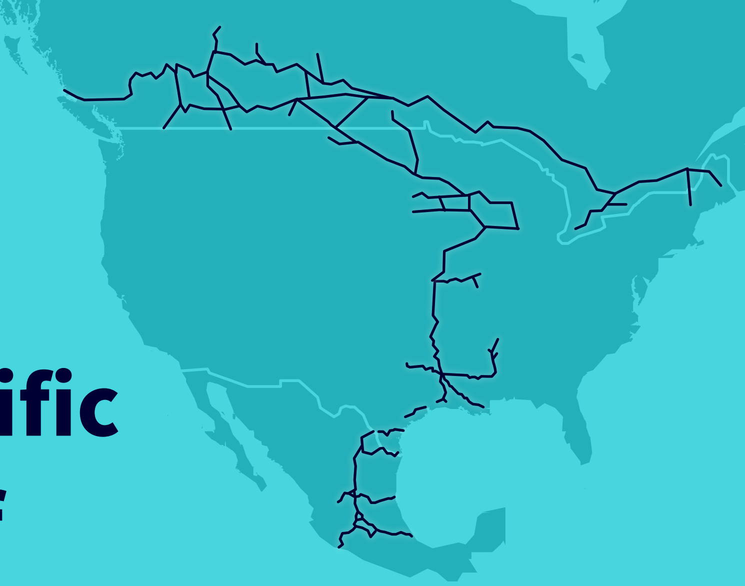


Served on Parties and
Delivered to U.S. EPA
on January 27, 2023

Canadian Pacific Acquisition of Kansas City Southern

FINAL ENVIRONMENTAL IMPACT STATEMENT

Docket No. FD 36500

Volume I: Summary and Chapters 1 - 5

LEAD AGENCY
Surface Transportation Board
Office of Environmental Analysis

APPLICANTS
Canadian Pacific Railway
Kansas City Southern Railway

Decision ID No. 51566

Lead Agency: Surface Transportation Board (Board)

Proposed Action: Canadian Pacific Railway Limited, et al. (CP) Acquisition of Kansas City Southern et al. (KCS)

Abstract: CP and KCS (collectively, Applicants) are seeking authority from the Board for CP to acquire KCS (Proposed Acquisition). If the Board authorizes the Proposed Acquisition, CP and KCS would combine into a single rail system to be known as Canadian Pacific Kansas City (CPKC). The combined CPKC network would include approximately 20,350 miles of track in total, including approximately 8,600 miles in the U.S., and would extend from Canada, through the U.S., and into Mexico. The Applicants expect that the Proposed Acquisition would create new operational efficiencies and would divert freight from other railroads and from trucks. As a result, rail traffic would increase on some rail lines in the combined CPKC rail network. To support this expected increase in rail traffic, the Applicants plan to make capital improvements within the existing rail right-of-way, which would include adding new passing sidings, extending existing sidings, adding a section of double track, and adding facility working track at a total of 25 locations along the combined CPKC network. The Board's Office of Environmental Analysis (OEA) prepared this Final Environmental Impact Statement (Final EIS) to analyze the environmental impacts of the Proposed Acquisition. OEA also considered the No-Action Alternative, which would occur if the Board were to deny authority for CP to acquire KCS. Under the No-Action Alternative, OEA anticipates that rail traffic would only increase on the CP and KCS networks as a result of general economic growth and that the Applicants would not add the planned capital improvements. The Final EIS describes the potential direct, indirect, and cumulative environmental impacts of the Proposed Acquisition on freight and passenger safety, grade crossing safety and delay, truck to rail diversion, intermodal facility traffic, noise, air quality, climate change, energy, cultural resources, hazardous material release sites, biological resources, water resources, and Environmental Justice. The Final EIS also responds to all substantive comments received on the Draft EIS and sets forth environmental mitigation measures that the Applicants have voluntarily proposed, as well as OEA's additional recommended mitigation measures. If the Board decides to authorize the Proposed Acquisition, the Board could impose the Applicants' voluntary mitigation measures and OEA's additional recommended mitigation measures as conditions of that decision.

SURFACE TRANSPORTATION BOARD
Washington, DC 20423

Office of Environmental Analysis

January 27, 2023

Re: Docket No. FD 36500, Canadian Pacific Railway Limited, et al.—Control of—Kansas City Southern, et al.; **Issuance of Final Environmental Impact Statement**

Dear Reader:

The Surface Transportation Board's (Board) Office of Environmental Analysis (OEA) is pleased to announce the issuance of the Final Environmental Impact Statement (EIS) for the Proposed Acquisition of Kansas City Southern Railway (KCS) by Canadian Pacific Railway (CP). A link to the document is available on the Board's website (www.stb.gov) and on the project website (www.CP-KCSMergerEIS.com).

CP and KCS (collectively, the Applicants) submitted an application to the Board on October 29, 2021 seeking Board authority for CP to acquire KCS (Proposed Acquisition). If the Board authorizes the Proposed Acquisition, CP and KCS would combine into a single rail system to be known as Canadian Pacific Kansas City (CPKC). The Proposed Acquisition would be an "end-to-end" merger because CP and KCS do not overlap. The combined CPKC network would include approximately 21,400 miles of track in total, including approximately 10,400 miles in the U.S., and would extend from Canada, through the United States, and into Mexico. The Applicants expect that the Proposed Acquisition would create new operational efficiencies and would divert freight from other railroads and from trucks. As a result, rail traffic would increase on some rail lines in the combined CPKC rail network. To support this expected increase in rail traffic, the Applicants plan to make capital improvements within the existing rail right-of-way, which would include adding new passing sidings, extending existing sidings, adding a section of double track, and adding facility working track at a total of 25 locations along the combined CPKC network.

On August 5, 2022, OEA issued a Draft EIS for public review and comment; comments were due September 26, 2022. In response to requests to extend the comment period, the Board granted an extension to October 14, 2022. During the comment period, OEA hosted seven public meetings to present findings in the Draft EIS and hear oral comments, including three online public meetings and in-person public meetings in Itasca, Illinois; Davenport, Iowa; Excelsior Springs, Missouri; and Beaumont, Texas. Also, during the comment period, OEA conducted site visits to observe current conditions in areas that could experience impacts as a result of the Proposed Acquisition, including Houston, Texas; Port Arthur, Texas; Camanche, Iowa; Davenport, Iowa; Muscatine, Iowa; Fredonia/Columbus Junction, Iowa; Clinton, Iowa; Bensenville, Illinois; Itasca, Illinois; Elgin, Illinois and Wood Dale, Illinois (the site visits between Elgin and Bensenville included riding the Metra MD-W line). In addition to oral comments, OEA also accepted written comments on the Draft EIS by mail, email, and via the Board-sponsored project website. OEA received comments from a wide range of stakeholders, including residents of towns and cities and rural lands, government and community leaders from many levels, tribal leaders and tribal members, groups and individuals representing environmental interests, land and water managers, emergency service providers, including police, fire fighters, and medical personnel, and transit and freight rail organizations, among many others. OEA received approximately 700 comments during the comment period.

OEA has considered and responded to all comments received on the Draft EIS in this Final EIS. Comment summaries and responses are set forth in **Appendix S**, and substantive changes made to the text of the Draft EIS appear in red and blue in the Final EIS (track changes indicate the language deleted in red and new language added appears in blue). Based on the analysis in the Draft EIS and Final EIS, OEA has determined that the conclusions reached in the Draft EIS remain valid—the Proposed Acquisition would not result in major impacts to environmental resource areas, with the exception of noise, where unavoidable adverse noise impacts would occur. While OEA has not changed its conclusions from the Draft EIS, OEA has included additional information in the Final EIS in response to comments.

WHERE TO FIND THE EIS

As noted above, the Final EIS consists of the Draft EIS with changes made to the text of the Draft EIS appearing in red and blue in the Final EIS (track changes indicate the language deleted in red and new language added appears in blue). Both the Draft EIS and the Final EIS are available for viewing and downloading on the Board's website (www.stb.gov) and on the Board-sponsored project website (www.CP-KCSMergerEIS.com).

WHAT HAPPENS NEXT

The Final EIS sets forth OEA's conclusions regarding the potential environmental impacts of the Proposed Acquisition of KCS by CP and OEA's final recommendations to the Board, including recommendations that the Board impose the Applicants' voluntary environmental mitigation and additional environmental mitigation developed by OEA. The Board will now issue a final decision that will consider the transportation merits of the Proposed Acquisition and the entire environmental record, including the Draft EIS, Final EIS, and all comments received. In making its final decision, the Board will consider the entire record, including the record on the transportation merits, the Draft EIS, Final EIS, and all public and agency comments. In its final decision, the Board will decide whether the Proposed Acquisition should be authorized and, if so, what conditions, including environmental mitigation conditions, to impose.

Thank you for your interest and participation in the EIS process.

Sincerely,

Danielle Gosselin
Director
Office of Environmental Analysis

Summary

S.1 Introduction

S.1.1 Proceeding Background

On October 29, 2021, Canadian Pacific Railway Limited, Canadian Pacific Railway Company, and their U.S. rail carrier subsidiaries Soo Line Railroad Company; Central Maine & Quebec Railway U.S. Inc.; Dakota, Minnesota & Eastern Railroad Corporation; and Delaware & Hudson Railway Company, Inc. (collectively, CP) and Kansas City Southern, The Kansas City Southern Railway Company, Gateway Eastern Railway Company, and The Texas Mexican Railway Company (collectively, KCS) filed an application with the Surface Transportation Board (Board) under 49 U.S.C. §§ 11323-25 seeking the Board's approval of CP's acquisition of KCS (Proposed Acquisition). If the Board authorizes the Proposed Acquisition, CP and KCS (collectively, Applicants) would combine to form an integrated system to be known as Canadian Pacific Kansas City (CPKC). **Figure 1.3-1** in *Chapter 1, Purpose and Need* provides a map of the proposed combined system showing current ownership.

The Board is reviewing the Proposed Acquisition through two parallel but distinct processes:

- The transportation-related process that examines the competitive, transportation, and economic implications of the Proposed Acquisition on the national rail system, and
- The environmental review process that is being conducted by the Board's Office of Environmental Analysis (OEA).

The statute setting forth the procedures for Board review of acquisitions at 49 U.S.C. § 11325 and the Board's implementing regulations at 49 C.F.R. § 1180.4 (2000) require that the Board complete both processes within approximately 15 months after the application is accepted for a "major" transaction such as this, and OEA must complete the environmental review process before the Board decides whether to authorize the Proposed Acquisition. The Board accepted the Applicants' application on November 23, 2021. On March 16, 2022, however, the Board issued a decision suspending the procedural schedule and directing the Applicants to explain an apparent inconsistency between data submitted in the application and information that the Applicants provided to OEA as part of the environmental review process. By decision issued on April 27, 2022, the Board directed the Applicants to amend their application and revise supporting workpapers to address the data inconsistency. The Applicants submitted their amended application and revised workpapers on May 13, 2022, and on May 27, 2022, the Board issued a revised procedural schedule for the proceeding.

Because the Proposed Acquisition has the potential to result in significant environmental impacts, OEA determined that the preparation of an Environmental Impact Statement (EIS) is appropriate to meet the Board's obligations under the National Environmental Policy Act

(NEPA) (42 U.S.C. §§ 4321-4370m-~~12~~11) and related laws, including Section 106 of the National Historic Preservation Act (NHPA) (54 U.S.C. § 306108). With this ~~Draft~~ EIS, OEA seeks to inform federal, state, and local agencies, elected officials, tribes, affected local communities, and the general public about the expected environmental effects of the Proposed Acquisition. To that end, the ~~Draft~~ EIS describes the affected environment; evaluates and compares the direct, indirect, and cumulative environmental effects of the Proposed Acquisition; and identifies mitigation measures that could eliminate or lessen the expected environmental impacts. OEA issued a Draft EIS on August 5, 2022 and accepted comments on the Draft EIS through October 14, 2022. After the close of the public comment period on the Draft EIS, OEA ~~will~~ prepared this~~a~~ Final EIS that ~~will~~ responds to all substantive comments received on the Draft EIS, including comments related to the Section 106 process, and sets forth OEA's final recommendations, including final recommended environmental mitigation measures. The Board will ~~then~~ issue a final decision, based on the entire record on the transportation merits and the environmental record, including the Draft EIS, the Final EIS, and all public and agency comments received. In its final decision, the Board will decide whether the Proposed Acquisition should be authorized and, if so, what ~~mitigation~~conditions, including environmental mitigation conditions, to impose.

S.1.2 Purpose and Need

The Proposed Acquisition involves an application for Board authority for CP to acquire KCS. The Proposed Acquisition is not a federal government-proposed or sponsored project. Therefore, the project's purpose and need is informed by both the Applicants' goals and the Board's enabling statute—the Interstate Commerce Act as amended by the ICC Termination Act, Pub. L. No. 104-188, 109 Stat. 803 (1996). See *Alaska Survival v. STB*, 705 F.3d 1073, 1084-85 (9th Cir. 2013). Under the Interstate Commerce Act, as amended, the Board "shall approve and authorize a transaction" such as this when, after considering several factors, "it finds the transaction is consistent with the public interest." 49 U.S.C. §§ 11324 (b) & (c).

According to the Applicants, the purpose of the Proposed Acquisition is to combine America's two smallest but fastest-growing Class I railroads (CP and KCS) to build a more efficient and competitive rail network. The Applicants state that the Proposed Acquisition would further the need for expanded and more capable and efficient transportation infrastructure while simultaneously advancing the interests of current and future customers in more reliable and economical rail transportation options serving important North-South trade flows. The Applicants also state that the Proposed Acquisition would generate environmental benefits by reducing truck transportation on highways in North America by more than 64,000 trucks annually, resulting in less congestion, less maintenance, and improved safety on those roads; as well as less noise pollution in the places where those trucks would have driven; and lowered air emissions, including greenhouse gas (GHG) emissions.

S.1.3 Proposed Action and Alternatives

The proposed federal action in this proceeding is the Applicants' Proposed Acquisition of KCS by CP. The combination of these two railroads would be an "end-to-end" merger because the CP and KCS railroad networks do not overlap. The Applicants expect that the Proposed Acquisition would create new efficiencies in the rail network that would result in rail traffic being diverted from other rail lines onto the combined CPKC network and the diversion of freight from trucks to rail transportation. Because of these expected diversions, the Applicants project that the Proposed Acquisition would result in changes in rail traffic on portions of the combined CPKC network. The largest expected change would occur on the CP mainline between Sabula, Iowa, and Kansas City, Missouri, where the Applicants project that rail traffic would increase by approximately 14.4 trains per day, on average. Other rail lines would experience smaller increases in rail traffic, no change in rail traffic, or a decrease in rail traffic.

OEA applied the thresholds set forth in the Board's environmental regulations at 49 C.F.R. § 1105.7(e) to identify rail lines where the projected increase in rail traffic warranted environmental review. The general thresholds for assessing environmental impacts from increased rail traffic on rail lines are an increase in rail traffic of at least 100 percent (measured in gross ton miles annually) or an increase of at least 8 trains per day. For rail lines located in areas that are in nonattainment under the Clean Air Act (42 U.S.C. §§ 7401-7671q), the threshold for air quality analysis is an increase in rail traffic of at least 50 percent (measured in gross ton miles annually) or an increase of at least 3 trains per day. 49 C.F.R. § 1105.7(e)(5)(ii). OEA identified rail lines in Illinois, Iowa, Missouri, Kansas, Oklahoma, Arkansas, Louisiana, and Texas that would experience increases in rail traffic that would exceed these analysis thresholds as a result of the Proposed Acquisition. **Figure 2-1** in *Chapter 2, Proposed Action and Alternatives* provides a map showing where rail traffic would increase as a result of the Proposed Acquisition and the ~~Draft~~ EIS discusses the potential environmental impacts of that increase.

In addition to increased rail traffic on rail lines, the Proposed Acquisition would result in changes in operational activities at rail yards and intermodal facilities that would meet or exceed environmental review thresholds. The threshold for environmental review of rail yards and intermodal facilities is an increase in rail yard activity of at least 100 percent (measured by carload activity) or an average increase in truck traffic of more than 10 percent of the average daily traffic or 50 vehicles a day on any affected road segment. 49 C.F.R. § 1105.7(e)(5)(i). For rail yards and intermodal facilities in nonattainment areas, the threshold for air quality analysis is an increase in rail yard activity of at least 20 percent (measured by carload activity) or an average increase in truck traffic of more than 10 percent of the average daily traffic or 50 vehicles a day on a given road segment. 49 C.F.R. § 1105.7(e)(5)(ii). **Figure 2-2** in *Chapter 2, Proposed Action and Alternatives* provides a map showing the locations of rail yards and intermodal facilities where the environmental review thresholds would be met or exceeded and this ~~Draft~~ EIS discusses potential environmental impacts from increased activities at those facilities.

If the Board authorizes the Proposed Acquisition, the Applicants plan to make capital improvements within the existing rail right-of-way (ROW) to support the projected increases in rail traffic. The capital improvements would include extending 13 existing passing sidings, adding 10 new passing sidings, adding a double track in Blue Valley near Kansas City, Missouri, and a facility working track adjacent to the International Freight Gateway intermodal terminal near Kansas City. **Figure 2-3** in *Chapter 2, Proposed Action and*

Alternatives provides a map showing the locations of the 25 planned capital improvements and this ~~Draft~~ EIS discusses potential environmental impacts that could result from those improvements. The Applicants have stated that they would add the capital improvements as needed based on increasing traffic and that design-level engineering for each capital improvement would occur only when each capital improvement is needed. The Applicants do not propose to construct any new rail lines subject to Board licensing or to abandon any rail lines as part of the Proposed Acquisition.

The alternative to the Proposed Acquisition is the No-Action Alternative. The No-Action Alternative would occur if the Board were to deny authority for the Proposed Acquisition. Under the No-Action Alternative, CP would not acquire KCS and the projected changes in rail traffic, rail yard activity, and intermodal facility activity would not occur as a result of the Proposed Acquisition. However, rail traffic on rail lines and activities at rail yards and intermodal facilities could still change to support regular railroad operations or as a result of changing market conditions, such as general economic growth. Under the No-Action Alternative, the Applicants would not construct the 25 planned capital improvements as a result of the Proposed Acquisition. However, CP and KCS could construct sidings, extend existing sidings, or add additional track within the rail ROW in the future without seeking Board authority as needed to support or improve rail operations on their respective rail networks. In general, under the No-Action Alternative, none of the anticipated adverse or beneficial environmental impacts of the Proposed Acquisition would occur.

S.2 Environmental Review Process

S.2.1 Scoping

The first step in the EIS process is scoping. To help determine the scope of the EIS, OEA involved the public; local, state, and federal agencies; tribes; and other interested organizations. On November 12, 2021, OEA published a Notice of Intent (NOI) to Prepare an EIS and Notice of Scoping Meetings in the Federal Register. OEA sent letters to local, state, federal, and tribal officials and agencies, as well as other potentially interested organizations. The letters announced OEA's intent to prepare an EIS, described the Proposed Acquisition, and set forth the dates, times, and log-in details for six online public scoping meetings. OEA also posted Google banner advertisements (banner ads) online focusing on areas with identified Environmental Justice (EJ) populations in the project area. The banner ads announced the project and encouraged viewers to click on the ad to visit the Board-sponsored project website for more information. The Board-sponsored project website provided information on the Proposed Acquisition including maps, the NOI, and dates and times for the public scoping meetings. In addition, OEA issued a press release to local media, including television stations, radio stations, and newspapers, along the proposed CPKC system. The press release announced OEA's intent to prepare an EIS and advertised the purpose, dates, and times for the public scoping meetings.

S.2.2 Tribal Consultation

During scoping and the preparation of this ~~Draft~~ EIS, OEA consulted with federally recognized tribes. During scoping, OEA identified 68 federally recognized tribes that may have current or historic interest in areas where the Proposed Acquisition could result in environmental impacts. OEA invited those tribes to participate in the consultation process under Section 106 of NHPA, government-to-government consultation, or both. OEA sent tailored letters to tribal leaders, Tribal Historic Preservation Officers (THPOs), and cultural resource officials, along with a response form to identify points of contact and indicate a preference for participation in the government-to-government consultation process and/or the Section 106 process. Following issuance of the Draft EIS, OEA contacted six additional tribes at the request of the Bureau of Indian Affairs. Consultation activities, including online meetings, telephone calls, emails, and letters, occurred throughout the development of this ~~Draft~~ EIS.

S.2.3 Agency Consultation

OEA consulted with appropriate federal, state, and local agencies during the preparation of this ~~Draft~~ EIS. At the federal level, OEA held online meetings with the U.S. Fish and Wildlife Service (USFWS) field and regional offices, U.S Army Corps of Engineers (Corps) district offices, and U.S. Environmental Protection Agency (EPA) regional offices. OEA invited state agencies with interests in the Proposed Acquisition and related impacts—such as transportation, wildlife, natural resources, and Environmental Justice—to online meetings in December 2021, and separately, held online meetings with State Historic Preservation Offices (SHPOs) in each affected state. To consult with local government agencies, OEA sent letters to city and county agencies in jurisdictions that could experience environmental impacts as a result of the Proposed Acquisition. OEA also consulted with individual local governments upon request. Additional consultation activities, including online meetings, telephone calls, emails, and mailed letters, occurred throughout the development of this ~~Draft~~ EIS.

S.2.4 Section 106 Consultation

In addition to conducting an environmental review of the Proposed Acquisition under NEPA, OEA assessed the potential effects of the Proposed Acquisition on historic properties that are listed in or are eligible for listing in the National Register of Historic Places (National Register), as required by Section 106 of NHPA. Pursuant to 36 C.F.R. § 800.4(a)(1) and in consultation with SHPOs, tribes, and other consulting parties, OEA defined an Area of Potential Effects (APE) that includes the locations of the 25 planned capital improvements and areas from which the capital improvements would be visible, in order to assess potential visual effects. OEA identified the properties within the APE that are listed in or eligible for listing in the National Register and assessed the potential effects of the Proposed Acquisition on those properties. ~~OEA has provided the results of OEA's identification and assessment of effects efforts to Section 106 consulting parties and has appended those results to this Draft EIS in **Appendix J** for public review.~~ OEA has completed the identification and assessment of effects and Section 106 consultation and has appended documentation of those processes and conclusions to this EIS in **Appendix J**. In consultation with appropriate SHPOs, THPOs, other Section 106 consulting parties, and the public, OEA finds that the Proposed Acquisition would have *No Adverse Effect* on historic properties listed on or eligible for listing on the National Register.

S.2.5 Draft EIS

OEA issued the Draft EIS on August 5, 2022, and notified federal, state, and local agencies, other interested stakeholders, and members of the public. A 45-day review and comment period began immediately following issuance of the Draft EIS, which the Board later extended to October 14, 2022. During the comment period, OEA hosted seven public meetings to present findings in the Draft EIS and hear oral comments, including three online public meetings and in-person public meetings in Itasca, Illinois; Davenport, Iowa; Excelsior Springs, Missouri; and Beaumont, Texas. Also, during the comment period, OEA conducted site visits to observe current conditions in areas that could experience impacts as a result of the Proposed Acquisition, including Houston, Texas; Port Arthur, Texas; Camanche, Iowa; Davenport, Iowa; Muscatine, Iowa; Fredonia/Columbus Junction, Iowa; Clinton, Iowa; Bensenville, Illinois; Itasca, Illinois; Elgin, Illinois and Wood Dale, Illinois (the site visits between Elgin and Bensenville included riding the Metra MD-W line). In addition to oral comments, OEA also accepted written comments on the Draft EIS by mail, email, and via the Board-sponsored project website. OEA has responded to all substantive environmental comments received to date in this Final EIS.

As appropriate, OEA also reviewed and addressed environmental issues that parties raised outside of the NEPA process, including in formal filings submitted to the Board and in statements made before the Board during the Board's public hearings on the transportation merits of the Proposed Acquisition.

~~S.2.5~~S.2.6 Final EIS

Following issuance of the~~is~~ Draft EIS and the opportunities for ~~a~~ public and agency comment~~ period~~, OEA ~~will~~ prepared ~~and issue a~~ this Final EIS. This~~e~~ Final EIS ~~will~~ responds to the substantive comments received on the Draft EIS, presents OEA's final conclusions regarding the potential environmental impacts of the Proposed Acquisition, and sets forth OEA's final recommendations to the Board, including final recommended environmental mitigation measures. ~~After OEA publishes the Final EIS~~Next, the Board will issue its final decision on whether to authorize the Proposed Acquisition. In making its final decision, the Board will consider the entire record, including the record on the transportation merits, the Draft EIS, Final EIS, and all public and agency comments. If the Board decides to authorize the Proposed Acquisition, the Board may impose conditions on the Applicants as part of that decision, including environmental mitigation conditions.

The Final EIS reflects new or expanded information that was added in response to public and agency comments on the Draft EIS. In some instances, these changes are confined to single technical sections and in others the changes are reflected across several technical sections and analyses. The following list highlights changes made to or additional mitigation measures included in the Final EIS:

- The Board encourages railroad applicants to negotiate and enter into voluntary agreements with potentially affected communities to address local concerns. Following issuance of the Draft EIS, the Applicants notified OEA that they have reached agreements with the following 10 communities in which rail traffic would increase as a result of the Proposed Acquisition:
  - City of Davenport, Iowa
  - City of Bettendorf, Iowa
  - City of Muscatine, Iowa
  - City of LeClaire, Iowa
  - City of Clinton, Iowa
  - City of Washington, Iowa
  - City of Fruitland, Iowa
  - Village of Hampshire, Illinois
  - Village of Pingree Grove, Illinois
  - City of Liberty, Missouri
- OEA recommends that the Board impose mitigation requiring the Applicants to abide by the conditions of these agreements as environmental mitigation in any final decision authorizing the Proposed Acquisition.
- The Applicants also submitted additional voluntary mitigation measures to address potential impacts 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. 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. OEA has revised *Chapter 4, Mitigation* in the Final EIS to reflect these additional mitigation measures (see VM-Community-01 and VM-Community-02) and recommends that the Board impose these conditions.
- The Applicants also submitted 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 working with those communities to install and fund a FRA-approved Quiet Zone, subject to necessary approvals and practicability; install and fund a predictive mobility system to deliver advanced notice of blocked grade crossings to citizens, police, fire, and rescue operations, and others; install and fund ITS Interconnect for Advanced Warning Signs at strategic locations to give drivers information about occupied grade crossings; and install and fund Positive Train Control wireless technology tie-ins at grade crossings adjacent to Metra platforms, which will minimize

the activation of crossing lights and gates. The Applicants have clarified that the Applicants would be responsible for funding these measures, which would be subject to approval by Metra, as the owner of the track. OEA has revised *Chapter 4, Mitigation* in this Final EIS to reflect these additional voluntary mitigation measures (see VM-Community-03) and recommends that the Board impose these conditions.

- To facilitate compliance with the additional voluntary mitigation measures that the Applicants submitted and ongoing consultation between the Applicants and community leaders in the Houston and Chicago areas, OEA is also recommending that the Board impose mitigation requiring the Applicants to establish Community Liaisons to consult with Houston area community leaders and with community leaders in the Chicago area communities of Itasca, Bensenville, Wood Dale, Roselle, Schaumburg, Hanover Park, Bartlett, Elgin, and DuPage County (MM-Community-03 and MM-Community-04).
- In response to public comments on the Draft EIS, OEA expanded the study area for noise and vibration, grade crossing safety, and freight rail safety to also include a segment of a Union Pacific Railroad (UP) rail line that extends from Beaumont to Rosenburg, Texas and passes through the Houston area (rail line segment U-BEAU-01). Although rail line segment U-BEAU-01 is owned by UP, CPKC would have trackage rights over this segment and the Proposed Acquisition would cause rail traffic on the segment to increase. 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. OEA understands that, because UP and BNSF Railway (BNSF) own most of the rail lines in Houston, CPKC could not control the dispatching of trains on those rail lines. OEA further understands 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 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 what the Applicants have projected. Therefore, the results reported in this Final EIS may overstate the potential impacts of the Proposed Acquisition in the Houston area.
- In response to comments on the Draft EIS raising concerns about the sufficiency of OEA's analysis related to vehicular delay at roadway/rail at-grade crossings (grade crossings) in general and grade crossing delay impacts on emergency response vehicles in particular, OEA is including additional information in this Final EIS related to those potential impacts. The additions include information on estimated gate down time for different types of trains at each of the 1,365 grade crossings in the study area; maps showing the location of grade crossings and grade separated crossings in relation to police stations, fire stations, and hospitals throughout the study area; and a discussion of the applicability of grade separation mitigation. In addition, for a subset of 751 grade crossings in the study area that could be used by emergency vehicles, OEA identified alternative routes that vehicles could use and calculated the length of those alternative routes.
- OEA updated the air quality analysis in this Final EIS to reflect EPA's recent reclassification of the Houston-Galveston-Brazoria Area Ozone Nonattainment Area and the Dallas-Fort Worth Ozone Nonattainment Area from 'Serious' nonattainment to 'Severe' nonattainment.

Additional changes made to technical sections in response to comments received on the Draft EIS are described throughout *Section S.3* below.

~~S.2.6~~S.2.7 Responsive Applications

On February 28, 2022, Canadian National Railway Company and Illinois Central Railroad Company (collectively, CN) filed a responsive application (RA) for consideration by the Board. RAs are proposals that parties other than the Applicants may file to request modifications or conditions to the primary application seeking acquisition authority from the Board. After the Board directed the Applicants to amend their application and revise supporting workpapers on April 27, 2022, the Board provided time for other parties to amend their filings, including any RAs, based on the Applicants' amended application and revised workpapers. On June 9, 2022, CN filed an amended RA. By decision served on July 1, 2022, the Board accepted CN's RA for consideration.

In its amended RA, CN requests that the Board require, as a condition of any decision granting authority for CP to acquire KCS, the Applicants to divest, or sell, certain KCS rail lines to CN. Specifically, CN requests that the Board order the Applicants to divest the KCS rail lines that extend between Kansas City, Missouri, and Roodhouse, Illinois; between Roodhouse and Springfield, Illinois; and between Roodhouse and East St. Louis. In total, CN is seeking to acquire ownership of approximately 355 miles of KCS rail lines in Missouri and Illinois through the proposed divestiture. CN's RA also seeks ownership interests in KCS's International Freight Gateway terminal south of Kansas City, as well as trackage rights over certain rail lines owned by KCS and Union Pacific Railroad Company.

According to CN, the proposed divestiture of the KCS rail lines to CN would increase rail traffic on those rail lines by preserving and enhancing competition in the regional rail transportation industry. For some of the rail lines proposed for divestiture, CN projects that the increase in rail traffic would reach or exceed the thresholds triggering an environmental review under the Board's environmental regulations at 49 C.F.R. §§ 1105.6(b)(4) and 1105.7(e)(5). Therefore, OEA is conducting an environmental review of CN's RA that is separate from~~, but conducted concurrently with,~~ OEA's EIS ~~ongoing environmental review~~ addressing~~of~~ the Proposed Acquisition. More information regarding the environmental review for CN's RA can be found on the Board's website at www.stb.gov by conducting a search for Docket No. FD 36500 (Sub-No. 1).

Norfolk Southern Railway Company (NSR) submitted an RA on February 28, 2022 and an amended RA on June 9, 2022 seeking trackage rights (i.e., the right to operate) over certain KCS rail lines in Texas and Louisiana. By decision served on July 1, 2022, the Board accepted NSR's RA for consideration. NSR's trackage rights proposal is categorically excluded from environmental and historic review under 49 C.F.R. §§ 1105.6(c)(3) and 1105.8(b)(3). More information regarding the environmental review for NSR's RA can be found on the Board's website at www.stb.gov by conducting a search for Docket No. FD 36500 (Sub-No. 5).

S.3 Summary of Major Conclusions in the ~~Draft~~ EIS

In preparing the ~~Draft~~ EIS, OEA conducted an extensive analysis of the environmental impacts that could result from the Applicants' Proposed Acquisition of KCS by CP. As discussed below, based on consultation with federal, state, and local agencies; consultation with tribes; input provided by organizations and the public; and its own independent environmental analysis, OEA has concluded that~~, apart from train noise, which could result in adverse impacts at some locations,~~ most of the potential adverse impacts of the Proposed Acquisition, including impacts on grade crossing delay and emergency vehicles, would be negligible, minor, and/or temporary~~.~~. However, train noise associated with increased rail traffic resulting from the Proposed Acquisition would result in adverse impacts on many residences and other locations that are sensitive to noise.

S.3.1 Freight and Passenger Rail Safety

OEA expects that the Proposed Acquisition would result in only minor adverse impacts on freight rail safety. As discussed in *Section 3.1, Freight and Passenger Rail Safety*, the probability of an accident, such as a derailment or collision, occurring on a particular rail line depends, in part, on the number of trains that move on that rail line. Therefore, the projected increase in rail traffic that would occur as a result of the Proposed Acquisition would increase the predicted risk of an incident (such as a derailment or other accident) occurring on certain rail lines in the combined CPKC system. Across all the rail lines in the combined CPKC system, OEA projects that the greatest increase in the number of incidents would occur on the rail line segment between Muscatine, Iowa, and Ottumwa, Iowa. On that segment, OEA projects that the number of incidents would increase by approximately 0.32 incidents per year from approximately 0.11 incidents per year under the No-Action Alternative to approximately 0.43 incidents per year under the Proposed Acquisition. Other rail lines in the combined CPKC system would experience smaller increases in the number of incidents.

OEA expects that most incidents would be minor and would not result in any injuries or fatalities. Further, because the Proposed Acquisition would result in increases in rail traffic by diverting freight from other rail lines and from truck to rail transportation, OEA expects that any potential increase in rail accidents on rail lines in the combined CPKC system would be partially or entirely offset by a decrease in the number of accidents on other rail lines and on highways. Moreover, as set forth in *Chapter 4, Mitigation*, the Applicants have proposed voluntary mitigation that would minimize the potential for incidents to occur during rail operations and would minimize the potential impacts of any incidents that do occur.

The Proposed Acquisition would result in negligible impacts on passenger rail safety. OEA identified nine rail line segments that are currently used for passenger rail on which the Proposed Acquisition would increase freight rail traffic. The probability of a collision occurring on any of those nine rail line segments is currently very low and would remain very low if the Board authorizes the Proposed Acquisition. Under the Proposed Acquisition, OEA predicts that a total of 0.019 collisions would occur each year across all nine rail segments, which is equivalent to one collision every approximately 53 years.

Similarly, OEA expects that the number of hazardous material releases along rail lines and at rail yards would remain low if the Board authorizes the Proposed Acquisition. In the event of a release of hazardous materials, the impacts of the release would depend on many factors, including the type of material or materials released; the number of rail cars involved; the volume of material released; the location of the incident in relation to inhabited or sensitive environmental areas; and the timing and effectiveness of local government and railroad emergency response plans as required under Pipeline and Hazardous Materials Safety Administration (PHMSA) and FRA regulations at 49 C.F.R. Parts 172 and 174. In general, OEA expects that a release of hazardous materials would involve a relatively short duration exposure and would be contained quickly. Across all of the rail line segments on which the transportation of hazardous materials would increase, OEA projects that a total of 12.88 releases would occur per year under the Proposed Acquisition, compared to 10.36 releases under the No-Action Alternative. Across all rail yards in the study area, OEA projects that a total of 24.99 releases would occur each year under the Proposed Acquisition, compared to 23.50 releases per year under the No-Action Alternative. OEA expects that the majority of releases that would occur would be minor and would not have the potential to result in environmental impacts, injuries or fatalities. Further, OEA expects that any potential increase in the number of releases along rail line segments on the combined CPKC network would be partially offset by a reduction in the number of releases along other rail lines owned and operated by other railroad companies. In addition, to the extent that the transportation of hazardous materials could be diverted from truck to rail as a result of the Proposed Acquisition, the total number of releases could decrease because rail transportation is generally safer than truck transportation.

As set forth in *Chapter 4, Mitigation*, the Applicants have proposed voluntary mitigation that would minimize the potential for incidents to occur during rail operations and would minimize the potential impacts of any incidents that do occur. Pursuant to 49 C.F.R. Part 1106 and FRA regulations at 49 C.F.R. Part 244, the Applicants also prepared a proposed Safety Integration Plan (SIP). The proposed SIP describes the Applicants' proposed process and timeline for merging the operations of CP and KCS, as well as the safety implications of merging these operations.

During the preparation of the SIP, the Applicants met with FRA to review drafts of the proposed SIP and related materials, respond to questions, and accept recommendations. Pursuant to 49 C.F.R. §§ 1106.4(b)(1) and 244.17, on December 28, 2021, the Applicants submitted their ~~proposed~~ SIP to the Board and, by letter dated February 28, 2022, FRA submitted comments to the Board stating that FRA is satisfied that the ~~proposed~~ SIP provides a reasonable assurance of safety for the proposed transaction, consistent with governing regulations. OEA also has reviewed the ~~proposed~~ SIP, which is appended to this Draft EIS as **Appendix G** to allow for public review and comment on it and on FRA's comments. ~~In the Final EIS~~, OEA has not received ~~will address~~ any written comments on the SIP and recommends that the Board adopt it~~submitted during the Draft EIS comment period~~. If the Board authorizes the Proposed Acquisition and adopts the SIP, the Board will require compliance with the SIP as a condition to its authorization. 49 C.F.R. § 1106.4(b)(4). The Applicants then would coordinate with FRA in implementing the approved SIP, including any amendments thereto. Id. FRA would provide the Board with updates as appropriate during the acquisition implementation period and advise the Board when, in FRA's view, the integration of the Applicants' operations has been fully and safely completed. Id.

S.3.2 Grade Crossing Safety

OEA expects that the Proposed Acquisition would result in only minor adverse impacts on safety at highway/rail at-grade crossings (grade crossings). As discussed in *Section 3.2, Grade Crossing Safety*, across all ~~1,134~~ 1,270 ~~evaluated~~ grade crossings in the study area that met the criteria for safety analysis~~,~~ (including the UP rail line segment that extends from Beaumont to Rosenberg, Texas, which was added in the Final EIS), the total predicted number of train-vehicle crashes would be ~~24.9~~ 31.7 crashes per year under the Proposed Acquisition, compared to ~~19.1~~ 25.6 crashes per year under the No-Action Alternative, which is a difference of ~~5.8~~ 6.1 crashes per year. Across all ~~1,134~~ 1,270 grade crossings in the study area that met the criteria for safety analysis, the total predicted number of train-pedestrian crashes would be ~~2.2~~ 2.9 crashes per year under the Proposed Acquisition, compared to 2.3 crashes per year under the No-Action Alternative, which is a difference of ~~0.5~~ 0.6 crashes per year. The largest impact on safety would occur at the grade crossing across Miller Road in Hungerford, Texas. For that grade crossing, OEA projects that the Proposed Acquisition would result in only approximately 0.0277 additional crashes per year compared to the No-Action Alternative. This means that the Proposed Acquisition would result in only one additional crash every approximately 36 years compared to the No-Action Alternative at that grade crossing. Other grade crossings in the study area would experience smaller increases in accident frequency or no increase in accident frequency.

As set forth in *Chapter 4, Mitigation*, the Applicants have proposed voluntary mitigation that would mitigate impacts on grade crossing safety. ~~and delay at grade crossings.~~ These include a commitment to work, upon request, with potentially affected communities in support of securing funding for grade crossing mitigation projects where such projects may be appropriate under criteria established by relevant agencies to increase the safety of existing grade crossings (VM-Grade Crossing-01) and a commitment to consult with potentially affected communities to improve visibility at grade crossings by clearing vegetation where practicable (VM-Grade Crossing-03). OEA recommends that the Board impose these voluntary mitigation measures in any decision authorizing the Proposed Acquisition and that the Board also impose mitigation requiring the Applicants to consult with appropriate state Departments of Transportation and other appropriate agencies prior to constructing, relocating, upgrading, or modifying grade crossings as part of the Proposed Acquisition, 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).

S.3.3 Grade Crossing Delay

As discussed in *Section 3.3, Grade Crossing Delay*, the Proposed Acquisition would also result in only minor adverse impacts on grade crossing delay. Across the ~~277~~ 276 grade crossings with an average annual daily traffic (AADT) of 2,500 or more vehicles per day, the Proposed Acquisition would result in an average increase in delay of only approximately 0.7 additional seconds per vehicle compared to 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 the grade crossing across Ripley Street in Davenport, Iowa. Other grade crossings in the study area would experience smaller increases in average delay, no increase in average delay, or a decrease in average delay compared to the No-Action Alternative. OEA projects that increased delay at grade crossings would result in a decrease in the level of service (LOS) at only five grade crossings.[1] For all five of these crossings, the LOS would decrease from LOS A to LOS B. Because LOS B corresponds to stable traffic flow, OEA concludes that the Proposed Acquisition would result in minor adverse delay impacts at these grade crossings but would not warrant mitigation.

For the 28 grade crossings on roadways in the study area that are FRA-designated ~~as~~ emergency routes~~ in the FRA grade crossing database~~, OEA concluded that grade crossing delay caused by the Proposed Acquisition would have a minor impact on~~ the provision of~~ emergency services. On average, the grade crossing delay along emergency routes would be 3.9 seconds per vehicle (corresponding to LOS A) under the Proposed Acquisition, compared to 2.9 seconds per vehicle (also corresponding to LOS A) under the No-Action Alternative.~~ The Proposed Acquisition would also not result in adverse impacts on grade crossings near rail yards where rail yard activity would increase.~~

In response to public comments on the Draft EIS, OEA revised Appendix H to include additional information about gate down time at all 1,365 grade crossings in the study area for grade crossing delay. This included predicted gate down time for specific types of trains, such as passenger trains (for grade crossings located on passenger routes), shorter bulk freight trains, and longer intermodal, automotive, and manifest freight trains.

In addition, OEA further analyzed 751 grade crossings for potential impacts 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 more than two miles from a grade-separated crossing and more than two miles from a grade crossing with an AADT of 2,500 or higher. Of those 751 grade crossings, most have an alternative route that is less than 10 miles long. However, for 115 grade crossings in rural areas and small towns in Arkansas, Iowa, Louisiana, Missouri, Oklahoma, and Texas, the alternative route would be more than 10 miles long. OEA also identified 111 grade crossings that either do not have a possible alternative route or that have an alternative route involving another grade crossing that could be blocked simultaneously by the same 10,000-foot train. While possible, it is unlikely that a train would become stopped in a position where it blocks such grade crossings for a substantial amount of time during an emergency situation. However, were that to occur, emergency services could be seriously affected.

With the exception of grade crossings located along the 25 planned capital improvements, the Proposed Acquisition would not affect the availability of alternative routes and the lengths of any alternative routes for blocked grade crossings. 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

[1] 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.

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 frequency with which emergency vehicles would be delayed by trains would likely increase as a result of the Proposed Acquisition.

OEA also compared grade crossing delay impacts to criteria developed by Federal Highway Administration (FHWA) for identifying grade crossings where grade separation should be considered. OEA identified 24 grade crossings where the Proposed Acquisition would cause FHWA criterion for freight volume (30 trains per day) or FWHA criterion for total vehicle hours of delay per day (30 hours per day) to be exceeded. However, for each of those 24 grade crossings, the Proposed Acquisition would result in a decrease in average delay per delayed vehicle, a decrease in average vehicle queue length, and no change in the LOS. Further, all 24 grade crossings have alternate routes, with an average length of 4.8 miles. For these reasons, OEA is not recommending grade separation mitigation.

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

As set forth in *Chapter 4, Mitigation*, the Applicants have voluntarily proposed mitigation that would minimize impacts on grade crossing delay. These include a commitment to operate under General Code of Operating Rules providing that, when practical, a standing train or switching movement must avoid blocking a public crossing longer than 10 minutes (VM-Grade Crossing-04); a commitment to notify appropriate Emergency Services Dispatching Centers of grade crossings blocked by trains that are stopped and may be unable to move for a significant period of time (VM-Grade Crossing-06); and a commitment to investigate the potential for creating alternative access for properties where access would be blocked for more than 10 minutes more than once per week (VM-Grade Crossing-04). OEA recommends that the Board impose these mitigation measures in any decision authorizing the Proposed Acquisition and that the Board also impose mitigation requiring the Applicants to consult with appropriate state Departments of Transportation and other appropriate agencies prior to constructing, relocating, upgrading, or modifying grade crossings as part of the Proposed Acquisition and to abide by those agencies' reasonable requirements for the design of grade crossings and associated warning devices (MM-Grade Crossing-01).

S.3.4 Truck to Rail Diversion

The Proposed Acquisition could affect traffic on roadways by diverting freight from truck to rail, which would reduce the number of trucks traveling on highways, and by increasing operational activities at certain intermodal facilities, which would increase the number of trucks traveling on the local roads that provide access to those intermodal facilities. OEA concludes that the Proposed Acquisition would not result in any adverse impacts to traffic and roadway systems as a result of truck-to-rail diversions.

S.3.5 Traffic at Intermodal Facilities

Based on the existing capacity of local roads serving intermodal facilities where activity could increase as a result of the Proposed Acquisition, OEA has concluded that increased truck traffic on those roads would not result in any adverse impacts.

S.3.6 Noise and Vibration

Noise from passing trains includes both noise from locomotive horns and wayside noise, such as locomotive engine noise, exhaust noise, and noise from steel train wheels rolling on steel rails. OEA recognizes that such rail-related noise can annoy people who live, work, or recreate near an active rail line, and many commenters expressed concern during scoping that the Proposed Acquisition could result in adverse noise impacts. People are particularly sensitive to noise in certain locations, including residences, schools, hospitals, nursing homes, and places of worship, which are collectively known as noise-sensitive receptors (receptors). OEA notes that receptors located near existing CP and KCS rail lines already experience intermittent train noise and have for many years. OEA does not expect that the Proposed Acquisition would cause individual trains on those rail lines to become substantially louder or to become audible in places where they are not currently. However, the projected increase in rail traffic from the Proposed Acquisition would make rail-related noise more frequent, which would result in a higher day-night average noise level (Ldn) at many receptors.

Based on past practice and the Board's environmental regulations at 49 C.F.R. § 1105.7(e)(6), an adverse noise impact would occur when a receptor would experience an increase in noise level of 3 A-weighted decibels (dBA) or more as result of increased rail traffic and reach an Ldn of 65 dBA or higher.[2] The thresholds for noise and vibration analysis for rail line segments is an increase in rail traffic of at least 100 percent (measured in gross ton-miles annually) or an increase of at least eight trains per day on any segment of rail line affected by the Proposed Acquisition. As discussed in detail in *Section 3.6, Noise and Vibration*, OEA used a computer model to identify a total of 6,307 receptors that would experience an adverse noise impact if the Board authorizes the Proposed Acquisition. Those receptors are spread out across 27 counties and parishes in 5 different states along the existing CP and KCS mainlines. In response to comments on the Draft EIS, OEA expanded the study area for noise and vibration in the Final EIS to also include rail line segment U-BEAU-01, which extends from Beaumont, Texas to Rosenburg and passes through the Houston area. OEA found that the Proposed Acquisition would not result in any adverse noise impacts in the Houston area. The counties with the greatest number of adversely affected receptors include Clinton County, Iowa; Scott County, Iowa; Muscatine County, Iowa; and Orange County, Texas.

As set forth in *Chapter 4, Mitigation*, the Applicants have voluntarily proposed mitigation measures to help address potential noise impacts, including a commitment to fund the improvements necessary to maintain existing Quiet Zone designations in communities

[2] Although the regulations at 49 C.F.R. § 1105.7(e)(6) indicate that either an increase of 3 dBA or an increase to an Ldn of 65 dBA would be an adverse impact, research indicates that both of these conditions must be met or exceeded to cause an adverse noise impact from rail operations to occur (Surface Transportation Board 1998a, Coate 1999).

where the Proposed Acquisition might otherwise cause the designation to be lost (VM-Noise-01). In addition, as noted above, the Applicants have committed to work with certain communities in the Chicago area (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) to create a new Quiet Zone, subject to necessary approvals and practicability (VM-Community-03). OEA is also recommending additional mitigation measures to address noise impacts that would require the Applicants to maintain rail and rail beds (MM-Noise-01), comply with FRA regulations establishing decibel limits for train operations (MM-Noise-02), consider lubricating curves where doing so would reduce noise (MM-Noise-03), employ other safe and efficient operating procedures that could effectively reduce noise from train operations (MM-Noise-04), and promptly respond to communities interested in establishing Quiet Zones (MM-Noise-05). Even if the Board imposes these mitigation measures, however, OEA expects that the Proposed Acquisition would result in unavoidable adverse noise impacts.

During scoping and the Draft EIS comment period, commenters expressed concern that ground-borne vibration from passing trains could cause damage to structures near rail lines in the combined CPKC system, including homes and other buildings. As discussed in *Section 3.6, Noise and Vibration*, vibration from passing trains is rarely strong enough to cause any damage to buildings or other structures. OEA does not expect that the Proposed Acquisition would cause vibration from individual trains to become stronger than it currently is along CP and KCS rail lines. However, the increased rail traffic resulting from the Proposed Acquisition would make this vibration more frequent. In total, OEA identified ~~161~~439 receptors where the Proposed Acquisition would cause vibration from trains to exceed vibration annoyance thresholds established by the Federal Transit Administration. Outside of the rail ROW, people may be able to feel vibration from passing trains and that vibration could cause annoyance, but damage to buildings or other structures would not occur.

S.3.7 Air Quality and Climate Change

As discussed in detail in *Section 3.7, Air Quality and Climate Change*, OEA expects that the Proposed Acquisition would not result in an overall increase in air pollutant emissions, including GHG emissions, and could result in an overall decrease in emissions due to the expected diversion of freight from truck to rail transportation and the resulting removal of approximately 64,000 trucks per year from highways.

Although OEA expects that the Proposed Acquisition would not result in an increase in overall air emissions and could result in an overall decrease in emissions, the Proposed Acquisition would change the local distribution of emissions by diverting trains from other rail lines and OEA expects that localized emissions of air pollutants from locomotives would increase along some rail line segments within the CPKC system. ~~In particular, OEA's analysis shows that the projected increase in rail traffic would result in nitrogen oxides (NOx) emissions in excess of the EPA's de minimis thresholds in three nonattainment areas for ozone.~~ In the Draft EIS, OEA found that the projected increase in rail traffic would result in an increase in nitrogen oxide (NO_X) emissions that would exceed EPA's *de minimis* thresholds within the Chicago Ozone Nonattainment Area, the Houston-Galveston-Brazoria

Ozone Nonattainment Area, and the Beaumont-Port Arthur Ozone Maintenance Area. Following issuance of the Draft EIS, EPA reclassified two Nonattainment Areas in Texas, the Houston-Galveston-Brazoria Ozone Nonattainment Area and the Dallas-Fort Worth Ozone Nonattainment Area, from 'Serious' nonattainment to 'Severe' nonattainment. This reclassification involved changing the *de minimis* threshold for NO_x for those Nonattainment Areas from 50 tons per year to 25 tons per year. As a result of this change, OEA now concludes that NO_x emissions associated with increased rail traffic resulting from Proposed Acquisition would also exceed the revised EPA *de minimis* thresholds in the Dallas-Fort Worth Ozone Nonattainment Area, the Chicago Ozone Nonattainment Area, the Houston-Galveston-Brazoria Ozone Nonattainment Area, and the Beaumont-Port Arthur Ozone Maintenance Area. OEA expects that EPA and relevant state agencies would account for the increased NO_x emissions from rail operations related to the Proposed Acquisition in future emissions inventories for the ~~three~~ affected nonattainment areas. The estimated increase in NO_x emissions would be less than one percent of the applicable emissions budget for mobile sources in each nonattainment area and therefore should not adversely affect enforcement of applicable State Implementation Plans for the nonattainment areas.

Aside from NO_x emissions, emissions of all other criteria air pollutants and hazardous air pollutants would be well below *de minimis* thresholds, and air emissions resulting from the Proposed Acquisition would be minimized by the Applicants' voluntary mitigation measures for air quality and climate change set forth in *Chapter 4, Mitigation*.

S.3.8 Energy

OEA assessed impacts of the Proposed Acquisition on energy consumption and the transportation of energy resources. Overall, OEA expects that the Proposed Acquisition would not increase the movement of energy resources in North America but would divert some energy resources from truck transportation to rail transportation and from other rail lines to the combined CPKC system. The primary energy commodities that would move on the combined CPKC system include liquified petroleum gas[3] from Alberta, Canada, and other production areas, chemical products from the chemical plants along the Gulf Coast, and bitumen and crude oil from Alberta. According to information provided by the Applicants, the Proposed Acquisition would potentially support a shift away from the transportation of flammable crude oil, which is classified as a hazardous material, toward non-hazardous DRUbit, from which the flammable diluent has been removed. DRUbit is a tar-like substance that does not spread quickly and would likely not harm the environment or nearby communities if inadvertently spilled in the event of a derailment, thereby increasing the shipping safety compared to the original product. OEA expects that, although transportation of DRUbit would increase as a result of the Proposed Acquisition, the transportation of crude oil on competing rail lines would decrease and that the Proposed Acquisition would not change the overall volume of energy resources transported in the United States. With respect to energy efficiency, the Proposed Acquisition would result in a net reduction in fuel use of approximately 7.97 million gallons per year, primarily due to

3 Liquified petroleum gas or LPG should not be confused with liquified natural gas (LNG). LPG has been transported by rail for many years. Under transportation regulations promulgated by the PHMSA and FRA, transportation of LNG by rail is currently prohibited in the United States.

truck-to-rail diversions. Accordingly, OEA concludes that the Proposed Acquisition would not adversely affect the transportation of energy commodities or energy efficiency.

S.3.9 Cultural Resources

Pursuant to NEPA and Section 106 of NHPA, OEA assessed the potential impacts of the Proposed Acquisition on cultural resources, including historic buildings, other historic structures, and archaeological sites. As discussed in detail in *Section 3.9, Cultural Resources*, OEA defined the APE to include the locations of the 25 planned capital improvements and areas from which the capital improvements would be visible, to account for potential visual effects.

OEA conducted reconnaissance surveys within the APE to identify above-ground resources, such as buildings and structures, and Phase I archaeological testing to identify archaeological sites within the rail ROW at the capital improvement locations. OEA identified ~~18~~ 15 historic properties that are eligible for listing on the National Register, including ~~16~~ 13 above-ground resources and 2 below-ground (archaeological) resources.

Because the addition of new passing sidings, the extension of existing sidings, and the addition of a second track would be consistent with the existing character and use of the rail lines where the capital improvements would be added, OEA concluded that the Proposed Acquisition would not adversely affect any National Register-eligible above-ground resources. Although OEA identified two National Register-eligible archaeological sites within the APE for one planned new passing siding located at MP 247 near Baron, Oklahoma, the Applicants have clarified that they intend to design the planned capital improvements so as to confine the permanent footprint and all construction activities to the existing disturbed area (railroad berm and ballast) in locations adjacent to any National Register-eligible archaeological sites that OEA identified. Therefore, the capital improvement at MP 247 would not adversely affect the two archaeological sites. Accordingly,~~Therefore,~~ OEA has determined that the Proposed Acquisition would have *No Adverse Effect* to historic properties listed in or eligible for listing in the National Register. All appropriate SHPOs, THPOs, and other Section 106 consulting parties have agreed with OEA that the Proposed Acquisition would not adversely affect historic properties. Therefore, the Section 106 process in this proceeding is complete.

Further, OEA is recommending mitigation requiring the Applicants to develop and implement a plan for archaeological monitoring during construction, train and familiarize construction personnel with the identification and appropriate treatment of historic properties and address~~ing~~ any unanticipated discoveries of archaeological sites or associated artifacts during construction (MM-Cultural-01).

Additionally, the Applicants have committed to design and engineer the 25 planned capital improvements to remain within existing rail ROW and to avoid construction within the boundaries of National Register-eligible archaeological sites identified by OEA (MM-Cultural-02).

~~Pursuant to Section 106, OEA requests public comments on the results of OEA's identification efforts and conclusions regarding the eligibility of historic properties for the~~

~~National Register and the potential effects on National Register-eligible properties from the Proposed Acquisition as presented in this Draft EIS. OEA is especially interested in receiving comments from any tribes, local governments, historical societies, and other stakeholders with interest in or expertise related to the areas and historic properties within the APE.~~

S.3.10 Hazardous Materials Release Sites

OEA assessed potential impacts related to planned capital improvements, such as extending existing passing sidings or adding new sidings, on soil or groundwater that have been contaminated by past releases (such as, spills or leaks) of hazardous materials. OEA identified hazardous material sites in the study areas for five of the 25 planned capital improvements and concluded that four capital improvements have the potential to impact hazardous material release sites. The Applicants' voluntary mitigation measures and OEA's additional recommended mitigation measures set forth in *Chapter 4, Mitigation* would avoid or minimize potential impacts related to hazardous materials release sites at the locations of the planned capital improvements.

S.3.11 Biological Resources

Pursuant to NEPA and Section 7 of the Endangered Species Act (16 U.S.C. § 1536), OEA assessed the potential impacts of the Proposed Acquisition on biological resources, including federally listed threatened and endangered species. Although the Proposed Acquisition would result in increased rail traffic on certain rail lines in the combined CPKC system, OEA concludes that this projected increase in rail traffic would not adversely affect plants, fish, or habitat. The rail lines on which rail traffic would increase have been in operation for many years, and any wildlife living near the rail lines will have become habituated to the presence of the rail line, the occasional presence of passing trains, and intermittent rail-related noise. The number of animal strikes by trains could potentially increase as a result of the Proposed Acquisition but would remain insignificant relative to other causes of injury and mortality.

OEA conducted fieldwork at each of the planned capital improvement locations where construction activities could disturb habitat. At several of the planned capital improvement locations, OEA identified suitable habitat for the Indiana bat (*Myotis sodalis*), which is a federally listed endangered species, and the northern long-eared bat (*Myotis septentrionalis*), which is a threatened species that is proposed for listing as endangered. At the Cave Springs, Oklahoma planned capital improvement location, OEA identified suitable foraging habitat for the Ozark big-eared bat (*Corynorhinus townsendii ingens*), which is a federally listed endangered species. As set forth in *Chapter 4, Mitigation*, the Applicants have voluntarily committed to avoid activities that could affect bat habitat, such as tree removal and the removal of bridges and culverts, during the active bat season, which extends from April 1 to October 31 (VM-Biological-03, VM-Biological-04, VM-Biological-05, VM-Biological-06). Considering these commitments, OEA, in consultation with USFWS, has concluded that the Proposed Acquisition *may affect*, but is *not likely to adversely affect* the Indiana bat, northern long-eared bat, and Ozark big-eared bat and would have negligible impacts on other biological resources. All applicable USFWS Ecological Services Field

Offices have concurred with OEA's conclusions and the Section 7 consultation process in this proceeding is complete.

USFWS recently moved to propose endangered status for the tri-colored bat, formerly known as the eastern pipistrelle (*Pipistrellus subflavus*). During fieldwork, OEA positively identified suitable habitat for the tri-colored bat in many drainage and bridge structures. In addition, during consultation with the Missouri Department of Conservation, OEA identified occurrence records for this species near the study area for the planned double track near Blue Valley in Missouri. Although Section 7 consultation is not required for species that are proposed, but not yet listed, as threatened or endangered, OEA considered the impact of the Proposed Acquisition on the tri-colored bat in this Final EIS. OEA concludes that, if the mitigation measures set forth in *Chapter 4, Mitigation* for the protection of the Indiana bat, northern long-eared bat, and Ozark big-eared bat (VM-Biological-03, VM-Biological-04, VM-Biological-05, and VM-Biological-06) are implemented, the Proposed Acquisition would be unlikely to adversely affect the tri-colored bat.

During scoping, commenters expressed concern that the Proposed Acquisition could increase the risk of train derailment occurring that would result in the spill or release of hazardous materials, such as crude oil, into the surrounding biological environment. Based on historical nationwide and systemwide incident rates, OEA concludes that the risk of a rail accident occurring that could result in a release of hazardous materials of any size onto the ground, where it could affect biological resources, is and would remain very low.

S.3.12 Water Resources

As discussed in *Section 3.12, Water Resources*, OEA assessed the potential impact of the Proposed Acquisition on water resources, including surface waters, wetlands, groundwater, and floodplains. Although commenters expressed concern that the projected increase in rail traffic resulting from the Proposed Acquisition would increase the risk of spills of hazardous materials into waterways, the probability of an incident occurring that could result in a release of hazardous materials into waterways or onto the ground where it affect groundwater is and would remain very low.

During the public comment period for the Draft EIS, commenters expressed concern that the Proposed Acquisition would increase the probability of a spill or release of hazardous materials that could adversely affect water resources. As explained in the Final EIS, the rail lines on which rail traffic would increase as a result of the Proposed Acquisition are already used to transport hazardous materials and have been for many years and the likelihood of a spill occurring is generally low. If a release were to occur, the impacts on vegetation would depend on the nature of the materials released, the volume of materials released, the location of the release relative to plant communities, and the effectiveness of the response. A release of hazardous materials could affect individual plants if they were exposed to a contaminant, which could cause injury, sickness, or death. A release could also result in the contamination of water or soil, which could affect plants. However, the typically small size of a release, when considered along with the response measures required by PHMSA and FRA regulations, would minimize the potential for groundwater contamination and allow for the proper management of surface water contamination, potentially affecting water resources.

OEA conducted fieldwork at each of the planned capital improvements where construction activities could affect waterbodies or wetlands. Based on this fieldwork and conservative assumptions about how construction could proceed, OEA concluded that the planned individual capital improvements could temporarily or permanently impact between 0.00 and 0.53 acres of surface waters and between 0.00 and 6.43 acres of wetlands, depending on the location. These impacts would be avoided or minimized by the implementation of the Applicants' voluntary mitigation measures and OEA's additional recommended mitigation measures as set forth in *Chapter 4, Mitigation*. OEA also concludes that the Proposed Acquisition would have negligible impacts on ground water and water quality.

S.3.13 Environmental Justice

For each of the different types of impacts described above, OEA considered whether the Proposed Acquisition could potentially result in any significant impacts that would be disproportionately borne by EJ populations, including minority populations, low-income populations, or American Indian tribes. As discussed in *Section 3.13, Environmental Justice*, OEA has concluded that the Proposed Acquisition would not result in any environmental impacts that would be high and adverse with the exception of noise impacts associated with the projected increase in rail traffic on certain rail line segments. Although OEA determined that noise would affect certain EJ populations, noise impacts would not be disproportionately borne by those EJ populations. Indeed, based on OEA's analysis of the demographic data for census block groups and communities along the combined CPKC network, most receptors that would experience adverse noise impacts are located in non-EJ populations. To minimize noise impacts on EJ populations, OEA is recommending mitigation requiring the Applicants to conduct proactive and targeted outreach to minority and low-income populations that would experience adverse noise impacts as a result of the Proposed Acquisition to provide information about the process for establishing Quiet Zones (MM-EJ-01). The Applicants have also voluntarily proposed mitigation measures related to EJ (see VM-EJ-01, VM-EJ-02, and VM-EJ-03).

S.3.14 Cumulative Impacts

OEA evaluated whether the Proposed Acquisition could potentially result in any impacts that, when considered along with the impacts of other reasonably foreseeable actions and projects in the project area, could contribute to cumulative adverse and significant effects on the environment. As discussed in *Section 3.14, Cumulative Impacts*, OEA identified several reasonably foreseeable projects and actions that could increase passenger rail traffic on certain rail lines in the combined CPKC network at about the same time as the Proposed Acquisition. Due to the low number of additional passenger trains that these projects could add, cumulative impacts on passenger rail safety, air quality, grade crossing safety, and grade crossing delay would be negligible.

Two proposed electrical transmission line projects could potentially overlap geographically with one or more of the planned capital improvements within the rail ROW. If this were to occur, then cumulative impacts on biological resources and water resources could result, but OEA expects that these cumulative impacts would be minor and would be minimized by the Applicants' voluntary mitigation measures and OEA's additional recommended mitigation measures set forth in *Chapter 4, Mitigation*.

~~S.4 Draft EIS Public Comment Period~~

~~OEA is providing a 45-day comment period on this Draft EIS during which interested parties and the public may review the Draft EIS and provide comments. OEA is notifying interested parties and the public of the availability of the Draft EIS through a combination of email, banner ads, and post cards with a link to the Draft EIS mailed to interested parties and media outlets. The entire Draft EIS is available on the Board's website (www.stb.gov) by clicking on the "View all Decisions" button and searching by Service date (August 5, 2022) or Docket Number (FD 36500). The Draft EIS will be listed as an Environmental Document under the "Decision Type" category. The Draft EIS is also available on the project-specific website (www.CP-KCSMergerEIS.com).~~

~~OEA is holding four in-person public meetings on the Draft EIS during which interested parties may review the Draft DEIS, make oral comments in a formal setting and/or submit written comments. OEA will begin each meeting with an open house followed by a brief overview of the Proposed Acquisition and environmental review process, followed by a public comment session. During the formal comment session, each interested individual will be given three minutes to convey their oral comments. A court reporter will be present to record these oral comments. If time permits, the court reporter will be available at the conclusion of the formal segment of the meeting to record oral comments from individuals not interested in addressing the meeting participants as a whole. Meeting transcripts will be available on the Board-sponsored project website. Meetings will be held at the following dates, times, and locations:~~

- ~~September 12, 2022, 6 to 8 p.m. (Central Daylight Time [CDT]) in Itasca, Illinois~~
  - ~~The Westin Chicago Northwest, 400 Park Boulevard, Itasca, Illinois, 60143~~
- ~~September 13, 2022, 6 to 8 p.m. (CDT) in Davenport, Iowa~~
  - ~~The River Center, 136 E. 3rd Street, Davenport, Iowa, 52801~~
- ~~September 14, 2022, 6 to 8 p.m. (CDT) in Excelsior Springs, Missouri~~
  - ~~The Montgomery Event Venue, 425 S. Thompson Avenue, Excelsior Springs, Missouri, 64024~~
- ~~September 15, 2022, 6 to 8 p.m. (CDT) in Vidor Texas~~
  - ~~The Oaks Event Center, 2110 South Main Street, Vidor Texas, 77662~~

~~In addition, OEA will hold three online public meetings. Individuals interested in commenting are encouraged to pre-register on the Board-sponsored project website. OEA will begin the online public meeting with a brief overview of the Proposed Acquisition and environmental review process. Following the overview, OEA will receive oral comments in the order speakers have pre-registered. The online public meetings will be a facilitated formal comment session during which individuals who have pre-registered will be given~~

~~three minutes to convey their oral comments. If time permits, the facilitator will allow other interested individuals who did not pre-register to provide oral comments. Interested individuals can participate in the meeting by phone, computer, or both. The meeting transcripts will be available on the project website after the meetings. To register for the online public meeting, visit www.CP-KCSMergerEIS.com. The online public meetings will be held at the following date and times:~~

- ~~September 7, 2022, 6 to 8 p.m. (CDT)~~
- ~~September 8, 2022, 12 to 2 p.m. (CDT)~~
- ~~September 19, 2022, 6 to 8 p.m. (CDT)~~

~~A court reporter will be present to record oral comments during the online public meetings. If time permits, the court reporter will be available at the conclusion of the formal segment of the online meeting to record oral comments from individuals not interested in addressing the meeting participants as a whole. All meeting transcripts will be available on the project website after the meetings.~~

~~In addition to holding public meetings, OEA is requesting written comments on the Draft EIS. The public and any interested parties are encouraged to submit written comments on all aspects of this Draft EIS, including the Section 106 process. OEA will consider all timely comments in preparing the Final EIS, which will include responses to all substantive comments, OEA's final conclusions on potential impacts, and OEA's final recommended environmental mitigation measures. The deadline for comments is September 26, 2022. When submitting comments on this Draft EIS, the Board encourages commenters to be as specific as possible and substantiate concerns and recommendations.~~

~~Comment forms will be provided at the in-person public meetings. Completed forms will be accepted at the meetings or the forms can be submitted later by mail. Any interested party may submit written comments on this Draft EIS regardless of whether they participate in any of the public meetings and provide oral comments. Comment forms or written letters may be mailed to the following contact and address:~~

~~Joshua Wayland~~
~~Office of Environmental Analysis, Surface Transportation Board~~
~~Environmental Filing, Docket No. FD 36500~~

~~c/o VHB~~
~~940 Main Campus Drive, Suite 500~~
~~Raleigh, NC 27606~~

~~Comments may also be submitted electronically through the environmental comment form on the Board's website at https://www.stb.gov/proceedings-actions/e-filing/environmental-comments/ or on the Board-sponsored website at www.CP-KCSMergerEIS.com. It is not necessary to mail written comments that have been filed electronically. Please refer to Docket No. FD 36500 when submitting comments.~~

~~Written comments on this Draft EIS must be postmarked by September 26, 2022. Electronically filed comments must be received by September 26, 2022. All comments received—written, e-filed, or transcribed—will carry equal weight in helping to complete the EIS process and guide the Board in making a decision in this proceeding. Further~~

~~information about the project can be obtained by calling OEA's toll-free number at 1-888-319-2337. Assistance for the hearing impaired is available through the Federal Information Relay Service at 1-800-877-8339.~~

~~Following the close of the comment period on the Draft EIS on September 26, 2022, OEA will issue a Final EIS that will consider and respond to all substantive comments received on the Draft EIS and set forth OEA's final recommendations on environmental mitigation. The Board will then issue a final decision based on the Draft and Final EISs and all public and agency filings and comments in the public record for this proceeding. The final decision will address the transportation merits of the proposed project and the entire environmental record. If the Board decides to authorize the Proposed Acquisition, the Board may impose conditions on the Applicants as part of that decision, including environmental mitigation conditions.~~

~~This Draft EIS is available for viewing or download on the Board's website at www.stb.gov or on the Board-sponsored project website at www.CP-KCSMergerEIS.com.~~ ~~**Table S.1-1**~~~~, provided at the end of this Summary, summarizes and compares potential impacts for each resource as well as cumulative impacts.~~

Table S.1-1. Impact Summary Table

Resource and Impact	No-Action Alternative	Proposed Acquisition
Freight Rail Safety		
Accident/incident rates per million-train-miles (2027 forecast; systemwide)[1]	CP: 1.44 KCS: 3.35	1.44
Accident/incident rates per million-train-miles (2027 forecast; mainline)[2]	CP: 0.74 KCS: 1.25	0.74
Impact Conclusion: Under the Proposed Acquisition, the number of accidents/incidents would remain low on all affected rail line segments, and would decrease on some segments. Under the No-Action Alternative, the Applicants expect that both the CP and the KCS networks would experience organic growth in rail traffic. The incident rates on KCS and CP respectively would continue to decline if safety trends continue.		
[1] Systemwide analysis includes accidents/incidents along rail segments and within rail yards and intermodal facilities. [2] Mainline analysis was based on rail segments only, and the numbers shown here are averages among segments of varying lengths.		
Hazardous Materials Transportation		
Mainline releases per year	10.36	12.88
Rail yards releases per year	23.50	24.99
Impact Conclusion: Increases in hazardous material carloads under the Proposed Acquisition would cause slight changes in the number of annual releases. However, the risk of a release occurring on any specific rail line segment would continue to be low regardless of whether or not the Board authorizes the Proposed Acquisition. In general, OEA expects that a release of hazardous materials would involve a relatively short duration exposure and would be contained quickly.		
Passenger Rail Safety		
Total predicted collisions per 100 years	0.9839	1.904
Impact Conclusion: The probability of a collision between a freight train and a passenger train occurring on any of the affected rail line segments would be very low under either the Proposed Acquisition or the No-Action Alternative.		
Grade Crossing Safety		
Total predicted number of vehicle crashes per year	25.5 ~~19.1~~	31.7 ~~24.9~~
Total predicted number of pedestrian crashes per year	2.3~~1.7~~	2.9 ~~2.2~~

Table S.1-1. Impact Summary Table

Resource and Impact	**No-Action Alternative**	**Proposed Acquisition**
Impact Conclusion: Across all 1~~,134~~ 1,270 roadway/rail at-grade crossings (grade crossings) in the study area that met the criteria for safety analysis, OEA projects that approximately ~~24.9~~ 31.7 crashes involving trains and motor vehicles would occur under the Proposed Acquisition per year, compared to ~~19.1~~ 25.5 crashes per year under the No-Action Alternative. The projected increase of approximately ~~5.8~~ 6.2 additional vehicle crashes per year would be offset by a decreased number of crashes at grade crossings on rail lines outside of the combined CPKC network due to the diversion of rail traffic from those rail lines to CPKC. Across all 1~~,134~~ 1,270 grade crossings in the study area that met the criteria for safety analysis, the total predicted number of train-pedestrian crashes would be ~~2.2~~ 2.9 crashes per year under the Proposed Acquisition, compared to ~~1.7~~2.3 crashes per year under the No-Action Alternative, which is a difference of ~~0.5~~0.6 crashes per year.		
Grade Crossing Delay		
Number of grade crossings experiencing increased delay	N/A	5
Affected crossings by Level Of Service (LOS)	LOS A: 257 ~~260~~ LOS B: 15~~3~~ LOS C: 2 LOS D: 1 LOS F: 1	LOS A: ~~255~~255 LOS B: ~~18~~17 LOS C: 2 LOS D: 1 LOS E: 1
Impact Conclusion for LOS: ~~Five~~ Four grade crossings would experience a decrease in the LOS from LOS A to LOS B. Because LOS B corresponds to stable flow, OEA concludes that the Proposed Acquisition would result in minor adverse delay impacts at these grade crossings. Delay at grade crossings would increase under the No-Action Alternative as a result of increased rail and road traffic due to organic growth.		
Impact Conclusion for Emergency Vehicle Delay: Under the Proposed Acquisition study area, 28 grade crossings are on designated emergency routes. All designated emergency routes have available alternate routes with an average distance of 2.1 miles. Emergency vehicle delay would increase under the No-Action Alternative as a result of increased rail and road traffic due to organic growth. Additionally, OEA analyzed 751 grade crossings in greater detail for potential impacts on emergency response vehicles. Of those 751 grade crossings, 640 have an alternate route and most alternative routes would be less than 10 miles long. There are 73 grade crossings with no possible alternative route because they are located on or provide access to dead-end streets and 37 grade crossings where the only alternative route involves another grade crossing that could be blocked by the same train.		
Impact Conclusion for Planned Capital Improvements: 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. Under the No Action Alternative the Applicants would not build the planned capital improvements. 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.		
Truck-to-Rail Diversions		
Projected change in truck traffic on U.S. highways annually	N/A	- 64,018

Table S.1-1. Impact Summary Table

Resource and Impact	No-Action Alternative	Proposed Acquisition
Impact Conclusion: The Proposed Acquisition would result in the diversion of trucks from highways, which could provide some benefits to the highway system. Under the No-Action Alternative, the Proposed Acquisition would not cause the diversion of freight from truck transportation to rail transportation.		
Intermodal Facility Traffic		
Capacity of roadways near intermodal facilities	Increased truck traffic would cause three roadway segments near intermodal facilities in the study area to exceed roadway capacity. The v/c ratio[1] would increase from less than 1.0 to more than 1.0.	No additional roadway segments near intermodal facilities would exceed roadway capacity beyond the three segments which exceed 1.0 under the No-Action Alternative. The v/c ratio on roadways near intermodal facilities would increase by less than 0.0045 over the No-Action Alternative due to the Proposed Acquisition.
Impact Conclusion: Under the Proposed Acquisition, there would be negligible potential increase in number of trucks on roadways near the six intermodal facilities. Under the No-Action Alternative, truck traffic would increase due to economic growth.		
[1] The v/c ratio, also referred to as degree of saturation, represents the sufficiency of an intersection to accommodate the vehicular demand (FHWA 2013). A v/c ratio over 1.0 represents a roadway where the calculated volumes exceed the assigned capacity.		
Noise and Vibration		
Number of receptors adversely affected	N/A	6,307
Impact Conclusion: The Proposed Acquisition would adversely affect receptors where noise levels would exceed 65 dBA (Ldn) and would increase by 3 dBA or more. There would be a total of 6,307 receptors adversely affected. The Proposed Acquisition would also cause the vibration annoyance threshold to be exceeded at 439 receptors in the study area.		
Air Quality and Climate Change		
Impact Conclusion: Because the Proposed Acquisition would likely result in the diversion of freight from truck transportation to rail transportation and from other rail lines, OEA expects that the Proposed Acquisition would not increase air emissions (including greenhouse gas emissions), and could result in a decrease in emissions, when measured at the system-wide or national scale. OEA's analysis shows that the projected increase in rail traffic would result in NO_x emissions in excess of EPA's *de minimis* thresholds in three nonattainment areas and one maintenance area for ozone. Following issuance of the Draft EIS, EPA reclassified the Houston-Galveston-Brazoria Ozone Nonattainment Area and the Dallas-Fort Worth Ozone Nonattainment Area from 'Serious' to 'Severe' nonattainment. As a result, Proposed Acquisition-related NO_X emissions would exceed the revised *de minimis* threshold in the Dallas-Fort Worth Ozone Nonattainment Area, in addition to the Houston-Galveston-Brazoria Ozone Nonattainment Area, the		

Table S.1-1. Impact Summary Table

Resource and Impact	No-Action Alternative	Proposed Acquisition
Chicago Ozone Nonattainment Area, and the Beaumont-Port Arthur Ozone Maintenance Area. However, the estimated NOx emissions from rail operations related to the Proposed Acquisition would be less than 1 percent of the total applicable emissions budget for mobile sources in each ozone nonattainment area. OEA expects that emissions related to projected increases in rail traffic on rail lines and projected increases in activities at rail yards and intermodal facilities may be offset by decreased emissions elsewhere.		
Energy		
Impact Conclusion: The Proposed Acquisition would not adversely affect the transportation of energy commodities or energy efficiency. The fuel savings related to truck-to-rail diversions (8.1 million gallons) would outweigh the increase in fuel usage at intermodal facilities (110,785 gallons) as well as fuel consumed during wait times at grade crossings (12,118 gallons). OEA did not include rail-to-rail diversions in the overall fuel consumption analysis because the increase in fuel consumption on the CPKC rail lines would likely be offset by a decrease in fuel consumption on the rail lines of competing railroads.		
Cultural Resources		
Archaeological site impacts	None; however, in the absence of the Proposed Acquisition, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority.	Although two National Register-eligible archaeological sites, 34AD283 and 34AD286, are located within the APE at one capital improvement location, the Applicants have clarified that the planned siding would be located within the current limits of the rail line footprint (railroad ballast and berm) in the areas adjacent to 34AD283 and 34AD286 and that no construction activities would take place within the limits of the sites.
Historic resources physical impacts	None; however, in the absence of the Proposed Acquisition, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority.	The Proposed Acquisition would affect ~~9~~ 8 eligible rail line segments due to the addition of the planned capital improvements; however, these effects would not be adverse.
Historic resources adverse visual impacts	None; however, in the absence of the Proposed Acquisition, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority.	The Proposed Acquisition would affect ~~9~~ 8 eligible rail line segments and ~~7~~ 5 above-ground historic resources due to the additional of the planned capital

Table S.1-1. Impact Summary Table

Resource and Impact	No-Action Alternative	Proposed Acquisition
		improvements; however, these effects would not be adverse.
Impact Conclusion: The Proposed Acquisition would not adversely affect any archaeological or historic resources. All of the appropriate SHPOs, THPOs, and other consulting parties have concurred with OEA that the Proposed Acquisition would not adversely affect historic properties within the APE.		
Hazardous Material Release Sites		
Capital improvement locations with potential hazardous material site impacts	None	4
Impact Conclusion: Based on conceptual designs, the Camanche (Iowa), Ottumwa (Iowa), Blue Valley (Missouri), and Asbury (Missouri) capital improvement locations have the potential to encounter residual hazardous materials during ground disturbing activities.		
Biological Resources		
Endangered Species Act – Listed Species	None; however, in the absence of the Proposed Acquisition, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority.	OEA consulted with USFWS and determined that~~; USFWS concurred that~~ impacts to the Indiana bat, northern long-eared, and Ozark big-eared bats are ~~determined to be~~ "may affect, not likely to adversely affect." The Missouri, Oklahoma, Illinois-Iowa, and Arkansas USFWS offices subsequently concurred with OEA's determination. OEA also determined that the Proposed Acquisition would not be likely to adversely affect the tri-colored bat.
Impact Conclusion: The Proposed Acquisition *may affect, but is not likely adversely affect* the federally endangered Indiana bat, the federally proposed endangered northern long-eared bat, and the federally endangered Ozark big-eared bat. The Proposed Acquisition would also not be likely to adversely affect the federally proposed endangered tri-colored bat. Impacts on other biological resources would be negligible.		

Table S.1-1. Impact Summary Table

Resource and Impact	No-Action Alternative	Proposed Acquisition
Water Resources		
Surface Water and Wetlands	None; however, in the absence of the Proposed Acquisition, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority.	Potential to impact a total of approximately 1.5 acres of streams and 15.94 acres wetlands due to fill, new track ballast, replacing or adding culverts, and extending or adding bridge piers.
Impact Conclusion: The Proposed Acquisition would have minimal impacts to wetlands and streams due to site work and construction, including the placement of fill material or conveyance structures.		
Environmental Justice (EJ)		
Disproportionately high adverse impact on minority population	No	No
Disproportionately high adverse impact on low-income population	No	No
Percentage of adversely affected receptors in EJ populations census block groups	N/A	28%
Percentage of adversely affected receptors in non-EJ populations census block groups	N/A	72%
Impact Conclusion: The Proposed Acquisition does not have the potential to result in disproportionately high and adverse human health or environmental impacts on minority or low-income populations.		
Cumulative Impacts		
Passenger Rail Safety	No	Cumulative impacts on the probability of rail collisions would increase slightly on segments where the Illinois Department of Transportation proposes new intercity passenger rail service and where Amtrak plans additional service between River

Table S.1-1. Impact Summary Table

Resource and Impact	No-Action Alternative	Proposed Acquisition
		Junction and St. Paul, MN; however, the probability of rail collisions involving passenger and freight trains is very low.
Grade Crossing Safety and Delay	No	Cumulative impacts would result from an increase in the number of crashes at certain grade crossings, and cumulative impacts would result in a slight increase in grade crossing delay at certain grade crossings. However, OEA expects that the amount of delay at crossings on other railroads in the U.S. and on roadways could decrease as the result of the diversion of trucks to rail and the diversion of rail traffic from other railroads to the combined CPKC network.
Air Quality	No	Cumulative impacts would result in a slight increase of emissions from the four proposed Amtrak trains; however, it would be less than 1 percent of the emissions budget for the Chicago Ozone Nonattainment Area.
Noise	No	No
Environmental Justice	No	No
Biological Resources	No	Two proposed electrical transmission line projects could potentially overlap geographically with one or more of the planned capital improvements within the rail ROW. If this were to occur, then cumulative impacts on biological resources could result, but OEA expects that these cumulative impacts would be minor.
Water Resources	No	Cumulative impacts on wetlands could result from the SGGR Transmission Line

Table S.1-1. Impact Summary Table

Resource and Impact	No-Action Alternative	Proposed Acquisition
		Project at the MP 71 (Turkey River) capital improvement in Iowa. The impacts would be temporary because the SGGR project is a buried electric cable.
Impact Conclusion: Cumulative impacts are possible for rail safety, grade crossing safety, grade crossing delay, air quality, and water resources. There would be no cumulative impacts under the No-Action Alternative.		

