3.3 Grade Crossing Delay

This section describes the existing conditions and environmental consequences for vehicular delay at roadway/rail at-grade crossings (grade crossings) resulting from the Proposed Acquisition. If the Board were to authorize the Proposed Acquisition, the Applicants expect that rail traffic would increase and average train lengths would decrease on certain rail line segments along the combined CPKC network. Increases in rail traffic would increase the total amount of time during the day that some grade crossings would be closed to vehicle traffic, which would cause delay for drivers. However, reductions in train lengths would reduce the average time a grade crossing would be blocked by each passing train. The subsections that follow describe the approach used to analyze the impacts, the affected environment, and the impacts of the Proposed Acquisition on grade crossing delay. In assessing grade crossing delay impacts, OEA considered federal, state, and local regulatory frameworks for transportation, including the requirements of FHWA and FRA, which both have jurisdiction over aspects of grade crossing safety under federal law.

3.3.1 Approach

This subsection discusses OEA's approach for estimating the expected delay at grade crossings under the Proposed Acquisition and the No-Action Alternative. During the scoping process leading to the preparation of this ~~Draft~~ EIS, many commenters expressed concern to OEA that the Proposed Acquisition would increase delay at grade crossings due to the projected increase in rail traffic. Drivers travelling on roadways experience delay whenever passing trains temporarily block crossings. For roads with low levels of vehicular traffic, the delay that drivers experience is approximately equal to the amount of time it takes the passing train to clear the crossing, which depends on the length of the train and the speed at which it is moving. For busier roads with more vehicle traffic, delays at crossings can be made longer by the queue of vehicles waiting for the passing train to clear the crossing. The longest delays occur when a train passes through a crossing on a busy road during the hours of peak traffic. Long delays can also occur when a train stops unexpectedly due to a crash or breakdown while traversing a crossing, but such events are relatively rare.

Consistent with past practices in other acquisition proceedings and thresholds set forth in the Board's environmental regulations at 49 C.F.R. § 1105.7(e)(5), OEA defined the study area for the grade crossing delay analysis to include all rail line segments where the Proposed Acquisition would result in a projected increase in rail traffic of eight or more additional freight trains per day or a 100 percent or greater increase in annual GTM. The study area also includes rail line segments in air quality nonattainment areas and Class I areas (areas managed by the National Park Service [NPS], U.S. Fish and Wildlife Service [USFWS], U.S. Forest Service, and several Native American Tribes) that would experience an increase of the segments with three or more additional freight trains per day or a 50 percent or more increase in annual GTM as a result of the Proposed Acquisition. OEA applies a lower threshold in nonattainment and Class I areas for grade crossing delay analysis because grade crossing delay can affect air quality by increasing the amount of time that motor vehicles spend idling at crossings.

To quantify changes in delay, OEA relied on rail traffic and vehicle traffic data projected out to the analysis year 2027. OEA then compared the predicted delay at grade crossings under the Proposed Acquisition to the predicted delay under the No-Action Alternative. OEA did not estimate delay at grade-separated crossings because those crossings do not create a potential for delay impacts. OEA did not estimate delay at private and pedestrian only crossings because of very low traffic volumes.

Consistent with past practice, OEA quantified delay impacts for grade crossings on public roadways with an AADT of 2,500 or more vehicles per day. Most of the grade crossings in the study area are on public roadways with an AADT of less than 2,500 vehicles per day. Because so few vehicles use crossings on those roadways, the average total increase in delay at those crossings as a result of increased rail traffic would be negligible. Although OEA did not quantify delay impacts at grade crossings with an AADT of less than 2,500 vehicles per day, **Table H.1-1** in **Appendix H** provides information for those grade crossings, and for all other grade crossings in the study area, including ~~the estimated time that a passing train would take to pass through the crossing~~average gate down time at each grade crossing location under the Proposed Acquisition and the No-Action Alternative. In characterizing the current and future conditions of highly trafficked grade crossings in the study area, OEA considered performance measures such as blocked crossing time per train; crossing delay per stopped vehicle; number of vehicles delayed per day; maximum vehicle queue length; average delay per vehicle in a 24-hour period; total vehicle delay per day; and level of service (LOS). LOS is a qualitative measure of motor vehicle traffic flow, indicated by letters from A to F, where A represents free flow conditions and F indicates extreme congestion. OEA calculated estimated delay time using the industry standard equations set forth in **Appendix H**, which include the following variables: AADT, train speed, train length, number of trains per day, number of railroad tracks, and number of roadway lanes.

OEA specifically considered the impact of increased delay on emergency vehicles on designated emergency routes as identified in the FRA database. In addition to delay, OEA considered site-specific conditions in analyzing the potential impacts on emergency vehicle response, including existing highway and road networks; locations of nearby grade or grade-separated crossings; and time to access the opposite side of the crossing if a train is encountered. OEA identified grade crossings and alternate routes. The distance for alternate routes was determined by the shortest alternate route. Posted speed limits along the alternate routes were determined by Google Maps Street View imagery. Impacts to emergency services were defined as a situation in which the Proposed Acquisition would completely block access to a residence or business without reasonable access via an alternate route.

OEA did not quantify delay impacts at private grade crossings because insufficient data exist on vehicle traffic volumes at private grade crossings to allow for such an analysis. However, because traffic on private roadways is generally very low, any impacts on private grade crossings would be similar to the impacts on public grade crossings with an AADT of less than 2,500 vehicles per day. The Proposed Acquisition would likely increase delay at private grade crossings, but the change in average total delay at those grade crossings would be negligible due to the very low vehicular traffic volumes.

3.3.2 Affected Environment

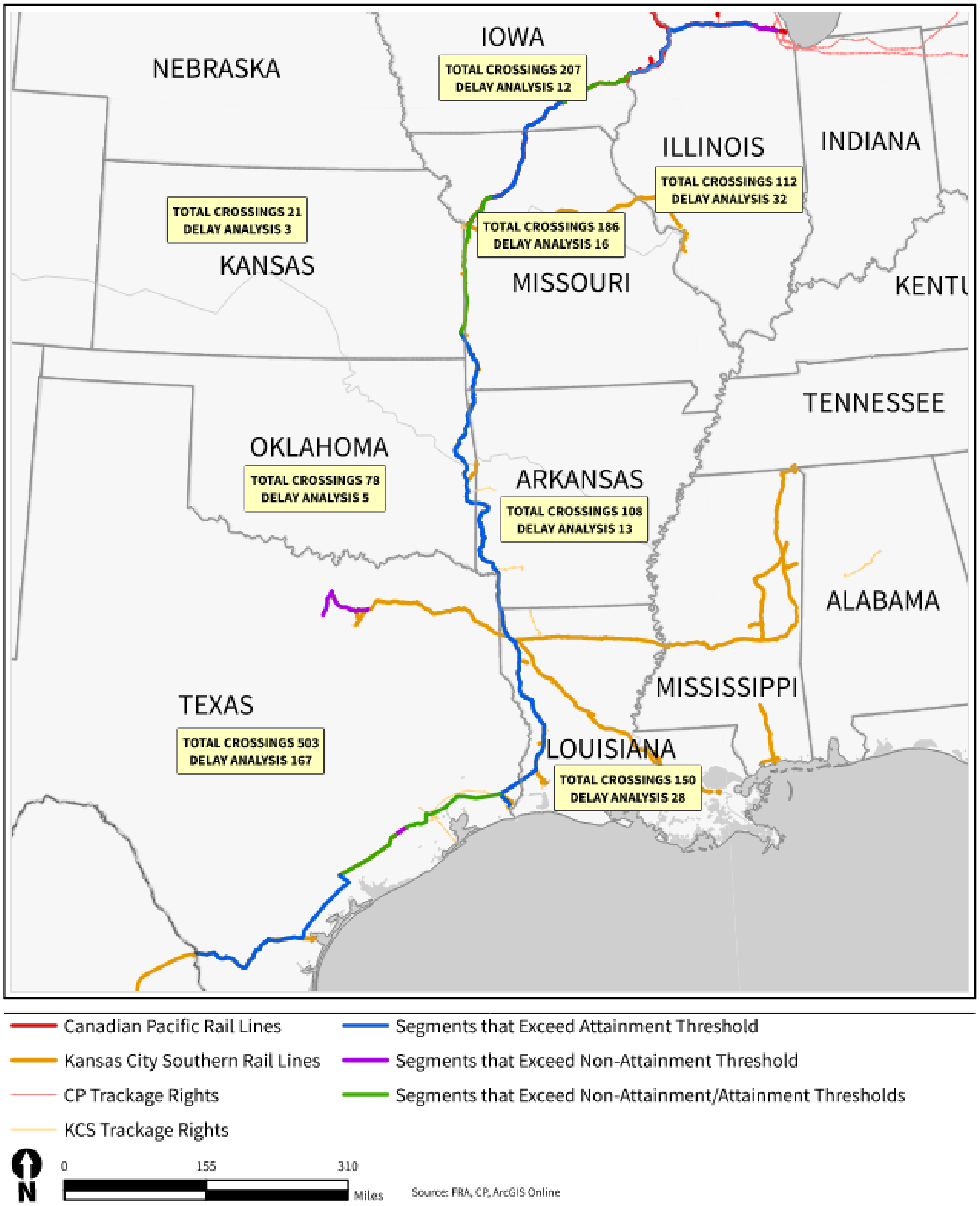
OEA identified a total of 1,365~~1,352~~ public grade crossings in the study area. Of these, OEA identified 276~~7~~ grade crossings that have an AADT of 2,500 or more vehicles per day (**Figure 3.3-1**). These 276~~7~~ grades crossings are distributed along the CP mainline, extending west and then south from Chicago, Illinois, to Kansas City, Missouri, and along the KCS mainline, extending south from Kansas City to Laredo, Texas. **Figure 3.3-1** shows the total number of grade crossings in each state within the study area, as well as the number of grade crossings in each state that met OEA's AADT threshold of 2,500 or more vehicles per day for inclusion in the grade crossing delay analysis. **Appendix H** provides a list of all grade crossings within the study area from Chicago, Illinois, to Laredo, Texas, including the 276~~7~~ crossings with an AADT of 2,500 or more vehicles. These include crossings in eight states: Illinois, Iowa, Kansas, Missouri, Arkansas, Oklahoma, Louisiana, and Texas. The grade crossings in the study area range from rural crossings with low levels of vehicle traffic to urban crossings with high levels of traffic. The number of mainline tracks at the grade crossings ranges from one to two tracks and the number of highway lanes ranges from two to eight lanes. The grade crossings included in the analysis include both paved and unpaved roads and both crossings with passive warning devices (such as signs) and crossings with active warning devices.

