count should involve more than an hour, he could not say how many hours would be appropriate. *Id.* at 158: 19-25—159:1-10. He believes that a formal count should cover different hours of the day (*i.e.*, morning, afternoon, and evening) and may include a comparison of weekday and weekend traffic. *Id.* at 158: 25—159: 1-7. He believes that a formal count would identify the direction that pedestrians were travelling, the type of pedestrian, exactly where they crossed the tracks, and should include bicycles. *Id.* at 156: 25—157: 1-22.

109. Mr. Rusk did not perform a formal pedestrian count for the crossing because BNSF did not ask him to do that. *Id.* at 159: 23-25—160: 1.

110. Mr. Rusk considered growth and development in the area and the type of facilities in close proximity to the crossing, such as schools and markets. Hearing Exhibit 132 at 18-22. He reviewed the United States Census Bureau data estimate of 14.8 percent growth from 2010 to 2017 in the City. *Id.* at 19. Mr. Rusk concluded that pedestrian traffic has increased significantly in the area due to residential growth. 6/14/19 Hg. Tr. at 102: 4-7. He believes it is important to consider future growth and conditions since crossings are rebuilt every 20 years. *Id.* at 102: 7-12. He believes that the area will continue to grow. *Id.* at 101: 19-23.

111. Mr. Rusk also considered the ten-minute walk rule in the Southern California Regional Rail Authority (SCRRA) Highway-Rail Grade Crossings Recommended Design Practices and Standards Manual (SCRRA Manual or Manual) to support his conclusion that

pedestrian treatment should be considered at the crossing. Hearing Exhibit 132 at 21 and Hearing Exhibit 138. According to the SCRRA Manual, the ten-minute walk rule “is based upon research conclusions that pedestrians will walk ten minutes to reach their destination,” equating to approximately one-third or one-half mile walk. Hearing Exhibit 138 at 103-104. It suggests that if the crossing is located within that radius of pedestrian generators, the lead engineer to should “consider . . . pedestrian traffic features over the crossing.” *Id.* at 104. The Manual does not cite or explain the research upon which the ten-minute walk rule is based. Hearing Exhibit 138.

112. The SCRRA Manual is intended to provide standards and recommended design practices for the highway-rail crossings on the SCRRA’s regional commuter rail network. Hearing Exhibit 138 at 8. The SCRRA is a five-county joint powers authority that operates mostly relatively dense mixed commuter, freight, and inner-city passenger train traffic (greater than 50 trains daily), with relatively high levels of motor vehicle, pedestrian, and bicycle traffic. *Id.* at 7. Thus, the Manual is intended to address the unique challenges associated with those types of crossings. *See id.* at 7-8. Rail crossings in the SCRRA network have “experienced significant train, motor vehicle and pedestrian traffic growth . . . and have high levels of traffic for all modes.” *Id.* at 8. All of that plainly feeds into the SCRRA’s approach to pedestrian treatment at its crossings, including its suggestion that pedestrian traffic features be considered for crossings with pedestrian generators within one third and one half mile.<sup>23</sup> *See id.* at 7-8.

113. The Manual also makes it clear that it should not be used as a substitute for engineering knowledge, experience, and judgment; that sound judgment should be exercised

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<sup>23</sup> The SCRRA Manual’s ten-minute rule appears independent from considerations of pedestrian traffic volume. Hearing Exhibit 138 at 103-104. The record lacks information explaining this.

when considering the Manual's standards and design practices; and that the design team should consider the particular conditions at each location. *Id.* at 9-10.

114. Mr. Rusk concluded that the City failed to appropriately consider pedestrian treatments, but does not recommend a specific type of pedestrian treatment. Hearing Exhibit 132 at 26. He believes a pedestrian count must first be done to determine which type of treatment is appropriate. *Id.* Yet, he also testified that flashing-light signals, gates, and mazes (*e.g.*, Z-barriers), may potentially be appropriate for the crossing. *Id.* at 114: 22-25—115: 1-11.