Table of Contents

Appendices

List of Tables

List of Figures

Acronyms

AADT	Annual average daily traffic
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
Amtrak	National Passenger Railroad Corporation
APE	Area of potential effects
AQRVs	Air quality related values
AREMA	American Railway Engineering and Maintenance-of-Way Association
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe Railway
Board	Surface Transportation Board of the United States
BRC	Belt Railway of Chicago
BTS	Bureau of Transportation Statistics
Btu	British thermal units
CAA	Clean Air Act
CASTNET	Clean Air Status and Trends Network
CCSP	U.S. Climate Change Science Program
CDA	Chicago Department of Aviation
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
CH4	Methane
CHC	Cardinal – Hickory Creek
CM&StP	Chicago, Milwaukee, and St. Paul Railroad
CMAP	Chicago Metropolitan Agency for Planning
CN	Canadian National Railway and Illinois Central Railroad Company, collectively
CO	Carbon monoxide
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalent

Corps	U.S. Army Corps of Engineering
CP	Canadian Pacific Railway
CPKC	Canadian Pacific Kansas City
CRCs	Comments and requests for conditions
CST	Central Standard Time
CSX	CSX Transportation
CWA	Clean Water Act
D-factor	Directional split factors
DART	Dallas Area Rapid Transit
dB	Decibels
dBA	A-weighted decibels
DOT	Department of transportation
DRU	Diluent recovery unit
ECOS	Environmental Conservation Online System
EDR	Environmental Data Resources, Inc.
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
FAF	Freight Analysis Framework
FAQs	Frequently asked questions
FCR	Fire-cracked rock
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GIS	Geographic information systems
GHG	Greenhouse gas
GPS	Global positioning system

GTM	Gross ton-miles
ha	Hectare
HAPs	Hazardous air pollutants
Hazmat	Hazardous materials
HCM	Highway Capacity Manual
HGAC	Houston-Galveston Area Council
HPMS	Highway Performance Monitoring System
HUD	U.S. Department of Housing and Urban Development
Hz	Hertz
ICC	Interstate Commerce Commission
ICCTA	Interstate Commerce Commission Termination Act
IDOT	Illinois Department of Transportation
IHB	Indiana Harbor Belt Railroad
IMPROVE	Interagency Monitoring of Protected Visual Environments
in/s	Inches per second
IPaC	Information for Planning and Consultation
IPCC	Intergovernmental Panel on Climate Change
IR	Inconsistent and Responsive Applications
K-factor	Design hourly volume factors
KCP&G	Kansas City, Pittsburg, and Gulf Railroad
KCS	Kansas City Southern Railway
kg	Kilogram
Ldn	Day-night average noise levels
Leq	Energy-average noise level
Lmax	Maximum instantaneous A-weighted noise level
LNG	Liquid natural gas
LOS	Level of Service
LPG	Liquified petroleum gas
MD-W	Milwaukee District West
Metra	Northern Illinois Railroad Corporation

mGTs	Million gross tons
MM	Mitigation measure
MMBtu	Metric million British thermal units
MOVES	Motor Vehicle Emissions Simulator
MP	Milepost
mph	Miles per hour
MPO	Metropolitan Planning Organization
MTA	Metropolitan Transit Authority
NAAQS	National Ambient Air Quality Standards
National Register	National Register of Historic Places
NCA5	Fourth National Climate Assessment
NCA5	Fifth National Climate Assessment
NCTCOG	North Central Texas Council of Governments
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act of 1966
NJTC	New Jersey Transit Company
N2O	Nitrous oxide
NO2	Nitrogen dioxide
NOx	Nitrogen oxides
NOI	Notice of Intent
NPS	National Park Service
NRC	National Research Council
NRCS	Natural Resources Conservation Service
NS	Norfolk Southern Railway Company
NSRT	National Significant Risk Threshold
O3	Ozone
o/d	Origin/destination
OEA	Office of Environmental Analysis
OFCM	Office of the Federal Coordinator for Meteorological Services and Supporting Research
OMP	O’Hare Modernization Program

ORD	Chicago O'Hare International Airport
OSHA	Occupational Safety and Health Administration
PM	Particulate matter
PP/K	Projectile Point Knife
PPV	Peak-particle velocity
PSD	Prevention of Significant Deterioration
PTC	Positive Train Control
kV	kilo-Volt
QZRI	Quiet Zone Risk Index
RA	Responsive Applications
RCP	Representative Concentration Pathway
RFP	Reasonable Further Progress
ROP	Rate of Progress
ROW	Right-of-way
RSIA	Rail Safety Improvement Act of 2008
RSIP	Residential Sound Insulation Program
SBTi	Science Based Targets initiative
SEL	Sound exposure level
SETRPC-MPO	South East Texas Regional Planning Commission-Metropolitan Planning Organization
SF6	Sulfur hexafluoride
SGRR	SOO Green Renewable Rail
SHPO	State Historic Preservation Office
SIP	Safety Integration Plan
SO2	Sulfur dioxide
SSM	Supplemental safety measure
SUV	Sport utility vehicle
SWPPP	Stormwater prevention pollution plan
TAP	Terminal Area Plan
TCFD	Task Force on Climate-related Financial Disclosures
TCMC	Twin Cities-Milwaukee-Chicago

THPO	Tribal Historic Preservation Office
TIP	Transportation improvement plan
TRANSCAER	Transportation Community Awareness and Emergency Response Program
UP	Union Pacific Railroad
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
USDOT	U.S. Department of Transportation
v/c	Volume to capacity
VdB	Decibels (vibration)
VM	Voluntary measure
VMT	Vehicle miles traveled
VOC	Volatile organic compound
WGA	Western Governors' Association
WPA	Works Progress Administration

Chapter 1
Purpose and Need

1.1 Introduction

On October 29, 2021, Canadian Pacific Railway Limited, Canadian Pacific Railway Company, and their U.S. rail carrier subsidiaries Soo Line Railroad Company; Central Maine & Quebec Railway U.S., Inc.; Dakota, Minnesota & Eastern Railroad Corporation; and Delaware & Hudson Railway Company, Inc. (collectively, CP) and Kansas City Southern, The Kansas City Southern Railway Company, Gateway Eastern Railway Company, and The Texas Mexican Railway Company (collectively, KCS) filed an application with the Surface Transportation Board (Board) under 49 U.S.C. §§ 11323-25 seeking the Board's approval of CP's acquisition of KCS (Proposed Acquisition). If the Board authorizes the Proposed Acquisition, CP and KCS (collectively, Applicants) would combine to form an integrated system to be known as Canadian Pacific Kansas City (CPKC). **Figure 1.3-1**, provides a map of the proposed combined system showing current ownership. See *Chapter 2, Section 2.2, Proposed Acquisition*, for a detailed description of the combined system.

Because the Proposed Acquisition has the potential to result in significant environmental impacts, the Board's Office of Environmental Analysis (OEA) has prepared this ~~Draft~~ Environmental Impact Statement (~~Draft~~ EIS) pursuant to the National Environmental Policy Act (NEPA) (42 U.S.C. §§ 4321-4370m-11) and related laws, including Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) (NHPA).

This chapter describes the purpose and need for the Proposed Acquisition, the Board's role in reviewing railroad acquisitions, and the Board's environmental review process.

1.2 Purpose and Need

The proposed federal action in this proceeding involves an application for Board authority under 49 U.S.C. §§11323-25 for CP to acquire KCS. The Proposed Acquisition is not a federal government proposed or sponsored project. Thus, the project's purpose and need should be informed by both the Applicants' goals and the Board's enabling statute, the Interstate Commerce Act, as amended by the Interstate Commerce Commission (ICC) Termination Act (ICCTA), Pub. L. No. 104-188, 109 Stat. 803 (1996). See Alaska Survival v. STB, 705 F.3d 1073, 1084-85 (9th Cir., 2013).

According to the Applicants, the purpose of the Proposed Acquisition is to combine America's two smallest but fastest-growing Class I railroads to build a more efficient and more competitive rail network.[1] The Applicants state that the Proposed Acquisition would address the need for

[1] Class I railroads are the largest railroads and are defined as having annual revenue greater than $250 million. There are seven Class I railroads in the U.S.

expanded and more capable and efficient transportation infrastructure while simultaneously advancing the interests of current and future customers with more reliable and economical rail transportation options serving important north-south trade flows. The Applicants also state that the Proposed Acquisition would generate environmental benefits by reducing truck transportation on highways in North America by more than 64,000 trucks annually, resulting in less congestion, less maintenance, and improved safety on those roads. The Applicants further state that the Proposed Acquisition would result in less noise pollution in the places where those trucks would have driven and lowered air emissions, including greenhouse gas emissions.

Under the Interstate Commerce Act, as amended, the Board "shall approve and authorize a transaction" such as this when, after considering several factors, "it finds the transaction is consistent with the public interest." (49 U.S.C. §§ 11324 (b) & (c)). When the Board determines that a transaction is consistent with the public interest, the Board is required by statute to approve the transaction. The Board's intention in making a decision to approve a railroad merger or acquisition is to allow railroads to expand their systems by acquiring other railroad facilities and thereby operate more efficiently and compete more effectively with trucks and other railroads.

1.3 Role of the Board in Reviewing Railroad Acquisitions

The Board is a nonpartisan, independent federal regulatory agency, composed of five presidentially appointed members confirmed by the Senate. The Board has jurisdiction over certain rail transportation matters, including financial transactions such as railroad acquisitions, mergers, and consolidations; new rail line construction; rail line rates and service issues; and line sales and the abandonment of rail service, as authorized by the Interstate Commerce Act, as amended by ICCTA.

The Board is reviewing the Proposed Acquisition through two parallel but distinct processes: (1) the transportation-related process that examines the competitive, transportation, and economic implications of the Proposed Acquisition on the national rail system, and (2) the environmental review process that is being conducted by OEA. The statute setting forth the procedures for Board review of acquisitions at 49 U.S.C. § 11325 and the Board's implementing regulations at 49 C.F.R. § 1180.4 require that the Board complete both processes within approximately 15 months after the primary application is accepted for a "major" transaction such as this. The Board accepted the Applicants' application on November 23, 2021. On March 16, 2022, however, the Board issued a decision suspending the existing procedural schedule and directed the Applicants to explain an apparent inconsistency between data submitted in the application and information that the Applicants provided to OEA as part of the environmental review process. By decision issued on April 27, 2022, the Board directed the Applicants to amend their application and revise supporting workpapers to address the data inconsistency. The Applicants submitted their amended application and revised workpapers on May 13, 2022, and on May 27, 2022, the Board issued a revised procedural schedule for the proceeding.

1.3.1 Review of Transportation Merits

In all its decisions, the Board is committed to advancing the national rail transportation policy goals established by Congress. In 1920, Congress established a national policy favoring railroad acquisitions, mergers, and consolidations in the interest of economy and efficiency. Congress reaffirmed its rail consolidation policy in subsequent amendments to the Interstate Commerce Act, including ICCTA, and it requires the Board, as it required its predecessor, the ICC, to approve railroad acquisitions that are consistent with the public interest (49 U.S.C. § 11324(c)).

When deciding whether to approve the merger of two or more Class I railroads or impose conditions on such a transaction, statutory provisions at 49 U.S.C. § 11324(b) require the Board to consider:

- The effect that the proposed transaction would have on providing adequate transportation to the public.
- The effect on the public interest of including, or failing to include, other rail carriers in the geographic area involved in the proposed transaction.
- The total fixed charges that would result from the proposed transaction.
- The interests of affected railroad employees.
- The possibility of an adverse impact on competition among railroads in the affected region or in the national rail system.

The Board licenses railroads as common carriers, requiring them to accept goods and materials for transport from all customers upon reasonable request (49 U.S.C. § 10101(a)). Railroads make decisions on an ongoing basis regarding which routes they will use to serve their customers in response to changes in multiple factors, including market conditions, the economy, and market demand. If a railroad simply wants to reroute its trains or update or otherwise improve a portion of its system in order to provide better service to shippers, it may do so without seeking the Board's permission; therefore, the Board does not regulate the number of trains operating over a specific section of rail line nor does it maintain control over general day-to-day railroad operations. In the case of railroad mergers or acquisitions, a Board decision approving a transaction would not require the railroads involved to run a specified number of trains or transport existing or new freight by any particular route. Rather, the Board's decision is intended to allow railroads to expand their rail line systems by acquiring the facilities of other railroads in order to operate more efficiently and compete more effectively with trucks and other railroads.

On July 22, 2022, the Board announced a three-day public hearing, scheduled September 28 to 30, 2022, regarding the transportation merits of the Proposed Acquisition pursuant to 49 U.S.C. § 11324(a). The hearing was extended to seven days to allow adequate time for all speakers to present and the Board to question the Applicants and other speakers. The actual dates of the hearing were September 28, 29, 30 and October 3, 4, 6, and 7, 2022. Several speakers at the public hearing provided environmental comments, and OEA has responded to those comments as appropriate in **Appendix S**.

Figure 1.3-1. Proposed CPKC Rail System

1.3.2 Review of Environmental Impacts

NEPA requires federal agencies to assess the environmental effects of proposed actions prior to making decisions. OEA is the office within the Board tasked with carrying out the Board's responsibilities under NEPA and related environmental laws, including Section 106 of NHPA and Section 7 of the Endangered Species Act (16 U.S.C. § 1536) (ESA).

Environmental impacts from the Proposed Acquisition would include impacts related to increased rail traffic on certain rail lines. The Applicants expect that the Proposed Acquisition would create new efficiencies in the rail network that would result in rail traffic being diverted from other rail lines onto the combined CPKC network and the diversion of freight from trucks to rail transportation. Because of these expected diversions, the Applicants project that the Proposed Acquisition would result in increased rail traffic on portions of the combined CPKC network. The largest expected change would occur on the CP mainline between Sabula, Iowa, and Kansas City, Missouri, where the Applicants project that rail traffic would increase by approximately 14.4 trains per day, on average. Other rail lines would experience smaller increases in rail traffic, no change in rail traffic, or a decrease in rail traffic.

OEA applied the thresholds set forth in the Board's environmental regulations at 49 C.F.R. § 1105.7(e) to identify rail lines where the projected increase in rail traffic warranted environmental review. The general thresholds in the Board's regulations for assessing environmental impacts from increased rail traffic on rail lines are an increase in rail traffic of at least 100 percent (measured in gross ton miles annually) or an increase of at least eight trains per day. For rail lines located in areas that are in nonattainment under the Clean Air Act (42 U.S.C. §§ 7401-7671q), the threshold for air quality analysis is an increase in rail traffic of at least 50 percent (measured in gross ton miles annually) or an increase of at least three trains per day (49 C.F.R. § 1105.7(e)(5)(ii)). OEA identified rail lines in Illinois, Iowa, Missouri, Kansas, Oklahoma, Arkansas, Louisiana, and Texas that would experience increases in rail traffic that would exceed these analysis thresholds as a result of the Proposed Acquisition.

In addition to increased rail traffic on rail lines, the Proposed Acquisition would result in changes in operational activities at rail yards and intermodal facilities. The threshold for environmental review of rail yards and intermodal facilities is an increase in rail yard activity of at least 100 percent (measured by carload activity) or an average increase in truck traffic of more than 10 percent of the average daily traffic or 50 vehicles a day on any affected road segment (49 C.F.R. § 1105.7(e)(5)(i)). For rail yards and intermodal facilities in nonattainment areas, the threshold for air quality analysis is an increase in rail yard activity of at least 20 percent (measured by carload activity) or an average increase in truck traffic of more than 10 percent of the average daily traffic or 50 vehicles a day on a given road segment (49 C.F.R. § 1105.7(e)(5)(ii)). This ~~Draft~~ EIS addresses environmental impacts that would be associated with increased operational activities at rail yards and intermodal facilities where the Board's thresholds related to rail yards and intermodal facilities would be reached or exceeded.

If the Board authorizes the Proposed Acquisition, the Applicants plan to make 25 capital improvements within the existing rail right-of-way (ROW) to support the projected increases in rail traffic, and this ~~Draft~~ EIS discusses environmental impacts that would be associated with them. The planned capital improvements would include extending 13 existing passing sidings, adding 10 new passing sidings, adding a section of double track in Blue Valley near Kansas City, Missouri, and adding a section of facility working track adjacent to the International Freight Gateway intermodal terminal near Kansas City. The Applicants have stated that they would add the capital improvements as needed based on increasing traffic and that design-level engineering for each capital improvement would occur only when each capital improvement is needed. The Applicants do not propose to construct any new rail lines subject to Board licensing or to abandon any rail lines as part of the Proposed Acquisition.

As part of the environmental review process, OEA makes recommendations to the Board regarding measures for mitigating potential adverse environmental impacts that could occur as a result of a Board decision. Environmental mitigation measures may include voluntary measures developed by railroad applicants and additional measures recommended by OEA. The Board encourages railroad applicants to propose voluntary mitigation. In some situations, voluntary mitigation can replace, supplement, or reach farther than mitigation measures the Board might otherwise impose. In making its final decision in a case, the Board considers OEA's conclusions regarding environmental impacts and OEA's final recommendations for mitigation. In railroad acquisition cases, the Board can authorize the transaction as proposed; authorize the transaction with conditions, including environmental conditions to avoid or reduce potential adverse environmental impacts; or deny the transaction. *Section 1.4, NEPA Process*, provides additional information regarding the NEPA process.

1.3.3 Review of Safety Integration Plan (SIP)

Pursuant to 49 C.F.R. Part 1106 and Federal Railroad Administration (FRA) regulations at 49 C.F.R. Part 244, the Applicants prepared a proposed Safety Integration Plan (SIP). The proposed SIP describes the Applicants' proposed process and timeline for merging the operations of CP and KCS, as well as the safety implications of merging these operations. During the preparation of the SIP, the Applicants met with FRA to review drafts of the proposed SIP and related materials, respond to questions, and accept recommendations. Pursuant to 49 C.F.R. §§ 1106.4(b)(1) and 244.17, on December 28, 2021, the Applicants submitted their proposed SIP to the Board and, by letter dated February 28, 2022, FRA submitted comments to the Board stating that FRA is satisfied that the proposed SIP provides a reasonable assurance of safety for the proposed transaction, consistent with governing regulations. OEA reviewed the proposed SIP and appended it to the Draft EIS to allow for public review and comment on it and on FRA's comments. OEA did not receive any comments on the SIP during the public comment period. ~~OEA also has reviewed the proposed SIP, which is appended to this Draft EIS as **Appendix G** to allow for public review and comment on it and on FRA's comments. In the Final EIS, OEA will address any written comments on the SIP submitted during the Draft EIS comment period.~~ If the Board authorizes the Proposed Acquisition and adopts the SIP, the Board will require compliance with the SIP as a condition to its authorization. 49 C.F.R. § 1106.4(b)(4). The Applicants then would coordinate with FRA in implementing the approved SIP, including any amendments thereto. Id. FRA would provide the Board with updates as appropriate during the acquisition implementation period and advise the Board when, in FRA's view, the integration of the Applicants' operations has been fully and safely completed. Id.

1.3.4 Review of Responsive Applications (RAs)

On February 28, 2022, Canadian National Railway and Illinois Central Railroad Company (collectively, CN) filed an RA for consideration by the Board. RAs are proposals that parties other than the Applicants may file with the Board to request modifications or conditions to the Applicants' primary application seeking Board authority. After the Board directed the Applicants to amend their application and revise supporting workpapers on April 27, 2022, the Board provided time for other parties to amend their filings, including any RAs, based on the Applicants' amended application and revised workpapers. On June 9, 2022, CN filed an amended RA based on the Applicants' amended application and revised workpapers. By decision served on July 1, 2022, the Board accepted CN's RA for consideration.

In its amended RA, CN requested that the Board require, as a condition of any decision granting authority for CP to acquire KCS, the Applicants to divest, or sell, a number of KCS rail lines to CN. Specifically, CN requested that the Board order the Applicants to divest the KCS rail lines that extend between Kansas City, Missouri, and Roodhouse, Illinois; between Roodhouse and Springfield, Illinois; and between Roodhouse and East St. Louis, Illinois. In total, CN is seeking to acquire ownership of approximately 355 miles of KCS rail lines in Missouri and Illinois through the proposed divestiture. CN's RA also seeks ownership interests in KCS's International Freight Gateway terminal south of Kansas City, as well as trackage rights over certain rail lines owned by KCS and Union Pacific Railroad Company.

According to CN, the proposed divestiture of the KCS rail lines to CN would increase rail traffic on those rail lines by preserving and enhancing competition in the regional rail transportation industry. For some of the rail lines proposed for divestiture, CN projects that the increase in rail traffic would reach or exceed the thresholds triggering an environmental review under the Board's environmental regulations at 49 C.F.R. §§ 1105.6(b)(4) and 49 C.F.R. 1105.7(e). Therefore, OEA is conducting an environmental and historic review of CN's RA that is separate from, but conducted concurrently with, OEA's environmental and historic review of the Proposed Acquisition. More information regarding the environmental review for CN's RA can be found on the Board's website at www.stb.gov by conducting a search for Docket No. FD 36500 (Sub-No. 1).

Norfolk Southern Railway Company (NSR) submitted an RA on February 28, 2022 and an amended RA on June 9, 2022 seeking trackage rights (such as, the right to operate) over certain KCS rail lines in Texas and Louisiana. By decision served on July 1, 2022, the Board accepted NSR's RA for consideration. NSR's trackage rights proposal is categorically excluded from environmental and historic review under 49 C.F.R. §§ 1105.6(c)(3) and 1105.8(b)(3). More information regarding the environmental review for NSR's RA can be found on the Board's website at www.stb.gov by conducting a search for Docket No. FD 36500 (Sub-No. 5).

1.4 NEPA Process

The environmental review process under NEPA is intended to assist the Board and the public in identifying and assessing the potential environmental consequences of a proposed action before a decision on that proposal is made. In conducting its environmental review, OEA considers the NEPA requirements and the Council on Environmental Quality (CEQ) implementing regulations; other related environmental laws and their implementing regulations; and the Board's environmental regulations at 49 C.F.R. Part 1105. Based on the information provided by the Applicants, OEA determined that the Proposed Acquisition has the potential to result in significant environmental impacts and that the preparation of an EIS is appropriate under NEPA.

1.4.1 Lead Agency

The Board, through OEA, is the lead agency responsible for preparing this ~~Draft~~ EIS to identify and evaluate the potential environmental impacts associated with the Proposed Acquisition. In performing its environmental analysis, OEA reviewed the Applicants' application and the Applicants' responses to OEA's information requests to identify projected changes in rail traffic on the rail line segments, and activity at rail yards and intermodal facilities that could cause potential environmental impacts. OEA prepared this Final EIS to provide corrected or additional information, respond to comments on the Draft EIS, and present changes to the Draft EIS made in response to comments and additional information.

Consultation with other government agencies and public involvement are central components of NEPA and the Board's environmental review process. OEA considered pertinent federal statutes, regulations, and executive orders, and as part of its role as the lead agency it coordinated and consulted with appropriate federal, state, and local agencies to ensure that they were notified of the Proposed Acquisition and knew about the time frame for agency review and comment on the Draft EIS. *Section 1.5, Agency Consultation*; *Section 1.6, Tribal Consultation*; and *Section 1.7, Public Involvement* provide additional detail regarding OEA's agency and tribal consultation and public involvement activities, including responses to comments on the Draft EIS.

OEA engaged an independent third-party contractor to assist with the environmental analysis and preparation of environmental documents for the Proposed Acquisition. The Board's environmental rules and those of CEQ specifically permit the use of agency-approved, independent third-party contractors (49 C.F.R. § 1105.10(d) and 40 C.F.R. § 1506.5, respectively). For this case, as in all Board proceedings where third-party contractors are retained, the independent third-party contractors' scope of work, approach, and activities are under OEA's sole supervision, direction, and control. The contractors work under OEA's direction to conduct independent environmental analysis; develop appropriate environmental approaches, documentation, and mitigation options; and verify the environmental information provided by the Applicants, consulting agencies, and all other interested parties.

OEA's environmental review of the Proposed Acquisition is a multi-step process. After OEA considered all public and agency comments received on the Draft EIS (including comments on the preliminary recommended mitigation and the proposed SIP); consulted further with appropriate agencies, tribes, concerned parties, and communities; and conducted additional environmental analysis, where appropriate, OEA, with the assistance of its independent third-party contractor, prepared this Final EIS that responds to all comments received and contains OEA's final environmental analysis and final recommended environmental mitigation. The Board will consider the entire environmental record including the Draft EIS, Final EIS, the information concerning the proposed SIP, and all public comments when making its final decision on whether to authorize the Proposed Acquisition and what mitigation, including environmental mitigation, to impose.

1.4.2 Other Agencies

This ~~Draft~~ EIS considers a potential major federal action by the Board. Although there are no Cooperating Agencies for this EIS, OEA has consulted with ~~and will continue to consult~~ appropriate federal and state agencies regarding the Proposed Acquisition. These agencies and their responsibilities are briefly discussed below.

1.4.2.1 U.S. Environmental Protection Agency (EPA)

Under Section 309 of the Clean Air Act (42 U.S.C. § 7609), EPA reviews and comments on the environmental impacts of major federal actions for which an EIS is prepared under NEPA. EPA's Office of Federal Activities, which is responsible for reviewing EISs, evaluates and comments on the quality of analysis in the EIS and the extent of the proposal's impact on the environment. EPA announces the availability of any Draft EIS for public comment in the *Federal Register*. EPA also has broad oversight and implementing responsibility for federal environmental laws, including the Clean Air Act (42 U.S.C. §§ 7401-7671q), the Clean Water Act (33 U.S.C. §§1251-1387), the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. Chapter 103), the Toxic Substances Control Act (15 U.S.C. §§ 2601-2629)), and the Resource Conservation and Recovery Act (40 U.S.C. §§ 6901-6992k). OEA consulted with EPA during preparation of the Draft EIS.

1.4.2.2 U.S. Army Corps of Engineers (the Corps)

The Corps is part of the U.S. Department of Defense, under the Secretary of the Army. The Corps, under Section 404 of the Clean Water Act (33 U.S.C. § 1344), has jurisdiction over activities that result in the discharge of dredge or fill material into any waters of the United States, including lakes, rivers, streams, oxbows, ponds, and wetlands. Activities within these systems could require Section 404 permits from the Corps. If the Board authorizes the Proposed Acquisition, the Applicants plan to undertake certain capital improvements within the rail ROW, including adding new passing sidings, extending existing sidings, adding double track, and adding a facility working track. Because some of the planned capital improvements could occur within waters of the United States, the Applicants may need to obtain Section 404 permits prior to beginning work on the planned capital improvements.

The Corps is also responsible for activities that may affect navigable waters of the United States, pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403). Section 10 requires that any entity proposing to perform work or place a structure in navigable waters obtain a Section 10 permit from the Corps prior to commencing the activity. Because some of the planned capital improvement projects associated with the Proposed Acquisition would involve crossing navigable waters of the United States, the Applicants could need to obtain a Section 10 permit prior to beginning work on the planned capital improvements.

1.4.2.3 U.S. Fish and Wildlife Service (USFWS)

USFWS is the federal agency with primary expertise in fish, wildlife, and natural resource issues. USFWS is responsible for implementing ESA and is also responsible for implementing the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712) and the Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668-668d). Under Section 7 of ESA, USFWS is responsible for the review of federal agency actions and potential impacts on threatened and endangered species, and could issue a determination, in the form of a biological opinion, that details projected impacts on threatened and endangered species in the area of a proposed agency action. As the lead agency, the Board is responsible for initiating Section 7 consultation with USFWS. OEA used the EIS process to concurrently complete and document compliance with Section 7. OEA has consulted with USFWS during the development of this EIS and provided USFWS with the Draft EIS for review and comment. This Final EIS includes the final completed Section 7 consultation documentation.~~This Draft EIS reflects the status of Section 7 consultation, which will be fully completed and documented in the Final EIS~~.

1.4.2.4 Advisory Council on Historic Preservation

The Advisory Council on Historic Preservation (ACHP) is an independent federal agency created under the authority of NHPA. Among its roles, ACHP is responsible for advocating consideration of historic preservation in federal agency decision-making and promulgating regulations to implement Section 106 of NHPA. The Section 106 regulations at 36 C.F.R. Part 800 require federal agencies to consider the impact of their “undertakings” on “historic properties” listed or eligible for listing in the National Register of Historic Places (National Register) prior to licensing or providing funds for a project. In considering project impacts, federal agencies are required to consult with their applicants (CP and KCS, in this case), appropriate State Historic Preservation Officers (SHPOs), appropriate Tribal Historic Preservation Officers (THPOs), tribes, and other Section 106 Consulting Parties with a demonstrated interest in the undertaking. As part of its mission, ACHP encourages agencies to coordinate their Section 106 reviews with other federal laws, including NEPA, the Native American Graves Protection and Repatriation Act (25 U.S.C. §§ 3001-3013), the American Indian Religious Freedom Act (42 U.S.C. § 1996), the Archaeological Resources Protection Act (16 U.S.C. §§ 470aa-470mm), and other applicable laws.

1.4.2.5 State Agencies

The Proposed Acquisition would affect 10 states, with eight states experiencing changes in rail operations that would exceed thresholds for environmental review detailed in *Chapter 2, Section 2.2.2, Impacts from Increased Rail Traffic*. OEA consulted with relevant state agencies including departments of transportation, environment, and conservation, as well as SHPOs. *Section 1.5, Agency Consultation*, describes the agency consultation process in more detail.

1.4.3 Scoping Process

The first stage of the environmental review process is scoping. Scoping is an open process for determining the range of issues that should be examined and assessed in the EIS. In addition to announcing that the Board would prepare an EIS for this proceeding, the Notice of Intent (NOI) that the Board issued on November 12, 2021 also requested comments on the scope of the EIS and presented the schedule of public scoping meetings. In the NOI, OEA solicited comments on the scope, alternatives, and issues to be analyzed in the EIS. OEA sent letters to local, state, federal, and tribal officials and agencies, as well as other potentially interested organizations. The letters announced OEA's intent to prepare an EIS, described the Proposed Acquisition, and set forth the dates, times, and log-in details for six online public scoping meetings. OEA also posted Google banner advertisements (banner ads) online focusing on areas with identified Environmental Justice (EJ) populations in the project area. The banner ads announced the project and encouraged viewers to click on the ad to visit the Board-sponsored project website for more information. The Board-sponsored project website provided information on the Proposed Acquisition including maps, the NOI, and dates and times for the public scoping meetings. In addition, OEA issued a press release to local media, including television stations, radio stations, and newspapers, along the proposed CPKC system. The press release announced OEA's intent to prepare an EIS and advertised the purpose, dates, and times for the public scoping meetings. After the close of the comment period on the scope of the EIS on January 3, 2022, OEA reviewed all comments received and issued a Final Scope of Study for the EIS on February 18, 2022, which responded to comments received during the scoping period and set forth the final issues to be examined in the EIS.

1.4.4 Draft EIS

Following the issuance of the Final Scope, OEA prepared the Draft EIS for the Proposed Acquisition. The Draft EIS identified and analyzed alternatives—the Proposed Acquisition and the No-Action Alternative—and addressed potential impacts on the environment, including those identified during the scoping process. The Draft EIS focused on:

1. Potential impacts from changes in rail operations along rail line segments, activity at rail yards, and activity at intermodal facilities where increases in rail traffic or activity as a result of the Proposed Acquisition would reach or exceed the thresholds for environmental review set forth in 49 C.F.R. § 1105.7(e), or thresholds developed by OEA in previous acquisition and merger cases;
2. Potential impacts related to changes in vehicular traffic that would reach or exceed the Board's thresholds for environmental analysis on roadways and at facilities as a result of the Proposed Acquisition; and
3. Potential impacts associated with making planned capital improvements within the rail ROW to accommodate the projected increase in rail traffic resulting from the Proposed Acquisition.

Based on the information provided by the Applicants and verified through the environmental review for the Draft EIS, rail lines in eight states—Illinois, Iowa, Missouri, Kansas, Oklahoma, Arkansas, Louisiana, and Texas—would experience increases in rail traffic that reach or exceed the Board's environmental analysis thresholds as a result of the Proposed Acquisition. In addition to assessing the environmental impacts of the Proposed Acquisition, the Draft EIS set forth OEA's preliminary recommendations for environmental mitigation measures.

1.4.5 Final EIS

OEA issued the Draft EIS on August 5, 2022 and held a 45-day comment period, which was later extended until October 14, 2022. OEA then prepared this Final EIS, which addresses comments on the Draft EIS and sets forth OEA's final recommended environmental mitigation. The Board will now consider the entire environmental record, including the Draft EIS, the Final EIS, public comments, and OEA's final recommended environmental mitigation in making its final decision on whether to authorize the Proposed Acquisition. ~~Following issuance of this Draft EIS and a 45-day public and agency comment period, OEA will prepare and issue a Final EIS that will address the comments on the Draft EIS from the public; federal, state, and local agencies; and other interested parties, and will set forth OEA's final recommended environmental mitigation. Then, in reaching its decision on whether to authorize the Proposed Acquisition, the Board will consider the Draft EIS, the Final EIS, public comments, and any final environmental mitigation recommended by OEA.~~

1.4.6 Section 106 Process

The Section 106 regulations at 36 C.F.R. Part 800 require federal agencies to consider the impact of their undertakings on historic properties listed or eligible for listing in the National Register prior to licensing or providing funds for a project. In considering project impacts, federal agencies are required to consult with project applicants, SHPOs, THPOs, tribes, and other Section 106 Consulting Parties. Federal agencies must also make their findings available to the public and provide the ACHP an opportunity to comment on the undertaking. OEA has consulted and will continue to consult with appropriate SHPOs, THPOs, and other Section 106 Consulting Parties regarding the potential effect of the Proposed Acquisition on historic properties. Consistent with past practice in proceedings involving the acquisition of existing rail lines, the Section 106 review in this case is focused on the potential effect of the 25 planned capital improvements that the Applicants intend to add within the existing ROW because the planned capital improvements have the potential to affect historic properties. *Chapter 3, Section 3.9, Cultural Resources*, provides details on the Section 106 consultation, OEA's efforts to identify historic properties that could be affected by the Proposed Acquisition, and OEA's conclusions regarding potential effects on those properties. This Final EIS includes the final Section 106 findings.

1.5 Agency Consultation

Following issuance of the NOI, OEA engaged with federal and state agencies through tailored meetings based on geography or resource topics. OEA sent letters to federal and state agencies providing background information on the Proposed Acquisition and how to participate in the process. The state agency letters extended invitations to relevant state agency staff for state-specific officials' briefings. Separately, OEA sent letters for individual agency meetings to the local regional offices, as applicable, of federal agencies with jurisdiction or interest in potentially affected resources. OEA held eight agency consultation meetings during the scoping period:

- Tuesday, November 30, 2021, Corps meeting
- Wednesday, December 1, 2021, Minnesota and Michigan state agencies meeting

- Wednesday, December 1, 2021, USFWS meeting
- Thursday, December 2, 2021, Illinois and Iowa state agencies meeting
- Monday, December 6, 2021, EPA meeting
- Tuesday, December 7, 2021, Kansas and Missouri state agencies meeting
- Wednesday, December 8, 2021, Louisiana and Arkansas state agencies meeting
- Thursday, December 9, 2021, Texas and Oklahoma state agencies meeting

OEA hosted meetings for relevant state and local agency staff (such as, transportation, environmental, and conservation departments). Agency comments addressed a range of issues, including:

- Potential impacts to nearby wildlife refuges;
- Potential impacts to tribal lands;
- Potential impacts to EJ communities;
- Railroad grade-crossing safety and delay; and
- Freight rail safety.

OEA also consulted with the SHPOs in a separate set of meetings to ensure that each state's individual cultural resource review processes were initiated and that the unique issues across the large project area were given appropriate attention. The letter OEA sent to SHPOs included a response form to identify points of contact and indicate their interest in participation based on whether known resources are present in the project area. OEA held nine SHPO meetings as follows:

- Wednesday, December 1, 2021, Texas SHPO
- Friday, December 3, 2021, Minnesota SHPO
- Friday, December 3, 2021, Illinois SHPO
- Monday, December 6, 2021, Iowa SHPO
- Tuesday, December 7, 2021, Oklahoma SHPO
- Tuesday, December 7, 2021, Missouri SHPO
- Thursday, December 9, 2021, Louisiana SHPO
- Monday, December 13, 2021, Arkansas SHPO
- Thursday, December 16, 2021, Kansas SHPO

At the end of the scoping period, OEA notified agencies of the availability of the Final Scope through email and OEA sent postcards to agencies for which email addresses were unavailable. Similarly, OEA notified the agencies of the availability of the Draft EIS through email with a link to the Draft EIS and by sending postcards to agencies for which email addresses were unavailable. Upon publication of the Notice of Availability of the Draft EIS in the *Federal Register*, a 45-day public and agency review and comment period began. On September 6, 2022, OEA extended the comment period to October 14, 2022. After the comment period ended, OEA prepared this Final EIS addressing comments on the Draft EIS. EPA is publishing a Notice of Availability of the Final EIS in the *Federal Register* and OEA is notifying interested parties and the public of the availability of the Final EIS through email, postcards, a press release, and updates to the Board's website and Board-sponsored project website.~~After the comment period ends and OEA prepares the Final EIS addressing the timely comments received, EPA will publish a Notice of Availability of the Final EIS in the *Federal Register*, and OEA will provide notification through emails and postcards to agencies.~~

1.6 Tribal Consultation

During scoping and the preparation of the Draft EIS, OEA consulted with federally recognized Indian tribes, consistent with NEPA, NHPA, and Executive Order (EO) 13175, "Consultation and Coordination with Indian Tribal Governments." EO 13175 requires that federal agencies conduct government-to-government consultation with federally recognized Indian tribes in the development of federal policies (including regulations, legislative comments or proposed legislation, and other policy statements or actions) that have tribal implications. Through government-to-government consultation, tribes can voice potential concerns about significant resources that may not otherwise be raised during the Section 106 process.

OEA identified 67 federally recognized tribes that may have current or historic interest in areas where the Proposed Acquisition could result in increased rail traffic, increased activity at rail yards or intermodal facilities, or construction of the 25 planned capital improvements within the existing rail ROW. OEA invited those tribes to participate in the Section 106 process, government-to-government consultation, or both. OEA sent tailored letters to tribal leaders, THPOs, and cultural resource officials along with a response form to identify points of contact and indicate a preference for participation in the government-to-government consultation process and/or the Section 106 process. **Appendix B** includes an example of the letter and the list of tribal recipients. OEA called each tribe to ensure that the tribes received the letters and to answer any questions.

No tribes chose to participate in government-to-government consultation. Six tribes elected to participate in the Section 106 process. The tribes were also able to participate through the same opportunities afforded to agencies and the public if they did not elect government-to-government or Section 106 consultation.

OEA notified tribes of the availability of the Final Scope through email and sent postcards to tribes for which email addresses were unavailable. OEA also notified tribes of the availability of the Draft EIS through emails or postcards and OEA is notifying the tribes of the availability of this Final EIS using the same methods.

Following issuance of the Draft EIS, the Bureau of Indian Affairs identified 11 additional tribes to consult. OEA invited those tribes to participate in the Section 106 process, government-to-government consultation, or both. OEA emailed consultation letters or mailed them in the event that an email address was undeliverable. OEA tried to call each tribe to confirm receipt and answer any questions. No tribes chose to participate in either process.

1.7 Public Involvement

In accordance with the NEPA regulations, OEA made diligent efforts to notify and involve the public during each phase of the environmental review process to date, starting with the issuance of the NOI on November 12, 2021.

1.7.1 Public Notification Activities

OEA announced each formal public comment period, described in the following sections, through the *Federal Register*; on the Board's website and the Board-sponsored project website; through press releases; online banner ads, postcards, and letters and emails to local, state, and federal elected officials. Upon EPA's publication of the Notice of Availability for the Draft EIS in the *Federal Register*, the public was given 45 days to review the Draft EIS and provide comments. OEA later extended the comment period until October 14, 2022. OEA announced the Draft EIS public comment period via the *Federal Register*; geotargeted online banner advertisements for EJ populations; the Board-sponsored project website; postcards; email notifications to local, state, and federal elected officials, as well as individuals who signed up to receive email notifications; and a press release. OEA also sent email notices to community leaders in areas with EJ populations, or postcards for whom email addresses were unavailable. The Community Leaders Distribution List can be found in **Appendix A**.

To announce the availability of this Final EIS, EPA is publishing a Notice of Availability in the *Federal Register*, and OEA is providing notification through geotargeted online banner advertisements for EJ populations in those population areas; the Board-sponsored project website; emails or postcards to local, state, and federal elected officials and to community leaders in EJ population areas, as well as to individuals who signed-up to receive notifications online or at in-person public meetings; and a press release. The Board-sponsored project website, project email inbox, and toll-free information phone line have been updated and monitored throughout the environmental review process.

1.7.2 Public Comment Periods

The EIS process for the Proposed Acquisition involved two formal public comment periods. The first comment period occurred during scoping and began with the issuance of the NOI on November 12, 2021. The scoping comment period was originally scheduled to end on December 17, 2021, but OEA extended the scoping comment period until January 3, 2022, in response to requests for an extension. During the scoping comment period, OEA hosted six online public scoping meetings at the following dates and times, listed in Central Standard Time (CST).

- Tuesday, November 30, 2021, 6 to 8 p.m.
- Wednesday, December 1, 2021, 2 to 4 p.m.
- Thursday, December 2, 2021, 6 to 8 p.m.
- Tuesday, December 7, 2021, 6 to 8 p.m.
- Wednesday, December 8, 2021, 2 to 4 p.m.
- Thursday, December 9, 2021, 6 to 8 p.m.

OEA also accepted written comments during the scoping comment period via the Board's website (www.stb.gov), the Board-sponsored project website, email, and regular mail. OEA received 443 written comments between November 12, 2021, and the end of the scoping comment period on January 3, 2022. The total number of comments received during the scoping period was 492, including both oral and written comments. All comments are available on the Board's website. OEA prepared the Final Scope of Study on February 18, 2022, for the EIS based on pertinent comments received during the scoping comment period.

OEA provided a 45-day comment period on the Draft EIS when interested parties could review the Draft EIS and provide comments. OEA later extended the comment period to October 14, 2022. OEA sent a combination of emails, banner ads, and post cards with a link to the Draft EIS to interested parties and media outlets. The entire Draft EIS is available on the Board's website (www.stb.gov) by clicking on the "View all Decisions" button and searching by Service date (August 5, 2022) or Docket Number (FD 36500). The Draft EIS is listed as an Environmental Document under the "Decision Type" category. The Draft EIS is also available on the Board-sponsored project website (www.CP-KCSMergerEIS.com).

Between November 12, 2021, when OEA issued the NOI, and October 14, 2022, when the review and comment period closed for the Draft EIS, the Board-sponsored project website had more than 25,000 users and 60,000 page views, including nearly 10,000 page views of the Public Involvement page and more than 3,000 views of the Draft EIS page.

OEA held four in-person public meetings on the Draft EIS during which interested parties could review the Draft EIS, make oral comments in a formal setting, and/or submit written comments. OEA began each meeting with an open house followed by a brief overview of the Proposed Acquisition and environmental review process, followed by a public comment session. During the formal comment session, each interested individual received three minutes to present oral comments. As time permitted, individuals could add to their comments once all speakers who had pre-registered online or signed up at the meeting had finished providing their initial three-minute comments. A court reporter recorded these oral comments. As time permitted, the court reporter was available at the conclusion of the formal segment of the meeting to record oral comments from individuals not interested in addressing the meeting participants as a whole. The court reporter was also available to record oral comments during the open house portion of each public meetings. Meeting transcripts are available on the Board-sponsored project website. Meetings were held at the following dates, times, and locations.

- September 12, 2022, 6 to 8 p.m. Central Daylight Time (CDT) in Itasca, Illinois
    - The Westin Chicago Northwest, 400 Park Boulevard, Itasca, Illinois 60143
- September 13, 2022, 6 to 8 p.m. (CDT) in Davenport, Iowa
    - River Center, 136 E. 3rd Street, Davenport, Iowa 52801
- September 14, 2022, 6 to 8 p.m. (CDT) in Excelsior Springs, Missouri
    - The Montgomery Event Venue, 425 S. Thompson Avenue, Excelsior Springs, Missouri 64024
- September 15, 2022, 6 to 8 p.m. (CDT) in Beaumont, Texas
    - Downtown Event Centre, 700 Crockett Street, Beaumont, Texas 77701

In addition, OEA held three online public meetings. Anyone interested in commenting was encouraged to pre-register on the Board-sponsored project website. OEA began the online public meeting with a brief overview of the Proposed Acquisition and environmental review process. Following the overview, OEA received oral comments in the order in which speakers had pre-registered. The online public meetings were facilitated as formal comment sessions during which individuals who pre-registered were given three minutes to present their oral comments. If time permitted, the facilitator invited other interested individuals who did not pre-register to provide oral comments. Interested individuals participated in the meeting by phone, computer, or both. A court reporter participated to record oral comments. The meeting transcripts are available on the project website. The online public meetings were held at the following date and times:

- September 7, 2022, 6 to 8 p.m. (CDT)
- September 8, 2022, 12 to 2 p.m. (CDT)
- September 19, 2022, 6 to 8 p.m. (CDT)

In addition to the public meetings, any interested parties were encouraged to submit written comments on all aspects of the Draft EIS. OEA considered all timely comments in preparing this Final EIS, which includes responses to all substantive comments in **Appendix S**, OEA's final conclusions on potential environmental impacts, and OEA's final recommended environmental mitigation measures. The deadline for comments on the Draft EIS was extended from September 26, 2022 to October 14, 2022, by a Board Decision issued on September 6, 2022. When submitting comments on the Draft EIS, the Board encouraged commenters to be as specific as possible and to substantiate concerns and recommendations.

Also, during the comment period, OEA conducted site visits to observe current conditions in areas that could experience impacts as a result of the Proposed Acquisition, including Houston, Texas; Port Arthur, Texas; Camanche, Iowa; Davenport, Iowa; Muscatine, Iowa; Fredonia/Columbus Junction, Iowa; Clinton, Iowa; Bensenville, Illinois; Itasca, Illinois; Elgin, Illinois; and Wood Dale, Illinois (the site visits between Elgin and Bensenville included riding the Metra MD-W line).

Comment forms were provided at the in-person public meetings. Completed forms were accepted at the meetings or received later by mail. OEA invited interested parties to submit written comments on the Draft EIS regardless of whether the commenter participated in any of the public meetings.

During the comment period for the Draft EIS, OEA received approximately 700 comments from federal, state, and local agencies; federal, state, and local elected officials; organizations; Class 1 railroads; passenger rail service providers; and individuals. Additional environmental comments were raised outside of the comment period, in submissions made by parties as part of the Board's review of the transportation merits of the Proposed Acquisition, and at the public hearing that the Board held in September and October 2022. OEA responded to these comments as appropriate.

1.7.3 Environmental Justice Population Engagement

Throughout the NEPA process, OEA made additional efforts to notify and consult with EJ populations, as required by EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. EO 12898 requires enhanced outreach efforts to Environmental Justice populations for public involvement opportunities. To identify potentially affected EJ populations, OEA applied a quarter-mile buffer along rail line segments where the projected increase in trains per day would reach or exceed the Board's analysis thresholds. Within those locations, OEA identified areas in the 80th percentile or higher of minority or low-income populations within each state as EJ population areas. OEA emailed letters to community leaders where email addresses were available and sent other community leaders letters by U.S. Mail. The letters sent to community leaders included flyers to post in their local communities.

In addition to contacting community leaders by letter, OEA issued geotargeted online banner advertisements to reach internet users on any platform (such as computers, tablets, and smart phones) through December 10, 2021. OEA determined that the online banner advertisements were appropriate means to reach Environmental Justice populations, as smart phone ownership rates among low-income and minority populations in the project area are estimated at 83% and 84%, respectively, indicating high rates of internet accessibility (Pew Research Center 2021). For the scoping period, the online banner advertisements were linked to the Board-sponsored project website and were posted from November 12, 2021 to December 10, 2021. During this time, banner ads made 236,000 impressions resulting in 986 clicks. For the Draft EIS review and comment period, online banner advertisements targeting the same EJ communities were posted from August 5, 2022, to October 14, 2022, resulting in approximately 1.9 million impressions and 18,700 clicks. **Appendix A, Public Involvement**, contains the distribution list for community leaders and examples of the banner advertisement and letters sent to the community leaders.

~~1.7.4 How to Submit Comments on the Draft EIS~~

~~Interested agencies, tribes, individuals, and other stakeholders are encouraged to submit comments on this Draft EIS. OEA will accept oral comments during the public meetings, as discussed above. OEA will also accept written comments during the comment period, which ends on Monday, September 26, 2022. OEA will consider all timely comments equally no matter how the comments are received, and it is not necessary to attend a public meeting to provide comments on the Draft EIS.~~

~~Interested parties are encouraged to file their written comments electronically through the Board-sponsored project website at www.CP-KCSMergerEIS.com. Written comments can also be submitted electronically on the Board's website, www.stb.gov, by clicking on the "File an Environmental Comment" link. Please refer to Docket No. FD 36500 in all correspondence, including E-filings, addressed to the Board. Comments submitted by mail should be addressed to:~~

~~Joshua Wayland~~
~~Surface Transportation Board~~
~~Environmental Filing, Docket No. FD 36500~~
~~c/o VHB~~
~~940 Main Campus Drive Suite 500~~
~~Raleigh, NC 27606~~

~~It is not necessary to mail written comments that have been filed electronically. Please refer to Docket No. FD 36500 in all correspondence addressed to the Board, including all comments submitted on the Draft EIS.~~

~~Written comments on this Draft EIS must be postmarked by September 26, 2022. Electronically filed comments must be received by September 26, 2022. All comments received—written, e-filed, or transcribed—will carry equal weight in helping to complete the EIS process and guide the Board in making a decision in this proceeding. Further information about the project can be obtained by calling OEA's toll-free number at 1-888-319-2337. Assistance for the hearing impaired is available through the Federal Information Relay Service at 1-800-877-8339.~~

~~Following the close of the comment period on the Draft EIS on September 26, 2022, OEA will issue a Final EIS that will consider and respond to all substantive comments received on the Draft EIS and set forth OEA's final recommendations on environmental mitigation. The Board will then issue a final decision based on the Draft and Final EISs and all public and agency filings and comments in the public record for this proceeding. The final decision will address the transportation merits of the proposed project and the entire environmental record. If the Board decides to authorize the Proposed Acquisition, the Board may impose conditions on the Applicants as part of that decision, including environmental mitigation conditions.~~

~~This Draft EIS is available for viewing or download on the Board's website at www.stb.gov or on the Board-sponsored project website at www.CP-KCSMergerEIS.com.~~

Chapter 2

Proposed Action and Alternatives

This chapter describes the Proposed Acquisition, alternatives to the Proposed Acquisition, and the scope of the EIS.

2.1 Overview of Existing CP and KCS Rail Systems

2.1.1 Existing CP Rail System

CP is one of Canada's two major railroads, extending across the country and connecting east and west coast ports. In the U.S., CP is a Class I railroad that connects to Buffalo and Albany, New York and Searsport, Maine. From south-central Canada, it runs through North Dakota, Minnesota, and Wisconsin, with trackage rights through Indiana, Ohio, Michigan, and Pennsylvania. CP also runs south into the U.S. Midwest through Iowa, Illinois, and Missouri, and connects with KCS in Kansas City, Missouri, as shown in **Figure 1.3-1** in *Chapter 1, Purpose and Need*.

CP's Central Corridor enters the U.S. from Canada at North Dakota's and Minnesota's northern borders, passes through Chicago, Illinois, and terminates in Kansas City, where it connects to four other large Class I railroads and local short line railroads that primarily serve the Midwest grain market. The freight carried on this corridor includes intermodal containers from the Port of Vancouver, which carry fertilizers, chemicals, crude oil, frac sand, automotive, grain, and other agricultural products.

Bensenville Yard is CP's primary classification yard[1] in the Chicago region and is located northwest of the city near Chicago O'Hare International Airport (ORD). Schiller Park Yard (about 4.3 track miles to the northeast of Bensenville) is primarily an intermodal yard that works in tandem with CP's intermodal facility adjacent to Bensenville Yard. Between Bensenville Yard and points east of Chicago, CP freight trains operate via two alternative routes pursuant to operating agreements with CSX Transportation (CSX) and Norfolk Southern Railway (NSR). In both cases, CP's trains move through the Chicago terminal without requiring intermediate handling. Between 75 and 80 percent of CP carloads passing through Chicago either originate or terminate on another railroad. Most rail yards in the region are located south of downtown Chicago and much of the rail traffic that CP interchanges with other railroads currently share the same highly trafficked rail corridors through the Chicago area as traffic from other Class I carriers. Two major intermediate switching terminal railroads, the Belt Railway of Chicago (BRC) and the Indiana Harbor Belt Railroad (IHB), play key roles in CP's interchange traffic with other Class I railroads by providing the track infrastructure and classification services required to exchange carloads. From Bensenville, CP operates two interchange trains daily in and out of the

[1] A classification yard is a railroad yard for organizing railcars by destination.

BRC's Clearing Yard via BRC's Kenton Line Subdivision. These trains include all of CP's traffic traveling to and from Canadian National Railway Company (CN), BNSF Railway (BNSF), and CSX.

CP's Eastern Corridor extends from Thunder Bay, Ontario to the Port of Montreal; Searsport, Maine; the Port of Saint John on the Atlantic Ocean (via a haulage agreement with the New Brunswick Southern Railway); and between Toronto and Chicago via Detroit or Buffalo. The major freight categories carried on the Eastern Corridor include forest products, chemicals and plastics, crude oil, ethanol, metals, minerals, consumer products, intermodal containers, automotive products, and general merchandise. CP connects in New York with NSR and CSX at Buffalo; NSR at Schenectady; and CSX at Albany. CP also connects with Pan Am Southern at Mechanicville, New York, and Northern Maine Junction, Maine, for service to the Boston and New England areas, as well as with the Vermont Railway at Whitehall, New York, and Newport, Vermont. CP supports its rail operations in the Eastern Corridor with rail yards at Sudbury, London, Toronto, and Montreal in Canada, as well as Saratoga Springs, New York, and Brownville Junction, Maine. CP's largest intermodal facility is located in the northern Toronto suburb of Vaughan and serves the Greater Toronto and Southwestern Ontario areas. CP also operates intermodal terminals in Montreal and Detroit.

Amtrak trains operate on approximately 675 miles of trackage either owned by CP or on segments where CP has trackage rights allowing it to conduct freight service on another carrier's lines in New York, Illinois, Wisconsin, and Minnesota. Metra, the Chicago metropolitan area commuter rail provider, overlaps with CP across approximately 67 miles of track owned by Metra on the Milwaukee District North Line and the Milwaukee District West Line. See **Figure 3.1-1** through **Figure 3.1-3** for maps of the passenger rail locations and *Chapter 3, Section 3.1, Freight and Passenger Rail Safety*, for more information on passenger rail systems and how they relate to the Proposed Acquisition.

2.1.2 Existing KCS Rail System

KCS is a Class I railroad that extends from Kansas City, Missouri to the Gulf Coast and into Mexico, operating across 10 states in the U.S. Midwest and Southeast, including Missouri, Illinois, Kansas, Oklahoma, Arkansas, Louisiana, Texas, Mississippi, Alabama, and Tennessee. See **Figure 1.3-1** in *Chapter 1, Purpose and Need* for a system map.

KCS' U.S. freight operations are based in Shreveport, Louisiana, with train operations radiating from there in a hub-and-spoke configuration. Loads of grain and coal comprise the majority of KCS' southbound traffic while most northbound freight trains are empty. Manifest trains[2] make up KCS' second largest type of rail traffic after grain. Many of these trains interchange at Kansas City, Missouri with other Class I railroads, including CP, Union Pacific Railroad (UP), and BNSF and to a lesser extent, NSR. Southbound manifest traffic predominately flows to and through Shreveport, which is a key junction location. From Shreveport, the KCS network branches into four routes: west to Dallas, Texas; east to Meridian/Artesia, Mississippi; southeast to New Orleans, Louisiana; and south to Port

2 Manifest trains are comprised of various types of railcars carrying different types of freight.

Arthur, Corpus Christi, the Laredo Gateway, and Mexico. The Dallas-Meridian route handles considerable volumes of east-west intermodal traffic. From Shreveport, KCS operates two routes to the Gulf of Mexico—one that ends at New Orleans, and the other that serves Port Arthur, Beaumont and Corpus Christi, Texas (and extends beyond, into Mexico). These port terminals handle a diverse range of products including paper, energy, chemicals, food, and consumer goods. KCS' route from Shreveport to Laredo, Texas (via Beaumont, Rosenberg, Victoria, and Robstown, Texas) is the gateway to the Mexican border. Large portions of this route rely on KCS' trackage rights over UP lines.

Amtrak trains also operate on approximately 29 miles of track where KCS has trackage rights in Texas and Louisiana. KCS would also gain trackage rights over 15 miles of a new Dallas Area Rapid Transit (DART) commuter rail segment (the "Silver Line"), which is scheduled to go into revenue service in late 2024. DART currently operates buses and light rail and co-operates a single commuter rail line in the Dallas, Texas area.

2.2 Proposed Acquisition

The proposed federal action in this proceeding is the Board's decision as to whether to authorize the Applicants' proposal for CP to acquire KCS. If the Board authorizes the Proposed Acquisition, CP and KCS would combine to form an integrated system to be known as CPKC. The combination of these two railroads would be an 'end-to-end' merger because the CP and KCS railroad networks do not overlap. The combined system would comprise approximately 20,350 miles of track in the U.S., Canada, and Mexico, including rail lines over which the Applicants have trackage rights, of which approximately 8,600 miles would be in the U.S. In addition, the Applicants are planning 25 capital improvements along the combined network to support the anticipated increased traffic, including extending existing 13 passing sidings, adding 10 new sidings, adding a section of double track, and adding facility working track within the existing rail right-of-way (ROW).

The Applicants state that the integrated CPKC system would enhance use of the existing CP and KCS north-south route between the U.S. upper Midwest and Louisiana and would funnel traffic from Mexico to the upper Midwest and western Canada, bypassing Chicago. Traffic to and from Chicago itself (or passing through Chicago and eastern Canada), would be supported by CP's Bensenville Yard and Schiller Park intermodal terminal reducing potential terminal delays that currently occur in Chicago. The Applicants anticipate that the combined CPKC system would offer operational efficiencies that would divert rail traffic from other railroads to the CPKC system and divert approximately 64,000 trucks to rail each year.

The Applicants intend to establish new intermodal services connecting Dallas, Texas with Chicago, Illinois and points beyond, and to enable new single-line intermodal routes[3] connecting Mexico with the upper Midwest and Canada. The Applicants anticipate that the single continuous CPKC network would improve reliability by eliminating unpredictable delays that occur when railroads interchange traffic. According to the Applicants, the

[3] A single-line intermodal route is a single carrier railroad line connected to intermodal facilities.

Proposed Acquisition would enhance competition because CP and KCS connect at only one point and operate no parallel lines, so that routing options would be expanded, not reduced.

The Applicants expect to be able to provide service to grain growers in Texas, the upper Midwest, south central states, and Mexico, and to transport grain and forest products from Canada to the Gulf, as well as chemicals from the Gulf to Canada. The Applicants also expect to be able to transport other commodities that currently move by truck, such as steel and paper products traveling to Texas from Canada and the upper Midwest. The Applicants anticipate that commodities such as corn, beans, wheat, canola, meals, and oils, as well as automotive parts, energy products, and ethanol would gain additional domestic markets because they would have more direct routes to the Gulf of Mexico and Mexico.

The Applicants intend to work cooperatively with passenger and commuter rail providers, including Amtrak and Metra, and to maintain on-time performance and safe and reliable service. The Applicants intend to facilitate Amtrak's planned expansion for the Hiawatha Service between Milwaukee and Chicago, the Empire Builder Service between the Twin Cities and Chicago, and to establish passenger service between Baton Rouge and New Orleans.

The Applicants would deploy safety technology to reduce potential accidents through wheel life forecasting, cracked wheel detection, wheel load impact detection, predictive bearing failure, broken rail detection, enhanced rail flaw detection, autonomous track geometry measurement, and infrastructure investments in signaling and line capacity. The Applicants state that the Proposed Acquisition would result in direct environmental benefits due to the combined CPKC network's increased efficiency and expanded capacity. Benefits may include truck traffic diversion off public highways, greenhouse gas emission and other air pollutant reductions, fuel efficiency as a result of more long-haul movements and fewer stops, as well as a shift from traditional flammable crude-by-rail to a non-flammable DRUbit alternative[4].

As a result of the efficiencies offered by the combined CPKC network, the Applicants expect that the Proposed Acquisition would cause rail traffic on certain rail lines to increase. Increases in activities at certain rail yards and intermodal facilities would also occur. The Applicants do not propose to construct any new rail lines subject to Board licensing or to abandon any rail lines as part of the Proposed Acquisition. However, the Applicants do plan to make certain capital improvements along the combined CPKC network to support the anticipated increased rail traffic, including extending existing passing sidings, adding new sidings, adding double tracking, and adding facility working track within the existing ROW.

4 The DRUbit process starts where pipelines from oilfields in Alberta, Canada connect to railroad loading facilities. To transport the dense oil, which is called bitumen, by pipeline, a chemical called diluent is added. At the railroad loading facility a "diluent recovery unit" ("DRU") separates out and removes the diluent creating "DRUbit," a form of bitumen that is specifically designed for rail transportation. When trains carrying DRUbit arrive at a destination, the bitumen is processed and delivered to nearby refineries (Wahba and Naatz 2021). Bitumen, also known as asphalt is a dense, viscous, petroleum-based product from oil sands, pitch lakes, and from the distillation of crude oil.

2.2.1 Changes in Rail Operations

The Applicants filed their Operating Plan with the Board as part of their application on October 29, 2021. The Operating Plan describes how the Applicants expect the integrated CPKC system would operate, including the projected future rail traffic on the rail lines in the combined system, expected changes in activities at intermodal facilities, and planned capital improvements to support projected increases in rail traffic. In addition, the application included verified statements from several industry experts in which they presented benefits of the Proposed Acquisition, analyzed the market, and described the approach to the logistics associated with the Proposed Acquisition. The Applicants presented environmental and cost benefits, reviewed changes to labor force needs, identified opportunities for rail-to-rail and truck-to-rail diversions, and described the financial terms of the Proposed Acquisition.

On March 16, 2022, the Board issued a decision that directed the Applicants to explain an apparent inconsistency between data submitted in their Operating Plan and information that the Applicants provided to OEA as part of the environmental review process. By decision issued on April 27, 2022, the Board directed the Applicants to amend their application to address the data inconsistency and the Applicants submitted an amended Operating Plan on May 13, 2022.

Both the original Operating Plan and the Amended Operating Plan can be accessed on the Board's website at www.stb.gov by conducting a search for Filings under Docket No. FD 36500.

If the Board authorizes the Proposed Acquisition, the Applicants project that rail traffic would increase on certain rail line segments throughout the combined network. Rail line segments are the portions of rail lines that run between two terminals or junction points. Increases in rail traffic on rail line segments would range from zero to more than 14 additional trains per day, on average. The largest increase would occur on the CP mainline between Sabula, Iowa, and Kansas City, Missouri, which would experience an increase of approximately 14.4 additional trains per day, on average (see **Table 2.2-1**). Increased rail traffic has the potential to result in environmental impacts related to noise and vibration, air quality, freight and passenger rail safety, grade crossing safety and delay, passenger rail transportation, and hazardous material transportation.

Table 2.2-1. Segments that Meet or Exceed Thresholds for Environmental Analysis[1]

Segment Number	From	To	Railroad	Segment Length (Miles)	Current Trains per Day	2027 No Acquisition Trains Per Day	2027 With Acquisition Trains Per Day	Acquisition-Related Growth	Attainment Status
76	Sabula Drawbridge, Iowa	Lake, Illinois	CP	0.7	5.91	6.12	14.12	8.00	Attainment
77	Davis Junction, Illinois	Sabula Drawbridge, Iowa	CP	61.5	6.35	6.56	14.56	8.00	Attainment
78	Randall Road, Illinois	Davis Junction, Illinois	CP	38.7	2.93	3.15	11.15	8.00	Attainment
81	Bensenville Metra, Illinois	Randall Road, Illinois	CP	23.0	3.20	3.41	11.41	8.00	Nonattainment
82	Bensenville Metra, Illinois	Tower B12, Illinois	CP	4.6	29.42	30.52	36.95	6.43	Nonattainment
95	Sabula, Iowa	Clinton, Iowa	CP	17.5	10.00	10.73	25.14	14.41	Attainment
96	Clinton, Iowa	Water Works, Iowa	CP	33.2	7.97	8.26	22.67	14.41	Attainment
97	Water Works, Iowa	Nahant, Iowa	CP	4.5	7.97	8.26	22.67	14.41	Attainment
99	Nahant, Iowa	Muscatine, Iowa	CP	24.6	6.09	6.38	20.78	14.40	Attainment
100	Muscatine, Iowa	Ottumwa, Iowa	CP	82.5	4.30	4.80	19.21	14.41	Attainment/ Nonattainment[2]
102	Ottumwa, Iowa	MO/IA-Laredo, Missouri	CP	61.2	3.17	3.41	17.81	14.40	Attainment
103	MO/IA-Laredo, Missouri	Laredo, Missouri	CP	41.1	3.17	3.41	17.81	14.40	Attainment
104	Laredo, Missouri	Polo, Missouri	CP	51.6	3.74	3.98	18.38	14.40	Attainment
105	Polo, Missouri	Airline JCT, Missouri	CP	42.1	3.62	3.83	18.24	14.41	Attainment/ Nonattainment
118	Kansas City, Missouri	Pittsburg, Kansas	KCS	124.5	15.14	17.57	30.41	12.84	Attainment/ Nonattainment
129	Pittsburg, Kansas	Watts, Oklahoma	KCS	107.8	14.14	16.17	28.57	12.40	Attainment
130	Watts, Oklahoma	Poteau, Oklahoma	KCS	90.4	12.29	14.15	26.56	12.41	Attainment
131	Poteau, Oklahoma	Heavener, Oklahoma	KCS	11.6	12.77	14.59	26.99	12.40	Attainment

Table 2.2-1. Segments that Meet or Exceed Thresholds for Environmental Analysis[1]

Segment Number	From	To	Railroad	Segment Length (Miles)	Current Trains per Day	2027 No Acquisition Trains Per Day	2027 With Acquisition Trains Per Day	Acquisition-Related Growth	Attainment Status
133	Heavener, Oklahoma	De Queen, Arkansas	KCS	94.6	11.96	13.78	26.18	12.40	Attainment
134	De Queen, Arkansas	Ashdown, Arkansas	KCS	37.1	14.48	16.26	28.67	12.41	Attainment
135	Ashdown, Arkansas	Shreveport, Louisiana	KCS	83.2	11.99	13.49	25.89	12.40	Attainment
136	Shreveport, Louisiana	Frierson, Louisiana	KCS	21.8	23.74	25.05	36.02	10.97	Attainment
140	Metro, Texas	Alliance, Texas	KCS	22.0	0.83	0.89	0.89	0.00	Nonattainment
141	Metro, Texas	Renner, Texas	KCS	45.0	1.13	1.19	1.19	0.00	Nonattainment
142	Renner, Texas	Wylie, Texas	KCS	9.1	1.27	1.33	1.33	0.00	Nonattainment
145	Shreveport, Louisiana	Leesville, Louisiana	KCS	91.4	10.01	10.71	21.55	10.84	Attainment
146	Leesville, Louisiana	De Quincy, Louisiana	KCS	50.6	10.31	10.98	21.82	10.84	Attainment
147	De Quincy, Louisiana	Beaumont, Texas	KCS	47.0	8.67	9.32	20.29	10.97	Attainment
148	Beaumont, Texas	Port Arthur, Texas	KCS	20.1	5.19	5.21	8.86	3.65	Attainment
149	Beaumont, Texas	Rosenberg, Texas	UP[3]	120.0	8.47	9.25	16.82	7.57	Attainment/ Nonattainment
152	Rosenberg, Texas	Kendleton, Texas	KCS	12.2	8.39	9.14	17.46	8.32	Nonattainment
153	Kendleton, Texas	Victoria, Texas	KCS	74.8	8.70	9.69	18.01	8.32	Attainment/ Nonattainment
154	Victoria, Texas	Placedo, Texas (UP)	UP[1]	12.8	7.94	8.75	17.07	8.32	Attainment
155	Placedo, Texas (UP)	Robstown, Texas	UP[1]	82.8	7.94	8.75	17.07	8.32	Attainment
157	Robstown, Texas	Laredo, Texas	KCS	144.0	13.55	14.77	22.80	8.03	Attainment

[1] This table does not include all segments that would experience an increase in the transportation of hazardous material. See *Section 3.1, Freight and Passenger Rail Safety* for a discussion of hazardous materials in transportation.

[2] Attainment/Nonattainment indicates segment includes both.

[3] KCS operates on the UP rail lines via trackage rights.

2.2.2 Impacts from Increased Rail Traffic

The Board's regulations at 49 C.F.R. § 1105.7(e) establish thresholds for environmental review of Board actions that result in increased rail traffic, including acquisitions requiring Board authority. The threshold for assessing environmental impacts from increased rail traffic is generally an increase in rail traffic of at least 100 percent (measured in gross ton miles annually) or an increase of at least eight trains per day, as set forth at 49 C.F.R. § 1105.7(e)(5)(i)(a). For air quality impacts, rail lines located in areas classified as being in nonattainment for the National Ambient Air Quality Standards under the Clean Air Act are also assessed if they would experience an increase in rail traffic of at least 50 percent (measured in gross ton miles annually) or an increase of at least three trains per day, pursuant to 49 C.F.R. § 1105.7(e)(5)(ii)(a). Although the thresholds contained in 49 C.F.R. § 1105.7(e)(5) refer specifically to air quality and noise impacts, OEA has determined that these thresholds should also apply to freight rail safety and grade crossing safety and delay.

OEA reviewed 178 rail line segments in the combined CPKC network (**Figure 2.2-1**) in the U.S., which are identified in a master segment table and figures in **Appendix C**. Of these segments, the projected increase in rail traffic would exceed the thresholds for environmental review on a total of 14 segments on the CP mainline (approximately 486.6 miles of rail lines) and a total of 21 segments of the KCS mainline (approximately 1,302.8 miles of rail lines, including rail lines over which KCS has trackage rights). These rail line segments are located in Illinois, Iowa, Missouri, Kansas, Oklahoma, Arkansas, Louisiana, and Texas. Therefore, this EIS includes analyses of environmental impacts along those 35 rail line segments.

Figure 2.2-1. Acquisition-Related Traffic Growth

2.2.3 Impacts related to Hazardous Material Transportation

In railroad acquisition cases, OEA assesses potential impacts from increased transportation of hazardous materials on rail lines. Consistent with previous acquisition cases, OEA assessed impacts related to the transportation of hazardous materials on all rail lines where the amount of hazardous material transported would increase as a result of the Proposed Acquisition. Increases in the amount of hazardous material transported would occur on 141 of the 178 rail segments (approximately 5,802 miles of rail lines) included in the master segment table in **Appendix C**. Those rail lines are located in Arkansas, Iowa, Illinois, Kansas, Oklahoma, Louisiana, Michigan, Minnesota, Missouri, North Dakota, New York, Ohio, South Dakota, Tennessee, Texas, and Wisconsin. *Chapter 3, Section 3.1, Freight and Passenger Rail Safety* presents the results of OEA's analysis of impacts related to the transportation of hazardous materials.

2.2.4 Impacts related to Passenger Rail Safety

In railroad acquisition cases, OEA assesses potential impacts from increased freight rail traffic on passenger rail safety. Consistent with previous acquisition cases, OEA applied a threshold to identify rail lines that warranted analysis of potential impacts on passenger rail safety. That threshold is a projected increase of one or more freight trains per day on a rail line that is currently used for passenger rail transportation. OEA identified a total of nine rail segments (approximately 374 miles of rail lines, including rail lines over which the Applicants have trackage rights) in Illinois, Minnesota, Iowa, Louisiana, and Texas, where the Proposed Acquisition would result in new freight rail traffic that would meet or exceed the threshold for analysis of passenger rail safety. *Chapter 3, Section 3.1, Freight and Passenger Rail Safety* identifies these segments and presents the results of OEA's analysis of impacts on passenger rail safety.

2.2.5 Changes in Rail Yard Activity

The Proposed Acquisition would result in changes in activities at rail yards, which could result in environmental impacts, including noise impacts and air quality impacts. Rail yards are areas containing complex systems of tracks, switches, and crossings. Most rail yard activities involve switching and storing individual rail cars and blocks of rail cars. Other activities include locomotive maintenance and fueling as well as freight car inspection, cleaning, and repair. The threshold for assessing environmental impacts at rail yards is an increase in rail yard activity of at least 100 percent (measured by carload activity, or the number of rail cars processed) for rail yards in attainment areas, as set forth at 49 C.F.R. § 1105.7(e)(5)(i)(b). For rail yards in nonattainment areas, the threshold for assessing air quality impacts is an increase in rail yard activity of at least 20 percent (measured by carload activity), pursuant to 49 C.F.R. § 1105.7(e)(5)(ii)(b). If the Board authorizes the Proposed Acquisition, rail yard activity would exceed the thresholds at four rail yards, as shown in **Figure 2.2-2** and **Table 2.2-2**.[5] Therefore, this EIS includes analyses of environmental impacts at those four rail yards.

Table 2.2-2. Rail Yards that Meet or Exceed the Board's Thresholds for Environmental Analysis

Facility	County	Location	Attainment Status	Rail Cars Handled per Day			
				Pre-Acquisition	Post-Acquisition	Increase	Percent Change
Detroit Container Terminal	Wayne	Michigan	Nonattainment	33.2	56.5	23.2	70%
Schiller Park Yard	Cook	Illinois	Nonattainment	74.0	150.6	76.5	103.4%
Bensenville Yard	Cook	Illinois	Nonattainment	1439.9	1807.6	367.7	25.5%
Wylie Rail Yard	Collin	Texas	Nonattainment	329.6	466.5	137.0	41.6%

5 The Wood River rail yard is located in a nonattainment area and has estimated carload activity increases that exceed 20 percent. However, CP expects that the Wood River rail yard would only process 0.8 cars per day under the No-Action Alternative and 1.0 car per day under the Proposed Acquisition. Since the increase in car activity is only 0.2 cars per day, the additional activity would have negligible effects on the environment. Therefore, OEA has not included the Wood River rail yard in the environmental analyses described in this ~~Draft~~ EIS.

Figure 2.2-2. Rail Yards and Intermodal Facilities that Meet or Exceed the Board's Thresholds for Environmental Analysis

2.2.6 Changes in Intermodal Facility Activity

The Proposed Acquisition would result in changes in activities at intermodal facilities, which has the potential to result in environmental impacts, including impacts associated with increased traffic on local roads. Intermodal facilities are sites where trains, trucks, and ships transfer trailers and containers. Intermodal facilities include railroad track, lifting equipment, paved and unpaved areas, and a control point to transfer (receive, load, unload, and dispatch) trailers and containers between rail and other modes of transportation. The Board's threshold for environmental analysis at intermodal facilities is an average increase in truck traffic of more than 10 percent of the average daily traffic or 50 vehicles per day on a given road segment, pursuant to 49 C.F.R. § 1105.7(e)(5)(i)(c). Projected truck traffic would exceed the threshold at six intermodal facilities (**Table 2.2-3** and **Figure 2.2-2**). Therefore, this ~~Draft~~ EIS includes analyses of environmental impacts at those six intermodal facilities.

Table 2.2-3. Intermodal Facilities that Meet or Exceed the Board's Threshold for Environmental Analysis

				Trucks per Day			
Facility	**County**	**Location**	**Attainment Status**	**Pre-Acquisition**	**Post-Acquisition**	**Increase**	**Percent Change**
Bensenville IMS	Cook	Illinois	Nonattainment	383	698	315	82%
Detroit Con Terminal	Wayne	Michigan	Nonattainment	141	228	87	62%
Minneapolis IMS	Hennepin	Minnesota	Attainment	279	332	53	19%
Schiller East IMS	Cook	Illinois	Nonattainment	190	324	134	70%
International Freight Gateway	Jackson	Missouri	Attainment	51	104	53	104%
Wylie	Collin	Texas	Nonattainment	326	474	148	45%

2.2.7 Planned Capital Improvements

If the Board authorizes the Proposed Acquisition, the Applicants plan to make 25 capital improvements within the existing rail ROW to support the projected increase in rail traffic. The planned capital improvements would include extending 13 existing passing sidings, adding 10 new passing sidings, adding approximately four miles of double track in Blue Valley near Kansas City, Missouri, and approximately five miles of facility working track adjacent to the International Freight Gateway intermodal terminal near Kansas City. Sidings are low-speed sections of track alongside the main rail line often used as passing lanes. Double tracks are two parallel main tracks. Industry tracks are a type of switching track or series of tracks that serve the needs of a commercial industry or other railroad (49 C.F.R. § 218.93). The Applicants would build the planned capital improvements as needed based on increasing rail traffic and intend to do so during the first three years following authorization of the Proposed Acquisition.

Railroads have the right to increase efficiency by improving their rail lines and rerouting their traffic without seeking authority from the Board. Therefore, railroad capital improvements that are designed to improve operational efficiency (such as sidings, double tracking, and industry track) typically do not require Board authorization or environmental review by OEA. Where, as here, planned capital improvements are related to a proposed merger or acquisition requiring Board approval, OEA considers, as appropriate, the potential environmental impacts from such planned capital improvements on a case-by-case basis. In this case, the Applicants have stated that the planned capital improvements are necessary to accommodate the projected increase in rail traffic and have sufficiently developed the engineering and design of the planned capital improvements to support an environmental review. Further, the Applicants have identified the location and general layout of these 25 planned capital improvements in sufficient detail to support an environmental review. Therefore, OEA has assessed the potential impacts of the planned capital improvements as part of this EIS. **Figure 2.2-3** below presents an overview map of planned capital improvement locations. *Section D-1* in **Appendix D** shows the individual capital improvement locations in the U.S. in the context of the proposed rail system. **Table 2.2-4** provides a list of all 25 planned capital improvements, the types of improvements, and their locations.

Table 2.2-4. Planned Capital Improvements

Capital Improvement	County	State	Type	Size (Miles)
MP 71 (Turkey River)	Clayton	Iowa	New Siding	2.70
MP 24 (Bellevue)	Jackson	Iowa	New Siding	2.07
MP 75 (Monroe)	Ogle	Illinois	New Siding	2.53
Deer Creek	Clinton	Iowa	Siding Extension	1.18
Camanche	Clinton	Iowa	Siding Extension	0.66
Letts	Louisa	Iowa	Siding Extension	0.34
MP 255 (Washington)	Washington	Iowa	New Siding	2.16
Ottumwa	Wapello	Iowa	Siding Extension	0.56
Moravia	Monroe	Iowa	New Siding	2.15
Newtown	Sullivan	Missouri	Siding Extension	0.55
Laredo	Grundy	Missouri	Siding Extension	0.68
MP 431 (Dawn)	Livingston	Missouri	New Siding	2.15
Blue Valley	Jackson	Missouri	Double Track	2.25
Grandview/IFG	Jackson/Cass	Missouri	Industry Track	2.36
Asbury	Jasper	Missouri	Siding Extension	1.10
MP 186	McDonald	Missouri	New Siding	2.03
Gentry	Benton	Arkansas	Siding Extension	2.02
MP 247 (Baron)	Adair	Oklahoma	New Siding	2.22
Cave Springs	Adair	Oklahoma	Siding Extension	1.10
Spiro	Le Flore	Oklahoma	Siding Extension	0.82
Heavener	Le Flore	Oklahoma	New Siding	2.49
MP 377 (Mena)	Polk	Arkansas	New Siding	2.04
Mansfield	De Soto	Louisiana	Siding Extension	1.67
Loring	Sabine	Louisiana	Siding Extension	1.18
Singer	Beauregard	Louisiana	Siding Extension	1.84

Figure 2.2-3. Planned Capital Improvement Locations

2.3 Alternatives to the Proposed Acquisition

In its evaluation of the Proposed Acquisition in this EIS, OEA considered both the Proposed Acquisition and the No-Action Alternative.

2.3.1 No-Action Alternative

Under the No-Action Alternative, the Board would not approve the Proposed Acquisition, and the projected changes in rail operations, rail yard activity, and intermodal facility activity would not occur. Rail traffic on rail lines and activities at rail yards and intermodal facilities could change to support regular railroad operations or as a result of changing market conditions, such as general economic growth, but would not change as a result of the Proposed Acquisition. In the master segment table and figures in **Appendix C**, the traffic levels for the No-Action Alternative are based on the Applicants' forecasts for organic growth, i.e., the growth that could occur in the absence of the Proposed Acquisition. Similarly, the Applicants would not build the 25 planned capital improvements under the No-Action Alternative. However, the Applicants could add sidings, extend sidings, or add additional track in the future to support rail operations, without seeking Board authority.

The No-Action Alternative includes several planned rail improvement projects that are scheduled to be completed regardless of the approval of the Proposed Acquisition. Importantly, the Applicants have indicated that Bensenville Yard in Bensenville, Illinois, is being reconfigured as part of the development of the Illinois Tollway's Elgin O'Hare Western Access Project. This reconfiguration will involve lengthening the Bensenville Yard receiving tracks to allow switching and staging of longer trains within the yard. This should reduce the need for trains to stop on the mainline as long trains are broken into smaller blocks of cars. The planned reconfiguration of the Bensenville Yard and other planned improvements on CP and KCS rail lines would proceed regardless of whether the Board authorizes the Proposed Acquisition.

Under the No-Action Alternative, none of the anticipated adverse or beneficial environmental impacts of the Proposed Acquisition would occur.

2.3.2 Capital Improvement Locations

During the public comment period for the scoping process, the U.S. Environmental Protection Agency (EPA) recommended that the EIS assess alternatives for sidings, double tracking, and other new infrastructure components. OEA notes that potential locations for siding extensions, new sidings, and other planned capital improvements along the combined CPKC system are limited. The locations of the 13 planned siding extensions are determined by the locations of the existing sidings that would be extended, so no alternative locations can be considered. OEA understands that the locations of the 10 planned new sidings are based on the Applicants' system-wide requirements, including the need for sidings to be placed at regular intervals along the mainline. The start and end points of new sidings are also constrained by site-specific conditions, such as the curvature of the existing mainline. For example, the start and end points for passing sidings are generally placed on straight sections of track for operational reasons. OEA understands that the planned double tracking and the planned facility working track are intended to serve site-specific operational needs and could not be constructed in other locations to serve those needs. Further, because the planned capital improvements would be constructed as needed based on increasing rail traffic, the final engineering and design of these improvements has not been completed to allow for comparison of alternatives that would differ in terms of final engineering and design (such as the final placement of switches or the locations of construction laydown areas).

Although OEA did not conduct a detailed analysis of alternative locations or designs of the planned capital improvements for the reasons discussed above, OEA did consider refinements developed by CP to the conceptual locations and designs of the planned capital improvements that would avoid potentially significant impacts. As originally described by the Applicants, the planned second track at Blue Valley would have potentially involved altering a historic arch bridge over Blue Parkway in Kansas City. The Applicants revised the conceptual design for the planned double tracking so that the planned double tracking would not result in any impacts on the historic bridge. Following scoping, the Applicants also revised the conceptual locations of the planned siding extension near Asbury, Missouri; the planned new siding at MP 75 near Monroe Center, Illinois; the planned siding extension near Ottumwa, Iowa; the planned new siding near Moravia, Iowa; the planned new siding at MP 24 near Bellevue, Iowa; and the planned siding extension near Loring, Louisiana so as to avoid crossing public or private roads and impacts that could be associated with such crossings.

2.4 Comparison of Alternatives

The Council on Environmental Quality regulations for implementing NEPA require agencies to consider the potential environmental impacts of the reasonable and feasible alternatives. To define the issues and provide a clear basis for choice among alternatives (40 C.F.R. § 1502.14), the following narrative and **Table 2.4-1** at the end of this chapter compare the environmental impacts of the Proposed Acquisition and the No-Action Alternative based on the information and analyses presented in *Chapter 3, Affected Environment and Environmental Consequences*.