The projected 2027 motor vehicle traffic volume for the grade crossings in the study area ranges from 2,500 to approximately 45,000 vehicles per day with an average of 9,700 vehicles per day. The current estimated delay per vehicle in 2027 ranges from 0.1 to 83.6 seconds per grade crossing with an average of 4.0 seconds per grade crossing based on projected traffic volumes and organic train growth only. The corresponding LOS ranges from LOS A to LOS F with an average LOS A based on the average delay per grade crossing.

In the Draft EIS, OEA identified 28 grade crossings along FRA-designated emergency routes. For these crossings, OEA identified potential alternate routes that could be used if needed and determined the distance and posted speed limits along the alternate routes.

In response to public comments on the Draft EIS, OEA expanded its analysis by reviewing the comprehensive list of 1,365 public grade crossings in the study area and identifying 751 grade crossings to evaluate for emergency vehicle impact analysis. These include all 276 grade crossings with an AADT of 2,500 or more vehicles per day, as well as 475 low-traffic grade crossings with lower AADT that are isolated (more than 2 miles away) from grade-separated crossings and from heavily trafficked grade crossings and that therefore may serve as a corridor for emergency service vehicles in more rural areas. OEA did not evaluate impacts on emergency vehicles for low-traffic grade crossings that are within 2 miles of a grade-separated crossing or within 2 miles of a grade crossing with an AADT of 2,500 or higher. Because the dispatching of emergency services vehicles is determined at a local level and depends on emergency-specific conditions, OEA cannot know which individual grade crossings emergency vehicles would use during a particular emergency or what the best alternative route would be for an emergency vehicle to reach its destination. However, OEA assumed that emergency vehicles would tend to use larger roadways (i.e., those with an AADT of 2,500 or higher) and grade separated crossings where available.

Figure 3.3-1. Grade Crossings for Delay Analysis on Proposed CPKC Rail System[1]



[1] Refer to **Appendix H** for a detailed list of grade crossings included in the delay analysis by state, county, and city.

3.3.3 Environmental Consequences

3.3.3.1 Proposed Acquisition

Table H.1-1 in **Appendix H** shows information for every grade crossing in the study area, including the projected increase in rail traffic, the estimated train speed and length, AADT, and the estimated time that a passing train would take to pass through the crossing under the Proposed Acquisition and the No-Action Alternative. **Table H.2-3~~2~~** in **Appendix H** shows the change in average delay per vehicle that would occur as a result of the Proposed Acquisition for the 276~~7~~ grade crossings on roadways with AADT of 2,500 vehicles or more. **Table H.1-1** in **Appendix H** also shows the gate down time by train type, the results of the emergency vehicle alternative route analysis, and the Proposed Acquisition-related increase in total vehicle delay and average delay per delayed vehicle.

Impacts to Grade Crossings

Across all 276~~7~~ grade crossings in the study area with an AADT of 2,500 or more vehicles per day, the Proposed Acquisition would result in an average increase in delay of approximately 0.7 seconds per vehicle. Average delay would be approximately 4.7 seconds per vehicle under the Proposed Acquisition, compared to 4.0 seconds per vehicle under the No-Action Alternative. ~~The greatest average increase in delay for any grade crossing would be 7.3 seconds per vehicle, which would occur at Crossing ID 865653R across Ripley Street in Davenport, Iowa.~~ [2] For some grade crossings, average delay would decrease under the Proposed Acquisition relative to the No-Action Alternative because of projected changes in train length. Specifically, the Applicants expect that Proposed Acquisition would allow train lengths to become shorter on some rail line segments, which would reduce the average time that a passing train would block a crossing. OEA assumed that average train speed would be the same under the Proposed Acquisition as under the No-Action Alternative. However, if train speed were to increase as a result of the Proposed Acquisition, then average delay at grade crossings would be lower.

The majority of grade crossings would operate at LOS A under either the Proposed Acquisition or the No-Action Alternative. Of the 276~~7~~ grade crossings, OEA expects that only ~~22~~ 21 crossings would operate at an LOS lower than LOS A under either the Proposed Acquisition or the No-Action Alternative and only ~~five~~ four would experience a decrease in LOS as a result of the Proposed Acquisition. All ~~five~~ four grade crossings where LOS would decrease are located on rail lines that the Applicants own.

Table 3.3-1 identifies the grade crossings at which LOS would change as a result of the Proposed Acquisition. Under the Proposed Acquisition, OEA expects that 255 crossings would operate at LOS A, ~~18~~ 17 crossings would operate at LOS B, two crossings would operate at LOS C, one crossing would operate at LOS D, and one crossing would operate at LOS E. By comparison, under the No-Action Alternative, OEA expects that 257~~60~~ crossings would operate at LOS A, 15~~3~~ crossings would operate at LOS B, two crossings would operate at LOS C, one crossing would operate at LOS D, and one crossing would

[2] See **Appendix H** for an explanation of the deletion of this sentence.

operate at LOS F. The Proposed Acquisition would result in an increase in the LOS at one three crossings compared to the No-Action Alternative. The grade crossings at 25th Avenue and Edgington Street in Franklin Park, Illinois would improve from LOS B to LOS A because trains moving through this crossing would become shorter, on average, as a result of the Proposed Acquisition and would therefore block the crossing for a shorter amount of time, on average, than under the No-Action Alternative. Similarly, the grade crossing at Phillips Road in Bloomington, Texas, which would improve from LOS F to LOS E because trains moving through this crossing would become shorter as a result of the Proposed Acquisition and would therefore block the crossing for a shorter amount of time than under the No-Action Alternative.

Appendix H presents the predicted number of stopped vehicles delayed per day, average delay per delayed vehicle, average delay per vehicle in a 24-hour period, total delay in a 24-hour period, LOS, and maximum vehicle queue by grade crossing, along with the basic train, vehicle, and roadway characteristics used in the calculation of these performance measures.

Impacts to Emergency Vehicle Routes

In the Draft EIS, OEA identified 28 grade crossings in the study area that are located along FRA-designated emergency routes (**Table 3.3-2**). The designated emergency routes are identified as "emergency vehicle route" in the FRA database (FRA 2020). Information on "emergency vehicle routes" is reported to FRA by state agencies. State agencies can identify a grade crossing as an emergency vehicle route if the grade crossing is routinely used by highway vehicles to obtain access to facilities that provide emergency services, such as hospitals and police and fire stations.

On average, the grade crossing delay along FRA-designated emergency vehicle routes would be 2.9 seconds per vehicle (LOS A) under the No-Action Alternative, compared to 3.9 seconds per vehicle (LOS A) under the Proposed Acquisition (**Table 3.3-2**). This is an average difference of 1.0 second of delay per vehicle between the Proposed Acquisition and the No-Action Alternative. For 26 of the 28 grade crossings on emergency vehicle routes, the maximum predicted increase in average delay is 2.2 seconds per vehicle between the Proposed Acquisition and the No-Action Alternative. Those 26 crossings would continue to operate at LOS A under either the Proposed Acquisition or the No-Action Alternative.