115. The evidence is undisputed that the sidewalks are adjacent to and within 25 feet of the highway-rail crossing. Based on this, the ALJ finds that the sidewalks at the subject crossing are not pathways or pathway crossings as defined by Commission Rule 7201(dd) and (ee), 4 CCR 723-7. As a result, the ALJ concludes that Commission Rules do not require the City to provide current and predicted pedestrian count data for approval of its Application. *See* Rule 7204(a), 4 CCR 723-7. Nevertheless, given the Commission's broad authority and mandate to require the installation of warning devices to prevent accidents and promote public safety, it is appropriate to consider whether the City should be required to take additional measures to ensure pedestrian safety. *See* § 40-4-106(2), C.R.S.

116. The ALJ finds that the preponderance of the evidence shows that the City evaluated the crossing to determine the appropriate pedestrian treatment, and that its plans appropriately account for pedestrian safety. *See e.g.*, Hearing Exhibit 5 and Hearing Exhibit 114 at 7, 11, 23, and 40. As discussed, the City's consultants reviewed and analyzed ample relevant data in determining that the crossing does not require additional pedestrian features. *Supra* at ¶¶ 98-103. The City considered optional pedestrian features for the crossing. *Id.* The ALJ finds that Mr. Lang's testimony demonstrates by a preponderance of the evidence that more pedestrian

treatment does not always render a crossing better or safer. In fact, depending on the conditions at the crossing, some treatments may create risk, and should only be used when absolutely necessary. *Supra* at ¶ 103. The ALJ finds that the preponderance of the evidence demonstrates that the City plans to implement one of the suggested optional treatments (installing an additional bell), and that the preponderance of the evidence does not establish that the City is able to implement the second suggested optional treatment (installing “LOOK” signs). *Supra* at ¶ 100.

117. The ALJ finds that evidence suggesting that pedestrian safety may be compromised is largely speculative or otherwise contradicted by credible evidence. For example, Mr. Rusk speculates that removing the train horn presents added risk to pedestrians because they may not pay attention to the multiple visual and audio active warning devices directly next to the sidewalks since those warning devices are for motorists. *Supra* at ¶¶ 105-106. This is contradicted by credible evidence that the flashing-light signals and gates the City proposes to install will be visible on both sidewalk approaches to the crossing and that the audible bell devices on each approach to the crossing will warn pedestrians of an approaching train. Hearing Exhibits 5, 100, 104 at 1, and 157 at 6; *see also* Hearing Exhibit 113 at 29, and 6/13/19 Hg. Tr. at 168: 10-18. Under BNSF’s theory, pedestrians would have to ignore flashing-light signals, multiple bells, and multiple lowering gates. The preponderance of the evidence does not support this. Given the multiple visual and audio warning devices within a close proximity to the sidewalk’s approach to the crossing, the ALJ finds that it is more probable than not that pedestrians will be alerted to an approaching train, even without a train horn.

118. This conclusion finds support in the MUTCD, which does not require separate active traffic control devices at pathway crossings located within 25 feet of a highway-rail grade crossing equipped with an active traffic control system. MUTCD, § 8D.06, ¶ 2.

119. The ALJ is unpersuaded by BNSF's speculation concerning growth in the area. BNSF asserts that the crossing will see increased pedestrian traffic based on anticipated growth in the area, and that this increases the risk of pedestrian-train accidents. Hearing Exhibit 132 at 24 and 6/14/19 Hg. Tr. at 150: 9-17. Assuming *arguendo* that pedestrian traffic in the area will increase, without more evidence, it is too far a leap to also assume that this will increase the risk of pedestrian-train accidents. The ALJ finds that the preponderance of the evidence does not support this conclusion.

120. The ALJ finds the ten-minute walk rule from the SCRRA Manual inapposite. The Manual provides standards for rail facilities that could not be more different from the one at issue here. *Supra* at ¶¶ 34, 35 and 112. The ALJ finds that the SCRRA's determination that its rail crossings have a high level of pedestrian and fast-moving rail traffic renders the Manual's guidance on pedestrian treatment inapplicable here. *See* Hearing Exhibit 138 at 7-8 and *supra* at ¶ 112. In addition, the record lacks evidence explaining the basis for the ten-minute walk rule. Regardless, the Manual itself acknowledges that the specific conditions at the crossing should be evaluated when deciding the crossing's design. The City did that. *Supra* at ¶¶ 41-44, 71-74, and 98-103.