If the Board authorizes the Proposed Acquisition, average daily rail traffic would increase on certain rail lines within the integrated CPKC system. Under the No-Action Alternative, the Board would not approve the Proposed Acquisition, and the potential impacts would not occur. However, the Applicants expect that both the CP and KCS networks would experience organic growth in rail traffic under the No-Action Alternative because of changing market conditions, such as general economic growth.

OEA analyzed potential impacts from increases in traffic on freight and passenger rail safety, grade crossing safety and delay, truck-to-rail diversion and intermodal facility traffic, noise and vibration, air quality and climate change, energy transport and consumption, cultural resources, hazardous material release sites, biological resources, water resources, and Environmental Justice (EJ). OEA also evaluated the potential for cumulative impacts when considering other reasonably foreseeable actions and projects.

With the exception of noise impacts, OEA's analysis found that the impacts of the Proposed Acquisition would be negligible, minor, or not adverse. OEA also found that the Applicants' proposed voluntary mitigation measures and OEA's additional recommended mitigation measures would minimize those impacts. The Proposed Acquisition, however, would result in adverse noise impacts at noise-sensitive receptors (receptors), such as residences, schools, hospitals, nursing homes, and places of worship at locations along the combined CPKC network. Based on past practice and the Board's environmental regulations at 49 C.F.R. § 1105.7(e)(6), an adverse noise impact occurs when a receptor would experience an increase in noise level of 3 A-weighted decibels (dBA) or more as result of increased rail traffic and reach an average higher day-night average noise level (Ldn) of 65 dBA or higher.[6] Compared to the No-Action Alternative, the Proposed Acquisition would adversely affect a total of 6,307 receptors. OEA does not expect that the Proposed Acquisition would cause individual trains to become substantially louder or to become audible in places where they are not currently. However, the projected increase in rail traffic from the Proposed Acquisition would make rail-related noise more frequent, which would result in a higher Ldn at the affected receptors. OEA's EJ analysis found that adverse noise impacts would not be borne disproportionally by EJ populations.

The Applicants have proposed voluntary mitigation measures to minimize noise and vibration impacts. OEA is recommending some mitigation to further reduce noise and vibration impacts. Even if the Board imposes these mitigation measures, however, OEA expects that the Proposed Acquisition would result in unavoidable adverse noise impacts.

[6] Although the regulations at 49 C.F.R. § 1105.7(e)(6) indicate that either an increase of 3 dBA or an increase to an Ldn of 65 dBA would be an adverse impact, research indicates that both of these conditions must be met or exceeded to cause an adverse noise impact from rail operations to occur (Surface Transportation Board 1998, Coate 1999).

Table 2.4-1. Comparison of Alternatives

Resource and Impact	No-Action Alternative	Proposed Acquisition
Freight Rail Safety		
Accident/incident rates per million-train-miles (2027 forecast; systemwide)[1]	CP: 1.44 KCS: 3.35	1.44
Accident/incident rates per million-train-miles (2027 forecast; mainline)[2]	CP: 0.74 KCS: 1.25	0.74
Impact Conclusion: Under the Proposed Acquisition, the number of accidents/incidents would remain low on all affected rail line segments, and would decrease on some segments. Under the No-Action Alternative, the Applicants expect that both the CP and the KCS networks would experience organic growth in rail traffic. The incident rates on KCS and CP respectively would continue to decline if safety trends continue.		
[1] Systemwide analysis includes accidents/incidents along rail segments and within rail yards and intermodal facilities. [2] Mainline analysis was based on rail segments only, and the numbers shown here are averages among segments of varying lengths.		
Hazardous Material Transportation		
Mainline releases per year	10.36	12.88
Rail yards releases per year	23.50	24.99
Impact Conclusion: Increases in hazardous material carloads under the Proposed Acquisition would cause slight changes in the number of annual releases. However, the risk of a release occurring on any specific rail line segment would continue to be low regardless of whether or not the Board authorizes the Proposed Acquisition. In general, OEA expects that a release of hazardous materials would involve a relatively short duration exposure and would be contained quickly.		
Passenger Rail Safety		
Total predicted collisions per 100 years	0.9839	1.904
Impact Conclusion: The probability of a collision between a freight train and a passenger train occurring on any of the affected rail line segments would be very low under either the Proposed Acquisition or the No-Action Alternative.		
Grade Crossing Safety		
Total predicted number of vehicle crashes per year	~~19.1~~ 25.5	~~24.9~~ 31.7
Total predicted number of pedestrian crashes per year	~~1.7~~2.3	~~2.2~~ 2.9

Table 2.4-1. Comparison of Alternatives

Resource and Impact	No-Action Alternative	Proposed Acquisition
Impact Conclusion: Across all ~~1,134~~ 1,270 roadway/rail at-grade crossings (grade crossings) in the study area that met the criteria for safety analysis, OEA projects that approximately ~~24.9~~ 31.7 crashes involving trains and motor vehicles would occur under the Proposed Acquisition per year, compared to ~~19.1~~25.5 crashes per year under the No-Action Alternative. The projected increase of approximately ~~5.8~~ 6.2 additional vehicle crashes per year would be offset by a decreased number of crashes at grade crossings on rail lines outside of the combined CPKC network due to the diversion of rail traffic from those rail lines to CPKC. Across all ~~1,134~~ 1,270 grade crossings in the study area that met the criteria for safety analysis, the total predicted number of train-pedestrian crashes would be ~~2.2~~ 2.9 crashes per year under the Proposed Acquisition, compared to ~~1.7~~2.3 crashes per year under the No-Action Alternative, which is a difference of 0.6~~5~~ crashes per year.		
Grade Crossing Delay		
Number of grade crossings experiencing increased delay	N/A	5
Affected crossings by Level Of Service (LOS)	LOS A: ~~260~~257 LOS B: ~~13~~15 LOS C: 2 LOS D: 1 LOS F: 1	LOS A: 255 LOS B: ~~18~~17 LOS C: 2 LOS D: 1 LOS E: 1
Impact Conclusion for LOS: ~~Five~~ Four grade crossings would experience a decrease in the LOS from LOS A to LOS B. Because LOS B corresponds to stable flow, OEA concludes that the Proposed Acquisition would result in minor adverse delay impacts at these grade crossings. Delay at grade crossings would increase under the No-Action Alternative as a result of increased rail and road traffic due to organic growth.		
Impact Conclusion for Emergency Vehicle Delay: Under the Proposed Acquisition study area, 28 grade crossings are on designated emergency routes. All designated emergency routes have available alternate routes with an average distance of 2.1 miles. Emergency vehicle delay would increase under the No-Action Alternative as a result of increased rail and road traffic due to organic growth. Additionally, OEA analyzed 751 grade crossings in greater detail for potential impacts on emergency response vehicles. Of those 751 grade crossings, 640 have an alternate route and most alternative routes would be less than 10 miles long. There are 73 grade crossings with no possible alternative route because they are located on or provide access to dead-end streets and 37 grade crossings where the only alternative route involves another grade crossing that could be blocked by the same train.		
Impact Conclusion for Planned Capital Improvements: 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. Under the No-Action Alternative the Applicants would not build the planned capital improvements. 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.		
Truck-to-Rail Diversions		
Projected change in truck traffic on U.S. highways annually	N/A	-64,018

Table 2.4-1. Comparison of Alternatives

Resource and Impact	No-Action Alternative	Proposed Acquisition
Impact Conclusion: The Proposed Acquisition would result in the diversion of trucks from highways, which could provide some benefits to the highway system. Under the No-Action Alternative, the Proposed Acquisition would not cause the diversion of freight from truck transportation to rail transportation.		
Intermodal Facility Traffic		
Capacity of roadways near intermodal facilities	Increased truck traffic would cause three roadway segments near intermodal facilities in the study area to exceed roadway capacity. The v/c ratio[1] would increase from less than 1.0 to more than 1.0.	No additional roadway segments near intermodal facilities would exceed roadway capacity beyond the three segments which exceed 1.0 under the No-Action Alternative. The v/c ratio on roadways near intermodal facilities would increase by less than 0.0045 over the No-Action Alternative due to the Proposed Acquisition.
Impact Conclusion: Under the Proposed Acquisition, there would be negligible potential increase in number of trucks on roadways near the six intermodal facilities. Under the No-Action Alternative, truck traffic would increase due to economic growth.		
[1] The v/c ratio, also referred to as degree of saturation, represents the sufficiency of an intersection to accommodate the vehicular demand (FHWA 2013). A v/c ratio over 1.0 represents a roadway where the calculated volumes exceed the assigned capacity.		
Noise and Vibration		
Number of receptors adversely affected	N/A	6,307
Impact Conclusion: The Proposed Acquisition would adversely affect receptors where noise levels would exceed 65 dBA (Ldn) and would increase by 3 dBA or more. There would be a total of 6,307 receptors adversely affected. The Proposed Acquisition would also cause the vibration annoyance threshold to be exceeded at 439 receptors in the study area.		
Air Quality and Climate Change		
Impact Conclusion: Because the Proposed Acquisition would likely result in the diversion of freight from truck transportation to rail transportation and from other rail lines, OEA expects that the Proposed Acquisition would not increase air emissions (including greenhouse gas emissions), and could result in a decrease in emissions, when measured at the system-wide or national scale. OEA's analysis shows that the projected increase in rail traffic would result in NO_x emissions in excess of EPA's *de minimis* thresholds in three nonattainment areas for ozone and one maintenance area for ozone. Following issuance of the Draft EIS, EPA reclassified the Houston-Galveston-Brazoria Ozone Nonattainment Area and the Dallas-Fort Worth Ozone Nonattainment Area from 'Serious' to 'Severe' nonattainment. As a result, Proposed Acquisition-related NO_X emissions would exceed the revised *de minimis* threshold in the Dallas-Fort Worth Ozone Nonattainment Area, in addition to the Houston-Galveston-Brazoria Ozone Nonattainment Area, the		

Table 2.4-1. Comparison of Alternatives

Resource and Impact	No-Action Alternative	Proposed Acquisition
Chicago Ozone Nonattainment Area, and the Beaumont-Port Arthur Ozone Maintenance Area. However, the estimated NO_x emissions from rail operations related to the Proposed Acquisition would be less than 1 percent of the total applicable emissions budget for mobile sources in each ozone nonattainment area. OEA expects that emissions related to projected increases in rail traffic on rail lines and projected increases in activities at rail yards and intermodal facilities may be offset by decreased emissions elsewhere.		
Energy		
Impact Conclusion: The Proposed Acquisition would not adversely affect the transportation of energy commodities or energy efficiency. The fuel savings related to truck-to-rail diversions (8.1 million gallons) would outweigh the increase in fuel usage at intermodal facilities (110,785 gallons) as well as fuel consumed during wait times at grade crossings (12,118 gallons). OEA did not include rail-to-rail diversions in the overall fuel consumption analysis because the increase in fuel consumption on the CPKC rail lines would likely be offset by a decrease in fuel consumption on the rail lines of competing railroads.		
Cultural Resources		
Archaeological site impacts	None; however, in the absence of the Proposed Acquisition, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority.	Although two National Register-eligible archaeological sites, 34AD283 and 34AD286, are located within the APE at one capital improvement location, the Applicants have clarified that the planned siding would be located within the current limits of the rail line footprint (railroad ballast and berm) in the areas adjacent to 34AD283 and 34AD286 and that no construction activities would take place within the limits of the sites.
Historic resources physical impacts	None; however, in the absence of the Proposed Acquisition, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority.	The Proposed Acquisition would affect ~~9~~ 8 eligible rail line segments due to the addition of the planned capital improvements; however, these effects would not be adverse.
Historic resources adverse visual impacts	None; however, in the absence of the Proposed Acquisition, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority.	The Proposed Acquisition would affect ~~9~~8 eligible rail line segments and ~~7~~ 5 above-ground historic resources due to the additional of the planned capital

Table 2.4-1. Comparison of Alternatives

Resource and Impact	No-Action Alternative	Proposed Acquisition
		improvements; however, these effects would not be adverse.
Impact Conclusion: The Proposed Acquisition would not adversely affect any archaeological or historic resources. All of the appropriate SHPOs, THPOs, and other consulting parties have concurred with OEA that the Proposed Acquisition would not adversely affect historic properties within the APE.		
Hazardous Material Release Sites		
Capital improvement locations with potential hazardous material site impacts	None	4
Impact Conclusion: Based on conceptual designs, the Camanche (Iowa), Ottumwa (Iowa), Blue Valley (Missouri), and Asbury (Missouri) capital improvement locations have the potential to encounter residual hazardous materials during ground disturbing activities.		
Biological Resources		
Endangered Species Act – Listed Species	None; however, in the absence of the Proposed Acquisition, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority.	OEA consulted with USFWS and determined that impacts to the Indiana bat, northern long-eared, and Ozark big-eared bats are "may affect, not likely to adversely affect." The Missouri, Oklahoma, Illinois-Iowa, and Arkansas USFWS offices subsequently concurred with OEA's determination. OEA also determined that the Proposed Acquisition would not be likely to adversely affect the tri-colored bat.
Impact Conclusion: The Proposed Acquisition *may affect, but is not likely adversely affect* the federally endangered Indiana bat, the federally proposed endangered northern long-eared bat, and the federally endangered Ozark big-eared bat. The Proposed Acquisition would also not be likely to adversely affect the federally proposed endangered tri-colored bat. Impacts on other biological resources would be negligible.		

Table 2.4-1. Comparison of Alternatives

Resource and Impact	No-Action Alternative	Proposed Acquisition
Water Resources		
Surface Water and Wetlands	None; however, in the absence of the Proposed Acquisition, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority.	Potential to impact a total of approximately 1.5 acres of streams and 15.94 acres wetlands due to fill, new track ballast, replacing or adding culverts, and extending or adding bridge piers.
Impact Conclusion: The Proposed Acquisition would have minimal impacts to wetlands and streams due to site work and construction, including the placement of fill material or conveyance structures.		
EJ		
Disproportionately high adverse impact on minority population	No	No
Disproportionately high adverse impact on low-income population	No	No
Percentage of adversely affected receptors in EJ populations census block groups	N/A	28%
Percentage of adversely affected receptors in non-EJ populations census block groups	N/A	72%
Impact Conclusion: The Proposed Acquisition does not have the potential to result in disproportionately high and adverse human health or environmental impacts on minority or low-income populations.		
Cumulative Impacts		
Passenger Rail Safety	No	Cumulative impacts on the probability of rail collisions would increase slightly on segments where the Illinois Department of Transportation proposes new intercity passenger rail service and where Amtrak plans additional service between River Junction and St. Paul, MN; however, the probability of rail collisions involving passenger and freight trains is very low.

Table 2.4-1. Comparison of Alternatives

Resource and Impact	**No-Action Alternative**	**Proposed Acquisition**
Grade Crossing Safety and Delay	No	Cumulative impacts would result from an increase in the number of crashes at certain grade crossings, and cumulative impacts would result in a slight increase in grade crossing delay at certain grade crossings. However, OEA expects that the amount of delay at crossings on other railroads in the U.S. and on roadways could decrease as the result of the diversion of trucks to rail and the diversion of rail traffic from other railroads to the combined CPKC network.
Air Quality	No	Cumulative impacts would result in a slight increase of emissions from the four proposed Amtrak trains; however, it would be less than 1 percent of the emissions budget for the Chicago Ozone Nonattainment Area.
Noise	No	No
Environmental Justice	No	No
Biological Resources	No	Two proposed electrical transmission line projects could potentially overlap geographically with one or more of the planned capital improvements within the rail ROW. If this were to occur, then cumulative impacts on biological resources could result, but OEA expects that these cumulative impacts would be minor.
Water Resources	No	Cumulative impacts on wetlands could result from the SGGR Transmission Line Project at the MP 71 (Turkey River) capital improvement in Iowa. The impacts would

Table 2.4-1. Comparison of Alternatives

Resource and Impact	No-Action Alternative	Proposed Acquisition
		be temporary because the SGGR project is a buried electric cable.
Impact Conclusion: Cumulative impacts are possible for rail safety, grade crossing safety, grade crossing delay, air quality, and water resources. There would be no cumulative impacts under the No-Action Alternative.		

Chapter 3

Affected Environment and Environmental Consequences

This chapter describes the affected environment and analyzes the environmental consequences for each resource that the Proposed Acquisition and No-Action Alternative could affect. OEA determined the resources to analyze through thresholds set forth in the Board's environmental regulations at 49 C.F.R. § 1105.7(e), scoping comments, and agency and tribal consultation.

OEA took the following steps to analyze each resource:

1. Reviewed regulations and guidance relevant to each resource, which are described in applicable sections.
2. Defined a study area or study areas to analyze.
3. Developed analysis approaches.
4. Reviewed the current conditions of the resource in the relevant study area(s).
5. Analyzed the potential impacts that the Proposed Acquisition and No-Action Alternative would or could have on the resource.
6. Identified mitigation that would minimize or compensate for impacts, if warranted.[1]
7. For cumulative impacts, analyzed the effects of the Proposed Acquisition when combined with impacts of other past, present, and reasonably foreseeable future projects and actions.

[1] *Chapter 4, Mitigation*, contains the complete list of mitigation measures. Each mitigation measure has a unique identifier that consists of a prefix and a number. The Applicants' voluntary mitigation measures have a prefix of VM while OEA's recommended mitigation measures include the prefix MM.

3.1 Freight and Passenger Rail Safety

This section describes the affected environment and environmental consequences for freight and passenger rail safety under both the Proposed Acquisition and the No-Action Alternative. The section is divided into three parts: *Sections 3.1.1, Freight Rail Safety*; *3.1.2, Hazardous Materials Transportation* as it pertains to freight rail; and *3.1.3, Passenger Rail Safety*.

3.1.1 Freight Rail Safety

This subsection describes the approach, affected environment, and environmental consequences for freight rail safety.

3.1.1.1 Approach

During the scoping process for the Draft EIS, elected officials, agencies, members of the public, and other stakeholders expressed concern that the Proposed Acquisition could increase the probability for rail incidents, such as collisions, derailments, or spills, because it would result in increased rail traffic on rail lines currently owned and operated by CP and KCS individually.[1] The probability of a rail incident occurring depends, in part, on the number of trains that operate on a particular rail line. The number of trains that move on a particular rail line each day is determined by many factors, including market conditions, such as the demand for particular commodities and goods. Railroad companies have the obligation to provide rail service to shippers upon reasonable request and the right to route and reroute traffic across their network as needed to safely and efficiently serve their customers. Therefore, railroads do not need to obtain Board authority to operate more or fewer trains on any particular rail line, and the Board generally cannot control the level of rail traffic on specific rail lines. Nevertheless, pursuant to the Board's environmental regulations at 49 C.F.R. § 1105.7(e)(5), when a pending proposal to acquire another railroad's rail lines would cause an increase in rail traffic on specific rail line segments that would meet or exceed the Board's thresholds for environmental review (typically an increase of eight or more trains per day or a doubling of traffic measured in gross ton-miles [GTM]), OEA analyzes the potential effects of that increase on freight rail safety and other issues.

In this case, based on the thresholds for environmental review and past practice in railroad acquisition proceedings, OEA evaluated freight operations safety along 29 rail line segments where the Applicants expect that the Proposed Acquisition would cause an increase in rail traffic of eight or more trains per day. In response to public comments on the Draft EIS, OEA expanded the study area for freight rail safety to also include rail line segment U-BEAU-01, which extends from Beaumont, Texas to Rosenburg and passes through the Houston area. This rail line segment is part of Union Pacific Railroad's (UP) Houston

[1] For simplicity, this section uses the term incidents to refer to all accidents/incidents as defined in the Federal Railroad Administration's (FRA) regulations at 49 C.F.R. § 225.5.

Subdivision and Glidden Subdivision. KCS currently operates trains on this segment under a trackage rights arrangement with UP, the segments owner. If the Board authorizes the Proposed Acquisition, CPKC would continue to operate on this segment under a trackage rights arrangement. The Applicants project that the Proposed Acquisition would increase rail traffic on segment U-BEAU-01 by 7.57 trains per day, on average, which is less than the freight rail safety analysis threshold of eight trains per day.

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. OEA understands that, because UP and BNSF Railway (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, OEA understands 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 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 freight rail safety impacts of the Proposed Acquisition along rail line segment U-BEAU-01.

The revised study area for freight rail safety includes 30 rail line segments, as shown in **Figure 2-1** in *Chapter 2*. The study area includes CP rail lines extending west from Chicago, Illinois to Sabula, Iowa, CP rail lines extending south from Sabula to Kansas City, Missouri; KCS rail lines extending south from Kansas City to Beaumont, Texas; the UP rail line segment U-BEAU-01 from Beaumont to Kendleton, Texas; and the KCS rail lines extending from Kendleton to the U.S./Mexico border at Laredo, Texas.

~~In this case, OEA identified 29 rail line segments where the Applicants expect that the integrated CPKC system would cause a projected increase in rail traffic that would meet or exceed the Board's thresholds for environmental review. The study area for freight rail safety includes those 29 rail line segments, as shown in **Figure 2-1** in *Chapter 2*. The study area includes CP rail lines extending west from Chicago, Illinois, to Sabula, Iowa; CP rail lines extending south from Sabula to Kansas City, Missouri; KCS rail lines extending south from Kansas City to Beaumont, Texas; and KCS rail lines extending from Kendleton, Texas, to the U.S./Mexico border at Laredo, Texas.~~

Regulatory Approach

In conducting the freight rail safety analysis, OEA also considered the relevant regulatory and industry standards that the Applicants implement on their rail lines. FRA's Office of Railroad Safety regulates safety throughout the railroad industry, including both passenger and freight operators (49 C.F.R. Chapter II Parts 200 through 299). This includes operations, track, signaling, and rolling stock (for example, locomotives and freight cars) for common carrier railroads that are part of the general railroad system.

The Federal Railroad Safety Act of 1970 granted FRA's Administrator rulemaking authority over all areas of railroad safety. Subsequently, FRA issued regulations covering a range of critical safety railroad equipment, infrastructure, and procedures. It also established enforcement tools for railroad companies and employees who violate these regulations. FRA regulations specify minimum safety requirements for rolling stock, track, signals, operating practices, and transporting hazardous materials. Railroad track safety standards (49 C.F.R. Part 213) are based on track classifications that determine maximum operating speed limits, inspection frequencies, maintenance tolerances, and record keeping. Higher class tracks can be operated at lower speeds, so posted speeds are not always an accurate indication of track class. Railroads set their desired operating speeds for track segments via timetables or train orders. They are required to maintain those track segments according to FRA standards for specific classes of track corresponding with desired train speeds. For example, lines that are maintained to Class III standards allow a maximum operating speed of 40 miles per hour for freight trains and require track segments to be inspected at least weekly to verify compliance with FRA regulations. The number of daily trains or commodities carried is not a factor in establishing the track class.

All incidents on mainlines, at rail yards, and at intermodal facilities resulting in damages greater than FRA's current reporting threshold are reported to FRA. FRA determines the reporting threshold for each calendar year. For instance, in 2017, 2018, and 2019, the reporting threshold was $10,700. Whenever a collision, derailment, or other incident occurs, FRA investigates the incident if it meets certain general criteria. For example, FRA investigates incidents that result in the derailment of a locomotive, derailment of 15 or more cars, or extensive property damage, as well as any incidents that are likely to generate considerable public interest (FRA 2020). FRA maintains a database of incidents as reported by railroads with details about the types and locations of incidents reported. FRA Office of Safety Analysis provides online query tools to dynamically search the incident data using selection criteria such as the railroad involved, year of the incident, and type of track where the incident occurred.

The Rail Safety Improvement Act of 2008 (RSIA) mandated the implementation of Positive Train Control (PTC), a collision avoidance system, on Class I railroad mainlines that transport five million or more gross tons of annual traffic and certain hazardous materials. PTC systems are designed to prevent train-to-train collisions, over-speed derailments, incursions into established work zones, and movements of trains through switches left in the wrong position. FRA expects that implementing PTC will decrease the number of incidents on those rail lines. According to FRA's PTC Database, PTC was fully implemented on all KCS rail lines where it is required[2] by June 30, 2020, and on all CP rail lines where it is required by November 30, 2020.[3] Although PTC is expected to improve railroad operations safety, it has not been in place long enough for its effect on railroad safety to be observable from historical data. Therefore, OEA did not account for the effects of the implementation of PTC in the quantitative freight rail safety analysis. Because PTC will likely increase rail safety over time, OEA's decision to not account for PTC is conservative because it may cause the results to overestimate the potential safety impacts of the Proposed Acquisition.

---

[2] The RSIA mandated the implementation of PTC on Class I railroad mainlines which transport five million or more gross tons of annual traffic and certain hazardous materials.

[3] Annual reports for the previous year are due March 31; year 2021 was not available at the time of analysis.

Pursuant to 49 C.F.R. Part 1106 of the Board's regulations and FRA regulations at 49 C.F.R. Part 244, the Applicants also prepared a proposed Safety Integration Plan (SIP). The proposed SIP describes the Applicants' proposed process and timeline for merging the operations of CP and KCS, as well as the safety implications of merging these operations. During the preparation of the SIP, the Applicants met with FRA to review drafts of the proposed SIP and related materials, respond to questions, and accept recommendations. Pursuant to 49 C.F.R. §§ 1106.4(b)(1) and 244.17, on December 28, 2021, the Applicants submitted their proposed SIP to the Board and, by letter dated February 28, 2022, FRA submitted comments to the Board stating that FRA is satisfied that the proposed SIP provides a reasonable assurance of safety for the proposed transaction, consistent with governing regulations. OEA reviewed the proposed SIP and appended it to the Draft EIS to allow for public review and comment on it and on FRA's comments. OEA did not receive any comments on the proposed SIP. The final SIP is appended to this Final EIS as **Appendix G**. ~~In the Final EIS, OEA will address any written comments on the SIP submitted during the Draft EIS comment period~~. If the Board authorizes the Proposed Acquisition and adopts the SIP, the Board will require compliance with the SIP as a condition to its authorization (49 C.F.R. § 1106.4(b)(4)). The Applicants then would coordinate with FRA in implementing the approved SIP, including any amendments thereto. Id. FRA would provide the Board with updates as appropriate during the acquisition implementation period and advise the Board when, in FRA's view, the integration of the Applicants' operations has been safely completed. Id.

In addition to FRA, individual states oversee public safety, especially with respect to roadway/rail at-grade crossings (grade crossings). Several railroad associations also develop and establish standards and practices for the industry, including the Association of American Railroads, the American Short Line and Regional Railroad Association, and the American Railway Engineering Maintenance-of-Way Association.

Systemwide Analysis

For the systemwide analysis of freight rail safety, OEA relied on historical incident data and rail traffic volume data from FRA; the Applicants' projections of future rail traffic under the Proposed Acquisition and the No-Action Alternative; and other information from the Applicants' Operating Plan. The Applicants' Operating Plan describes how the Applicants expect the integrated CPKC system would operate, including projected future rail traffic, expected changes in activities at rail yards and intermodal facilities, and planned capital improvements that would support the projected increases in rail traffic. **Appendix F** provides additional information about the data sources that OEA used in its analysis of freight rail safety.

OEA used data from FRA's Office of Safety Analysis to estimate future incident rates on CP and KCS rail lines under the No-Action Alternative and on CPKC rail lines under the Proposed Acquisition. To estimate future incident rates under the No-Action Alternative, OEA calculated the historical average incident rates for CP and KCS over the five-year period from 2015 to 2019, measured in incidents per one million train-miles. OEA assumed that the future incident rate in 2027 for CP and KCS would be the same as the historical five-year average incident rate for CP and KCS, respectively. To predict future incident rates under the Proposed Acquisition, OEA assumed that the future incident rate in 2027 for the entire CPKC system would be the same as the historical five-year average incident rate for CP (as shown in **Table 3.1-1** and as described further in **Appendix F**). This is a reasonable assumption because CP would acquire KCS under the Proposed Acquisition and would implement CP's safety procedures across the entire network, as discussed in detail in the SIP (see **Appendix G**). OEA's use of historical five-year average incident rates to predict future incident rates is conservative because rail transportation safety has tended to improve over time and will likely continue to improve in the future due to the implementation of new safety measures, such as PTC. This means that the results of OEA's analysis may tend to overestimate the potential adverse safety impacts of the Proposed Acquisition.

The analysis described in this section does not include incidents that could occur at grade crossings, such as collisions between trains and motor vehicles and accidents involving pedestrians, because OEA considered those incidents separately in *Section 3.2, Grade Crossing Safety*.

~~OEA evaluated how changes in rail activity across the U.S. portion of the integrated CPKC system would affect the probability of freight rail incidents under the Proposed Acquisition. OEA used systemwide incident data sourced from FRA's Office of Safety Analysis to calculate future incident rates under the Proposed Acquisition. These incident rates are calculated by taking the annual number of incidents and dividing them by the total annual million train-miles, as described in Appendix F. OEA assumed a future incident rate for 2027 near the five-year average of the historical rates. OEA calculated this rate by compiling the incident rate data from the FRA database and calculating the average of the rates from years 2015 to 2019, as described in Appendix F. This approach is conservative because it does not account for the fact that rail transportation safety has tended to improve over time and will likely continue to do so in the future due to the implementation of new safety measures, such as PTC. This means that the results of OEA's analysis may tend to overestimate the potential adverse safety impacts of the Proposed Acquisition. The incident rates that OEA used to assess freight rail safety impacts exclude incidents occurring at grade crossings because OEA considered those incidents separately in *Section 3.2, Grade Crossing Safety* and *Section 3.3, Grade Crossing Delay*. OEA supplemented the data with information about anticipated changes in the level of rail traffic, as described in the Applicants' Operating Plan and historical operational data that OEA obtained from FRA, including annual train-mile data, as described in **Appendix F**. The Operating Plan describes how the Applicants expect the integrated CPKC system would operate, including the projected future rail traffic on the rail lines in the combined system, expected changes in activities at intermodal facilities, and planned capital improvements to support projected increases in rail traffic.~~

~~To evaluate the probability of freight rail incidents associated with the estimated increases in freight train traffic, OEA used FRA's reported annual incident rates for the entire system for the five-year analysis period. OEA then averaged the five years of annual incident rates for both CP and KCS individually to determine the expected individual systemwide annual rates for CP and KCS, respectively, in the year 2027 under the No-Action Alternative. To determine the expected combined CPKC systemwide annual incident rate in 2027 under the~~

~~Proposed Acquisition, OEA used the average of CP's and KCS's individual five-year averages (as shown in Table 3.1-1 and as described further in Appendix F).~~

Rail Line Segment-Specific Analysis

As noted above, OEA's threshold for analyzing rail operations safety is eight or more additional freight trains per day on a rail line segment. According to the Operating Plan, the Applicants expect that 29 rail line segments would experience an increase of eight or more freight trains per day. OEA evaluated the probability of an incident occurring from the Proposed Acquisition on these rail line segments. In response to comments on the Draft EIS, OEA also included rail line segment U-BEAU-01 in the rail line segment-specific analysis in the Final EIS even though the projected increase in rail traffic on this segment would be slightly under the threshold for freight rail safety analysis. OEA used mainline incident totals and rates from 2015-2019, sourced from FRA's Office of Safety Analysis, to calculate changes in incident rates in the 2027 analysis year by analyzing the historical trends in the annual mainline incident rates, as described in **Appendix F**. As in the systemwide analysis, OEA determined the No-Action Alternative incident rates for 2027 for CP and KCS by taking the average of incident rates across analysis years for each railroad. OEA then applied each railroad's calculated incident rate to each of their respective rail segments to determine the expected probability by segment under the No-Action Alternative in the year 2027.

The safety record of railroads is often measured in terms of the number of incidents per million train-miles. Million train-miles is the measurement of how many million miles all of the trains in a system have traversed annually. To determine the projected number of incidents for each segment studied, OEA multiplied the Applicants' projected average number of trains-per-day by the segment's length and by 365 days. OEA then divided this value by one million to determine the annual million train-miles, and then multiplied by the calculated 2027 mainline annual rate of either CP or KCS, depending on the segment. This equation resulted in the projected number of incidents per year for each segment under the No-Action Alternative (taking into account organic growth expected to occur in 2027 without the Proposed Acquisition). The calculations that OEA used to determine the projected "years between incidents," are described in **Appendix F**.

Since the Proposed Acquisition is based on CP gaining control of KCS, OEA used the CP mainline projected rate for 2027 to determine the projected number of incidents per segment under the Proposed Acquisition. **Appendix F** provides additional detail about the calculations performed.

3.1.1.2 Affected Environment

The existing conditions of the current rail operations of both CP and KCS are outlined in *Chapter 2.1, Overview of Existing CP and KCS Rail Systems*. As a result of the Proposed Acquisition, the Applicants expect that the largest increases in average daily rail traffic would occur on the north-south corridor from Chicago, Illinois, to the U.S./Mexico border at Laredo, Texas (see **Figure 2-1** in *Chapter 2*).

Systemwide Analysis

For the systemwide analysis, OEA evaluated all incidents on mainlines, at rail yards, and at intermodal facilities that were reported to FRA from 2015 through 2019. **Table 3.1-1** shows the incident rates for all Class I railroads and their five-year average rates. Annual incident rates over this timeframe ranged from 1.06 to 1.7 incidents per million train-miles for CP, and from 2.62 to 4.02 incidents per million train-miles for KCS. Overall, both railroads trended downward for the five-year analysis period. For context, the combined average incident rate for both railroads from 2015 to 2019 was 2.39 incidents per million train-miles, which is below the U.S. Class I railroad average of 2.66 (FRA Office of Safety Analysis 2022).

Table 3.1-1. 2015-2019 U.S. Class I Incident Rates (per million train-miles)

Railroad	**2015**	**2016**	**2017**	**2018**	**2019**	**Five-Year Average**
CP	1.70	1.61	1.56	1.06	1.26	1.44
Burlington Northern Santa Fe Railway (BNSF)	2.28	2.09	2.01	2.14	2.21	2.15
Canadian National Railway Company (CN)	2.67	1.63	2.06	2.90	2.68	2.39
Norfolk Southern Railway (NSR)	2.21	2.6	2.33	2.76	3.31	2.64
CSX Transportation	2.63	2.84	3.14	3.71	2.36	2.94
KCS	4.02	2.62	3.68	3.40	3.03	3.35
Union Pacific (UP)	3.29	3.25	3.41	3.85	4.76	3.71
All Class I	2.69	2.38	2.60	2.83	2.80	2.66

Source: Federal Railroad Administration 2019

CP and KCS reported 272 non-highway related reportable incidents from 2015 through 2019. Of these incidents, 128 (approximately 47 percent) involved freight trains, while the remaining 144 (53 percent) involved single or multiple locomotives, single or multiple rail cars, maintenance-of-way equipment, or yard/switching equipment.

Of the total 272 reportable incidents, 180 (66 percent) involved the derailment of one or more rail cars or locomotives. Most of the derailments occurred within rail yards (50 percent), on industry track (14 percent), or on sidings (5 percent). Only about 31 percent of derailments occurred on main line track. Of the 180 total derailments, 113 (63 percent) involved loaded freight cars. Only five of derailments (3 percent) involved a release of hazardous materials from one or more loaded rail cars. In total, CP and KCS together reported releases of hazardous materials from 13 loaded rail cars from 2015 through 2019 (see *Section 3.1.2.2, Affected Environment* for more detail on hazardous materials releases).

Of the 272 reportable incidents over the five-year review period, there were zero lay person injuries or fatalities reported by either railroad. There were zero reported crew fatalities and only nine reported crew injuries among seven incidents. This means that less than 0.03 percent of incidents produced any injury to any person at all.

Of the 14,842 railcars and 537 locomotives involved in trains in reportable incidents, only 903 (0.06 percent) railcars and 54 (0.10 percent) locomotives derailed.

Rail Line Segment-Specific Analysis

To analyze individual mainline segments that are part of the study area, OEA used FRA's method for calculating rates for incidents occurring on mainline tracks only. Annual incident rates over the five-year analysis period ranged from 0.66 to 0.83 incidents per million train-miles for CP, and from 0.48 to 2.01 incidents per million train-miles for KCS. Overall, both railroads trended downward for the five-year analysis period. **Table 3.1-2** shows the mainline annual number of incidents, the annual number of train miles, total incidents, and the incident rates for CP and KCS from 2015 through 2019. Because CP is seeking to acquire KCS, OEA used CP's five-year average incident rate (2015-2019) as the estimated incident rate for mainline segments in the combined CPKC system for the analysis year 2027. This approach is consistent with OEA's past practice and is conservative because it does not account for the fact that rail safety has generally improved over time and will likely continue to do so in the future due to the implementation of new safety measures, such as PTC.

Table 3.1-2. 2015-2019 Mainline Incident Rates

Year	Incidents	Main Track Million Train-Miles	Incident Rate per Million Train-Miles
CP			
2015	8	10.06	0.80
2016	6	8.05	0.75
2017	7	8.46	0.83
2018	6	8.96	0.67
2019	6	9.10	0.66
KCS			
2015	14	8.79	1.59
2016	4	8.32	0.48
2017	18	8.96	2.01
2018	12	8.65	1.39
2019	7	9.00	0.78

Source: Federal Railroad Administration 2019

3.1.1.3 Environmental Consequences

This section presents the expected operating volumes for the Proposed Acquisition and the No-Action Alternative and describes the environmental consequences of the Proposed Acquisition and the No-Action Alternative on freight rail safety. **Table C.1-1**, **Master Rail Line Segment Table**, in **Appendix C** outlines the Applicants' expected changes in rail traffic due to both organic growth and Acquisition-related growth.

Proposed Acquisition

Systemwide Analysis

Under the Proposed Acquisition, the Applicants expect that most of the rail traffic growth would occur along a generally north-south corridor extending between Chicago, Illinois, to the U.S./Mexico border at Laredo, Texas. Between Bensenville, Illinois, and Sabula Junction, Iowa, the Applicants project that freight rail traffic would increase by eight trains per day, on average, under the Proposed Acquisition. Between Sabula Junction to Kansas City, Missouri, the Applicants project that traffic would increase by 14.4 trains per day, on average. The Applicants expect that the average projected growth in rail traffic would decrease moving south from Kansas City, from an additional 12.8 to 10.9 trains per day between Kansas City and Beaumont, Texas. In addition, the Applicants expect an average of 8.3 to 8 additional trains per day between Rosenburg, Texas, to the U.S./Mexico border at Laredo, Texas (see **Appendix C, Table C.1-1**, and *Chapter 2*, **Figure 2.2-1**). Under the Proposed Acquisition, OEA projects that CPKC would have a projected annual incident rate of ~~2.39~~1.44 incidents per million train-miles across all types of track. As described in *Section 3.1.1.1*, *Approach* (also see **Appendix F**), OEA used the CP incident rates received from FRA for 2015 to 2019 to represent the average annual incident rate for 2027 under the Proposed Acquisition. **Table 3.1-3** below shows the calculated 2027 systemwide incident rates for CPKC under the Proposed Acquisition and for CP and KCS separately under the No-Action Alternative.

Table 3.1-3. Systemwide Incident Rates by Alternative

	Assumed 2027 Incident Rates per Million Train-miles	
Railroad	**No-Action Alternative**	**Proposed Acquisition**
CP	1.44	-
KCS	3.35	-
CPKC	-	1.44

Rail Line Segment-Specific Analysis

Under the Proposed Acquisition, CPKC would have a projected annual segment-specific incident rate of 0.74 incidents per million train-miles across the mainline. As described in *Section 3.1.1.1*, *Approach* (also see **Appendix F**), OEA used the CP segment-specific incident rates for 2015 to 2019 as the average annual incident rate for the Proposed Acquisition. **Table 3.1-4** below shows the calculated 2027 segment-specific incident rates for CPKC under the Proposed Acquisition.

Table 3.1-4. Mainline Incident Rates by Alternative

Railroad	**Forecasted 2027 Incident Rates per Million Train-miles**	
	No-Action Alternative	**Proposed Acquisition**
CP	0.74	-
KCS	1.25	-

Table 3.1-4. Mainline Incident Rates by Alternative

Railroad	Forecasted 2027 Incident Rates per Million Train-miles	
CPKC	-	0.74

Because the Applicants expect that the Proposed Acquisition would cause average rail traffic to increase on the 30~~29~~ rail line segments within the study area, OEA expects that the annual number of incidents would increase. Across all of the rail line segments, OEA estimates that the annual number of incidents would increase from approximately 17.45 to approximately 18.74. The greatest increase in the predicted number of incidents for any rail line segment would occur on segment C-OTTU-02 between Muscatine, Iowa, and Ottumwa, Iowa, where the predicted number of incidents would increase by 0.32 per year, from 0.11 under the No-Action Alternative to 0.43 under the Proposed Acquisition. This is equivalent to one incident approximately every 9.4 years under the No-Action Alternative and one incident approximately every 2.3 years under the Proposed Acquisition.

No-Action Alternative

Under the No-Action Alternative, the Proposed Acquisition would not occur, and CP would not acquire KCS. Therefore, the projected increase in rail traffic on rail lines in the study area would not occur as a result of the Proposed Acquisition. However, the Applicants expect that both the CP and the KCS networks would experience organic growth in rail traffic under the No-Action Alternative. Therefore, the number of rail incidents on rail line segments in the study area under the No-Action Alternative likely would be higher than under current conditions but lower than under the Proposed Acquisition. See **Table C.1-1**, **Master Rail Line Segment Table**, in **Appendix C** for further information. In general, OEA expects that rail lines will continue to become safer over time due to improvements in safety measures, such as the implementation of PTC.

3.1.1.4 Conclusion

Incident rates on the CP and KCS systems have declined in recent years at least likely in part due to the implementation of PTC and other industry-wide improvements in safety. OEA expects that those rates would continue to decline in the future regardless of whether or not the Board authorizes the Proposed Acquisition. As outlined in **Table 3.1-5** below, under the Proposed Acquisition, OEA expects that the number of incidents would remain low on the affected rail line segments, and even decrease on some segments. Systemwide, OEA expects that the CPKC incident rate (~~2.39~~1.44) would remain well below the Class I average (2.66). Under the No-Action Alternative, the projected increase in rail traffic on rail lines in the study area would not occur. However, the Applicants expect that both the CP and the KCS networks would experience organic growth in rail traffic. The incident rates on KCS and CP respectively would continue or decline if safety trends continue.

As indicated in *Section 3.1.1.2, Affected Environment*, 99.9 percent of incidents during the five-year review period did not result in injuries or fatalities. OEA expects that under the Proposed Acquisition, most incidents would continue to be minor and only a small percentage would result in impacts to human health. In addition, because the projected increase in rail traffic under the Proposed Acquisition would be caused by the diversion of trains from rail lines outside of the study area and by the diversion of freight from truck transportation to rail transportation, the Applicants expect that any increase in the number of incidents on rail line segments in the study area would generally be offset by a decrease in the number of incidents on rail lines outside of the study area and by a decrease in the number of highway incidents involving trucks, which are generally less safe than trains.

To minimize the potential for incidents and help prevent incidents that do occur from resulting in damage to property, injuries, or fatalities, the Applicants have proposed voluntary mitigation measures committing them to funding railroad focused emergency response training for firefighters from potentially affected communities (see *Chapter 4, Mitigation*, Voluntary Mitigation [VM]-Rail-04); reviewing coverage of emergency response equipment assets across the combined network and redistributing or adding assets as necessary to improve emergency response capability (VM-Rail-05); and compliance with the SIP per FRA and Board requirements (49 C.F.R. Part 1106).

Table 3.1-5. Incident Rates on CP and KCS Segments

Rail Line Segments				Incidents per Year			Years between Incidents	
Between	**And**	**Segment Code**	**Segment Length**	**No-Action Alternative**	**Proposed Acquisition**	**Anticipated Change**	**No-Action Alternative**	**Proposed Acquisition**
Sabula Drawbridge, IA	Lake, IA	C-CHIC-01	0.7	0.00	0.00	0.00	864.49	374.77
Davis Jct, IL	Sabula Drawbridge, IA	C-CHIC-02	61.5	0.11	0.24	0.13	9.18	4.14
Randall Road, IL	Davis Jct, IL	C-CHIC-03	38.7	0.03	0.12	0.08	30.42	8.59
Bensenville Metra, IL	Randall Road, IL	C-ELGI-01	23.0	0.02	0.07	0.05	47.21	14.11
Sabula Drawbridge, IA	Clinton, IA	C-DAVE-01	17.5	0.05	0.12	0.07	19.73	8.42
Clinton, IA	Water Works, IA	C-DAVE-02	33.2	0.07	0.20	0.13	13.49	4.92
Water Works, IA	Nahant, IA	C-DAVE-03	4.5	0.01	0.03	0.02	100.16	36.51
Nahant, IA	Muscatine, IA	C-OTTU-01	24.6	0.04	0.14	0.10	23.60	7.24
Muscatine, IA	Ottumwa, IA	C-OTTU-02	82.5	0.11	0.43	0.32	9.35	2.34
Ottumwa, IA	Laredo, MO/IA	C-LARE-01	61.2	0.06	0.29	0.24	17.75	3.40
Laredo, MO/IA	Laredo, IA	C-LARE-02	41.1	0.04	0.20	0.16	26.43	5.06
Laredo, IA	Polo, MO	C-KACI-01	51.6	0.06	0.26	0.20	18.04	3.91
Polo, MO	Airline Jct, MO	C-KACI-02	42.1	0.04	0.21	0.16	22.96	4.83
Kansas City, KS	Pittsburg, KS	K-PITT-01	124.5	1.00	1.02	0.02	1.00	0.98
Pittsburg, KS	Watts, OK	K-HEAV-01	107.8	0.79	0.83	0.04	1.26	1.20
Watts, OK	Poteau, OK	K-HEAV-02	90.4	0.58	0.65	0.06	1.71	1.54
Poteau, OK	Heavener, OK	K-HEAV-03	11.6	0.08	0.08	0.01	12.96	11.83
Heavener, OK	De Queen, AR	K-SHRE-01	94.6	0.59	0.67	0.07	1.68	1.50
De Queen, AR	Ashdown, AR	K-SHRE-02	37.1	0.28	0.29	0.01	3.64	3.48
Ashdown, AR	Shreveport, LA	K-SHRE-03	83.2	0.51	0.58	0.07	1.95	1.72
Shreveport, LA	Frierson, LA	K-SHRE-04	21.8	0.25	0.21	(0.04)	4.02	4.72

Table 3.1-5. Incident Rates on CP and KCS Segments

Rail Line Segments				Incidents per Year			Years between Incidents	
Between	**And**	**Segment Code**	**Segment Length**	**No-Action Alternative**	**Proposed Acquisition**	**Anticipated Change**	**No-Action Alternative**	**Proposed Acquisition**
Frierson, LA	Leesville, LA	K-BEAU-01	91.4	0.45	0.53	0.09	2.24	1.88
Leesville, LA	De Quincy, LA	K-BEAU-02	50.6	0.25	0.30	0.04	3.95	3.36
De Quincy, LA	Beaumont, TX	K-BEAU-03	47.0	0.20	0.26	0.06	5.01	3.88
Beaumont, TX	Rosenberg, TX	U-BEAU-01	120.0	0.51	0.54	0.04	1.98	1.84
Rosenberg, TX	Kendleton, TX	K-ROSE-01	12.2	0.05	0.06	0.01	19.66	17.39
Kendleton, TX	Victoria, TX	K-ROSE-02	74.8	0.33	0.36	0.03	3.02	2.75
Victoria, TX	Placedo, TX	U-VICT-01	12.8	0.05	0.06	0.01	19.58	16.95
Placedo, TX	Robstown, TX	U-VICT-02	82.8	0.33	0.38	0.05	3.03	2.62
Laredo, TX	Robstown, TX	K-LARE-02	144.0	0.97	0.89	(0.08)	1.03	1.13

3.1.2 Hazardous Materials Transportation

This section describes the affected environment and environmental consequences for hazardous materials transport.

3.1.2.1 Approach

The Board's regulations do not have a threshold for analyzing hazardous materials transport but do require a description of the Applicants' safety record on derailments, incidents, and hazardous spills, as well as reporting on the likelihood of an accidental release of hazardous materials. Consistent with prior rail line acquisitions, for this analysis, OEA considered all rail line segments in the U.S. portion of CPKC on which the Applicants' projected increases in the transport of hazardous materials. OEA evaluated whether the probability of a hazardous materials release would increase along the rail line segments. OEA evaluated these Applicant-identified segments to calculate the release frequencies by segment for both the No-Action Alternative and the Proposed Acquisition.

Regulatory Approach

The Applicants are required to comply with laws and regulations governing the safe transport of hazardous materials. U.S. Department of Transportation (USDOT) regulations include requirements for shipping and packaging containers for hazardous materials, emergency response information, and training. FRA enforces USDOT regulations that require shippers to transport hazardous materials in rail cars specifically designed for safety of transport (49 C.F.R. Parts 171 through 180). These include: 1) FRA Office of Railroad Safety (49 C.F.R. Chapter II), which regulates the railroad industry; 2) the Comprehensive Environmental Response, Compensation, and Liability Act (40 C.F.R. 300), which governs the clean-up of uncontrolled or abandoned hazardous material sites, incidents, spills, and other emergency releases of pollutants and contaminants to the environment; 3) the Resource Conservation and Recovery Act (40 C.F.R. Part 264), which establishes the framework for the proper management of hazardous and non-hazardous waste from cradle to grave; and 4) the Hazardous Materials Transportation Act (49 U.S.C. 5101 et seq.), which applies to the transportation of hazardous materials in commerce, including interstate and intrastate carriers. The Applicants must also comply with FRA regulations governing track safety standards, freight car standards, and operating rules and practices, which all affect the potential for hazardous materials releases.

In addition, the transportation of hazardous materials is subject to U.S. Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA) regulations. EPA regulations address spill prevention and cleanup. Most EPA regulations address only fixed facilities rather than transport activities. However, EPA regulations in 40 C.F.R. Part 263, "Standards Applicable to Transporters of Hazardous Waste," specify immediate response actions, discharge clean-up, and other requirements for transporters of hazardous waste. The OSHA regulations in 29 C.F.R. §1910.120, "Hazardous Waste Operations and Emergency Response," specify emergency response and clean-up operations for releases, or substantial threats of releases, of hazardous substances.

Mainline Release Analysis

OEA evaluated how changes in rail activity on rail segments under the Proposed Acquisition would change the likelihood of an accidental release of hazardous materials. This included identifying rail line segments that would experience any increase in hazardous materials transport and information provided by the Applicants in the **Table C.1-1, Master Segment Table** in **Appendix C**. OEA calculated the likelihood of hazardous materials releases for both the No-Action Alternative and the Proposed Acquisition on the identified segments by applying historic release rates in number of annual releases per carload to existing operational conditions to estimate existing condition release frequencies for CP and KCS. OEA then applied the historical release rates to the projected operational conditions under the Proposed Acquisition to predict release frequencies for CPKC. OEA evaluated the estimated release frequencies under both the No-Action Alternative and the Proposed Acquisition to determine whether the increase in hazardous materials transport on identified segments would increase the likelihood of an accidental release. **Appendix F** provides details on the calculations used in the aforementioned approach.

Rail Yards Release Analysis

To evaluate potential impacts on safety at rail yards, OEA calculated the likelihood of a hazardous materials release. OEA applied the respective No-Action Alternative release rate to CP's and KCS's respective rail yards to calculate the No-Action Alternative impacts and applied the Proposed Acquisition release rate to all yards to calculate the Proposed Acquisition impacts.

3.1.2.2 Affected Environment

Releases of hazardous materials can occur because of incidents, human error, device issues, and other causes. Definitions for the causes of hazardous materials releases are included in **Appendix F**. USDOT has specific protocols for the transport of hazardous materials by rail, which is usually done by tank car. Tank car releases of hazardous materials can occur because of incidents, human error, packaging failure, and other problems. Human errors may include not closing a valve tightly or overfilling a tank. Packaging failures include situations where inner liners are compromised or containers leak. Other sources of releases include vandalism and improperly vented tank cars. USDOT regulations require railroads to submit a report each time a release occurs.

Types of Hazardous Materials Transported

As part of its review of potential impacts on rail safety, OEA reviewed the types of chemicals CP and KCS transport. Common carrier railroads, such as CP and KCS, are required to serve shippers upon reasonable request, including shippers that move hazardous materials. Therefore, CP and KCS generally cannot control what types of regulated hazardous materials they transport. Currently, each railroad transports commodities from all nine hazard classes. Class 3 (flammable liquids) make up 50 percent of hazardous materials transported annually on the CP and KCS networks. CP transports bitumen,[4] and to a lesser

[4] A dense, highly viscous, petroleum-based hydrocarbon that is found in deposits such as oil sands and pitch lakes.

extent crude oil, from Alberta, Canada to the U.S., where it is generally destined for the Gulf Coast. Liquified petroleum gas (LPG) is another common commodity moved by rail, passing through the U.S. from Alberta. It is important to distinguish between LPG transported here and liquified natural gas (LNG). LPG is stored, shipped, and transported in tanks or cylinders, which is what makes it suitable for rail shipping. LNG, by contrast, must be stored and shipped in specialized cryogenic tanks. It is then transported by pipeline. While LPG has been transported by rail for many years, rail transportation of LNG is currently prohibited in the United States under transportation regulations promulgated by the Pipeline and Hazardous Materials Safety Administration and FRA.

KCS has direct access to chemical products used in plastics and lubricants from the following sites: Princeton, Baton Rouge, Westlake, Reserve, Cotton Valley, and Woodlawn in Louisiana; Port Neches and Beaumont in Texas; and Vicksburg in Mississippi.

The Applicants follow USDOT regulations that specify shipping and packaging requirements that prevent hazardous materials mixing to form more hazardous compounds. USDOT regulations prohibit mixing materials in the same package or container that may cause dangerous levels of heat, flammable or poisonous gases or vapors, or produce corrosive materials. There is a prohibition against chemical mixing and release that may compromise packaging integrity. Railcars carrying materials whose mixing would be harmful are not permitted to be sequenced next to each other in the rail consist.[5]

Both CP and KCS have established hazardous materials protocols, training, and emergency response practices that address emergency preparedness, prevention, and response. These plans identify available resources and procedures for responding to a potential incident involving hazardous materials. Following the Proposed Acquisition, the Applicants would coordinate their safety and emergency response programs as described in the Applicants' application and the SIP.

Historical Hazardous Material Releases on Mainlines and in Rail Yards

CP and KCS reported 233 releases between 2015 and 2019. Of these incidents, 161 (69.1 percent) occurred in rail yards, while 72 (30.9 percent) occurred outside of rail yards. Out of the total 233 releases, 170 (73.0 percent) were non-locomotive related, and 63 (27.0 percent) were locomotive fueling/servicing related. **Table 3.1-6** shows the number of hazardous materials incidents that were non-locomotive related as reported by CP and KCS.

Table 3.1-6. 2015-2019 Hazardous Materials Incidents (non-locomotive related)

Railroad	**Hazardous Materials Incidents, 2015-2019**					
	2015	***2016***	***2017***	***2018***	***2019***	***Total***
CP	27	13	14	7	21	82
KCS	18	20	14	19	17	88

Hazardous material releases were categorized by the Applicants into five types: accident-related release, non-accident related, locomotive response, third party/adjacent property

5 A consist is the rolling stock (railroad cars), exclusive of the locomotive, making up a train.

impacting operations, and fixed facility response (non-lading). Of the total 233 reported releases, the historical breakdown is as follows:

- Accident-Related Release: There were 21 (9.0 percent) incident-related releases. Incident-related releases are unintentional releases of a hazardous material while in transport, including loading and unloading, that are caused by a derailment, collision, or other rail-related incident.
- Non-Accident Related: There were 112 (48.1 percent) non-incident related releases. Non-incident releases are unintentional releases of a hazardous material while in transport, including loading and unloading, that are not caused by a derailment, collision, or other rail related incident. These releases can include leaks, splashes, and other releases from improperly secured or defective valves, fittings, and tank shells, as well as venting of non-atmospheric gases from safety relief devices.
- Locomotive Response: There were 62 (26.6 percent) locomotive response releases. These releases refer to spills and releases associated with the fueling and maintenance of locomotives.
- Third Party/Adjacent Property Impacting Operations: There were 32 (13.7 percent) third party/adjacent property impacting operations releases. These refer to incidents occurring on property adjacent to the railroad that directly caused a release of a hazardous material. Railroad operations and shipping processes were disrupted.
- Fixed Facility Response (Non-Lading): There were six (2.6 percent) fixed facility response (non-lading) releases. A fixed facility is a non-railroad entity where these hazardous materials are stored. Examples of fixed facilities include factories, storage tanks, and pipelines. Releases in these incidents originated in fixed facilities rather than during transport.

When reviewing accident-related releases, OEA reviewed data provided by the Applicants. OEA found that over the five-year review period for both railroads, there were only seven types of hazardous materials released, which included:

- Alcohols, N.O.S.:[6] 58,069 gallons[7]
- LPGs: 10,200 gallons
- Sodium Chlorate: 1,039 pounds
- Diesel: 820 gallons
- Crude Oil: 500 gallons
- Polymeric Beads: 45 cubic yards
- Batteries (Acid): 2 gallons
- Hazardous Waste N.O.S.: 0.5 gallons

Of the 170 non-locomotive related hazardous materials incidents, 151 were liquid releases. Almost two-thirds of all liquid releases were 10 gallons or less. Of these liquid releases:

[6] N.O.S.: Not Otherwise Specified (such as ethanol)

[7] 53,180 of the 58,069 gallons released over the five-year period were from a single incident in February 2015.

- 16 percent were equal to or less than 1 gallon
- 58 percent were equal to or less than 10 gallons
- 78 percent were equal to or less than 50 gallons

Across all release types, excluding the single incident for Alcohols N.O.S. noted above, diesel was the biggest contributor to hazardous material releases (25,450 gallons). Locomotive response-related releases comprised 78.7 percent of the diesel releases, and only 3.2 percent were due to accident-related releases.

Of the 180 derailment related incidents, only five of these derailments caused any loaded hazardous material cars to derail and spill. Overall, rail-related releases accounted for only 9 percent of all hazardous material releases.

Overall, there were only five incidents were releases of crude oil; four of the five were 100 gallons or less; and all five combined released less than 700 gallons across the 6,890 miles of the CP and KCS networks.

3.1.2.3 Environmental Consequences

The following describes the environmental consequences of the Proposed Acquisition and No-Action Alternative for hazardous materials transportation. **Table C.1-1**, **Master Rail Line Segment Table**, in **Appendix C** outlines the Applicants' expected changes in Hazardous Material Carloads due to both organic growth and Acquisition-related growth.

Proposed Acquisition

Mainline Release Rate Analysis

Table 3.1-7 shows the five-year average release rates for both CP and KCS in terms of releases per hazardous materials car-mile.

Table 3.1-7. 2015-2019 Average Mainline Release Rates

Railroad	Releases	Hazardous Materials Car-miles	Release Rate
CP			
Five-year average	5.4	207,217,406	2.61×10^{-8}
KCS			
Five-year average	2.8	102,790,252	2.72×10^{-8}

Consistent with past practice, OEA assumed that the combined CPKC system would have an average mainline release rate equal the five-year average mainline release rate for CP because CP is seeking to acquire KCS. This is a conservative assumption because it does not account for the fact that rail safety has generally improved over time and will likely continue to do so in the future with the implementation of new safety equipment and procedures. OEA used the CP five-year average release rate to estimate how the projected increase in hazardous materials carloads under the Proposed Acquisition would affect the number of predicted hazardous materials releases on specific rail line segments. Out of the

141 total rail line segments on which the number of transported hazardous material carloads would increase, 50 would experience measurable increases in the predicted number of releases. The rail line segment that would experience the greatest increase in the predicted number of releases as a result of the Proposed Acquisition is segment K-PITT-01 between Pittsburg, Kansas, and Kansas City, Missouri. That segment would experience an estimated 0.23 releases per year under the Proposed Acquisition, compared to 0.08 releases per year under the No-Action Alternative, which is an increase of approximately 0.17 releases per year or one additional release every approximately 5.9 years. As described above in *Historical Hazardous Material Releases on Mainlines and in Rail Yards*, OEA expects that the majority of releases that would occur would be minor and would not have the potential to result in environmental impacts, injuries, or fatalities. The 10 most affected segments are highlighted in **Table 3.1-8**. See **Table F.2-2** in **Appendix F** for all affected segments.

Table 3.1-8. Top 10 Rail Line Segments with Highest Change in Acquisition-Related Releases

Segment Information			Hazardous Material (Hazmat) Carloads Per Year					Projected Releases per Year	
Segment	Railroad	Segment Length	Base Hazmat Carloads	Organic Growth Hazmat Carloads	2027 No-Action Alternative Hazmat Carloads	Acquisition-related Growth Hazmat Carloads	2027 Proposed Acquisition Hazmat Carloads	2027 No-Action Alternative	2027 Proposed Acquisition
K-PITT-01	KCS	124.50	17,716	4,677	22,392	48,313	70,705	0.08	0.23
C-CARR-01	CP	139.60	151,476	39,990	191,465	39,346	230,811	0.70	0.84
C-RIVE-02	CP	114.50	200,798	53,011	253,809	41,014	294,823	0.76	0.88
K-HEAV-01	KCS	107.80	15,643	4,130	19,773	43,850	63,623	0.06	0.18
K-BEAU-01	KCS	91.40	62,609	16,529	79,138	48,997	128,135	0.20	0.31
C-MARQ-03	CP	98.00	129,465	34,179	163,644	41,668	205,312	0.42	0.52
K-SHRE-01	KCS	94.60	17,403	4,594	21,997	42,481	64,478	0.06	0.16
C-PAYN-02	CP	97.10	180,538	47,662	228,200	40,115	268,316	0.58	0.68
C-PORT-03	CP	99.20	138,322	36,517	174,838	39,210	214,048	0.45	0.55
K-SHRE-03	KCS	83.20	21,326	5,630	26,957	46,627	73,583	0.06	0.16

In the event of a release of hazardous materials, the impacts of the release would depend on many factors, including the type of material or materials released; the number of rail cars involved; the volume of material released; the location of the incident in relation to inhabited or sensitive environmental areas; and the timing and effectiveness of local government and railroad emergency response plans.[8] Based on a review of past hazardous materials releases on the CP and KCS systems, OEA expects that most hazardous materials releases resulting from rail incidents would be small. In general, OEA expects that a release of hazardous materials would involve a relatively short duration exposure and would be contained quickly. This would minimize the potential for groundwater contamination, limit the extent of any soil contamination, and allow for the proper management of any surface water contamination. If hazardous materials were to enter surface waters as a result of a release, appropriate management actions would depend on the materials involved and the resources affected. These might include, but would not necessarily be limited to, cleaning up the spill and temporarily restricting the use of the water body. Such measures would minimize the potential for long-term impacts through unrecognized soil or water contamination. OEA considered the potential impacts to biological and water resources in *Section 3.11* and *Section 3.12*, respectively.

Rail Yards Release Rate Analysis

OEA calculated the five-year average rail yard release rate for both railroads to be 3.29 x 10^{-6} releases per carload processed, as shown in **Table 3.1-9**, and described in **Appendix F**, **Table F.2-3**.

Table 3.1-9. Five-Year Averaged Rail Yard Release Rates

Railroad	No-Action Alternative	Proposed Acquisition
CP	2.42 x 10^{-6}	-
KCS	4.50 x 10^{-6}	-
CPKC	-	2.42 x 10^{-6}

Of the 165 rail yards in the study area, 42 yards would experience an increase in at least one carload processed per day. Using the rate outlined above, OEA calculated that of these 42 yards, 17 would experience increases in the predicted number of annual releases, ranging from an additional 0.01 releases per year to an additional 0.3 releases per year, as shown in **Table 3.1-10.**

[8] As required by 49 C.F.R. Parts 172 and 174.

Table 3.1-10. Rail Yards with Acquisition-Related Growth ≥1 Carloads Processed Per Day

Yard Information			Cars Processed Per Day					Projected Releases per Year	
Yard Name	**Railroad**	**State**	**Base**	**Organic Growth**	**2027 No-Action Alternative**	**Acquisition-Related Growth**	**2027 Proposed Acquisition**	**2027 No-Action Alternative**	**2027 Proposed Acquisition**
Advance	KCS	Louisiana	38.0	10.0	48.0	1.1	49.1	0.08	0.04
Arbela	KCS	Mississippi	147.7	39.0	186.7	2.1	188.8	0.31	0.17
Artesia	KCS	Mississippi	370.2	97.7	468.0	2.2	470.1	0.77	0.42
Ashdown	KCS	Arkansas	46.2	12.2	58.4	7.9	66.2	0.10	0.06
Baton Rouge	KCS	Louisiana	413.4	109.1	522.5	5.2	527.7	0.86	0.47
Bensenville Yard	CP	Illinois	1,139.2	300.7	1,439.9	367.7	1,807.6	1.27	1.60
Blue Island	CP	Illinois	9.4	2.5	11.9	1.4	13.2	0.01	0.01
Bossier City	KCS	Louisiana	63.1	16.6	79.7	1.5	81.2	0.13	0.07
Calumet	CP	Illinois	180.9	47.8	228.7	2.0	230.7	0.20	0.20
Chicago	CP	Illinois	408.2	107.8	516.0	3.8	519.7	0.46	0.46
Chicago Clearing	CP	Illinois	705.6	186.3	891.9	2.0	893.9	0.79	0.79
Cordova	CP	Illinois	6.9	1.8	8.7	3.4	12.1	0.01	0.01
Cottage Grove	CP	Minnesota	103.3	27.3	130.6	8.6	139.2	0.12	0.12
Cotton Valley	KCS	Louisiana	12.7	3.3	16.0	1.4	17.4	0.03	0.02
Dallas	KCS	Texas	78.7	20.8	99.5	8.4	107.9	0.16	0.10
Davis Junction	CP	Illinois	15.4	4.1	19.5	1.2	20.7	0.02	0.02
Det Con Term	CP	Michigan	26.3	6.9	33.2	23.2	56.5	0.03	0.05
Geismar	KCS	Louisiana	33.8	8.9	42.7	1.3	44.0	0.07	0.04

Table 3.1-10. Rail Yards with Acquisition-Related Growth ≥1 Carloads Processed Per Day

Yard Information			Cars Processed Per Day					Projected Releases per Year	
Yard Name	**Railroad**	**State**	**Base**	**Organic Growth**	**2027 No-Action Alternative**	**Acquisition-Related Growth**	**2027 Proposed Acquisition**	**2027 No-Action Alternative**	**2027 Proposed Acquisition**
Gibsland	KCS	Louisiana	45.4	12.0	57.3	1.3	58.6	0.09	0.05
Glenwood	CP	Minnesota	259.8	68.6	328.4	6.3	334.8	0.29	0.30
Hughes Springs	KCS	Texas	29.3	7.7	37.0	3.3	40.3	0.06	0.04
Intl Freight Gate	KCS	Missouri	98.0	25.9	123.8	19.3	143.1	0.20	0.13
Kendleton	KCS	Texas	90.1	23.8	113.9	2.2	116.1	0.19	0.10
Mason City	CP	Iowa	124.4	32.8	157.3	21.4	178.7	0.14	0.16
Milwaukee	CP	Wisconsin	141.2	37.3	178.5	10.5	189.0	0.16	0.17
Minneapolis Humbo	CP	Minnesota	53.6	14.2	67.8	1.0	68.8	0.06	0.06
Muscatine	CP	Iowa	226.7	59.9	286.6	5.4	291.9	0.25	0.26
Nahant	CP	Iowa	363.7	96.0	459.8	8.4	468.1	0.41	0.41
New Orleans	KCS	Louisiana	364.1	96.1	460.2	6.3	466.5	0.76	0.41
Ottumwa	CP	Iowa	217.8	57.5	275.3	1.0	276.3	0.24	0.24
Pittsburg	KCS	Texas	14.7	3.9	18.6	2.7	21.3	0.03	0.02
Port Arthur	KCS	Texas	245.4	64.8	310.2	209.4	519.6	0.51	0.46
Port Neches	KCS	Texas	245.7	64.9	310.6	2.1	312.7	0.51	0.28
Princeton	CP	Iowa	7.7	2.0	9.7	1.5	11.2	0.01	0.01
Schiller Park Yard	CP	Illinois	58.6	15.5	74.0	76.5	150.6	0.07	0.13
Shoreham Yard	CP	Minnesota	70.6	18.6	89.2	28.7	117.8	0.08	0.10
Shreveport	KCS	Louisiana	1,245.4	328.8	1,574.2	80.7	1,654.9	2.58	1.46

Table 3.1-10. Rail Yards with Acquisition-Related Growth ≥1 Carloads Processed Per Day

Yard Information			Cars Processed Per Day					Projected Releases per Year	
Yard Name	**Railroad**	**State**	**Base**	**Organic Growth**	**2027 No-Action Alternative**	**Acquisition-Related Growth**	**2027 Proposed Acquisition**	**2027 No-Action Alternative**	**2027 Proposed Acquisition**
Sibley	KCS	Louisiana	19.9	5.3	25.2	1.4	26.6	0.04	0.02
St. Paul	CP	Minnesota	1,805.1	476.6	2,281.7	69.7	2,351.3	2.01	2.08
Thief River Falls	CP	Minnesota	97.0	25.6	122.6	6.1	128.8	0.11	0.11
Tracy	CP	Minnesota	176.1	46.5	222.6	21.7	244.3	0.20	0.22
Wylie	KCS	Texas	260.7	68.8	329.6	137.0	466.5	0.54	0.41

No-Action Alternative

Under the No-Action Alternative, the Proposed Acquisition would not occur, and CP would not acquire KCS. Therefore, the projected increase in rail traffic on rail lines and projected increase in operational activities at rail yards would not occur as a result of the Proposed Acquisition. However, the Applicants expect that both the CP and the KCS networks would experience organic growth in rail traffic under the No-Action Alternative. Therefore, the number of hazardous material releases along rail lines and in rail yards under the No-Action Alternative likely would be higher than under current conditions but lower than under the Proposed Acquisition. Across all of the CP and KCS rail line segments in the study area, OEA projects that a total of 10.36 total releases would occur per year under the No-Action Alternative compared to 12.88 releases per year under the Proposed Acquisition. Across all of the rail yards in the study area, OEA projects that a total of 23.50 releases would occur per year, compared to 24.99 releases per year under the Proposed Acquisition.

3.1.2.4 Conclusion

As outlined in **Table F.2-2** and **Table F.2-5**, OEA expects the number of hazardous material releases would remain low on both the affected rail line segments and yards. On rail segments, OEA expects that CPKC release rates would range on average from 1.02 releases per year to zero releases per year, with some segments likely to see a reduction in average number of releases. OEA expects that rail yards would also have low release rates, averaging from 2.82 releases per year to near zero releases per year, and some yards are likely to have a reduction in average number of releases.

Based on the information in *Section 3.1.2.2, Affected Environment*, 91 percent of releases were not accident related (for example, the releases were in a yard or a shipper's facility). OEA expects that most incidents would be minor, and the majority of releases would not be caused by train accidents. The Applicants expect that the Proposed Acquisition would increase the volumes of certain hazardous commodities on rail lines in the study area, but the majority of that traffic is already moving by rail on other carriers' lines. The Applicants forecast that the efficiencies created by the Proposed Acquisition would allow CPKC to capture a portion of the hazardous material traffic from those other carriers to the combined CPKC system. Therefore, OEA expects that any potential increase in the number of releases along rail line segments on the combined CPKC network would be partially offset by a reduction in the number of releases along other rail lines owned and operated by other railroad companies. In addition, to the extent that the transportation of hazardous materials could be diverted from truck to rail as a result of the Proposed Acquisition, the probability of a release occurring would decrease because rail transportation is generally safer than truck transportation.

To further minimize the potential release of hazardous materials and the potential for a hazardous materials release to affect human health and the environment, the Applicants have proposed voluntary mitigation measures to reduce potential adverse impacts, including a commitment to notify appropriate federal, state, and local agencies in the event of a reportable hazardous materials release (VM-Rail-02) and the commitment to conduct training workshops for emergency responders in communities through which dangerous goods are transported (VM-Rail-03). Additionally, a condition requiring completion of the SIP process and compliance with the SIP per FRA and Board requirements (49 C.F.R. Part 1106) would reduce the probability of incidents occurring (VM-Rail-02).

3.1.3 Passenger Rail Safety

This section describes the affected environment, and environmental consequences for passenger rail safety.

3.1.3.1 Approach

The Applicants do not expect that the Proposed Acquisition would result in an increase in passenger rail traffic on rail lines in the combined CPKC network.[9] However, the Proposed Acquisition could affect passenger rail safety because it would cause an increase in the average daily number of freight trains on rail lines that passenger trains also use. In general, increased freight rail traffic on rail lines that are used for passenger service has the potential to increase the probability of collisions between freight and passenger trains.

The threshold for passenger rail safety analysis here is an increase of one or more freight trains per day due to the Proposed Acquisition of KCS by CP, on rail line segments where freight and passenger rail operations share tracks. OEA applied this analysis threshold, also used in previous mergers, as a conservative benchmark to identify potential impacts on passenger rail in shared corridors. The Applicants' Operating Plan identifies nine rail line segments with passenger rail service that would exceed OEA's threshold for analysis due to the Proposed Acquisition.

As part of the passenger rail safety analysis, OEA reviewed current operating/trackage agreements between the Applicants and passenger service operators on rail line segments in the study area. Operating/trackage agreements set parameters for each railroad's movements and track occupancy to address the inherently competing interests of the freight and passenger rail service. Operating/trackage agreements establish protocols for using track sections during certain times of day and identify operating priorities and dispatching responsibilities among other provisions. The existing operating/trackage agreements between passenger rail service operators and the Applicants that OEA reviewed preclude actions by the Applicants that would result in a reduction in established commuter or intercity passenger rail service frequency. The agreements allow for increases in intercity passenger service in some cases, and commuter passenger rail service during established time periods.

Table 3.1-11 shows the nine rail line segments on which the Applicants share trackage with a passenger rail operator that would increase above the analysis threshold under the Proposed Acquisition. Two intercity passenger rail services (Amtrak Sunset Limited and Empire Builder) and two commuter rail services (Metra Milwaukee District West Line and Metro Transit Northstar) operate on segments where freight traffic would increase above the

[9] OEA is aware that Amtrak intends to increase passenger rail service on certain rail lines within the CPKC network in the future. However, those potential increases in Amtrak service would not occur as a result of the Proposed Acquisition and therefore are appropriately considered in *Section 3.14, Cumulative Impacts*.

analysis threshold due to the Proposed Acquisition. Therefore, OEA analyzed those segments to determine the impact of the Proposed Acquisition on the passenger rail services that operate over these segments.

To evaluate potential impacts to passenger rail safety resulting from the Proposed Acquisition, OEA calculated a nationwide freight and passenger train collision rate (nationwide incident rate) in collisions per million passenger train miles. The nationwide incident rate covers the most recent 10 years of data from January 1, 2008, to December 31, 2018, and only includes collision incidents between freight and passenger trains. The potential nationwide incident rate includes head-on, rear-end, and side-collisions between passenger and freight trains. Passenger train incidents unrelated to freight trains that occurred on shared rail line segments are not included. The nationwide incident rate does not include other incident types such as fire, collisions with obstructions, and derailments that are not initially caused by a freight and passenger train collision.

Table 3.1-11. Existing (2019) Freight and Passenger Traffic on CP and KCS Lines that Exceed Board Thresholds for Analysis

Rail Line Segment							**Existing Train Traffic (trains per day)**		
Between	**And**	**Segment Code**	**Segment Length**	**Rail Line Corridor**	**Rail Segment Owner (Trackage Rights)**	**Passenger Service Provider**	**Passenger Trains**	**Freight Trains**	**Total Trains**
Tower B12, IL	Bensenville Metra Station, IL	C-ELGI-02	4.6	Chicago Union Station to Big Timber Station (Elgin, IL)	Metra	Metra	58 (Weekday)	29.4	87.4
Bensenville Metra Station, IL	Randall Road, IL	C-ELGI-01	23.0	Chicago Union Station to Big Timber Station (Elgin, IL)	Metra	Metra	57 (Weekday)	3.2	60.2
St. Paul Yard, MN	Northtown, MN	B-TWIN-01	14.7	Chicago to Seattle/Portland via Minneapolis (Amtrak), Minneapolis to Big Lake (Northstar)	BNSF (CP)	Amtrak, Metro Transit	14	16.7	30.7
River Jct, MN	Newport, MN	C-RIVE-02	114.5	Chicago to Seattle/Portland via Minneapolis	CP	Amtrak	2	16.2	18.2
Newport, MN	Minneapolis, MN	C-RIVE-01	16.5	Chicago to Seattle/Portland via Minneapolis	CP	Amtrak	2	13.7	15.7
Beaumont, TX	Rosenberg, TX	U-BEAU-01	120.1	New Orleans to Los Angeles via Minneapolis	UP (KCS)	Amtrak	0.9	8.5	9.3
De Quincy, LA	Beaumont, TX	K-BEAU-03	47.6	New Orleans to Los Angeles via Houston	KCS	Amtrak	0.9	8.7	9.5
Marquette, IA	River Jct, MN	C-MARQ-01	28.4	Chicago to Seattle/Portland via Minneapolis	CP	Amtrak	2	4.7	6.7
Hoffman St. Paul, MN	Fordson Jct, MN	C-MEPA-01	4.9	Chicago to Seattle/Portland via Minneapolis	CP	Amtrak	2	1	3

Sources: Amtrak (2019), Metra (2019), Metro Transit (2019), Canadian Pacific Railway (2021), ArcGIS (2019)

OEA determined the nationwide incident rate as approximately 0.0047 collisions per million passenger train miles or approximately 2.2 years between incidents throughout the U.S. passenger rail network. To predict future collision frequencies, OEA applied the nationwide incident rate to estimated operations on rail line segments shared between passenger and freight trains, specifically, to segments that would potentially increase in freight train traffic of one train or more per day under the Proposed Acquisition. OEA's approach to predicting passenger rail safety conservatively assumes freight and passenger rail operations are mixed throughout the day even though in many cases they have separate operating windows by time period in accordance with their operating/trackage agreements. OEA predicted incident frequencies using incident rates per year and intervals between collisions in years on the nine rail line segments where passenger and freight trains share trackage with an increase of one or more freight trains per day due to the Proposed Acquisition. First, OEA multiplied the national incident rate by the total train miles in the future with the Proposed Acquisition (2027), divided by the total train miles in the existing conditions for each of the nine segments. That number was then multiplied by the total train miles on a segment basis to obtain the predicted annual collision rate. The results are also expressed in terms of the estimated number of years between predicted collisions, which was obtained by dividing 1 by the annual rate (**Table 3.1-13**). **Appendix F** further explains the safety analysis calculation methods.

3.1.3.2 Affected Environment

For the existing conditions in 2027 for passenger rail services, OEA used 2019, the last full year before the COVID-19 pandemic began in early 2020, which led to significant service reductions on commuter and intercity passenger rail lines throughout the U.S. Full pre-pandemic passenger rail service has not been restored as of June 2022; therefore, 2019 schedules were conservatively assumed. Passenger rail services in the project area include intercity rail services and commuter rail services. There are 47 rail segments where CP or KCS freight operations share trackage with passenger rail services. **Table F.3-1** in **Appendix F** contains a table of these 47 rail segments. According to FRA collision data between 2015 and 2019 (the most recent available five-year time frame), no collisions between a freight and passenger train occurred on any of these 47 shared rail segments.

Intercity Rail Service

The National Passenger Railroad Corporation (Amtrak) operates long haul and short haul intercity passenger rail services in the U.S. Amtrak trains operate on trackage on which CP also operates in New York, Illinois, Wisconsin, and Minnesota. Amtrak operates on track where KCS trains also operate in Illinois, Louisiana, and Texas. Per the Rail Passenger Service Act of 1970, as amended, Amtrak intercity passenger rail trains have operating priority over freight trains.

In New York, Amtrak's Adirondack Service operates on a 178-mile segment that CP owns between Schenectady and Rouses Point near the Canadian border. Amtrak's Ethan Allen service between New York City and Rutland, Vermont, also operates on a 60-mile portion of the same segment between Schenectady and Whitehall. Both services operate daily with one train in each direction. None of the New York segments on which Amtrak operates meet the Board's threshold for passenger rail operation environmental analysis because the projected increase in freight is less than one train per day.

In the Midwest, the Amtrak Empire Builder operates on a 384-mile segment from Rondout, Illinois, to St. Paul, Minnesota, and through Wisconsin, where CP operates. The Empire Builder is a daily long haul Amtrak service that operates between Chicago and Seattle/Portland via Minneapolis. Some segments of the Empire Builder are owned by BNSF, on which CP has operating rights. The Amtrak Hiawatha Line also operates on a 53-mile portion of the segment between Rondout, Illinois, and Milwaukee, Wisconsin. Amtrak operates 14 Hiawatha trains and two Empire Builder trains per day over those segments. In Illinois, northeast of St. Louis, Missouri, the Amtrak Lincoln and Texas Eagle services use KCS trackage on a 20.8-mile-long segment between Godfrey and East St. Louis. KCS has trackage rights from UP on the northern portion of the segment between Godfrey and East Alston. Amtrak operates eight Lincoln Service and two Texas Eagle trains per day on this segment. Two Amtrak services, the Lake Shore Limited and Capitol Limited, use a 151-mile segment of NSR trackage on which CP has operating rights, between northeastern Illinois and Butler, Indiana.

In New Orleans, Louisiana, Amtrak operates the Sunset Limited and the City of New Orleans services daily in each direction on an eight-mile segment of CN trackage on which KCS has operating rights. In Texas, Amtrak's long haul Sunset Limited service operates six times per week over a 120-mile segment of UP track between Beaumont and Rosenberg, on which KCS also has operating rights, and a KCS-owned 1.8-mile segment in and just east of Beaumont. Sunset Limited service operates between New Orleans and Los Angeles via Houston.

Commuter Rail Service

There are two existing commuter rail operators in the project area that share trackage with CP: the Northern Illinois Railroad Corporation (Metra) in the Chicago, Illinois, area and Metro Transit in the Minneapolis, Minnesota area. One planned future commuter rail service, the Dallas Area Rapid Transit (DART) Silver Line, would overlap with KCS trackage (segment KALLI-03) in the area of Plano, Texas. DART anticipates that Silver Line service will begin in 2023.

Under an operating/trackage agreement with Metra, CP has trackage rights across approximately 67.3 miles of track owned by Metra on two of its lines, the Milwaukee District-West (MD-W) line and the Milwaukee District-North (MD-N) line. The MD-W line runs from Chicago Union Station to Big Timber Station in Elgin, Illinois. CP has operating rights on 34.3 miles of the MD-W line. In 2019, the MD-W line had an estimated 5.9 million annual passenger trips, or approximately 20,600 weekday riders, and operated 58 daily trains. The MD-N line runs from Chicago Union Station to Fox Lake, Illinois, and Metra and CP share operations for 47 miles on the line. Metra owns 33 miles of the line from Union Station to Rondout, Illinois, and CP owns 17 miles from Rondout to Fox Lake. In 2019, the MD-N had an estimated 6.5 million annual passenger trips, or approximately 22,100 weekday riders, and operated 63 daily trains. CP has trackage rights on a BNSF-owned segment shared with Northstar, a 40-mile commuter rail line that connects downtown Minneapolis and Big Lake, Minnesota, which is operated by Metro Transit. As of 2019, Metro Transit operated 12 Northstar trains on weekdays and six trains on weekend days, carrying 787,000 passengers per year in 2018.

3.1.3.3 Environmental Consequences

The following describes the environmental consequences of the Proposed Acquisition and the No-Action Alternative for passenger rail safety.

Proposed Acquisition

Two Amtrak intercity services, the Empire Builder and the Sunset Limited, and two commuter rail services, the Metra MD-W line and the Metro Transit Northstar line, operate on rail line segments that would experience freight traffic increases above the analysis threshold for passenger rail safety of one or more additional freight trains per day, on average.