There are only two grade crossings along a designated emergency route where the LOS would decrease under the Proposed Acquisition in comparison to the No-Action Alternative. These are the grade crossing over Flournoy Lucas Road in Shreveport, Louisiana, where the LOS would decrease from LOS A to LOS B and the grade crossing over College Street (U.S. 60 Business) in Neosho, Missouri, where the LOS would also decrease from LOS A to LOS B. For the Flournoy Lucas Road grade crossing, OEA estimates that average delay would be 8.4 seconds per vehicle under the No-Action Alternative and 10.7 seconds per vehicle with the Proposed Acquisition, which is a difference of 2.3 seconds per vehicle. For the College Street grade crossing, OEA expects that average delay would be 7.6 seconds per vehicle under the No-Action Alternative and 10.6 seconds per vehicle under the Proposed Acquisition, which is a difference of 3.0 seconds per vehicle.

All of the grade crossings along emergency vehicle routes have an alternate route (see **Table 3.3-2** for a subset of delay results presented in detail in **Appendix H**). The distance to access the opposite side of the crossing via alternate routes ranges from 0.19 to 5.1 miles, with an average distance of 2.1 miles. For all 28 crossings, however, the alternate route also involves a grade crossing, which could also result in delay if both routes were to be delayed by a train. Under the Proposed Acquisition, the Applicants expect that the average train length would decrease at 214~~5~~ of the 276~~7~~ crossings. Throughout the study area, OEA estimates that the average train length would be 8,198~~205~~ feet under the No-Action Alternative and 7,153~~8~~ feet under the Proposed Acquisition, which corresponds to an average reduction of 1,045~~7~~ feet. The shorter train lengths under the Proposed Acquisition would reduce the average delay per train crossing and also reduce the likelihood of a train blocking both the primary and alternate crossing locations compared to the No-Action Alternative.

While those grade crossings designated as emergency routes are where an emergency vehicle would be more likely to cross, an emergency vehicle could cross at any grade crossing~~, those designated as emergency routes are where an emergency vehicle would be more likely to cross~~.

In response to public comments on the Draft EIS, OEA analyzed the gate down time at all 1,365 grade crossings in the study area for particular types of freight and passenger trains. Gate down time represents the time it would take a train to pass through a grade crossing and thus represents a reasonable estimate of the delay that emergency vehicles would experience at grade crossings. For many grade crossings in the study area, average gate down time would decrease as a result of the Proposed Acquisition because the average length of freight trains would decrease; however, OEA estimated the gate down time for three separate types of trains to illustrate the longer or shorter gate down times for different types of trains. **Appendix H** presents the estimated gate down time for passenger trains, bulk freight trains, and intermodal/automotive/manifest freight trains, using the estimated length of each type. **Appendix H** also includes maps showing the locations of emergency service facilities, including hospitals, fire stations, and police stations, in relation to grade crossings and grade separated crossings throughout the study area.

Under normal conditions, trains are moving. Railroads utilize operational procedures to minimize the frequency of trains stopped at crossings, including:

- Planning train schedules, inbound and outbound yard movements, and crew work schedules that result in minimizing the time a train occupies a grade crossing.
- Modifying railcar-switching practices and operations such as stopping a train clear of a crossing to conduct legally required mechanical inspections.
- Extending sidings and constructing new ones where trains can be stationed, resulting in fewer blocking crossings.
- Holding trains outside of crossings where vehicular traffic is substantial.
- Seeking to park trains outside of crossings when the crews have worked the maximum hours permitted.
- Considering the potential for blocked crossings on sidings when trains are meeting.

- Training dispatchers to optimize the utilization of sidings, meeting and passing opportunities, and stopping points, resulting in fewer blocked crossings.
- Issuing orders across all Class I railroads that require train crews to minimize the occurrence of blocked crossings and to cut crossings where appropriate.
- Requiring crews to alert dispatchers when crossings are blocked and giving the dispatchers the authority to address the blocked crossing.
- Testing notification systems at crossings that notify dispatchers when crossings are blocked.

As shown in **Table H.2-4** in **Appendix H**, the average gate down time is relatively short. As such, emergency vehicles would typically wait for the train to pass. Although an infrequent occurrence, a grade crossing can become blocked when a train comes to a stop before clearing the crossing. While also infrequent, it is possible that an emergency could occur at the same time that a stopped train blocks a grade crossing. These simultaneous events are rare, but represent a potentially serious situation. Therefore, OEA analyzed 751 of the 1,365 grade crossings in greater detail for potential impacts of stopped trains on emergency response vehicles. These include all grade crossings in the study area with an AADT of 2,500 vehicles per day or greater, as well as grade crossings with an AADT less than 2,500 vehicles per day that are "isolated" because they are more than 2 miles from a grade-separated crossing and more than 2 miles from a grade crossing with an AADT of 2,500 or higher. For the 751 grade crossings that met these criteria, **Appendix H** reports the length of the closest alternative route that an emergency vehicle could take in the event that a long freight train (10,000 feet long) were to block the grade crossing.

In identifying alternative routes, OEA made two very conservative assumptions that may tend to overestimate the length of the alternative route. First, because there is no way of knowing exactly where a train could become stopped, OEA assumed that a freight train that could block a grade crossing would also block any other grade crossings within 2 miles in either direction, measured along the track. By definition, therefore, all alternative routes that do not involve a grade-separated crossing are more than 2 miles long. In reality, it would not be possible for a single train to block all grade crossings within 2 miles in either direction, so shorter alternative routes could be available for many grade crossings depending on where a train became stopped.

Second, OEA calculated the length of the alternative route as the distance from one side of each grade crossing to the opposite side of the same grade crossing. In reality, the destination of most vehicles would not be the opposite side of the railroad tracks and vehicles would most likely use only a portion of the alternative route to reach their destination. The alternate route distance is essentially a round-trip mileage from one side of the blocked grade crossing to the other, using only grade separated crossings or crossings more than 2 miles away, measured along the tracks. Therefore, the alternative route lengths reported in **Appendix H** represent the upper limit of the additional mileage that a vehicle would need to travel to go around a train blocking a grade crossing.

An example of the analysis process is shown in **Figure 3.3-2**. This example is specific to Crossing ID 329317F, which is across Mahlon St in De Ridder, Louisiana. The alternative route shown on the map is 8 miles long, which is the shortest route utilizing the closest public crossing (Crossing ID 329352X) that would not be blocked simultaneously by the same 10,000-foot train.

Of the 751 grade crossings for which OEA conducted an alternative route analysis, 640 grade crossings have a viable alternative route and the majority of those alternative routes (82 percent) are less than 10 miles in length. OEA identified 118 grade crossings with alternative routes that are 10 miles or longer. Those grade crossings are located in the communities of Grannis, Gravette, Hatfield, Horatio, Mena, Ogden, Texarkana, Wilton, and Winthrop in Arkansas; Blakesburg, Letts, Rathbun, and Richland in Iowa; Anacoco, Blanchard, Converse, De Quincy, De Ridder, Hornbeck, Leesville, Mansfield, Mooringsport, Rodessa, Rosepine, Singer, Starks, and Vivian in Louisiana; Arcadia, Chillicothe, Chula, Dawn, Deerfield, Drexel, Foster, Galt, Harris, Laredo, Merwin, Newtown, Osgood, Powersville, Richards, and West Line in Missouri; Heavener, Marble City, Panama, Poteau, Sallisaw, Stilwell, Watts, and Westville in Oklahoma; and Agua Dulce, Beasley, Benavides, Devers, Edna, Hebbronville, Hungerford, Kendleton, Laredo, Louise, Mirando City, Odem, Raywood, Refugio, San Diego, and Woodsboro in Texas. In the unlikely event that a train could become stopped in a position where it blocks those grade crossings, and all crossings within 2 miles, for an extended period of time during an emergency, emergency services could be adversely affected.

OEA also identified 73 grade crossings that do not have a possible alternative route because they are located on or provide the only access to dead-end streets. In addition, OEA identified 38 grade crossings where the only alternative route involves another grade crossing that could potentially be blocked by the same train. These grade crossings are located in the communities of Hatfield, Mena, Ogden, and Siloam Springs in Arkansas; Davis Junction, Kirkland, and Monroe Center in Illinois; Bettendorf, Buffalo, Camanche, Clinton, Davenport, Fredonia, Le Claire, Muscatine, Pleasant Valley, Princeton, Riverdale, Sabula, and Seymour in Iowa; Anacoco, Converse, De Quincy, Florien, Leesville, Mansfield, Mooringsport, Rodessa, Rosepine, Singer, and Starks in Louisiana; Amoret, Chula, Cowgill, Dawn, Drexel, Goodman, Harris, Laredo, Ludlow, and Neosho in Missouri; Heavener, Marble City, Sallisaw, and Watts in Oklahoma; and Banquete, Bloomington, China, Crosby, Edna, Laredo, Louise, McFaddin, Raywood, Realitos, Richmond, Rosenberg, and Texarkana in Texas. In the unlikely event that a train could become stopped in a position where it blocks those grade crossings for an extended period of time during an emergency situation, emergency services could be adversely affected.