121. Although BNSF faults the City for not performing a pedestrian count or study, it did not perform one. BNSF states that it cannot identify the appropriate pedestrian treatment for the crossing; yet, it appears that BNSF assumes that the City's proposed treatment is not appropriate. The ALJ finds that the preponderance of the evidence demonstrates that the City's decision not to perform a pedestrian count or study was not unreasonable given that the FRA has no reports of accidents or incidents at the crossing; there are no known pedestrian safety issues at the crossing; the sidewalks are within 25 feet of a crossing that will include multiple active visual

and audio warning devices; and Commission Rules do not require a pedestrian count or study. As a result, the ALJ rejects BNSF's argument concerning the City's failure to perform a pedestrian count or study.

122. For the foregoing reasons and authorities, the ALJ finds that the preponderance of the evidence demonstrates that the City carefully considered pedestrian safety, and that its plans for the crossing, including the sidewalks, provide reasonable and necessary measures to serve the purpose and intent of preventing accidents and promoting public safety. *See* § 40-4-104(2)(a), C.R.S.

## 5. Other Issues

123. The City seeks to use a timed exit gate system to manage the timing to lower exit gates for its proposed four-quadrant gate system. Hearing Exhibit 100 at 14. With a timed exit gate system, the exit gates begin to lower within a predetermined number of seconds after the entrance gates begin to lower. The City calculated a proposed exit gate clearance time considering the type of vehicles anticipated to travel through the crossing, the posted speed limit, and the distance between the entrance and exit gates. Hearing Exhibit 100 at 14 and Hearing Exhibit 105. The City proposes an eight-second exit gate delay time; this means that eight seconds will pass from the time the entrance gates start to lower before the exit gates start to lower. Hearing Exhibit 105.

124. BNSF never specifically objected to a timed exit gate system, but witness testimony and hearing exhibits imply that BNSF challenges the proposed timed exit gate system. *Compare* Intervention and BNSF Statement to Hearing Exhibits 110 and 157. For example, Mr. Phillips testified that BNSF does not use timed exit gate systems, and instead uses radar (or dynamic) exit gate systems. 6/13/19 Hg. Tr. at 31: 6-22. BNSF's estimates and state sketches for

the crossing include radar exit gate systems; none include the proposed timed exit gate system. Hearing Exhibits 110 and 157.

125. As relevant here, a radar system is a type of presence detection system that detects whether vehicles are in the crossing before lowering exit gates. 6/13/19 Hg. Tr. at 284: 21-25—285: 1-3. Mr. Phillips testified that BNSF's design policy standard does not include timed exit gates. *Id.* at 31: 23—32-1. Instead, BNSF always uses a radar system. *Id.* at 31: 6-9 and 19-22. BNSF presented no evidence showing it reviewed the crossing's specific conditions to determine whether a timed or radar exit gate system should be used.

126. BNSF's approach to radar systems contradicts FRA findings. The FRA assigns a higher effectiveness rate for four-quadrant gates without presence detection (than those with it) because drivers may use the system to delay the exit gates from lowering, thus increasing the potential for a crossing collision. 49 CFR Part 222 Appendix A, ¶ (A)(2). But, this alone is not a deciding factor; the FRA states that the location should be reviewed to determine whether site-specific circumstances make using presence detection advisable. *Id.* The ALJ finds this to be persuasive evidence supporting the City's plans to use a timed exit gate system, particularly when viewed in light of BNSF's position that radar systems should always be used.

127. Based on the foregoing, the ALJ concludes that to the extent that BNSF challenges the City's plans to use a timed exit gate system, that challenge fails. The preponderance of the evidence demonstrates that the proposed timed exit gate system and clearance time is based on an analysis of circumstances present at the crossing, and appropriate calculations relevant to the operations at the crossing. Hearing Exhibits 105 and 100 at 14; *see also* 6/13/19 Hg. Tr. at 284: 17-21. The ALJ concludes that the preponderance of the evidence shows that the City's plans to use a timed exit gate system is reasonable and necessary to serve

the purpose of preventing accidents and promoting public safety at the crossing. *See* § 40-4-104(2)(a), C.R.S.