Amtrak's Sunset Limited service operates over a 1.8-mile portion of the 47.6-mile-long segment K-BEAU-03 through Beaumont, Texas. It also operates over segment U-BEAU-01, which extends 120 miles from Beaumont through Houston, Texas to Rosenberg, Texas. Although UP owns segment U-BEAU-01, KCS has operating rights over the segment (**Figure 3.1-1**). The Applicants expect that the Proposed Acquisition would increase freight traffic on segment K-BEAU-03 and segment K-BEAU-01 by an average of 11 freight trains and 7.6 freight trains per day, respectively (**Table 3.1-12**).

Amtrak's Empire Builder service operates on five segments shared by CP that would potentially experience an increase in freight trains as a result of the Proposed Acquisition (**Figure 3.1-2**). Segments C-RIVE-02 and C-MARQ-01, which connect at River Junction, Minnesota, would potentially increase by six freight trains per day for a total of 25.1 and 13.3 combined passenger and freight trains per day, respectively (**Table 3.1-12**). Segment C-MEPA-01 would potentially increase by 3.6 freight trains per day to 4.6 freight trains (6.6 trains total including two daily passenger trains). Segment C-RIVE-01 has shared trackage between passenger and freight trains on 13.5 miles of its 16.5-mile extent and would potentially increase by 4.6 freight trains per day for a total of 19.1 freight trains, and 21.1 total trains, including two daily passenger trains (**Table 3.1-12**). Segment B-TWIN-01, a BNSF-owned segment in Minneapolis over which CP has operating rights, would potentially increase by 5.6 freight trains per day as a result of the Proposed Acquisition, for a total of 23.1 CP trains daily and 37.1 trains overall, including intercity and Northstar commuter trains.

Table 3.1-12. Post-Acquisition Freight and Passenger Traffic on CP and KCS Lines that Exceed the Board's Analysis Threshold

Rail Line Segment				No-Action Alternative - 2027 Train Traffic (trains per day)			Proposed Acquisition - 2027 Train Traffic (trains per day)			Change in Freight Train Traffic
Between	**And**	**Segment Code**	**Segment Length**	**Passenger Trains**	**Freight Trains**	**Total Trains**	**Passenger Trains**	**Freight Trains**	**Total Trains**	
De Quincy, LA	Beaumont, TX	K-BEAU-03	47.6	0.9	9.3	10.2	0.9	20.3	21.1	11.0
Bensenville Metra Station, IL	Randall Road, IL	C-ELGI-01	23.0	57	3.4	60.4	57	11.4	68.4	8
Beaumont, TX	Rosenberg, TX	U-BEAU-01	120.1	0.9	9.3	10.1	0.9	16.8	17.7	7.6
Tower B12, IL	Bensenville Metra Station, IL	C-ELGI-02	4.6	58	30.5	88.5	58	37.0	95.0	6.4
River Jct, MN	Newport, MN	C-RIVE-02	114.5	2	17.1	19.1	2	23.1	25.1	6
Marquette, IA	River Jct, MN	C-MARQ-01	28.4	2	5.3	7.3	2	11.3	13.3	6
St. Paul Yard, MN	Northtown, MN	B-TWIN-01	14.7	14	17.5	31.5	14	23.1	37.1	5.6
Newport, MN	Minneapolis, MN	C-RIVE-01	16.5	2	14.5	16.5	2	19.1	21.1	4.6
Hoffman St. Paul, MN	Fordson Jct, MN	C-MEPA-01	4.9	2	1	3	2	4.6	6.6	3.6

Sources: Amtrak (2019), Metra (2019), Metro Transit (2019), Canadian Pacific Railway (2021), ArcGIS (2019)

Figure 3.1-1. Shared Passenger/Freight Segments that Exceed the Board's Analysis Threshold – Beaumont to Rosenberg, Texas

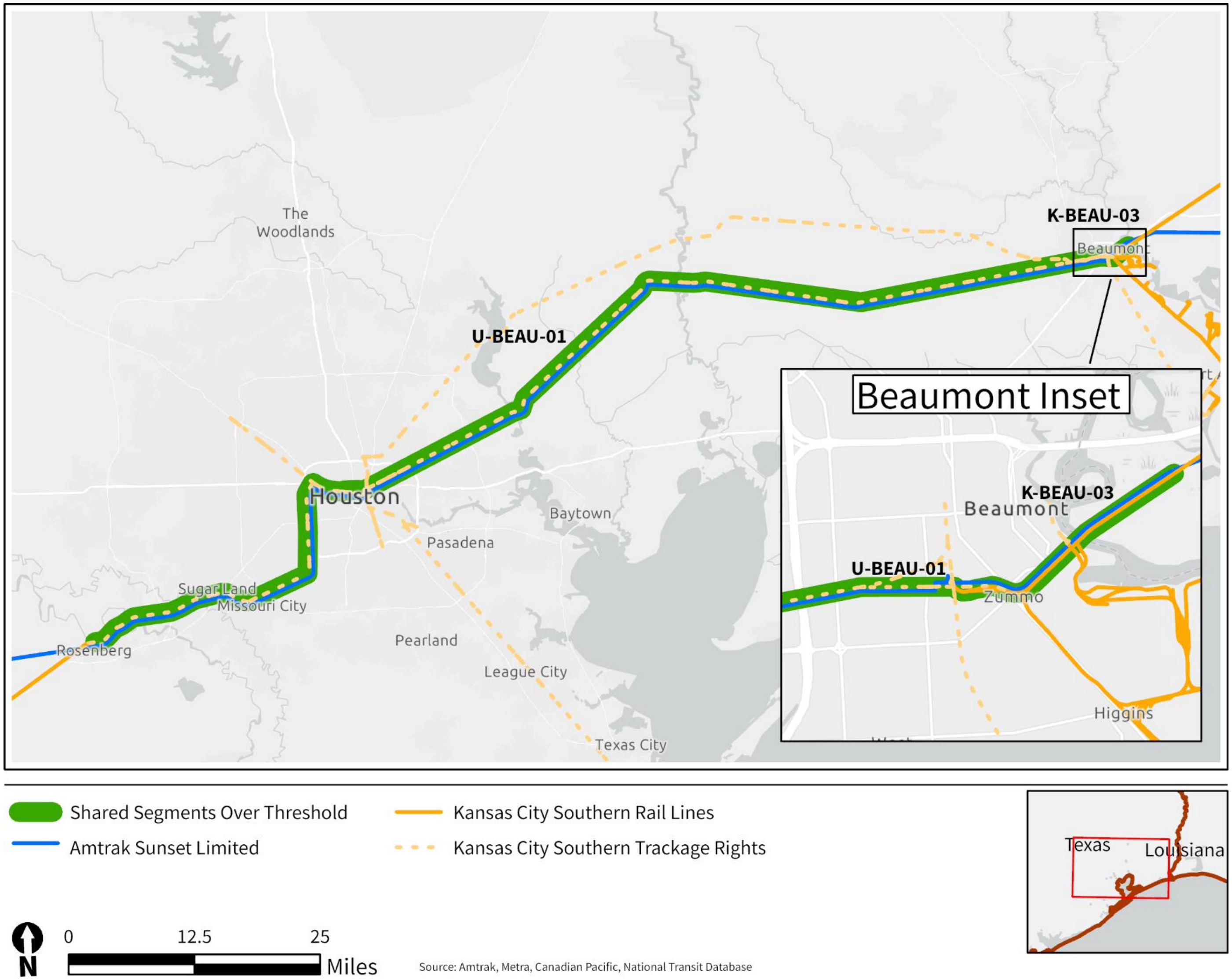
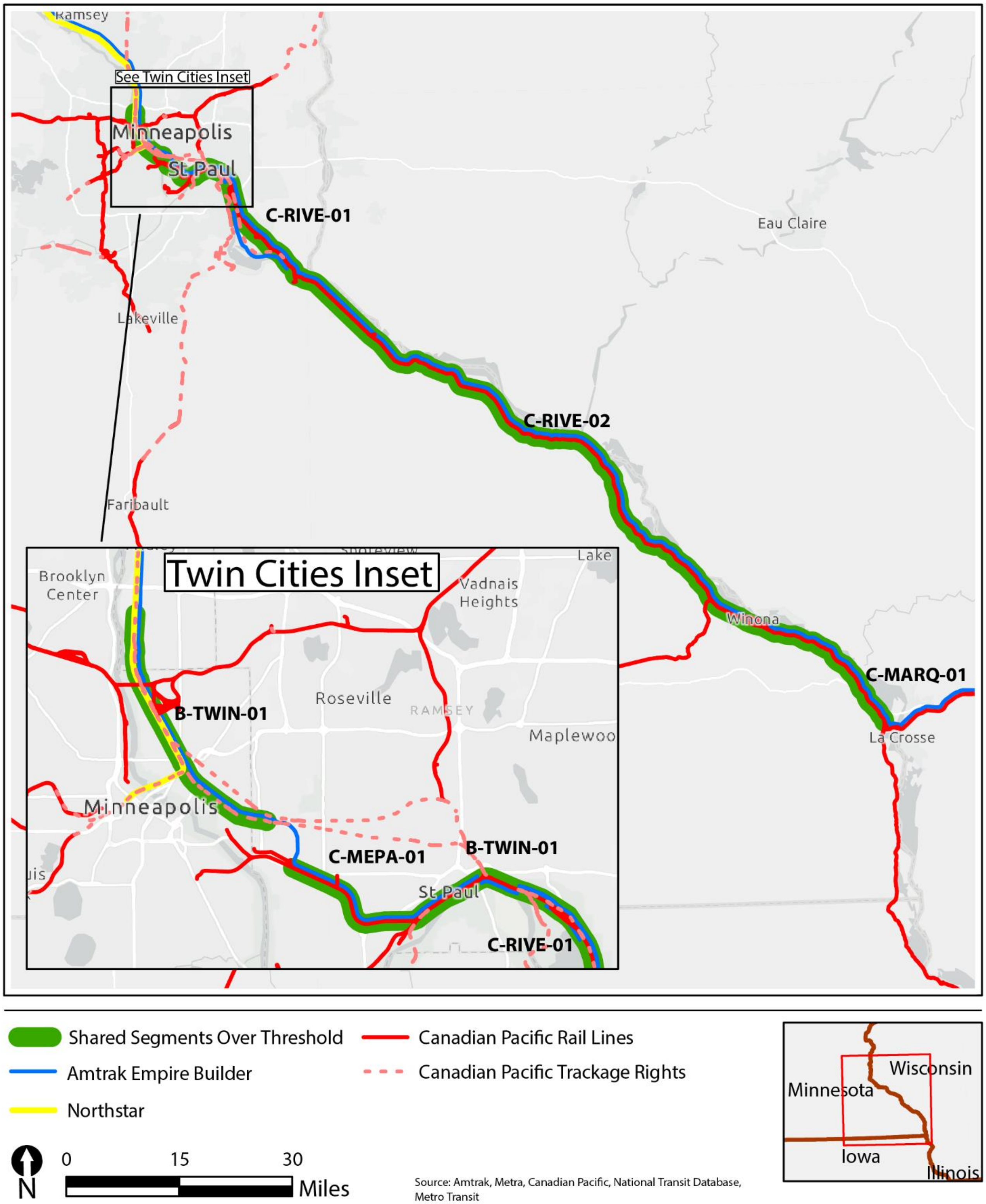


Figure 3.1-2. Shared Passenger/Freight Segments that Exceed the Board's Analysis Threshold – Minneapolis to La Crescent, Minnesota



Source: Amtrak, Metra, Canadian Pacific, National Transit Database, Metro Transit

The Metra MD-W line operates on two track segments (C-ELGI-01 and C-ELGI-02) where rail traffic would increase as a result of the Proposed Acquisition (**Figure 3.1-3**). Segment C-ELGI-01, which is 23 miles long and stretches from Metra's Bensenville Station to the last stop on the MD-W line in Elgin, Illinois, would experience a projected increase of eight daily freight trains, on average, for a total of 11.4 daily freight trains. Including 57 daily Metra passenger trains on the MD-W Line, this segment would have 68.4 daily trains under the Proposed Acquisition (**Table 3.1-12**). C-ELGI-02, a 4.6-mile segment east of C-ELGI-01 and west of Chicago Union Station, would experience a projected increase of 6.4 freight trains per day as a result of the Proposed Acquisition, which would result in a daily total of 37 freight trains per day, on average. Metra operates 58 passenger trains per day on segment C-ELGI-02, for a combined total with freight operations of 95 total trains per weekday. Segments C-ELGI-01 and C-ELGI-02 are double tracked at a minimum and Centralized Traffic Controlled, which maximizes available track capacity. Metra and CP's operating/trackage agreement over Metra-owned tracks provides full operating rights to Metra during a.m. and p.m. peak period operating windows, in addition to several scheduled trips outside the peak periods.[10] Metra uses all tracks on the corridor to provide local and zone-express commuter service[11] to and from Chicago Union Station. CP is obligated to protect these windows to avoid interfering with scheduled Metra trains. While Metra is the owner of the tracks, CP dispatches all passenger and freight trains along the MD-W line from its US Operations Center in Minneapolis. The Applicants intend to move the Operations Center to Kansas City if the Board authorizes the Proposed Acquisition. All freight traffic growth resulting from the Proposed Acquisition would need to adhere to the established agreement with Metra and be scheduled around the agreed upon operating times.

The Metro Transit Northstar commuter line shares approximately 5.7 miles of segment B-TWIN-01 with freight and Amtrak trains. This segment, specifically the BNSF Midway Subdivision that is part of the BNSF-owned and -dispatched Twin Cities Division, would potentially see an increase of 5.6 freight trains per day as a result of the Proposed Acquisition, for a total of 23.1 CP trains daily. With growth in freight traffic as a result of the Proposed Acquisition, the segment would total 37.1 freight and passenger trains per day (**Table 3.1-12**). This analysis conservatively assumes that freight and commuter rail operations share approximately 5.7 miles of the B-TWIN-01 segment; however, the Northstar service typically only overlaps with CP operations for approximately 1.2 miles because many CP trains access Shoreham Yard and the CP Paynesville Subdivision by diverting to or from B-TWIN-01. CP's yard and the junction with the Paynesville line use tracks on the east side of the corridor and Northstar typically operates on the west side of the corridor.

As a result of the Proposed Acquisition, the predicted annual collision rate would increase and the interval between collisions (years) would decrease for each of the nine identified segments (**Table 3.1-13**). Segment U-BEAU-01 would have the highest predicted annual collision rate of 0.007002 and the shortest interval between collisions (142 years). Segment

[10] Metra a.m. peak corresponds to trains arriving in Chicago between 6:30 a.m. and 9:30 a.m., and p.m. peak corresponds to trains departing Chicago between 3:00 p.m. and 7:00 p.m. on weekdays.

[11] Zone-express commuter service skips some local stops to provide faster overall trip times. These trains typically operate during the peak periods only and may pass a local train if the track infrastructure and capacity is available.

C-MEPA-01 would have the lowest predicted annual collision rate of 0.000124 and the longest interval between collisions (8,083 years) in the future with the Proposed Acquisition.

No-Action Alternative

Under the No-Action Alternative, the Proposed Acquisition would not occur, and CP would not acquire KCS. However, the Applicants expect that both the CP and the KCS networks would experience organic growth in freight rail traffic under the No-Action Alternative as a result of general economic growth. Because of this organic growth, the Applicants expect that the average volume of freight rail traffic would increase on 41 of the 47 rail segments on which CP or KCS operate and share trackage with passenger rail services (**Table F.3-2** in **Appendix F**). OEA assumed that there would be no change to the passenger rail service under the No-Action Alternative compared to the existing conditions. Under the No-Action Alternative, the lowest predicted interval between collisions (years) was 250 years on segment C-RIVE-02, (a 0.003995 annual collision rate) and 39,003 years on segment C-MEPA-01, (a 0.000026 annual collision rate) as summarized in **Table 3.1-13.**

Figure 3.1-3. Shared Passenger/Freight Segments that Exceed the Board's Analysis Threshold – Chicago to Elgin, Illinois

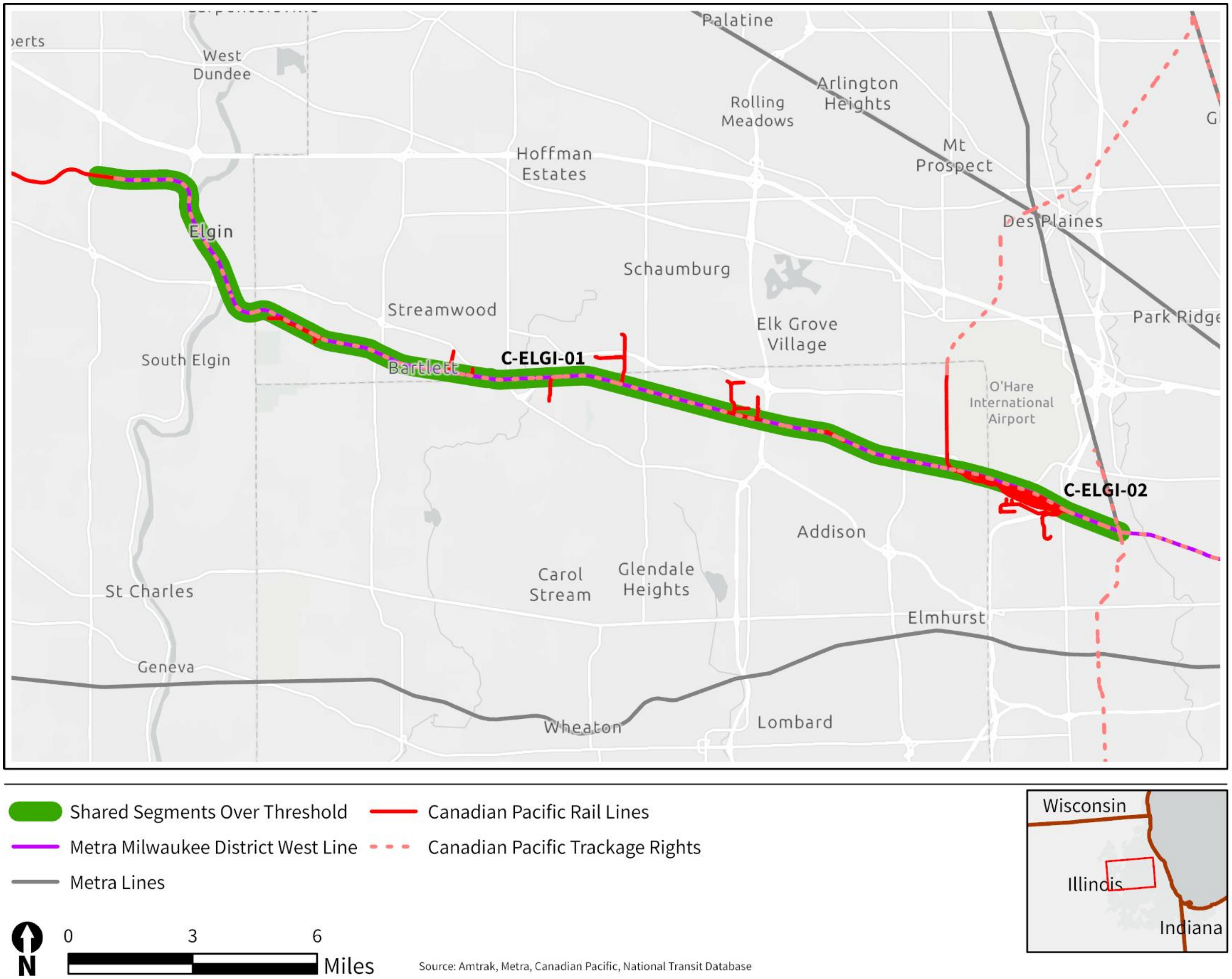


Table 3.1-13. Predicted Intervals Between Collisions

Rail Line Segment					Collisions Per Year		Years between Collisions	
Between	**And**	**Segment Code**	**Segment Length**	**Length of Passenger Rail Operations on Segment (miles)**	**No-Action Alternative**	**Proposed Acquisition**	**No-Action Alternative Predicted Interval**	**Proposed Acquisition Predicted Interval**
De Quincy, LA	Beaumont, TX	K-BEAU-03	47.6	1.8	0.000034	0.000148	29,177	6,753
Bensenville Metra Station, IL	Randall Road, IL	C-ELGI-01	23.0	23.0	0.002019	0.002715	495	368
Beaumont, TX	Rosenberg, TX	U-BEAU-01	120.1	120.1	0.002294	0.007020	436	142
Tower B12, IL	Bensenville Metra Station, IL	C-ELGI-02	4.6	4.6	0.000634	0.000743	1,576	1,345
River Jct, MN	Newport, MN	C-RIVE-02	114.5	114.5	0.003995	0.006906	250	145
Marquette, IA	River Jct, MN	C-MARQ-01	28.4	3.6	0.000050	0.000166	20,022	6,017
St. Paul Yard, MN	Northtown, MN	B-TWIN-01	14.7	7.7 (Amtrak) 5.7 (Northstar)	0.000376	0.000547	2,660	1,828
Newport, MN	Minneapolis, MN	C-RIVE-01	16.5	13.5	0.000411	0.000671	2,433	1,489
Hoffman St. Paul, MN	Fordson Jct, MN	C-MEPA-01	4.9	4.9	0.000026	0.000124	39,003	8,083

3.1.3.4 Conclusion

OEA concludes that the probability of a collision between freight and passenger trains would be very low under the Proposed Acquisition. The Applicants expect that the Proposed Acquisition would result in an increase in one or more freight trains per day on nine rail segments that share trackage with a passenger rail operator and thus meet the Board's analysis threshold. The probability of a collision occurring on any of those nine rail line segments would be very low under either the Proposed Acquisition or the No-Action Alternative. Across all nine rail line segments, OEA predicts a total of 0.98 collisions per 100 years between freight and passenger trains would occur each year under the No-Action Alternative. By comparison, OEA predicts a total of 1.90 collisions per 100 years across all nine rail segments in the future with the Proposed Acquisition. The Applicants' voluntary mitigation measures, as set forth in *Chapter 4, Mitigation,* would minimize the potential for passenger rail impacts. In addition, the Applicants would be required to complete the SIP process and implement the SIP, when it is finalized, and the SIP includes provisions that address safety on rail lines that are shared with passenger trains. FRA would monitor the Applicants' implementation of the SIP during the operations integration period, consistent with the governing FRA regulations at 49 C.F.R. Part 244 and the Board's regulations at 49 C.F.R. Part 1106. Given this mitigation, and because the probability of a collision between freight and passenger trains would be very low on any rail line segment in the combined CPKC network, OEA concludes that additional mitigation to address such impacts is unnecessary.

3.2 Grade Crossing Safety

This section describes the impacts of the Proposed Acquisition on safety at roadway/rail at-grade crossings (grade crossings). A grade crossing is defined as "a location where a public highway, road, street, or private roadway, including associated sidewalks and pathways, crosses one or more railroad tracks at grade," according to 49 C.F.R. § 234.5. If the Board were to authorize the Proposed Acquisition, the Applicants expect that rail traffic would increase on certain rail line segments along the combined CPKC network. This increase in rail traffic would result in an increased risk of crashes involving trains and motor vehicles at grade crossings. Aside from crashes involving individuals trespassing on railroad tracks, the majority of rail-related fatalities and injuries, including fatalities involving motor vehicles and pedestrians, occur at grade crossings (AAR 2022). Based on FRA data from 2017 to 2021, there were 9,030 crashes at public grade crossings in the United States, resulting in 1,262 deaths and 2,865 injured people.

In assessing grade crossing safety impacts, OEA considered federal, state, and local regulatory frameworks for transportation, including the requirements of Federal Highway Administration (FHWA) and FRA, which both have jurisdiction over aspects of grade crossing safety under federal law.

3.2.1 Approach

This subsection discusses the approach for estimating safety impacts at grade crossings under the No-Action Alternative and the Proposed Acquisition. During the scoping period, commenters expressed concern regarding grade crossing safety. OEA considered these concerns and developed the approach below to assess grade crossing safety.

Crashes can occur at crossings when vehicles attempt to cross the tracks at the same time as a passing train. Although such crashes are generally rare, they can result in damages, injuries, or fatalities when they occur. In 2020, FRA published a report that includes statistics on the safety performance of more than 105,000 public grade crossings in the U.S. that are not closed and not grade-separated (FRA 2020). During the five-year period from 2014 to 2018, there were 8,467 crashes at those grade crossings, representing an average of 0.016 crashes per grade crossing per year, or approximately one crash per grade crossing every 62.5 years. OEA analyzed more recent FRA data to estimate the proportion of pedestrian crashes relative to total grade crossing crashes. During the five-year period from 2017 to 2021, there were 9,030 crashes at public grade crossings, including 833 pedestrian-train crashes. Based on the five years of national data at grade crossings, pedestrian crashes represent approximately 9 percent of total grade crossing crashes.

OEA defined the study area for grade crossing safety to include all rail lines where the Proposed Acquisition would result in an increase in rail traffic of eight or more trains per day, on average. OEA identified those rail lines by comparing projected rail traffic for the year 2027 under the Proposed Acquisition to projected rail traffic in 2027 under the No-Action Alternative. OEA then identified all grade crossings in the study area and estimated the probability of a crash occurring at each grade crossing. In response to public comments on the Draft EIS, OEA expanded the study area to also include rail line segment U-BEAU-01, which passes through the Houston area in Texas. This rail line segment is part of UP's Houston Subdivision and Glidden Subdivision. KCS currently operates trains on this segment under a trackage rights arrangement with UP, the segment's owner. If the Board authorizes the Proposed Acquisition, CPKC would continue to operate on this segment under a trackage rights arrangement. The Applicants project that the Proposed Acquisition would increase rail traffic on segment U-BEAU-01 by 7.57 trains per day, on average, which is less than the grade crossing safety analysis threshold of eight trains per day.

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. 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, OEA understands 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 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 grade crossing safety impacts of the Proposed Acquisition in the Houston area.

OEA estimated the probability of a crash occurring and other related statistics based on historical performance data for each grade crossing, as recorded by FRA. Other related statistics included estimated crash frequency per year, intervals between crashes, fatal crash frequency per year, casualty (such as crashes involving injuries) crash frequency per year, and pedestrian crash frequency per year. OEA also relied on other variables to estimate future crash frequency, including the projected number of trains operated per day through each crossing under the Proposed Acquisition and the No-Action Alternative, the estimated train speed, the estimated average train length, the annual average daily traffic (AADT) on the affected roadway, the type of protection at the crossing (for example, flashing lights or crossing gates), the road surface type, the number of roadway lanes, and the number of main line tracks.

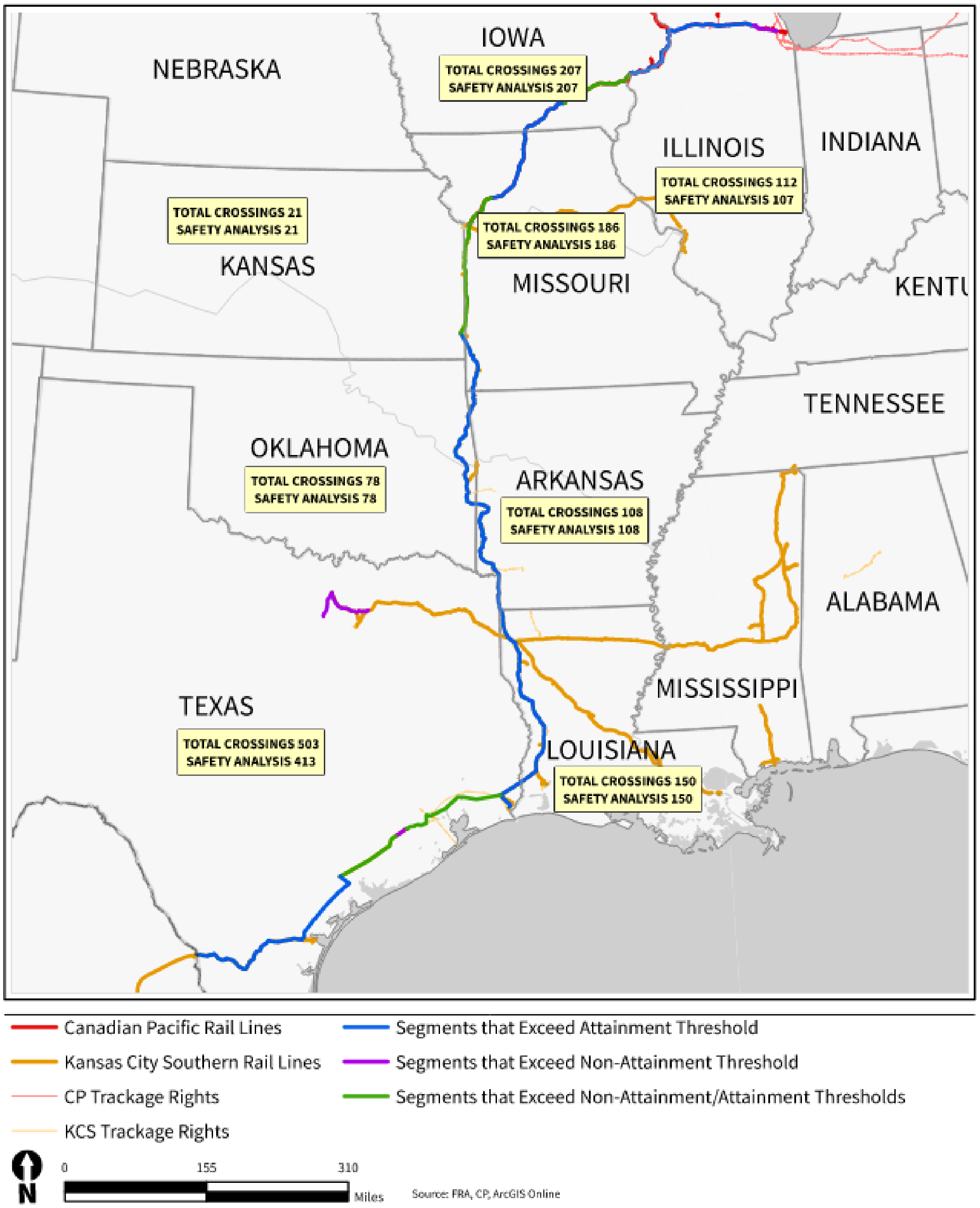
OEA specifically considered the potential impacts associated with grade crossings in designated quiet zones. Quiet zones are locations where trains do not need to sound their horns at grade crossings. Because trains do not sound their horns in quiet zones, crossings in these areas may be more susceptible to safety impacts than crossings elsewhere, depending on rail and vehicular traffic levels and crossing safety enhancements. OEA also considered the potential impacts associated with pedestrian-only grade crossings. While the lack of reliable pedestrian crossing volume data precludes the use of quantitative analysis methods, OEA considered the safety performance of pedestrian-only crossings based on the type of protection and historical safety performance at each crossing.

OEA did not estimate safety performance at grade-separated crossings, which are crossings where a roadway passes over or under a rail line via an overpass or underpass, because grade-separated crossings do not create a potential for safety impacts. OEA also did not estimate safety performance at private ~~and pedestrian-only~~ grade crossings because of very low traffic volumes and because insufficient data exist to support a quantitative analysis.

3.2.2 Affected Environment

OEA identified a total of 1,270 public grade crossings and 31 pedestrian-only grade crossings in the study area that met the criteria for safety analysis, which encompasses 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 3.2-1**). ~~OEA identified a total of 1,352 public, at-grade vehicle crossings, and filtered to 1,134 grade crossings in the study area that have a projected increase of eight or more trains per day under the Proposed Acquisition (**Figure 3.2-1**). The affected environment for grade crossing safety encompasses 1,134 grade crossings 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 3.2-1**).~~ **Appendix H** provides a list of all grade crossings within the study area. The study area includes eight states: Illinois, Iowa, Kansas, Missouri, Arkansas, Oklahoma, Louisiana, and Texas. The grade crossings in the study area range from rural crossings with low volumes of vehicular traffic, at fewer than 10 vehicles per day, to urban crossings with high traffic volumes, at more than ~~2~~30,000 vehicles per day. The number of mainline tracks at the crossings at issue here ranges from one to ~~two~~ three tracks and the number of roadway lanes at the crossings ranges from one to ~~six~~ seven lanes. The grade crossings include both paved and unpaved roads and the existing warning devices include both passive (such as signage) and active measures (such as flashing lights or flashing lights and gates). Of the ~~1,134~~1,270 evaluated grade crossings in the study area, ~~45~~ 77 are located in a designated quiet zone. There were ~~90~~ 156 crashes reported over the ~~1,134~~1,270 grade crossings during the most recent five-year period (2017-2021). This equates to an average of 0.025~~016~~ crashes per grade crossing per year, or approximately one crash per grade crossing every ~~62.5~~40.7 years, which is ~~identical to~~greater than the national averages reported by FRA based on data from 2014-2018 (FRA 2020). During the same five-year period (2017-2021), there were two crashes at pedestrian-only crossings in study area and both were confirmed suicides.

Figure 3.2-1. ***Grade Crossings for Safety Analysis on Proposed CPKC Rail System[1]***



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

3.2.3 Environmental Consequences

To characterize the potential environmental consequences at the ~~1,134~~1,270 grade crossings for safety analysis, OEA estimated vehicular traffic safety performance due to anticipated train movements in 2027 under the Proposed Acquisition and the No-Action Alternative.

3.2.3.1 Proposed Acquisition

OEA expects that the Proposed Acquisition would result in minor impacts on the safety performance of grade crossings in the study area. Because collisions between trains and road users (including vehicles and pedestrians) tend to occur more frequently as rail traffic increases, OEA expects that the projected increase in rail traffic would result in an increase in predicted number of crashes and a reduction in the time between crashes at the grade crossings. Across the ~~1,134~~1,270 grade crossings included in the safety analysis, the predicted number of crashes would increase by an average of 0.005 crashes per crossing per year as a result of the Proposed Acquisition. Assuming that pedestrian crashes represent approximately 9 percent of total train crashes based on national FRA data, the predicted number of train-pedestrian crashes would increase by an average of 0.00045 crashes per crossing per year as a result of the Proposed Acquisition. This corresponds to one additional grade crossing crash approximately every 200 years, which includes one additional train-pedestrian crash every approximately 2,000 years, on average. **Appendix H** provides detailed inputs and results of OEA's analysis, including current safety-related conditions at each grade crossing and pedestrian-only grade crossing in the study area, as well as the predicted number of crashes per year and estimated time between crashes under the Proposed Acquisition and the No-Action Alternative for each grade crossing in the study area.

In general, crossings with less traffic volume and more safety measures (such as gates and flashers) have the lowest predicted crashes and the lowest increase in predicted crashes. On the other hand, crossings with more traffic volume and less safety protection (such as passive protection) have the highest predicted crashes. The crossings with the highest projected increases in train volumes have the largest increase in predicted crashes, but these crossings also have less protection (such as passive protection). The crossings with the lowest predicted increase in crash frequency include Crossing ID 329007L across Roy Hopkins Drive in Vivian, Louisiana, and Crossing ID 329237M across McDonald Drive in Many, Louisiana. For these crossings, the predicted increase in crash frequency is 0.0007 crashes per year, or one additional crash every 1,429 years. The largest increase is 0.0277 crashes per year, or one additional crash every 36 years. This predicted increase would occur at Crossing ID 743351B across Miller Road in Hungerford, Texas. This is also the crossing with the highest total predicted number of crashes per year, with a predicted average of 0.2075 crashes per year, or one crash approximately every five years, under the Proposed Acquisition.

Adding together all potential crashes at the ~~1,134~~1,270 crossings resulted in a total of 31.7~~24.9~~ predicted crashes per year, as compared to the No-Action Alternative of 25.5~~19.1~~ total crashes per year. This results in a predicted total increase of 6.2~~5.8~~ crashes per year under the Proposed Acquisition compared to the No-Action Alternative throughout the entire system of ~~1,134~~1,270 crossings. Assuming that pedestrian crashes represent approximately 9 percent of total train crashes based on national FRA data, there would be a total of 2.9~~2.2~~ predicted train-pedestrian crashes at the ~~1,134~~1,270 crossings per year, as compared to ~~1.7~~2.3 train-pedestrian crashes per year under the No-Action Alternative. This is a predicted total increase of 0.6~~0.5~~ train-pedestrian crashes per year under the Proposed Acquisition compared to the No-Action Alternative throughout the entire system of

~~1,134~~1,270 crossings. Detailed information on potential environmental consequences of the Proposed Acquisition on grade crossing safety is presented in **Appendix H**.

Impacts to Quiet Zones

OEA identified ~~45~~ 77 grade crossings located in designated quiet zones. **Appendix H** presents the predicted total, fatal, and casualty crashes under the No-Action Alternative and under the Proposed Acquisition for these ~~45~~ 77 grade crossings, along with the basic train, vehicle traffic, and roadway characteristics used in the calculation of performance measures.

Under the Proposed Acquisition, there would be an impact on the predicted safety performance of the ~~45~~ 77 grade crossings. Specifically, the expected increase in train traffic would result in an increase in the predicted number of crashes. Across the ~~45~~ 77 grade crossings in quiet zones, there would be a predicted increase of 0.15 crashes per year under the Proposed Acquisition as compared to the No-Action Alternative.

Of the ~~45~~ 77 grade crossings located in designated quiet zones, all ~~45~~ 77 of the grade crossings have lights and gates installed, and ~~40~~ 72 of the grade crossings have supplemental safety measures (SSM) installed (such as median barriers or quad gates). As long as the SSMs remain in place, the conditions needed to establish a quiet zone would remain for all but one of the quiet zones under the Proposed Acquisition.

The five grade crossings without SSMs are spread across quiet zones in three communities: Bartlett, Illinois (Crossing IDs 372210R, 372206B, 372207H), Bensenville, Illinois (Crossing ID 372170V), and Edna, Texas (Crossing ID 746639T). The conditions to maintain the existing quiet zones would remain under the Proposed Acquisition provided that Quiet Zone Risk Index (QZRI) would remain less than the National Significant Risk Threshold (NSRT) or the Risk Index with Horns. OEA does not expect that the projected increase in rail traffic associated with the Proposed Acquisition would cause the QZRI to exceed the higher value of the NSRT or Risk Index with Horns for the existing quiet zones in Bensenville, Illinois, and Edna, Texas. Therefore, OEA expects that these two quiet zones would remain if the Proposed Acquisition were implemented even though there are grade crossings within the two quiet zones that do not currently have SSMs. OEA expects that, in the absence of mitigation, the projected increase in rail traffic associated with the Proposed Acquisition would cause the QZRI to exceed the Risk Index with Horns for the existing quiet zone in Bartlett. However, OEA expects that the Applicants' voluntary mitigation (VM) (specifically, VM-Noise-01) would ensure that the existing quiet zones would remain in compliance with safety regulations for grade crossings in quiet zones. Therefore, OEA does not anticipate that the Proposed Acquisition would adversely affect grade crossing safety in quiet zones.

Pedestrian-Only Grade Crossings

OEA identified 31 pedestrian-only grade crossings in the study area. **Appendix H** presents the current crossing protection and historical fatal and casualty crashes for these 31 pedestrian-only grade crossings.

3.2.3.2 No-Action Alternative

Under the No-Action Alternative, the Board would not authorize the Proposed Acquisition and CP would not acquire KCS. Therefore, impacts related to safety at grade crossings and pedestrian-only grade crossings would not occur as a result of the Proposed Acquisition. However, rail traffic at grade crossings and pedestrian-only grade crossings could increase in the future due to changing market conditions, including general economic growth, under the No-Action Alternative, which would affect grade crossing safety.

3.2.4 Conclusion

If the Board authorizes the Proposed Acquisition, OEA estimates that the number of crashes at grade crossings would increase by 0.005 crashes per grade crossing per year, on average, in the study area. Across all ~~1,134~~1,270 grade crossings in the study area that met the criteria for safety analysis, the total predicted number of crashes would be 31.7~~24.9~~ crashes per year under the Proposed Acquisition, compared to 25.5~~19.1~~ crashes per year under the No-Action Alternative, which is a difference of 6.2~~5.8~~ crashes per year. Across all ~~1,134~~1,270 grade crossings in the study area, the total predicted number of train-pedestrian crashes would be 2.9~~2~~ crashes per year under the Proposed Acquisition, compared to ~~1.7~~2.3 crashes per year under the No-Action Alternative, which is a difference of 0.6~~5~~ crashes per year. While OEA thus expects that the Proposed Acquisition would result in an increase in the number of crashes in the study area, the number of crashes at grade crossings along other rail lines in the U.S. and on roadways could decrease as the result of the diversion of rail traffic from other rail lines to the combined CPKC network and the diversion of truck traffic to rail traffic.

To reduce grade crossing safety impacts, the Applicants have voluntarily proposed mitigation measures. These measures include a commitment to making Operation Lifesaver programs available to affected communities, including schools and other organizations (see *Chapter 4, Mitigation*, VM-EJ-02). Operation Lifesaver is a non-profit education and awareness program that helps increase the public's awareness of the dangers around rail lines. In addition, the Applicants have committed to work with affected communities upon request in support of securing funding for increasing the safety of existing grade crossings (VM-Grade Crossing-01) and to consult with affected communities to improve visibility at grade crossings by clearing vegetation, where practicable (VM-Grade Crossing-03). The Applicants have also committed to notifying appropriate Emergency Services Dispatching Centers if grade crossings become blocked by trains that may be unable to move for a prolonged period of time (VM-Grade Crossing-06). The Applicants have also committed to funding improvements necessary to allow communities with existing quiet zones to maintain their quiet zone designation if an increase in rail traffic resulting from the Proposed Acquisition would otherwise cause the quiet zone to fall out of compliance with FRA's quiet zone regulations (VM-Noise-01). These mitigation measures would also address pedestrian safety at grade crossings and elsewhere.

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, which could include impacts related to grade crossing safety. 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 Intelligent Transportation Systems (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).[1]

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 mitigation measure requiring the Applicants to consult with appropriate state Departments of

[1] 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 to 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 to transmit 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.

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 safety.

~~Because impacts related to grade crossing safety would be minor and would be reduced by the mitigation measures proposed by the Applicants, OEA is not recommending any additional mitigation measures for grade crossing safety.~~

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

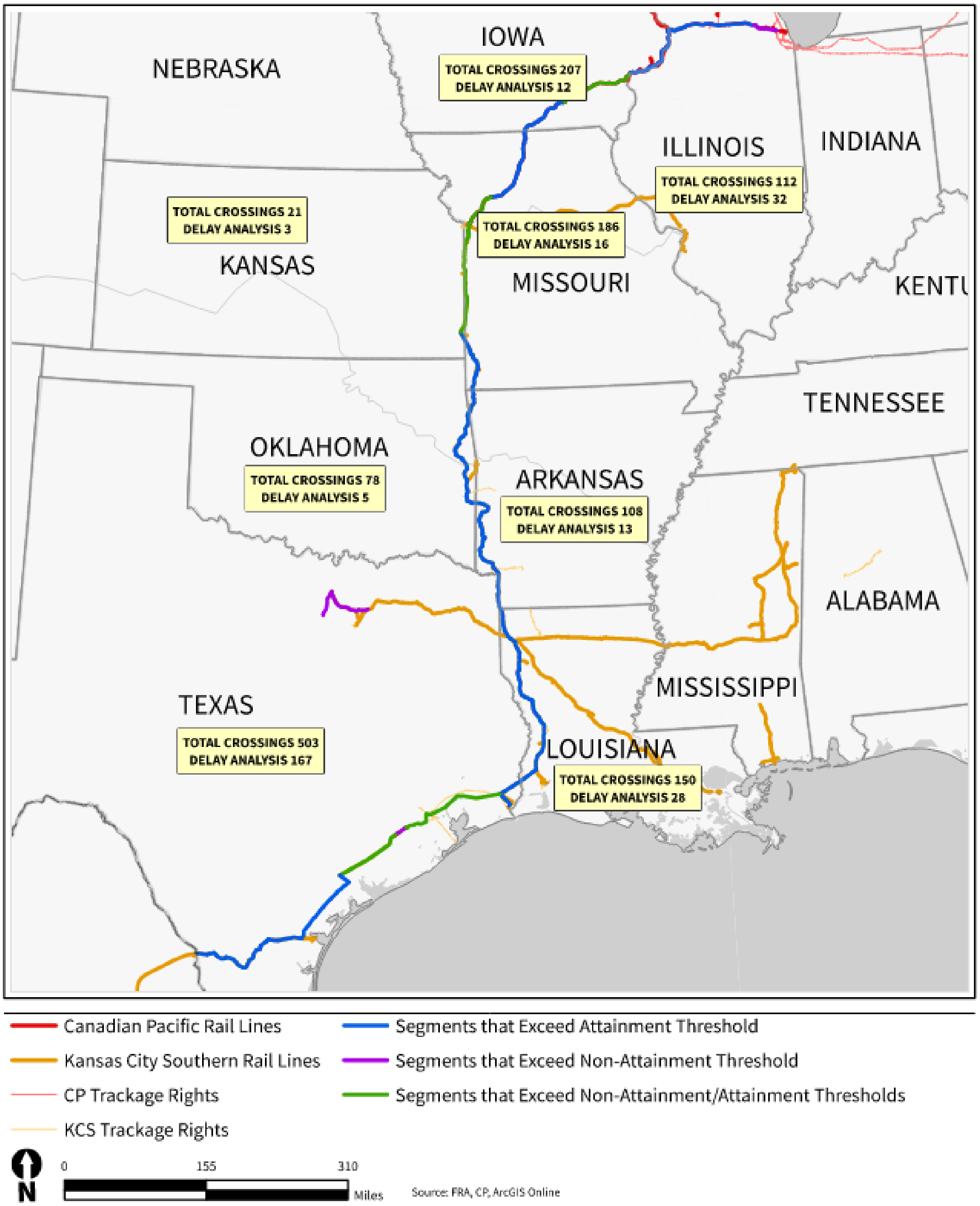
OEA identified a total of 1,365~~1,352~~ public grade crossings in the study area. Of these, OEA identified 276~~7~~ grade crossings that have an AADT of 2,500 or more vehicles per day (**Figure 3.3-1**). These 276~~7~~ grades crossings are distributed along the CP mainline, extending west and then south 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

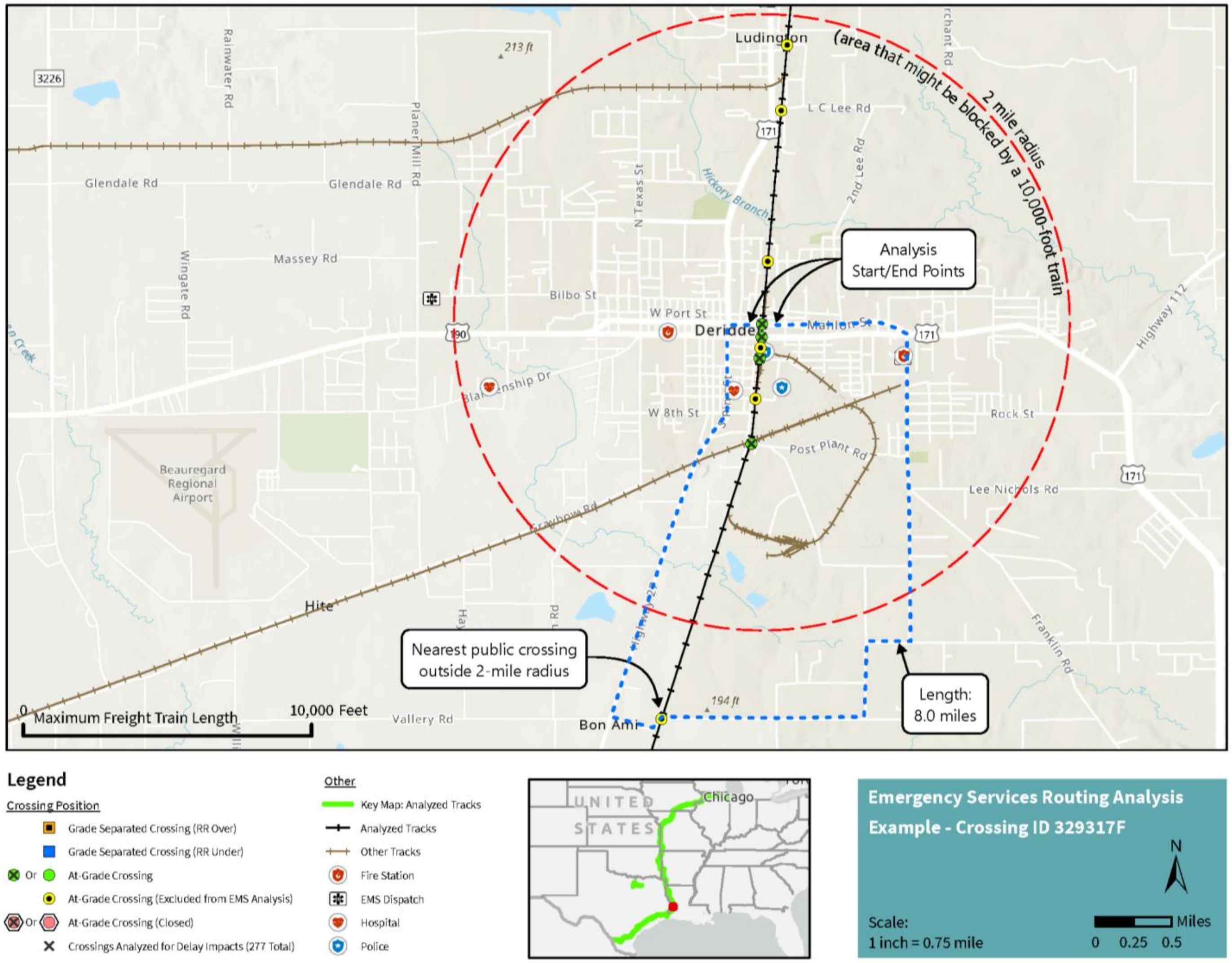


Table 3.3-2. Grade Crossings along Emergency Vehicle Routes designated by FRA

State	City	Street	Crossing ID	AADT	No-Action Alternative: Average Delay per Vehicle in 24-hour Period (seconds)	No-Action Alternative: LOS	Proposed Acquisition: Average Delay per Vehicle in 24-hour Period (seconds)	Proposed Acquisition: LOS	Alternate Route	Alternate Route Distance (miles)	Alternate Route Speed Limit(s) (mph)
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: Average Delay per Vehicle in 24-hour Period (seconds)	No-Action Alternative: LOS	Proposed Acquisition: Average Delay per Vehicle in 24-hour Period (seconds)	Proposed Acquisition: LOS	Alternate Route	Alternate Route Distance (miles)	Alternate Route Speed Limit(s) (mph)
									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) 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
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)		Distance to Opposite Side of Crossing via Nearest Alternate Route (miles)	Alternate Route Speed Limit (mph)	Comments
			No-Action Alternative	Proposed Acquisition			
							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.

3.4 Truck-to-Rail Diversions

This section describes the approach, affected environment, and potential environmental consequences for truck-to-rail diversion. The Proposed Acquisition could result in impacts on traffic and roadway systems by diverting freight from truck transportation to rail transportation, which would decrease the number of trucks along certain trucking routes. While this section focuses on the impact of truck-to-rail diversions on vehicular traffic, those diversions would also affect the movement of energy commodities and energy efficiency, as discussed in *Section 3.8, Energy*. *Section 3.7, Air Quality and Climate Change*, discusses the implications of truck-to-rail diversion on air quality and climate change.

3.4.1 Approach

The Applicants predict that the Proposed Acquisition would reduce truck transportation on certain U.S. highways because some freight that currently moves by truck would move by rail instead. The Applicants project that the Proposed Acquisition would reduce truck traffic by approximately 64,018 trucks per year along various highway routes. The total distance that trucks would travel would be reduced by approximately 80,371,708 truck-miles under the Proposed Acquisition compared to the No-Action Alternative. The approach that the Applicants used to make these projections is detailed in the Applicants' application, and additional information is also provided in **Appendix I** of this Draft EIS.

The truck-to-rail diversion study area includes highways on which truck traffic would decline as a result of the Proposed Acquisition. OEA expects that truck traffic would decrease along the major north-south trucking routes across the Midwest, including between the Detroit/U.S.-Canada border ports and Dallas/San Antonio/U.S.-Mexico border ports (approximately 1,490 miles on average); between Chicago and Dallas/San Antonio/U.S.-Mexico border ports (approximately 1,185 miles on average); and between Minneapolis and Dallas/San Antonio/U.S.-Mexico border ports (approximately 1,208 miles on average).

As described in detail in **Appendix I**, OEA assessed the potential impacts of truck-to-rail diversions using industry standard capacity evaluation procedures and highway network data derived from the Freight Analysis Framework (FAF) and the Highway Performance Monitoring System (HPMS). The FAF is a transportation modeling tool produced through a partnership between the Bureau of Transportation Statistics (BTS) and FHWA that integrates data from a variety of sources to create a comprehensive picture of freight movement among states and major metropolitan areas by all modes of transportation (BTS 2018). The HPMS is a national highway information system that includes data on the extent, condition, performance, use, and operating characteristics of the nation's highways. Critical information in the HPMS includes highway class, speed limit, number of travel lanes, terrain, current year AADT, single unit and combination truck volumes, directional split factors (D-factor), design hourly volume factors (K-factor), future year (2039/2040) AADT, and other geometric and control information that have impacts on the potential capacities of the highway facilities.

OEA identified highways on which truck traffic could decrease as a result of the Proposed Acquisition, based on the origins and destinations (O/D) for truck traffic described in the Applicants' application. Each O/D pair represents a trade flow between two geographical areas with distinct economic markets, corresponding to "Business Economic Areas" based around cities in the U.S., "Canadian Metropolitan Areas" in Canada, and "federal entities" or states in Mexico. The Applicants identified approximately 115 O/D pairs including, for example, Dallas, Texas to Detroit, Michigan; Chicago, Illinois to Nuevo Leon, Mexico; and Toronto, Canada to Kansas City, Missouri (see **Table I.1-1, Appendix I**). OEA simplified this list of O/D pairs by replacing locations in Mexico and Canada with the most logical border crossing into the U.S. OEA then used the FAF to model the likely route that trucks would take between each O/D pair, taking into account highway, roadway, and traffic data included from the HPMS (see **Figure I.1-1**, **Appendix I**).

OEA conducted a capacity evaluation and performance assessment following the *Highway Capacity Manual 6th Edition* (HCM) (Transportation Research Board 2016) approach, while adopting the simplified capacity evaluation methods in HPMS. OEA grouped and evaluated highways based on similarities in geometrics and traffic control methods. OEA then conducted capacity evaluations for each FAF/HPMS-designated highway segment based on its facility type, including freeway facilities, multilane highways, two-lane highways, and signalized corridors. OEA quantified the effect of reduced truck traffic in terms of the volume to capacity (v/c) ratio averaged across highway routes, states, and the country as a whole. The v/c ratio is a commonly used measure of how sufficient an intersection is for handling the traffic that passes through it. A v/c ratio less than 0.85 is generally adequate capacity, and vehicles are not expected to experience significant queues and delays. As the v/c ratio approaches 1.0, traffic flow may become unstable, and delay and queuing conditions may occur. A v/c ratio greater than 1.0 results in the demand exceeding capacity and traffic flow is unstable and excessive delay and queuing is expected (FHWA 2016).

3.4.2 Affected Environment

Based on the latest available data (2018) published by BTS, truck transports account for 38.7 percent of the 5.25-million-ton annual volume of freight throughout the U.S., in comparison with 32.9 percent that moves by rail. The major truck movement corridors that the Proposed Acquisition could affect are as follows:

- Approximately 113,245 annual highway loads travel an average distance of 1,490 miles between the Detroit/U.S.-Canada border ports to Dallas/San Antonio/U.S.-Mexico border ports.
- Approximately 78,125 annual highway loads travel an average distance of 1,185 miles between Chicago to Dallas/San Antonio/U.S.-Mexico border ports.
- Approximately 52,321 annual highway loads travel an average distance of 1,208 miles between Minneapolis to Dallas/San Antonio/U.S.-Mexico border ports.

3.4.3 Environmental Consequences

3.4.3.1 Proposed Acquisition

OEA determined that the Proposed Acquisition would have some beneficial impacts to the highway system by diverting freight from trucks to rail (**Figure 3.4-1**). The projected reduction in truck traffic on the U.S. highway network of approximately 64,018 trucks annually (**Table I.1-1**, **Appendix I**) could potentially result in marginal benefits in terms of highway performance compared to the No-Action Alternative. OEA estimates that 9,765 miles of highways would, on average, experience a traffic decrease of 0.071 percent, while the v/c ratio would decrease by 0.033 percent, on average. Midwestern states, including Texas, Oklahoma, Illinois, and Missouri, among others, would see the most benefit to roadways from trucks being removed from the roadway network under the Proposed Acquisition. These highways support more than 113 trillion vehicle miles traveled (VMT), including 26.9 trillion truck-miles traveled. Among roadways that would be beneficially affected by the diversion of truck transportation to rail, 82.5 percent are classified as freeways with full control of access, 10.3 percent are multilane highways, 6.6 percent are two-lane highways, and 0.6 percent are signalized corridors. Most roadways are within rural areas (78 percent), and about 58 percent of roadway segments have reported truck percentages of 25 percent or greater. The Proposed Acquisition would not change the percentage of the highway network operating near, at, or over capacity compared to the No-Action Alternative.

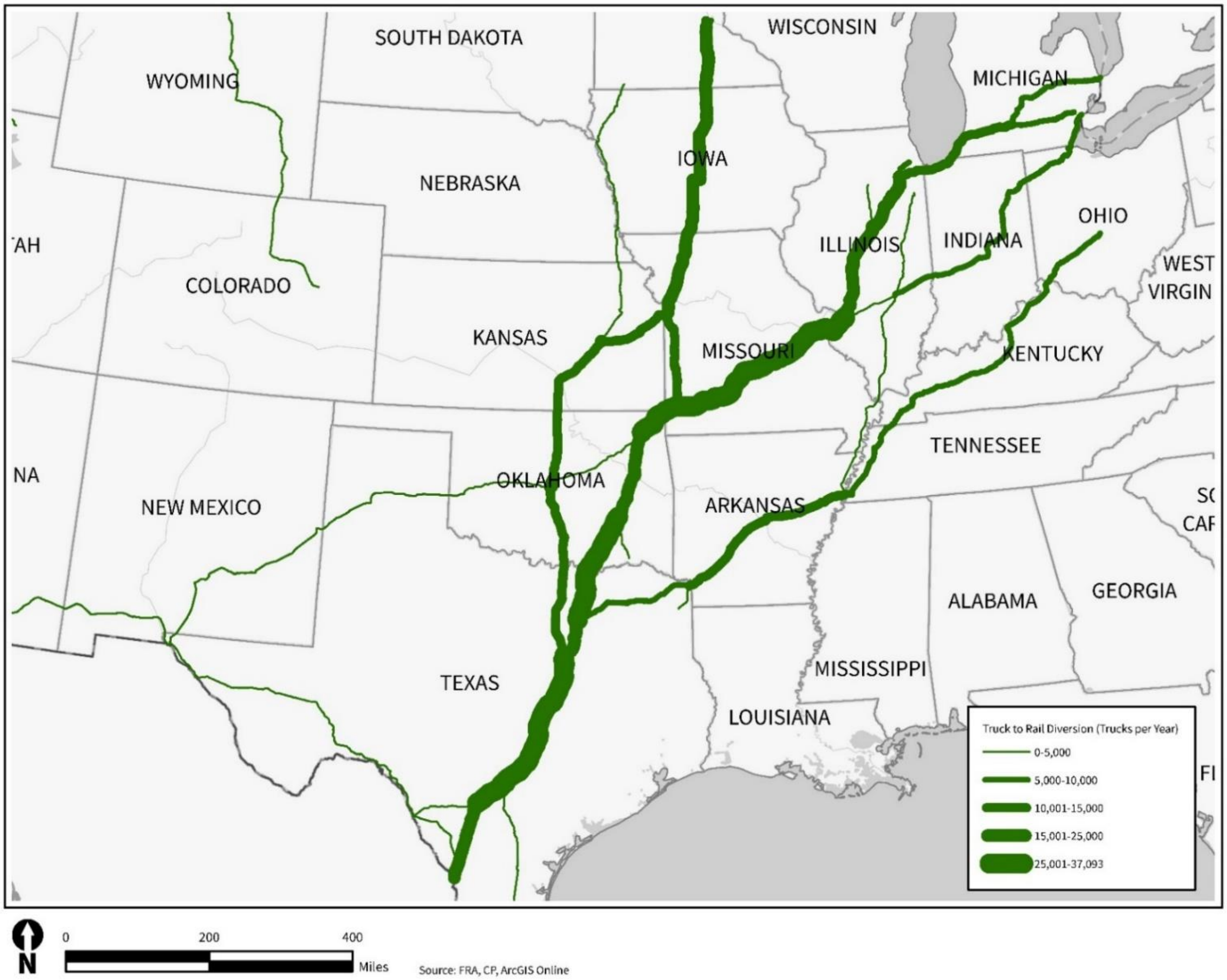
3.4.3.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Acquisition would not cause the diversion of freight from truck transportation to rail transportation. Based on existing traffic on roadways in the study area and projected growth rates, OEA estimates that 16 percent of the highway network would operate near capacity, 4 percent would operate at capacity, and 7 percent would operate over capacity in 2027 under the No-Action Alternative.

3.4.4 Conclusion

As evidenced in the analysis, the Proposed Acquisition would result in the diversion of trucks from the highway network system, which could provide some benefits to the highway system (**Figure I.1-3** in **Appendix I**). The capacity evaluation shows that the roadway network could have a 0.071 percent reduction of VMT, and a 0.00033 reduction, from 0.40450 to 0.40417, in v/c ratio. Because the Proposed Acquisition would not result in any adverse impacts to traffic and roadway systems as a result of truck-to-rail diversions, OEA is not recommending any mitigation related to traffic and roadway systems.

Figure 3.4-1 Primary Roadway Network Truck Diversions



Source: FRA, CP, ArcGIS Online

3.5 Intermodal Facility Traffic

This section describes the approach, affected environment, and potential environmental consequences for intermodal facility traffic. The Proposed Acquisition could result in impacts on traffic and roadway systems by increasing operations at certain intermodal facilities, which could increase truck traffic on local roadways that provide access to those facilities.

3.5.1 Approach

The Applicants' Operating Plan identified U.S. intermodal facilities that would experience increases in truck traffic on nearby local roads as a result of the Proposed Acquisition. OEA analyzed six intermodal facilities that the Applicants project would experience an increase in truck traffic of at least 50 trucks per day, a 10 percent increase in average daily truck traffic, or both (**Table I.2-1** in **Appendix I**). OEA identified local roadways near the six intermodal facilities, as well as major routes and connecting routes. OEA also considered limiting factors, such as truck route designations, truck restrictions (signed or physical), and minor local roadways. Based on these criteria, applicable roadway segments were selected for evaluation. For the purposes of this analysis, OEA assumed there would be no physical changes to roadway networks resulting from the Proposed Acquisition.

OEA calculated the AADT for the 2027 No-Action Alternative using the base year 2022 AADTs with a 1.5 percent annual organic growth rate, derived from a survey of sample data from the HPMS. OEA estimated traffic in 2027 under the Proposed Acquisition by adding the projected additional truck trips to the base 2027 AADTs.

OEA conducted a capacity analysis for the roadway network based on the HCM (Transportation Research Board 2016), the Simplified Highway Capacity Calculation Method for the HPMS, and Generalized Service Volume Tables in HPMS. For roadway segments where HPMS data were not available, OEA used the HCM default values based on the roadway's functional class, context (urban, small urban, or rural), and observations of traffic data at the state and local levels. OEA conducted a capacity evaluation separately for freeway (full control of access), multilane highway (partial or no control of access), two-lane highway (partial or no control of access), and signalized highway corridors.

OEA calculated v/c ratios for roadways in the study area based on AADTs and service volumes reported in FHWA's Simplified Highway Capacity Calculation Method Tables (FHWA 2018).[1] OEA determined facility performance capacity using the service volumes associated with LOS E. A roadway segment operating at LOS E represents a perceptible level of delay for drivers and roadway conditions that are nearing over capacity. For this assessment, a v/c ratio over 1.0 represents a roadway where the calculated volumes exceed the assigned capacity.

---

1 The v/c ratio, also referred to as degree of saturation, represents the sufficiency of an intersection to accommodate the vehicular demand (FHWA 2013).

See **Appendix I** for more details on the approach for intermodal facility traffic.

3.5.2 Affected Environment

The local roadways near the six intermodal facilities are primarily used by motor vehicles, including passenger vehicles and trucks. However, in more urban areas, pedestrian and bicycle facilities are also present along some of the roadways. The Intermodal Facility Summary Tables (**Tables I.2-1** through **I.2-9**) in **Appendix I** provide a detailed summary of segments that OEA identified along the local roadways. OEA determined the capacity of each roadway segment based on roadway characteristics and service volumes, as explained in detail in **Appendix I**. OEA determined the v/c ratios for each roadway segment based on the current AADT of the segment and the projected AADT under the Proposed Acquisition and the No-Action Alternative. OEA identified four roadway segments that are currently operating with a v/c over 1.0 (exceeding the roadway capacity): one segment at the Minneapolis Intermodal Management System facility at Minneapolis, Minnesota; one segment at the International Freight Gateway in Kansas City, Missouri; and two segments at the Wylie KCS Terminal in Wylie, Texas. All other roadway segments currently operate within the roadway capacity, based on the v/c ratios that OEA calculated.

3.5.3 Environmental Consequences

3.5.3.1 Proposed Acquisition

The Proposed Acquisition would result in increased truck traffic on some local roads in the vicinity of intermodal facilities because activities at those intermodal facilities (such as loading and unloading trains) would increase. However, the Proposed Acquisition would not cause the v/c ratio to exceed 1.0 for any roadway segments beyond those that would already exceed 1.0 under the No-Action Alternative. OEA estimated that the v/c ratio on roadways near intermodal facilities would increase by less than 0.0045 as compared to the No-Action Alternative, which is a minor increase that would have a negligible effect on safety or delay on those roads. As shown in **Table I.2-3** in **Appendix I**, OEA projects that the Proposed Acquisition would result in an increase in average truck trips per mile of less than 1.5 percent for all intermodal facilities. Based on the results of the intermodal facility network assessment, this projected increase in truck traffic would not result in degradation along the network roadways as compared to the No-Action Alternative. **Table I.2-4** through **Table I.2-9** in **Appendix I** provide a detailed summary table of roadway segments for each intermodal facility.

3.5.3.2 No-Action Alternative

Under the No-Action Alternative, the Board would deny the Proposed Acquisition and CP would not acquire KCS. Therefore, there would be no increase in activities at intermodal facilities and no increase in truck traffic on roadways near intermodal facilities as a result of the Proposed Acquisition. However, OEA expects that activities at intermodal facilities and truck traffic on nearby roadways would increase as a result of general economic growth. OEA predicts that increased truck traffic unrelated to the Proposed Acquisition would cause three roadway segments near intermodal facilities in the study area to exceed roadway capacity (i.e., the v/c ratio would increase from less than 1.0 to more than 1.0). Two of those roadway segments are located near the Wylie KCS Terminal and one segment is located near the International Freight Gateway. **Table I.2-4** through **Table I.2-9** of **Appendix I** provides a detailed summary table of roadway segments in the study area for each intermodal facility.

3.5.4 Conclusion

The Proposed Acquisition would result in an increased number of trucks on roadways near the six intermodal facilities that OEA evaluated. However, the additional trucks would account for only a small proportion of total daily traffic on roadways near those facilities and the v/c ratios for those roadways would be largely unaffected. As a result, OEA concludes that these increases would have a negligible effect on the networks surrounding the intermodal facilities. Accordingly, OEA is not recommending any mitigation related to effects on local roadways near intermodal facilities.

3.6 Noise and Vibration

This section describes the existing conditions and potential environmental consequences for noise and vibration under the Proposed Acquisition and the No-Action Alternative. As detailed in this section, the Proposed Acquisition would introduce additional train traffic and increase freight handled at rail yards and intermodal facilities, which would increase noise in nearby communities. The Proposed Acquisition would also cause temporary construction noise and vibration related to the 25 planned capital improvements, which could affect nearby communities.

3.6.1 Approach

This subsection describes the approach that OEA used to analyze noise and vibration under the Proposed Acquisition and the No-Action Alternative.

3.6.1.1 Noise and Vibration Study Area

The study area for noise and vibration includes rail line segments, rail yards, and intermodal facilities where the Proposed Acquisition would result in increased rail traffic, increased vehicular traffic, or increased activities that would exceed the thresholds set forth in the Board's regulations at 49 C.F.R. § 1105.7(e)(6). **Table 3.6-1** shows the thresholds for noise and vibration analysis for rail line segments, rail yards, and intermodal facilities.

Table 3.6-1. Thresholds for Noise Analysis

Activity	Threshold
Rail Line Segment	An increase in rail traffic of at least 100 percent (measured in GTMs annually) or an increase of at least eight trains per day on any segment of rail line affected by the Proposed Acquisition.
Rail Yard	An increase in rail yard activity of at least 100 percent (measured by carload activity).
Intermodal Facility	An average increase in truck traffic of more than 10 percent of the average daily traffic or 50 vehicles a day on any affected road segment.

Source: 49 C.F.R. § 1105.7(e)(6)

In addition to rail line segments, rail yards, and intermodal facilities where analysis thresholds would be met, the noise and vibration study area also includes the locations of 25 planned capital improvements. If the Board authorizes the Proposed Acquisition, the Applicants intend to add new sidings, extend existing sidings, add double track, and add facility working track at these locations to support the projected increase in rail traffic. As shown in **Figure 3.6-1** the noise and vibration study area extends along CP mainlines from Bensenville, Illinois to Kansas City, Missouri; along KCS mainlines from Kansas City to Port Arthur, Texas; and from Rosenberg, Texas to Laredo, Texas.

In response to public comments on the Draft EIS, OEA expanded the study area for noise and vibration to also include rail line segment U-BEAU-01, which extends from Beaumont, Texas to Rosenburg and passes through the Houston area. This rail line segment is part of

UP's Houston Subdivision and Glidden Subdivision. KCS currently operates trains on this segment under a trackage rights arrangement with UP, the segment's owner. If the Board authorizes the Proposed Acquisition, CPKC would continue to operate on this segment under a trackage rights arrangement. The Applicants project that the Proposed Acquisition would increase rail traffic on segment U-BEAU-01 by 7.57 trains per day, on average, which is less than the noise analysis threshold of eight trains per day.

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. 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, OEA understands 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 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 noise and vibration impacts of the Proposed Acquisition in the Houston area.

The noise and vibration study area also includes the areas surrounding the Bensenville, Schiller Park, Detroit Container Terminal, Wylie, Minneapolis, and International Freight Gateway intermodal facilities and the Schiller Park Rail Yard. At these locations, there would be an increase in rail yard activity of at least 100 percent (measured by carload activity) and/or an average increase in truck traffic of more than 10 percent of the average daily traffic or 50 vehicles per day on any affected road segment.

Figure 3.6-1. Noise and Vibration Study Area

3.6.1.2 Background Information

Noise

Noise is unwanted or undesirable sound. Sound is the result of small vibrations that cause air pressure to oscillate above and below the ambient atmospheric pressure, which humans perceive through their sense of hearing. This section describes noise impacts on humans, but noise may also affect wildlife, as described in *Section 3.11, Biological Resources*. The basic parameters of sound that affect how humans perceive it are:

- Sound level;
- Sound frequency; and
- Variation in sound over time.

Sound level is determined by how greatly the sound pressure fluctuates above and below the atmospheric pressure and is expressed on a compressed scale in units called decibels (dB). Values between 0 and 120 dB fall in the range of normally encountered sound.

The frequency of sound relates to its tone or pitch, which is determined by the rate of air pressure fluctuation and is expressed in terms of cycles per second or Hertz (Hz). The human ear can detect a wide range of frequencies, from about 20 Hz to 17,000 Hz. Because the sensitivity of human hearing varies with frequency, sound is measured for environmental noise commonly using a weighting system to provide a single-number descriptor that correlates with subjective human response. Sound levels measured using this weighting system are called "A-weighted" and are expressed in decibel notation as "dBA." Sound and noise experts widely accept the A-weighted sound level as a unit for describing environmental noise.

Because sound levels fluctuate from moment to moment, there are different ways to characterize the range of sound levels over a period of time. This is commonly done using the following sound level metrics:

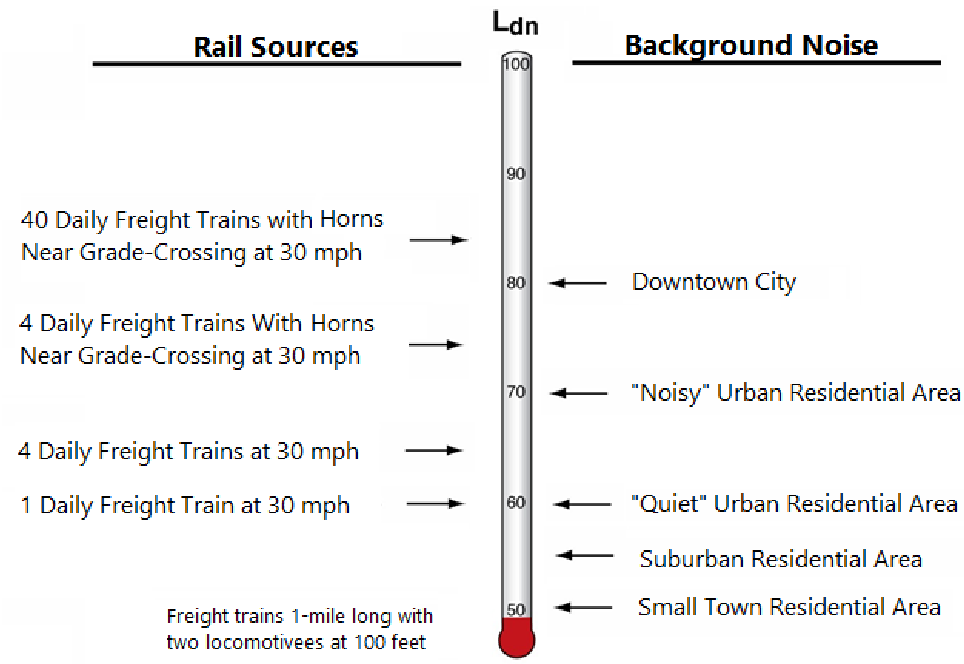
- **Lmax** is the maximum instantaneous A-weighted sound level. The Lmax represents the highest sound level generated by a source.
- **Leq** is the energy-average sound level. The Leq is a single value that is equivalent in sound energy to the fluctuating levels over a period. The Leq accounts for how loud noise events are, how long they last, and how many of them occur.
- **Ldn** is the day-night average sound level. The Ldn is a single value equivalent to the sound energy fluctuating over 24 hours with a 10-dB penalty applied to sound at night (10:00 p.m. to 7:00 a.m.). The Ldn accounts for how loud noise events are, how long they last, how many of them occur over a 24-hour period, and how many occur at night.
- **SEL** is the sound exposure level. The SEL is a single-value equivalent to the total sound energy from an event normalized to one second. The SEL is a fundamental measure of sound from a source used to determine Leq and Ldn levels.

Because sound levels are measured in decibels, adding sound levels is not linear. When two equal sources of sound are added together, the overall sound level increases by 3 dB. For example, 60 dB plus 60 dB equals 63 dB. Research indicates the following relationships between A-weighted sound level and human perception:

- A 3-dB increase in sound level is a doubling of acoustic energy and is generally the threshold of perceptibility to the average person. This means that if a constant source of sound increases by less than 3 dB, that difference is usually not perceptible to the average person.
- A 10-dB increase is a tenfold increase in acoustic energy and is perceived as a doubling in loudness.

Figure 3.6-2 presents the typical range of background Ldn noise levels, based on setting and typical Ldn noise levels, generated by freight train activity, at a distance of 100 feet from the tracks.

Figure 3.6-2. Typical Ldn Noise Levels



Source: Federal Transit Administration (FTA) 2018

EPA, in consultation with the USDOT, regulates noise from railroad equipment and facilities pursuant to Section 17 of the Noise Control Act of 1972, 42 U.S.C. § 4916. EPA regulates railroad noise by controlling the noise at the source—locomotives and rail cars. For example, EPA’s regulations at 49 C.F.R. § 201.11(c) limit sound levels from stationary locomotives manufactured after December 31, 1979 to 87 dBA at a distance of 100 feet at any throttle setting except idle and to 70 dBA at idle throttle setting. EPA’s regulations at 49 C.F.R. § 201.12(c) limit sound levels from locomotives manufactured after December 31, 1979, while moving at any speed to 90 dBA at a distance of 100 feet.

To characterize noise impacts, OEA considers not only the source of noise, but also existing background noise levels, as well as sensitivity to noise. Noise especially affects people in certain locations, such as schools, places of worship, libraries, hospitals, residences, retirement communities, and nursing homes, and these locations are therefore known as noise-sensitive receptors (hereafter, receptors). The Board's regulations at 49 C.F.R. 1105.7(e)(6) include two specific thresholds for noise analysis as follows:

- An increase in noise exposure as measured by a day-night average noise level, and
- 3 dBA or more.

If the thresholds are exceeded, OEA identifies the receptors in the project area and quantifies the noise increase for these receptors. An adverse noise impact occurs when the noise level at a receptor increases by 3 dBA or more and reaches or exceeds a Ldn of 65 dBA when combined with the existing background noise. Research indicates that both of these conditions must be met or exceeded to cause an adverse noise impact from rail operations (Surface Transportation Board 1998; Coate 1999).[1]

Unlike noise from rail operations, noise from construction activities are temporary in nature. The Federal Transit Administration (FTA) has developed general methods for assessing noise impacts from construction activities related to transportation, including noise impacts from construction equipment. **Table 3.6-2** shows FTA's criteria for construction noise, expressed in Leq. These criteria are based on the noise levels that FTA has found to cause annoyance in humans. They depend on the type of land use category and whether construction occurs during the day or night.

Table 3.6-2. Construction Noise Criteria

	Construction Noise Criteria (Leq, dBA)	
Land Use Category	**Day**	**Night**
Residential	80	70
Commercial	85	85
Industrial	90	90

Source: FTA 2018

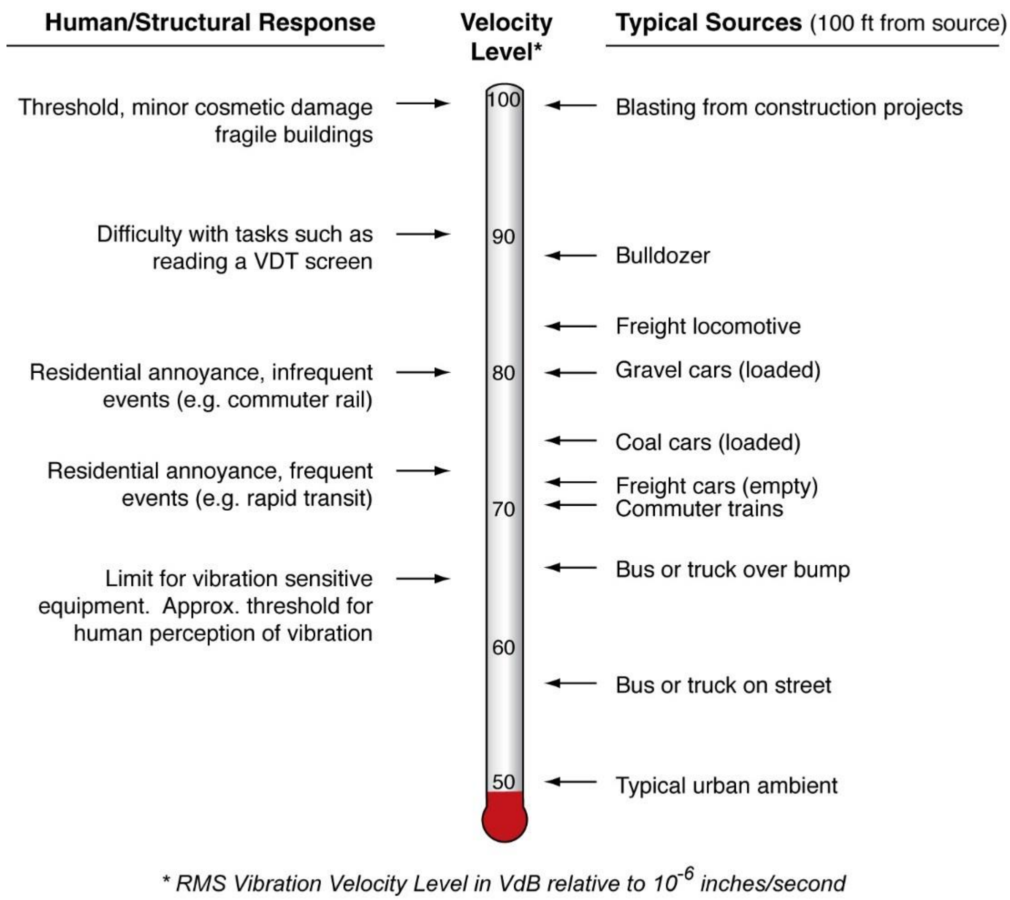
Vibration

Ground-borne vibration is the oscillatory motion (moving back and forth) of the ground around an equilibrium position. Vibration can be a concern because it can annoy people and, if it is strong enough, damage buildings and other structures. When evaluating annoyance, vibration is measured in terms of decibels with "VdB" used in place of dB to avoid confusing vibration decibels with sound decibels. For annoyance impacts, receptors are generally the same as for noise because vibrations can annoy people inside buildings like schools, residences, libraries, nursing homes, hospitals, and places of worship. When evaluating potential damage to structures, vibration is measured in terms of the peak-particle velocity (PPV) in inches per second. Building damage thresholds are much higher than

[1] Although the Board's regulations at 49 C.F.R. § 1105.7(e)(6) indicate that either an increase of 3 dBA or an increase to an Ldn of 65 dBA would be an adverse impact, research indicates that both of these conditions must be met or exceeded for an adverse noise impact from rail operations to occur.

human annoyance thresholds. **Figure 3.6-3** illustrates a range of vibration levels using typical sources as examples. It also includes typical human responses to thresholds and levels generated by common sources.

Figure 3.6-3. Typical Ground-Borne Vibration Levels



Source: FTA 2018

Although federal regulations do not set thresholds for ground-borne vibration from train operations, FTA's *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018) provides guidance on evaluating and assessing potential adverse vibration effects. **Table 3.6-3** shows FTA's criteria for construction-related vibration, based on the thresholds at which FTA determined that damage to different types of buildings could occur. As the table shows, most modern buildings without plaster have a vibration threshold of 0.5 inches per second, while some historic buildings that are particularly susceptible to vibration damage have a lower threshold of 0.12 inches per second. If vibration levels should exceed these thresholds, it does not necessarily mean that structural damage would occur but rather that there would be an increased potential for damage.

Table 3.6-3. Construction Vibration Criteria

Building Category	Vibration Threshold peak particle velocity (PPV) (in/s)	Vibration Threshold (VdB)
I. Reinforced-concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: FTA 2018

Vibrations caused by passing trains are generally not nearly strong enough to cause damage to even the most susceptible buildings. OEA has concluded in past cases that vibration from passing trains has the potential to exceed FTA's criteria for fragile buildings only within the rail ROW, where no such buildings are present. Outside of the rail ROW, vibration could cause annoyance, but not damage to structures (Surface Transportation Board 2015; Surface Transportation Board 2021). **Table 3.6-4** shows FTA's criteria for annoyance impacts from vibration. Because even events that cause lower levels of vibration can be annoying if they occur often throughout the day, FTA's criteria depend on the frequency of events, as well as the type of receptor.