Table 3.3-1. Grade Crossings with Potential Decreases in LOS Under the Proposed Acquisition

State	City	Street	Crossing ID	Owner	AADT	No-Action			Proposed Acquisition		
						Trains Per Day	Average Delay per Vehicle (seconds)	LOS	Trains Per Day	Average Delay per Vehicle (seconds)	LOS
Iowa	Davenport	Perry Street	865649B	CP	4,389	8.3	5.5	A	22.7	10.9	B
~~Iowa~~	~~Davenport~~	~~Ripley Street~~	~~865653R~~	~~CP~~	~~11,717~~	~~8.3~~	~~7.3~~	~~A~~	~~22.7~~	~~14.6~~	~~B~~
Louisiana	Shreveport	Flournoy Lucas Road	329154Y	KCS	20,451	25.1	8.4	A	36.0	10.7	B
Missouri	Neosho	College Street	330102D	KCS	5,077	16.2	7.6	A	28.6	10.6	B
Missouri	Neosho	Landis Road	330120B	KCS	2,528	16.2	7.3	A	28.6	10.1	B

With the exception of grade crossings located along the 25 planned capital improvements, which are discussed in more detail below, the presence of an alternative route and the length from any alternative route is an existing condition that would exist regardless of whether or not the Board authorizes the Proposed Acquisition. Moreover, because the Applicants expect that average train length would decrease at many grade crossings as a result of the Proposed Acquisition, the average amount of time that an emergency vehicle would have to wait for a train to pass would decrease at most grade crossings in the study area. However, because average rail traffic would increase, the chance that emergency vehicles could be delayed by trains would increase as a result of the Proposed Acquisition. For the rare and unpredictable events that could stop a train and result in a blocked grade crossing, there are existing Emergency Notification System (ENS) signs at most grade crossings. The signs include a toll-free phone number to contact the railroad. FRA provides guidance and resources to law enforcement and first responders on what to do in the event of an emergency at a grade crossing, such as a stopped train. To address the possibility of blocked grade crossings, the Applicants voluntarily proposed mitigation measures, including a commitment to not block public crossings for longer than 10 minutes unless it cannot be avoided (see *Chapter 4*, *Mitigation*, Voluntary Mitigation [VM]-Grade Crossing-02) and to investigate the potential to create alternative access for properties whose sole access would be blocked more than once a week by a train stationary for longer than 10 minutes at a single location, where practical (VM-Grade Crossing-04). Further, the Applicants have committed to notifying Emergency Services Dispatching Centers for potentially affected communities of all grade crossings blocked by trains that are stopped and may be unable to move for a significant period of time (VM-Grade Crossing-06).

Figure 3.3-2. Example Emergency Services Routing Analysis

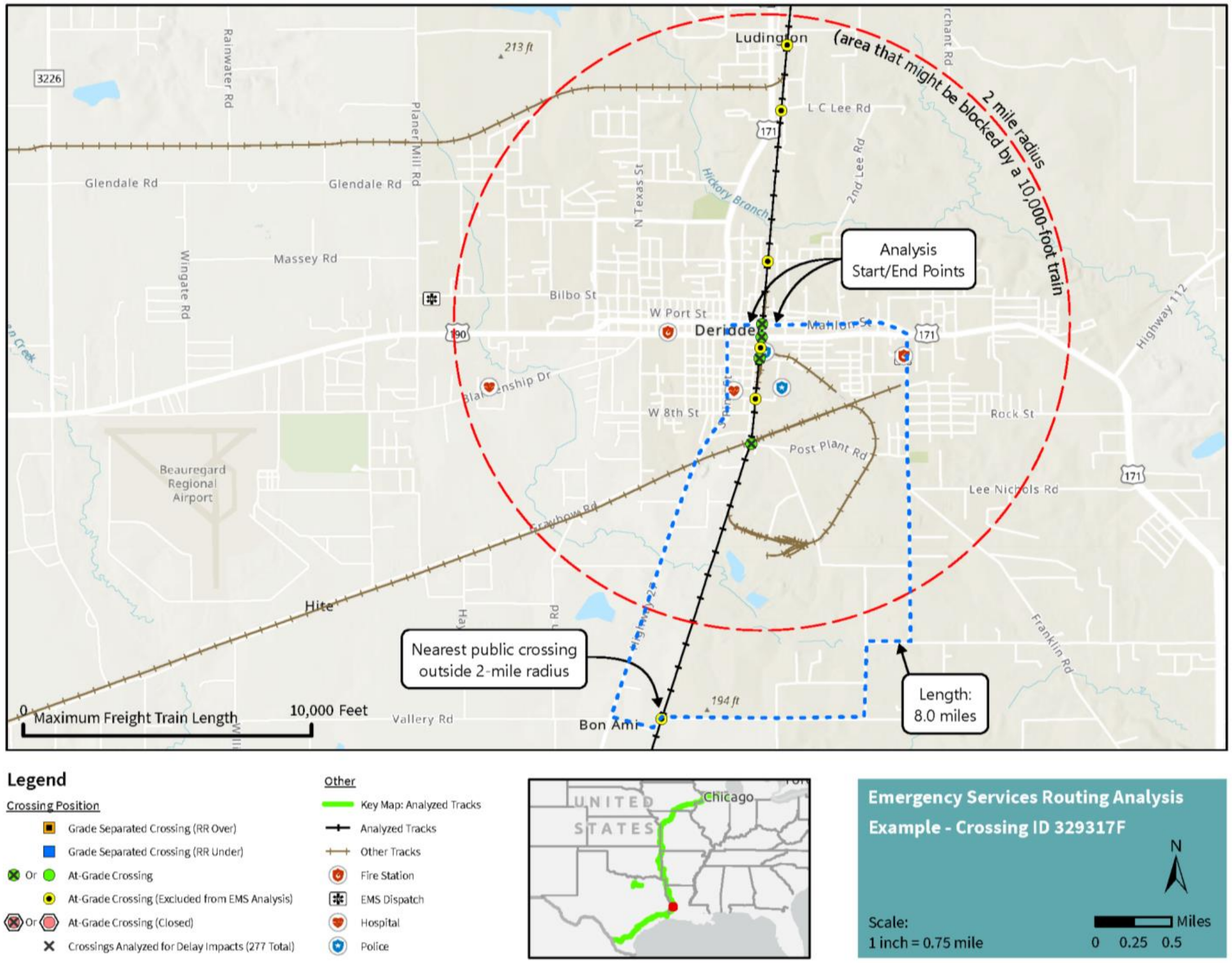


Table 3.3-2. Grade Crossings along Emergency Vehicle Routes designated by FRA

State	City	Street	Crossing ID	AADT	No-Action Alternative		Proposed Acquisition		Alternate Route	Alternate Route Distance (miles)	Alternate Route Speed Limit(s) (mph)
					Average Delay per Vehicle in 24-hour Period (seconds)	LOS	Average Delay per Vehicle in 24-hour Period (seconds)	LOS			
Arkansas	Ashdown	Main Street	330575G	4,335	2.8	A	3.8	A	Main Street Constitution Avenue Commerce Street Front Street	0.21	35
Arkansas	De Queen	East Stilwell Avenue	330524W	4,804	3.6	A	5.2	A	Stilwell Avenue Lakeside Drive Red Bridge Road 3rd Street	2.15	30 to 45
Arkansas	Siloam Springs	Jefferson Street	330375X	5,038	3.5	A	4.9	A	Jefferson Street Main Street Britt Street	0.78	25 to 30
Arkansas	Siloam Springs	Lincoln Street	330405M	6,561	3.4	A	4.8	A	Lincoln Street Ashley Street Hico Street Main Street	1.07	30 to 45
Louisiana	Anacoco	Trigger Trapp Road	329259M	4,218	2.5	A	4.2	A	Shreveport Highway Beavers Road Miers Street Miller Road Port Arthur Avenue Trigger Trapp Road	2.84	25 to 45
Louisiana	De Quincy	East 4th Street	329356W	14,267	3.0	A	4.9	A	4th Street College Street Center Street	0.21	45