128. The ALJ finds that the Commission has jurisdiction over the Application under § 40-4-106(2)(a), C.R.S., and Rules 7203 and 7204, 4 CCR 723-7. The ALJ finds that the subject crossing is a public highway-rail crossing as contemplated by Commission Rules, and the City is the road authority for the public highway at issue. *See* Rule 7201(u), (v), and (hh) and Rule 7001(f), 4 CCR 723-7. The ALJ concludes that the City is authorized under Commission Rules to file the subject Application. Rules 7203(d) and 7001(f), 4 CCR 723-7.

129. Based on the reasons and authorities discussed in detail, the ALJ finds that the City met its burden to demonstrate by a preponderance of the evidence that its proposed plans, as stated in the Application and attachments, are reasonable and necessary measures which serve the purpose and intent of preventing accidents and promoting public safety. *See* § 40-4-104(2)(a), C.R.S. Consequently, the ALJ recommends the Commission grant the Application.

130. The ALJ will next consider the City's additional requests for relief against BNSF. The City asks the Commission to require BNSF to provide an estimate and state sketch conforming to PUC requirements within 15 days; to file a copy of a signed construction and maintenance agreement for the crossing within two months; to require BNSF to construct the changes to the crossing within six months; to require BNSF to inform the Commission in writing when construction is complete within ten days of the deadline to complete construction; and to require BNSF to maintain the active warning devices at the crossing for the life of the crossing. City's Statement at 13. In deciding these requests, the ALJ considers whether good cause exists to grant the requested relief, as demonstrated through the record and evidence in this proceeding.

131. The preponderance of the evidence shows that BNSF does not prioritize quiet zone projects, and that it generally disfavors them. 6/13/19 Hg. Tr. at 234: 13-15, and at 256: 5-7. It is not clear exactly how BNSF treats projects which it does not consider a priority, but, as explained below, evidence suggests that timeliness may be an issue.

132. Mr. Phillips's team is responsible for creating estimates and designs when a road authority proposes changes to a BNSF crossing. *See id.* at 279: 18-24. The resulting document is the "estimate and state sketch" (estimate) that approximates construction costs for the proposed changes, and a detailed schematic design showing the changes to be made. *Id.* at 23: 2-10; Hearing Exhibits 110 and 157. Such estimates and designs are required by Commission Rule 7204(a)(X)(C) and (D) when a road authority seeks to make changes to a crossing as sought here. 4 CCR 723-7. BNSF's practice is to create estimates that account for the specifics in the road authority's request, but only to the extent that the request conforms to BNSF's design standards and policies. *Id.*; *see also* 6/14/19 Hg. Tr. at 31: 10-25—32: 1-9.

133. On June 27, 2018, the City requested that BNSF provide the required estimate to show costs and design consistent with the City's proposal in this case and Commission rules. Hearing Exhibit 134 at 35 and Hearing Exhibit 153 at 2-9; and *see* Hearing Exhibit 100 at 13-14. BNSF did not provide the estimate and design until late April 2019, only after being ordered to do so in this proceeding. Hearing Exhibit 157; and Decision No. R19-0352-I.<sup>24</sup>

134. The evidence and record also establish that BNSF may require additional motivation to comply with Commission requirements. As mentioned, BNSF was ordered to provide an estimate and design consistent with the City's Application and Commission

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<sup>24</sup> BNSF provided another estimate before then, but that estimate is not the estimate the City requested, as it includes advanced preemption. Hearing Exhibits 100 and 110; and *see also* Decision Nos. R19-0337-I and R19-0352-I.