Table 3.6-4. Vibration Impact Criteria

Land Use Category	Vibration Level (VdB)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Special-use Buildings	65	65	65
Residential	72	75	80
Institutional	75	78	83

Source: FTA 2018
[1] Frequent events correspond to more than 70 trains per day
[2] Occasional events correspond to 30 to 70 trains per day
[3] Infrequent events correspond to fewer than 30 trains per day

For most of the rail lines in the study area, the total projected rail traffic under the Proposed Acquisition would be fewer than 30 trains per day, so the criteria for infrequent events would apply. Along rail lines where there would be between 30 and 70 projected trains per day under the Proposed Acquisition, such as the segment between Shreveport, Louisiana and Frierson, Louisiana, the occasional events criteria would apply.

3.6.1.3 Noise and Vibration Measurements

To characterize the sound and vibration from trains in the study area, OEA conducted sound level measurements of freight train operations at 10 locations and vibration measurements at seven locations in the study area. OEA selected the measurement sites to include several locations spread throughout the study area near receptors where there were a relatively high number of existing daily train operations. OEA selected sites to capture both CP and KCS train operations along relatively straight track segments with typical train speeds. OEA conducted sound level measurements on wayside segments of track and near or at grade crossings to determine levels with and without the train horn. OEA collected these data to supplement the broader set of data available on sound and vibration emissions of freight trains and to evaluate actual measurements with the emissions that were previously used in other railroad mergers (Surface Transportation Board 1997; Surface Transportation Board 2015; Surface Transportation Board 2021). See **Appendix M** for further information on the measurement results.

OEA conducted noise measurements at locations near Davis Junction, Illinois; Stillman Valley, Illinois; Clinton, Iowa; Kansas City, Missouri; Grandview, Missouri; and Shreveport, Louisiana. OEA calculated the SEL, Leq, and frequency content of locomotives, railcars, and horns from these sound level measurements. The sound level results include:

- Locomotives generated sound levels from 85 to 100 dBA (SEL), with an average of 92 dBA (SEL), depending on train speed.
- Horns typically ranged from 106 to 116 dBA (SEL), with an average of 108 dBA (SEL) at locations between a quarter mile and an eighth mile from grade crossings and 111 dBA (SEL) at the grade crossing.
- Railcars generated 63 to 83 dBA (Leq), with an average of 75 dBA (Leq), depending on train speed.

These sound measurements are relatively consistent with prior OEA environmental reviews, including the Conrail merger (Surface Transportation Board 1997), and the Tongue River Railroad (Surface Transportation Board 2015), and Uinta Basin Railway (Surface Transportation Board 2021) construction cases. Therefore, OEA used the same reference noise levels as those prior projects to model potential noise increases that could result from the Proposed Acquisition. *Section 3.6.3, Environmental Consequences*, presents the results of OEA's model.

OEA conducted vibration measurements from passing trains at locations near Davis Junction; Stillman Valley, Illinois; Clinton, Iowa; Kansas City, Missouri; and Shreveport, Louisiana. The intensity of the vibrations that OEA measured varied between sites due to different soil conditions and rail conditions (see **Appendix M**). Train speed and distance from the tracks also affected the vibration measurements. Overall, OEA's vibration measurements were generally consistent with FTA's general ground-borne vibration curves (see **Appendix M**). Therefore, OEA used FTA's vibration curves as the basis for modeling predicted vibration resulting from the Proposed Acquisition.

3.6.1.4 Noise Modeling Methods

Freight Train Noise

OEA used a sound prediction software program to predict noise from freight rail operations throughout the study area. The noise modeling software, Cadna-A, implements the International Standards Organization Standard 9613-2:1996, "Acoustics—Attenuation of

Sound During Propagation Outdoors— Part 2: General Method of Calculation." Cadna-A is a three-dimensional model that accounts for the sound emissions of sources in octave-bands, terrain, intervening objects such as buildings, ground cover, and atmospheric conditions. OEA modeled noise levels from locomotives, railcars, and horns in octave-bands from 31.5 to 8,000 Hz.

OEA calculated noise levels (Ldn) at a reference distance of 100 feet for each track segment using equations based on the daily train volumes, number of locomotives, train length, and speed, assuming flat, acoustically soft ground conditions (see **Appendix M** for details). These track segments included:

- Wayside track (without horns);
- The first half of horn-sounding segments (within one quarter to one eighth mile from the grade crossing);
- The second half of horn-sounding segments (within one eighth mile to the grade crossing); and
- Noise at planned track siding locations, where locomotives would idle.

Based on freight train emissions used in prior cases, OEA predicted that the sound emissions would be:

- 95 dBA (SEL) at 100 feet from a single locomotive moving at 40 mph;
- 82 dBA (Leq) at 100 feet from railcars moving at 40 mph;
- 110 dBA (SEL) within one eighth mile from a crossing for train horns;
- 107 dBA (SEL) between one fourth mile and one eighth mile from a crossing for train horns; and
- 70 dBA (Leq) at 100 feet from idling locomotives are 70 dBA.

To predict train noise beyond 100 feet, OEA used Cadna-A to account for terrain, intervening objects, ground cover, and atmospheric conditions using a combination of digital elevation models with one-third arc-second (approximately 10-meter) resolution from the United States Geological Survey for terrain and the Microsoft National Building Footprints dataset to identify receptors. OEA categorized buildings as residences, schools, libraries, museums, places of worship, and nursing homes based on a review of aerial photography, state and/or municipal zoning maps, and limited field observations. OEA conducted the Cadna-A calculations in a grid with 30-foot spacing at a height of 5 feet above ground across a half-mile area from either side of the tracks.

Passenger Train Noise

Because receptors in the study area are already located near an operation rail line, those receptors already experience noise from passing trains and would continue to do so whether or not the Board authorizes the Proposed Acquisition. In some portions of the study area, the vast majority of passing trains are passenger trains, such as Metra trains in the Chicago area. To account for noise from passenger trains, which would continue whether or not CP were to acquire KCS, OEA used a similar approach as for modeling noise from freight trains. OEA calculated predicted noise levels (Ldn) at a distance of 100 feet of each track segment based on daytime and nighttime train volumes, number of locomotives, train length, speed, and assuming flat, acoustically soft ground conditions. To predict train noise beyond 100 feet, the use of Cadna-A accounted for terrain, intervening objects, ground cover, and atmospheric conditions. Reference noise levels at 100 feet with and without train horn noise were calculated using FTA's Noise Impact Assessment Spreadsheet (dated October 1, 2018) for Metra. The passenger train volumes were based on the Metra train schedule (dated July 12, 2021).

Rail Yards and Intermodal Facilities

As discussed in *Chapter 2, Proposed Action and Alternatives*, OEA identified six rail yards and intermodal facilities where the Proposed Acquisition would cause the number of railcars processed per day or the volume of truck traffic per day to exceed the thresholds for environmental analysis (see **Table 3.6-1** above). Those six rail yards and intermodal facilities are the Bensenville yard, the Schiller Park yard, the Detroit Container Terminal, the Wylie yard, the Minneapolis IMS facility, and International Freight Gateway facility. In general, noise from intermodal facilities includes noise from cranes that are used for lifting freight containers and noise from trucks. Noise from rail yards includes the noise produced by the movement of the switching engines that process railcars from the departure yard to the receiving yard and noise from railcars coupling as new trains are put together. The rail yards at issue here do not include wheel retarders, which generate noise when braking railcars.

OEA modeled noise from rail yards and intermodal facilities based on methods used in previous environmental reviews (Surface Transportation Board 1997; EPA 1979; FRA 1982). See **Appendix M** for details on the equations that OEA used to predict noise from rail yards and intermodal facilities. OEA's noise modeling accounted for the number of lifts performed each day, the volume of trucking operations, the number of rail cars processed, and the hours of operations of the rail yards and intermodal facilities.

3.6.1.5 Vibration Modeling Methods

Trains generate vibration from the force of locomotives and railcars on the track. Vibration propagates through the track structure, the ground, and into nearby buildings, creating the potential to cause human annoyance. Locomotives typically generate higher vibration levels compared to railcars due to their greater weight. FTA has established general ground-borne vibration curves for freight locomotives and railcars, basing the outdoor vibration level on the distance from the track. OEA used these FTA general ground-borne vibration curves to predict vibration levels throughout the noise and vibration study area for the Proposed Acquisition, adjusting the levels for train speed and for the fact that vibration tends to be reduced as it passes from outside to inside of buildings.

Train speed affects vibration levels such that higher speeds generally correspond to higher vibration levels. According to FTA guidelines, a doubling in speed typically corresponds to a 6 VdB difference in vibration level. For most wood-framed buildings, interior vibration levels are 5 VdB lower than outdoor levels. Larger buildings or heavier masonry buildings generally provide additional vibration attenuation to the interior of the building. For all buildings in this analysis, OEA has assumed an outdoor-to-indoor building vibration attenuation of 5 VdB.

Based on the applicable FTA impact criterion, the speed and number of trains, the general vibration curves, and outdoor-to-indoor vibration attenuation, OEA calculated the distance from the track at which receptors would experience vibration effects. OEA calculated the distances to potential vibration impacts for the Proposed Acquisition and the No-Action Alternative and compared these to existing conditions.

Table 3.6-5 shows the distance from the track centerline at which the vibration from a standard freight locomotive would exceed 75 VdB or 80 VdB for train speeds of 10 to 60 mph. As discussed above, 80 VdB is the criterion for annoyance impacts from vibration for infrequent events (such as fewer than 30 trains per day), while 75 VdB is the criterion for annoyance impacts from vibration for occasional events (e.g., between 30 and 70 trains per day). The distances to vibration annoyance (75 and 80 VdB) account for 5 VdB of outdoor-to-indoor vibration attenuation. The distance to potential structural damage for buildings extremely susceptible to vibration damage (0.12 inches per second) is evaluated at the exterior of the building and does not include outdoor-to-indoor vibration attenuation. As the table shows, the distance from the track at which vibration becomes annoying ranges from 8 feet for rail lines with few slow-moving trains to 94 feet for rail lines with many fast-moving trains. The distance to potential structural damage for buildings extremely susceptible to vibration damage is 4 feet from the track for slow-moving trains to 28 feet for fast-moving trains.

Table 3.6-5. Train Vibration Levels

Train Speed (mph)	Distance from Track Centerline to 75 VdB (feet)	Distance from Track Centerline to 80 VdB (feet)	Distance from Track Centerline to 90 VdB (0.12 in/s) (feet)
10	14	8	4
20	29	16	9
30	45	24	13
40	61	33	18
50	77	42	23
60	94	51	28

Based on these modeled distances, OEA created vibration contours for each rail line segment in the study area. The contours represent the area in which vibration levels would reach the annoyance criterion threshold under the Proposed Acquisition and the No-Action Alternative. OEA then identified all receptors located within the vibration contours, as discussed in *Section 3.6.3, Environmental Consequences*. **Appendix M** presents maps of the vibration contours.

3.6.2 Affected Environment

3.6.2.1 Existing Noise and Vibration Sources

Sources of existing noise and vibration in the study area include freight trains; passenger trains, including the Metra Milwaukee District West Line from Bensenville to Elgin, Illinois and the Heartland Flyer Amtrak line from Metro to Alliance, Texas; Chicago O'Hare International Airport; Fort Worth Alliance Airport; vehicular traffic, trucking activity, and stationary equipment at intermodal facilities; and natural sources such as wind blowing through trees and ground cover, insects, and birds. Throughout most of the study area, the predominant source of existing noise is the existing freight train activity, except near O'Hare International Airport and locations near interstate highways, where aviation and roadway sources also contribute to the existing noise environment.

As presented in *Chapter 2, Proposed Action and Alternatives*, **Table 2-1**, existing KCS and CP freight train operations in the noise and vibration study area range from approximately three to over 20 daily trains. Each train typically has two to three locomotives and ranges from 4,200 to 7,100 feet in length. The types of railcars include hopper cars, tank cars, boxcars, automotive cars, intermodal container cars, and flat cars. Because the primary source of noise is from the wheel/rail interaction, most railcars generate similar noise and vibration. The trains have diesel-electric locomotives such as the EMD SD40-2, EMD GP20C-ECO, GE AC4400CW, and SD40, which have approximately 3,000 to 4,400 horsepower. The trains typically operate at speeds between 20 and 60 mph throughout the study area.

OEA's observations of existing trains in the field showed that the vast majority of train wheelsets are in good running condition, with limited wheel flats[2] that can increase noise or vibration conditions. The existing tracks are primarily continuous-welded rail, which provides a smooth-running surface to minimize increases in noise and vibration such as what may occur with jointed tracks.

In accordance with 49 C.F.R. Parts 222 and 229, Use of Locomotive Horns at Highway-Rail Grade Crossings; Final Rule, FRA requires locomotive engineers to sound their train horns at public at roadway/rail at-grade crossings. FRA regulations require train engineers to sound their horn for 15 to 20 seconds (not to exceed 25 seconds), using a long-long-short-long sounding pattern. Engineers may not sound the horn farther than a quarter of a mile from the crossing and must continue until the first locomotive has passed through the crossing. The horns must generate a sound level between 96 and 110 dBA (Lmax) at a distance of 100 feet in front of the locomotive. Although train horns are sounded for a relatively short time compared to the time it takes for an entire freight train to pass by—often two minutes or more—horns are substantially louder than the locomotive and railcars and, consequently, Ldn noise levels are higher at grade crossings than at wayside locations.

[2] Wheel flats are a flat section on a steel wheel of a rail vehicle that is a result of skidding on steel rails and affect the wheel radius (FTA 2018).

There are approximately 1,200 grade crossings throughout the noise and vibration study area. A few municipalities are designated quiet zones by FRA; in these zones, locomotive engineers do not routinely sound their horn through the crossings except during emergency conditions. There are existing quiet zones in portions of Bartlett, Illinois; Schaumberg, Illinois; Bensenville, Illinois; Itasca, Illinois; Muscatine, Iowa; Neosho, Missouri; Beaumont, Texas; Victoria, Texas; Wharton, Texas; El Campo, Texas; Louise, Texas; Edna, Texas; and north of Texarkana, Texas.

Based on the noise and vibration approach described in *Section 3.6.1.4* and *Section 3.6.1.5*, OEA determined existing noise and vibration conditions throughout the study area from Bensenville, Illinois to Laredo, Texas. **Appendix M** presents the existing noise contours. **Table 3.6-6** presents the noise levels at a distance of 100 feet from the track centerline for trains at 40 mph on wayside track segments (with no train horn noise) and segments within one eighth mile of at-grade crossings. These noise levels vary based on the number of trains, number of locomotives per train, and length of trains. OEA assumed train operations occur equally throughout all hours of the day. OEA reported noise levels in this table based on a train speed of 40 mph, since this is a typical operating speed throughout the study area. As described in *Section 3.6.1.4, Noise Modeling Methods*, the noise contour calculations using Cadna-A are based on actual train speeds throughout the study area.

Table 3.6-6 also presents the number of receptors within the existing 65 dBA (Ldn) noise contour and within the existing vibration impact threshold. This table shows that there are a total of 16,043~~2,385~~ receptors currently within the 65 dBA (Ldn) noise contour and 278~~44~~ receptors currently within the annoyance threshold for vibration (75 or 80 VdB depending on the number of trains per day).

Table 3.6-6. Existing Noise and Vibration Conditions (2019)

Track Segment	Length (miles)	Noise Level at 100 feet and 40 mph (Ldn, dBA)		Receptors within 65 dBA (Ldn)	Receptors within Vibration Annoyance Threshold
		Wayside	Grade-Crossing (within 1/8-mile)		
Bensenville, IL to Elgin, IL[1]	23.0	67.0	77.7	189	1
Elgin, IL to Davis Junction, IL	38.7	65.5	72.6	227	0
Davis Junction, IL to Sabula, IA	61.4	68.9	76.0	235	0
Sabula, IA	0.7	68.6	75.7	1	0
Sabula, IA to Clinton, IA	17.5	70.6	77.9	173	0
Clinton, IA to Water Works, IA	33.2	69.6	76.9	643	25
Water Works, IA to Nahant, IA	4.5	69.6	76.9	4	0
Nahant, IA to Muscatine, IA	24.6	69.3	75.9	183	0
Muscatine, IA to Ottumwa, IA	82.5	67.8	74.4	325	0
Ottumwa, IA to MO/IA State Border	61.2	66.2	73.0	105	2
MO/IA State Border, to Laredo, MO	41.1	66.2	73.0	15	0
Laredo, MO to Polo, MO	51.6	66.9	73.7	64	0

Table 3.6-6. Existing Noise and Vibration Conditions (2019)

Track Segment	Length (miles)	Noise Level at 100 feet and 40 mph (Ldn, dBA)		Receptors within 65 dBA (Ldn)	Receptors within Vibration Annoyance Threshold
		Wayside	Grade-Crossing (within 1/8-mile)		
Polo, MO to Kansas City, MO	42.1	66.7	73.6	191	3
Kansas City, MO to Pittsburg, KS	124.5	71.4	79.5	661	0
Pittsburg, KS to Watts, OK	107.8	72.0	79.4	1,565	0
Watts, OK to Poteau, OK	90.4	71.4	78.8	806	0
Poteau, OK to Heavener, OK	11.6	71.6	79.0	203	0
Heavener, OK to De Queen, AR	94.6	70.7	78.6	486	0
De Queen, AR to Ashdown, AR	37.1	71.6	79.4	189	0
Ashdown, AR to Shreveport, LA	83.2	70.7	78.6	734	1
Shreveport, LA to Frierson, LA	21.8	74.4	81.7	509	0
Frierson, LA to Leesville, LA	91.4	70.3	77.9	621	0
Leesville, LA to De Quincy, LA	50.6	70.5	78.0	508	1
De Quincy, LA to Beaumont, TX	47.0	69.7	77.2	425	0
Beaumont, TX to Port Arthur, TX	20.1	67.5	75.0	333	0
Beaumont, TX to Rosenberg, TX	120.0	74.9	82.4	3,658	234
Rosenberg, TX to Kendleton, TX	12.2	69.8	77.1	133	0
Kendleton, TX to Victoria, TX	74.8	69.9	77.3	478	5
Victoria, TX to Placedo, TX (UP)	12.8	71.4	77.3	250	0
Placedo, TX (UP) to Robstown, TX	82.8	71.4	77.3	610	0
Robstown, TX to Laredo, TX	144.0	71.8	79.2	1,519	6
			Total	**16,043** ~~2,385~~	**278** ~~44~~

[1] Noise levels include METRA Milwaukee District West Line train operations

3.6.3 Environmental Consequences

The following subsections discuss the environmental consequences of the Proposed Acquisition and the No-Action Alternative.

3.6.3.1 Proposed Acquisition

Noise Impacts from Increased Rail Traffic

Under the Proposed Acquisition, rail traffic would increase on certain rail line segments throughout the combined network. There would be an increase of eight or more trains per day in the noise and vibration study area, which runs from Bensenville, Illinois to Port Arthur, Texas and from Rosenberg, Texas to Laredo, Texas, as shown in **Figure 3.6-1**. The

Applicants plan to make 25 capital improvements within the existing rail ROW to support the projected increase in rail traffic. These capital improvements include new passing sidings, which are low-speed sections of track alongside the main rail line often used as passing lanes. Under the Proposed Acquisition, there would be increased noise due to idling locomotives at these siding locations. As described in *Section 3.2, Grade Crossing Safety and Section 3.3, Grade Crossing Delay*, the Proposed Acquisition would result in the removal of quiet zone designations for four grade crossings in Bartlett, Illinois. These grade crossings include Prospect Avenue, South Oak Avenue, South Western Avenue, and Naperville Road. Therefore, OEA has conservatively assumed that locomotive engineers would sound horns at these crossings.

The Proposed Acquisition would not increase the number of daily trains from Renner, Texas to Alliance, Texas and would minimally increase carload tonnage of CP and KCS trains—from approximately 1.29 to 1.97 million gross tons per mile (mGT) under the No-Action Alternative to 3.33 to 4.22 mGT under the Proposed Acquisition. OEA did not conduct further noise and vibration analysis, since four to 26 trains currently operate on these segments and the small increase in carload tonnage would not result in a doubling of overall carload activity and not result in a 3 dBA or greater increase in noise.

The largest increase in rail traffic under the Proposed Acquisition would occur on the CP mainline between Sabula, Iowa, and Kansas City, Missouri, where OEA estimates that rail traffic would increase by approximately 14.4 additional trains per day, on average. **Table 3.6-7** presents the number of receptors within the 65 dBA (Ldn) noise contours and the vibration thresholds for the Proposed Acquisition and the No-Action Alternative. This table shows that there would be a total of 29,853~~3,742~~ receptors within the 65 dBA (Ldn) and 439~~60~~ receptors within the vibration thresholds under the Proposed Acquisition.

As the table shows, the Proposed Acquisition would cause the vibration annoyance threshold to be exceeded at 439 receptors in the study area, including 379 receptors along rail line segment U-BEAU-01 in UP's Houston Subdivision. This result is due to the fact that average rail traffic on portions of segment U-BEAU-01 would be under 30 trains per day under the No-Action Alternative but would be over 30 trains per day under the Proposed Acquisition. Therefore, under the No-Action Alternative, FTA's "infrequent events" threshold for vibration annoyance would apply, while the lower "occasional events" threshold for vibration annoyance would apply under the Proposed Acquisition. Although OEA does not expect that the Proposed Acquisition would cause vibration levels from passing trains to increase, people living along the affected rail lines would experience the vibration more frequently than they do currently and thus vibration would affect more receptors due to the lower vibration threshold.

As noted above, OEA assumed for the purposes of its environmental review that all new freight trains would move on rail line segment U-BEAU-01. 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, OEA understands 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 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 in the Houston area, including vibration annoyance impacts.

Table 3.6-7. Receptors Within Noise and Vibration Contours Under the Proposed Acquisition and No-Action Alternative

	Receptors within 65 dBA (Ldn) Noise Contour		Receptors within Vibration Annoyance Threshold	
Track Segment	**Proposed Acquisition**	**No-Action**	**Proposed Acquisition**	**No-Action**
Bensenville, IL to Elgin, IL[1]	561[2]	237	1	1
Elgin, IL to Davis Junction, IL	622	281	0	0
Davis Junction, IL to Sabula, IA	480	274	0	0
Sabula, IA	4	1	0	0
Sabula, IA to Clinton, IA	313	188	0	0
Clinton, IA to Water Works, IA	1,246	747	25	25
Water Works, IA to Nahant, IA	18	4	0	0
Nahant, IA to Muscatine, IA	399	210	0	0
Muscatine, IA to Ottumwa, IA	1,020	373	0	0
Ottumwa, IA to MO/IA State Border	395	120	2	2
MO/IA State Border, MO to Laredo, MO	79	18	0	0
Laredo, MO to Polo, MO	242	78	0	0
Polo, MO to Kansas City, MO	684	283	3	3
Kansas City, MO to Pittsburg, KS	1,253	932	6	0
Pittsburg, KS to Watts, OK	2,775	1,858	7	0
Watts, OK to Poteau, OK	1,454	983	0	0
Poteau, OK to Heavener, OK	380	246	0	0
Heavener, OK to De Queen, AR	943	610	0	0
De Queen, AR to Ashdown, AR	322	224	0	0
Ashdown, AR to Shreveport, LA	1,434	981	1	1
Shreveport, LA to Frierson, LA	865	644	3	0
Frierson, LA to Leesville, LA	1,102	731	0	0
Leesville, LA to De Quincy, LA	930	622	1	1
De Quincy, LA to Beaumont, TX	847	507	0	0
Beaumont, TX to Port Arthur, TX	551	397	0	0
Beaumont, TX to Rosenberg, TX	6,111	4,832	379	234
Rosenberg, TX to Kendleton, TX	217	170	0	0
Kendleton, TX to Victoria, TX	855	624	5	5
Victoria, TX to Placedo, TX (UP)	409	270	0	0

Table 3.6-7. Receptors Within Noise and Vibration Contours Under the Proposed Acquisition and No-Action Alternative

Track Segment	Receptors within 65 dBA (Ldn) Noise Contour		Receptors within Vibration Annoyance Threshold	
	Proposed Acquisition	**No-Action**	**Proposed Acquisition**	**No-Action**
Placedo, TX (UP) to Robstown, TX	969	662	0	0
Robstown, TX to Laredo, TX	2,373	1,922	6	6
Total	29,853 ~~3,742~~	20,029 ~~15,197~~	439 ~~60~~	278 ~~44~~

1 Noise levels include METRA Milwaukee District West Line train operations
2 Grade crossings at Prospect Avenue, South Oak Avenue, South Western Avenue, and Naperville Road would exceed the risk threshold for a quiet zone with Proposed Acquisition. OEA has assumed horns would be sounded with Proposed Acquisition prior to mitigation.

Applying the Board's thresholds, the Proposed Acquisition would result in an adverse noise impact for receptors where noise levels from rail operations meet or exceed 65 Ldn and increase by at least 3 dBA Ldn, compared to the No-Action Alternative. The increase in noise would vary from track segment to track segment based on train volumes as well as train consists (the lengths of the trains including all locomotives and railcars). OEA assumed that the Proposed Acquisition would not affect train speeds. The train consists are an important factor in determining Ldn noise levels at wayside locations, where there is no train horn noise. At grade crossings, where the train horn is the predominant source of noise, train consists do not affect Ldn noise levels as much, since longer or shorter trains sound their horn equally. Therefore, noise levels would increase with the Proposed Acquisition slightly differently at wayside and grade crossing locations.

Table 3.6-8 presents the noise levels at a speed of 40 mph and a distance of 100 feet from the track centerline for each rail line segment in the study area under the Proposed Acquisition and the No-Action Alternative. The table reports the modeled noise levels based on an assumed train speed of 40 mph, since this is a typical operating speed throughout the study area. The increase in noise would be consistent at all train speeds. The increase in noise is applicable to all receptors within the study area since they are close enough to the tracks and other non-train noise sources (such as airplanes, traffic, and natural sources) do not contribute substantially to the overall noise levels. As shown in the table, there would be a 3 dBA or greater increase in noise (see bolded values) along the rail line segments between Bensenville, Illinois and Davis Junction, Illinois and Clinton, Iowa and Kansas City, Missouri. There would be a 3 dBA or greater increase in noise at the four existing grade crossings that would no longer qualify as quiet zones in Bartlett, Illinois. There would also be a 3 dBA or greater increase in noise near grade crossings between Elgin, Illinois and Kansas City, Missouri and De Quincy, Louisiana and Beaumont, Texas. Noise levels would not increase by 3 dBA or more at other track segments, generally because these segments already have a relatively high number of daily train operations.

Table 3.6-8. Noise Level Increase by Track Segment for Proposed Acquisition

Track Segment	Noise Level at 100 feet and 40 mph (Ldn, dBA)					
	Wayside			**Grade-Crossing**		
	Proposed Acquisition	**No-Action**	**Increase**	**Proposed Acquisition**	**No-Action**	**Increase**
Bensenville, IL to Elgin, IL[1]	71.8	68.0	**3.8**	80.4[2]	77.8	2.6
Elgin, IL to Davis Junction, IL	71.5	67.3	**4.2**	78.4	73.3	**5.1**
Davis Junction, IL to Sabula, IA	72.6	70.5	2.1	79.6	76.5	**3.1**
Sabula, IA	72.5	70.2	2.3	79.5	76.2	**3.3**
Sabula, IA to Clinton, IA	75.9	73.0	2.9	82.2	78.7	**3.5**
Clinton, IA to Water Works, IA	75.4	71.8	**3.6**	81.7	77.5	**4.2**
Water Works, IA to Nahant, IA	75.4	71.8	**3.6**	81.7	77.5	**4.2**
Nahant, IA to Muscatine, IA	74.3	70.4	**3.9**	81.2	76.3	**4.9**
Muscatine, IA to Ottumwa, IA	73.9	69.2	**4.7**	80.8	75.1	**5.7**
Ottumwa, IA to MO/IA State Border	73.7	68.8	**4.9**	80.5	73.9	**6.6**
MO/IA State Border to Laredo, MO	73.7	68.8	**4.9**	80.5	73.9	**6.6**
Laredo, MO to Polo, MO	74.0	69.8	**4.2**	80.7	74.7	**6.0**
Polo, MO to Kansas City, MO	74.0	69.7	**4.3**	80.7	74.5	**6.2**
Kansas City, MO to Pittsburg, KS	76.5	74.6	1.9	83.0	80.7	2.3
Pittsburg, KS to Watts, OK	75.9	74.1	1.8	82.6	80.3	2.3
Watts, OK to Poteau, OK	75.6	73.5	2.1	82.3	79.7	2.6
Poteau, OK to Heavener, OK	75.7	73.6	2.1	82.4	79.8	2.6
Heavener, OK to De Queen, AR	76.0	74.0	2.0	82.3	79.7	2.6
De Queen, AR to Ashdown, AR	76.4	74.7	1.7	82.7	80.5	2.2
Ashdown, AR to Shreveport, LA	75.9	73.9	2.0	82.3	79.6	2.7
Shreveport, LA to Frierson, LA	78.0	76.7	1.3	83.9	82.4	1.5
Frierson, LA to Leesville, LA	75.2	72.6	2.6	81.5	78.6	2.9
Leesville, LA to De Quincy, LA	75.2	72.7	2.5	81.5	78.7	2.8
De Quincy, LA to Beaumont, TX	74.9	72.0	2.9	81.2	78.0	**3.2**
Beaumont, TX to Port Arthur, TX	71.3	69.5	1.8	77.6	75.4	2.2
Beaumont, TX to Rosenberg, TX (UP)[3]	78.7	77.1	1.6	84.3	83.2	1.1
Rosenberg, TX to Kendleton, TX	74.0	72.2	1.8	80.5	78.0	2.5
Kendleton, TX to Victoria, TX	74.1	72.5	1.6	80.6	78.2	2.4
Victoria, TX to Placedo, TX (UP)	74.1	72.4	1.7	80.5	77.9	2.6
Placedo, TX (UP) to Robstown, TX	74.1	72.4	1.7	80.5	77.9	2.6
Robstown, TX to Laredo, TX	76.1	75.4	0.7	81.9	80.4	1.5

[1] Noise levels include METRA Milwaukee District West Line train operations

[2] Grade crossings at Prospect Avenue, South Oak Avenue, South Western Avenue, and Naperville Road would exceed the risk threshold for a quiet zone with Proposed Acquisition. Therefore, OEA conservatively assumed that trains would sound their horns at these locations.

[3] The projected increase in rail traffic for this segment is 7.57 trains per day. Although this projected increase is below the threshold for noise analysis, OEA modeled train noise for this segment in response to public comments on the Draft EIS.

OEA assessed noise impacts throughout the study area to determine the number of receptors in each county that would exceed 65 dBA (Ldn) with a 3 dBA increase under the Proposed Acquisition. **Table 3.6-9** and **Figure 3.6-4** present the number of receptors by county where noise levels would exceed 65 dBA (Ldn) in the existing, No-Action Alternative and Proposed Acquisition, and where there would be noise impact. See **Appendix M** for additional information on the number of receptors within the 65 dBA (Ldn) and noise impacts by cities and towns throughout the study area.

OEA's analysis found that the Proposed Acquisition would result in adverse noise impacts at a total of 6,307 receptors. Many of those receptors are near at-grade crossings where there are higher noise levels and a generally higher density of receptors. The counties with the greatest number of adversely affected receptors include Clinton County, Iowa; Scott County, Iowa; Muscatine County, Iowa; and Orange County, Texas.

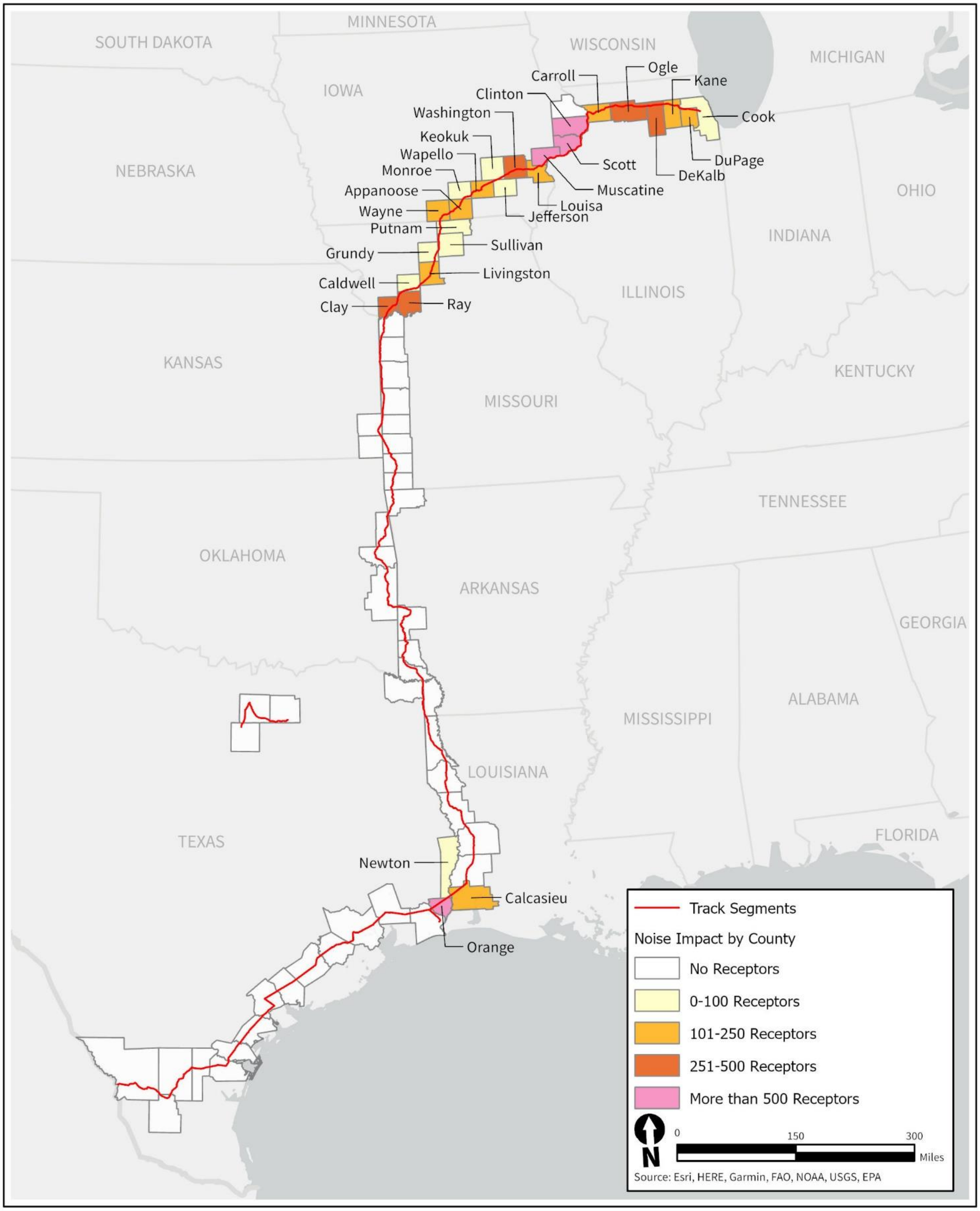
Table 3.6-9. Noise Results by County

County	Receptors within 65 dBA (Ldn)			Receptors with Adverse Noise Impacts (65 dBA Ldn and 3 dBA increase)
	Existing	Proposed Acquisition	No-Action	
DuPage County, IL	116	289	140	127
Cook County, IL	26	147	38	8
Kane County, IL	85	263	116	146
DeKalb County, IL	99	299	128	299
Ogle County, IL	266	515	297	472
Carroll County, IL	59	150	73	135
Jackson County, IA	13	18	14	0
Clinton County, IA	345	616	373	590
Scott County, IA	499	1016	593	1,016
Muscatine County, IA	260	675	294	675
Louisa County, IA	60	180	73	180
Washington County, IA	94	333	107	333
Keokuk County, IA	0	2	0	2
Jefferson County, IA	3	12	4	12
Wapello County, IA	71	233	86	233
Monroe County, IA	1	8	1	8
Appanoose County, IA	33	127	39	127
Wayne County, IA	55	175	59	175
Putnam County, MO	7	28	9	28
Sullivan County, MO	6	39	6	39
Grundy County, MO	2	12	3	12
Livingston County, MO	48	182	60	182
Caldwell County, MO	19	71	24	71
Ray County, MO	90	261	118	261
Clay County, MO	98	412	159	412
Jackson County, MO	169	371	278	0
Cass County, MO	144	293	213	0
Miami County, KS	3	6	5	0
Bates County, MO	151	258	193	0
Vernon County, MO	52	67	58	0
Barton County, MO	43	47	46	0
Crawford County, KS	405	767	510	0
Cherokee County, KS	1	2	2	0
Jasper County, MO	342	590	408	0
Newton County, MO	169	272	201	0

Table 3.6-9. Noise Results by County

County	Receptors within 65 dBA (Ldn)			Receptors with Adverse Noise Impacts (65 dBA Ldn and 3 dBA increase)
	Existing	Proposed Acquisition	No-Action	
McDonald County, MO	355	597	411	0
Benton County, AR	375	718	444	0
Adair County, OK	277	475	323	0
Sequoyah County, OK	256	455	306	0
Le Flore County, OK	585	1,123	731	0
Polk County, AR	331	647	421	0
Sevier County, AR	72	133	92	0
Little River County, AR	278	491	338	0
Miller County, AR	12	14	12	0
Bowie County, TX	185	376	245	0
Cass County, TX	59	112	77	0
Caddo Parish, LA	835	1,548	1,108	0
De Soto Parish, LA	332	545	381	0
Sabine Parish, LA	203	366	240	0
Vernon Parish, LA	419	756	500	0
Beauregard Parish, LA	164	295	203	0
Calcasieu Parish, LA	165	335	203	198
Newton County, TX	34	64	41	56
Orange County, TX	291	582	348	510
Jefferson County, TX	463 ~~333~~	774 ~~551~~	561 ~~397~~	0
Liberty County, TX	397	673	486	0
Harris County, TX	2,347	3,895	3,151	0
Fort Bend County, TX	974 ~~190~~	1,628 ~~308~~	1,266 ~~235~~	0
Wharton County, TX	181	329	240	0
Jackson County, TX	148	257	195	0
Victoria County, TX	491	815	554	0
Refugio County, TX	173	261	187	0
San Patricio County, TX	216	347	231	0
Nueces County, TX	426	652	503	0
Jim Wells County, TX	268	508	388	0
Duval County, TX	387	564	471	0
Jim Hogg County, TX	133	237	170	0
Webb County, TX	377	545	474	0
Total	**16~~2~~,043 ~~385~~**	**~~23,742~~29,853**	**~~15,197~~20,029**	**6,307**

Figure 3.6-4. Receptors with Adverse Noise Impact by County



Intermodal Facilities and Rail Yards

The Proposed Acquisition would result in changes in activities associated with increased truck traffic, lifting equipment such as cranes and gantries, switching engine movements, and car coupling when processing cars and building trains at the six intermodal facilities and rail yards in the study area. These changes would result in an increase in the average noise levels that nearby receptors would experience. The average noise levels near each rail yard and intermodal facility would depend on the number of lifts (moving containers between trucks and railcars) conducted each day, the daily volume of truck traffic, and the total number of railcars processed each day. **Table 3.6-10** summarizes these factors and the estimated average noise levels at the closest receptors under the Proposed Acquisition and the No-Action Alternative (see **Appendix M** for maps showing the locations of the closest receptors).

As the table shows, OEA estimates that average noise levels under the No-Action Alternative would range from 42.5 to 65.0 dBA (Ldn) at the closest receptor locations. Under the Proposed Acquisition, OEA estimates that the average noise levels would range from 43.2 to 66.5 dBA at the closest receptors. The largest difference in average noise levels between the Proposed Acquisition and the No-Action Alternative would be approximately 2.9 dBA, which would occur near the Schiller Park yard, where OEA estimates that average noise levels would be approximately 60.2 dBA under the Proposed Acquisition. The only receptors where OEA expects that average noise levels would exceed 65 dBA (Ldn) under the Proposed Acquisition are the residences on Colby Lane near the Wylie yard. Noise levels at these residences would only increase by up to 1.6 dBA under the Proposed Acquisition. As discussed above, a receptor experiences an adverse noise impact when the average noise level increases by 3 dBA or more and exceeds 65 dBA (Ldn). OEA did not identify any receptors that would experience an adverse noise impact as a result of increased activities at intermodal facilities and rail yards caused by the Proposed Acquisition.

Table 3.6-10. Intermodal Facilities and Rail Yards Noise Impact Assessment Results

Intermodal Facility/ Rail Yard	Distance to Receptors (feet)	Proposed Acquisition (Daily)			No-Action (Daily)			Noise Level (Ldn)		
		Lifts	Trucks	Railcars	Lifts	Trucks	Railcars	Proposed Acquisition	No-Action	Increase
Minneapolis IMS[1]	1,444 - 5,584	543	332	131.7	457	279	103	55.9 - 60.4	55.1 - 59.6	0.8
Detroit Container Terminal	1,451 - 2,352	248	228	57	156	141	33	51.4 - 55.7	49.1 - 53.5	2.2 - 2.3
Bensenville[2]	1,099 - 5,344	955	698	1796	534	383	1428	53.7 - 57.4	52.5 - 55.3	1.2 - 2.0
Schiller Park[3]	650 - 1,849	356	324	151	190	190	74	51.9 - 60.2	49.0 - 57.3	2.8 - 2.9
International Freight Gateway	5,555 - 7,757	204	104	143	103	51	124	43.2 - 46.8	42.5 - 46.1	0.7
Wylie	1,052 - 4,560	994	474	460	702	326	323	51.1 - 66.5	49.6 - 65.0	1.5 - 1.6

[1] Shoreham rail yard has been included with the Minneapolis IMS intermodal facility.
[2] Intervening buildings between the receptors and rail yard/intermodal facilities provide a minimum of 10 dBA noise reduction.
[3] Schiller Park includes a noise barrier along eastern boundary assumed to provide a minimum of 5 dBA noise reduction.

Noise and Vibration from Capital Improvements

As described in *Chapter 2*, the Applicants plan to make 25 capital improvements within the existing ROW. The siding track construction would include excavating, grading, constructing the sub-ballast and ballast layers, placing ties, laying track, welding track sections, and spiking the track on the ties. OEA anticipates that construction activities would generally occur over a short period of time (typically, approximately two weeks) at each location, and since construction occurs linearly along the track, it would not occur in front of any particular receptor for a prolonged period of time. Nevertheless, noise and vibration during construction of the capital improvements has the potential to cause annoyance to nearby receptors.

Table 3.6-11 presents the utilization factor (percent of time the equipment is used) and maximum noise level at 50 feet from construction equipment typically used for track construction related to the planned capital improvements. The table presents the energy-average noise level (Leq) at 50 feet from each piece of equipment and the cumulative noise level of all equipment. Cumulatively, track construction would generate 86 dBA (Leq) at a distance of 50 feet.

Table 3.6-11. Construction Noise Levels

Equipment	Maximum Noise Level at 50 feet (Lmax, dBA)	Utilization Factor (%)	Energy-Average Noise Level at 50 feet (Leq, dBA)
Compactor	82	20%	75
Crane	83	16%	75
Dump Trucks	76	40%	72
Front End Loaders	80	40%	76
Road Grader	85	40%	81
Rail Tamper	83	40%	79
Rail Tensor/Stressor	82	50%	79
Thermite Welder	74	40%	70
Cumulative Construction Noise Level at 50 feet (Leq, dBA)			86

OEA calculated the distances to construction noise levels under the 25 planned capital improvements that exceed the FTA construction noise criteria based on a 7.5 decibel reduction per distance doubling. The distances to construction noise impact are as follows:

- Construction noise would exceed the residential day threshold of 80 dBA (Leq) within 88 feet.
- Construction noise would exceed the commercial threshold of 85 dBA (Leq) within 56 feet.
- Construction noise would exceed the industrial threshold of 90 dBA (Leq) within 35 feet.

Construction noise levels would exceed FRA construction noise guidelines at three noise sensitive receptors (such as residences) within 88 feet of the proposed Heavener siding in

LeFlore County, Oklahoma and two commercial and two industrial facilities within 56 and 35 feet from the proposed Blue Valley siding in Jackson County, Missouri.

Generally speaking, ground-borne vibration from some construction equipment, such as earth-moving equipment, loaded trucks, and vibratory rollers may have the potential to cause some damage to nearby buildings only if those buildings are located very close to the construction activities. **Table 3.6-12** presents the vibration level of construction equipment typically used during track construction. This table shows that vibration levels from this equipment would approach the thresholds for potential structural damage within 14 feet of Category I buildings and within 34 feet of Category IV buildings which are particularly susceptible to vibration damage. Since these distances to construction vibration impacts would not extend beyond the railroad ROW, there are no structures within these screening distances and therefore no potential for structural damage.

Table 3.6-12. Construction Vibration

Equipment	Vibration Level at 25 feet (in/s)	Distance (feet) to Building Category I Threshold (0.5 in/s)	Distance (feet) to Building Category II Threshold (0.3 in/s)	Distance (feet) to Building Category III Threshold (0.2 in/s)	Distance (feet) to Building Category IV Threshold (0.12 in/s)
Compactor/Vibratory Roller	0.210	14	18	25	34
Dump Trucks	0.076	7	10	14	18
Front End Loaders	0.089	8	11	15	20

Source: FTA 2018; VHB 2022

3.6.3.2 No-Action Alternative

Under the No-Action Alternative, CP would not acquire KCS and rail traffic on rail lines and activities at rail yards and intermodals facilities would not increase as a result of the Proposed Acquisition. However, rail traffic could increase on CP and KCS lines as a result of changing market conditions, such as general economic growth, and activities at rail yards at intermodal facilities could also increase. These changes would not involve authorization from the Board or environmental review by OEA under NEPA. As discussed above and in *Chapter 2, Proposed Action and Alternatives*, OEA anticipates that, even in the absence of the Proposed Acquisition, rail traffic due to general economic growth would result in higher average noise levels than currently exist along those rail lines today. As shown in **Table 3.6-7**, OEA estimates that a total of 20,029~~15,197~~ receptors in the study area would experience an average noise level of 65 dBA (Ldn) or above under the No-Action Alternative. This is more than the estimated number of receptors in the study area that currently experience a noise level of 65 dBA or above (16,043~~2,385~~), but less than the number of estimated receptors that would experience that noise level under the Proposed Acquisition (29,853~~3,742~~). OEA does not expect that the number of receptors currently affected by vibration from passing trains (278~~44~~) would change under the No-Action Alternative.

Table 3.6-13 presents the noise levels at a speed of 40 mph and a distance of 100 feet from the track centerline for each rail line segment in the study area under the Existing and No-Action Alternative. The table reports the modeled noise levels based on an assumed train speed of 40 mph since this is a typical operating speed throughout the study area. The increase in noise that would occur with the No-Action Alternative would be up to 3.6 dBA at wayside locations and up to 1.2 dBA at grade crossing locations.

Table 3.6-13. Noise Level Increase by Track Segment for No-Action Alternative

Track Segment	Noise Level at 100 feet and 40 mph (L_{dn}, dBA)					
	Wayside			Grade-Crossing		
	Existing	No-Action	No-Action minus Existing	Existing	No-Action	No-Action minus Existing
Bensenville, IL to Elgin, IL[1]	67.0	68.0	1.0	77.7	77.8	0.1
Elgin, IL to Davis Junction, IL	65.5	67.3	1.8	72.6	73.3	0.7
Davis Junction, IL to Sabula, IA	68.9	70.5	1.6	76.0	76.5	0.5
Sabula, IA	68.6	70.2	1.6	75.7	76.2	0.5
Sabula, IA to Clinton, IA	70.6	73.0	2.4	77.9	78.7	0.8
Clinton, IA to Water Works, IA	69.6	71.8	2.2	76.9	77.5	0.6
Water Works, IA to Nahant, IA	69.6	71.8	2.2	76.9	77.5	0.6
Nahant, IA to Muscatine, IA	69.3	70.4	1.1	75.9	76.3	0.4
Muscatine, IA to Ottumwa, IA	67.8	69.2	1.4	74.4	75.1	0.7
Ottumwa, IA to MO/IA State Border	66.2	68.8	2.6	73.0	73.9	0.9
MO/IA State Border to Laredo, MO	66.2	68.8	2.6	73.0	73.9	0.9
Laredo, MO to Polo, MO	66.9	69.8	2.9	73.7	74.7	1.0
Polo, MO to Kansas City, MO	66.7	69.7	3.0	73.6	74.5	0.9
Kansas City, MO to Pittsburg, KS	71.4	74.6	3.2	79.5	80.7	1.2
Pittsburg, KS to Watts, OK	72.0	74.1	2.1	79.4	80.3	0.9
Watts, OK to Poteau, OK	71.4	73.5	2.1	78.8	79.7	0.9
Poteau, OK to Heavener, OK	71.6	73.6	2.0	79.0	79.8	0.8
Heavener, OK to De Queen, AR	70.7	74.0	3.3	78.6	79.7	1.1
De Queen, AR to Ashdown, AR	71.6	74.7	3.1	79.4	80.5	1.1
Ashdown, AR to Shreveport, LA	70.7	73.9	3.2	78.6	79.6	1.0
Shreveport, LA to Frierson, LA	74.4	76.7	2.3	81.7	82.4	0.7
Frierson, LA to Leesville, LA	70.3	72.6	2.3	77.9	78.6	0.7
Leesville, LA to De Quincy, LA	70.5	72.7	2.2	78.0	78.7	0.7
De Quincy, LA to Beaumont, TX	69.7	72.0	2.3	77.2	78.0	0.8
Beaumont, TX to Port Arthur, TX	67.5	69.5	2.0	75.0	75.4	0.4
Beaumont, TX to Rosenberg, TX	74.9	77.1	2.2	82.4	83.2	0.8
Rosenberg, TX to Kendleton, TX	69.8	72.2	2.4	77.1	78.0	0.9
Kendleton, TX to Victoria, TX	69.9	72.5	2.6	77.3	78.2	0.9
Victoria, TX to Placedo, TX (UP)	71.4	72.4	1.0	77.3	77.9	0.6

Table 3.6-13. Noise Level Increase by Track Segment for No-Action Alternative

Track Segment	Noise Level at 100 feet and 40 mph (L_{dn}, dBA)					
	Wayside			Grade-Crossing		
	Existing	No-Action	No-Action minus Existing	Existing	No-Action	No-Action minus Existing
Placedo, TX (UP) to Robstown, TX	71.4	72.4	1.0	77.3	77.9	0.6
Robstown, TX to Laredo, TX	71.8	75.4	3.6	79.2	80.4	1.2

[1] Noise levels include METRA Milwaukee District West Line train operations

3.6.4 Conclusion

The Proposed Acquisition would result in adverse noise and vibration impacts due to the projected increase in rail traffic. The Proposed Acquisition would cause noise levels to increase by at least 3 dBA and to exceed 65 dBA (Ldn) at 6,307 receptors in the study area. Those receptors include residences, hospitals, school, libraries, nursing homes, and places of worship. OEA does not expect that the Proposed Acquisition would cause individual trains to become substantially louder or to become audible in places where they are not currently. However, the projected increase in rail traffic from the Proposed Acquisition would make rail-related noise more frequent, which would result in a higher day-night average noise level (Ldn) at many receptors. Noise from construction activities associated with the 25 planned capital improvements would be temporary, and there would be no adverse vibration impacts from construction activities. Although vibration from passing trains would not be strong enough to cause damage to any buildings, the projected increase in rail traffic would exceed the annoyance threshold for vibration at some receptors in the study area.

The Applicants have proposed voluntary mitigation measures to minimize noise and vibration impacts. These measures include a commitment to minimize construction-related noise between 9:00 p.m. and 7:00 a.m. local time during construction of the 25 planned capital improvements (see *Chapter 4, Mitigation*, Voluntary Mitigation [VM]-Noise-02) and a commitment to use continuously welded rail at the planned capital improvements to reduce wheel-rail wayside noise, to the extent practicable (VM-Noise-03). The Applicants have also committed to fund the improvements necessary to allow any potentially affected community with an existing quiet zone to maintain that designation should the increase in merger related train traffic cause that community to fall out of compliance with FRA regulations (VM-Noise-01).

OEA is also recommending additional mitigation measures to ensure that noise impacts would be minimized. These measures would require the Applicants to maintain rail and rail beds according to American Railway Engineering and Maintenance-of-Way Association standards (MM-Noise-01), to comply with FRA regulations establishing decibel limits for train operations (MM-Noise-02), to consider lubricating curves where doing so would be a safe and effective means of reducing noise (MM-Noise-03), to employ other safe and efficient operating procedures that would reduce noise (MM-Noise-04), and to promptly respond to community inquiries concerning the establishment of quiet zones and assist communities in identifying measures, methods, or technologies that may enable those communities to establish quiet zones (MM-Noise-05). Even if the Board imposes these mitigation measures, however, OEA expects that the Proposed Acquisition would result in unavoidable adverse noise impacts.

3.7 Air Quality and Climate Change

This section describes the existing conditions and environmental consequences for air quality and climate change under the Proposed Acquisition and the No-Action Alternative. Compared to the No-Action Alternative, the Proposed Acquisition would result in increases in rail traffic on some rail lines in the combined CPKC system, and increased activities at some rail yards and intermodal facilities that would exceed the thresholds for air quality analysis set forth in the Board's environmental regulations (49 C.F.R. § 1105.7(e)(5)). In addition, the Applicants plan to make certain capital improvements within the rail ROW to support the projected increase in rail traffic. Because the increased rail traffic would be diverted from other rail lines and from trucks, OEA does not expect that the Proposed Acquisition would result in an overall net increase in air pollutant and greenhouse gas (GHG) emissions when measured at the national level. In fact, the Proposed Acquisition could result in an overall net decrease in emissions due to the expected diversion of freight from truck to rail transportation and the resulting removal of approximately 64,000 trucks per year from highways. However, OEA expects that localized emissions of air pollutants from locomotives would increase along certain specific rail line segments, which could affect air quality along those rail lines.

3.7.1 Air Quality and Greenhouse Gas Emissions

This section describes the approach, existing conditions, and environmental consequences for air quality and GHGs. Air quality is an area of concern because air pollutants, such as emissions from locomotives, can affect human health and the environment. GHG emissions are also a concern because they contribute to climate change (the impacts of climate change on the CPKC system and adaptation approaches are further discussed in *Section 3.7.2*, below). The Proposed Acquisition would result in a projected increase in rail traffic on rail lines and activities at rail yards and intermodal facilities within the CPKC system. Conversely, the increased freight carried in the CPKC system would result in decreased rail traffic on other rail lines, decreased truck traffic on highways, and decreased activities at other rail yards/intermodal facilities. OEA expects that, relative to the No-Action Alternative, the increases in emissions in the CPKC system associated with the Proposed Acquisition would be offset by these decreases in emissions, including GHGs, elsewhere. However, the Proposed Acquisition would affect locales where emissions associated with CPKC activities occur.

3.7.1.1 Approach

The air quality study area includes the counties in which the projected increase in rail traffic on rail lines or activities at rail yards or intermodal facilities under the Proposed Acquisition would exceed the thresholds for environmental analysis at 49 C.F.R. § 1105.7(e) (see **Table 3.7-1**). The study area also includes counties in which the Applicants intend to make capital improvements in the rail ROW to support the projected increase in rail traffic.

Table 3.7-1 summarizes the thresholds that initiate air quality analysis. To define the study area, OEA compared the projected levels of rail traffic on rail lines and activities at rail yards and intermodal facilities in the analysis year 2027 to these thresholds. **Figure 2.2-1**, **Figure 2.2-2**

and **Table 2.2-1** through **Table 2.2-3** in *Chapter 2, Proposed Action and Alternatives*, present additional information about the thresholds for environmental review, including maps of where those thresholds would be met or exceeded.

To analyze the impacts of GHG emissions on climate change that would occur under the Proposed Acquisition in the U.S., OEA used CEQ's *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*, which provides direction on how to apply NEPA to the analysis of GHG emissions and climate change (2016). Per CEQ's guidance, OEA considered GHG emissions as a proxy for assessing the Proposed Acquisition's impact on climate change. For its analysis, OEA also quantified the tons of GHG emissions per year that it projects would occur under the Proposed Acquisition as well as the No-Action Alternative (see **Table 3.7-4**). The study area for GHG emissions is the same as described above and detailed in **Table 3.7-1** below.

Table 3.7-1. Board Air Quality Analysis Thresholds

Activity	The Board's Threshold
Attainment Areas	
Rail line segment	An increase in rail traffic of at least 100 percent (measured in gross ton-miles annually) or an increase of at least eight trains per day
Rail yard	An increase in rail yard activity of at least 100 percent (measured by carload activity)
Intermodal facility	An average increase in truck traffic of more than 10 percent of the average daily traffic or 50 vehicles per day
Nonattainment and Class I Areas	
Rail line segment	An increase in rail traffic of at least 50 percent (measured in gross ton-miles annually) or an increase of at least three trains per day
Rail yard	An increase in rail yard activity of at least 20 percent (measured by carload activity)
Intermodal facility	An average increase in truck traffic of more than 10 percent of the average daily traffic or 50 vehicles per day

Source: 49 C.F.R. § 1105.7

3.7.1.2 Regulatory Background

In assessing the potential impacts of the Proposed Acquisition on air quality, OEA considered the Clean Air Act (CAA), as amended; EPA guidelines; and the Board's environmental regulations.

The CAA amendments codify the approach for attainment of the National Ambient Air Quality Standards (NAAQS). The CAA requires EPA to set NAAQS (40 C.F.R. Part 50) for six criteria pollutants: carbon monoxide (CO), lead, nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2). NAAQS standards are based on human health criteria to protect public health (primary standards), on environmental criteria to prevent environmental and property damage, and to protect public welfare (secondary standards). **Table K.3-1** in **Appendix K** presents the current NAAQS.

EPA classifies each county in the U.S. as being in "attainment" or "nonattainment" for each criteria pollutant. A county is in attainment for a specific pollutant when the pollutant concentration is below the NAAQS. A county is in nonattainment for a specific pollutant when the pollutant concentration exceeds the NAAQS. Some nonattainment pollutants (such as O_3, CO, and PM_{10}) are further classified by the degree to which they exceed the NAAQS. For ozone, these classifications are rank based on severity, in the order of "Marginal," "Moderate," "Serious," "Severe," and "Extreme." A county can be in attainment for some pollutants and in nonattainment for other pollutants. A third category, "maintenance area," is an area that was formerly in nonattainment but has reduced pollutant concentrations to be in attainment of the NAAQS. EPA bases its attainment status designations on ongoing air monitoring studies and the number of times specific criteria pollutants exceed NAAQS. EPA uses a fourth category, "unclassifiable," for areas with insufficient data to make an attainment determination. EPA treats unclassifiable areas like attainment areas.

EPA uses the term "*de minimis*" across a variety of contexts to describe impacts that are too small or trivial for consideration by regulatory authorities. Under EPA's Transportation Conformity (40 C.F.R. Part 93, Subpart A) and General Conformity (40 C.F.R. Part 93, Subpart B) regulations, federal agencies compare the total estimated annual emissions from their projects to *de minimi*s emissions thresholds to determine whether additional analysis and consultation are appropriate. The Transportation Conformity regulations pertain to highway and transit projects under the jurisdiction of the U.S. Department of Transportation and thus do not apply to Board actions. In consultation with EPA, OEA has determined that certain emissions from Board actions, such as emissions from construction activities related to the jurisdictional construction of a new line of railroad, are subject to the General Conformity regulations because those meet the definition of direct or indirect emissions set forth at 40 C.F.R. § 93.152. However, emissions related to projected increases in rail operations on rail lines or projected increases in activities at rail yards and intermodal facilities resulting from Board decisions are not subject to General Conformity regulations because the Board does not exercise continuing program responsibility over and cannot practically control rail operations on rail lines or activities at rail yards and intermodal facilities (STB 2021). Accordingly, emissions from projected increases in rail traffic and increased activities at rail yards and intermodal facilities resulting from the Proposed Acquisition are not subject to General Conformity regulations. Nevertheless, OEA has compared those emissions to the *de minimis* thresholds to contextualize the potential air quality impacts of the Proposed Acquisition (presented in **Table K.3-2** in **Appendix K**).

The CAA establishes a list of federal lands with special air quality protections from major stationary sources (40 C.F.R. Part 52 Subpart 21, 40 C.F.R. Part 81). These areas primarily include national parks, federal wilderness areas, and national monuments. The CAA divides the lands into Class I, II, or III, where restrictions on emissions are most severe in Class I areas and are progressively more lenient in Class II and III areas. Mandatory Class I areas include all federal wilderness areas exceeding 5,000 acres and national parks exceeding 6,000 acres (NPS 2020). Although locomotives are a mobile source of emissions rather than a major stationary source, OEA considered the potential impact of the Proposed Acquisition on Class I areas in response to comments that EPA submitted during scoping requesting such an analysis. Consistent with EPA guidance, OEA identified Class I areas within 100 kilometers (62 miles) of the air quality study area and considered the effects of emissions from increased rail traffic and activities on air quality related values (AQRVs) of the Class I areas. OEA did not evaluate short-term emissions associated with implementation of the planned capital improvements since they are temporary, lasting up to approximately three weeks as estimated by OEA. **Appendix K** further describes AQRVs for Class I areas.

Federal approaches that address GHG emissions include EPA programs that require GHG permitting and reporting for certain facilities. As a result of a 2007 U.S. Supreme Court ruling finding that GHGs are air pollutants under the CAA, EPA proposed the Endangerment Finding and the Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the CAA, which covers six main GHGs: carbon dioxide (CO_2), methane (CH_4), nitrogen dioxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF_6) (EPA 2009a). While these findings do not directly impose any industry regulations, they have established the required legal foundation for regulating GHG emissions from sources including vehicles, power plants, and industrial facilities.

Pollutant Descriptions and Effects

In the impact analysis, OEA identified pollutants to consider and summarized their effects on human health and the environment based on EPA regulations and EPA databases. **Appendix K** describes the various pollutants OEA analyzed and their potential effects on human health or the environment. These descriptions include criteria pollutants, hazardous air pollutants (HAPs), and GHGs.

Emissions Inventory

OEA evaluated the environmental consequences of the Proposed Acquisition and the planned capital improvements by comparing predicted air emissions under the Proposed Acquisition to the No-Action Alternative at the county, nonattainment area, and system-wide (national) levels. OEA estimated emissions for nitrogen oxides (NO_X), volatile organic compounds (VOC), PM_{10}, $PM_{2.5}$, SO_2, CO, carbon dioxide equivalent (CO_2e), CH_4, N_2O, and HAPs. OEA calculated CO_2e by deriving CO_2, CH_4, and N_2O emissions and applying global warming potentials (EPA 2021a). As appropriate, OEA quantified potential reductions in emissions from the projected diversion of freight from truck transportation to rail transportation (truck-to-rail diversions). Additional information on OEA's system-wide analysis and likely truck-to-rail diversions is available in **Appendix K**.

OEA also assessed potential impacts of the planned capital improvements. The planned capital improvements assessment included quantifying air quality impacts of the construction equipment, as well as fugitive dust associated with the general construction sitework and earthwork. **Appendix K** presents additional information on the approach for analysis.

3.7.1.3 Affected Environment

OEA characterized the affected environment in terms of the attainment status of the counties in the study area and proximity of the study area to Class I Areas.

Criteria Pollutant Attainment Status

Most counties in the study area are in attainment for all NAAQS. **Table 3.7-2** presents the counties that are in nonattainment or maintenance areas for O_3. In addition, Muscatine County, Iowa and Jackson County, Missouri, are both in nonattainment for SO_2 and Wayne County, Michigan is in maintenance for $PM_{2.5}$. **Table K.4-1** in **Appendix K** describes the status for all counties in the study area.

Since the publication of the Draft EIS, EPA has reclassified the ozone attainment status of some of the counties in the study area. Specifically, EPA reclassified the nonattainment status of Collin, Denton, Fort Bend, Harris, Liberty and Tarrant Counties in Texas from "serious" to "severe" effective as of November 7, 2022.

Table 3.7-2. Ozone Nonattainment Status of Affected Counties

State	County	O_3 Criteria Pollutant
Illinois	Cook[1]	NA-Serious[2]
Illinois	DuPage[1]	NA-Serious[2]
Illinois	Kane[1]	NA-Serious[2]
Michigan	Wayne[3]	NA-Marginal[2]
Missouri	Jackson	M[4]
Texas	Collin	NA-Severe~~Serious~~[2]
Texas	Denton	NA-Severe~~Serious~~[2]
Texas	Fort Bend	NA-Severe~~Serious~~[2]
Texas	Harris	NA-Severe~~Serious~~[2]
Texas	Jefferson	M[5]
Texas	Liberty	NA-Severe~~Serious~~[2]
Texas	Orange	M[5]
Texas	Tarrant	NA-Severe~~Serious~~[2]

Source: EPA 2021b

Note: M = Maintenance; NA = Nonattainment; O_3 = Ozone.

[1] This county is a former maintenance area for the revoked 1997 Annual $PM_{2.5}$ standard. Areas that have been redesignated to attainment are not required to make transportation or general conformity determinations.

[2] Ozone nonattainment designations are ranked by the severity of their exceedance of the NAAQS. The affected counties have "severe," "serious," and "marginal" designations which affect the *de minimis* thresholds used to assess the Proposed Acquisition's emissions. The classifications in the Final EIS reflect EPA's ozone reclassifications that became effective on November 7, 2022.

[3] This county is a former maintenance area for the respective pollutant. The 20-year maintenance plan has expired, as such transportation and general conformity are no longer applicable.

[4] This county is a former maintenance area for the revoked 1979 1-hour Ozone standard. Areas that have been redesignated to attainment are not required to make transportation or general conformity determinations.

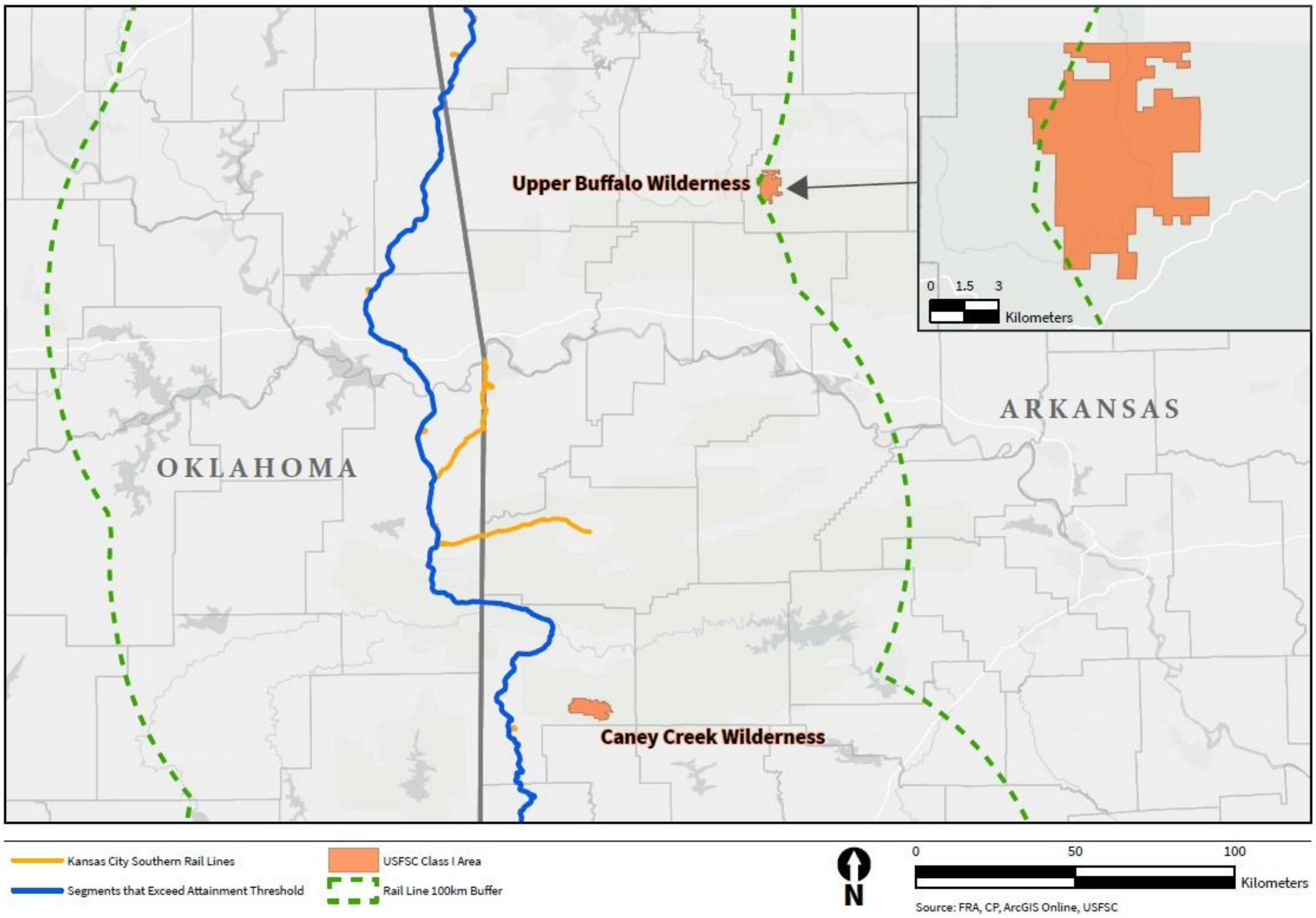
[5] This county is a former maintenance area for the revoked 1997 8-hour Ozone standard. As a result of the South Coast Air Quality Management District v. EPA court case, these areas are considered "orphan areas" and are still subject to conformity requirements under their maintenance plans.

Class I Areas

Two Class I Areas qualify for restrictive special air quality protections under the CAA (40 C.F.R. Part 52 Subpart 21; 40 C.F.R. Part 81) and are within 100 kilometers of the study area (see **Figure 3.7-1**). Both areas are under U.S. Forest Service jurisdiction.

- Caney Creek Wilderness in Arkansas is approximately 18 kilometers at the closest point to the Proposed Acquisition's affected rail line segment. All rail line segments within 100 kilometers include K-HEAV-02, K-HEAV-03, K-SHREV-01, K-SHREV-02 and K-SHREV-03; and
- Upper Buffalo Wilderness in Arkansas is approximately 100 kilometers at the closest point to rail line segments (K-HEAV-01 and K-HEAV-02).

Figure 3.7-1. Class I Areas within 100 Kilometers of the Proposed Rail System



Acid Deposition

Acid deposition occurs when sulfur oxides (SO_x) and NO_x are released from various sources and combine in the atmosphere to form acidic substances. These sulfuric and nitric acids damage soil, vegetation, and water quality, particularly the acid-neutralizing capacity of lakes. EPA Clean Air Status and Trends Network (CASTNET)[1] monitors closest to the Caney Creek and Upper Buffalo Wilderness areas are the Caddo Valley and Cherokee Nation monitors. Data from both monitors show that acid deposition levels have declined or remained generally the same over the latest 10 years of available data (2009-2019). **Table 3.7-3** presents total average sulfuric

[1] CASTNET is a national monitoring network established to assess trends in pollutant concentrations, atmospheric deposition, and ecological effects due to changes in air pollutant emissions.

and nitric acid deposition at the two monitors. Generally, sulfuric and nitric acid deposition of less than five kilograms/hectare/year would not negatively affect soil and vegetation. Historical annual acid deposition at the Cherokee Nation site exceeds this value for nitrogen. However, the annual acid deposition levels are less than the 12 kilograms/hectare/year at which increased toxicity would occur in soils.

Table 3.7-3. Historical Average Acid Deposition at Class I Areas

	Total Average Annual Deposition (kg/ha/year)	
Monitoring Site	**Sulfur (Dry and Wet)**	**Nitrogen (Dry and Wet)**
Caddo Valley, AK	1.95	4.21
Cherokee Nation, OK	1.78	5.87

Source: EPA 2021g, EPA 2021h

Visibility

The Interagency Monitoring of Protected Visual Environments (IMPROVE) is a network established by EPA to monitor atmospheric aerosols and visibility degradation issues at Class I areas throughout the U.S. The data from IMPROVE monitors for the Caney Creek and Upper Buffalo Wilderness areas report an overall decline in the haze index for over a decade, indicating that visibility is improving in these areas. The data also indicate that the average haze index over the latest 10 years of available data (2009-2019) are:

- Caney Creek Wilderness: 20.98 deciviews/year[2] on the haziest days and 8.73 deciviews/year on the clearest days
- Upper Buffalo Wilderness: 20.69 deciviews/year on the haziest days and 8.87 deciviews/year on the clearest days

Greenhouse Gas Emissions

GHG emissions are a key driver of climate change. In the U.S., most GHG emissions are composed of CO_2 emissions and originate from the combustion of fossil fuels (EPA 2021). Transportation is the leading source of U.S. emissions from fossil fuels, attributable largely to passenger cars, sport utility vehicles (SUVs), and other light trucks (EPA 2021). Emissions from these vehicles have increased 14 percent since 1990 (EPA 2021), due in part to increased popularity in SUVs and light trucks that have lower fuel economy than other passenger vehicles (EPA 2021; USDOT 2017) as well as an increase in vehicle miles traveled as a result of population growth, suburban expansion, and economic growth. Although emissions in the U.S. have generally risen over the past 30 years, periods of decreased economic activity (such as the COVID-19 pandemic) have correlated to a reduction in emissions (Liu et al. 2020). Other key contributors to emissions include other energy-related activities, agriculture, forestry, waste, and other land uses.

[2] A deciview is the unit of measurement for quantifying in a standard manner the human perception of visibility.

3.7.1.4 Environmental Consequences

The following subsections describe the potential environmental impacts of the Proposed Acquisition and the No-Action Alternative.

Proposed Acquisition

As noted above, OEA expects that the Proposed Acquisition may not result in an overall net increase in emissions of air pollutants or GHGs when measured at the national level. As discussed in *Chapter 2, Proposed Action and Alternatives*, the Applicants project that the Proposed Acquisition would increase rail traffic on the combined CPKC system as a result of the diversion of rail traffic from other rail lines and the diversion of freight from truck transportation to rail. Freight shipments that currently must stop in rail yards to change carriers would be handled as a single, long-haul movement on the combined network. Stopping, idling, and switching are less fuel efficient and cause increased GHG emissions. Therefore, OEA expects that emissions related to projected increases in rail traffic on rail lines and projected increases in activities at rail yards and intermodal facilities may be offset by decreased emissions elsewhere. Because the Proposed Acquisition would likely result in the diversion of freight from truck transportation to rail transportation and from other rail lines, OEA expects that the net effect of the Proposed Acquisition could be similar to the No-Action Alternative or a reduction in air emissions when measured at the system-wide or national scale.

Table 3.7-4 shows the total air emissions that would be associated with the Proposed Acquisition across the study area (those areas that meet the Board's thresholds for environmental review). Since the study area only includes those areas which experience large increases in activity, the summarized emissions show an increase. When considering the entire national rail network (including rail lines owned by other railroads and portions of the CPKC network where increased rail traffic would not meet the thresholds for environmental review), the Proposed Acquisition may result in reduced emissions due to the diversion of freight from truck to rail transportation, as well as potential operational efficiencies, such as allowing for fewer interchanges and more long-haul movements. The table includes locomotive emissions from increased rail traffic; emissions from increased vehicular delay at at-grade roadway/rail crossings (grade crossings); and emissions from trucks, cranes, and other equipment related to increased activities at rail yards and intermodal facilities that would occur under the Proposed Acquisition. The table also shows the estimated reduction in emissions that would result from the diversion of freight from truck transportation to rail transportation under the Proposed Acquisition.

As **Table 3.7-4** shows, NO_x is the air pollutant of greatest concern from locomotive emissions, and OEA estimates that increased rail traffic on rail lines in the study area would result in the emission of approximately 5,703 tons of NO_x each year. OEA expects that these NO_x emissions could be offset by lower NO_x emissions on other rail lines outside of the CPKC network. **Table K.5-1** in **Appendix K** provides additional information regarding study area-wide emissions.

Table 3.7-4. Summary of Study Area-Wide Emissions Estimates

Pollutant	Locomotive Emissions	Rail Yards	Intermodal Facilities	Grade Crossings	CPKC Total Emissions
Criteria Pollutants (tons/year)					
NO_X	5,702.5	7.8	14.4	0.1	5,724.9
VOC	239.7	0.5	0.7	0.0	240.9
PM_{10}	152.3	0.2	0.3	0.0	152.8
$PM_{2.5}$	147.7	0.2	0.3	0.0	148.2
SO_2	3.8	0.0	0.0	0.0	3.8
CO	1,083.2	1.1	3.9	0.6	1,088.8
Greenhouse Gases (tons/year)					
CO_2e[1]	416,787	420	5,752	123	423,083
Hazardous Air Pollutants (tons/year)					
Acetaldehyde	18.77	0.04	0.03	0.00	18.84
Acrolein	3.84	0.01	0.00	0.00	3.85
Benzene	5.39	0.01	0.01	0.00	5.41
1,3-Butadiene	0.45	0.00	0.00	0.00	0.45
Ethyl Benzene	0.92	0.00	0.00	0.00	0.93
Formaldehyde	53.46	0.11	0.06	0.00	53.63
Napthalene	0.65	0.00	0.00	0.00	0.66
POM	0.67	0.00	0.00	0.00	0.67

Notes:
[1] CO_2e values were calculated using the 100-year potential global warming potential (GWP) values from the IPCC Fourth Assessment Report (IPCC 2007).

Note: Values of zero indicate emissions were smaller than 0.05 or 0.005 tons per year, respective to the number of decimal places presented.
NO_x = Oxides of Nitrogen; VOC = Volatile Organic Compounds; PM_{10} = Particulate Matter 10 microns or less in diameter; $PM_{2.5}$ = Particulate Matter 2.5 microns or less in diameter; SO_2 = Sulfur Dioxide; CO = Carbon Monoxide; CO_2e = Carbon Dioxide Equivalent; POM = Polycyclic Organic Matter.

Similarly, OEA expects the overall impact of the Proposed Acquisition would be to decrease national and global air emissions specifically as a result of freight being diverted from truck transportation to the CPKC rail system. Rail transportation is more fuel efficient than truck transportation and therefore results in fewer GHG emissions for each ton of freight moved. The system-wide reduction in truck emissions from diversions is presented in **Table 3.7-5**. These emission reductions would occur on highways across the U.S. OEA estimated that the Proposed Acquisition would cause NO_x emissions on highways to decrease by approximately 231.2 tons each year due to truck-to-rail diversions. OEA also notes that emerging technologies, such as hydrogen and battery-electric locomotives, may contribute to reduced emissions in the future. CP has been retrofitting three locomotives in its fleet to be powered by hybrid hydrogen fuel cells and batteries and plans to launch those retrofitted locomotives in the coming months (Wilson 2021).

Table 3.7-5. System-Wide Truck Diversion Emissions Reductions

Pollutant	**System-wide Truck-to-Rail Diversions**
Criteria Pollutants (tons/year)	
NO_X	-231.2
VOC	-6.8
PM_{10}	-8.3
$PM_{2.5}$	-4.0
SO_2	-0.4
CO	-129.6
Greenhouse Gases (tons/year)	
CO_2e[1]	-127,113
Hazardous Air Pollutants (tons/year)	
Acetaldehyde	-0.34
Acrolein	-0.03
Benzene	-0.01
1,3-Butadiene	0.00
Ethyl Benzene	-0.06
Formaldehyde	-0.36
Napthalene	-0.01
POM	0.00

Notes:

[1] CO_2e values were calculated using the 100-year potential GWP values from the IPCC Fourth Assessment Report (IPCC 2007).

Note: Values of zero indicate emissions were smaller than 0.05 or 0.005 tons per year, respective to the number of decimal places presented.

NO_x = Oxides of Nitrogen; VOC = Volatile Organic Compounds; PM_{10} = Particulate Matter 10 microns or less in diameter; $PM_{2.5}$ = Particulate Matter 2.5 microns or less in diameter; SO_2 = Sulfur Dioxide; CO = Carbon Monoxide; CO_2e = Carbon Dioxide Equivalent; POM = Polycyclic Organic Matter.

Per CEQ guidance, OEA acknowledges that climate change "results from the incremental addition of GHG emissions from millions of individual sources, which collectively have a large impact on a global scale" and that "the totality of climate change impacts is not attributable to any single action…" (CEQ 2016). With this understanding, OEA considered GHG emissions as a proxy for assessing the Proposed Acquisition's impact on climate change in the U.S. and expects that it would result in an overall decrease in GHG emissions.

As reported in **Table 3.7-4**, GHG emissions associated with the Proposed Acquisition include emissions from locomotives on rail lines and in rail yards, emissions from trucks and equipment at intermodal facilities, and emissions from vehicles delayed at grade crossings. Taken together, OEA estimates that the increased rail traffic on rail lines, increased operational activities at rail yards and intermodal facilities, and increased vehicular delay at grade crossings resulting from the Proposed Acquisition would emit approximately 423,083 tons of CO_2e per year. However, because increases in rail traffic on rail lines in the CPKC system would mostly be caused by the diversion of rail traffic from other rail lines, GHG emissions associated with the Proposed Acquisition would be mostly offset by decreased rail-related emissions elsewhere, including decreased locomotive emissions on rail lines outside of the CPKC network, decreased emissions from vehicles delayed at grade crossings along rail lines outside of the CPKC network, and decreased emissions from rail yards and intermodal facilities outside of the study area.

Because rail transportation is more efficient than trucks, decreased truck emissions from truck-to-rail diversions would more than offset increased locomotive emissions from truck-to-rail diversions. As shown in **Table 3.7-5**, OEA estimates that the diversion of trucks from highways would reduce truck fuel consumption by approximately 10.8 million gallons of diesel fuel per year. This decrease in fuel consumption would decrease GHG emissions from trucks by approximately 127,113 tons of CO_2e per year. Because rail transportation is approximately four times more fuel efficient than trucks, on average, OEA estimates that truck-to-rail diversions would increase locomotive fuel consumption by approximately 2.7 million gallons of diesel fuel per year (AAR 2021). This corresponds to an increase in GHG emissions from locomotives of approximately 30,475 tons of CO_2e per year. Therefore, due to truck-to-rail diversions, OEA estimates that the Proposed Acquisition would result in a net decrease in GHG emissions of approximately 96,638 tons of CO_2e per year compared to the No-Action Alternative. This estimate is very conservative because it does not account for additional potential reductions in GHG emissions associated with new rail operations-related efficiencies that the Proposed Acquisition could introduce, such as allowing for fewer interchanges and more long-haul movements.[3] This means that OEA's estimated reduction of 96,638 tons of CO_2e per year may tend to understate the potential beneficial impacts of the Proposed Acquisition on climate change.

Although OEA expects that the Proposed Acquisition might result in a net decrease in air emissions at the system-wide scale, the Proposed Acquisition would change the distribution of emissions at the local scale because freight would be diverted from trucks and other rail lines onto the CPKC rail lines in the study area. Under the Proposed Acquisition, county-level emissions of criteria pollutants, HAPs, and GHGs would increase due to the projected changes in

[3] Indeed, the Applicants estimate that, by Year 3 following the approval of the Proposed Acquisition, improvements in operational efficiency would result in a further reduction in GHG emissions of approximately 324,000 tons of CO_2e per year compared to the No-Action Alternative, which would be in addition to the reduction in GHG emissions associated with truck-to-rail diversions.

rail traffic and activity at rail yards and intermodal facilities. OEA did not consider the emissions benefits of truck-to-rail diversions at the county level because truck traffic would likely decrease on many different highways in many different counties throughout North America, so the benefits from truck-to-rail diversions would be diffuse and the truck traffic reductions would not necessarily align with the counties experiencing increases in rail-related emissions.