Table 3.3-2. Grade Crossings along Emergency Vehicle Routes designated by FRA

State	City	Street	Crossing ID	AADT	No-Action Alternative		Proposed Acquisition		Alternate Route	Alternate Route Distance (miles)	Alternate Route Speed Limit(s) (mph)
					Average Delay per Vehicle in 24-hour Period (seconds)	LOS	Average Delay per Vehicle in 24-hour Period (seconds)	LOS			
									Lake Charles Avenue		
Louisiana	De Quincy	West 4th Street	329346R	10,896	2.3	A	4.2	A	4th Street Holly Street Canterberry Street 4th Street	0.57	--
Louisiana	De Ridder	East Fourth Street/ West Third Street	329320N	4,171	2.2	A	3.7	A	4th Street Jefferson Street 2nd St/City Hall Washington Street	0.19	--
Louisiana	De Ridder	First Street	329319U	27,095	3.2	A	5.4	A	1St St (LA-171) Jefferson Street Washington Street	0.21	--
Louisiana	Rosepine	Louisiana 10	329298D	8,436	2.0	A	3.4	A	Pitkin Highway Lebleu Road Lake Charles Highway	4.5	45
Louisiana	Shreveport	East 85th Street	329128J	2,929	4.8	A	6.2	A	East 85th Street Fairfield Avenue East 79th Street St Vincent Avenue	1.8	25 to 35
Louisiana	Shreveport	Flournoy Lucas Road	329154Y	20,451	8.4	A	10.7	B	Flournoy Lucas Road Ellerbe Road	1.60	40 to 50

Table 3.3-2. Grade Crossings along Emergency Vehicle Routes designated by FRA

State	City	Street	Crossing ID	AADT	No-Action Alternative		Proposed Acquisition		Alternate Route	Alternate Route Distance (miles)	Alternate Route Speed Limit(s) (mph)
					Average Delay per Vehicle in 24-hour Period (seconds)	LOS	Average Delay per Vehicle in 24-hour Period (seconds)	LOS			
									Dalton Street Forbing Road		
Louisiana	Shreveport	Norris Ferry Road	329157U	4,988	4.8	A	6.1	A	Norris Ferry Road Par Road 118/Overton Brooks Road Par Road 153 Southern Loop	4.87	45
Louisiana	Vivian	Camp Vivian Road	329006E	4,687	2.1	A	3.1	A	Camp Road Pardue Street Arkansas Avenue Pine Street	1.77	35 to 40
Louisiana	Vivian	East Arkansas Avenue	328998G	5,572	2.3	A	3.4	A	Arkansas Avenue Front Street Alabama Avenue Front Street	0.34	45
Missouri	Grandview	Main Street	329807X	6,087	2.5	A	3.6	A	Main Street 7 Street Duck Road 2nd Street	1.64	25 to 35
Missouri	Joplin	32nd Street	330061B	17,557	4.1	A	5.9	A	32nd Street Davis Boulevard 20th Street Rangeline Road	2.85	30 to 40

Table 3.3-2. Grade Crossings along Emergency Vehicle Routes designated by FRA

State	City	Street	Crossing ID	AADT	No-Action Alternative		Proposed Acquisition		Alternate Route	Alternate Route Distance (miles)	Alternate Route Speed Limit(s) (mph)
					Average Delay per Vehicle in 24-hour Period (seconds)	LOS	Average Delay per Vehicle in 24-hour Period (seconds)	LOS			
Missouri	Neosho	College Street	330102D	5,077	7.6	A	10.6	B	College Street La-Z-Boy Parkway Spring Street	1.90	25 to 35
Oklahoma	Stilwell	Oklahoma 51	330625H	2,987	2.8	A	4.2	A	OK 51 4720 Road 810 Road 2nd St/ OK-59	3.92	40
Texas	Alice	Flournoy Road	793651B	8,476	5.7	A	5.6	A	Flournoy Road Villegas Street Stadium Road Sain Drive Flournoy Road	1.79	30 to 50
Texas	Carrollton	Josey Lane	021765H	35,576	0.2	A	0.2	A	Josey Lane Hebron Parkway Old Denton Road Parker Road	3.14	40 to 55
Texas	Highland Village	Highland Village	021676R	12,970	0.2	A	0.2	A	Highland Village Road Brazos Boulevard Sellmeyer Lane	3.09	30 to 35
Texas	Lewisville	Garden Ridge Boulevard	021774G	7,850	0.2	A	0.2	A	Garden Ridge Boulevard Valley Ridge Boulevard Stone Hill Farms	2.74	30 to 40

Table 3.3-2. Grade Crossings along Emergency Vehicle Routes designated by FRA

State	City	Street	Crossing ID	AADT	No-Action Alternative		Proposed Acquisition		Alternate Route	Alternate Route Distance (miles)	Alternate Route Speed Limit(s) (mph)
					Average Delay per Vehicle in 24-hour Period (seconds)	LOS	Average Delay per Vehicle in 24-hour Period (seconds)	LOS			
									Parkway Justin Road		
Texas	Refugio	FM 774 Empresario	427570V	6,004	5.1	A	4.9	A	Empresario Street Mesquite Street Purisima Street Osage Street	0.47	40
Texas	Richardson	Alma Road	753757M	14,802	0.2	A	0.2	A	Alma Road Plano Parkway Central Expressway Renner Road	2.4	40 to 45
Texas	Richardson	Custer	789628A	14,203	0.2	A	0.2	A	Custer Parkway Plano Parkway Alma Drive Renner Road	3.23	40
Texas	Wylie	Country Club Road	789648L	13,583	0.2	A	0.2	A	Country Club Road Farm to Market Road 544 West Gate Way Brown Street	5.1	40 to 45
Texas	Wylie	Springwell Parkway	331279Y	13,223	0.2	A	0.2	A	Springwell Parkway Riverway Lane McCreary Road Farm to Market Road 544	2.65	30 to 35

Delay Impacts from New Sidings

If the Board authorizes the Proposed Acquisition, the Applicants plan to make certain capital improvements within the existing rail right-of-way (ROW) to support the projected increase in rail traffic. Those planned capital improvements include extending 13 existing sidings, adding 11 new sidings, adding an industrial working track at one location, and adding double track at one location. Where these planned capital improvements would cross roadways, it is possible that the stopped trains could block crossings.

Blocked crossings occur when a stopped train impacts the flow of vehicles or pedestrians at crossings for an extended amount of time. This is most common at sidings where trains stop to allow other trains to pass by on the main track. Blocked crossings can impact public safety, especially if there are no feasible alternate routes. Blocked crossings can also pose a safety issue to pedestrians who try to go under or cut through trains to get to the other side of crossings. Further, blocked crossings may cause trucks to take detours on local streets that might not be equipped to handle trucks.

Table 3.3-3 shows a list of the 25 planned capital improvements and identifies grade crossings that would be blocked by stopped trains and the average dwell times of those stopped trains. The Applicants have indicated that the average dwell times would range from 24.03 to 97.58 minutes. Of the 18 grade crossings that could be blocked by stopped trains, seven crossings involve businesses, facilities, or residences that could be completely isolated due to a stopped train if the Applicants do not develop alternate access during final engineering and design, while the other 11 crossings currently have alternate routes, ranging from 1.22 to 8.85 miles in length. The alternate route distance is based on the distance from one side of the crossing to the other via the nearest alternate route. One planned siding extension, located near Loring, Louisiana, would involve relocating the western endpoint of the siding so as to avoid blocking a grade crossing that is currently crossed by the existing siding; however, this siding extension would cross a different grade crossing near its eastern endpoint, as shown in **Table 3.3-3**.

Table 3.3-3. Potential Blocked Grade Crossings at Planned Capital Improvements

City, State, Crossing	Crossing ID	Alternate Route (yes/no)	Average Dwell Time (min)		Distance to Opposite Side of Crossing via Nearest Alternate Route (miles)	Alternate Route Speed Limit (mph)	Comments
			No-Action Alternative	Proposed Acquisition			
Asbury, Missouri							
None	n/a	n/a	n/a	n/a	n/a	n/a	No impacts.
MP 247 (Baron), Oklahoma							
None	n/a	n/a	n/a	n/a	n/a	n/a	No impacts.
Bellevue, Iowa							
334th Street	376106K	No	n/a	n/a	n/a	n/a	This grade crossing could impact approximately 30 to 40 residences along Smith's Ferry Road. While there is no current alternate route, the Applicants intend to relocate the crossing by approximately 0.5 miles to avoid impacts.
Blue Valley, Missouri							
17th Street	329764G	Yes	73.18	73.18	1.5	35	Alternate route available.
Camanche, Iowa							
Beaver Channel Parkway	865539R	No	48.62	34.62	n/a	n/a	This grade crossing could impact one business driveway. While there is no current alternate route, the crossing could be relocated by approximately 0.25 miles to avoid impacts.
Cave Spring, Oklahoma							
N4660 Road	330640K	Yes	51.10	51.10	8.33	--	Alternate route available.