Rule 7204(a)(X)(C) and (D), 4 CCR 723-7. Decision No. R19-0352-I. The same Decision specifies that the relevant Commission rule requires a design or diagram that identifies the equipment response time, advance preemption time, minimum warning time, clearance time, buffer time, and total warning time. Decision No. R19-0352-I, ¶ 2; *see* Rule 7204(a)(X)(C) and (D), 4 CCR 723-7. BNSF's estimate lacks estimated costs for the City's proposed timed exit gate system, and does not include the information the referenced Commission Rule requires. Hearing Exhibit 157; and 6/14/19 Hg. Tr. at 27: 13-25—29: 1-11, and at 31: 10-15—32: 1-9; and *compare* Hearing Exhibit 157 to Rule 7204(a)(X)(C) and (D), 4 CCR 723-7.

135. Based on all of this and the record as a whole, the ALJ finds good cause to grant the majority of the City's additional requests and recommends that the Commission do so, as detailed below. The ALJ is not recommending an order requiring construction to be complete by a date certain, as there are many factors outside the parties' control that may impact their ability to meet such a deadline. In addition, the ALJ finds that it is unnecessary to enter an order requiring BNSF to maintain the equipment at the crossing for the life of the crossing because BNSF does not contest its responsibility to do so, and statute and Commission rules plainly require this. § 40-4-106(2)(b), C.R.S.; Rules 7211(h) and (i), and 7301(a), 4 CCR 723-7; *See e.g.*, 6/13/19 Hg. Tr. at 248: 8-11, and at 265: 9-11, and BNSF Statement at 19-20.

136. The ALJ transmits the record of this proceeding, this recommended decision containing findings of fact and conclusions thereon, and a recommended order to the Commission as provided under § 40-6-109, C.R.S.

### III. ORDER

#### A. The Commission Orders That:

1. Consistent with the discussion above, the City of Louisville's (City) Application for Authority to Install 4-Quadrant Railroad Gates with Flashing Lights, Bells, Constant Warning Time Circuitry, and New Signal Cabin at Tracks Owned by BNSF Railway Company Crossing South Boulder Road US DOT No. 244804N, in Boulder County, Colorado (Application) filed on November 16, 2019 is granted.

2. On or by October 15, 2019, BNSF Railway Company (BNSF) must file and serve an estimate and schematic diagram consistent with the City's Application in this proceeding, and which specifically includes the equipment response time, minimum warning time, clearance time, buffer time and total warning time, as required by Commission Rule 7204(a)(X)(C) and (D), 4 *Code of Colorado Regulations* 723-7.

3. On or by December 15, 2019, BNSF and the City must file a copy of the signed Construction and Maintenance Agreement between the City and BNSF in this proceeding. This must be filed before starting construction work at the crossing.

4. BNSF and the City must inform the Commission in writing that the authorized improvements are complete and operational within ten days of completion. The Commission expects to receive this letter by March 15, 2020. This notice may be provided earlier or later if there are changes or delays to the construction schedule.

5. BNSF must submit an updated copy of the United States Department of Transportation Inventory Form for the subject crossing showing changes made to the crossing to the Commission, and to file that document in this proceeding by March 15, 2020.

6. This Recommended Decision will be effective on the day it becomes the Decision of the Commission, if that is the case, and is entered as of the date above.

7. As provided by § 40-6-106, C.R.S., copies of this Recommended Decision will be served upon the parties, who may file exceptions to it.

8. If no exceptions are filed within 20 days after service or within any extended period of time authorized, or unless the recommended decision is stayed by the Commission upon its own motion, the recommended decision will become the decision of the Commission and subject to the provisions of § 40-6-114, C.R.S.

9. If a party seeks to amend, modify, annul, or reverse a basic finding of fact in its exceptions, that party must request and pay for a transcript to be filed, or the parties may stipulate to portions of the transcript according to the procedure stated in § 40-6-113, C.R.S. If no transcript or stipulation is filed, the Commission is bound by the facts set out by the administrative law judge; and the parties cannot challenge these facts. This will limit what the Commission can review if exceptions are filed.

10. If exceptions to this Recommended Decision are filed, they may not exceed 30 pages in length, unless the Commission for good cause shown permits this limit to be exceeded.

( S E A L )



THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF COLORADO

MELODY MIRBABA

\_\_\_\_\_  
Administrative Law Judge

ATTEST: A TRUE COPY

A handwritten signature in cursive script that reads "Doug Dean".

Doug Dean,  
Director