Table 3.7-6 presents the estimated county-level emissions of criteria pollutants for counties within nonattainment areas in the study area. **Table K.6-1** in **Appendix K** presents all county-level criteria pollutant emissions estimates in the study area. **Table 3.7-7** presents the estimated total emissions for ozone-related pollutants for each ozone nonattainment area. These tables also provide the *de minimis* threshold for each pollutant. As noted above, OEA has determined, in consultation with EPA, that locomotive emissions from rail operations resulting from Board actions are not subject to General Conformity because the Board does not exercise continuing program responsibility over and cannot practically control emissions from rail operations. Similarly, emissions associated with increased activities at rail yards and intermodal facilities are not subject to the General Conformity regulations because the Board does not exercise continuing program control over operations at rail yards or intermodal facilities. However, the *de minimis* threshold provides context for understanding the change in localized air emissions that would occur under the Proposed Acquisition.

As the tables show, the annual NO_x emissions associated with the Proposed Acquisition would exceed the *de minimis* thresholds within the Chicago Ozone Nonattainment Area, the Houston-Galveston-Brazoria Ozone Nonattainment Area, the Dallas-Fort Worth Ozone Nonattainment Area, and the Beaumont-Port Arthur Ozone Maintenance Area. Emissions of other criteria pollutants would be well below the applicable *de minimis* thresholds. Additional analysis under the General Conformity regulations is not necessary because emissions associated with changes in rail traffic are not subject to the General Conformity regulations as noted above. However, emissions associated with rail operations under the Proposed Acquisition could affect EPA and state agency enforcement of applicable State Implementation Plans for the affected nonattainment areas in the future.

Following the publication of the Draft EIS, EPA reclassified the ozone attainment status of some of the counties in the study area. Specifically, EPA reclassified the nonattainment status of Collin, Denton, Fort Bend, Harris, Liberty and Tarrant Counties in Texas from "serious" to "severe" effective November 7, 2022. Therefore, OEA has revised the applicable *de minimis* thresholds for these counties and for the corresponding nonattainment areas from 50 tons to 25 tons per year for NO_x and VOC in this section and in **Appendix K** in this Final EIS. The 2015 ozone designations of Cook, DuPage, and Kane counties in Illinois were reclassified from "marginal" to "moderate" but their worst ozone nonattainment classification of "serious" under the 2008 standard remains unchanged. Accordingly, the applicable *de minimis* thresholds for these counties remain the same.

NO_x in ozone nonattainment areas is a regional pollutant and is of particular concern when combined with VOCs, heat and sunlight in the atmosphere, as the combination of those elements result in ground-level ozone. Because it is a regional pollutant, the effects of NO_x and its transformation to ozone are experienced over a large area (ranging up to thousands of kilometers) as opposed to a smaller, localized area. As promulgated by the CAA, EPA-designated nonattainment areas for ozone must adopt State Implementation Plans that ensure that the

NAAQS are met and sustained for those areas. Nonattainment areas are further classified by the degree to which they exceed the NAAQS. For instance, areas can be in marginal, moderate, serious, or extreme nonattainment for ground-level ozone. The severity of the exceedance requires more stringent rules in the State Implementation Plans. Section 182 of Part D of Title I of the CAA presents the rules for ozone nonattainment areas in detail.

One of the key components of the State Implementation Plans is conducting an emission inventory. Emission inventories are recordkeeping databases of the various pollutant emission quantities by source. Sources include (but are not limited to) human-caused stationary sources and on-road and non-road mobile sources, which include aircrafts, commercial marines, and locomotives. The CAA requires states to present actual emissions of a baseline year inventory for ozone State Implementation Plans. Ozone nonattainment areas that are moderate or above must present Rate of Progress and Reasonable Further Progress plans to ensure that states are making progress in achieving attainment for nonattainment areas and are decreasing in NO_x and VOC emissions from the baseline inventory year. The State Implementation Plans define specific reduction targets for the emissions inventories that must be met within certain timeframes. States in nonattainment for ozone must reevaluate their emissions inventory every three years.

Overall, these inventories allow state entities such as the Metropolitan Planning Organizations (MPOs) and Departments of Transportation to identify primary sources of air pollution, and set emission budgets for various sources, which include permitting requirements for large stationary sources and transportation improvement plans for mobile sources. The anticipated increases in emissions due to rail activity in these nonattainment areas should be accounted for in future State Implementation Plan inventories, sometimes requiring offsets in emissions budgets in order to achieve the required reductions in emissions from the base year inventories. **Table 3.7-7** provides the associated mobile source emissions budgets in each applicable ozone nonattainment area for comparative purposes. The Proposed Acquisition-related NO_x emissions are projected to be less than 1 percent of the current emissions budget for the respective nonattainment areas.

As stated above, EPA recently reclassified the Houston-Galveston-Brazoria and Dallas-Fort Worth Ozone Nonattainment Areas in Texas from a "serious" to "severe" classification effective November 7, 2022. The reclassification does not have a substantial impact on OEA's analysis or conclusions with the exception that emissions resulting from the Proposed Acquisition would now exceed the revised *de minimis* threshold for NO_x in the Dallas-Fort Worth Ozone Nonattainment Area. The transition to a "severe" classification will likely require MPOs and state agencies to create new major stationary source requirements and establish a new updated emissions inventory, transportation control measures to offset vehicle miles travelled growth, and the use of low VOC reformulated gas in these nonattainment areas. With the reclassification, MPOs and state air agencies will likely update the emissions inventory and create new emissions reductions targets to meet the requirements of the CAA. The proposed revisions to the State Implementation Plan in light of the reclassification are not yet available to assess the estimated emissions increases of the Proposed Acquisition in relation to new emissions budgets. Areas that have been reclassified to severe nonattainment must submit State Implementation Plan revisions within 18 months of the effective date of the reclassification (May 2024).

Table 3.7-6. Summary of County-Level Emissions Estimates in Nonattainment Counties

			Acquisition-related Emissions (tons/yr)						***de minimis* Threshold (tons/yr)**					
State	**County**	**Nonattainment Pollutant**	**NO_x**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**CO**	**NO_X**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**CO**
Illinois	Cook	O_3-Serious	38.0	1.8	1.0	0.9	0.0	7.6	50	50	-	-	-	-
Illinois	DuPage	O_3-Serious	29.3	1.2	0.8	0.8	0.0	5.6	50	50	-	-	-	-
Illinois	Kane	O_3-Serious	45.5	1.9	1.2	1.2	0.0	8.7	50	50	-	-	-	-
Iowa	Muscatine	SO_2	43.6	1.8	1.2	1.1	0.0	8.3	-	-	-	-	100	-
Michigan	Wayne	O_3: Marginal $PM_{2.5}$: Maintenance	1.4	0.1	0.0	0.0	0.0	0.4	100	100	-	100	-	-
Missouri	Jackson	SO_2	21.3	0.9	0.6	0.6	0.0	4.0	-	-	-	-	100	-
Texas	Collin	O_3: ~~Serious~~ Severe	10.4	0.5	0.3	0.3	0.0	2.2	~~50~~25	~~50~~25	-	-	-	-
Texas	Denton	O_3: Severe~~Serious~~	17.0	0.7	0.5	0.4	0.0	3.2	~~50~~25	~~50~~25	-	-	-	-
Texas	Fort Bend	O_3: Severe~~Serious~~	37.6	1.6	1.0	1.0	0.0	7.2	~~50~~25	~~50~~25	-	-	-	-
Texas	Harris	O_3: Severe~~Serious~~	31.5	1.3	0.8	0.8	0.0	6.1	~~50~~25	~~50~~25	-	-	-	-
Texas	Jefferson	O_3: Maintenance	111.1	4.7	3.0	2.9	0.1	21.1	100	100	-	-	-	-
Texas	Liberty	O_3: Severe~~Serious~~	24.1	1.0	0.6	0.6	0.0	4.6	~~50~~25	~~50~~25	-	-	-	-
Texas	Orange	O_3: Maintenance	76.5	3.2	2.0	2.0	0.1	14.5	100	100	-	-	-	-
Texas	Tarrant	O_3: ~~Serious~~ Severe	1.4	0.1	0.0	0.0	0.0	0.3	~~50~~25	~~50~~25	-	-	-	-

Notes:

Values of zero indicate emissions were smaller than 0.05 tons per year.

NO_x = Nitrogen oxides; VOC = Volatile organic compounds; PM_{10} = Particulate matter 10 microns or less in diameter; $PM_{2.5}$ = Particulate Matter 2.5 microns or less in diameter; SO_2 = Sulfur dioxide; CO = Carbon monoxide; CO_2e = Carbon dioxide equivalent; O_3 = Ozone; - = *de minimis* threshold not applicable due to attainment status.

Table 3.7-7. Summary of Total Emissions Estimates in Ozone Nonattainment Areas

			Acquisition-related Emissions (tons/yr)		*de minimis* Threshold (tons/yr)		Local MPO Emissions Budget (tons/yr)[1]	
Nonattainment Area	***State***	***Pollutant***	***NO_X***	***VOC***	***NO_X***	***VOC***	***NO_X***	***VOC***
Chicago Ozone Nonattainment Area	Illinois	O_3: Serious	112.8	4.9	50	50	54,850	21,950
Houston-Galveston-Brazoria Area Ozone Nonattainment Area	Texas	O_3: ~~Serious~~Severe	93.3	3.9	~~50~~25	~~50~~25	44,460	24,830
Dallas-Fort Worth Ozone Nonattainment Area	Texas	O_3: ~~Serious~~Severe	28.8	1.3	~~50~~25	~~50~~25	47,730	23,690
Beaumont-Port Arthur Ozone Maintenance Area	Texas	O_3: Maintenance	187.6	7.9	100	100	[2]	[2]

Source: CMAP 2018, HGAC 2019, NCTCOG 2018, SETRPC-MPO 2019.

Notes:

[1] Current ~~A~~annual budget of NO_x and VOC extrapolated from tons per day budget in respective current Long Range Transportation Plans assuming 365 days per year.

[2] Budget not applicable to this area as it is in attainment/maintenance, the MPO does not need to show compliance with a budget to meet State Implementation Plan requirements.

NO_X = Nitrogen oxides; VOC = Volatile organic compounds; O_3 = Ozone.

Table K.6-2 in **Appendix K** presents the county-level HAPs emissions estimates by county. The largest increase in total HAPs emissions of 4.5 tons per year would occur in Caddo Parish, Louisiana. This increase is primarily composed of a 2.8 ton-per-year increase of formaldehyde. These increases of HAPS are relatively small. By comparison, a stationary emissions source would need to either emit more than 10 tons per year of any single HAP or more than 25 tons per year of all combined HAPs to be required to obtain a Title V air quality permit (EPA 2021k).[4]

To minimize the potential impacts on air quality from locomotive emissions, the Applicants have proposed voluntary mitigation measures that, if imposed by the Board, would require the Applicants to develop an anti-idling policy for construction equipment used in the planned capital improvements as well as ongoing operations for use in communities within the study area (Voluntary Mitigation [VM]-Air-05), develop GHG reduction targets (VM-Air-01), and comply with EPA emissions standards for locomotives when purchasing and rebuilding locomotives.

Class I Area Assessment

Agencies typically only assess air quality impacts on Class I Areas for major stationary sources, pursuant to the Prevention of Significant Deterioration (PSD) requirements of the CAA. Although rail lines are not major stationary sources that are subject to the PSD requirements of the CAA, EPA recommended in comments submitted during the scoping process that OEA consider potential air quality impacts of the Proposed Acquisition on Class I Areas. In response, OEA has quantified air pollutant emissions near Class I Areas for informational purposes. Although the Proposed Acquisition would not result in any new air emissions within any Class I Areas, changes in rail traffic would result in emissions near Class I Areas. There are two Class I Areas located within 100 kilometers of rail lines where OEA expects that increased rail traffic would meet or exceed the Board's thresholds for environmental review. There are no Class I Areas within 100 kilometers of rail yards or intermodal facilities where increases in activities would meet the thresholds for environmental review.

Table 3.7-8 presents operational emissions from project rail segments within 100 kilometers of the Class I areas. Upper Buffalo Wilderness in Arkansas is approximately 100 kilometers at the closest point to rail line segments (K-HEAV-01 and K-HEAV-02). This distance is at the threshold for assessing impacts for a Class I area. The rail line segments within 100 kilometers of the Upper Buffalo Wilderness Class I area spans 69 miles. OEA concluded that emissions resulting from operations on these rail line segments would have no adverse impacts because the locomotive emissions would be spread out across this extended distance which spans multiple states and counties and would not be emitted close enough to the Upper Buffalo Wilderness to affect air quality in that Class I area.

Caney Creek Wilderness in Arkansas is approximately 18 kilometers from the closest rail line that would experience increased rail traffic as a result of the Proposed Acquisition. Rail line segments within 100 kilometers of Caney Creek Wilderness include K-HEAV-02, K-HEAV-03, K-SHREV-01, K-SHREV-02, and K-SHREV-03. Arkansas has established State Implementation Plan provisions under its Regional Haze Program to protect AQRVs in the state's Class I Areas. Under these State Implementation Plan provisions, Arkansas has

[4] Note that the criteria pollutant thresholds for Title V air quality permitting are generally similar to the *de minimis* thresholds.

established a NO_x emissions budget of 9,210 tons per year for 2018 and beyond under the updated Cross State Air Pollution Rule (Arkansas Department of Environmental Quality 2017). NO_x emissions on rail line segments in Arkansas associated with the Proposed Acquisition would represent approximately 8 percent of this total budget. Moreover, emissions from locomotives would be spread over a large geographic area representing 202 miles of track that primarily travel north-south, parallel to the wilderness area. The Class I area also must be downwind from the locomotives for emissions to result in negative impacts. Based on the geometry shown in **Figure 3.7-1**above, there is no one wind condition (for example, from the east) that would result in all estimated rail emissions presented in **Table 3.7-8** being upwind of Caney Creek Wilderness at the same time. Emissions from the rail line span a large geographic area and are not emanating from a single point (for example, directly west of the Caney Creek Wilderness). For these reasons, OEA concluded that emissions resulting from the Proposed Acquisition's rail operations would not adversely affect this Class I area and that emissions resulting from operations on these rail line segments would have no adverse effects on Caney Creek Wilderness.

Table 3.7-8. Emissions within 100 Kilometers of Class I Areas

Class I Area	**Project Element**	**Track Length (miles)**	**Acquisition-related Emissions (tons/yr)**				
			NO_X	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**
Upper Buffalo	Rail Segments	69	277.1	11.6	7.4	7.2	0.2
Caney Creek	Rail Segments	202	809.8	34.0	21.6	21.0	0.5

Short-Term Impacts

OEA estimated emissions of criteria pollutants, GHGs, and HAPs for activities in both attainment and nonattainment areas that relate to the 25 planned capital improvement sites. OEA compared emissions in nonattainment areas to *de minimis* thresholds, as presented in **Table 3.7-9**. OEA determined that only the Blue Valley capital improvement site in Kansas City would partially occur in a nonattainment area, which is a SO_2 nonattainment area. All other planned capital improvements would be located in attainment areas. In addition, OEA projects that emissions of all criteria pollutants and GHGs within attainment areas would be relatively small. **Table K.12-1** in **Appendix K** presents all county-level criteria pollutant emission estimates. OEA also projects HAPs emissions to be small, with the largest single HAP emission being 0.0008 tons of formaldehyde per year occurring in Adair County, Oklahoma.

The Applicants have proposed voluntary mitigation measures that would minimize the air quality impacts associated with the planned capital improvements. These measures include a commitment to develop an anti-idling policy that would pertain to idling of construction equipment (VM-Air-05), a commitment to implement appropriate fugitive dust suppression controls during construction activities related to the planned capital improvements (VM-Air-06), a commitment to work with contractors to ensure that construction equipment would be properly maintained to limit construction-related emissions (VM-Air-07), and a commitment to begin revegetation as soon as practicable following the completion of the capital improvements to minimize impacts of wind erosion and fugitive dust (VM-Air-08). The anti-idling and properly maintained equipment would help to mitigate the SO_2 emissions.

No-Action Alternative

Under the No-Action Alternative, the Board would not authorize the Proposed Acquisition and CP would not acquire KCS. Therefore, the projected increase in rail traffic on rail lines in the combined CPKC system and the projected increase in operational activities at rail yards and intermodal facilities would not occur as a result of the Proposed Acquisition. In addition, the Applicants would not add the 25 planned capital improvements as a result of the Proposed Acquisition. Therefore, air emissions would not increase along rail lines in the study area as a result of the Proposed Acquisition and air emissions would not decrease as a result of the diversion of freight from other rail lines or from truck transportation to rail transportation. However, the Applicants expect that rail traffic could increase in the future on rail lines in the study area under the No-Action Alternatives due to changing market conditions, including general economic growth. Similarly, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority if needed to support each carrier's rail operations.

Table 3.7-9. Summary of Capital Improvement Criteria Pollutant and GHG Emissions

				Acquisition-Related Emissions (tons/yr) County Totals							*de minimis* Threshold (tons/yr)					
State	**County**	**Nonattainment Pollutant**	**Site(s)**	**NO_x**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**CO**	**CO_2e[1]**	**NO_X**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**CO**
Arkansas	Benton		Gentry	0.02	0.00	2.13	0.21	0.00	0.01	15.88	-	-	-	-	-	-
Arkansas	Polk		Mena	0.02	0.00	1.87	0.19	0.00	0.01	13.99	-	-	-	-	-	-
Illinois	Ogle		Monroe	0.02	0.00	1.96	0.20	0.00	0.01	15.88	-	-	-	-	-	-
Iowa	Clayton		Turkey River	0.02	0.00	1.99	0.20	0.00	0.01	14.90	-	-	-	-	-	-
Iowa	Clinton		Camanche Deer Creek	0.02	0.00	1.70	0.17	0.00	0.01	12.67	-	-	-	-	-	-
Iowa	Jackson		Bellevue	0.02	0.00	1.63	0.16	0.00	0.01	12.21	-	-	-	-	-	-
Iowa	Louisa		Letts	0.00	0.00	0.20	0.02	0.00	0.00	1.49	-	-	-	-	-	-
Iowa	Monroe		Moravia	0.02	0.00	1.76	0.18	0.00	0.01	13.13	-	-	-	-	-	-
Iowa	Wapello		Ottumwa	0.00	0.00	0.36	0.04	0.00	0.00	2.69	-	-	-	-	-	-
Iowa	Washington		Washington	0.02	0.00	1.66	0.17	0.00	0.01	12.38	-	-	-	-	-	-
Louisiana	Beauregard		Singer	0.01	0.00	0.84	0.09	0.00	0.00	6.31	-	-	-	-	-	-
Louisiana	De Soto		Mansfield	0.02	0.00	1.51	0.15	0.00	0.01	11.30	-	-	-	-	-	-
Missouri	Grundy		Laredo	0.00	0.00	0.45	0.04	0.00	0.00	3.33	-	-	-	-	-	-
Missouri	Jackson	SO_2	Blue Valley	0.02	0.00	1.59	0.16	0.00	0.01	11.88	-	-	-	-	100	-
Missouri	Jackson		Grandview	0.02	0.00	2.00	0.20	0.00	0.01	14.92	-	-	-	-	-	-
Missouri	Jasper		Asbury	0.02	0.00	1.70	0.17	0.00	0.01	12.74	-	-	-	-	-	-
Missouri	Livingston		Dawn	0.02	0.00	1.67	0.17	0.00	0.01	12.45	-	-	-	-	-	-
Missouri	McDonald		Goodman	0.01	0.00	0.82	0.08	0.00	0.00	6.14	-	-	-	-	-	-
Missouri	Sullivan		Newtown	0.00	0.00	0.34	0.03	0.00	0.00	2.52	-	-	-	-	-	-
Oklahoma	Adair		Baron (MP247) Cave Springs	0.04	0.00	3.28	0.33	0.00	0.01	24.54	-	-	-	-	-	-
Oklahoma	Le Flore		Spiro Heavener	0.02	0.00	1.45	0.15	0.00	0.01	10.84	-	-	-	-	-	-

Notes:

[1] CO_2e values were calculated using the 100-year potential GWP values from the IPCC Fourth Assessment Report (IPCC 2007). Values of zero indicate emissions were smaller than 0.005 tons per year.

NA = Nonattainment; NO_x = Nitrogen oxides; VOC = Volatile organic compounds; PM_{10} = Particulate matter 10 microns or less in diameter; $PM_{2.5}$ = Particulate matter 2.5 microns or less in diameter; SO_2 = Sulfur dioxide; CO = Carbon Monoxide; CO_2e = Carbon dioxide equivalent; - = *de minimis* threshold not applicable due to attainment status.

3.7.2 Climate Change and Adaptation

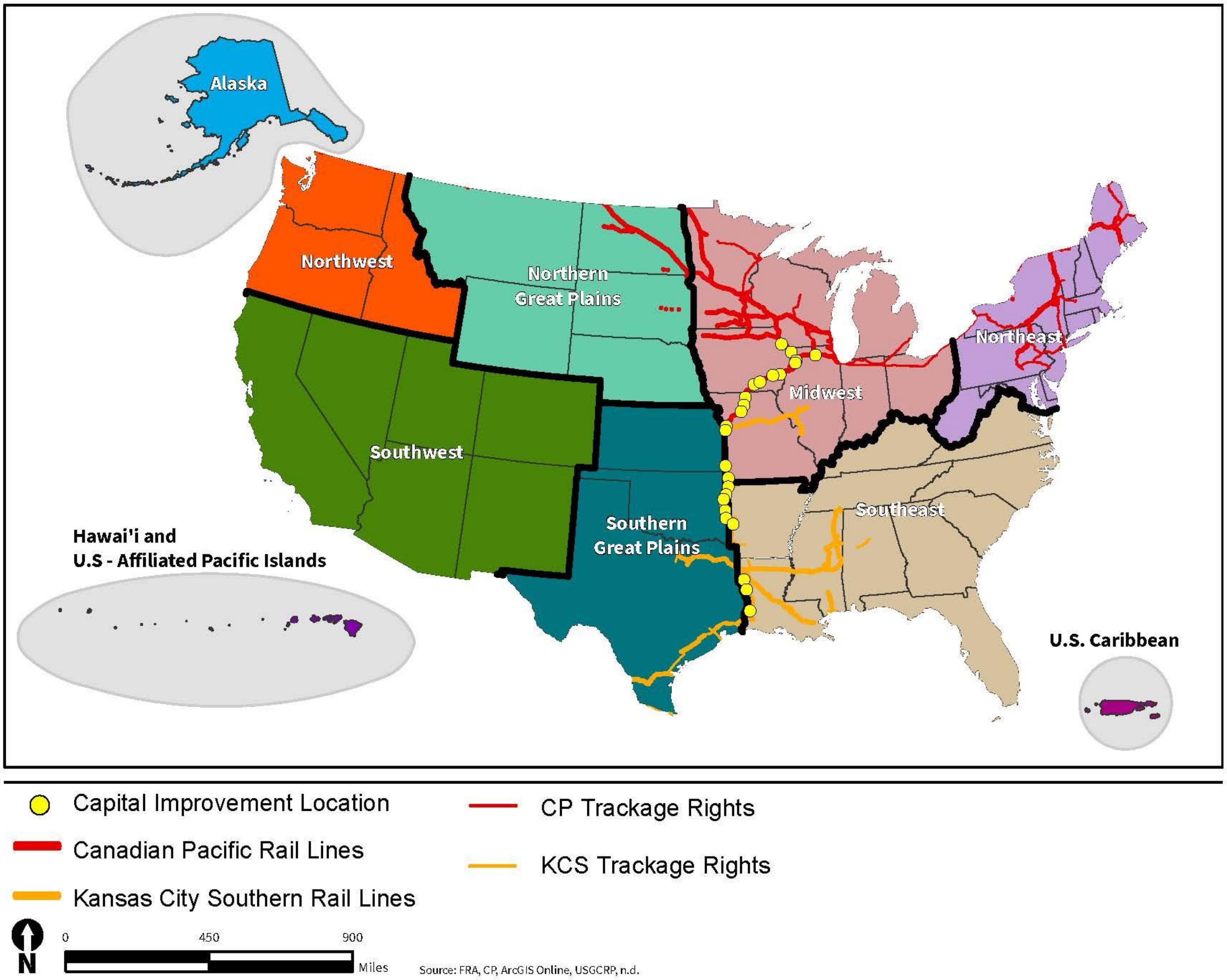
Many factors can affect global climate change, including changes in atmospheric composition due to GHG emissions, as described in *Section 3.7.1, Air Quality and Greenhouse Gas Emissions*. Climate change adaptation or climate adaptation means taking action to prepare for and adjust to both the current and projected impacts of climate change (EPA 2021). This section analyzes how climate change could affect the rail lines in the integrated CPKC system in the U.S., including the 25 planned capital improvements. It describes the existing conditions and anticipated impacts of climate change in specific regions in which the 25 planned capital improvements would be located, as well as regions in which CP and KCS rail lines are located.

3.7.2.1 Approach

The study area for climate change encompasses the five U.S. regions in which the CP and KCS rail lines are located. In its analysis and assessment, OEA used regions established by the *Fifth National Climate Assessment* (NCA5), which the U.S. Global Change Research Program (USGCRP) is developing and anticipates releasing in 2023. The merged system under the Proposed Acquisition would travel through five of the ten NCA5 regions: the Northeast, the Midwest, Southern Great Plains, Northern Great Plains, and the Southeast. To assess existing climate change conditions, OEA reviewed key climate trends in each of the five regions in which the CP and KCS rail lines are located, including the three regions in which the 25 planned capital improvements would occur. See **Figure 3.7-2** for additional detail.

To evaluate climate change impacts on the Proposed Acquisition, OEA reviewed the U.S. Geological Survey (USGS) National Climate Change Viewer and the USGCRP's most recent assessment, *Fourth National Climate Assessment* (NCA4), published in 2018. NCA4 summarizes current and future impacts of climate change in the U.S. OEA based its analysis of predicted climate change outcomes on future scenarios often used in climate change research, called Representative Concentration Pathways (RCPs). RCPs estimate factors such as emissions, GHG concentrations, and particulate matter; various climate models use these data to predict future climate outcomes (USGCRP 2018). Specifically, OEA assessed outcomes under the RCP4.5 and RCP8.5 scenarios. The RCP4.5 is considered a lower scenario with less warming, in which lower population growth, more technological innovation, and lower carbon intensity occur (USGCRP 2018). The RCP8.5 is associated with more warming and higher population growth, less technological innovation, and higher carbon intensity (USGCRP 2018). OEA also applied the U.S. Department of Transportation's (USDOT) Climate Change Sensitivity Matrix (USDOT 2014) to evaluate climate change impacts on the Proposed Acquisition. This tool presents the relationship between climate stressors (such as flooding and extreme heat) and impacts on transportation systems, including railroads.

Figure 3.7-2. CP and KCS Rail Lines within NCA5 Climate Regions



OEA also reviewed the *CP Climate Strategy*, which outlines CP's approach to addressing climate change impacts on its rail infrastructure. The *CP Climate Strategy* organizes CP's actions across five strategic pillars (Canadian Pacific 2021): understand climate-related risks and opportunities; reduce carbon footprint; respond to physical risks from climate change; integrate climate factors across business; and engage with stakeholders.

3.7.2.2 Affected Environment

This section summarizes recent and projected climate conditions in the regions where the CP and KCS rail lines are located: the Northeast, Midwest, Southern Great Plains, Northern Great Plains, and Southeast (planned capital improvements would be located in the Midwest, Southern Great Plains, and Southeast regions). This section provides temperature and precipitation trends and projections for each region and details anticipated climate change conditions in these regions.

Northeast

The Northeast has already begun to experience the effects of climate change throughout the region. NCA4 projects that by 2035, under both RCP4.5 and RCP8.5 scenarios, the Northeast will warm more than 3.6 degrees Fahrenheit on average as compared to the preindustrial era, which is typically referred to as the time period 1850-1900. This temperature increase would be the greatest increase in the contiguous U.S. The Northeast is also particularly susceptible to threats from sea level rise and has experienced some of the highest rates of sea level rise and ocean warming in the country. Sea level rise, as well as storm surges, recurrent coastal flooding, and erosion threaten marshes, fisheries, ecosystems, and coastal infrastructure in the Northeast. Specifically, industrial and commercial development in New England historically occurred along water bodies such as rivers, canals, and coasts; thus, some of these areas encompass a higher density of contaminated sites as well as waste management and petroleum storage facilities that are more susceptible to flooding given their proximity to adjacent waterways. Flooding in these areas could spread contaminants further into waterways and soils, jeopardizing ecosystem health, as well as the health of animals and humans (USGCRP 2018).

The Northeast has already begun experiencing milder, warmer winters and earlier spring conditions, which NCA4 projects as a key climate trend that would continue under the RCP8.5 scenario. This change in seasonality will affect aquatic ecosystems, forest productivity, agriculture, and resource-based industries such as forest-based industries and water dependent resources (Rustad et al. 2012). Notably, as late winters and early springs warm, plants could lose their tolerance to cold temperatures and start blooming earlier; early blooms followed by hard freezes have already contributed to the widespread loss of fruit crops in the Northeast (USGCRP 2018). These temperature changes may also increase populations of certain species, such as white-tailed deer and nutria. Warmer winters could also result in insects emerging earlier in the year and expanding their geographic range and population size. This can in turn harm other species, such as moose, which have already experienced higher death rates and infections from parasites and ticks (Janowiak et al. 2018).

NCA4 also projects a continuation of the recent trend in intense precipitation throughout the Northeast. Increases in precipitation are expected during the winter and spring and extending into the summer season. The agriculture industry would likely benefit from this increased precipitation as it would lead to greater productivity over a longer growing season (Wolfe et al. 2017). However, excess moisture can also lead to crop loss as well as increased soil erosion and agricultural runoff which could adversely impact water bodies (USGCRP 2018).

Table 3.7-10 below includes information about projected temperature and precipitation changes in the six states where CP and KCS rail lines are located within the Northeast region.

Table 3.7-10. Projected Temperature and Precipitation Changes in the Northeast under the RCP4.5 and RCP8.5 Scenarios

State	Projected Temperature Change[1] (degrees Fahrenheit)	Projected Precipitation Change[2] (inches per month)
RCP4.5		
Massachusetts	+2.89	+0.18
Maine	+3.07	+0.18
New Jersey	+2.82	+0.14
New York	+3.11	+0.15
Pennsylvania	+3.02	+0.14
Vermont	+3.12	+0.17
RCP8.5		
Massachusetts	+3.21	+0.20
Maine	+3.45	+0.22
New Jersey	+3.08	+0.19
New York	+3.45	+0.18
Pennsylvania	+3.32	+0.18
Vermont	+3.50	+0.20

Source: Alder and Hostetler 2013g-l

[1] Change is the difference in mean annual temperature between historical data (1981-2010) and the future climatology period from 2025-2049.

[2] Change is the difference in mean annual precipitation (measured in inches per month) between historical data (1981-2010) and the future climatology period from 2025-2049.

Midwest

Daily minimum temperatures in the Midwest recently have increased in all seasons due to increasing humidity; similarly, the region has seen an increase in precipitation from April through June over the past 30 years (USGCRP 2018). Increasing absolute humidity has resulted in higher precipitation amounts during the warm season and a decreased temperature difference between days and nights; increased humidity and precipitation have also eroded soils and created more favorable conditions for pests (USGCRP 2018). **Table 3.7-11** below details projected temperature and precipitation changes in states where 16 planned capital improvements would be located, in Iowa, Illinois, and Missouri:

- Iowa: Deer Creek, Camanche, Letts, MP 24 (Bellevue), Moravia, MP 255 (Washington), MP 71 (Turkey River), Ottumwa
- Illinois: MP 75 (Monroe)
- Missouri: Asbury, Blue Valley, Grandview (IFG), Laredo, MP 186, MP 431 (Dawn), Newtown

It also includes information about projected temperature and precipitation changes in the other five states where CP and KCS rail lines are located within the Midwest region (although no planned capital improvements would be located in these states): Minnesota, Wisconsin, Michigan, Indiana, and Ohio.

Table 3.7-11. Projected Temperature and Precipitation Changes in the Midwest under the RCP4.5 and RCP8.5 Scenarios

State	Projected Temperature Change[1] (degrees Fahrenheit)	Projected Precipitation Change[2] (inches per month)
RCP4.5		
Iowa	+3.25	+0.07
Illinois	+3.18	+0.08
Missouri	+2.98	+0.04
Minnesota	+3.46	+0.10
Wisconsin	+3.37	+0.09
Michigan	+3.25	+0.10
Indiana	+3.07	+0.11
Ohio	+3.04	+0.12
RCP8.5		
Iowa	+3.66	+0.10
Illinois	+3.49	+0.10
Missouri	+3.38	+0.07
Minnesota	+3.88	+0.12
Wisconsin	+3.78	+0.14
Michigan	+3.63	+0.14
Indiana	+3.40	+0.13
Ohio	+3.33	+0.14

Source: Alder and Hostetler 2013a-c, 2013q-u

[1] Change is the difference in mean annual temperature between historical data (1981-2010) and the future climatology period from 2025-2049.

[2] Change is the difference in mean annual precipitation (measured in inches per month) between historical data (1981-2010) and the future climatology period from 2025-2049.

NCA4 projects that warm-season temperatures in coming years will increase more in the Midwest than any other region in the U.S. and that, under RCP8.5, the frost-free season will increase by one month by 2070-2099, as compared to the period from 1976-2005. NCA4 also projects that rainfall will increase, along with humidity, through the middle of the 21st century.

Increased risk of flooding is a projected climate trend in the Midwest. For example, Anderson et al. project that the flood risk in the Cedar River Basin watershed in Iowa, through which existing CP rail lines are located, will shift from a 1 percent chance flood (100-year flood) in the 20th century to a 4 percent chance flood (25-year flood) in the 21st century (2015). With the projected increase in flooding and humidity also comes the increased chance of soil erosion. Other projected climate change impacts include more frequent drought conditions in the late growing season, increases in lake surface temperature, and a decline in lake ice cover (USGCRP 2018).

Southern Great Plains

Climate conditions in the Southern Great Plains are diverse and can be intense. The region is subject to extreme weather such as hurricanes, flooding, drought, heat waves, tornadoes, blizzards, ice storms, and heavy winds. The Southern Great Plains encompasses a varied landscape, with high-elevation borders and mountainous terrain to the west and humid states in the Mississippi River Valley to the east (USGCRP 2018). Average annual precipitation is also variable, with 2010 data showing less than 10 inches in the western area of the region and over 60 inches in the southeastern area. Historically, the region has been prone to periods of drought (1910s, 1930s, 1950s, and 2010-2015), as well as periods of high precipitation (1980s and early 1990s). The annual average temperature has also increased by 1 to 2 degrees Fahrenheit since the early 20th century. Overall, the region has seen swings between extreme drought followed by flooding for the past 50 years. This type of weather variation, along with high temperatures, are linked to the increased number of wildfires in the region (USGCRP 2018).

Table 3.7-12 details projected temperature and precipitation changes in Oklahoma, the state of four planned capital improvements: Cave Springs, Heavener, MP 247 (Baron), and Spiro. It also includes information about projected temperature and precipitation changes in Texas and Kansas, where CP and KCS rail lines are located, although no planned capital improvements would be located in these states.

Table 3.7-12. Projected Temperature and Precipitation Changes in the Southern Great Plains under the RCP4.5 and RCP8.5 Scenarios

State	Projected Temperature Change[1] (degrees Fahrenheit)	Projected Precipitation Change[2] (inches per month)
RCP4.5		
Oklahoma	***+2.84***	***-0.01***
Texas	+2.66	-0.02
Kansas	+2.92	+0.02
RCP8.5		
Oklahoma	+3.23	+0.01
Texas	+3.03	-0.02
Kansas	+3.37	+0.02

Source: Alder and Hostetler 2013d, 2013o, 2013p

[1] Change is the difference in mean annual temperature between historical data (1981-2010) and the future climatology period from 2025-2049.

[2] Change is the difference in mean annual precipitation (measured in inches per month) between historical data (1981-2010) and the future climatology period from 2025-2049.

Projected climate change impacts could include more intense and frequent events of extreme heat, drought, flooding, and severe storms (USGCRP 2018). According to NCA4, by the middle of the 21st century, annual average temperatures in the region would increase by 3.6 to 5.1 degrees Fahrenheit compared to the period from 1976-2005. Severe storms may vary across the region, with some data suggesting the possibility for an increase in the instances of larger hail sizes by 2040. Although the chance for more intense and frequent heavy precipitation would occur later in the 21st century, average annual precipitation projections indicate small changes overall. Climate change would worsen arid conditions in this region, primarily caused by drying soils as a result of increased evapotranspiration (the evaporation of water on land and loss of water from plants) due to higher temperatures. As temperatures rise, the risk of wildfires could also increase throughout the region, as will the duration of the fire season (USGCRP 2018).

Northern Great Plains

Climate conditions in the Northern Great Plains are markedly diverse and variable between sub-regions. The eastern edge of the region experiences more precipitation than the west and includes the Red River Valley, through which CP's existing rail network is located, and where there is often flooding (USGCRP 2018). The central part of the Northern Great Plains is defined by an arid to semiarid basin where temperatures and rates of evapotranspiration are very high (USGCRP 2018). The far western part of the region is mountainous and supports forests and other native ecosystems.

Given the region's distance from the coasts, the climate system here is prone to dramatic fluctuations, especially the Upper Missouri River Basin, which has seen variability in extreme flooding or drought approximately every decade for the past century (Livneh and Hoerling 2016). NCA4 projects that this variability is likely to become more common as the climate continues to warm. There is also high variability in the amount of precipitation that reaches streams each year, as well as a high frequency of extreme events (such as heavy rainfall and droughts) which makes managing water resources in the region challenging.

In addition to this annual variability, climate models indicate consistent warming in the Northern Great Plains over the next two to three decades with temperatures rising steadily (USGCRP 2018). The lower, RCP4.5 scenario projects that temperature increases in the Northern Great Plains will be between 2 to 4 degrees Fahrenheit by 2050, which would likely result in more drought and heat waves. Models also project more heavy precipitation events in most of the region and more days when the maximum temperature exceeds 90 degrees Fahrenheit. Changes of this sort are likely to impact agriculture, energy production, human health, streamflows, snowmelt, and fires (USGCRP 2018). Losses in snowpack resulting from higher temperatures and higher evapotranspiration rates may also contribute to a reduced amount of water availability. Further, although the RCP8.5 scenario projects an increase in winter and spring precipitation of 10 to 30 percent by the end of the century, summer precipitation is expected to reduce by 10 to 20 percent and warmer temperatures are expected to increase evaporation, leading to more frequent and severe droughts in some parts of the region (USGCRP 2017). Other parts of the region that could experience warmer and wetter conditions may see declining crop yields due to higher temperatures during critical pollination and grain fill periods, an increase in weeds and invasive species, longer growing season at higher latitudes, and a decrease in the forage available for livestock (USGCRP 2018).

Table 3.7-13 below includes information about projected temperature and precipitation changes in the two states where CP and KCS rail lines are located within the Northern Great Plains region.

Table 3.7-13. Projected Temperature and Precipitation Changes in the Northern Great Plains under the RCP4.5 and RCP8.5 Scenarios

State	Projected Temperature Change[1] (degrees Fahrenheit)	Projected Precipitation Change[2] (inches per month)
RCP4.5		
North Dakota	+3.39	+0.06
South Dakota	+3.20	+0.06
RCP8.5		
North Dakota	+3.78	+0.10
South Dakota	+3.60	+0.09

Source: Alder and Hostetler 2013m, 2013n

[1] Change is the difference in mean annual temperature between historical data (1981-2010) and the future climatology period from 2025-2049.

[2] Change is the difference in mean annual precipitation (measured in inches per month) between historical data (1981-2010) and the future climatology period from 2025-2049.

Southeast

Historically, the Southeast has experienced a fluctuation in annual average temperatures. In the 1920s and 1930s, the region saw high average annual temperatures, followed by cooler temperatures for the next three decades. In the 1970s, average annual temperatures warmed again, surpassing levels in the 1930s, and the time period from 2010-2017 was the warmest in all seasons for average daily minimum temperature (USGCRP 2018).

The Southeast has also experienced an increase in the number of extreme rainfall events; the 1990s, 2000s, and 2010s had more days with precipitation above three inches than any other decade during the 1900-2016 time period (USGCRP 2018).

Future climate models indicate regional increases in temperature and extreme precipitation for both the RCP4.5 and RCP8.5 scenarios. **Table 3.7-14** below details projected temperature and precipitation changes in Arkansas and Louisiana, states of five planned capital improvements: Gentry, MP 377 (Mena), Loring, Mansfield, and Singer.

It also includes information about projected temperature and precipitation changes in the other three states where CP and KCS rail lines are located within the Southeast region (although no planned capital improvements would be located in these states): Mississippi, Alabama, and Tennessee.

Table 3.7-14. Projected Temperature and Precipitation Changes in the Southeast under the RCP4.5 and RCP8.5 Scenarios

State	Projected Temperature Change[1] (degrees Fahrenheit)	Projected Precipitation Change[2] (inches per month)
RCP4.5		
Arkansas	+2.77	+0.01
Louisiana	+2.43	-0.02
Mississippi	+2.57	+0.01

Table 3.7-14. Projected Temperature and Precipitation Changes in the Southeast under the RCP4.5 and RCP8.5 Scenarios

State	Projected Temperature Change[1] (degrees Fahrenheit)	Projected Precipitation Change[2] (inches per month)
Alabama	+2.42	-0.01
Tennessee	+2.69	+0.04
RCP8.5		
Arkansas	+3.10	+0.06
Louisiana	+2.64	-0.05
Mississippi	+2.79	+0.03
Alabama	+2.68	+0.09
Tennessee	+2.99	+0.13

Source: Alder and Hostetler 2013e, 2013f, 2013v-x

[1] Change is the difference in mean annual temperature between historical data (1981-2010) and the future climatology period from 2025-2049.

[2] Change is the difference in mean annual precipitation (measured in inches per month) between historical data (1981-2010) and the future climatology period from 2025-2049.

Longer, more frequent heat waves, flooding in coastal and low-lying regions, and modified ecosystems are the primary climate change impacts expected in the Southeast region. Currently occurring heat waves are expected to worsen in many southeastern areas. The combination of sea level rise and more extreme rainfall events are attributable to climate change effects in this region (USGCRP 2018).

Industry and CP's Current Climate Change Response

The CP Climate Strategy outlines CP's approach to address climate change and incorporate adaptation measures into its business planning processes. Specifically, CP's goals to account for and report GHG emissions, identify and manage climate-related risks and opportunities, and evaluate emerging technologies (such as hydrogen-powered locomotives) guide its strategy to reduce its carbon footprint (Canadian Pacific 2021). The American Railway Engineering and Maintenance-of-Way Association (AREMA), which sets industry standards and publishes recommended practices for railway infrastructure design, construction, and maintenance, also provides guidance for rail network resiliency in response to climate change. AREMA's *Climate Resilient Railroads: Vulnerability Assessment Methodologies and Solutions* (2021) recommends performance-based resilience solutions to supplement code-level design standards. The assessment recommends that railroads focus on site-specific elements (such as bridge geometries and aging infrastructure materials) that are vulnerable to climate change shocks and stresses by implementing physical improvements to mitigate future impacts to people, assets, operations, and revenue. Specifically, it recommends strategies such as flood-resistant backup power systems, flood walls and pressure slabs, and continuous waterproofing (AREMA 2021).

CP's management processes, work practices, and use of innovative technology help maintain the resiliency of its rail infrastructure and allow its network to operate safely and efficiently, according to the CP Corporate Sustainability Report (2020, p.32). Regular and timely investment in strategic network and infrastructure hardening improvements is critical to maintaining resilient rail operations. CP utilizes scenario analysis to evaluate how climate change could amplify network resiliency risks at critical points along its ROW. Further described below are efforts that CP has undertaken, specifically to address the physical risks posed by climate change.

Given the increased likelihood and ongoing impacts of flooding across portions of its network, CP is improving rail corridors, raising track, and adding rip-rap stones to mitigate water erosion and flood damage in higher-risk areas. CP has made portions of its network more resilient to climate-related impacts through these and other infrastructure-hardening efforts. CP typically spends more than $1 billion (Canadian dollars) annually in capital upgrades to the network, with the majority going to resiliency projects. In 2020, CP invested over $1 billion (Canadian dollars) to renew track and roadway assets (namely rail, ties, ballast, signals, and bridges) to ensure system reliability.

CP's main rail corridor in Davenport, Iowa, experienced major flooding from the Mississippi River in 2019. As part of an emergency response, CP raised 3 miles of track by approximately 3 feet, successfully keeping trains operational and on schedule during the highest and longest duration flood event recorded at this location.

Following this incident, CP performed a risk-based review of flood risks across the region and identified locations where river flows may impact operations. As part of a resilient strategy, CP invested in rail infrastructure upgrades in response to anticipated future flood events. Some examples of these improvements include:

- CP raised a bridge on the Turkey River (Iowa) by an additional 1.5 feet to allow greater clearance for future ice and peak water flows.
- CP raised a rail bridge over the Maquoketa River (Iowa) and nearby track by approximately 1.5 feet to accommodate increased variability in streamflow.
- CP replaced three wooden structures along CP's Kansas City Subdivision with raised steel and concrete structures to minimize impacts from future flooding events.

3.7.2.3 Environmental Consequences

This section presents the environmental consequences climate change would have on the Proposed Acquisition and No-Action Alternative.

Proposed Acquisition

Increased Precipitation and Flooding

OEA expects an increased risk of flooding as a result of climate change in regions where CP and KCS rail lines are located. Whether inland flooding in valleys or coastal flooding due to sea level rise and storm surges, flooding causes a serious risk to railroad infrastructure, and under the Proposed Acquisition, there would potentially be impacts to bridges, tracks, ties, and ballast. Rail infrastructure in low-lying, flood-prone areas is at risk of damage from washout (USDOT 2014). Wood ties immersed in water from floodwater inundation can weaken the ties' ability to support tracks because the water softens and expands the wood (USDOT 2014). This in turn can lead to derailments and dangerous accidents (Rossetti 2002). Flooded areas can also cause track segments to become misaligned (Palin et al. 2021). Rail lines and infrastructure located near rivers are at risk of flooding if heavy rains cause the river to exceed its banks (FTA 2011). Heavy flooding may place debris within the ROW, causing disruptions and potential delays. Electrical equipment is also prone to damage from flooding. Electrical shortages from flood inundation can cause rail sensor failure, as well as failures in switches, gates, and signals (Agarwal and Wickersham 2010; OFCM 2002; Rossetti 2002; FTA 2011). Floodwaters are also capable of inundating locomotive motors, causing damage that requires repair (USDOT 2014), and flash flooding can submerge track segments, making them impassable (Rossetti 2002).

Extreme Heat and Increased Drought

All regions along the combined CPKC system would experience increased temperatures and heat events, potentially impacting the rail lines and supporting infrastructure, including the 25 planned capital improvements. The urban heat island effect—a phenomenon in which the heat absorbed and emitted by features such as buildings and asphalt intensifies heat in urban centers and makes them warmer than their surroundings—would also contribute to extreme heat conditions within the project area (USGCRP 2018). The degree of warming, however, would vary widely by location and would not be possible to precisely quantify. During heat events, electric utility brownouts can occur, affecting signal systems. Electrical equipment is susceptible to overheating and malfunction, particularly at ambient air temperatures of 90 degrees Fahrenheit or greater (OFCM 2002). Overheating may lead to electronics melting or temporary shutdown in cases for which temperature thresholds result in an automatic shutdown. The possibility of malfunction within track and signal sensors also increases with higher air temperatures.

Rail that experiences temperatures of 110 degrees Fahrenheit are more likely to buckle, which occurs when the metal in the track expands beyond the capacity of the supporting infrastructure (OFCM 2002). If the metal cannot expand within the confines of the track support, it will buckle either vertically or horizontally, requiring replacement. Continuous welded rail is particularly susceptible to temperature-related buckling (Agarwal and Wickersham 2010; OFCM 2002; Rossetti 2002, 2007; Peterson et al. 2008; U.S. CCSP 2008; Bipartisan Policy Center 2009; Zeman et al. 2009; EC 2012). Buckled tracks remove rail lines from service until damaged sections can be replaced. High heat can also affect service buildings such as maintenance garages and rail yard buildings, as well as service personnel (FTA 2011; NJTC 2012). Heat indices above 105 degrees Fahrenheit increase health and safety risks for rail personnel, potentially leading to operational delays (OFCM 2002).

Heat index values at or greater than 105 degrees Fahrenheit and ambient temperatures above 90 degrees Fahrenheit exacerbate the risk of rail expansion and increase the risk for derailment. In response to public comments on the Draft EIS raising concerns about this risk, OEA evaluated the frequency of days in the Southern Great Plains region projected to exceed 100 degrees Fahrenheit. In Adair and Le Flore counties, Oklahoma, where planned capital improvements would be located, the number of days projected with a maximum temperature greater than 100 degrees Fahrenheit in the 2030 decade are 14.5 under a higher emissions scenario and 12.9 under a lower emissions scenario for Adair (NOAA 2022a), and 24.2 (higher scenario) and 21.9 (lower scenario) in Le Flore (NOAA 2022b). OEA also evaluated these events in cities in Texas and Kansas, the two other states comprising the Southern Great Plains region and through which KCS rail lines run. In Harris County, Texas, where Houston is located, the number of days projected with a maximum temperature greater than 100 degrees Fahrenheit in the 2030 decade are 10.6 under a higher emissions scenario and 10 under a lower emissions scenario (NOAA

2022c). In Crawford County, Kansas, where Pittsburg is located, the number of days projected with a maximum temperature greater than 100 degrees Fahrenheit in the 2030 decade are 20.7 under a higher emissions scenario and 17.8 under a lower emissions scenario (NOAA 2022d). However, it would not be possible to precisely predict where and when extreme temperatures would occur in the future or what the effects of such events on rail infrastructure would be in specific locations. Best practice for rail operations is typically to reduce speeds when ambient temperatures exceed the limits for that particular track, resulting in decreased efficiency. Rules for temperature that warrants reductions in speed vary with each rail line (OFCM 2002; Agarwal and Wickersham 2010; Bipartisan Policy Center 2009; U.S. CCSP 2008; NJTC 2012; FTA 2011).

Increased Wildfires

The USGCRP (2018) projects that higher temperatures and more arid conditions will occur, increasing the risk of potential wildfires in the Southern Great Plains region. Wildfires pose a serious risk to rail infrastructure. Wooden bridges can burn down from direct exposure to fires and metal bridges can warp depending on the temperature and severity of the fire (USDOT 2014). Similarly, wooden rail ties can combust from fire (FTC 2011; NRC 2008) and metal components can warp or melt. Wildfires can also damage electrical equipment used to operate and maintain the railroad (USDOT 2014). Smoke from wildfires may reduce visibility for train operators.

Increased Soil Erosion

Climate models project that the five regions in which CP and KCS rail lines are located will experience increases in precipitation, including more intense and frequent heavy rain events, in the future. Increased precipitation tends to increase the potential for soil erosion. Erosion can wash away sediment around piers and abutments during storm events, compromising the structural integrity of features. The erosion of supporting systems (such as ballast and other nearby ground) can threaten track stability. Loss of embankment support due to gradual or sudden inundation-related erosion is also a risk (Rossetti 2002). Erosion rates vary greatly but tracks on gravel ballast are less likely to erode nearby substrate since the gravel itself is a permeable surface and allows water and other liquids to pass through it.

Severe Storms

Due to climate change, more frequent and severe storms would occur in the Southern Great Plains. This includes events such as tornadoes, hailstorms, and severe thunderstorms. Although impacts would vary widely across the region, these events may impact the merged system that would occur under the Proposed Acquisition. High winds that accompany tornadoes and storms can damage rail structures and threaten the stability of rail bridges (Agarwal and Wickersham 2010; NJTC 2012). High winds can also blow down trees, potentially damaging infrastructure in wooded areas and blowing debris into the railroad ROW (NJTC 2012), blocking the passage of trains. Winds can damage or destroy exposed electrical equipment such as signals and at-grade crossing gates or knock these elements over (OFCM 2002). In addition, strong crosswinds have been known to topple rail cars over or cause trains to collide (Peterson et al. 2008; USDOT 2014). Lightning strikes from thunderstorms present a risk to switching equipment (Rossetti

2002) and could cause electrical outages. Hailstorms may damage rail cars or reduce visibility for train operators.

Mitigation

CP has taken steps to improve resiliency of its system, including rail lines and supporting infrastructure, to impacts from climate change, as discussed in the CP Climate Strategy, and OEA expects that CPKC would continue this effort. As a voluntary mitigation measure, the Applicants have also committed to undertaking an in-depth climate scenario analysis to understand how a changing climate would impact CPKC and have further committed to improving the resiliency of the combined network to the physical risks of climate change (VM 21). These activities would help address the potential impact of climate change on the planned capital improvements and on the CPKC network as a whole.

No-Action Alternative

Under the No-Action Alternative, the Board would not approve the Proposed Acquisition and CP would not acquire KCS; the projected changes associated with the 25 planned capital improvements would not occur. The changes to the affected environment of the CP and KCS networks resulting from climate change would occur even if the Board denied the Proposed Acquisition.

3.7.3 Conclusion

OEA concludes that the Proposed Acquisition would not adversely affect air quality or climate change except for air quality impacts in three nonattainment areas where emissions would be accounted for in the State Implementation Plan budgets. The Proposed Acquisition would result in increased average rail traffic on certain rail lines in the combined CPKC system and increased operational activities at some rail yards and intermodal facilities. Increased rail traffic on rail lines and increased activities at rail yards and intermodal facilities would result in air emissions from locomotives and from other vehicles and loading equipment. However, because the projected increase in rail traffic would be due to the diversion of traffic from other rail lines and from other transportation modes, OEA expects that any increase in air emissions may be offset by decreased emissions on other rail lines and at other rail yards and intermodal facilities outside of the study area. In addition, since OEA expects that the Proposed Acquisition would result in the diversion of freight from trucks to rail, the Proposed Acquisition could reduce overall emissions because rail transportation is more fuel efficient than truck transportation. Further, the Applicants have committed to voluntary mitigation measures that would further reduce air emissions from locomotives (see *Chapter 4, Mitigation*).

Although OEA expects that the Proposed Acquisition may not result in an increase in overall air emissions and could result in an overall decrease in emissions, the Proposed Acquisition would change the local distribution of emissions. OEA found that the projected increase in rail traffic would result in an increase in NO_x emission that would exceed EPA's *de minimis* thresholds within the Chicago Ozone Nonattainment Area, the Houston-Galveston-Brazoria Ozone Nonattainment Area, the Dallas-Fort Worth Ozone Nonattainment Area, and the Beaumont-Port Arthur Ozone Maintenance Area. Emissions associated with changes in rail traffic are not subject to the General Conformity regulations because the Board does not exercise continuing program responsibility and cannot practically control emissions from rail operations. The anticipated increases in emissions due to rail activity in these nonattainment areas should be accounted for in future State Implementation Plan inventories, which could include offsets in emissions budgets in order to achieve the required reductions in emissions from the base year inventories. However, the estimated NO_x emissions from rail operations related to the Proposed Acquisition would be less than 1 percent of the total applicable emissions budget for mobile sources in each ozone nonattainment area. Emissions from the 25 planned capital improvements would be temporary, minor, and well below any applicable *de minimis* thresholds; the Applicants have also committed to voluntary mitigation measures that would minimize the temporary emissions associated with the planned capital improvements.

OEA expects that the Proposed Acquisition would result in an overall decrease in GHG emissions of approximately 127,113 tons of CO_2e per year by removing approximately 64,000 trucks from highways each year. OEA expects that climate change would affect the 25 planned capital improvements, but that the Applicants would incorporate climate change resiliency into final engineering and design of the capital improvements. In addition, the Applicants have committed to voluntary mitigation measures that would reduce GHG emissions and adapt to climate change.

3.8 Energy

This section describes the affected environment and potential environmental consequences for energy resources. The Board's environmental regulations at 49 C.F.R. § 1105.7(e)(4) require the analysis of impacts on the transportation of energy resources, the transportation of recyclable commodities, overall energy efficiency, and the diversion of traffic to freight transportation from rail to trucks. The Proposed Acquisition has the potential to affect the transportation of energy resources and overall energy efficiency.

3.8.1 Approach

This subsection summarizes the approach for analysis of energy resources. **Appendix N** presents a detailed approach. OEA focused the analysis on the transportation of energy resources and changes in overall energy efficiency because the Proposed Acquisition would not affect the transportation of recyclable commodities or cause the diversion of freight from rail to trucks.

The study area for the analysis of impacts on energy resources includes all rail lines in the integrated CPKC system in the U.S. on which trains would transport energy resources, and all rail lines on which rail traffic would increase as a result of diversion from other rail lines or diversion from truck transportation to rail transportation.

OEA assessed the effects on the transportation of energy resources and changes in energy efficiency (such as fuel consumption by trains, trucks, and equipment) due to rail-to-rail and truck-to-rail diversions. OEA considered the transportation of energy resources and increased traffic flows of energy-related commodities, such as oil, coal, and liquified petroleum gas (LPG[1]), that could be diverted onto the combined CPKC rail network from competing railroads or from other transportation modes if the Board authorizes the Proposed Acquisition.

Additionally, OEA analyzed increases and decreases in overall energy efficiency as a result of freight diversions from other railroads due to the introduction of single-line service; freight diversions from truck to rail; changes in operations at intermodal facilities that would meet or exceed thresholds for environmental review; and changes in vehicle delays at roadway/rail at-grade crossings (grade crossings) along rail lines where projected increases in rail traffic would meet or exceed thresholds for environmental review.

To perform the analysis, OEA considered the Applicants' proposed Operating Plan and traffic studies, commodities transported by CP and KCS in 2019 during a normal (pre-pandemic) operational year, operational data from relevant intermodal facilities, gross ton-miles (GTM) for 2019, and other data sources as necessary. The energy analysis is

[1] LPG should not be confused with liquified natural gas (LNG). LPG has been transported by rail for many years. However, under transportation regulations promulgated by the Pipeline and Hazardous Materials Safety Administration and FRA, transportation of LNG by rail is not currently allowed in the United States. For more detail about safety, see *Section 3.1, Freight and Passenger Rail Safety*.

consistent with data, approaches, and assumptions used in *Section 3.4, Truck-to-Rail Diversions; Section 3.5, Intermodal Facility Traffic;* and *Section 3.7, Air Quality and Climate Change*.

3.8.2 Affected Environment

Energy resources associated with CP and KCS involve the transport of energy resources by rail (for example, oil), the energy consumed by rail operations, and vehicles impacted by rail operations. Energy resources move throughout the rail network from Canada to Mexico on CP and KCS rail lines. In 2019, there were 75,664 total movements of carloads containing energy commodities, chemicals, and plastics. Inclusive of all commodities, there were 1,876,725 intermodal containers (units) moved in 2019. The movement of intermodal containers affects operations at intermodal facilities where these containers are managed, as well as the trucks that currently transport intermodal containers between rail lines and intermodal facilities.

In addition to the energy consumed in vehicles and equipment system-wide that is directly related to rail transportation of shipments, there are effects on energy from increased rail operations. Cars and trucks are required to wait at grade crossings based on increased train operations and consume fuel while delayed at these grade crossings. The affected environment related to energy resources is closely related to that of *Section 3.4, Truck-to-Rail Diversion; Section 3.5, Intermodal Facility Traffic;* and *Section 3.7, Air Quality and Climate Change*.

3.8.3 Environmental Consequences

The following sections detail the potential environmental consequences of the Proposed Acquisition and the No-Action Alternative associated with energy resources.

3.8.3.1 Proposed Acquisition

This section details the potential environmental consequences of the Proposed Acquisition associated with energy resources, including transportation of energy resources and energy efficiency.

Transportation of Energy Resources

To assess impacts on the transportation of energy resources, OEA evaluated information that the Applicants provided in their Operating Plan. In general, the Applicants expect that, if the Board were to authorize the Proposed Acquisition, the volume of energy commodities transported on the combined CPKC system would increase. However, this increase would be due to rail-to-rail and truck-to-rail diversions and the overall volume of energy resources transported in the United States would not change as a result of the Proposed Acquisition.

The Applicants' Operating Plan provides information on the projected shipment of energy commodities, including LPG, bitumen, crude oil, propane, and coal. The Operating Plan describes how the Applicants believe that the Proposed Acquisition would improve access to markets for energy commodities. The Operating Plan identifies three key diversions of rail traffic from other rail lines to the combined CPKC system that would involve energy resources: (1) LPG movement from Alberta, Canada and other production regions to Mexico; (2) movement of products from Gulf Coast chemical plants to the areas where they are used; and (3) shipment of bitumen and crude oil from Alberta to the Gulf Coast (Brown and Zebrowski 2021):

- LPG Movement from Alberta and Other Production Regions to Mexico: The Applicants have stated that the Proposed Acquisition would provide LPG customers faster speed to market, reduced cycle times for loaded and unloaded cars, and overall fleet savings, which would encourage market growth through a safe and cost-efficient supply chain. For example, the Proposed Acquisition would create a single-line route from northern Alberta, Canada to Beaumont, Texas that would be 33 miles shorter than a competing route involving CP and Union Pacific rail lines via Chicago and would also avoid delays and handling costs associated with an interchange in Chicago. According to the Applicants, the improved transportation options for LPG originating in western Canada could create enhanced competition between western Canada and Ontario propane suppliers and propane currently sourced from production facilities in other locations, such as Conway, Kansas and Mont Belvieu, Texas for receivers served by KCS, particularly in Mexico. The Applicants project that the Proposed Acquisition would increase LPG shipments on the combined CPKC system by more than 1,500 carloads per year (**Table 3.8-1**) (Brown and Zebrowski 2021).
- Movement of Energy Products from Gulf Coast Chemical Plants to Areas of Use: OEA used the data provided in **Table 3.8-1** and **Table 3.8-2** for the Applicants' estimates of resources moved by rail including energy, chemicals, and plastics with a projected increase from approximately 21,000 potentially divertible carload movements in 2019 to 83,000 in 2027 under the Proposed Acquisition.
- Shipment of Bitumen[2] and Crude Oil from Alberta to the Gulf Coast: According to the Applicants, the Proposed Acquisition would potentially accelerate a shift away from the transportation of flammable crude oil (which is classified as hazardous material) toward non-hazardous DRUbit[3], from which the flammable diluent has been removed. The Applicants estimate an over 16,000-carload increase of DRUbit shipments under the Proposed Acquisition (**Table 3.8-1**) (Wahba and Naatz 2021). If a typical unit train is assumed to be 100 cars in length, this increase would be equivalent to 0.5 trains per day, or approximately one train every other day.

Several commenters on the Draft EIS stated concerns about oil shipments across Native American lands, near sensitive biological resources, such as the Nahant Marsh, and adjacent to rivers including the Mississippi River. A detailed discussion of the risk and potential

2 Bitumen, also known as asphalt, is a dense, viscous, petroleum-based hydrocarbon that naturally occurs in oil sands and pitch lakes or is a residue from distilling crude oil.

3 The DRUbit process starts at the railhead with a "diluent recovery unit" ("DRU"), which separates out and removes the diluent that has been added to raw bitumen in the production process, creating "DRUbit," a form of bitumen that is specifically designed for rail transportation. When trains carrying DRUbit arrive at a destination, the bitumen is processed and delivered to nearby refineries (Wahba and Naatz 2021).

environmental consequences of a spill of energy shipments is discussed in *Section 3.1.2., Hazardous Materials Transportation.*

Some of the additional trains that would use the CP rail line through the White Earth Reservation could transport DRUbit, which is a nonhazardous bitumen. According to the Applicants, the Proposed Acquisition could support a shift away from the transportation of hazardous crude oil and increase the transportation of the DRUbit alternative by an estimated 16,341 carloads per year. DRUbit is a tar-like substance that does not spread quickly and would likely not harm the environment or nearby communities if inadvertently spilled in the event of a derailment, thereby increasing the shipping safety compared to the original product, which is a hazardous substance. OEA expects that, although transportation of DRUbit would increase as a result of the Proposed Acquisition, the transportation of crude oil on competing rail lines would decrease and that the Proposed Acquisition would not change the overall volume of energy resources transported in the United States.

In conclusion, by increasing the percentage of non-hazardous DRUbit in energy commodities transported, the Proposed Acquisition would reduce the impacts from potential releases of energy commodities during transport.

Table 3.8-1. Energy Resource Shipment Estimates from Railroads Flow Diversion to CP and KCS, 2019 vs. Under the 2027 Proposed Acquisition

Energy Resource	Route	Total Diverted Carloads under Proposed Acquisition	Overall Percent Diverted
Non-hazardous bitumen (DRUbit)	Northern Alberta to Texas Gulf	16,341	69%
LPG	Alberta to Mexico	1,545	60%

Table 3.8-2. Energy Resource Shipment Estimates from Other Railroads Diverted to CP and KCS Rail Systems, 2019 and Under the 2027 Proposed Acquisition

	Energy Commodities, Chemicals, and Plastics (measured in carloads)	Coal (measured in carloads)
Estimated volume of existing 2019 rail traffic flows diverted to CP and KCS	21,143	n/a
Potentially Divertible to CP and KCS carloads/unit Under 2027 Proposed Acquisition		
Interline to Single-line Movements (extended haul traffic)	34,643	222
New Single-Line Movements (carloads/unit)	31,021	1,240
Total 2019 Movements	75,664	1,462
Total 2019 Potentially Divertible Movements	83,303	1,462

Energy Efficiency

OEA expects that the Proposed Acquisition would have a beneficial impact on overall energy efficiency. Because the Proposed Acquisition would support the diversion of freight transportation from truck to rail, OEA estimates that fuel consumption would decrease by approximately 7.97 million gallons per year under the Proposed Acquisition compared to the No-Action Alternative.

As shown in **Table 3.8-3**, OEA estimated the effects on energy efficiency and fuel consumption that would result from truck-to-rail diversions, changes in operations at intermodal facilities, and vehicle delays at grade crossings. The estimates in the table do not include the fuel that would be used to move freight that would be diverted from other rail lines onto the combined CPKC system. This is because increased fuel consumption on CPKC rail lines associated with diversions of traffic from other rail lines would be offset by a decrease in fuel consumption on the other rail lines from which the traffic was diverted. Therefore, those rail-to-rail diversions would not cause system-wide changes in energy consumption. Similarly, for changes in fuel consumption associated with intermodal facility activity, the table only reports fuel consumption from operational changes that would result from truck-to-rail diversions because any operational changes due to rail-to-rail diversions would be offset by decreased operations at other intermodal facilities and would not cause system-wide changes in energy consumption. OEA included fuel consumption related to vehicle delays at grade crossings in the calculation of total fuel consumption because changes in rail traffic at grade crossings has a direct effect on the amount of time that cars and trucks spend idling. **Table 3.8-3** presents a summary of fuel consumption changes estimated to result from the Proposed Acquisition.

Table 3.8-3. Summary of Fuel Consumption Changes

Activity	**Change in Fuel Consumption (gallons/year)[1]**
Truck-to-Rail Diversions	-8,096,362
Operations at Intermodal Facilities	110,785
Over-the-Road Trucks	25,269
Lift Equipment	14,954
Yard Trucks	70,561
Vehicle Delays at Grade Crossings	12,118
TOTAL	-7,973,460

[1] Change in Fuel Consumption represents gallons of diesel fuel year, with the exception of Vehicle Delays at Grade Crossings, which is a projection for an increase in gasoline use.

The following sections describe the projected changes in energy consumption for each activity in further detail:

1. Energy Changes Due to Single-Line Service and Rail-to-Rail Diversions:

Under the Proposed Acquisition, OEA expects that fuel efficiency would increase due to the availability of single-line service. According to the Applicants, trains would not be interchanging between CP and KCS, which would lead to fuel savings within the network and enable new through train service. The current CP network does not offer intermodal service to Kansas City. Following the Proposed Acquisition, the integrated CPKC system would establish new intermodal services connecting Dallas, Texas with Chicago, Illinois and beyond, in addition to new single-line intermodal routes connecting Mexico with the U.S. upper Midwest and Canada. From a fuel efficiency standpoint, the Applicants state that CP already outperforms industry averages for locomotive fuel efficiency and continues to improve. Compared to the No-Action Alternative, OEA estimates that the Proposed Acquisition would increase fuel efficiency from 971 GTM/gallon to 1,024 GTM/gallon. This change in fuel efficiency was estimated from the Applicants' application and is consistent with the fuel efficiency factors used in *Section 3.7, Air Quality and Climate Change.*

The Applicants expect that the availability of single-line service would result in an increase of goods being moved by the CPKC system due to rail-to-rail diversions. OEA estimates that total freight diversions, from both other rail lines and truck service, would result in an increased consumption of 36,909,385 gallons of diesel per year on the combined CPKC rail lines. This estimate is based on the projected change in GTM that the Applicants provided and only includes rail line segments on which the projected change in rail traffic would exceed the thresholds for environmental analysis. As mentioned above, OEA did not include rail-to-rail diversions in the overall fuel consumption analysis because the increase in fuel consumption on the CPKC rail lines would likely be offset by a decrease in fuel consumption on the rail lines of competing railroads. However, the portion of total freight diversions resulting from a truck-to-rail mode shift are accounted for as described in the following section.

2. Energy Changes from Truck-to-Rail Diversions:

Under the Proposed Acquisition, the Applicants estimate that truck-to-rail diversions would reduce truck traffic by approximately 80.4 million vehicle miles traveled. This corresponds to a decrease in diesel fuel consumption of approximately 10.8 million gallons. Rail traffic would increase slightly as a result of truck-to-rail diversions, corresponding to an estimated increase in fuel consumption of approximately 2.7 million gallons of diesel fuel per year. This increase in rail traffic due to truck-to-rail diversions would comprise 7.3 percent of the total increase in fuel consumption on the combined CPKC rail lines, with the remaining 92.7 percent resulting from rail-to-rail diversions. The increase in energy consumption by the CPKC rail lines that can be attributed to truck-to-rail diversions is based on accepted fuel efficiency factors for truck and rail transport. Overall, the net decrease in fuel consumption from the diversion of freight from truck transportation to rail transportation would be approximately 8.1 million gallons of diesel fuel per year under the Proposed Acquisition. **Table N.2-1** in **Appendix N** presents the total projected reduction in fuel consumption by trucks by state.

3. Changes in Energy Consumption at Intermodal Facilities:

OEA estimates that the Proposed Acquisition would result in an annual increase in fuel consumption of 110,785 gallons of diesel at intermodal facilities based on traffic data received from the Applicants. This increase in fuel consumption would be due to operational changes at intermodal facilities affected by the Proposed Acquisition. OEA's analysis focused on operational changes that would result from truck-to-rail diversions of intermodal freight because these diversions represent additional freight that was not previously transported by rail. Based on the Applicants' traffic studies, the number of intermodal containers is expected to increase by 216,675 from rail-to-rail diversions and 64,018 from truck-to-rail diversions, for a total of 280,693 intermodal containers. Accordingly, truck-to-rail diversions would account for about 22.8 percent of the total change in intermodal freight transported as a result of the Proposed Acquisition. This estimate does not include increases in intermodal freight from other growth factors, such as post-Acquisition changes in traffic patterns or investments by CPKC in growth opportunities made available by the resulting combined network.

OEA predicts that changes in intermodal facility operations from truck-to-rail diversions would result in an annual increase in diesel fuel consumption of approximately 110,785 gallons. This projected increase includes fuel consumption changes for the primary vehicles associated with intermodal facility operations (for example, trucks and lift equipment). **Appendix N** presents a full analysis of expected changes in energy consumption, data types used, and assumptions for each vehicle type.

4. Energy Changes from Vehicle Delays at Grade Crossings:

Under the Proposed Acquisition, OEA calculated the increase in vehicle delays at grade crossings and calculated an increase in fuel use of 12,118 gallons per year. Consistent with the approach taken in *Section 3.3 Grade Crossing Delay*, OEA identified 277 grade crossings where potential changes in delay could result from the Proposed Acquisition. OEA identified those grade crossings based on the criteria of crossing at least one main track and a highway AADT of at least 2,500 vehicles per day. The identified intersections and associated traffic volumes are provided in **Appendix H2**. The anticipated diversions from truck-to-rail, as well as the overall increase in trains per day would increase rail traffic at these grade crossings, with delay increases expected for crossing highway traffic.

As shown in **Table 3.8-4** below, OEA predicts that annual gasoline consumption would increase by about 12,118 gallons per year because of increased vehicle delays at grade crossings. This is equivalent to approximately 33.2 gallons per day. However, this increase in gasoline consumption would be partially offset by decreased delays at grade crossings on other rail lines due to the diversion of rail traffic from those lines onto the integrated CPKC system.

Table 3.8-4. Change in Energy and Fuel Consumption from Vehicle Delays

Total Energy Consumption		**Energy Changes**	
No-Action Alternative (MMBtu[2]/year)	**Proposed Acquisition (MMBtu/year)**	**Change in Energy (MMBtu/year)**	**Change in Fuel Consumption (gallons/year)[1]**
4,495	5,953	1,458	12,118

[1] Conversion factor used for gallons of gasoline from British thermal units (Btu) was 120,286 Btu for 1 U.S. gallon (U.S. Energy Information Administration 2021), based on U.S. finished motor gasoline consumption in 2020, including fuel ethanol content.

[2] Metric Million British Thermal Units (MMBtu) is a measure of heat content or energy value, generally used as a unit of measurement for natural gas.

3.8.3.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Acquisition would not occur and CP and KCS would continue carrying energy commodities on their separate networks, interchanging carloads through interline service. Energy commodities and other freight that is currently hauled by railroad competitors or moved by truck would not be diverted to the combined CPKC system. Therefore, no changes in energy efficiency (such as fuel consumption) would occur as a result of rail-to-rail diversions, truck-to-rail diversions, or changes in vehicle delays at grade crossings. Changes in the transportation of energy commodities and overall energy efficiency could occur as a result of changes in future market conditions and the operational needs of railroads but would not change as a result of the Proposed Acquisition.

3.8.4 Conclusion

Overall, the Proposed Acquisition would increase the volume of energy commodities being shipped on the combined CPKC system because the availability of single-line service would result in the diversion of commodities such as LPG, chemical products, bitumen, and crude oil from competing rail lines. The overall volume of energy resources transported in the U.S. would not change as a result of the Proposed Acquisition. With respect to energy efficiency, the Proposed Acquisition would reduce fuel use by 7.97 million gallons per year, primarily due to truck-to-rail diversions. The fuel savings related to truck-to-rail diversions (8.1 million gallons) would outweigh the increase in fuel usage at intermodal facilities (110,785 gallons) as well as fuel consumed during wait times at grade crossings (12,118 gallons). Accordingly, OEA concludes that the Proposed Acquisition would not adversely affect the transportation of energy commodities or energy efficiency and is not recommending any mitigation related to energy.

3.9 Cultural Resources

This section describes OEA's analysis of potential impacts on cultural resources that could result from the Proposed Acquisition. The Board's decision whether to grant authority for CP to acquire KCS is a federal action under NEPA and is also a federal undertaking under Section 106 of the National Historic Preservation Act (NHPA) (54 U.S.C. § 306108). The Section 106 regulations at 36 C.F.R. Part 800 require federal agencies to consider the effects of their undertakings on historic properties that are listed in or are eligible for listing in the National Register of Historic Places (National Register). Historic properties can include buildings, prehistoric and historic archaeological sites, districts, objects, and structures, as well as traditional cultural properties and landscapes. The term "historic property" includes properties of religious or cultural significance to tribes. In this case, OEA is coordinating the environmental review process under NEPA with the Section 106 process, and the NEPA term "cultural resources" as used in this section is interchangeable with the Section 106 term "historic properties."

Pursuant to 36 C.F.R. § 800.3(a), OEA has determined that sales, leases, or transfers of operational rail lines for the purpose of continued rail operation are generally not a type of activity that has the potential to cause effects to historic properties. This determination is reflected in the Board's environmental regulations at 49 C.F.R. § 1105.8(b)(1), which exempt such sales, leases, and transfers from historic review requirements. However, if the acquisition of one railroad by another would result in constructing new rail lines, abandoning existing rail lines, or causing physical changes within the existing rail ROW, then the acquisition may have the potential to affect historic properties. In this case, if the Board authorizes the Proposed Acquisition, the Applicants intend to build 25 capital improvements within the rail ROW. Those capital improvements would include adding 10 new passing sidings, extending 13 existing sidings, adding a section of facility working track, and adding a section of double track. These 25 planned capital improvements have the potential to alter historic properties, including previously unidentified archaeological sites. Accordingly, OEA's historic review, as summarized in this section, addresses the potential effects of the 25 planned capital improvements.

~~OEA identified 18 historic properties that are eligible for listing on the National Register, including 16 above-ground resources and two below-ground (archaeological) resources. After detailed analysis, OEA determined that the Proposed Acquisition would have *No Adverse Effect* on those National Register-eligible historic properties.~~

OEA initially identified 18 historic properties as eligible for listing on the National Register, including 16 above-ground resources and two below-ground (archaeological) resources. Following further consultation with appropriate State Historic Preservation Officers (SHPOs), Tribal Historic Preservation Officers (THPOs), and other consulting parties after issuance of the Draft EIS, OEA revised its findings under Section 106. OEA now finds that 15 historic properties within the Area of Potential Effects (APE) are eligible for listing in the National Register, including 13 above-ground resources and two below-ground resources. Descriptions of the properties removed during the Section 106 process have been removed from the EIS. OEA further finds that the Proposed Acquisition would have *No Adverse Effect* on those

National Register-eligible historic properties. As discussed in detail in **Appendix J, Cultural Resources,** all of the appropriate SHPOs, THPOs, and other consulting parties have concurred with OEA that the Proposed Acquisition would not adversely affect historic properties within the APE. Therefore, the Section 106 process in this proceeding is concluded.

3.9.1 Approach

To evaluate the potential for the Proposed Acquisition to affect cultural resources due to the construction of the planned capital improvements, OEA conducted background research using available sources, including state surveys, state archaeological site records, National Register files, state context documents, historic mapping and aerial photography, tribal documentation, and other information, as available. In a letter dated November 17, 2021, OEA initiated consultation with State Historic Preservation Officers (SHPOs), Tribal Historic Preservation Officers (THPOs), and tribal governments with an interest in the planned capital improvements. OEA also conducted consultation meetings with SHPOs, the Advisory Council on Historic Preservation (ACHP), and THPOs/tribal governments (see **Table 3.9-1**). **Appendix J** provides additional detailed information on all efforts to reach out to potential consulting parties.

Table 3.9-1. Consultation Meetings

Meeting	Date	Result
Texas SHPO	12/1/21	The SHPO agreed that there was no APE in state; provided a letter (12/9/21) with a finding of No Effect.
Illinois SHPO	12/3/21	The SHPO agreed with the APE and requested survey of above-ground resources.
Iowa SHPO	12/6/21	The SHPO agreed with APE and requested survey of above-ground and below-ground resources.
Oklahoma SHPO	12/7/21	The SHPO agreed with APE and requested survey of above-ground and below-ground resources; recommended further consultation with tribes for reservation lands (Cherokee Nation, Choctaw Nation).
Missouri SHPO	12/7/21	The SHPO agreed with APE and requested survey of above-ground and below-ground resources.
Louisiana SHPO	12/9/21	The SHPO agreed with APE and requested survey of above-ground resources.
Arkansas SHPO	12/13/21	The SHPO agreed with APE and provided a letter (12/14/21) with a finding of No Effect.
Kansas SHPO	12/16/21	The SHPO stated there was no APE in state; provided a letter (12/16/21) with a finding of No Effect.
ACHP	1/28/22	OEA provided a summary of the Proposed Acquisition and the Section 106 consultation efforts to date and received input from ACHP.
Osage Nation	2/11/22	The THPO agreed with APE and requested survey of below-ground resources.

Table 3.9-1. Consultation Meetings

Meeting	Date	Result
Choctaw Nation of Oklahoma	2/24/22	The THPO agreed with APE and supported approach to survey above-ground and below-ground resources, including within reservation lands.

As a result of these efforts, OEA developed an APE. The APE, as defined in 36 C.F.R. § 800.16(d), is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties if any such properties exist. Based on the nature and scope of the undertaking, as well as consultation, the APE consists of noncontiguous areas within the existing rail ROW in the area of the planned capital improvements as well as a buffer on each side of the ROW (and at the ends) to account for potential setting, visual, or other impacts from construction activities. The APE was presented to all of the above-referenced parties at the consultation meetings.

OEA developed the methods for above-ground and below-ground surveys in accordance with 36 C.F.R. § 800, as well as state and tribal guidelines for the identification of historic properties. Additional detailed information on these methods by state can be found within the Section 106 reports that were provided to SHPOs, THPOs, tribal governments, and other consulting parties.

3.9.2 Affected Environment

This subsection identifies the existing cultural resources within the APE. The noncontiguous APE is located within six states throughout the central and southern United States. As such, the existing environmental conditions and cultural history vary greatly throughout the APE; however, the construction locations all consist of existing railroad ROW. Railroad construction in the late 19th century and subsequent alterations previously disturbed large portions of the APE. The viewshed of the APE varies from dense woods to agricultural fields and farms, to urban/industrial corridors and small towns. OEA will provide further detail regarding the existing environmental conditions and cultural context for each state to consulting parties as part of the Section 106 documentation included with the technical reports.

- In compliance with NEPA and Section 106, OEA conducted surveys within the APE for above-ground and below-ground historic properties between January and June 2022. The purpose of the surveys was to locate, identify, and evaluate the significance of any historic resources within the APE and to determine whether these resources were listed or were eligible for listing, in the National Register.

Appendix J provides summary information on properties 50 years old or older identified within the APE, including properties recommended eligible and not eligible for listing in the National Register. Following issuance of the Draft EIS, OEA completed the documentation of the survey results and provided detailed information on the findings in each state as technical reports to the appropriate SHPOs, THPOs, and other consulting parties, as detailed in **Appendix J**. ~~OEA is in the process of documenting the survey results, which are expected to be complete in August 2022. Upon completion of survey documentation, OEA will provide~~

~~detailed information on the findings in each state in technical reports that will be distributed to consulting parties as part of the Section 106 process.~~

Eligible historic resources encountered in the APE consisted of transportation properties or sites associated with the railroad, infrastructure associated with the Works Progress Administration (WPA) program, early to mid-20th century homes and other buildings, and precontact (such as describing a period before contact was established between American Indians and Europeans) archaeological sites (see **Table 3.9-2**).

Table 3.9-2. Eligible Historic Resources

State	Associated Capital Improvement Location	Resource Number	Property Type
Above-Ground Resources			
Arkansas, Kansas, Missouri	Asbury, Gentry	K-HEAV-01	Railroad
Arkansas	Mena/MP377	K-SHRE-01	Railroad
Iowa	Bellevue/MP 24, Turkey River/MP 71	C-MARQ-03	Railroad
Iowa	Letts, Washington/MP 255	C-OTTU-02	Railroad
Iowa	Ottumwa, Moravia	C-LARE-01	Railroad
Kansas, Missouri	Blue Valley, Grandview/IFG	K-PITT-01	Railroad
Louisiana	Mansfield, Loring	K-BEAU-01	Railroad
Louisiana	Singer	K-BEAU-02	Railroad
Iowa	Camanche	IA-CA-001	Industrial
Louisiana	Mansfield	LA-MA-004	Ranch House
Louisiana	Mansfield	LA-MA-009	Ranch House
Missouri	Goodman	MO-GO-004	Cemetery
~~Oklahoma~~	~~Heavener~~	~~OK-HE-020~~	~~Historic House~~
~~Oklahoma~~	~~Heavener~~	~~OK-HE-024~~	~~Historic House~~
Oklahoma	Heavener	OK-HE-027	Drainage Structure
Below-Ground Resources			
Oklahoma	Baron/MP 247	34AD283	Archaic Lithic Scatter
Oklahoma	Baron/MP 247	34AD286	Archaic Lithic Scatter

3.9.2.1 Above-Ground Resources

Within the APE, the survey identified the above-ground resources described below. Some of these resources (such as rail line segments) extend beyond the APE; however, all of the resources include portions of the property that could be affected by the planned capital improvements.