Table 3.3-3. Potential Blocked Grade Crossings at Planned Capital Improvements

City, State, Crossing	Crossing ID	Alternate Route (yes/no)	Average Dwell Time (min)		Distance to Opposite Side of Crossing via Nearest Alternate Route (miles)	Alternate Route Speed Limit (mph)	Comments
			No-Action Alternative	Proposed Acquisition			
MP 431 (Dawn), Missouri							
None	n/a	n/a	n/a	n/a	n/a	n/a	No impacts.
Deer Creek, Iowa							
None	n/a	n/a	n/a	n/a	n/a	n/a	No impacts.
Gentry, Arkansas							
Private Crossing	330361P	Yes	31.50	31.50	1.22	--	Alternate route available.
Floyd Moore Road	330360H	Yes	31.50	31.50	3.6	--	Alternate route available.
MP 186 (Goodman), Missouri							
Splitlog Road	330150T	Yes	38.34	38.34	8.85	--	Alternate route available.
Blackstock Lane	330148S	No	38.34	38.34	n/a	n/a	This grade crossing would impact three residences. No alternate route is currently available.
Private crossing	330147K	Yes	38.34	38.34	5.0	--	Alternate route available.
Grandview, Missouri							
None	n/a	n/a	n/a	n/a	n/a	n/a	No impacts.
Heavener, Oklahoma							
Stand Pipe Road	330789Y	Yes	97.58	97.58	6.31	--	Alternate route available
Nichols Lane	330788S	No	97.58	97.58	n/a	n/a	This grade crossing would impact one farm including its

Table 3.3-3. Potential Blocked Grade Crossings at Planned Capital Improvements

City, State, Crossing	Crossing ID	Alternate Route (yes/no)	Average Dwell Time (min) No-Action Alternative	Average Dwell Time (min) Proposed Acquisition	Distance to Opposite Side of Crossing via Nearest Alternate Route (miles)	Alternate Route Speed Limit (mph)	Comments
							residence. No Alternate route is currently available.
Private Crossing	330787K	No	97.58	97.58	n/a	n/a	This grade crossing would impact a sewer treatment plant. No alternate route is currently available.
Laredo, Missouri							
None	n/a	n/a	n/a	n/a	n/a	n/a	No impacts.
Letts, Iowa							
None	n/a	n/a	n/a	n/a	n/a	n/a	No impacts.
Loring, Louisiana							
Private Crossing	329231W	Yes	56.90	56.90	5.5	--	Alternate route available.
Mansfield, Louisiana							
Private Crossing	329180N	No	34.20	34.20	--	--	This grade crossing would impact one residence. No alternate route is currently available.
MP 75 (Monroe), Illinois							
North Bennett Road	372324D	Yes	44.97	44.97	5	--	Alternate route available.
Moravia, Iowa							
None	n/a	n/a	n/a	n/a	n/a	n/a	No impacts.
MP 377 (Mena), Arkansas							

Table 3.3-3. Potential Blocked Grade Crossings at Planned Capital Improvements

City, State, Crossing	Crossing ID	Alternate Route (yes/no)	Average Dwell Time (min)		Distance to Opposite Side of Crossing via Nearest Alternate Route (miles)	Alternate Route Speed Limit (mph)	Comments
			No-Action Alternative	Proposed Acquisition			
Polk 76 Road West	330448F	Yes	24.03[3]	24.03	6.8	--	Alternate route available.
Newtown, Missouri							
None	n/a	n/a	n/a	n/a	n/a	n/a	No impacts.
Ottumwa, Iowa							
None	n/a	n/a	n/a	n/a	n/a	n/a	No impacts.
MP 71 (Turkey River), Iowa							
None	n/a	n/a	n/a	n/a	n/a	n/a	No impacts.
Spiro, Oklahoma							
Bailey Road	330709D	Yes	37.05	37.05	3.72	--	Alternate route available.
Singer, Louisiana							
Private driveway	329334W	No	34.82	34.82	n/a	n/a	This grade crossing would impact one residence. No alternate route is currently available.
MP 255 (Washington), Iowa							
None	n/a	n/a	n/a	n/a	n/a	n/a	No impacts.

[3] No dwell time data for Mena; assumed similar dwell times nearby siding in Potter, which is along the same Shreveport subdivision.

Impacts from Rail Yards

Most of the rail yards located in the study area would experience minimal increases in rail yard activity as a result of the Proposed Acquisition. However, four rail yards—Bensenville and Schiller Park in Illinois, Detroit Container Terminal in Michigan, and Wylie in Texas—would experience increases in rail yard activity that would exceed thresholds for environmental review (**Table 3.3-5**). The delay analysis accounted for the projected increase in truck traffic and rail traffic that could be associated with the increase in activity at rail yards under the Proposed Acquisition. Specifically, the delay analysis included any projected increases in truck traffic and rail traffic at crossings near these rail yards. The following is a summary of the expected delay for grade crossings near the rail yards under the Proposed Acquisition and the No-Action Alternative.

- Bensenville and Schiller Park Yards: There are four grade crossings that exceed the threshold for delay analysis in Bensenville and Franklin Park, which are proximate to the Bensenville and Schiller Park rail yards in Illinois. For these four grade crossings, the average delay per vehicle would be 6.6~~3.7~~ seconds per grade crossing under the Proposed Acquisition compared to 6.3~~3.4~~ seconds per grade crossing under the No-Action Alternative. Only one of the four crossings (York Road in Bensenville) is located along a truck route and associated with a projected increase in truck traffic; approximately another 200 trucks per day under the Proposed Acquisition compared to the No-Action Alternative.
- Detroit Container Terminal: There are no grade crossings that exceed the thresholds for delay analysis near the Detroit Container Terminal in Michigan.
- Wylie Yard: There are six grade crossings that exceed the threshold for delay analysis in Wylie, which are proximate to the Wylie rail yard in Texas. For these six grade crossings, the average delay per vehicle would be 0.2 seconds per grade crossing under the Proposed Acquisition compared to 0.2 seconds per grade crossing under the No-Action Alternative. These grade crossings are not along major truck routes. As such, there is not a projected increase in truck traffic at these crossings under the Proposed Acquisition.

While there would be a 25 percent to 100 percent increase in rail yard activity in these four rail yards under the Proposed Acquisition, only one of the crossings is along a truck route and associated with a projected increase in truck traffic under the Proposed Acquisition. Based on this analysis, OEA concluded there would be a minimal increase in average delay per vehicle at the proximate grade crossings under the Proposed Acquisition compared to the No-Action Alternative.

Table 3.3-4. Grade Crossings Near Rail Yards

Yard Name	State	2027 No-Action Alternative Cars Processed Per Day	Acquisition-Related Growth Cars Processed Per Day	2027 Proposed Acquisition Cars Processed Per Day	Acquisition-Related Growth Percentage Cars Processed Per Day
Bensenville Yard	Illinois	1,427.7	367.7	1795.5	25.8

Table 3.3-4. Grade Crossings Near Rail Yards

Yard Name	State	2027 No-Action Alternative Cars Processed Per Day	Acquisition-Related Growth Cars Processed Per Day	2027 Proposed Acquisition Cars Processed Per Day	Acquisition-Related Growth Percentage Cars Processed Per Day
Schiller Park Yard	Illinois	74.0	76.5	150.6	103.4
Detroit Container Terminal	Michigan	33.2	23.2	56.5	70.0
Wylie	Texas	323.1	137.0	460.0	42.4

Criteria for Considering Grade Crossing Separation

USDOT, through FHWA and FRA, has regulatory jurisdiction over safety at grade crossings, pursuant to the Highway Safety Act of 1966 (HSA) (23 U.S.C. §§ 401-408). The HSA governs the distribution of funds to states aimed at eliminating hazards at grade crossings and USDOT has issued regulations that address grade crossing safety and provides funding for the installation and improvement of warning devices through the states. Jurisdiction over grade crossings falls primarily to the states. Each state is required to periodically inspect grade crossings and to determine the adequacy of warning devices at each location, as well as to order safety improvements. USDOT oversees and approves the state determinations. In addition to federal oversight and funding, states also monitor crossings and, in many cases, designate funding to complement the federal funds. Grade separations are very costly and, because grade separations typically benefit primarily the community and not the railroad, railroads typically pay a small share of the total cost. Under USDOT regulations at 23 C.F.R. § 646.210 and pursuant to 23 U.S.C. § 130(b), the railroad share for a grade separation project seeking federal aid that would eliminate an existing crossing with active warning devices (i.e., flashing lights, bell and/or gates) would be 5 percent of the project costs, including preliminary engineering, right-of-way and construction costs.