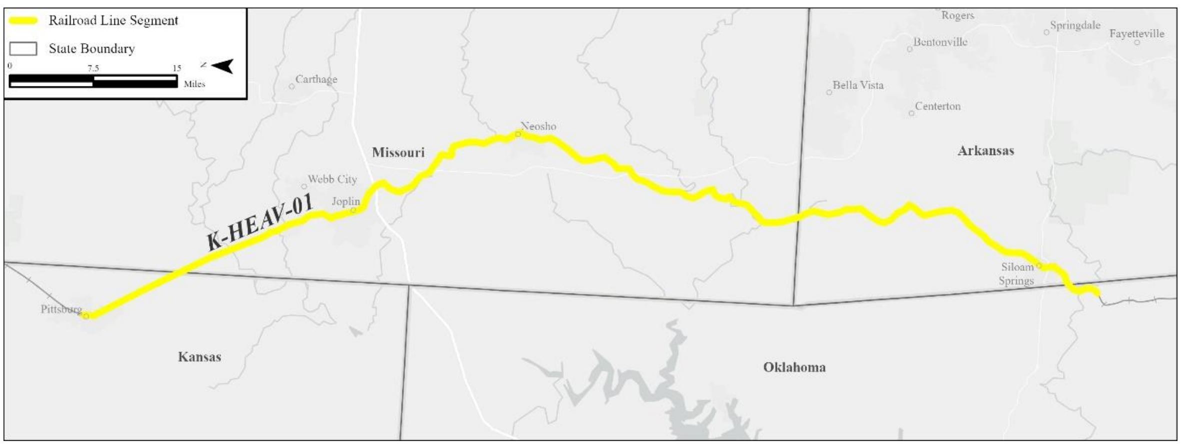
K-HEAV-01

This property is a 107.8-mile rail line segment of KCS that travels south from Pittsburg, Kansas to Watts, Oklahoma. The railroad passes through the communities of Pittsburg, Kansas; Asbury, Joplin, and Kelly Springs, Missouri; Gentry, Arkansas; and Watts, Oklahoma. Portions of this line were built by the Kansas City, Pittsburg, and Gulf Railroad (KCP&G) during the 1890s while other portions consist of existing railroads purchased by Arthur Stilwell, president of KCP&G, and incorporated into the line. The portion of this rail line segment from Joplin, Missouri to Sulphur Springs, Arkansas, was built by the Kansas City, Fort Smith, and Southern Railroad. The remainder of the segment was built by KCP&G. As it progressed south, KCP&G passed through established towns, providing these communities with an outlet for their goods, shipping them to the Gulf Coast or Kansas City. KCP&G, which was reorganized as KCS after 1900, became the primary driver of trade and economic activity in this rural segment of Missouri, Arkansas, and Oklahoma. Built as the second major stretch of KCP&G, this segment connected Kansas City to multiple small agrarian communities in Missouri, Arkansas, and Oklahoma, including Joplin, Missouri, which was a major center of zinc and lead mining. Though Joplin possessed several rail connections by the arrival of the first KCP&G train in 1893, none of these existing connections had the same impact as KCP&G, which enabled the lead and zinc extracted from Joplin to travel the length of the country and overseas. Joplin's population grew during the final decades of the 19th century; however, the most marked growth happened between 1890 and 1900, when the population rose from 9,000 to 26,000.

KCP&G was the first railroad to pass through many small towns in Arkansas and Oklahoma, and in some cases, the location of the railroad directly determined where communities first developed. This was particularly true for Benton County in northwestern Arkansas. Between 1880 and 1900 the county's population grew from 20,000 to 31,000; new towns like Gentry were established and existing towns such as Siloam Springs expanded significantly. The railroad's extension through Benton County led to the establishment of significant fruit orchards, stock farms, and the expansion of existing wheat farms. The railroad also directly motivated settlements such as Asbury, Missouri and Watts, Oklahoma which both developed after KCS established the towns as division headquarters in 1912. The construction of rail yards and other infrastructure at Watts led to speculative real estate development within the town and encouraged the development of stock farms in the surrounding countryside. Based on the introduction and expansion of transportation and commerce, this rail segment is eligible in Arkansas and Missouri for listing in the National Register under Criterion A. Criterion A is applied to properties that are associated with events that have made a significant contribution to the broad patterns of our history. To be eligible to be listed in the National Register, a property must also be able to convey its significance through its integrity, which is evaluated based on seven aspects: location, design, setting, materials, workmanship, feeling, and association.

This rail segment is also eligible in Arkansas and Missouri under Criterion B due to its association with Arthur Stilwell, founder and driving force behind the expansion of KCP&G. Criterion B is applied to properties that are associated with the lives of persons significant in our past. Arriving in Kansas City in 1888, Arthur Stilwell began to operate his first railroad, the Kansas City Suburban Belt Railway, in 1889. Extending the line south to Pittsburg, Kansas, Stilwell renamed the line KCP&G. Through the 1890s, Stilwell pushed his railroad further south, consolidating his tracks with other lines and laying new railbeds as he strove to reach the Gulf of Mexico. Stilwell secured financial backing for the railroad by selling railroad stock to Dutch investors, a necessity after the United States was rocked by an economic depression known as the Panic of 1893. To thank his Dutch investors, Stilwell named several towns in Arkansas, Texas, and Louisiana after them and their wives. In 1897, Stilwell's railroad reached the Gulf of Mexico, where he built the City of Port Arthur, named after himself. In total, Stilwell's enterprise laid over 1,200 miles of track through the center of the country and created an alternative shipping corridor that allowed farmers and industrialists in middle America to efficiently export their products and circumvent more distant eastern seaports.

Figure 3.9-1. Map of K-HEAV-01 Rail Line Segment



K-SHRE-01

This property is a 94.6-mile segment of KCS that travels south from Heavener, Oklahoma to De Queen, Arkansas. The railroad passes through the communities of Heavener, Oklahoma as well as Mena, Hatfield, Cove, and De Queen, Arkansas. Built by KCP&G between 1893 and 1897, this segment of the railroad connected the major hub of Kansas City to multiple small agrarian communities in Oklahoma and Arkansas on its way to Port Arthur on the Gulf of Mexico. The railroad, the first major line to pass through this portion of Oklahoma, opened a major regional shipping corridor from the Gulf Coast to Kansas City in central Missouri that didn't previously exist. The railroad also directly generated commerce, such as in Heavener, Oklahoma, Mena, Arkansas (named for the wife of one of Arthur Stilwell's investors), and De Queen, Arkansas, each of which were made a division headquarters with track yards and repair shops. These three communities and other stops along this rail line segment became important local centers for mining, logging, and agricultural trade. Corn, fruit trees, berries, and cotton were grown while cattle and hogs were raised in stock farms. In Mena, large planing mills were built along the railroad tracks, as were cold storage buildings. Planing mills of a similar size were also built in De Queen. The construction of KCP&G in this area made the extraction and development of these resources viable and created a cost-effective shipping corridor to major markets in Kansas City or international markets which could be accessed from the harbor at Port Arthur. Additionally, because the United States began its acquisition of land in eastern

Oklahoma long after many of the surrounding states, the railroad played a critical role in determining the location of many towns. The rail line segment is ~~regionally~~ significant within Arkansas under Criterion A in the areas of Transportation, Exploration and Settlement, and Commerce.

Figure 3.9-2. Map of K-SHRE-01 Rail Line Segment

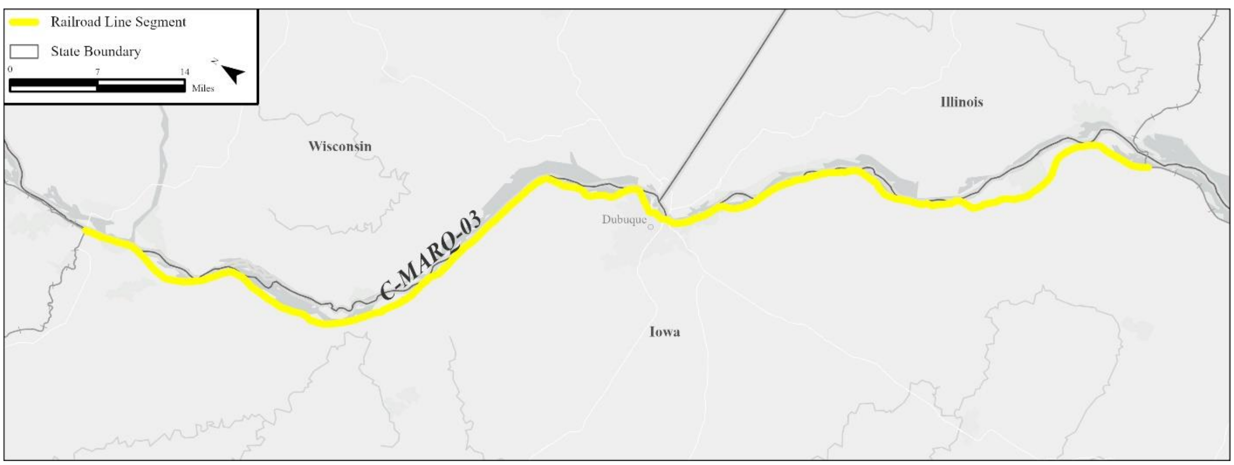
This segment of railroad is also eligible within Arkansas under Criterion B due to its association with Arthur Stilwell, the founder and driving force behind the expansion of KCP&G. Stilwell's importance and contributions supporting the eligibility under Criterion B are elaborated above under *K-HEAV-01* and apply to this segment as well.

C-MARQ-03

This property is a 98-mile rail line segment which travels in a northerly direction parallel to the Mississippi River and stretches between Sabula and Marquette, Iowa, passing through the communities of Bellevue, Dubuque, and Guttenberg. This segment of railroad was originally constructed circa 1871 as part of the Chicago, Dubuque and Minnesota Railroad (north of Dubuque) and the Clinton and Dubuque Railroad (from Dubuque to Sabula). In 1878, these companies combined to form the Chicago, Clinton, Dubuque and Minnesota Railroad, which the Chicago, Milwaukee & St. Paul Railroad purchased in 1880. Under the ownership of the latter, this line was a secondary trackage connecting riverport towns like Sabula, Bellevue, and Guttenberg to the greater Chicago, Milwaukee, and St. Paul Railroad (CM&StP) network. Sanborn maps (Sanborns) from Bellevue, Guttenberg, and Sabula each show that soon after CM&StP's arrival, industrial buildings were built in each town to take advantage of the railroad. The 1893 Sanborns show a major slaughterhouse in Sabula while Sanborns from 1886 show Guttenberg with major lumber yards and grain elevators all with access to the railroad. By 1914, Bellevue possessed similar agricultural infrastructure as well as lumber mills, machine shops, and a piano factory. Although this segment of railroad travels through towns that were well established prior to the widespread construction of railroads in Iowa, maps from the mid-19th century show Guttenberg, Sabula, and Bellevue as highly developed communities with industrial buildings oriented towards the Mississippi River, at that time an important transportation corridor and an important log shipping way. After the arrival of the railroad, river commerce remained an important part of the region's economy; however, by the late 19th century, industrial development in Guttenberg, Bellevue, and Sabula had migrated closer to CM&StP's tracks, highlighting the shift of industry from river-based transportation to rail-based transit. In Guttenberg, stacked lumber lined CM&StP's tracks and while major sawmills such as Zimmerman and Ives maintained their riverfront mills, they used the railroad to ship their products.

In Bellevue, Sanborns show a near identical arrangement of trackside lumber ready for shipment, having been produced at water powered sawmills along the Mississippi and nearby Mill Creek. Bellevue also had a large stockyard, which would have been important for residents of rural Jackson County. For farmers, driving their animals and crops to the railroad stops in Sabula, Guttenberg, Bellevue, and Dubuque was critical to their livelihoods. Without a rail connection, it was impossible for farmers to raise crops or animals on a large scale. To make the change from subsistence farming and local trade to commercial farming, farmers needed a national market; access to that market in Jackson, Dubuque, and Clayton Counties was supplied by CM&StP. Dubuque drew additional benefits from CM&StP when, in 1880, the railroad opened a large repair shop in the city. CM&StP's shops employed over 800 men by 1900, many of them German immigrants and the company's shops covered fifty acres of land within Dubuque. The rail line segment is regionally significant under Criterion A in Commerce and Transportation.

Figure 3.9-3. Map of C-MARQ-03 Rail Line Segment



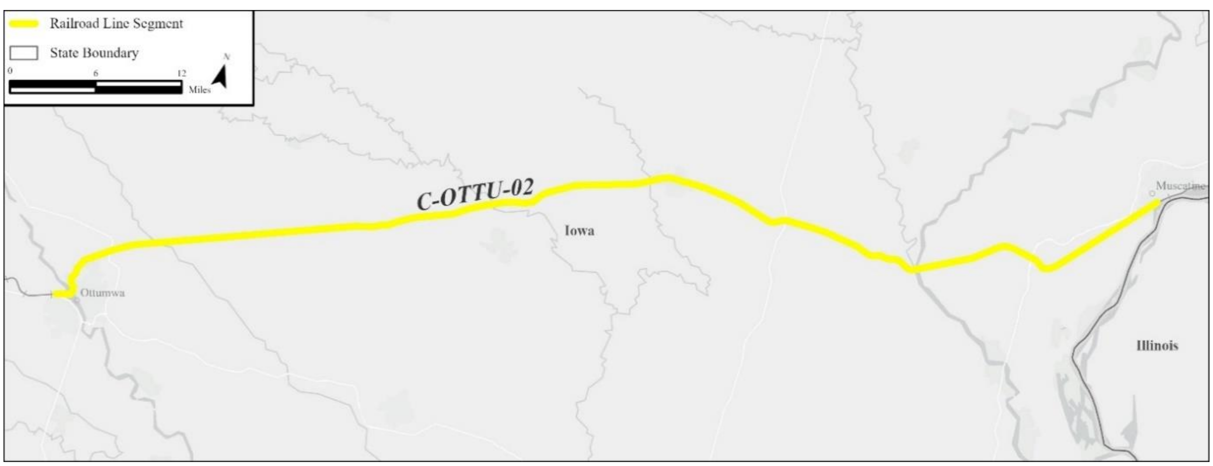
C-OTTU-02

This property is an 82.5-mile segment of CP that stretches from Washington, Iowa to Muscatine, Iowa. Traveling in a general easterly direction, the rail line segment passes through the towns of Washington, Ainsworth, Cotter, Columbus Junction, Fredonia, Letts, and Muscatine. This segment between Washington and Muscatine appears to have been constructed as part of the Mississippi and Missouri Railroad, which was established by the Chicago, Rock Island, and Pacific Railroad (Rock Island Line) and was later incorporated into it. Between 1856 and 1860, the first railroads were developed between Washington and Muscatine. Washington, located on the fertile prairie, immediately became a major collection point for grain and animals raised in the surrounding county. Washington possessed some of the earliest railroad connections in Iowa and by 1875, four railroad lines came together in

Washington. Farmers brought wagonloads of corn or drove their herds to the city and after conducting their business left with finished goods that had been purchased from one of the city's merchants.

The rail line segment is regionally significant under Criterion A in the areas of Transportation and Commerce. This segment of railroad played a critical role in transporting agricultural products from regional hubs like Washington to major distribution centers like Chicago. The number and scale of agricultural buildings developed in the towns during the late 19th century are indicative of the commercial and economic opportunities that were a direct result of railroad access. For example, the early establishment of the railroad in Washington enabled the city to grow into a regionally important settlement, where Sanborns from 1897 show major agricultural buildings such as stock yards, corn cribs, coal, and grain elevators along the railroad tracks. Nearby Letts, Iowa was similarly sustained by the passage of the railroad, which permitted foodstuffs from within the township to be gathered and efficiently transported. Established in the 1850s, the relationship between farmers in Washington County and the railroad was formative to the development of agriculture in the region. To the northeast, the City of Muscatine developed into a major settlement in part due to the Rock Island Line, which had run trains through the city since 1855. Sanborns from the 1880s show Muscatine with planing mills, furniture factories, boiler makers, pottery factories, cold storage facilities, and stock yards. The presence of all this industrial activity, aided directly by the railroad's passage, led to Muscatine's population growing by roughly 25 percent in each census from 1870 to 1900.

Figure 3.9-4. Map of C-OTTU-02 Rail Line Segment

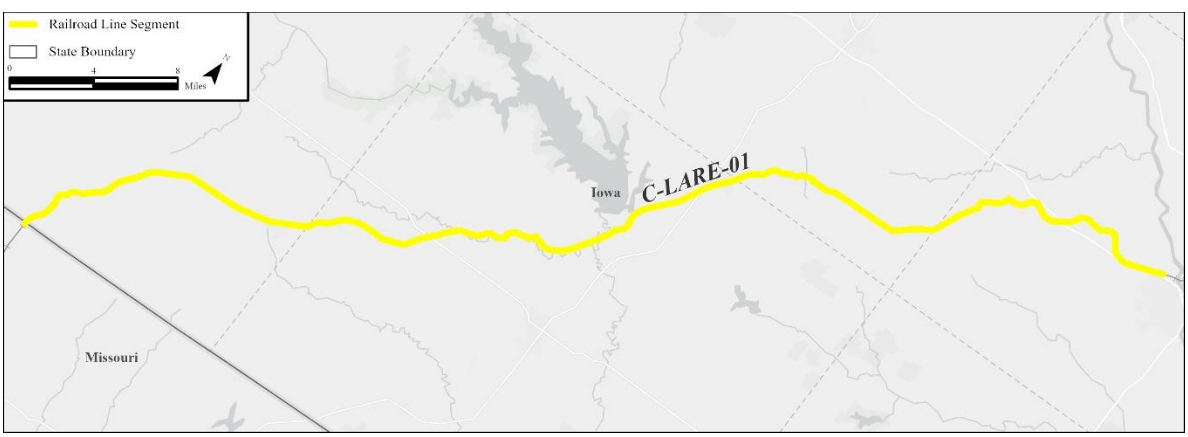


C-LARE-01

This property is a 61.2-mile segment of CP that stretches from Ottumwa, Iowa to the Iowa/Missouri border. Traveling in a general southwesterly direction, this rail line segment passes through the towns of Ottumwa, Blakesburg, Moravia, Rathburn, Mystic, Seymour, and Sewal. This segment was constructed around 1887 as part of CM&StP. At the time, CM&StP was constructing rail lines through this area of Iowa to compete with the Rock Island Line. This rail line segment was strategically positioned to take advantage of the significant coalfields in Wapello County. Iowa coal was a critical resource to powering many of the railroads crisscrossing the state, and Wapello County was, by the late 19th century, among the 10 most productive coal producers in Iowa. Sitting at the heart of the Wapello County coalfields, Ottumwa developed into a major regional rail magnet. This rail line segment is regionally significant under Criterion A in the areas of Transportation and Commerce. As it expanded in the 1880s, CM&StP built tracks, passenger depots, and freight stations along this 61.2-mile stretch of track. For the residents of these towns along the ROW, the presence or absence of the railroad often determined a community's future. With the establishment of a railroad, a small village or town could become a critical hub of local commercial activity. For this rail segment, coal mining became particularly important.

Along the Des Moines River there were significant deposits of bituminous and anthracite coal, and by 1889 there were 15 active mine shafts in Ottumwa, Wapello County's largest community. Similarly, the Town of Mystic in Appanoose County had a number of active coal mines by the 1880s. The coal dug around Ottumwa and Mystic was vital to CM&StP's operation. In general, Iowa coal was a crucial power source to the railroads. Companies like CM&StP built rail lines specifically to capture strategic coalfields. Passing through Ottumwa and Mystic on its way to the Missouri border, this rail segment took advantage of the local coal supply, stopping to refuel trains prior to journeying southwest towards Kansas City. For Ottumwa in particular, the demands of CM&StP and other regionally and nationally important railroads for coal encouraged significant population growth. They also encouraged industrial growth in the city, which developed significant ironworks, machine shops, and foundries. As a result of the mining and manufacturing, aided by the railroad, Ottumwa's population grew from 5,200 in 1870 to 14,000 in 1890. Additionally, grain and animals were brought to stock yards and grain elevators along the railroad's more rural stops such as Moravia. From these gathering points, freight cars sent the animals and grain on to major collection points such as Chicago. As a result, millions of dollars' worth of livestock, grain, coal, iron, and other goods were funneled from the agrarian areas of southwest Iowa to the more industrialized East.

Figure 3.9-5. Map of C-LARE-01 Rail Line Segment

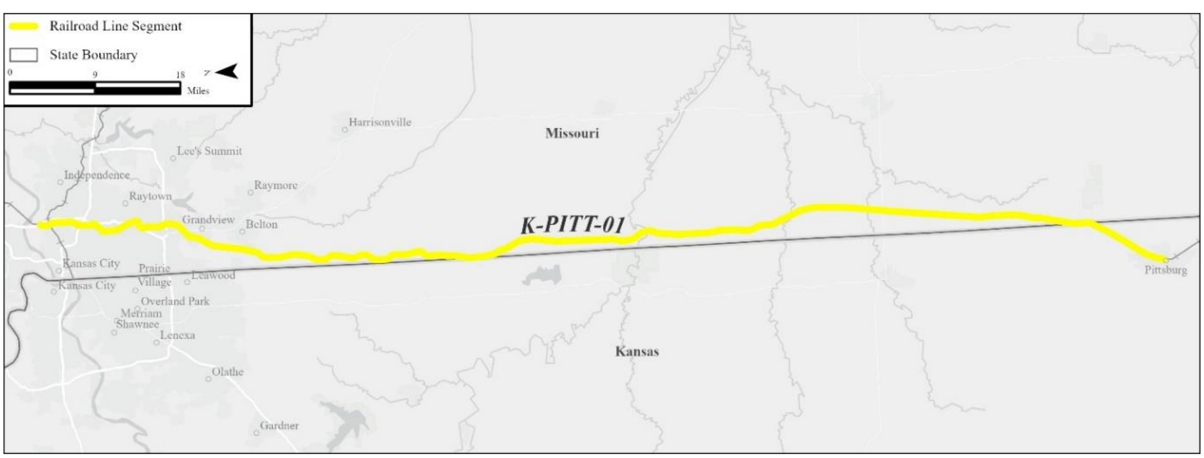


K-PITT-01

This property is a 124.5-mile segment of KCS that travels south from Kansas City, Missouri to Pittsburg, Kansas. The rail line segment passes through the communities of Kansas City, Grandview, Cleveland, Amoret, Hume, Richards, and Pittsburg. Built as the first segment of the KCP&G (later KCS), this rail segment was the first link of what would develop into one of the most important north/south transportation routes in the United States. Traveling to Pittsburg, Kansas, the railroad was connected to significant coalfields in Hume, Missouri and Pittsburg. Additionally, as it expanded, KCP&G built tracks, depots, and other rail-related infrastructure across the south, enabling the flow of agricultural products, oil, metals, chemicals, and people through the center of the country. The rail line segment is regionally significant under Criterion A in the areas of Transportation and Commerce. Built by railroad magnate Arthur Stilwell and his financial backers, this stretch of railroad was the first portion of what would become KCS, the first major land transportation corridor to link the Midwest and a port at the Gulf of Mexico. This particular rail segment connected Kansas City to major coal fields in Hume, Missouri and Pittsburg, Kansas, providing the raw materials to run the new rolling stock, as well as providing the multiple small agrarian communities along the Kansas/Missouri border with their first opportunity to develop commercial agricultural instead of subsistence farming. Immediately after the railroad's arrival, the towns of Amoret, Richards, and Cleveland were platted, creating new town centers on the Missouri prairie. Though small, these towns acted as collection points for grain which was shipped in KCS freight cars. The railroad also led to a major population spike in several communities, most notably Pittsburg, Kansas, which grew from 624 residents in 1880 to over 6,600 residents in 1890, and over 10,000 residents by 1900. Already an important local site for zinc mining and smelting by the time of KCP&G's arrival, Pittsburg, Kansas benefitted greatly from a direct connection first to Kansas City, and after 1897, to the harbor of Port Arthur. Though its population growth cannot be exclusively tied to KCS, it is worth noting that between 1880 and 1900 Kansas City's population grew from 55,000 to 163,000 as the city became a major rail nexus.

This segment of railroad is also eligible under Criterion B due to its association with Arthur Stilwell, the founder and driving force behind the expansion of KCP&G. Stilwell's importance and contributions supporting the eligibility under Criterion B are elaborated upon under *K-HEAV-01* and apply to this segment as well.

Figure 3.9-6. Map of K-PITT-01 Rail Line Segment



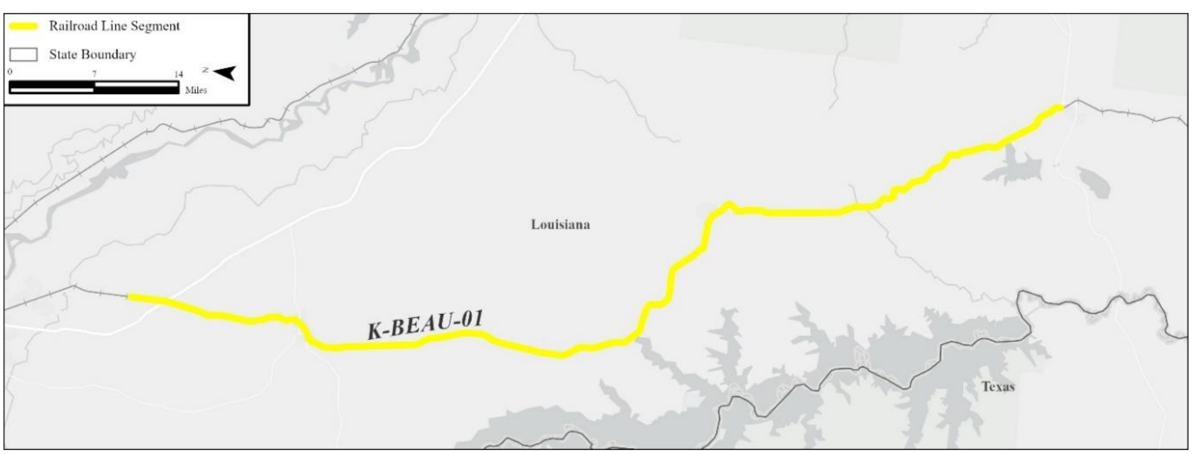
K-BEAU-01

This property is a 91.4-mile segment of KCS that extends south from Frierson, Louisiana to Leesville, Louisiana. The rail line segment travels through the towns of Frierson, Mansfield, Converse, Noble, Zwolle (named for one of Arthur Stilwell's investor's wives), Loring, Many, Hornbeck, and Leesville. Originally built in 1897, this portion of the railroad was originally part of KCP&G. The railroad reached Shreveport, Louisiana in March 1897 and by September of that same year the line had reached the Gulf Coast. After the Civil War, companies like KCP&G which began to build track in Louisiana and rural towns throughout the state relocated to take advantage of the developing railroad infrastructure. Louisiana railroads typically handled passengers, foodstuffs, and lumber, much of which was directed to major Gulf Coast ports like New Orleans and Port Arthur, Texas.

This rail line segment is regionally significant under Criterion A in the areas of Transportation and Commerce. Built as one of the final portions of KCP&G, this segment of the railroad played a major role in the ultimate fulfillment of the vision of a link between the Midwest and the Gulf of Mexico. KCP&G, as the first major rail line to pass through this section of Louisiana, enabled capitalists and investors to develop large scale farms and timber operations in rural Louisiana. In Sabine, Vernon, and Calcasieu Parishes, short and long leaf pine were harvested for the first time on an industrial scale. Prior to the arrival of KCP&G, the nearest railroad to these parishes had been 100 miles away. The development of Louisiana’s timber industry coincided with the decline of the stands of timber in Michigan, Minnesota, and Wisconsin, all of which had been timbered for decades. Louisiana, with its extremely warm climate, also produced sugar and tropical fruits such as oranges, resources that KCP&G and later KCS could quickly ship to domestic and international markets. The railroad also led to direct commercial investment in Hornbeck, where the railroad built repair shops.

This segment of railroad is also eligible under Criterion B due to its association with Arthur Stilwell, the founder and driving force behind the expansion of KCP&G. Stilwell's importance and contributions supporting the eligibility under Criterion B are elaborated upon under *K-HEAV-01* and apply to this segment as well.

Figure 3.9-7. Map of K-BEAU-01 Rail Line Segment



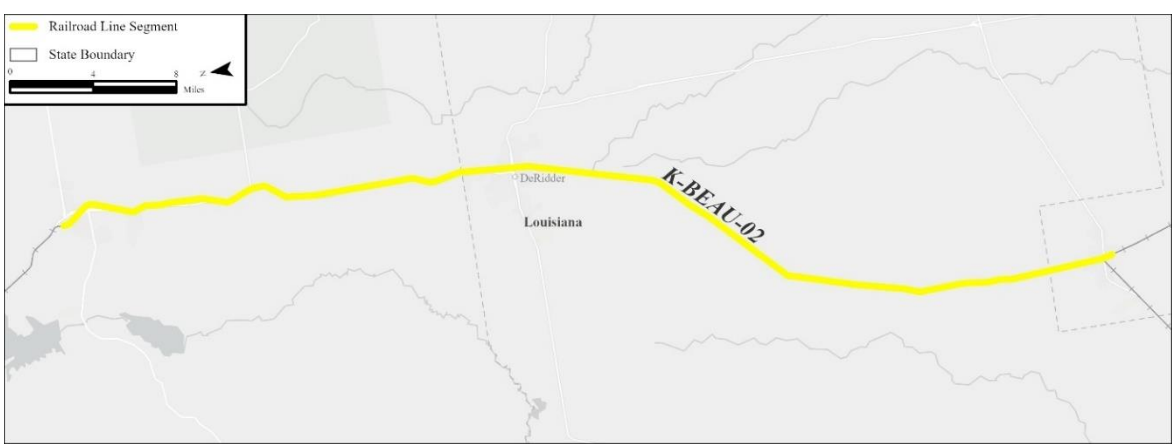
K-BEAU-02

This property is a 50.6-mile segment of KCS that travels south from Leesville, Louisiana to De Quincy, Louisiana. The rail line segment travels through the towns of Leesville, Rosepine, Deridder, Singer, and De Quincy. Originally built in 1897, this portion of the railroad was part of KCP&G. The railroad reached Shreveport, Louisiana in March 1897 and by September of that same year the line had reached the Gulf Coast. After the Civil War, companies like KCP&G began to build track in Louisiana and rural towns throughout the state relocated to take advantage of the developing railroad infrastructure. Louisiana railroads typically handled passengers, foodstuffs, and lumber, much of which was directed to major Gulf Coast ports like New Orleans and Port Arthur, Texas.

The rail line segment is regionally significant under Criterion A in the areas of Transportation and Commerce. Built as one of the final portions of KCP&G, this segment of the railroad played a major role in the ultimate fulfillment of the vision of a link between the Midwest and the Gulf of Mexico. KCP&G, as the first major line to pass through this section of Louisiana, enabled capitalists and investors to develop large scale farms and timber operations in rural Louisiana. In Sabine, Vernon, and Calcasieu Parishes, short and long leaf pine were harvested for the first time on an industrial scale. Prior to KCP&G's arrival, the nearest railroad to these parishes had been 100 miles away. The development of Louisiana’s timber industry coincided with the decline of the stands of timber in Michigan, Minnesota, and Wisconsin, all of which had been timbered for decades. Rosepine and DeRidder, Louisiana are representative examples of the economic transformation brought about by the arrival of KCP&G. In 1897, the railroad came though both towns soon after there were four lumber companies in Rosepine, which was incorporated in 1902. In nearby DeRidder, two lumber companies were organized after the railroad’s arrival, while the town was formally incorporated in 1903.

This segment of railroad is also eligible under Criterion B due to its association with Arthur Stilwell, the founder and driving force behind the expansion of KCP&G. Stilwell's importance and contributions supporting the eligibility under Criterion B are elaborated upon under *K-HEAV-01* and apply to this segment as well.

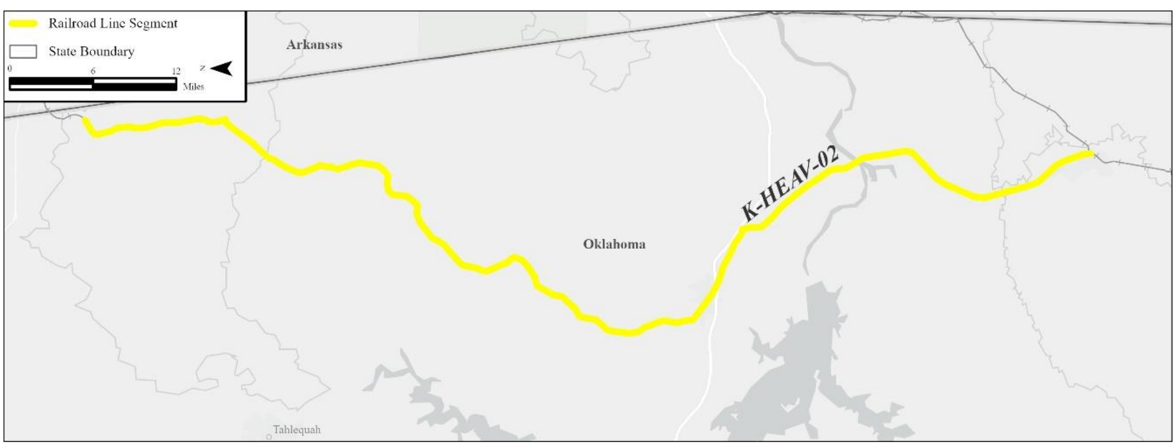
Figure 3.9-8. Map of K-BEAU-02 Rail Line Segment



~~*K-HEAV-02*~~

~~This property is a 90.4-mile segment of KCS that travels south from Watts, Oklahoma to Poteau, Oklahoma. The railroad passes through the towns of Watts, Westville, Stilwell, Sallisaw, Spiro, Panama, and Poteau. Built by KCP&G, this segment of the railroad connected Kansas City to multiple small agrarian communities in Oklahoma as well as regions rich in coal, fruit trees, and metals. In 1912, KCS' Immigration Department documented some of the resources and opportunities that had developed in Oklahoma along its trackage in a booklet entitled "Eastern Oklahoma Along the Kansas City Southern Railway." Similar books were produced to promote the Ozark Mountain region and coastal Louisiana. KCS highlighted how its Oklahoma trackage acted as magnets for farm products such as wheat and cotton, timber, coal, and metals. At Poteau, gas and oil wells were developed, while at Sallisaw, Spiro, and Panama, anthracite coal seams were developed. The local climate also permitted the growth of hay, making stock farms another viable undertaking. The extraction and development of these resources was made viable by the arrival of KCP&G, which created a cost-effective shipping corridor to major markets in Kansas City or international markets which could be accessed from the harbor at Port Arthur. KCP&G was, for many of these towns, the first railroad to pass through the area and the railroad was the critical factor in determining the location of many new towns. The presence of KCP&G and later KCS can be directly tied to the establishment and initial growth of multiple settlements including Westville, Stilwell, Spiro, and Panama, all of which were established in the 1890s on formerly Indigenous territory throughout eastern Oklahoma; for this reason, this segment is eligible for the National Register under Criterion A.~~

~~***Figure 3.9-9. Map of K-HEAV-02 Rail Line Segment***~~



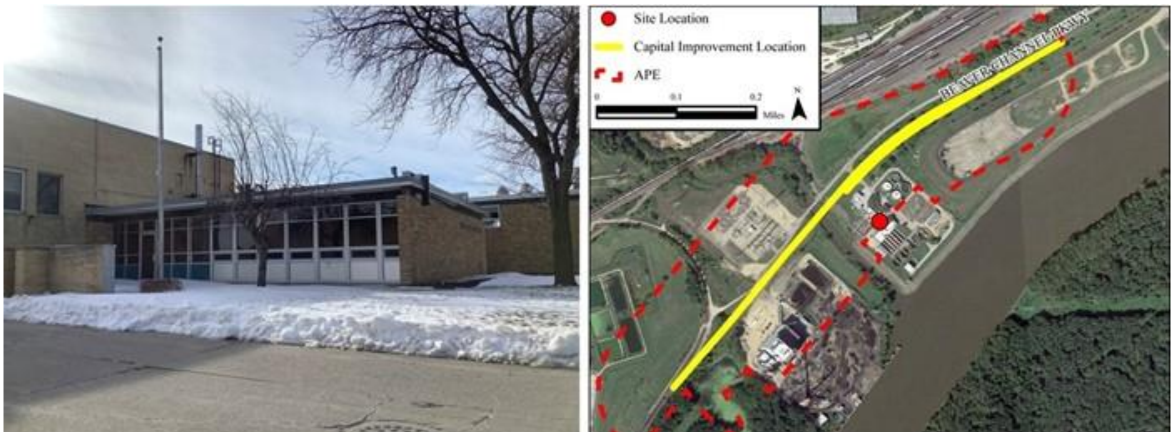
~~This segment of railroad is also eligible under Criterion B due to its association with Arthur Stilwell, the founder and driving force behind the expansion of KCP&G. Stilwell's importance and contributions supporting the eligibility under Criterion B are elaborated on above under K-HEAV-01 and apply to this segment as well.~~

IA-CA-001

This property is the former City of Clinton Water Pollution Control Plant, constructed in 1958 and subsequently expanded over the next 60 years. The property consists of a Central

Administration Building, a variety of support buildings, and circular and rectangular holding tanks. The property meets National Register Criterion A, local significance, as a critical public utility that allowed residential, commercial, and industrial development to grow and prosper in this area. The property also meets National Register Criterion C, as a good example of an International Style industrial complex, featuring character defining features in the Central Administration Building including banks of floor-to-ceiling casement windows with spandrels, as well as brick veneer, supporting the architectural style. The design aesthetic carries over to other buildings in the complex. The property retains integrity and is eligible for listing in the National Register.

~~Figure 3.9-10.~~Figure 3.9-9. IA-CA-001



LA-MA-004

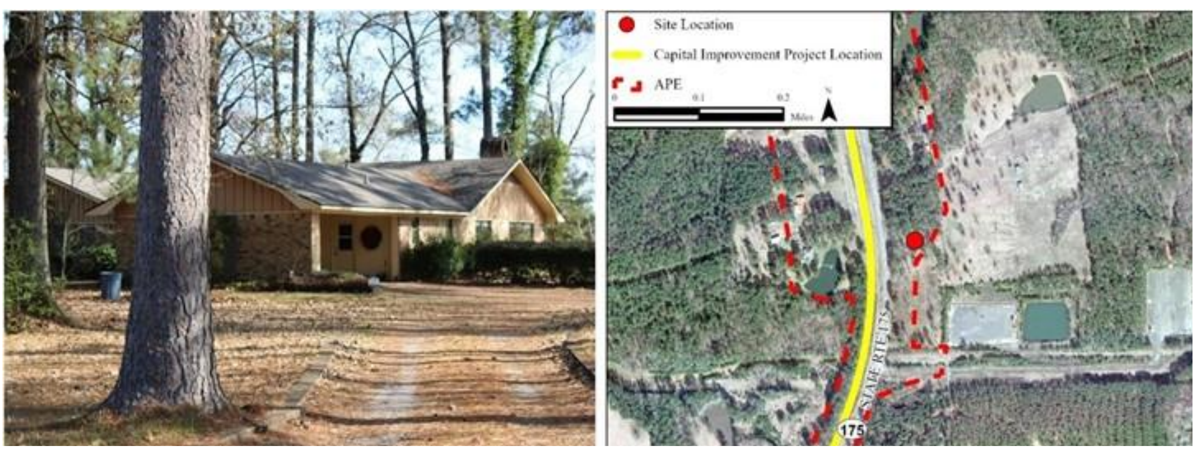
This residential property consists of a 1960s brick Ranch house on Holley Hill Road, in Mansfield, Louisiana. It is set back from Holley Hill Road within a wooded setting and is approximately 175 feet west of the rail ROW. The property meets National Register Criterion C, as a good example of a mid-to-late 20th century Ranch house, retaining its one-story form, which is horizontality emphasized by the wide, overhanging eaves and other character defining elements. Within the context of similar period Ranch houses in the area, this property retains integrity and is eligible for listing in the National Register.

~~Figure 3.9-11.~~Figure 3.9-10. LA-MA-004

LA-MA-009

This residential property consists of a 1960s brick Ranch house on Louisiana Highway 75, in Mansfield, Louisiana. It is located approximately 250 feet west of the rail ROW. The property meets National Register Criterion C, as a good example of a mid-to-late 20th century Ranch house, retaining an asymmetrical plan, integrated carport, and long, horizontal massing with a shallow roof slope and deep overhanging eaves. Within the context of similar Ranch houses in the area, this property retains integrity and is eligible for listing in the National Register.

~~Figure 3.9-12.~~Figure 3.9-11. LA-MA-009



MO-GO-004

This property is the Mitchell Cemetery, located on Blackstock Lane, in Goodman, Missouri. The 0.85-acre cemetery is located 195 feet west of the rail ROW, with burial markers dating from 1864 to the 1980s. Headstones of various materials exhibit designs incorporating burial and organizational symbols and appear to be in their original configuration. The setting consists of a gently rolling landscape and a partial border of black walnut and oak trees. The cemetery meets National Register Criterion A for its association with the 19th century settlement and community development in the region, specifically the town of Goodman.

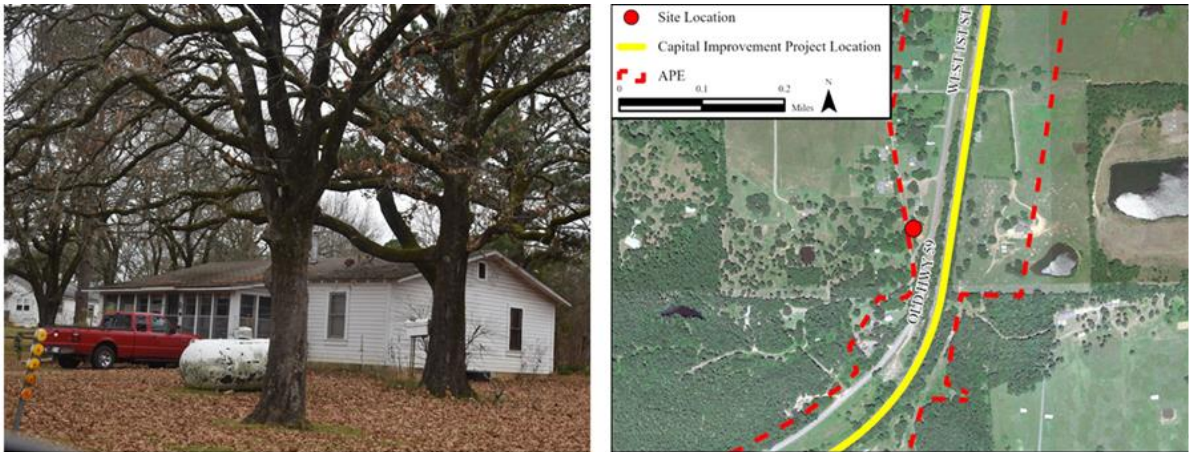
Grave markers exhibit various forms and materials, including tables and flush markers of marble, granite, and bronze, and are arranged in a linear fashion with occasional family plots set off by curbing. Under Criterion D, burials in the cemetery are associated with some of the earliest European settlers of the area and are locally significant as part of the early settlement of Goodman. Criterion D is applied to properties that have yielded, or may be likely to yield, information important in prehistory or history. The Mitchell Cemetery retains integrity and is eligible for listing in the National Register.

~~Figure 3.9-13.~~Figure 3.9-12. MO-GO-004

~~*OK-HE-020*~~

~~This residential property consists of a one-story, wood-framed, 1940s bungalow, located on Norvell Road, in Heavener, Oklahoma. It is located approximately 215 feet west of the rail ROW and is set on a tree covered lot. The property meets National Register Criterion C as a good example of a 1940s era bungalow with its character defining features intact. Bungalow elements include side-gable roof, exposed rafter tails, wood shiplap siding, and original wood-sash windows and trim. Enclosed porches extending across the façade and south elevation also appear to be original. Within the context of similar bungalows in the area, this property retains integrity and is eligible for listing in the National Register.~~

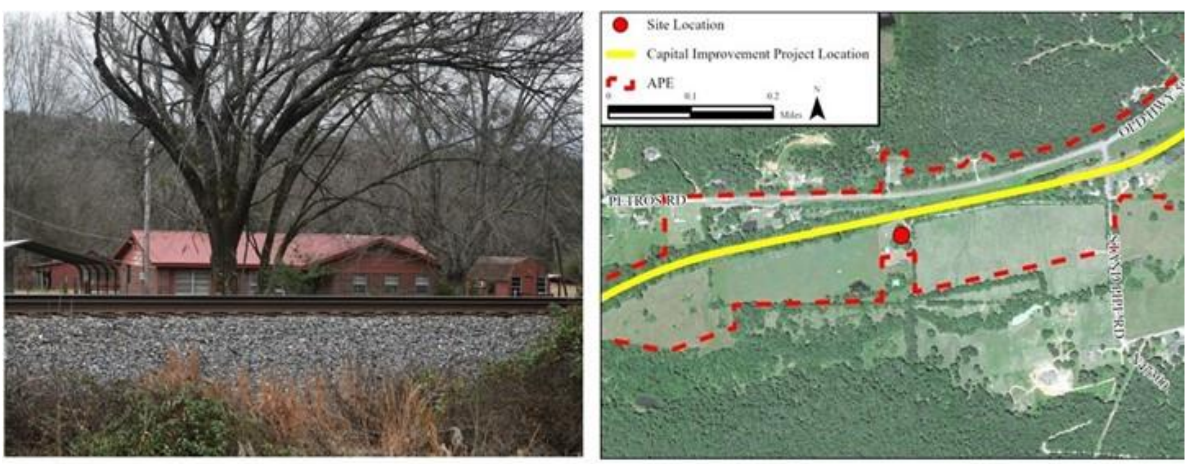
~~Figure 3.9-14. OK-HE-020~~



~~*OK-HE-024*~~

~~This residential property consists of a 1960s brick Ranch house as well as three outbuildings, located on Stand Pipe Road, in Heavener, Oklahoma. It is located west of the rail ROW, across Stand Pipe Road. An approximately 50-foot tree line buffer on the property separates the house itself from the road and the rail ROW. The property meets National Register Criterion C as a good example of a mid-to-late 20th century Ranch house, retaining its original form, plan, windows, and cladding materials, including wood clapboard, brick veneer, and original windows. Within the context of similar Ranch houses in the area, this property retains integrity and is eligible for the National Register.~~

~~Figure 3.9-15. OK-HE-024~~



OK-HE-027

This property is an approximately 0.9-mile stone-lined drainage channel that carries the Oil Branch through downtown Heavener, Oklahoma. At the south end of downtown, the channel runs adjacent to the rail ROW at the bottom of the slope on the east side, ending approximately 260 feet south of Avenue I. Constructed in 1939, the Oil Branch Channel was a WPA project meant to reduce flooding and community impacts related to the Oil Branch. The property meets National Register Criterion A for its association with the WPA and the New Deal era infrastructure improvement projects completed in the region, and the impact that program had on the communities in the area. The property also meets National Register Criterion C as a good example of its type, period, and method of construction. Its walls are constructed of wet laid native Oklahoma sandstone cut into long, rough-hewn blocks, ranging from four to eight feet in height. Sandstone pavers also line the bottom of the channel. The WPA constructed stone-lined drainage channel carrying Oil Branch retains integrity and is eligible for listing in the National Register.

~~Figure 3.9-16.~~Figure 3.9-13. OK-HE-027

3.9.2.2 Below-Ground Resources

34AD283

Site 34AD283 is an archaeological resource that consists of a below-ground scatter of manufactured stone (such as lithic) artifacts. The archaeological site is located west of the existing KCS railroad track and berm at the location of the planned new siding at MP 247 near Baron, Oklahoma. OEA identified the site through the excavation of 14 shovel tests, which contained 80 undifferentiated lithic artifacts and three Projectile Point Knife (PP/K) fragments. Site 34AD283 is located on an elevated terrace that rises approximately 1.5 meters above the existing railroad bed. Current conditions suggest the construction of the railroad during the late 19th century cut directly through the landform. The site measures approximately 162 meters in length northeast to southwest and is approximately nine meters wide northwest to southeast.

OEA recovered three dateable, or diagnostic, PP/Ks at 34AD283. Two of the PP/Ks are similar to the Standlee tradition which dates from the Late Archaic to Early Woodland transitional period (circa 200 B.C.- 400 AD). The other PP/K fragment is probably a Kings or Patterson Springs form which dates from the Late Archaic period (circa 2000-1000 B.C.).

Site 34AD283 retains good integrity of location, materials, design, and association. The artifacts recovered suggest that the site was occupied in the Late Archaic to Early Woodland transitional periods and that it was used as a lithic processing and manufacturing location. The site could potentially yield valuable data regarding our understanding of how stone tools were manufactured, and how precontact people both procured resources and seasonally exploited the environment. The large size of the site also suggests that the occupation may not have been small and short-lived. Therefore, within the APE, 34AD283 has significant data potential under Criterion D and is eligible for listing in the National Register.

34AD286

Site 34AD286 is an archaeological resource that consists of a moderately-dense, below-ground scatter of lithic artifacts. The archaeological site is located west of the existing KCS railroad track and berm at the location of the planned new siding at MP 247 near Baron, Oklahoma. OEA identified the site through the excavation of eight shovel tests which contained 108 undifferentiated artifacts. Site 34AD286 is located atop a flat terrace located 65 meters west of a creek. The site, on a flat 229 meters above mean sea level landform, measures 52 meters in length northeast to southwest and 14 meters in width, northwest to southeast. The APE is bounded by an existing fence line to the northwest.

OEA recovered artifacts consisting of lithic flakes from the early to late stages of tool manufacturing. Some of the flakes show evidence for being heated prior to modification. While no dateable artifacts were recovered, 34AD286 has the strong potential to date to the Paleoindian or Early Archaic periods (circa 12000 B.C.-3050 B.C.) based upon the depths of the artifacts recovered. The site may evidence very early human activity in the region. The deeply buried nature of the deposits may have been the result of flooding episodes, preserving the materials and potentially offering important information. Site 34AD286 retains good integrity of location, design, and association and has significant data potential related to our understanding of how precontact people interacted with their environment possibly during the Paleoindian and Early Archaic periods. Therefore, within the APE, 34AD286 is eligible for listing in the National Register under Criterion D.

3.9.3 Environmental Consequences

3.9.3.1 Proposed Acquisition

This subsection discusses the anticipated impacts of the planned capital improvements on cultural resources. As discussed above, the federal undertaking in this case is the Proposed Acquisition of KCS by CP. Pursuant to 36 C.F.R. § 800.3(a), OEA has determined that sales, leases, or transfers of operational rail lines for the purpose of continued rail operation are generally not a type of activity that has the potential to cause effects to historic properties. This determination is reflected in the Board's environmental regulations at 49 C.F.R. § 1105.8(b)(1), which exempt such sales, leases, and transfers from historic review requirements. However, if the acquisition of one railroad by another would result in constructing new rail lines, abandoning existing rail lines, or causing physical changes within the existing rail ROW, then the acquisition may have the potential to affect historic properties. In this case, if the Board authorizes the Proposed Acquisition, the Applicants intend to build 25 capital improvements within the rail ROW. Therefore, OEA evaluated the potential effects of adding the planned capital improvements on National Register-eligible properties within the APE. **Table 3.9-3** summarizes OEA's findings.

Table 3.9-3. Historic Property Impacts

Resource	Primary Potential Impact Type	Finding
Above-Ground Resources		
K-HEAV-01	Physical	No Adverse Effect
K-SHRE-01	Physical	No Adverse Effect
C-MARQ-03	Physical	No Adverse Effect
C-OTTU-02	Physical	No Adverse Effect
C-LARE-01	Physical	No Adverse Effect
K-PITT-01	Physical	No Adverse Effect
K-BEAU-01	Physical	No Adverse Effect
K-BEAU-02	Physical	No Adverse Effect
~~K-HEAV-02~~	~~Physical~~	~~No Adverse Effect~~
IA-CA-001	Visual	No Adverse Effect
LA-MA-004	Visual	No Adverse Effect
LA-MA-009	Visual	No Adverse Effect
MO-GO-004	Visual	No Adverse Effect
~~OK-HE-020~~	~~Visual~~	~~No Adverse Effect~~
~~OK-HE-024~~	~~Visual~~	~~No Adverse Effect~~
OK-HE-027	Visual	No Adverse Effect
Below-Ground Resources		
34AD283	Physical	No Adverse Effect
34AD286	Physical	No Adverse Effect

OEA provided Section 106 consultation materials to all SHPOs prior to issuance of the Final EIS. **Table 3.9-4** summarizes the outcomes of 106 consultation with each state.

Table 3.9-4. SHPO Concurrence

SHPO	Concurrence Date	Finding
Arkansas	8/16/2022	No Adverse Effect
Illinois	9/7/2022	No Adverse Effect
Iowa	11/18/22	No Adverse Effect
Louisiana	9/13/2022	No Adverse Effect

Table 3.9-4. SHPO Concurrence

SHPO	**Concurrence Date**	**Finding**
Missouri	11/10/2022	No Adverse Effect
Oklahoma	9/28/22 (OK Arch Survey), 10/18/22 (OK SHPO), 11/23/22 (OK SHPO)	No Adverse Effect; response letter included a commitment from Applicants to avoid impacts to the Oil Branch Drainage Channel (OK-HE-027)

Physical

The planned capital improvements would have a physical effect on the eligible rail line segments within the APE. However, this effect would not be adverse. Sidings and second tracks are already part of the character of the rail line segments, and the addition of new sidings, the addition of new double tracking or facility working track, or the extension of existing sidings would therefore be consistent with the existing characteristic of these properties. Some individual historic features of the rail line segments may be impacted, for example, stone culverts or small timber trestles. However, the overarching character of the property would be unaffected due to the large number of similar contributing features throughout the extensive rail line segments. The planned capital improvements would not alter the physical features of the properties that make them eligible for the National Register in the areas of transportation. OEA expects that such changes would have *No Adverse Effect* on the historic rail line segments because they would support the continued use of the corridor for rail transportation and would therefore not diminish the characteristics of the properties that make them eligible for inclusion in the National Register under Criterion A and/or B.

The capital improvements would not have a physical impact on any of the other historic properties identified within the APE. Although two National Register-eligible archaeological sites, 34AD283 and 34AD286, are located within the APE at one planned capital improvement location, the Applicants have clarified that the planned siding would be located within the current limits of the rail line footprint (railroad ballast and berm) in the areas adjacent to 34AD283 and 34AD286 and that no construction activities would take place within the limits of the sites. Therefore, the planned capital improvement siding would not physically affect any eligible below-ground (archaeological) resources. ~~None of the other historic properties are located within the limits of any potential construction activity associated with the planned capital improvements and all are outside of the ROW (within which all planned construction would occur).~~

A portion of the Oil Branch Drainage Channel is located within the rail ROW near the location of the planned new siding at Heavener. However, the Applicants have committed to designing and engineering the new siding so as to avoid physical effects on the Oil Branch Drainage Channel. None of the other historic properties that OEA identified are located within the expected limits of any potential construction activities associated with the planned capital improvements.

Use

OEA does not expect the Proposed Acquisition to result in a change to the character or the use of any of the historic properties identified within the APE. The Applicants plan to add new sidings, extend existing sidings, or add a second track within the existing, active railroad ROW. These planned capital improvements would support the continued transportation use of the historic rail line segments. Because the Applicants would build the planned capital improvements within existing railroad ROW, OEA does not anticipate impacts to the continued use of surrounding historic properties within the APE, which are already characterized by their close association with the existing railroad.

Setting

OEA does not expect that the Proposed Acquisition would result in a change in the character of the setting of any of the historic properties. Although the existing settings of the historic properties vary, they are all characterized by their relationship to the existing railroad. As the planned capital improvements would consist of an addition to the existing railroad facility within the existing ROW, there would be no alteration to the existing setting.

Audible

OEA does not expect that the Proposed Acquisition would result in audible effects that could diminish the integrity of significant historic characteristics or features of any National Register-eligible properties. Because the historic properties within the APE are all located near an active rail line that has been operational for many years, rail-related noise, such as intermittent wayside or horn noise from passing trains, is and has long been part of the historic character of those properties. Although the completion of the 25 planned capital improvements would result in noise from construction equipment, this would be temporary and would be consistent with the industrial nature of the active rail corridor in which it would take place. Aside from this temporary construction-related noise, the Proposed Acquisition would not introduce any new auditory elements within the APE.

Visual

The Proposed Acquisition would not result in the introduction of visual elements that could diminish the integrity of the properties' significant historic characteristics or features. The railroad is already part of the visual character of the non-railroad properties, and the addition of a new siding, extension of an existing siding, or addition of a second track would merely expand the existing facility within its current ROW. These planned capital improvements would be compatible with the existing rail-related infrastructure and would not alter views from the properties.

3.9.3.2 No-Action Alternative

Under the No-Action Alternative, the Board would not authorize the Proposed Acquisition, and CP would not acquire KCS. Therefore, the Applicants would not add the 25 planned capital improvements as a result of the Proposed Acquisition and the physical effects to historic properties from the capital improvements would not occur. However, CP and KCS could make capital improvements along their respective rail lines in the future without seeking Board authority if needed to support rail operations.

3.9.4 Conclusion

The Proposed Acquisition would have *No Adverse Effect* on the historic properties identified within the APE. The Proposed Acquisition would not adversely affect the 13~~6~~ above-ground National Register-eligible historic properties that OEA identified because it would not result in any physical impacts to the properties; change the character of the properties' use or physical features within the properties' setting that contribute to their historic significance; or introduce visual, atmospheric, or audible elements that would diminish the integrity of the properties' significant historic features. The Applicants also have committed to avoiding physical effects on the Oil Branch Drainage Channel, a portion of which is located within the railroad ROW near the planned new siding at Heavener. Although two National Register-eligible archaeological sites, 34AD283 and 34AD286, are located within the APE at the planned new siding at MP 247 near Baron, the Applicants have clarified that the planned siding would be located within the current limits of the rail line footprint in the areas adjacent to National Register-eligible archaeological sites and that no construction activities would take place within the limits of the sites. Therefore, the planned capital improvement siding would not physically affect any eligible below-ground resources. ~~The Applicants have proposed voluntary mitigation for cultural resources, which includes a commitment to abide by the terms of any negotiated agreement pursuant to Section 106 of the NHPA (see *Chapter 4, Mitigation*, Voluntary Mitigation Measure [VM]-Cultural-01).~~ In addition, OEA is recommending that the Board impose mitigation requiring the Applicants to develop and implement an unanticipated discoveries plan and an archaeological monitoring plan for the planned capital improvements, in consultation with consulting parties. The Applicants shall provide the construction monitoring plan to OEA and appropriate THPOs for review no later than 30 days prior to the start of any construction activities related to the 25 planned capital improvements and shall abide by the provisions of the plan, including any revisions by OEA and appropriate THPOs, during construction activities (Mitigation Measure [MM]-Cultural-01).

Prior to issuance of the Draft EIS, the Applicants voluntarily proposed mitigation referencing a potential agreement document that could be negotiated pursuant to Section 106 (Voluntary Mitigation Measure [VM]-Cultural-01). Following consultation with appropriate Section 106 consulting parties, however, OEA now finds that the Proposed Acquisition would not adversely affect any historic properties that are listed on or eligible for listing on the National Register. Therefore, no Section 106 agreement document (such as a Memorandum of Agreement or Programmatic Agreement) would be needed to resolve adverse effects on historic properties. Accordingly, the Applicants' voluntary mitigation measure VM-Cultural-01 is not necessary and OEA is no longer recommending that the Board impose that condition in any decision authorizing the Proposed Acquisition. OEA is recommending that the Board impose mitigation requiring the Applicants to abide by their commitments to design and engineer the 25 planned capital improvements to remain within the existing rail ROW, to maintain the existing rail footprint in locations immediately adjacent to archaeological sites that OEA has identified as eligible for listing on the National Register, and to not perform any construction activities related to the 25 planned capital improvements within the boundaries of National Register-eligible archeological sites identified by OEA (MM-Cultural-02).

3.10 Hazardous Material Release Sites

This section describes the existing conditions and potential environmental impacts associated with hazardous material release sites under the Proposed Acquisition and the No-Action Alternative. If the Board were to authorize the Proposed Acquisition, activities related to planned capital improvements, such as extending existing passing sidings or adding new sidings, could impact soil or groundwater that have been contaminated by past releases (such as spills or leaks) of hazardous materials.

3.10.1 Approach

OEA used the following methods to identify hazardous material release sites and evaluate each site's potential to affect or be affected by planned capital improvements related to the Proposed Acquisition. OEA defined the study areas for hazardous material release sites as the area within a 500-foot buffer around the estimated construction footprint of each planned capital improvement. OEA then conducted a search for hazardous material release sites in the study areas. For the purposes of this analysis, a hazardous material release site is an area that has been affected by a documented release of hazardous material into soil, groundwater, surface water, sediments, and/or air. Hazardous materials are hazardous substances as defined by the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. § 103), including hazardous wastes. EPA defines hazardous waste as waste with properties that make it dangerous or potentially harmful to human health or the environment.

In order to search for documented releases of hazardous materials, OEA obtained environmental database reports from Environmental Data Resources, Inc. (EDR) to identify environmental database listings within the study areas. Descriptions of these different environmental databases are included in **Appendix L**. In addition, OEA conducted a review of the FRA database of train collision reports and incidents reported to the Pipeline and Hazardous Materials Safety Administration to identify recorded hazardous materials incidents within the study areas.

After identifying hazardous material release sites in the study areas, OEA evaluated whether construction of the planned capital improvements could potentially affect those hazardous material release sites, based on the available information about each site. OEA concluded that a capital improvement could result in potential impacts on a hazardous material release site if one or more of the following conditions were met:

- The construction activities would disturb properties where identified hazardous material sites had not achieved regulatory closure with the applicable state or federal agency.
- The construction activities would disturb hazardous material release sites where an existing land use restriction prohibited disturbing contamination that was left in place (for example, contaminated soil covered with asphalt, clean soil, or another barrier).
  - If insufficient documentation was available for a hazardous material release site (such as a rail-related spill of hazardous materials) to make conclusions about

potential impacts, OEA conservatively assumed that no remediation had occurred and that the hazardous materials might still be present at the site.

3.10.2 Affected Environment

All 25 planned capital improvements would be adjacent to existing track and within the existing ROW. Areas adjacent to railroad tracks sometimes contain contamination from spills or releases during rail operations. In many locations, rail lines are also surrounded by industrial operations where releases of hazardous materials have occurred, and it is possible that hazardous materials have migrated into the railroad ROW from those operations. **Table 3.10-1** below presents the number of hazardous material release sites that OEA identified in the study area for each planned capital improvement, based on OEA's search of available environmental databases. The table shows both the number of rail-related releases in the study area for each planned capital improvement and the number of properties in the study area with documented releases. Some properties in the study areas may have had multiple documented releases but are counted only once in the table.

3.10.3 Environmental Consequences

This subsection discusses the potential environmental impacts related to hazardous material release sites from the Proposed Acquisition and the No-Action Alternative.

3.10.3.1 Proposed Acquisition

Based on OEA's review of the planned locations of the capital improvements, environmental database listings, and reports of rail-related incidents, OEA concluded that five of the 25 planned capital improvements have the potential to impact hazardous material release sites (**Table 3.10-1**). These are the Camanche, Blue Valley, Ottumwa, Laredo, and Asbury capital improvements (see Appendix L for maps of each capital improvement). The Applicants would build the capital improvements only as needed to support future rail traffic. As a result, the Applicants have not yet completed engineering and design for the planned capital improvements and would not complete engineering and design until after the completion of the Proposed Acquisition's environmental review process. Therefore, the details and timing of construction activities are not known. However, OEA assumes that construction of the planned capital improvements would involve ground-disturbing activities that could encounter hazardous materials if such materials are present. The Applicants would have to comply with federal and state regulations prior to construction if there is the potential to disturb contaminated soil and properly dispose of it if present. Those regulations are designed to protect the environment and human health from hazardous material release sites.

The Camanche capital improvement is a planned extension of an existing siding near Camanche, Iowa. The Archer Daniels Midland Corn Processing Facility Industrial Waste Landfill built in the 1980s-1990s is in the vicinity of the planned capital improvement construction footprint.

Table 3.10-1. Hazardous Material Release Sites in Capital Improvement Study Areas

Name of Capital Improvement	State	County	Number of Properties with Releases in Study Area[1]	Number of Rail-Related Incidents in Study Area[2]	Number of Sites with Potential for Impacts
MP 377	Arkansas	Polk	0	2	0
Chicago MP 75	Illinois	Ogle	0	7	0
MP 71	Iowa	Clayton	0	0	0
Deer Creek	Iowa	Clinton	0	0	0
Camanche	Iowa	Clinton	3	4	2
Letts	Iowa	Louisa	0	0	0
Moravia	Iowa	Monroe	0	1	0
MP 255	Iowa	Washington	0	0	0
MP 24	Iowa	Jackson	0	0	0
Ottumwa	Iowa	Wapello	0	1	1
Mansfield	Louisiana	De Soto Parish	0	0	0
Gentry	Arkansas	Benton	1	1	0
Loring	Louisiana	Sabine	0	2	0
Singer	Louisiana	Beauregard	1	2	0
Newtown	Missouri	Sullivan	0	1	0
MP 431	Missouri	Livingston	0	0	0
MP 186	Missouri	McDonald	0	3	0
Grandview/IFG	Missouri	Cass, Jackson	2	3	0
Blue Valley	Missouri	Jackson	6	19	3
Laredo	Missouri	Grundy	0	3	1
Asbury	Missouri	Jasper	1	1	1
MP 247	Oklahoma	Adair	0	0	0
Cave Springs	Oklahoma	Adair	0	2	0
Heavener	Oklahoma	Le Flore	1	9	0
Spiro	Oklahoma	Le Flore	0	4	0

[1] Hazardous material release sites were compiled by EDR Inc., from the databases listed in **Appendix L**. OEA collected location information from these listings from EDR and other sources.

[2] FRA incidents were determined using information derived from the Pipeline and Hazardous Materials Safety Administration and FRA online databases.

[3] Sites with potential for impacts include: (1) releases for which remediation has not been completed that are located within or adjacent to the estimated construction footprint of the planned capital improvement, (2) locations where construction activities could disturb a contained release, and (3) locations where releases are known to have occurred but for which there is insufficient documentation to determine whether or not contamination could remain.

The May 2016 *Landfill Cap Improvement Plan* shows the approximate waste limits of the landfill as occurring beneath the railroad tracks and within the conceptual construction footprint of the siding extension. However, the landfill originated in the 1900s and its exact limits in relation to the ROW are unavailable. The railroad in this area predates the landfill since it was originally part of the Chicago, Milwaukee, St. Paul, and Pacific Railroad, which was built around the 1880s and 1890s. In addition, the Camanche siding extension would abut the Alliant Energy Generation Station, a coal-fired power plant, and contamination from the coal ash landfill at that power plant could be present within the conceptual construction footprint of the siding extension.

The Ottumwa capital improvement is a planned extension of an existing siding near Ottumwa, Iowa. OEA identified one rail-related incident that potentially occurred in June 1985 at the location of the planned siding extension (Incident ID I-1985060133), which resulted in spillage of acetic acid solution from a tank car due to a defective auxiliary valve on the tank car. Based on the limited documentation available for this incident, OEA conservatively concluded that residual amounts of acetic acid may be present within the estimated construction footprint of the Ottumwa siding extension.

The Blue Valley capital improvement would involve extending an existing siding in both directions in order to create an approximately 4-mile double track in the Blue Valley area of Kansas City, Missouri. OEA identified three properties with documented releases of hazardous materials near the Blue Valley capital improvement. These properties are the Kerr-McGee Chemical Corporation, Union Wire Rope, and the former General Motors Leeds Plant. It is possible that contamination from these properties has migrated into the estimated construction footprint of the capital improvement and could be encountered during construction activities.

The Laredo capital improvement is a planned extension of an existing siding near Laredo, Missouri. OEA identified one rail-related incident involving hazardous materials at this location. The incident (Incident ID I-2003060224) involved the release of approximately 200 gallons of argon caused by a loose valve. According to the incident report, the valve was closed to stop the release and no additional response actions were performed. Because argon is a gas at room temperature, OEA concludes that there is no potential to encounter residual hazardous material at the Laredo capital improvement location as a result of this incident. OEA also notes that argon is nontoxic and is not known to contribute to any long-term environmental effects in soil or water.

The Asbury capital improvement is a planned extension of an existing siding near Asbury, Missouri. This siding extension would be located within the Oronogo-Duenweg Mining Belt Superfund site, which encompasses approximately 270 square miles in Jasper and Newton counties in Missouri. According to documentation produced by EPA, cleanup activities in this Superfund site are ongoing. The Superfund site is divided into a number of distinct areas called Operable Units that each require specific cleanup actions. The Asbury siding extension is not located within any of the Operable Units associated with the Oronogo-Duenweg Mining Belt Superfund site. Therefore, OEA concludes that contamination related to the Superfund site is unlikely to be present in the estimated construction footprint of the siding extension.

Aside from the Camanche, Blue Valley, Ottumwa, and Asbury capital improvements, OEA concludes that the other 21 planned capital improvements would not affect or be affected by hazardous material release sites (see **Appendix L** for additional information).

3.10.3.2 No-Action Alternative

Under the No-Action Alternative, the Board would not authorize the Proposed Acquisition, and CP would not acquire KCS. The Applicants would not construct the 25 planned capital improvements associated with the Proposed Acquisition. Therefore, the potential impacts described above on hazardous material sites would not occur under the No-Action Alternative. In the absence of the Proposed Acquisition, however, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority if needed to support rail operations.

3.10.4 Conclusion

If the Board authorizes the Proposed Acquisition, the Applicants plan to make certain capital improvements in the existing railroad ROW. OEA identified hazardous material sites in the study areas for five of the 25 planned capital improvements and concluded that four capital improvements have the potential to impact hazardous material release sites. The Applicants would have to comply with federal and state regulations prior to construction if there is the potential to disturb contaminated soil and properly dispose of it if present. Those regulations are designed to protect the environment and human health from hazardous material release sites.

To minimize impacts to hazardous material release sites, the Applicants have proposed voluntary mitigation that includes a commitment to comply with applicable solid and hazardous waste regulations during the work associated with the planned capital improvements (see *Chapter 4, Mitigation*, Voluntary Mitigation Measure [VM]-Haz. Material Sites-01 and VM-Haz. Material Sites-05). The Applicants also commit to developing a site-specific spill prevention, control, and response plan for each capital improvement (VM-Haz. Material Site-02). To further minimize the potential for impacts, OEA is recommending mitigation measures for the Board to consider. Specifically, OEA recommends that the Board impose mitigation requiring the Applicants to confine construction activities to the existing railroad ROW to the extent practicable (Mitigation Measure [MM]-General-03), follow appropriate procedures for identifying potential contamination and consulting with applicable agencies in the event that contamination is encountered (MM-Haz. Material Sites-05) and comply with applicable regulations regarding the handling and disposal of any waste materials (MM-Haz. Material Sites-04).

OEA also recommends that the Board impose mitigation requiring the Applicants to notify EPA prior to undertaking any capital improvements related to the Proposed Acquisition within the EPA Oronogo-Duenweg Mining Belt Superfund site (MM-Haz. Material Sites-02) and notify the Iowa Department of Natural Resources prior to undertaking any capital improvements related to the Proposed Acquisition adjacent to the Archer Daniels Midland Corn Processing Facility Industrial Waste Landfill (MM-Haz. Material Sites-02).

3.11 Biological Resources

This section describes the affected environment and -potential environmental consequences on biological resources that would result from planned capital improvements and planned system operations under the Proposed Acquisition. The subsections that follow also describe the study areas for the planned capital improvements, data sources, and approach that the OEA used to analyze potential impacts. The biological resources that this section discusses include plant communities, wildlife habitat (terrestrial and aquatic), special status species, and natural areas. Special status species include listed species or those proposed to be listed as threatened or endangered under the Endangered Species Act (ESA); candidate species for ESA listing; bald and golden eagles; and sensitive species listed by state agencies. In addition, consistent with previous mergers, OEA considered the potential impact of projected increases in rail traffic and resulting noise on wildlife and habitat, as appropriate.

3.11.1 Approach

During scoping, commenters expressed concern that the Proposed Acquisition could increase the risk of train derailment occurring that would result in the spill or release of hazardous materials, such as crude oil, into the surrounding biological environment. *Section 3.1, Freight and Passenger Rail Safety* describes the potential impacts associated with the transportation of hazardous materials, including the risk of hazardous materials releases, in detail. OEA concludes the risk of a rail accident occurring that could result in a release of hazardous materials of any size onto the ground, where it could affect biological resources, is and would remain very low. The rail lines that would make up the combined CPKC system are and would continue to be maintained and operated in compliance with applicable federal regulations for rail transportation of hazardous materials. However, in response to public comments, OEA analyzed the potential impacts of a spill or release of hazardous materials on biological resources.

If the Board authorizes the Proposed Acquisition, the Applicants plan to make certain capital improvements within the existing rail ROW to support the projected increase in rail traffic. Those capital improvements would include adding 10 new passing sidings, extending 13 existing sidings, adding a section of facility working track, and adding a section of double track. Because the Applicants have stated that the 25 planned capital improvements would be necessary to accommodate the increased rail traffic that the Applicants expect would occur as a result of the Proposed Acquisition, OEA has assessed the potential impacts of the 25 planned capital improvements as part of the environmental review of the Proposed Acquisition. However, the Applicants have also stated that the planned capital improvements would be added only as needed to support increased traffic. Therefore, the Applicants have not completed detailed design and engineering for the 25 planned capital improvements. Accordingly, OEA's analysis of the potential impacts from implementing the planned capital improvements is based largely on conceptual design information, as well as conservative assumptions about how construction would proceed.

The study area for biological resources includes the existing rail ROW at each planned capital improvement location. The ROW at these locations varies in width, extending between 35 and 100 feet from the centerline of the existing mainline, with most of the ROW extending 50 feet wide from the centerline. As detailed below in **Table 3.11-1** and **Table 3.11-2**, most of the study area consists of the existing railroad and ballast. See **Figure O.1-1** in **Appendix O** (pages 3-165) for the study boundary at each planned capital improvement. Consistent with past practice, OEA also considered the potential effects of projected increases in rail traffic, including potential increases in rail-related noise, on wildlife and critical habitat. This analysis focused on rail line segments where OEA anticipates that rail traffic could increase by eight or more trains per day, pursuant to the thresholds for environmental review at 49 C.F.R. § 1105.7(e). OEA expects that any increases in rail traffic would not have the potential to adversely affect other biological resources, such as fish or vegetative communities.

OEA consulted with local, regional, state, and federal agencies regarding the presence of special status species in the areas where the Applicants intend to make capital improvements. OEA researched the behavior of special status species and their preferred habitat to determine whether they may occur in the study areas. In addition, OEA researched invasive species lists for states with planned capital improvements. OEA conducted field work at the planned capital improvement locations from January 13-18, 2022, and January 24-28, 2022, to investigate baseline conditions, existing vegetation, wildlife presence, and protected species habitat. OEA conducted habitat-level field work at 24 of the 25 planned capital improvement locations through pedestrian surveys. OEA did not conduct field work at the location of the planned new siding at MP 75 near Monroe Township in Ogle County, Illinois because that planned new siding would be located within the footprint of a previously removed second track and would therefore not result in any new impacts.

OEA evaluated the potential effects of the planned capital improvements on special status species; other vegetation, fish, and wildlife; and natural areas and critical habitat in the study area. In its analysis, OEA used data from published reports, feasibility studies, regulatory agency documents, guidance manuals, discussions with resource personnel, aerial photographs, U.S. Geological Survey (USGS) topographic maps, field visits (January 2022 pedestrian surveys), and Geographic Information Systems (GIS) databases. OEA evaluated the potential effects of operations on wildlife and critical habitat throughout the mainline within the ROW using the USFWS Threatened and Endangered Species Active Critical Habitat Report GIS files (updated March 8, 2022).

3.11.2 Affected Environment

This subsection describes the affected environment with respect to biological resources. OEA characterized the affected environment in terms of general existing conditions within the study area, plant communities, wildlife habitat, special status species, and natural areas.

3.11.2.1 Study Area Existing Conditions

Because the planned capital improvements would be located within the existing rail ROW, the study area primarily consists of developed and heavily altered land that is barren due to the use of herbicides, mechanical clearing, and the placement of ballast within the existing railroad corridor. **Table 3.11-1** summarizes the existing conditions of the 25 planned capital improvements. **Figure O.1-1** in **Appendix O**, pages 3-165, show maps of each planned capital improvement site, and pages 379-424 in **Appendix O** contain photos taken of site conditions during field work.

Table 3.11-1. Planned Capital Improvement Study Areas Existing Conditions (north to south)

Capital Improvement	**Site Description**
MP 71 (Turkey River), IA	Includes primarily forested wetlands located directly adjacent to the existing railroad and ballast sloping down into the Mississippi River backwaters with stagnant water and areas with no current.
MP 24 (Bellevue), IA	Includes mixed hardwood forested areas, residential and agricultural land use, and Spruce Creek Park is located within the southeastern portion.
MP 75 (Monroe), IL	Includes the existing mainline track and ballast from a previously removed siding that the Applicants plan to reuse for the new siding.
Deer Creek, IA	Includes upland mixed hardwood forested areas on steep slopes, bottomland mixed hardwood forest on the eastern side sloping down to the Mississippi River, and residential land use (residential buildings are not located within the study area). The Mississippi River is directly adjacent to the study area on the eastern side.
Camanche, IA	Includes primarily industrial land use and heavily disturbed and frequently maintained areas.
Letts, IA	Includes mixed hardwood forested areas separating the existing railroad from agricultural fields adjacent to the study area.
MP 255 (Washington), IA	Boundary narrowly falls along agricultural land with a small, isolated section of hardwood forest within the riparian zone surrounding South Fork Long Creek.
Ottumwa, IA	The existing siding that CP plans to extend is present within the study area. Boundary narrowly falls along agricultural land on the eastern end and two patches of hardwood forest. Highway 34 borders the study area on the southern side.
Moravia, IA	Includes primarily agricultural land with an area of hardwood forest on the eastern end.
Newtown, MO	Includes primarily agricultural land with no forested areas. Highway 139 borders the entire study area on the western side.
Laredo, MO	Boundary narrowly falls along agricultural fields with a section of mixed hardwood forest within the riparian zone surrounding a stream.
MP 431 (Dawn), MO	Includes primarily bottomland or lowland mixed hardwood forest and a riparian corridor for adjacent Shoal Creek, which are both bordered by agricultural land outside of the ROW.
Blue Valley, MO	Includes primarily industrial areas, some areas of mixed hardwood forest, and multiple limestone bedrock outcrops.
Grandview/IFG, MO	Includes primarily industrial areas with the northern portion being graded and filled.
Asbury, MO	Boundary narrowly falls along agricultural fields.
MP 186, MO	Includes primarily agricultural land with buffers of mixed hardwood forested areas.

Table 3.11-1. Planned Capital Improvement Study Areas Existing Conditions (north to south)

Capital Improvement	Site Description
Gentry, AR	Includes a maintained area between the railroad and Arkansas Highway 59 which borders the length of the study area. There are buffers of mixed hardwood forest between the highway and existing railroad.
MP 247 (Baron), OK	Includes primarily mixed hardwood forested areas and agricultural land. Includes scattered areas of river cane (*Arundinaria gigantea*).
Cave Springs, OK	Includes primarily mixed hardwood forested areas and agricultural land.
Spiro, OK	Includes primarily agricultural land and with areas of disturbed and previously cleared forested areas that are beginning to revegetate.
Heavener, OK	Includes primarily bottomland or lowland early successional (very young) mixed hardwood forested areas and agricultural land. Includes scattered areas of river cane.
MP 377 (Mena), AR	Includes primarily early successional (very young) mixed hardwood forested areas, recently cleared areas, industrial and agricultural land.
Mansfield, LA	Includes mostly maintained and historically cleared land that separates the existing railroad corridor from the highway corridor. There is a natural gas utility corridor that runs through the center of the study area.
Loring, LA	Includes primarily mature, mixed hardwood forest.
Singer, LA	Includes primarily maintained highway ROW with small areas of planted pine and early successional mixed hardwood forested areas.

3.11.2.2 Plant Communities

Vegetation provides habitat and food sources for wildlife, improves air quality, provides in-stream shade, filters stormwater, and contributes to flood control. Even though the study area is highly developed, the existing vegetation within and adjacent to the ROW provides important functions to the immediate surroundings, affecting natural resources. No ESA-listed threatened or endangered plant species or suitable habitat for those species are known to occur within the study area.

Invasive plant species identified during field work include: tree-of-heaven (*Ailanthus altissima*), wild chervil (*Anthriscus sylvestris*), Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), Chinese bushclover (*Lespedeza cuneata*), Chinese privet (*Ligustrum sinense*), Japanese honeysuckle (*Lonicera japonica*), multiflora rose (*Rosa multiflora*), Himalayan blackberry (*Rubus armeniacus*), Chinese foxtail (*Setaria faberi*), yellow foxtail (*Setaria pumila*), and Johnsongrass (*Sorghum halepense*).

3.11.2.3 Wildlife Habitat

Habitat and land use types within the study area include agricultural, maintained ROW, industrial, floodplain/rivers/streams, wetlands, residential, fallow field/early successional, and mixed hardwood forest (see **Table 3.11-2**, below, and **Figure O.1-1** in **Appendix O**). The existing riparian and forested areas are primarily located along the edge of the railroad ROW and extend outside the study area. Riparian and forested areas generally provide important habitat and resources for birds, fish, and wildlife. ~~In~~ Within the study area, however, the quality of these habitats has already been reduced by herbicide use, mechanical clearing, and ballast placement within the railroad ROW. ~~have rendered most of these habitats as low quality~~.

Table 3.11-2. Total Acreage by Habitat Type within the Study Area (Totaled Across All 25 Planned Capital Improvement Locations)

Habitat Type	Acreage
Agricultural	49.4
Maintained Roadway ROW	29.7
Industrial	24.7
Riparian (Floodplain/Rivers)	12.6
Residential	9.6
Fallow Field/Early Successional Forest	3.3
Mixed Hardwood Forest	37.4
Existing Railroad and Ballasts	118.0

Previous construction activities for railway corridor, highways, and smaller roads, as well as actions associated with converting land for agricultural, residential, commercial, and industrial uses, have resulted in fragmentation of the habitat that remains in the study area. Land use changes have disrupted the original wildlife habitat continuity, which has likely affected wildlife foraging habits, reproductive habits, and migratory movements. To the extent that wildlife may still use the remaining patches of forested habitat along the existing rail line, those animals have likely adapted to the fragmented and heavily altered state of the habitat, as well as to exposure to intermittent noise from passing trains and other railroad-related activities, such as ROW maintenance.

Some of the planned capital improvements would be located within or along the Mississippi Flyway, which is a bird migration corridor used by birds protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (16 U.S.C. §§ 703-712) (BGEPA). During field visits at each of the planned capital improvement sites, OEA observed migratory bird nests, including barn swallow (*Hirundo rustica*), cliff swallow (*Petrochelidon pyrrhonota*), and eastern phoebe (*Sayornis phoebe*) nests in structures supporting the railroad, such as bridge abutments, and in vegetation within the rail ROW. **Appendix O** provides a summary of the structures with observed migratory bird nests at each of the planned capital improvement locations.