According to FHWA guidelines (FHWA and FRA 2019), grade crossings should be considered for grade separation if one or more of the following conditions exist:

- The road is a limited access facility;
- The posted highway speed equals or exceeds 55 mph;
- AADT exceeds 30,000 in urban areas or 20,000 in rural areas;
- Maximum authorized train speed exceeds 79 mph;
- Freight trains average 30 or more trains per day;
- Passenger trains average 75 or more per day in urban areas or 30 or more per day in rural areas;
- Transit trains average 150 or more per day in urban areas or 60 or more per day in rural areas;

- Freight train crossing exposure (the number of freight trains per day times the AADT) exceeds 900,000 in urban areas or 600,000 in rural areas;
- Passenger train crossing exposure (the product of the number of passenger trains per day and AADT) exceeds 2,250,000 in urban areas or 600,000 in rural areas;
- Transit train crossing exposure (the number of transit trains per day times the AADT) exceeds 4,500,000 in urban areas or 1,200,000 in rural areas;
- The expected accident frequency for active devices with gates, as calculated by the USDOT Accident Prediction Formula, including five-year history, exceeds 0.5 per year. If the highway is a part of the designated National Highway System, the expected accident frequency for active devices with gates, as calculated by the USDOT Accident Prediction Formula including five-year accident history, exceeds 0.2 per year; or
- Vehicle delay exceeds 30 vehicle hours per day with consideration for cost effectiveness.

While OEA considered FHWA criteria, these are not federal requirements for grade separation and many grade crossings that meet these criteria have not been allocated federal or state funding for separation. Further, only certain FHWA criteria are applicable to evaluating the potential impacts of the Proposed Acquisition. There are many criteria that would remain the same in both the No-Action Alternative and the Proposed Acquisition, including road facility type, posted speed of the roadway, AADT, train speed, number of passenger and transit trains, and the crossing exposure for passenger and transit trains.

Of the 276 grade crossings that OEA analyzed for delay, **Table 3.3-5** identifies 23 that would exceed FHWA criterion for freight volume per day or the FWHA criterion for vehicle hours of delay per day under the Proposed Acquisition but not under the No-Action Alternative. While several additional grade crossings within the study area would exceed one or more of the FHWA criteria under the Proposed Acquisition, those grade crossings would also exceed one or more criteria under the No-Action Alternative.

As part of its analysis of grade crossings and whether to recommend site-specific grade crossing mitigation, OEA also considered whether the Proposed Acquisition would increase average delay per delayed vehicle by 30 seconds or more at any of the grade crossings listed in **Table 3.3-5** or whether the Proposed Acquisition would result in an increase in average queue length at the grade crossing that could adversely affect mobility of a community by blocking a major roadway that would not be blocked under the No-Action Alternative. OEA found that, for all of the grade crossings where FHWA criteria would be met or exceeded, the Proposed Acquisition would result in a decrease in average delay per delayed vehicle and a decrease in average queue length. This is because the Applicants expect that, although average rail traffic would increase at those grade crossings, the length of the average train would decrease. In addition, OEA found that the Proposed Acquisition would not cause the LOS of any of the grade crossings in **Table 3.3-5** to decrease.

OEA also notes that all of the grade crossings where FHWA criteria would be met or exceeded under the Proposed Acquisition have alternate routes that could be used by emergency service providers or other vehicles to cross the rail line in the unlikely event that the grade crossing were to be blocked for a substantial amount of time. For all of those grade crossings, the distance of the alternative route from the grade crossing would be less than 10 miles, with an average distance of 4.8 miles.

For these reasons, OEA is not recommending that the Board require the Applicants to fund or partially fund grade separations at those grade crossings as mitigation to address the environmental impacts of the Proposed Acquisition. OEA is recommending that the Board impose the mitigation measures that the Applicants voluntarily proposed. Those measures include a commitment to not block public crossings for longer than 10 minutes unless it cannot be avoided (see *Chapter 4*, *Mitigation*, Voluntary Mitigation [VM]-Grade Crossing-02) and to investigate the potential to create alternative access for properties whose sole access would be blocked more than once a week by a train stationary for longer than 10 minutes at a single location, where practical (VM-Grade Crossing-04). OEA is also recommending additional mitigation that would require the Applicants to consult with appropriate state Departments of Transportation and other appropriate agencies prior to constructing, relocating, upgrading, or modifying grade crossings, including grade crossing warning devices, and to abide by those agencies' reasonable requirements for the design of grade crossings and associated warning devices (MM-Grade Crossing-01).

Table 3.3-5. Grade Crossings Exceeding FHWA Criteria for Separation Consideration

State	City	Street	Crossing ID	30+ freight trains/day	Vehicle delay > 30 hours/day
Louisiana	De Ridder	First Street	329319U	--	Yes
Louisiana	De Ridder	Mahlan Street	329317F	--	Yes
Louisiana	Frierson	Gravel Point Road	329164E	Yes	--
Louisiana	Frierson	Louisiana 175	329162R	Yes	--
Louisiana	Shreveport	East 85th Street	329128J	Yes	--
Louisiana	Shreveport	Norris Ferry Road	329157U	Yes	--
Missouri	Grandview	Main Street	329807X	Yes	--
Missouri	Kansas City	17th Street	329764G	Yes	--
Texas	Bloomington	Texas 185	435914C	Yes	--
Texas	Crosby	Crosby Eastgate Road	762865H	Yes	--
Texas	Crosby	Miller Wilson Road	762872T	Yes	--
Texas	Crosby	Ramsey Road	762869K	Yes	--
Texas	Houston	Beechnut Street	758519L	Yes	--
Texas	Houston	Bissonnet Street	758517X	Yes	--
Texas	Houston	Braeswood Boulevard	758521M	Yes	--
Texas	Houston	John Ralston Road	762907S	Yes	--
Texas	Houston	Roy Street	758532A	Yes	--
Texas	Houston	San Felipe Road	758512N	Yes	--
Texas	Houston	US 59 Westbound Frontage	758611L	Yes	--
Texas	Houston	Van Hut Lane	762901B	Yes	--
Texas	Houston	West Bellfort Avenue	758523B	Yes	--

Table 3.3-5. Grade Crossings Exceeding FHWA Criteria for Separation Consideration

State	City	Street	Crossing ID	30+ freight trains/day	Vehicle delay > 30 hours/day
Texas	Houston	Willowbend Boulevard	758525P	Yes	--
Texas	Liberty	Bowie Street	762770A	Yes	--

As shown in the table, 10 of the 23 grade crossings where the FWHA criterion of 30 or more freight trains per day would be met are located in Houston, Texas. These grade crossings are located along rail line segment U-BEAU-01, which is part of UP's Houston Subdivision and Glidden Subdivision. KCS currently operates trains on this rail line segment under a trackage rights arrangement with UP, and CPKC would continue to operate under a trackage rights arrangement if the Board authorizes the Proposed Acquisition. Depending on the exact location, rail line segment U-BEAU-01 currently supports between approximately 21.76 and 43.61 trains per day, most of which are UP trains. The Applicants project that the Proposed Acquisition would increase rail traffic through Houston by approximately 7.57 trains per day and, for the purposes of its environmental analysis of the Proposed Acquisition, OEA assumed that all new freight trains would move on rail line segment U-BEAU-01. The addition of 7.57 trains per day would increase rail traffic through the 10 grade crossings in Houston shown in the table from between 20 and 30 freight trains per day to between 30 and 40 freight trains per day.

However, OEA understands that, because UP and BNSF own most of the rail lines in Houston, CPKC could not control the dispatching of trains on those rail lines. Based on information submitted to the Board by UP, BNSF, and others, it appears that trains through Houston are typically dispatched directionally, with westbound traffic using UP's Houston Subdivision and eastbound traffic using UP's Beaumont Subdivision. To the extent that some CPKC trains may be dispatched on rail line segments other than U-BEAU-01, then the increase in rail traffic on that segment resulting from the Proposed Acquisition is likely to be less than the 7.57 trains per day that the Applicants have projected. Therefore, the results reported in this section in the Final EIS may overstate the potential impacts of the Proposed Acquisition on grade crossing delay in Houston, including at the 10 grade crossings shown in **Table 3.3-5**.

3.3.3.2 No-Action Alternative

Under the No-Action Alternative, the Board would not authorize the Proposed Acquisition and CP would not acquire KCS. The projected increases in rail traffic on existing rail lines and the projected increases in activity at rail yards would not occur as a result of the Proposed Acquisition. Similarly, the Applicants would not make the planned capital improvements associated with the Proposed Acquisition under the No-Action Alternative and thus are existing conditions. However, rail traffic could increase on rail lines and road traffic could increase at the crossings within the study area in the future due to changing market conditions, including general economic growth. CP and KCS could also make capital improvements along their respective rail lines in the future without seeking Board authority if needed to support rail operations. Grade crossing delay could also increase under the No-Action Alternative as a result of increased road traffic if population growth occurs. Delay at grade crossings would increase under the No-Action Alternative as a result of increased rail and road traffic due to organic growth.

3.3.4 Conclusion

Although the Proposed Acquisition has the potential to cause increased delay at grade crossings due to the projected increase in rail traffic, OEA expects that this impact would be minor. In response to comments on the Draft EIS, OEA provided information related to grade crossing delay under the Proposed Acquisition and the No-Action Alternative for 1,365 grade crossings in the study area and further quantified delay impacts at 276 grade crossings with an AADT of 2,500 or more vehicles per day. OEA found that the Proposed Acquisition would result in a decrease in the LOS at only four grade crossings.

~~OEA evaluated potential impacts at 277 grade crossings that would experience an increase in rail traffic of eight or more trains per day and concluded that the Proposed Acquisition would result in a decrease in the LOS at only five of those grade crossings.~~ OEA predicts that the Proposed Acquisition would cause the LOS to decrease from LOS A to LOS B at all ~~five~~ four of these crossings. Because LOS B corresponds to stable flow, OEA concludes that the Proposed Acquisition would result in minor adverse delay impacts at these grade crossings but would not warrant mitigation. OEA notes that, because most of the projected increase in rail traffic on the combined CPKC network would be diverted from other rail lines outside of the study area, the Proposed Acquisition could potentially result in decreased delay at grade crossings on those other rail lines.

For the 28 grade crossings on FRA-designated emergency routes, OEA concluded that grade crossing delay caused by the Proposed Acquisition would have a minor impact on the provision of emergency services because, on average, the grade crossing delay along emergency vehicle routes would be 2.9 seconds per vehicle (LOS A) under the No-Action Alternative, compared to 3.9 seconds per vehicle (LOS A) under the Proposed Acquisition and because all of these crossings have alternative routes, no mitigation is warranted.

OEA finds that the Proposed Acquisition generally would have minor effects on emergency service vehicles. For the 28 grade crossings on FRA-designated emergency routes, OEA concluded that grade crossing delay caused by the Proposed Acquisition would have a minor impact because, on average, the grade crossing delay along emergency vehicle routes would be 3.9 seconds per vehicle (LOS A) under the Proposed Acquisition, compared to 2.9 seconds per vehicle (LOS A) under the No-Action Alternative. For the 751 grade crossings that OEA included in the alternative route analysis, the majority (approximately 82 percent) have a viable alternative route that is less than 10 miles long. Further, a 10,000-ft freight train could become stopped and block these grade crossings under both the Proposed Acquisition and the No-Action Alternative, resulting in the same alternative routes. For the majority of the 1,365 grade crossings in the study area, average gate down time per train would decrease, which means that, although the frequency with which emergency vehicles would be stopped by trains would increase, those emergency vehicles would have to wait for a shorter time, on average, for a train to pass compared to the No-Action Alternative.

The vast majority (approximately 98 percent) of grade crossings in the study area would not meet FHWA criteria for considering grade crossing separation under either the Proposed

Acquisition or the No-Action Alternative. The Proposed Acquisition would cause 21 grade crossings to exceed the FHWA criterion of 30 or more freight trains per day and would cause two grade crossings to exceed the FHWA criterion of 30 hours of total delay. However, the Proposed Acquisition would not result in an increase in average delay per delayed vehicle, an increase in maximum queue length, or a decrease in the LOS at any of these 24 grade crossings and all of these crossings have viable alternative routes. OEA did not identify any grade crossings where the impacts of the Proposed Acquisition would warrant site-specific mitigation, such as grade separation mitigation.

The Proposed Acquisition would also not result in adverse impacts on grade crossings near rail yards where rail yard activity would increase.

The Proposed Acquisition would result in delay impacts at 18 grade crossings where the Applicants intend to add a new passing siding or extend an existing siding. Among these, seven have the potential to completely isolate residences, businesses, or other buildings if the Applicants do not develop alternate access routes during final engineering and design. ~~The Applicants have committed to abide by federal rules requiring railroads to not block public crossings for longer than 10 minutes unless it cannot be avoided (see Chapter 4, *Mitigation*, Voluntary Mitigation [VM]-Grade Crossing-02) and to investigate the potential to create alternative access for properties whose sole access would be blocked more than once a week by a train stationary for longer than 10 minutes at a single location, where practical (VM-Grade Crossing-04).~~

The Applicants have voluntarily proposed a number of mitigation measures that would address grade crossing delay, as set forth in *Chapter 4, Mitigation*. The Applicants have committed to work upon request with potentially affected communities in support of securing funding, in conjunction with appropriate state agencies, for crossing mitigation projects where they may be appropriate under criteria established by relevant state transportation departments to increase the safety of existing grade crossings (VM-Grade Crossing-01). The Applicants have also committed to operate under the General Code of Operating Rules rule numbers 6.32.6 (Blocked Public Crossings) and 6.32.4 (Clear of Crossings and Signal Circuits), which provide that, when practical, a standing train or switching movement must avoid blocking a public crossing longer than 10 minutes and, when practical, cars, engines and other equipment should not be left standing closer than 250 feet from a road crossing when there is an adjacent track (VM-Grade Crossing-04). To address the possibility of blocked grade crossings, the Applicants have committed to notifying Emergency Services Dispatching Centers for potentially affected communities of all grade crossings blocked by trains that are stopped and may be unable to move for a significant period of time (VM-Grade Crossing-06).

In addition, the Applicants have committed to consult with local transportation officials regarding detours and associated signs, as appropriate and practical, during the construction of the planned capital improvements to allow for the quick passage of emergency vehicles (VM-Grade Crossing-05). ~~These mitigation measures would minimize the impacts on grade crossing delay resulting from the planned capital improvements. Because impacts related to grade crossing delay would be minor and would be minimized by the mitigation measures proposed by the Applicants, OEA is not recommending any additional mitigation measures for grade crossing delay.~~

Following issuance of the Draft EIS, the Applicants notified OEA that the Applicants are committed to implementing additional voluntary mitigation measures to address potential impacts in communities in the Houston area. These measures include a commitment to meet regularly with community representatives in the Houston area and to work with communities to address concerns related to impacts resulting from the Proposed Acquisition. The Applicants also commit to providing community leaders with options for reporting issues, such as blocked grade crossings. The Applicants state that these options would include CP's "Community Connect" webpage and CP's Public Safety Communication Centre, which can be reached toll-free at 1-800-716-9132. The Applicants state that the Public Safety Communications Centre is staffed 24 hours a day, 365 days a year with trained communication officers who track reported incidents using Computer Aided Dispatch (CAD) software (see VM-Community-01 and VM-Community-02).

Also following issuance of the Draft EIS, the Applicants notified OEA that the Applicants are committed to implementing additional voluntary mitigation measures to address potential impacts in communities in the Chicago area with which the Applicants have been unable to reach agreements, including DuPage County, the Village of Bartlett, the Village of Bensenville, the City of Elgin, the Village of Itasca, the Village of Hanover Park, the Village of Roselle, the City of Wood Dale, and the Village of Schaumburg. Those commitments include funding and installing a predictive mobility system, interconnected with existing railroad crossing signals, that will deliver advanced notice of blocked grade crossings to citizens, police, fire, and rescue operations, and others; funding and installing ITS Interconnect for Advanced Warning Signs at strategic locations to give drivers information about occupied grade crossings, allowing them to make better on-the-spot decisions; and funding and installing Positive Train Control wireless technology tie-ins at grade crossings adjacent to Metra platforms, which will minimize the activation of crossing lights and gates (see VM-Community-03).[4]

To facilitate compliance with VM-Community-01 and VM-Community-02, OEA is recommending that the Board impose an additional mitigation measure MM-Community-03, which would require the Applicants to establish a Community Liaison to consult with Houston area community leaders. To facilitate compliance with VM-Community-03, OEA is also recommending that the Board impose mitigation measure MM-Community-04, which would require the Applicants to establish a Community Liaison to consult with community leaders of the Chicago area communities referenced above (the Village of Itasca, the Village of Bensenville, the City of Wood Dale, the Village of Roselle, the Village of Schaumburg, the Village of Hanover Park, the Village of Bartlett, the City of Elgin, and DuPage County) (MM-Community-04). Finally, OEA is also recommending that the Board impose a

[4] FRA defines ITS as "the application of new communications, computer, and sensor technologies to highways and transit systems and the careful integration of system functions to provide more efficient and effective solutions to multimodal transportation problems. The goal of ITS is provide a seamless, multimodal, and nationwide transportation system." Tie-ins to Positive Train Control provide information on train locations because each locomotive has a Global Positioning (GPS) device. FRA is working with the American Railway Engineering and Maintenance-of-Way Association to develop standards for ITS grade crossing systems for broader deployment. An example of potential use includes an ITS interconnect system transmitting the status of a crossing to in-vehicle navigation systems. Another example includes Changeable Messaging Signs that use PTC train locations and speed to provide information about trains approaching, second trains, and estimated delay times.

mitigation measure requiring the Applicants to consult with appropriate state Departments of Transportation and other appropriate agencies prior to constructing, relocating, upgrading, or modifying grade crossings, including grade crossing warning devices, and to abide by those agencies' reasonable requirements for the design of grade crossings and associated warning devices (MM-Grade Crossing-01).

OEA believes that the Applicants' voluntary mitigation measures and OEA's additional recommended mitigation measures would minimize the impact of the Proposed Acquisition on grade crossing delay.