3.11.2.4 ESA-Listed Species

Early coordination with USFWS and use of their Information for Planning and Consultation (IPaC) tool (USFWS n.d.) indicated that a total of 29 federally listed species could be present in the study area (see **Table O.2-1** for the list of species in **Appendix O**). OEA identified suitable habitat for three of the 29 species within the study area. OEA identified suitable summer roosting and foraging habitat for both Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*), as well as suitable foraging habitat for Ozark big-eared bat (*Corynorhinus townsendii ingens*). As a result, OEA eliminated the remaining species from further consideration. However, on September 14, 2022, USFWS published a proposed rule to list the tricolored bat (*Perimyotis subflavus*) as endangered following a 12-month finding on the listing petition to gather additional information and public comment. Because the proposed status anticipates a final listing decision within the next 12 months, OEA is addressing potential impacts on the tricolored bat in this section of the Final EIS.

The Indiana bat (*Myotis sodalis*) is federally listed as endangered and has the potential to occur in a range of planned capital improvement sites in Illinois, Iowa, Missouri, Arkansas, and Oklahoma (**Table 3.11-3**). OEA identified suitable summer roosting habitat and foraging habitat throughout the study area (Luensmann 2005) at 13 planned capital improvement locations. In Iowa, OEA identified suitable Indiana bat habitat at the planned siding extension near Letts, the planned new siding at MP 255 near Washington, the planned siding extension near Ottumwa, and the planned new siding near Moravia. In Missouri, OEA identified suitable habitat at the planned siding extension near Newtown, the planned siding extension near Laredo, the planned siding extension at MP 431 near Dawn, the planned new siding at MP 186 near Goodman, the planned double tracking at Blue Valley, and the planned facility working track at Grandview/IFG. In Arkansas, OEA identified suitable habitat at the planned siding extension near Gentry. In Oklahoma, OEA identified suitable habitat at the planned new siding at MP 247 near Baron and the planned siding extension near Cave Springs.

At these locations, OEA identified summer roosting habitat in the forested areas along edges of railroad ROW, under multiple bridges, and in multiple culverts throughout the study area. OEA identified foraging habitat in the canopy-enclosed flyways of forested edges of the railroad ROW, adjacent roads, and throughout riparian corridors. **Figure O.1-2** in **Appendix O** shows suitable bat habitat identified within the study area.

The northern long-eared bat (*Myotis septentrionalis*) is currently federally listed as threatened; however, on March 22, 2022, USFWS announced a proposal to reclassify the northern long-eared bat as endangered. The species has potential to occur at some of the planned capital improvement sites in Illinois, Iowa, Missouri, Arkansas, Oklahoma, and Louisiana (**Table 3.11-3**). OEA identified suitable roosting and foraging habitat present throughout the study area (USFWS Environmental Conservation Online System n.d.) at 16 planned capital improvement locations. In Iowa, OEA identified suitable northern long-eared bat habitat at the planned new siding at MP 71 near Turkey River, the planned new siding at MP 24 near Bellevue, the planned siding extension near Deer Creek, the planned siding extension near Letts, the planned new siding at MP 255 near Washington, the planned siding extension near Ottumwa, and the planned new siding near Moravia. In Missouri, OEA identified suitable habitat at the planned siding extension near Newtown, the planned siding extension near Laredo, the planned siding extension at MP 431 near Dawn, the planned new siding at MP 186 near Goodman, the planned double tracking at Blue Valley, and the planned facility working track at Grandview/IFG. In Arkansas, OEA identified suitable habitat at the planned siding extension near Gentry and, in Oklahoma, OEA identified suitable habitat at the planned new siding at MP 247 near Baron and the planned siding extension near Cave Springs.

At these locations, OEA identified roosting habitat in the forested areas along edges of the railroad ROW, under multiple bridges, and in multiple culverts throughout the study area. There was foraging habitat present in the canopy-enclosed flyways of forested edges of the railroad ROW, adjacent roads, and throughout riparian corridors. **Figure O.1-2** in **Appendix O** shows suitable bat habitat identified in the study area.

The Ozark big-eared bat (*Corynorhinus townsendii ingens*) is federally listed as endangered and has the potential to occur at planned capital improvement sites in Arkansas and Oklahoma (**Table 3.11-3**). Based on consultation with USFWS, the Cave Springs capital improvement location area is within 1.5 miles of known caves occupied by Ozark big-eared bats. This species forages in forested habitats and edges in summer (both uplands and near water), but roosts exclusively in caves year-round. OEA did not identify any caves or cave features within the study area of the Cave Springs planned capital improvement; however, OEA did identify suitable foraging habitat in the canopy-enclosed flyways of forested edges of the railroad ROW. **Figure O.1-2** in **Appendix O** shows suitable bat habitat identified in the study area.

The tricolored bat, formerly known as the eastern pipistrelle (*Pipistrellus subflavus*) until recently, was a nearly ubiquitous species across eastern and central North America. Due to severe population declines from an introduced fungal disease that has substantially affected this and other federally listed bats, USFWS has recently moved to propose endangered status for tricolored bat. During fieldwork, OEA positively identified suitable habitat for the tricolored bat in many drainage and bridge structures. In addition, during consultation with the Missouri Department of Conservation, OEA identified occurrence records for this species near the study area for the planned double track near Blue Valley in Missouri (see **Table 3.11-4**).

Table 3.11-3. Potential Listed Species in Planned Capital Improvement Locations

Common and Scientific Name	States within Species Range	Counties within Species Range	Planned Capital Improvement Location where Species has Potential to Occur
Indiana Bat (*Myotis sodalis*)	Illinois	Ogle	MP 75 (Monroe)
	Iowa	Monroe, Louisa, Washington, Wapello	Letts*, MP 255 (Washington)*, Ottumwa*, Moravia*
	Missouri	Sullivan, Grundy, Livingston, Jackson, Jasper, Cass, McDonald	Newtown*, Laredo*, MP 431 (Dawn)*, Blue Valley*, Grandview/IFG*, Asbury, MP 186*
	Arkansas	Benton, Polk	Gentry*, MP 377 (Mena)
	Oklahoma	Adair, Le Flore	MP 247 (Baron)*, Cave Springs*, Spiro*, Heavener*
Northern Long-eared Bat (*Myotis septentrionalis*)	Iowa	Clayton, Jackson, Clinton, Louisa, Washington, Wapello, Monroe	MP 71 (Turkey River)*, MP 24 (Bellevue)*, Deer Creek*, Camanche, Letts*, MP 255 (Washington)*, Ottumwa*, Moravia*

Table 3.11-3. Potential Listed Species in Planned Capital Improvement Locations

Common and Scientific Name	States within Species Range	Counties within Species Range	Planned Capital Improvement Location where Species has Potential to Occur
	Illinois	Ogle	MP 75 (Monroe)
	Missouri	Sullivan, Grundy, Livingston, Jackson, Cass, Jasper, McDonald	Newtown*, Laredo*, MP 431 (Dawn)*, Blue Valley*, Grandview/IFG*, Asbury, MP 186*
	Arkansas	Benton, Polk	Gentry*, MP 377 (Mena)
	Oklahoma	Adair, Le Flore	MP 247 (Baron)*, Cave Springs*, Spiro*, Heavener*
	Louisiana	De Soto	Mansfield
Ozark Big-eared Bat (*Corynorhinus townsendii ingens*)	Arkansas	Benton	Gentry
	Oklahoma	Adair	MP 247 (Baron), Cave Springs*
Tricolored Bat (Perimyotis subflavus)	Missouri	Sullivan, Grundy, Livingston, Jackson, Cass, Jasper, McDonald	Newtown, Laredo, MP 431 (Dawn)*, Blue Valley*, Grandview/IFG, Asbury, MP 186
	Oklahoma	Adair, Le Flore	MP 247 (Baron), Cave Springs, Spiro, Heavener

*OEA identified suitable habitat for this species at these capital improvement locations.

3.11.2.5 State-Listed and Sensitive Species

During early coordination with state agencies, OEA identified nine state-listed and state-ranked species that could be present in the study area (see **Table O.2-2** for the list of species in **Appendix O**). During agency consultation, OEA identified an occurrence record for only one of those nine species, the tricolored bat at the location of the planned double track near Blue Valley in Missouri (see **Table 3.11-4**). **Appendix O** presents OEA's coordination letters with state agencies.

Table 3.11-4. State-Listed Species with Suitable Habitat in Planned Capital Improvements

Species Name	Status	State	Capital Improvement Location	Is Potentially Suitable Habitat Present in the Study Area?
Tricolored bat (Perimyotis subflavus)	S2[1]	Missouri	Blue Valley	Yes, OEA identified potentially suitable habitat for this species in the bridges and culverts at this site. Coordination with the Missouri Department of Conservation indicated that there are records of this species near the study area.

[1] Critically imperiled in Missouri because of extreme rarity of or because of some factor(s) making it especially vulnerable to extirpation from the state (Missouri Department of Conservation 2021)

3.11.2.6 Bald and Golden Eagles

OEA observed one bald eagle (*Haliaeetus leucocephalus*) nest and a solitary, perching eagle in the vicinity of the nest within the study area of MP 431 near Dawn, Missouri. OEA did not identify suitable habitat for bald and golden eagles (*Aquila chrysaetos*) within the study areas at any of the other planned capital improvement locations.

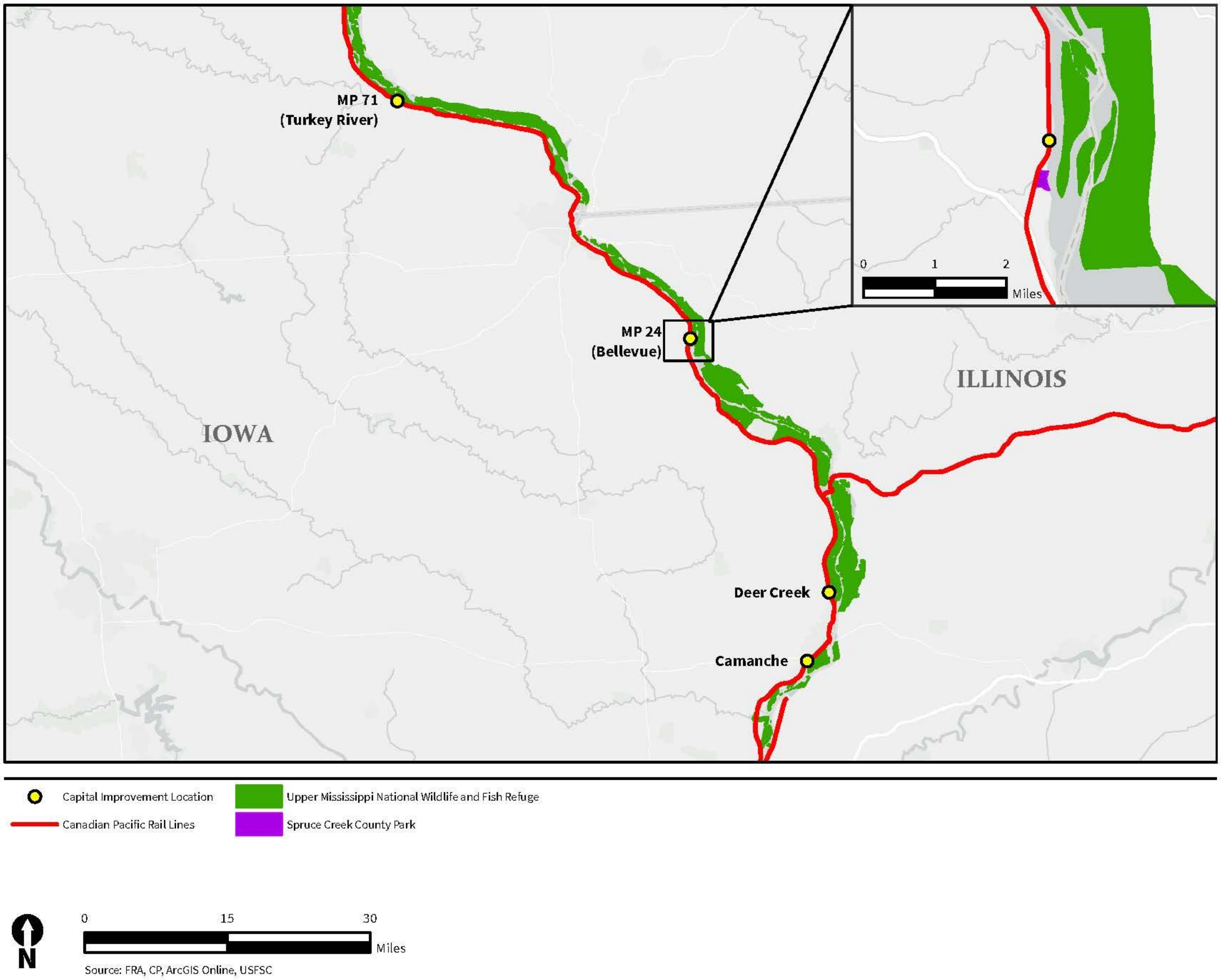
3.11.2.7 Natural Areas

Natural areas refer to areas that are protected under federal or state law for the purpose of providing habitat for native vegetation, fish, and wildlife. OEA identified two natural areas in the vicinity of the planned capital improvements in Iowa (**Figure 3.11-1**). The Upper Mississippi River National Wildlife and Fish Refuge is located adjacent to the rail ROW at the locations of the planned new siding at MP 71 near Turkey River, the planned new siding at MP 24 near Bellevue, the planned siding extension near Deer Creek, and the planned siding extension near Camanche. The rail line also bisects the Spruce Creek Park in Jackson County, Iowa at the location of the planned new siding at MP 24 near Bellevue.

3.11.2.8 Critical Habitat

As mentioned in *Section 3.11.1, Approach*, OEA reviewed the planned capital improvement sites and the existing mainline adjacent to the capital improvements for potential critical habitat. The IPaC reports indicated that there are no critical habitat areas within the capital improvement study areas. However, OEA identified critical habitat areas for five species within one mile or less from the existing mainline on segments that would experience an increase in traffic as a result of the Proposed Acquisition. See **Table O.2-3, Appendix O** for a summary of identified critical habitat areas. The five species with critical habitat areas include four species of freshwater mussel, the Neosho mucket (*Lampsilis rafinesqueana)* in Missouri and Oklahoma, rabbitsfoot (*Quadrula cylindrica*) in Arkansas and Missouri, the Texas fawnsfoot (*Truncilla macrodon*), Texas pimpleback (*Cyclonaias petrina*) in Texas, and one butterfly in Minnesota, the Poweshiek skipperling (*Oarisma poweshiek*).

Figure 3.11-1. Natural Areas Identified Adjacent to the Planned Capital Improvements



3.11.3 Environmental Consequences

3.11.3.1 Proposed Acquisition

The Proposed Acquisition would affect biological resources primarily because it would result in the 25 planned capital improvements. Some of the planned capital improvements would be mostly or entirely located within previously disturbed areas. For example, the planned new siding at MP 75 near Monroe Township in Ogle County, Illinois would be placed within the footprint of a previously removed second track. Therefore, no impacts on biological resources would occur at that location. However, for other planned capital improvements, tree clearing, grading, and placing fill material for additional track could occur outside of already disturbed areas. This subsection describes the potential impacts related to the planned capital improvements on plant communities; wildlife; special status species; and natural areas. As appropriate, this subsection also discusses the potential impacts on biological resources that could be associated with increased rail traffic that would result from the Proposed Acquisition.

Plant Communities

OEA expects that the planned capital improvements would result in minor adverse impacts to plant communities. The 25 planned capital improvements would involve clearing, grubbing (removing roots from the soil), grading, and some excavating and placing fill material for additional track and siding within portions of the rail ROW. These activities could result in permanent or temporary alteration of existing vegetation. The extent of such impacts would vary based on the affected vegetation, relative abundance of vegetation, soil conditions, hydrology, topography, and the extent of clearing, grubbing, and earthmoving required. Land disturbing activities would occur within portions of the ROW for the capital improvements, such as clearing vegetation for staging areas and other temporary facilities. Although OEA expects vegetation to recover in the temporarily disturbed areas, clearing woody shrub and forest vegetation could permanently alter the vegetative cover class to nonwoody, herbaceous, and scrub/shrub classes.

Table 3.11-5 details the estimated acres of habitat that would be lost due to the planned capital improvements. The estimates in the table are based on the preliminary design information provided by the Applicants and OEA's conservative assumptions, which may tend to overstate the affected area of habitat.

Table 3.11-5. Acres of Potential Plant Community Impacts by Capital Improvement Location

Capital Improvement	Acres of Potential Plant Community Impact
MP 71 (Turkey River), IA	10.6
MP 24 (Bellevue), IA	12.5
Deer Creek, IA	5.7
Camanche, IA	0.0[1]
Letts, IA	2.8
MP 255(Washington), IA	8.1
Ottumwa, IA	1.9
Moravia, IA	7.9
Newtown, MO	2.2
Laredo, MO	2.3
MP 431(Dawn), MO	11.4
Blue Valley, MO	9.7
Grandview/IFG, MO	6.4
Asbury, MO	0.0[2]
MP 186, MO	2.0
Gentry, AR	2.5
MP 247 (Baron), OK	9.7

Table 3.11-5. Acres of Potential Plant Community Impacts by Capital Improvement Location

Capital Improvement	Acres of Potential Plant Community Impact
Cave Springs, OK	3.8
Spiro, OK	2.8
Heavener, OK	11.4
MP 377-Mena, AR	7.3
Mansfield, LA	6.6
Loring, LA	4.8
Singer, LA	7.0
Total	138.4

[1] The Camanche planned capital improvement would have no vegetative community impacts because it would be located entirely within a disturbed industrial area and adjacent to a rail yard.

[2] The Asbury planned capital improvement would have no vegetative community impacts because it would be located entirely within a maintained, grassy ROW between the existing railroad and an adjacent roadway.

Activities related to the planned capital improvements in general have the potential to increase the spread of noxious and invasive weeds. Noxious weeds are plants designated by a federal, state, or county government as injurious to public health, agriculture, recreation, wildlife, or property (Bureau of Land Management [BLM] 2022). Invasive weeds are plants that have been introduced into a new habitat where they did not evolve and where they have no natural enemies to limit their reproduction and spread, with some producing significant changes to vegetation, composition, structure, or ecosystem function (BLM 2022; Westbrooks 1998; Cronk and Fuller 1995). Noxious and invasive weeds are often more aggressive than native vegetation, and the disturbed conditions of construction sites can create an environment where some noxious and invasive weeds thrive. Introduced noxious and invasive weeds that spread beyond the planned capital improvement sites could out-compete native vegetation and reduce the quality of understory habitat, increase soil erosion and fire hazards, and disrupt the ecosystem overall (USFWS 2012).

During the public comment period for the Draft EIS, commenters expressed concern that the Proposed Acquisition would increase the probability of a spill or release of hazardous materials that could adversely affect vegetation. OEA notes that the rail lines on which rail traffic would increase as a result of the Proposed Acquisition are already used to transport hazardous materials and have been for many years. As discussed in *Section 3.1, Freight and Passenger Rail Safe*ty, OEA expects that the Proposed Acquisition would result in only a minor increase in the probability of a release of hazardous materials. If a release were to occur, the impacts on vegetation would depend on the nature of the materials released, the volume of materials released, the location of the release relative to plant communities, and the effectiveness of the response. A release of hazardous materials could affect individual plants if they were exposed to a contaminant, which could cause injury, sickness, or death. A release could also result in the contamination of water or soil, which could affect plants. *Chapter 4, Mitigation* sets forth the mitigation measures that OEA recommends the Board impose to address impacts related to hazardous materials releases.

Wildlife

OEA expects that the planned capital improvements would result in minor adverse impacts to wildlife. Activities within portions of the rail ROW, such as land clearing, earthmoving, constructing the railbed, laying rail line, and relocating roads could result in temporary and permanent impacts on wildlife. Permanently altered habitats would cause species displacement to similar adjacent habitat. The intensity of these impacts would vary depending on the type of habitat and specific species affected.

The planned capital improvements could also result in wildlife mortality or injury from construction-related collisions or crushing. Collisions or crushing would be more likely to affect smaller, less mobile species (such as reptiles and insects) that are not able to move away quickly from construction equipment. Collisions would be less likely to occur with larger animals and birds because those animals could move more quickly and vacate a construction area. Because construction vehicles typically move at slow speeds and because most construction activities would take place within or immediately adjacent to a previously disturbed and heavily maintained corridor, OEA expects that wildlife fatalities and injuries from operating construction equipment would be infrequent. While some species could be more susceptible to collisions or crushing, many species would likely vacate an area once land clearing activities start and noise and construction equipment become perceptible to wildlife. This temporary impact would only last for the duration of construction.

The Applicants project that the Proposed Acquisition would result in increased rail traffic on certain rail line segments throughout the combined CPKC network (see *Chapter 2, Proposed Action and Alternatives*). The projected increase in the average number of trains per day moving on certain rail lines would not result in new impacts on wildlife but could affect the frequency of impacts or the chance of an impact occurring. For example, OEA expects that increased rail traffic would increase the frequency with which animals would be struck and killed by trains and maintenance equipment. In general, wildlife mortality from train strikes is and would continue to be higher in areas where the density of wildlife is higher. Species that feed on carrion (flesh of dead animals), species that use the rail corridor for moving around, and species that use habitats adjacent to the rail line have an increased chance of fatality by a collision. While there is a potential for increased wildlife mortality from train strikes, OEA concludes that such impacts would be minor and not have population-level effects on wildlife species.

As discussed in detail in *Section 3.6, Noise*, OEA expects that the projected increase in rail traffic resulting from the Proposed Acquisition would cause average noise levels to increase in some areas along the combined CPKC network. OEA estimates that the increase in the Ldn would range from 0.0 to 6.9 A-weighted decibels and that the greatest increase would occur along the rail line segments that make up the CP mainline between Ottumwa, Iowa and Kansas City, Missouri. OEA expects that the potential increase in train noise along existing rail lines would not significantly affect wildlife because any animals living near active rail lines have likely already become habituated to train noise over many years of regular exposure to such noise. OEA recognizes that certain species of wildlife may not become habituated to train noise; however, to the extent that such species may have once lived in the areas where the existing CP and KCS rail lines are located, those animals will have relocated long ago in response to train noise. Although noise can affect birds in particular by interfering with communication, research suggests that noise occurring at regular intervals (such as noise from passing trains) may cause insignificant impacts on bird density compared to continuous noise (such as from vehicular traffic on busy roads). Indeed, studies have found bird abundance to be higher near rail lines than in other areas, despite occasional noise, likely due to the presence of forest edge habitat that some species use for foraging and nesting (Wiącek et al. 2015; Wiącek et al. 2019).

During the public comment period for the Draft EIS, commenters expressed concern that the Proposed Acquisition would increase the probability of a spill or release of hazardous materials that could adversely affect wildlife. OEA notes that the rail lines on which rail traffic would increase as a result of the Proposed Acquisition are already used to transport hazardous materials and have been for many years. As discussed in *Section 3.1, Freight and Passenger Rail Safety*, OEA expects that the Proposed Acquisition would result in only a minor increase in the probability of a release of hazardous materials. If a release were to occur, the impacts on wildlife would depend on the nature of the materials released, the volume of materials released, the location of the release relative to wildlife and wildlife habitat, and the effectiveness of the response. A release of hazardous materials could affect individual animals if they were exposed to a contaminant, which could cause injury, sickness, or death. A release could also result in the contamination of wildlife habitat. *Chapter 4, Mitigation* sets forth the mitigation measures that OEA recommends the Board impose to address impacts related to hazardous materials releases.

Because OEA expects that increased rail traffic on the CPKC network would be diverted from other rail networks or from truck transportation, impacts on wildlife associated with increased rail traffic, such as increased frequency of wildlife strikes, increased probability of releases of hazardous materials, and increased average noise level, would be at least partially offset by decreased rail traffic on other rail lines and decreased truck traffic on highways.

ESA-Listed Species

OEA estimates that construction activities could permanently clear a total of approximately 61.8 acres of potential forested bat habitat within portions of the ROW at 14 planned capital improvement locations. **Table 3.11-6** provides a summary of the acres of potential impact to bat habitat by capital improvement location.

Table 3.11-6. Acres of Potential Impact to Bat Habitat by Capital Improvement Location

Capital Improvement Site	Acres of Potential Impact to Bat Habitat
Letts, IA	3.2
Ottumwa, IA	0.1
MP 431 (Dawn), MO	7.6
MP 24 (Bellevue), IA	6.5

Table 3.11-6. Acres of Potential Impact to Bat Habitat by Capital Improvement Location

Capital Improvement Site	Acres of Potential Impact to Bat Habitat
Deer Creek, IA	3.8
MP 255 (Washington), IA	2.7
MP 71 (Turkey River), IA	6.9
Moravia, IA	3.8
Laredo, MO	1.7
Blue Valley, MO	9.4
MP 186, MO	0.7
Gentry, AR	4.1
MP 247 (Baron), OK	8.2
Cave Springs, OK	3.0
Total	61.8

OEA identified 35 bridges and culverts within the study area that provide suitable roosting habitat for the northern long-eared bat and Indiana bat. Plans are still in conceptual design, and some of the planned capital improvements could involve extending or replacing existing bridges and culverts, potentially including bridges and culverts that provide suitable roosting habitat. OEA determined that the planned capital improvements *may affect, but are not likely adversely affect* the Indiana bat, the northern long-eared bat, and the Ozark big-eared bat.

Pursuant to Section 7 of ESA, OEA notified the appropriate USFWS Ecological Services Field Offices of its determination in June 2022. The field offices subsequently concurred with OEA's determination.

As noted above, USFWS issued a proposed rule on September 14, 2022, listing the tricolored bat as endangered. OEA identified suitable habitat for the tricolored bat at planned capital improvement locations in Missouri and Oklahoma and occurrence records for the tricolored bat near the study area of the planned double track near Blue Valley. Accordingly, OEA expanded its determination to include the tricolored bat. OEA determined that the Proposed Acquisition *may affect, but is not likely to adversely affect* the Indiana bat, the northern long-eared bat, the Ozark big-eared bat, and the tricolored bat.

OEA notified the USFWS Ecological Services Field Offices in Missouri and Oklahoma of its revised determination, and those Field Offices did not raise additional concerns about the tricolored bat. For full documentation of agency consultation, see **Appendix B**.

OEA has revised *Section O.4.2* in **Appendix O** to include updated official species lists obtained through IPaC. The revised lists now include the proposed endangered tricolored bat for the planned capital improvements in Missouri and Oklahoma. The IPaC species lists for the planned capital improvements in Iowa, Illinois, Arkansas, and Louisiana remain the same.

Critical Habitat

OEA determined that adding the planned capital improvements within the rail ROW would not result in any impacts to critical habitat because none of the 25 planned capital improvements would be located within critical habitat areas. OEA also determined that the projected increase in rail traffic would not affect habitat areas located near the rail ROW. **Table 3.11-7** details the operational changes along each rail line segments where critical habitat areas are within one mile of the existing mainline. The Poweshiek skipperling habitat consists of natural prairies within Minnesota that are located between 0.5 and 0.8 miles away from the existing railroad. The natural prairies provide larval food plants necessary for this butterfly species. The projected increase in train traffic as a result of the Proposed Acquisition is between 0.9 and 2.6 trains per day along the rail line segments near the natural prairies. This slight increase in train traffic would not require any take within the natural prairies.

The other four species with critical habitat areas near the existing rail lines are mussel species (Neosho mucket, rabbitsfoot, Texas fawnsfoot, and Texas pimpleback), and their critical habitats consist of rivers and a creek that currently pass underneath and are adjacent to the railroad. If the Board authorizes the Proposed Acquisition, OEA projects that rail traffic could increase by between 7.6 and 12.4 trains per day, on average, along the rail line segments near rivers and stream that are designated as critical habitat for the federally listed mussel species. The increase in train traffic would not result in any impacts on rivers or streams that could affect mussels; therefore, OEA does not anticipate the increase in rail traffic to affect these critical habitat areas.

Table 3.11-7. Critical Habitat and Proposed Operation Changes

Segment	Merger Related Increase in Trains Per Day	Species with Critical Habitat within One Mile of Segment
C-DELA-02	2.6	Poweshiek skipperling
C-ELLA-04	0.9	Poweshiek skipperling
K-HEAV-01	12.4	Neosho mucket, rabbitsfoot
K-SHRE-02	12.4	Rabbitsfoot
U-BEAU-01	7.6	Texas fawnsfoot
K-ROSE-01	8.3	Texas fawnsfoot
K-ROSE-02	8.3	Texas fawnsfoot, Texas pimpleback

State-Listed and Sensitive Species

OEA identified suitable habitat within the study area for one state-listed protected species, the tricolored bat. The Applicants' voluntary mitigation measures related to tree clearing and bridge or culvert removal, which are intended to minimize impacts on habitat for the federally protected Indiana bat and northern long-eared bat, would also minimize impacts to habitat that supports tricolored bats because all three bat species utilize similar habitat types.

Bald and Golden Eagles

The BGEPA provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession, and commerce (buying or selling) of such birds. Under the BGEPA, a "take" of an eagle is defined as to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb." OEA identified a bald eagle nest within the study area for the planned new siding at MP 431 near Dawn. If removal of the nest tree is required for a planned siding, a "take" would occur. The Applicants have committed to protecting bald and golden eagles by adhering to the BGEPA and by following USFWS National Bald Eagle Management Guidelines, as applicable. Implementation of this mitigation would minimize potential impacts on bald and golden eagles. If removal of the nest tree that OEA identified or nesting trees for bald or golden eagles is required, the Applicants would need to obtain an Eagle Nest Take Permit pursuant to 50 C.F.R. § 22.27.

Natural Areas

Because the planned capital improvements would be located within the existing ROW, OEA does not expect the planned capital improvements would result in any impacts on the Upper Mississippi River National Wildlife and Fish Refuge or Spruce Creek Park. Further, the implementation of the Applicants' voluntary mitigation measures and OEA's additional recommended mitigation measures would minimize the potential for the planned capital improvements to result in impacts outside of the ROW that could affect natural areas.

3.11.3.2 No-Action Alternative

Under the No-Action Alternative, CP would not acquire KCS. Therefore, rail traffic on rail lines and activity at rail yards and intermodal facilities would not change as a result of the Proposed Acquisition and the Applicants would not build the 25 planned capital improvements as a result of the Proposed Acquisition. Accordingly, OEA concludes that the No-Action Alternative would not cause new impacts on plant communities, wildlife, special status species, critical habitat, or natural areas. However, under the No-Action Alternative, rail traffic would continue on the CP and KCS systems and would therefore continue to have potential impacts on wildlife due to disturbance from noise and mortality from strikes. Also, rail traffic on rail lines and activity at rail yards and intermodal facilities could change in the future under the No-Action Alternative as a result of changing market conditions, such as general economic growth. In addition, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority.

3.11.4 Conclusion

OEA concludes that the Proposed Acquisition would not result in any long-term impacts on plant communities, wildlife, special status species, critical habitat, or natural areas. The 25 planned capital improvements could result in temporary noise impacts on wildlife and could involve the removal of trees or structures that provide suitable habitat for eagles, other birds, or ESA-listed and state-listed bat species. However, OEA expects that any such impacts would be minor and would be minimized by the implementation of the Applicants' voluntary mitigation measures and OEA's additional recommended mitigation measures. OEA determined that the planned capital improvements *may affect, but are not likely adversely affect* the Indiana bat, the northern long-eared bat, and the Ozark big-eared bat. Pursuant to Section 7 of ESA, OEA notified the appropriate USFWS Ecological Services Field Offices of its determination in June 2022. The field offices subsequently concurred with OEA's determination. Following issuance of the Draft EIS, OEA revised its determination to include the tricolored bat and notified USFWS Ecological Services Field Offices in Missouri and Oklahoma. Those Field Offices did not raise additional concerns about the tricolored bat. OEA expects that the projected increases in rail traffic and projected increases in activities at rail yards and intermodal facilities would result in negligible impacts on biological resources.

To minimize impacts to biological resources, the Applicants have proposed voluntary mitigation that includes commitments to implement methods to promote no net loss of sensitive habitats during completion of the planned capital improvements (*see Chapter 4, Mitigation*, Voluntary Mitigation [VM]-Biological-01 and VM-Biological-05). To minimize impact on ESA-listed bat species, the Applicants have committed to conducting any tree removal related to the planned capital improvements outside of the roosting period of bat species (April 1 to October 31) (VM-Biological-03). Similarly, the Applicants have committed to conducting any culvert or bridge removal related to the planned capital improvements outside of the bat roosting period, where practicable (VM-Biological-04).

To further minimize impacts to biological resources, OEA is also recommending additional mitigation measures, including requiring the Applicants to not knowingly include any federally- or state-listed invasive weed species in seed mixes for revegetating disturbed areas within the rail ROW (MM-Biological-01) and requiring the Applicants to reexamine the USFWS list of threatened and endangered species during final design and engineering of the capital improvements and consult with USFWS, as necessary (MM-Biological-02). OEA is further recommending a new mitigation measure (MM-Biological-03) to ensure that the measures voluntarily proposed by the Applicants would apply to the proposed endangered tricolored bat, in addition to the endangered Indiana bat and threatened northern long-eared bat.

3.12 Water Resources

This section describes the potential impacts on water resources that would result from the Proposed Acquisition. Consistent with previous mergers, the scope of the analysis focuses on activities with the potential to affect water resources. The subsections that follow describe the study areas as they apply to the planned capital improvements, planned system operations, data sources, and approach used to analyze potential impacts. Water resources considered in this section include groundwater, surface waters (streams and rivers), wetlands, and water quality.

3.12.1 Approach

During scoping, commenters expressed concern that the Proposed Acquisition could increase the risk of train derailment occurring that would result in the spill or release of hazardous materials, such as crude oil, into waterways such as the Mississippi River. *Section 3.1, Freight and Passenger Rail Safety* describes the potential impacts associated with the transportation of hazardous materials, including the risk of hazardous materials releases, in detail. OEA concludes the risk of a rail accident occurring that could result in a release of hazardous materials of any size into waterways or onto the ground, where it could affect groundwater, is and would remain very low. The rail lines that would make up the combined CPKC system are and would continue to be maintained and operated in compliance with applicable federal regulations for rail transportation of hazardous materials. However, in response to public comments, OEA analyzed the potential impacts of a spill or release of hazardous materials on water resources.

If the Board authorizes the Proposed Acquisition, the Applicants plan to make 25 capital improvements within the existing rail ROW to support the projected increase in rail traffic. Those capital improvements would include adding 10 new passing sidings, extending 13 existing sidings, adding a section of facility working track, and adding a section of double track. Because the Applicants have stated that the 25 planned capital improvements would be necessary to accommodate the increased rail traffic that the Applicants project would occur as a result of the Proposed Acquisition, OEA has assessed the potential impacts of the 25 planned capital improvements as part of the environmental review of the Proposed Acquisition. However, the Applicants have also stated that the planned capital improvements would be added only as needed to support increased traffic. Therefore, the Applicants have not completed detailed design and engineering for the 25 planned capital improvements. Accordingly, OEA's analysis of the potential impacts of the capital improvements is based on the largely conceptual design information, as well as conservative assumptions about how construction would proceed.

The study area for water resources includes the 25 planned capital improvements within the existing rail ROW. The existing ROW at each planned capital improvement location varies in width, extending between 35 and 100 feet from the centerline of the existing mainline, with most ROW extending 50 feet wide from the centerline. As detailed in **Table 3.12-1**, most of the study area is developed, consisting of existing railroad line and ballast. See

Figure O.1-1 in **Appendix O** for the study area boundary at each capital improvement. OEA conducted field work within the study area from January 13-18, 2022, and from January 24-28, 2022. During field work, OEA investigated baseline conditions and identified and geo-located water resources, including wetlands and stream centerlines, using global positioning system (GPS) devices. OEA conducted field work at 24 of the 25 planned capital improvements. OEA did not conduct fieldwork for water resources at the location of the planned new siding at MP 75 near Monroe Township in Ogle County, Illinois. This planned new siding would be located within the footprint of a previously removed second track; thus, any impacts on water resources at this location have already occurred, and there would not be any new impacts.

OEA evaluated the potential effects of the planned capital improvements on groundwater, surface waters, wetlands, and water quality in the study area. In its analysis, OEA used data from published reports, feasibility studies, regulatory agency documents, guidance manuals, discussions with resource personnel, aerial photographs, U.S. Geological Survey (USGS) topographic maps, OEA field visits (January 2022 field inspections using public access areas and hi-rail vehicles), and federal and state Geographic Information Systems (GIS) databases.

3.12.1.1 Groundwater

OEA used the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey to estimate near-surface groundwater depths. The USDA NRCS Web Soil Survey lists depth to water table based on existing soils within the footprint of each planned capital improvement area. Deeper principal aquifers occur in the project area and are referenced in the USGS Ground Water Atlas of the United States, which describes the location, extent, and geologic and hydrologic features of the important aquifers of the nation.

3.12.1.2 Surface Waters and Wetlands

The Corps and state environmental departments administer Sections 404 and 401 of the Clean Water Act (CWA), 33 U.S.C. §§ 1251-1389, which regulates discharges of fill into waters of the U.S., including wetlands. Wetlands are defined at 33 C.F.R. § 328.3(c) as "those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils." Executive Order (EO) 11990, "Protection of Wetlands," discourages direct or indirect support of new construction impacting wetlands wherever there is a practicable alternative (White House 1977a).

OEA used available topographic surveys, GIS elevation data, and field surveys to identify and characterize waterways and hydrology at the planned capital improvement areas. The dimensions of the permanent and temporary construction footprints for the planned capital improvements would not be delineated until final engineering and design, which would occur after the completion of the environmental review process and after the Board issues a final decision on the Proposed Acquisition. Therefore, OEA quantified potential impacts on surface waters and wetlands using conservative assumptions. In this context, a conservative assumption is one that may tend to overstate potential environmental impacts. In assessing impacts on surface waters and wetlands, OEA conservatively assumed that the capital improvements could temporarily or permanently impact any surface waters or wetlands located between the existing track and the edge of the rail ROW.

3.12.1.3 Floodplains

A floodplain is an area of land that is susceptible to being inundated by floodwaters from riverine flooding or other sources of flooding. EO 11988, "Floodplain Management" (White House 1977b) requires federal agencies to "avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative." The Federal Emergency Management Agency (FEMA) has primary federal jurisdiction for administration of EO 11988 and their guidance (44 C.F.R. Part 9; EO 13690).

To evaluate potential impacts on floodplains, OEA compared the locations of the planned capital improvements to FEMA floodplain mapping. FEMA typically maps the 100-year (1 percent annual chance base flood) floodplain at points along a stream where the contributing drainage area is generally 1 square mile or larger. For the planned capital improvement areas, the FEMA-mapped floodplain represents riverine flooding and is shown as either Zone A, which is an approximate boundary based on preliminary estimates of hydrology (quantity of flow) and hydraulics (flow velocity and elevation), or Zone AE, where a detailed hydrologic and hydraulic study was performed, and specific flood elevations are determined and mapped.

3.12.1.4 Water Quality

Water quality is enforced at the state level, based on standards set by both the state and EPA. For controlling pollutants generated during construction, when land disturbance exceeds one acre, states also issue National Pollutant Discharge Elimination System permits with EPA approval. OEA assessed impacts from the planned capital improvements on water quality based on OEA's understanding of how construction could proceed if the Board authorizes the Proposed Acquisition.

3.12.2 Affected Environment

Land use types within the study area include agricultural, maintained ROW, industrial, floodplain/rivers/streams, wetlands, residential, fallow field/early successional, and mixed hardwood forest (see **Table 3.12-1**, below, and **Figure O.1-1** in **Appendix O**). The existing riparian and forested areas are primarily located along the edge of the railroad ROW and extend outside the study areas. The total acreage within the study area is just under 305 total acres.

Table 3.12-1. Total Acreage by Land Use Type within the Study Area for All Planned Capital Improvement Locations

Land Use	Acreage
Agricultural	49.4
Maintained Roadway ROW	29.7
Industrial	24.7
Wetlands	19.97
Floodplain/Rivers/Streams	12.6
Residential	9.6
Fallow Field/Early Successional Forest	3.3
Mixed Hardwood Forest	37.4
Existing Railroad and Ballast	118.0

3.12.2.1 Groundwater

Table 3.12-2 shows the principal aquifers that underlie the planned capital improvements. These aquifers are important for public drinking water, wildlife, agriculture, livestock, and non-agricultural uses (including industrial, thermoelectric power generation, mining, and commercial), but account for only a small amount of the total water use in these regions. Individual principal aquifers extend under several states within the study area and rely on a broad footprint for recharge. **Table 3.12-2** summarizes the depths to near surface groundwater and identifies the principal aquifers at planned capital improvement locations. In general, aquifers that are closer to the surface may be more susceptible to impacts from certain construction activities on the surface, such as regrading and excavation.

Table 3.12-2. Principal Aquifers by Planned Capital Improvement Area

Name	State	Surficial Water Table Depth (inches)	Principal Aquifer
MP 71 (Turkey River)	Iowa	greater than 80	Cambrian-Ordovician
MP 24 (Bellevue)	Iowa	greater than 80	Cambrian-Ordovician
Deer Creek	Iowa	greater than 80	Cambrian-Ordovician
Camanche	Iowa	48 to 72	Cambrian-Ordovician
Letts	Iowa	12 to greater than 80	Cambrian-Ordovician
MP 255 (Washington)	Iowa	0 to 72	Mississippian and Cambrian-Ordovician
Ottumwa	Iowa	12 to 42	Mississippian and Cambrian-Ordovician
Moravia	Iowa	12 to greater than 80	Mississippian and Cambrian-Ordovician
MP 75 (Monroe)	Illinois	greater than 80	Cambrian-Ordovician
Newtown	Missouri	0 to 72	Mississippian

Table 3.12-2. Principal Aquifers by Planned Capital Improvement Area

Name	State	Surficial Water Table Depth (inches)	Principal Aquifer
Laredo	Missouri	0 to 42	Mississippian
MP 431 (Dawn)	Missouri	0 to 30	Mississippian
Blue Valley	Missouri	0 to 80	Western Interior Plains
Grandview/IFG	Missouri	12 to greater than 80	Western Interior Plains
Asbury	Missouri	6 to 41	Ozark Plateaus
MP 186 (Goodman)	Missouri	greater than 80	Ozark Plateaus
Gentry	Arkansas	18 to greater than 80	Ozark Plateaus
MP 247 (Baron)	Oklahoma	greater than 80	Ozark Plateaus
Cave Springs	Oklahoma	6 to greater than 80	Ozark Plateaus
Spiro	Oklahoma	24 to 36	None
Heavener	Oklahoma	8 to 42	None
MP 377 (Mena)	Arkansas	24 to greater than 80	None
Mansfield	Louisiana	15 to greater than 80	Coastal Lowlands
Loring	Louisiana	24 to 48	Coastal Lowlands
Singer	Louisiana	0 to 36	Coastal Lowlands

3.12.2.2 Surface Waters and Wetlands

OEA identified surface waters and wetlands in the study area for 24 of the 25 planned capital improvements during fieldwork conducted January 13–18, 2022, and January 24–28, 2022. As noted above, OEA did not conduct fieldwork for water resources at the location of the planned new siding at MP 75 near Monroe Township in Illinois because this new siding would not result in any impacts. **Table 3.12-3** provides the length of streams and the area of wetlands that OEA identified within the study area for each planned capital improvement.

Table 3.12-3. Stream Length and Wetland Acreages within Study Area

Name	Stream Length (linear feet)	Wetland Area (acres)
MP 71 (Turkey River)	1,336	7.88
MP 24 (Bellevue)	90	None
Deer Creek	499	1.70
Camanche	432	None
Letts	1,820	None
MP 255 (Washington)	555	None

Table 3.12-3. Stream Length and Wetland Acreages within Study Area

Name	Stream Length (linear feet)	Wetland Area (acres)
Ottumwa	1,041	0.03
Moravia	1,645	0.07
MP 75 (Monroe)	Not Surveyed[1]	Not Surveyed[1]
Newtown	1,168	None
Laredo	418	0.08
MP 431 (Dawn)	189	2.67
Blue Valley	1,035	0.95
Grandview/IFG	None	0.01
Asbury	40	0.36
MP 186 (Goodman)	34	0.23
Gentry	64	0.21
MP 247 (Baron)	239	0.16
Cave Springs	767	0.47
Spiro	704	0.25
Heavener	2,480	1.26
MP 377 (Mena)	73	0.32
Mansfield	None	0.49
Loring	100	0.11
Singer	55	1.45

[1] The planned siding at MP 75 (Monroe) would be built on the site of a former section of double track. Therefore, this area was previously disturbed.

The planned double tracking at Blue Valley near Kansas City, Missouri would cross the Blue River, which the Corps has recognized as a Section 10 Navigable Water of the U.S. (USACE, n.d.). The Blue River is a 40-mile-long tributary of the Missouri River that flows through the eastern portion of Kansas City in Jackson County, Missouri (USGS 1981). Two-thirds of southern Kansas City's rainwater drains into the river, which has experienced increased flooding in recent years (The Nature Conservancy 2022). The river supports a mix of recreational areas, public parks, and trails, as well as wildlife habitat (The Nature Conservancy 2019). Portions of the river lie in heavily urbanized areas, where water quality is poor and few recreational opportunities are available, although several restoration efforts are underway (The Nature Conservancy 2019).

3.12.2.3 Floodplains

In general, all the planned capital improvement areas may be susceptible to flooding, either in the case of localized flooding or riverine flooding. Localized flooding occurs during heavy rainfall where poor drainage may exist and water ponds for a period of time. Riverine flooding, which is also associated with rainfall, follows the landscape and is associated with higher flowing velocities that can result in debris movement and erosion at bridges, culverts, or changes in slope. Four of the sites are located within the floodplain of the Mississippi River. While they are on the fringes of the floodplain boundary, the Mississippi is a large capacity river, with high flow rates that could result in significant debris transportation and erosion. The Blue Valley site that is within the urban Blue River valley is also susceptible to higher flow rates, debris, and erosion. Of the remaining sites that have floodplain mapped within the study area, all are in rural areas, and most are located within the fringe of the floodplain where velocities and flood depths are typically low. **Table 3.12-4** summarizes the FEMA-mapped floodplain information for each planned capital improvement area.

Table 3.12-4. FEMA-Mapped 100-Year Floodplain Information within the Planned Capital Improvements

Name	FEMA Community Number	Flood Source	Floodplain Designation
MP 71 (Turkey River)	190858	Turkey River / Mississippi River	Zone A/AE
MP 24 (Bellevue)	190879	Spruce Creek / Mississippi River	Zone A/AE
Deer Creek	190859/190088	Deer Creek / Mississippi River	Zone AE
Camanche	190859/190086	Beaver Slough / Mill Creek / Mississippi River	Zone AE
Letts	190193	None	None
MP 255 (Washington)	190913	South Fork Long Creek	Zone A
Ottumwa	190911	Bear Creek	Zone A
Moravia	190894	Soap Creek Tributaries	None
MP 75 (Monroe)	170525 / 170808	None	None
Newtown	290839	Medicine Creek	Zone A
Laredo	290150	Grand River / Medicine Creek	Zone A
MP 431 (Dawn)	290814	Grand River / Shoal Creek / Wolf Creek	Zone A
Blue Valley	290173	Blue River / Round Grove Creek	Zone AE
Grandview/IFG	290173/290783	None	None
Asbury	290820	None	None
MP 186 (Goodman)	290817	Beaver Branch	Zone A
Gentry	050419	Wolf Creek	Zone A
MP 247 (Baron)	400501	Shell Branch	Zone A
Cave Springs	400501	Upper Sallisaw Creek	Zone A

Table 3.12-4. FEMA-Mapped 100-Year Floodplain Information within the Planned Capital Improvements

Name	FEMA Community Number	Flood Source	Floodplain Designation
Spiro	400484	Holt - Tushka Creek	Zone A
Heavener		Hontubby Creek / Poteau River	Zone A
MP 377 (Mena)	050473	Brier Creek / Ouachita River	Not Mapped
Mansfield	220337/22031C	Siphorien Bayou	Zone A
Loring	22085C	Hurricane Creek	Not Mapped
Singer	220026	Bear Head Creek	None

3.12.2.4 Water Quality

Table 3.12-5 provides information about local watersheds and any impaired waterbodies within the study area for each planned capital improvement. Pollutant sources for the listed impairments are primarily from manufacturing, agriculture, and livestock practices within the contributing watersheds.

Table 3.12-5. Watershed and Impaired Waterbody Information at the Planned Capital Improvement Locations

Name	Watershed and Hydrologic Unit Code	303(d) Listed	Impaired Water Body	Impairment
MP 71 (Turkey River)	Deer Creek-Mississippi River (070600051203)	Yes	Mississippi River	Aluminum
MP 24 (Bellevue)	Spruce Creek-Mississippi River (070600050404)	Yes	Mississippi River	Aluminum
Deer Creek	Deer Creek-Mississippi River (070600051203)	Yes	Mississippi River	Aluminum
Camanche	Mill Creek (070801010202)	Yes	Mississippi River	Aluminum
Letts	Indian Creek (070802091101), Lower Muscatine Slough (070801010702)	No	-	-
MP 255 (Washington)	South Fork Long Creek (070802090902)	No	-	-
Ottumwa	Bear Creek School-Bear Creek (071000090706)	Yes	Bear Creek	Dissolved Oxygen
Moravia	Upper Soap Creek (071000090602)	Yes	Soap Creek	Fish Bioassessments

Table 3.12-5. Watershed and Impaired Waterbody Information at the Planned Capital Improvement Locations

Name	**Watershed and Hydrologic Unit Code**	**303(d) Listed**	**Impaired Water Body**	**Impairment**
MP 75 (Monroe)	South Branch Kishwaukee River (070900060609)	Yes	S. Branch Kishwaukee River	Mercury / polychlorinated biphenyls
Newtown	Hooton Creek-Medicine Creek (102801030207)	Yes	Medicine Creek	*E. coli*
Laredo	Black Oak Branch-Medicine Creek (102801030301)	No	-	-
MP 431 (Dawn)	Shoal Creek (102801011603)	No	-	-
Blue Valley	Blue River Outlet (103001010106)	Yes	Blue River	*E. coli*
Grandview/IFG	Headwaters Little Blue River (103001010201), Camp Branch-Blue River (103001010104)	No	-	-
Asbury	Town of Waco-Spring River (110702070508)	Yes	Spring River	*E. coli*
MP 186 (Goodman)	Lower Indian Creek (110702080307)	No	-	-
Gentry	Middle Flint Creek (111101030503)	Yes	Flint Creek	Phosphorus
MP 247 (Baron)	Shell Branch Creek-Baron Fork (111101030705)	No	-	-
Cave Springs	Upper Sallisaw Creek (111101040102)	No	-	-
Spiro	Holt-Tushka Creek (111101050901)	Yes	New Spiro Lake	Dissolved Oxygen / pH
Heavener	Coal Creek (111101050501), Hontubby Creek-Poteau River (111101050305)	Yes	Poteau River	*E. coli / Enterococcus*
MP 377 (Mena)	Brier Creek-Prairie Creek (080401010103), Ouachita River Headwaters (080401010101)	Yes	Prairie Creek	Dissolved Oxygen / Turbidity

Table 3.12-5. Watershed and Impaired Waterbody Information at the Planned Capital Improvement Locations

Name	Watershed and Hydrologic Unit Code	303(d) Listed	Impaired Water Body	Impairment
Mansfield	Na Bonchasse Bayou (111402060304)	Yes	Clear Lake/Smithport Lake	Dissolved Oxygen / Mercury / Nitrate / Non-Native Aquatic Plants / Phosphorus
Loring	Hurricane Creek (120100040602)	No	-	-
Singer	Middle Beckwith Creek (080802050104), Bear Head Creek Headwaters (080802050301)	Yes	Bear Head Creek / Beckwith Creek	Dissolved Oxygen / Lead / pH / Mercury

3.12.3 Environmental Consequences

3.12.3.1 Proposed Acquisition

If the Board authorizes the Proposed Acquisition, the Applicants project that rail traffic would increase on certain rail lines in the combined CPKC network. An increase in rail traffic would increase the probability of rail accidents, including accidents that could result in spills or releases of hazardous materials, on those rail lines. If a release of hazardous materials were to occur, then impacts on groundwater or surface water quality could result.

During the public comment period for the Draft EIS, commenters expressed concern that the Proposed Acquisition would increase the probability of a spill or release of hazardous materials that could adversely affect water resources. OEA notes that the rail lines on which rail traffic would increase as a result of the Proposed Acquisition are already used to transport hazardous materials and have been for many years. As discussed in *Section 3.1, Freight and Passenger Rail Safety*, OEA expects that the Proposed Acquisition would result in only a minor increase in the probability of a release of hazardous materials, and that the likelihood of a release would remain low on all affected rail line segments. The duration and severity of a release would be limited by the volume of the railcar, and the local and railroad emergency response plans[1] would likely contain any release quickly. Moreover, in OEA's review of reportable incidents resulting in liquid hazardous material releases, approximately 80 percent were less than 50 gallons, and approximately 60 percent were less than 10 gallons. The typically small size of a release, combined with response measures, would minimize the potential for groundwater contamination and allow for the proper management of surface water contamination potentially affecting water resources.

[1] As required by 49 C.F.R. Parts 172 and 174.

If a release were to occur, the impacts on water resources would depend on the nature of the materials released, the volume of materials released, the location of the release relative to the water resources, and the effectiveness of the response. Spills released directly or indirectly (e.g., via runoff from stormwater or overland flow) to lakes, rivers, reservoirs, or other potential drinking water sources could potentially impact human health and/or the environment through contamination of drinking water supplies. Exposure to a contaminant could cause injury, sickness, or death. If a larger release enters flowing water or other surface water features, the extent of the release could become more widespread. However, once a hazardous material is released into the environment, natural processes—including evaporation, degradation (i.e., where bacteria consume the material), and dilution (the product mixes with water)—would begin to break it down immediately. *Chapter 4, Mitigation* sets forth the mitigation measures that OEA recommends the Board impose to address impacts related to hazardous materials releases.

For each planned capital improvement, the Applicants have identified the intended start and end point of the planned new siding, siding extension, double track, or facility working track. The Applicants have also identified the side of the existing track on which they plan to add each capital improvement. OEA understands that the Applicants would build the capital improvements primarily within previously disturbed areas of the existing rail ROW and would utilize existing railbed and ballast where feasible. However, the Applicants could also clear trees, regrade, and place fill in previously undisturbed areas in order to widen the existing railbed to accommodate a second track. As noted above, OEA has conservatively assumed that the capital improvements could impact any water resources between the existing track and the edge of the rail ROW. This approach may tend to overstate impacts on water resources because some impacts could be avoided during the final engineering, design, and construction planning processes. The following subsections describe the potential impacts related to the planned capital improvements on groundwater, surface waters, floodplains, and water quality.

Groundwater

Impacts to groundwater typically occur from water withdrawals, changes in aquifer recharge areas, or excavation of the landscape, which may draw down the surficial water table. OEA expects that construction activities related to the planned capital improvements would include removing ground surface vegetation and adding ballast to support a second track adjacent to the existing rail line. These activities would not involve significant water withdrawals, changes in aquifer recharge areas, or excavation. OEA expects that the Proposed Acquisition would have a negligible impact on groundwater.

Surface Waters and Wetlands

The Proposed Acquisition has the potential to affect waterways, wetlands, and their associated floodplains. To construct the 25 planned capital improvements, the Applicants would place ballast and other fill material within wetlands to support a second track adjacent to the existing rail line. The Applicants would also add new bridges and culverts in waterways or widen existing bridges and culverts to support a second track. The preliminary design information indicated that the Applicants would replace existing culverts by means of jack and boring under the existing rail bed with a culvert equivalent to or larger than the existing culvert. The Applicants would then fill the existing culverts once the new culvert is completed. OEA assumed that the connection of replacement culverts to existing wetlands and waterways would have a small fill impact due to transitional grading from the culvert opening to the receiving waters.

Table 3.12-6 summarizes the potential impacts on waterways and wetlands in terms of acreage. For streams, the table includes impacts from new and modified crossing structures, as well as impacts from fill. OEA estimated the area of new and modified crossings based on preliminary design information provided by the Applicants and OEA's conservative assumptions about the size of the new or modified crossing structures. OEA estimated the area of fill based on preliminary site-specific design information, the topography at each capital improvement location, and the estimated width of the second track. OEA assumed that streams that run parallel to the existing tracks within the estimated footprint of each capital improvement would be filled.

As shown in the table, the greatest impacts would occur where wetlands and/or streams run parallel to the existing rail lines. Among the capital improvements, the planned new siding at MP 71 near Turkey River in Iowa has the potential to impact the largest acreage of wetlands due to the large wetland system immediately east of the existing track that runs for almost the entire length of the planned siding (**Figure O.1-1** in **Appendix O** [pages 3-12]). At this location, the existing track exists at the foot of a steep embankment on its west side, which may make avoiding the wetlands during final engineering and design impractical.

CWA Section 404(b)(1) Guidelines state that "secondary effects are effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material." (40 C.F.R. § 230.11(h)). OEA does not expect that the planned capital improvements would result in any secondary impacts. The planned capital improvements would be added within an existing rail ROW adjacent to existing railroad tracks that already cross most of the potentially affected waterways. To the extent that the Applicants may install new culverts of equal or greater capacity than those currently in place, this could improve the movement of surface water and the connectivity of surface waters.

Table 3.12-6. Estimated Impacts to Non-Tidal Waters within the Planned Capital Improvement Locations

Name	**Potential Surface Water Impacts**	**Estimated Surface Water Impacts (acres)**	**Potential Wetland Impacts**	**Estimated Wetland Impact (acres)**
MP 71 (Turkey River)	Crossings	0.02	Fill	6.43
MP 24 (Bellevue)	Crossings	0.01	None	0.00
Deer Creek	Crossings	0.03	Fill	0.52
Camanche	Crossings	0.03	None	0.00
Letts	Fill	0.15	None	0.00
MP 255 (Washington)	Crossings	0.03	None	0.00
Ottumwa	Fill/Crossings	0.15	Fill	0.01

Table 3.12-6. Estimated Impacts to Non-Tidal Waters within the Planned Capital Improvement Locations

Name	Potential Surface Water Impacts	Estimated Surface Water Impacts (acres)	Potential Wetland Impacts	Estimated Wetland Impact (acres)
Moravia	Fill/Crossings	0.04	None	0.07
MP 75 (Monroe)	Not Field Surveyed	0.00	None	0.00
Newtown	Fill	0.08	None	0.00
Laredo	Fill/Crossings	0.05	Fill	0.08
MP 431 (Dawn)	None	0.00	Fill	2.63
Blue Valley	Fill/Crossings	0.09	Fill	0.95
Grandview/IFG	None	0.01	None	0.00
Asbury	Fill	0.04	Fill	0.36
MP 186 (Goodman)	Crossings	0.04	Fill	0.23
Gentry	Crossings	0.02	Fill	0.21
MP 247 (Baron)[1]	Crossings	0.01	Fill	0.16
Cave Springs	Fill/Crossings	0.06	Fill	0.47
Spiro	Fill/Crossings	0.04	Fill	0.25
Heavener	Fill/Crossings	0.53	Fill	1.26
MP 377 (Mena)	Crossings	0.00	Fill	0.27
Mansfield	None	0.00	Fill	0.48
Loring	Crossings	0.07	Fill	0.11
Singer	None	0.00	Fill	1.45
Total	**1.5 acres**		**15.94 acres**	

Based on the information provided by the Applicants regarding the location of the planned double tracking at Blue Valley, the Applicants would add a new bridge over the Blue River adjacent to the existing railroad bridge. OEA assumes that the Applicants would design the navigation clearance of the new bridge to be the same as the clearance of the existing bridge. Therefore, the Proposed Acquisition would not result in any permanent impacts to waterborne traffic on the Blue River or other navigable waterways.

OEA also evaluated the potential for environmental consequences related to a rail accident and subsequent release of hazardous materials to the surrounding environment. For surface water, appropriate management actions depend on the material and the resources affected, and might include, but not be limited to, cleaning up the spill and temporarily restricting the use of the water body. Thus, the potential for longer-term impacts through unrecognized soil or water contamination would be minimized.

Floodplains

In most cases, the planned capital improvements would be located in the floodplain fringe, where an increase in fill resulting from additional ballast placed in the floodplain would be minor in comparison to the overall floodplain capacity. OEA expects that the planned capital improvements as well as system operations would result in negligible impacts to floodplains.

Water Quality

Construction of the 25 planned capital improvements could result in short-term localized and downstream water quality impacts. During construction, ground disturbance could lead to erosion of sediments, which could flow downslope into low lying areas and eventually into water bodies. Following construction, erosion at bridge and culvert crossings, and changes in flow patterns have the potential to deliver sediment and pollutants to downstream waters. OEA expects that the Proposed Acquisition would result in negligible water quality impacts.

3.12.3.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Acquisition would not occur, CP would not acquire KCS and the Applicants would not build the 25 planned capital improvements. Therefore, the potential impacts on groundwater, surface waters, floodplains, and water quality as described above would not occur under the No-Action Alternative. In the absence of the Proposed Acquisition, however, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority.

3.12.4 Conclusion

OEA concludes that the Proposed Acquisition would result in negligible impacts on ground water and water quality. OEA concludes that the risk of a rail accident occurring that could result in a release of hazardous materials of any size into waterways or onto the ground, where it could affect groundwater, is and would remain very low. The 25 planned capital improvements could result in impacts on surface waters, wetlands, and floodplains, including the placement of fill material or conveyance structures. The Applicants are volunteering mitigation measures to minimize impacts to groundwater, including a commitment to limit ground disturbance to the areas necessary for the construction of the planned capital improvements (see *Chapter 4, Mitigation*, Voluntary Mitigation [VM]-Biological-10). To minimize impacts to surface waters and wetlands, the Applicants are volunteering mitigation measures, including commitments to obtain necessary authorizations from the Corps (VM-Water-03 and VM-Water-04), minimize impacts to wetlands where practicable, and compensate as appropriate for the loss of wetlands (VM-Water-07). The Applicants are also volunteering mitigation measures to minimize impacts to water quality, including a commitment to developing a site-specific Stormwater Pollution Prevention Plan (SWPPP) for each capital improvement that would incorporate best management practices and site-specific measures to control erosion and reduce the amount of sediment and pollutants that could enter surface waters, groundwater, and wetlands (VM-Water-05). In addition, to minimize impacts to floodplains, the Applicants have committed to designing all drainage crossing structures to pass a 100-year storm event (VM-Water-08).

To further ensure that impacts on floodplains would be minimized, OEA is recommending mitigation requiring the Applicants to design culverts and bridges so as to maintain existing surface water drainage patterns to the extent practicable and not cause or exacerbate flooding (MM-Water-01). OEA is also recommending mitigation requiring the Applicants to coordinate with FEMA if construction of bridges, culverts, or embankments related to the 25 planned capital improvements would result in an unavoidable increase greater than one foot to the 100-year water surface elevations (MM-Water-02). In addition, OEA is recommending mitigation requiring the Applicants to obtain and comply with National Pollutant Discharge Elimination System (NPDES) permits for storm water discharges resulting from project-related construction activities at each of the planned capital improvements that meet the requirements for a NPDES permit (MM-Water-03)

3.13 Environmental Justice

EPA defines Environmental Justice (EJ) as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies" (EPA 2021a). This section describes the process that OEA used to identify potential EJ populations within the study area (that is, low-income populations and minority populations, including American Indians)[1] ,document potential high and adverse human health or environmental effects from the Proposed Acquisition, and evaluate whether those effects would disproportionately impact the EJ populations in comparison to non-EJ populations.

The primary policy governing EJ is Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (1994), which directs federal agencies to "identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law" (EPA 2021b). When determining whether human health and environmental effects are disproportionately high and adverse, agencies are to consider, to the extent practicable, whether the effects are significant under NEPA or above generally accepted norms. Per an accompanying Presidential Memorandum to EO 12898, NEPA reviews must include an analysis of effects on minority populations and low-income populations (The White House 1994b). In 1997, CEQ issued guidance for agencies on addressing EJ in the NEPA process (CEQ 1997). The consideration, prioritization, and advancement of EJ is also emphasized in EO 13985, "Advancing Racial Equity and Support for Underserved Communities Through the Federal Government" (2021a), EO 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis" (2021b), and EO 14008, "Tackling the Climate Crisis at Home and Abroad" (2021c).

3.13.1 Approach

OEA applied the following steps to evaluate the potential for the Proposed Acquisition to cause disproportionately high and adverse impacts on EJ populations:

- OEA identified all potentially high and adverse impacts of the Proposed Acquisition. OEA defined potentially high and adverse impacts as impacts that would be significant under NEPA or above generally accepted norms.
- Based on the identified high and adverse impacts, OEA defined the study area within which the Proposed Acquisition could adversely affect potential EJ populations.
- OEA identified potential EJ populations (low-income and minority populations, including American Indians) in the study area using the best available demographic data managed by the U.S. Census Bureau and the U.S. Department of Housing and Urban

[1] Per the U.S. Census, American Indian refers to "A person having origins in any of the original peoples of North and South America (including Central America) and who maintains tribal affiliation or community attachment."

Development (HUD), as well as through public outreach. OEA considered populations with high rates of limited English-speaking households to inform the public outreach process.

- OEA evaluated whether the Proposed Acquisition or No-Action Alternative would result in disproportionately high and adverse impacts on potential EJ populations.

Based on the assessment of the potential environmental impacts of the Proposed Acquisition, OEA determined that noise from the projected increased rail traffic would be the only type of impact that could potentially result in high and adverse impacts on EJ populations. As discussed in *Section 3.6, Noise and Vibration*, OEA found that within the noise study area, 6,307 noise-sensitive receptors (receptors), including residences, schools, hospitals, nursing homes, and places of worship, would experience an adverse noise impact under the Proposed Acquisition. An adverse noise impact occurs when the noise level at a receptor increases by 3 dBA[2] or more and reaches or exceeds a 65 Ldn when combined with the existing background noise.[3] Also as discussed in *Section 3.6, Noise and Vibration*, noise associated with adding planned capital improvements within the rail ROW would exceed annoyance thresholds for construction noise at several receptors, but this noise would be temporary and would be minimized by the Applicants' voluntary mitigation measures.

Impacts other than noise from increased rail traffic would not be above generally accepted norms, and thus do not warrant an evaluation of disproportionately high and adverse human health or environmental effects of the Proposed Acquisition on minority and low-income populations. For example, although the Proposed Acquisition would affect rail safety, those impacts would be relatively minor. As discussed in *Section 3.1, Freight and Passenger Rail Safety*, the probability of an incident, such as a derailment, collision, or other accident occurring on a particular rail line depends, in part, on the number of trains that move on that rail line. Therefore, the projected increase in rail traffic that would occur with the Proposed Acquisition would increase the predicted risk of an incident occurring on certain rail lines in the combined CPKC system. Across all of those rail lines, OEA predicts that the greatest increase in the number of incidents would occur on segment C-OTTU-02 between Muscatine, Iowa and Ottumwa, Iowa. On that segment, OEA predicts that the number of incidents would increase by approximately only 0.32 per year, from 0.11 under the No-Action Alternative to 0.43 under the Proposed Acquisition. Other rail lines in the combined CPKC system would experience smaller increases in the number of predicted incidents and OEA expects that majority of incidents would be minor and would not result in any injuries, fatalities, or damage to property. Under the Proposed Acquisition, OEA expects that the number of incidents would remain low on the affected rail line segments,

---

[2] The frequency of sound relates to its tone or pitch, which is determined by the rate of air pressure fluctuation and is expressed in terms of cycles per second or Hertz (Hz). The human ear can detect a wide range of frequencies, from about 20 Hz to 17,000 Hz. Because the sensitivity of human hearing varies with frequency, sound is measured for environmental noise commonly using a weighting system to provide a single-number descriptor that correlates with subjective human response. Sound levels measured using this weighting system are called "A-weighted" and are expressed in decibel notation as "dBA." Sound and noise experts widely accept the A-weighted sound level as a unit for describing environmental noise.

[3] Ldn is the day-night average sound level. The Ldn is a single value equivalent to the sound energy fluctuating over 24 hours with a 10-dB penalty applied to sound at night (10:00 p.m. to 7:00 a.m.). The Ldn accounts for how loud noise events are, how long they last, how many of them occur over a 24-hour period, and how many occur at night.

and even decrease on some segments. Systemwide, OEA expects that the CPKC incident (2.39) rate would remain well below the Class I average (2.66). The incident rates on KCS and CP respectively would continue or decline if safety trends continue. Further, because the Proposed Acquisition would result in increases in rail traffic by diverting freight from other rail lines and from truck transportation to rail transportation, OEA expects that any potential increase in rail incidents on rail lines in the combined CPKC system would be partially or entirely offset by a decrease in the number of incidents on other rail lines and on highways.

Similarly, the Proposed Acquisition would result in minor adverse impacts on safety and delay at roadway/rail at-grade crossings (grade crossings). As discussed in *Section 3.2, Grade Crossing Safety*, across all 1,134 grade crossings that OEA analyzed in the safety analysis, the predicted number of crashes would increase by an average of 0.005 crashes per crossing per year with the Proposed Acquisition. This corresponds to one additional crash approximately every 200 years, on average. Adding together all potential crashes at the 1,134 crossings resulted in a total of 24.6 predicted crashes per year, as compared to the No-Action Alternative of 18.6 total crashes per year, which is a difference of 6.0 crashes per year. The largest predicted increase in crash frequency is 0.0282 crashes per year, or one additional crash every 35 years, compared to the No-Action Alternative, which is equivalent to one additional crash every approximately 55 years. This predicted increase would occur at Crossing ID 743351B across Miller Road in Hungerford, Texas. This is also the crossing with the highest total predicted number of crashes per year, with a predicted average of 0.2067 crashes per year, or one crash approximately every five years, under the Proposed Acquisition. While OEA expects that the Proposed Acquisition would result in an increase in the number of crashes in the study area, other rail lines in the combined CPKC system would experience smaller increases in the number of predicted incidents and OEA expects that the majority of incidents would be minor and would not result in any injuries, fatalities, or damage to property. Further, because the Proposed Acquisition would result in increases in rail traffic by diverting freight from other rail lines and from truck transportation to rail transportation, OEA expects that any potential increase in rail incidents on rail lines in the combined CPKC system would be partially or entirely offset by a decrease in the number of incidents on other rail lines and on highways.

As discussed in *Section 3.3, Grade Crossing Delay*, across the 277 grade crossings with an average annual daily traffic (AADT) of 2,500 or more vehicles per day, the Proposed Acquisition would result in an average increase in delay of only approximately 0.7 additional seconds per vehicle compared to the No-Action Alternative. 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 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.

The Proposed Acquisition would also not result in adverse impacts related to truck-to-rail diversion (*Section 3.4*), intermodal facility traffic (*Section 3.5*), air quality and climate change (*Section 3.7)*, energy (*Section 3.8*), cultural resources (*Section 3.9*), hazardous material release sites (*Section 3.10*), biological resources (*Section 3.11*), or water resources (*Section 3.12*) that would be significant or above generally accepted norms. Therefore, the analysis of potential impacts on EJ populations is focused on potential adverse noise impacts from increased rail traffic resulting from the Proposed Acquisition.

OEA defined an EJ study area to include area in which OEA identified adverse noise impacts, as described in *Section 3.6, Noise and Vibration*. To assess whether adverse noise impacts would disproportionately affect potential EJ populations, OEA expanded the noise impact areas for the EJ study area to include all intersecting U.S. Census block groups.[4] As part of a system-wide analysis, OEA conducted a desktop analysis of U.S. Census Bureau data from the American Community Survey (ACS) 2019 Five-Year Estimates (2015-2019) to determine whether each intersecting block group had the potential to include an EJ population. In addition to data on minority populations and low-income populations, OEA also reviewed data from ACS on limited English-speaking households for the purpose of supporting the public outreach component of this EIS to maximize opportunities for engagement. As described in *Section 3.6, Noise and Vibration*, increased activities at rail yards and intermodal facilities caused by the Proposed Acquisition would not result in adverse noise impacts; therefore, rail yards and intermodal facilities were not included in the EJ study area.

OEA used ACS data on minority status to determine whether each block group in the study area could include minority populations. In this context, minority status means that an individual identified themselves as being "Black or African American alone," "American Indian and Alaska Native alone," "Asian alone," "Native Hawaiian and Other Pacific Islander alone," "Some Other Race alone" (non-white), and/or "Hispanic or Latino." Consistent with EPA guidance and past OEA practice, OEA identified a block group as potentially containing minority populations when one or both of the following conditions was met:

- At least 50 percent of the people in the block group self-identify as being of minority status; or
- The percentage of the population of minority status in the block group is at least 10 percentage points higher than for the entire county in which the population is located.

OEA used ACS data on income and poverty levels to determine whether each block group in the study area could include low-income populations. Consistent with EPA's definition of low-income (EPA 2016), OEA defined low-income to mean individuals with an income less than 200 percent of the federal poverty level (less than or equal to twice the federal poverty level). Consistent with EPA's guidance (EPA 2016) and OEA's practice in past railroad

[4] A block group is a geographical unit defined by the U.S. Census Bureau. Census block groups generally contain between 600 and 3,000 people and are the smallest geographical units for which the Census Bureau publishes sample household data, such as data on racial and ethnic identification and income level.

merger cases, OEA identified a block group as potentially containing low-income populations when one or both of the following conditions was met:

- At least 50 percent of the population for whom poverty status is determined in the block group qualifies as low-income; or
- The percentage of the population for whom poverty status is determined in the block group that qualifies as low-income is at least 10 percentage points higher than for the entire county in which the population is located.

Although it was not a threshold applied to identify potential EJ populations, OEA also identified households that may need English-language assistance to support the outreach process. Identifying potential populations in the study area with limited English proficiency enables OEA to facilitate meaningful engagement and informed participation, and to determine where it may be appropriate for OEA to provide interpretation and translation services. Per the U.S. Census Bureau ACS definition, "[a] 'limited English-speaking household' is one in which no member 14 years old and over (1) speaks only English at home or (2) speaks a language other than English at home and speaks English 'very well'" (U.S. Census 2021). Note that previous U.S. Census Bureau data products referred to these households as "linguistically isolated." The definition and data tables compiled for both terms ("limited English-speaking households" vs. "linguistically isolated") are directly comparable. OEA applied similar thresholds for the identification of minority and low-income populations to determine where limited English-speaking populations exist in the study area. OEA identified a census block group as limited English speaking when one or both of the following conditions were met:

- At least 50 percent of households in the block group are limited English speaking; or
- The percentage of limited English-speaking households in the block group is at least 10 percentage points higher than for the entire country in which the block group is located.

3.13.2 Affected Environment

The study area for EJ analysis intersects block groups in more than 31 counties across five states, including Illinois, Iowa, Louisiana, Missouri, and Texas. In total, OEA collected and analyzed data for 217 different block groups, encompassing a total population of more than 296,000 people.

Table 3.13-1 summarizes the block group data by state, including details on those block groups with potential EJ populations. As shown in this table and based on the thresholds established in *Section 3.13.1, Approach*:

- OEA identified potential EJ populations in approximately 38 percent of the block groups in the study area. Collectively, those block groups include more than 106,000 people.
- OEA identified less than one-fourth (approximately 23 percent) of block groups as areas with potential minority populations.
- The block groups that OEA identified as potential minority populations included "Black or African American alone" (approximately 5 percent of block groups in the study area),

followed by "Asian alone" (3 percent of the block groups in the data set), and "Some Other Race alone" (approximately 2 percent of the block groups in the study area).

- OEA identified approximately 14 percent of the block groups in the study area as having potential "Hispanic or Latino" populations.
- OEA identified less than one percent of the block groups as potential "American Indian and Alaska Native alone" populations.
- OEA identified approximately 29 percent of the block groups as potential low-income populations.
- OEA identified approximately 13 percent of the block groups as potentially both low-income and minority populations.

Appendix P lists the block groups within the study area that met the thresholds established for identifying potential EJ populations. **Table P.1-1** in **Appendix P** lists the block groups that met the thresholds established for identifying potential minority populations and **Table P.1-2** lists the block groups that met the thresholds established for identifying potential low-income populations.

With respect to limited English-speaking households, OEA identified 12 block groups (or approximately six percent of the total block groups) as potentially needing English-language assistance, located in Illinois (eight block groups), Iowa (two block groups), and Texas (two block groups). Among these block groups, the predominant language spoken is Spanish, with some concentrations of households speaking "Other Indo-European Languages" and "Asian and Pacific Island Languages." **Table P.1-3** lists the block groups that met the thresholds established for identifying potential limited English-speaking populations.

Table 3.13-1. Summary of Potentially Affected Environmental Justice Populations by State

State [1]	Block Groups in Study Area	Block Groups in Study Area with Potential EJ Populations (% of Total Block Groups)	Potential Minority Block Groups in Study Area with EJ Populations [2]	Potential Low-Income Block Groups in Study Area with EJ Populations [3]	Potential Minority & Low-Income (Both) Block Groups in Study Area with EJ Populations	Potential EJ Populations
IL	71	26 (37%)	23 (32%)	11 (15%)	8 (11%)	Populations in Elgin (Kane County), Hanover Park, Itasca, and Wood Dale (DuPage County), and south and west of O'Hare Airport (Cook and DuPage County) in Bensenville. Populations also present along the border with IA/the Mississippi River in the cities of Savanna and Lanark (Carroll County), and Rock Island (Rock Island County).
IA	85	34 (40%)	17 (20%)	32 (38%)	15 (18%)	Populations on the east side of IA along the Mississippi River/border with IL including in Clinton and Camanche (Clinton County), Davenport and Bettendorf (Scott County), and Muscatine (Muscatine County). Additional populations in Fredonia (Louisa County) and in southern IA along the border with MO in Wayne County.
LA	6	3 (50%)	1 (17%)	2 (33%)	0 (0%)	Populations in the city of Dequincy in Calcasieu Parish in the southwest side of the state.
MO	37	10 (27%)	3 (8%)	9 (24%)	2 (5%)	Populations in and around Kansas City (Jackson County), including to the northeast in Liberty and Excelsior Springs (Clay County), and Chillicothe (Livingston County).
TX	18	10 (56%)	5 (28%)	8 (44%)	3 (17%)	Populations in east TX in and near Beaumont (Jefferson County), Rose City, Vidor, and Mauriceville (Orange County), and close to LA in Deweyville (Newton County).
TOTAL	**217**	**83 (38%)**	**49 (23%)**	**62 (29%)**	**28 (13%)**	

Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates Data Profiles (2015-2019).

[1] IL = Illinois, IA = Iowa, LA = Louisiana, MO = Missouri, TX = Texas

[2] OEA assumed minority populations exist when either a) at least 50 percent of the people in a block group self-identify as being of minority status; or b) the percentage of the population of minority status in the block group is at least 10 percentage points higher than for the entire county in which the population is located.

[3] OEA assumed low-income populations exist when either a) at least 50 percent of the population for whom poverty status is determined in the block group qualifies as low-income; or b) the percentage of the population for whom poverty status is determined in the block group that qualifies as low-income is at least 10 percentage points higher than for the entire county in which the population is located.

3.13.2.1 Additional Investigation of Potential EJ Populations

In addition to identifying potential EJ populations through a desktop analysis of ACS data, OEA identified concentrations of potential EJ populations through agency and public outreach during the scoping process for this EIS, direct outreach to community leaders, and through a review of public and subsidized housing data managed by HUD.

Project Scoping

During the scoping period for this EIS (from November 12, 2021, to January 3, 2022), OEA encouraged agencies and the public to submit comments on the range of issues and potential alternatives that the EIS would address. OEA held six online public scoping meetings and multiple agency meetings during the scoping period, receiving both oral and written comments (all comments received during the scoping comment period are publicly available on the Board's website at www.stb.gov). Several commenters identified specific areas in Illinois, Iowa, Missouri, and Texas, where the commenters expressed concerns that the Proposed Acquisition could adversely affect EJ populations. Commenters raised numerous concerns beyond potential impacts on EJ populations in their scoping comments, including truck traffic around intermodal facilities, grade crossing safety and delay, delays in emergency response times at grade crossings, pedestrian accessibility and safety, noise and vibration, economic development, water resources, hazardous materials transport, quality of life, air quality, and parking accessibility. As discussed above, however, OEA determined that noise would be the only impact that could result in high and adverse impacts on EJ populations.

Among the potential EJ populations identified through scoping, only one—the City of Dubuque, Iowa—was not identified as an area with potential EJ populations through the desktop analysis summarized above. Although the City of Dubuque contains potential EJ populations, as explained in this EIS, the projected increases in rail traffic through Dubuque from the Proposed Acquisition do not meet the Board's environmental analysis thresholds. Associated rail segments were therefore not included in the EJ study area. There is no potential for the Proposed Acquisition to cause disproportionately high and adverse impacts on EJ populations in this community.

Direct Outreach to Community Leaders

Beyond the scoping process for this EIS, OEA conducted direct outreach to local, county, and regional planning organizations and government representatives to identify local concentrations of potential minority and low-income populations at the scale of neighborhoods or specific developments. Among the local concentrations of potential EJ populations that OEA identified through this process, only five were located outside of block groups that OEA identified as potentially containing EJ populations. Only one of these concentrations (neighborhood at 936 Williams Street in Missouri) was located within the EJ study area.

1. 291 North Street, Singer, Louisiana (community)
2. 100 First Avenue, Bartlett, Illinois (mobile home park)

3. 936 Williams Street, Excelsior Springs, Missouri (neighborhood of single-family homes)
4. 201 West Mill, Liberty, Missouri (elementary school)
5. Neighborhood between West Mississippi Street, North Morse Avenue, and Gallatin Street, Liberty, Missouri (single-family homes)

Table P.2-1 lists all the local concentrations of potential EJ populations identified by local, county, and regional planning organizations and government representatives.

Additionally, OEA conducted direct outreach to the community members representing community centers, food pantries, shelters, police stations, fire stations, worship leaders, principals and other school representatives within areas with minority and low-income populations. The list of these members and their contact information were primarily obtained from the local, county, and regional planning organizations and government representatives discussed above. OEA attempted to contact 225 community leaders from Illinois to Texas. The aim of these engagements was to make sure the leaders were familiar with the Proposed Acquisition, to inform them of the environmental review process, and to collect information on their concerns about the potential impacts of the Proposed Acquisition.

Subsidized and Public Housing

OEA also collected data on public and subsidized housing from HUD. OEA collected these data for areas within the study area to determine if any public and subsidized housing facilities exist outside of the block groups already determined to meet the EJ thresholds identified under *Section 3.13.1, Approach*.

According to HUD housing inventory data, there is one property categorized as a subsidized housing unit that is located within the study area. This property is located within a block group that OEA identified as a potential EJ population. Two properties categorized as public housing units were also identified within the study area. These two properties, both located in Iowa, are outside of block groups that OEA identified as potential EJ populations.

3.13.3 Environmental Consequences

This section describes how noise from rail traffic under the Proposed Acquisition and the No-Action Alternative could impact EJ populations, as compared to non-EJ populations.

3.13.3.1 Proposed Acquisition

As discussed in *Section 3.6, Noise and Vibration*, OEA expects that the Proposed Acquisition would result in an adverse noise impact on a total of 6,307 receptors. The predominant source of noise under the Proposed Acquisition would be train horn noise, due to the combination of higher noise levels near roadway/rail at-grade crossings (grade crossings) and the greater number of receptors near grade crossings, particularly in more rural towns.

As noted in **Table 3.13-1**, OEA identified 83 block groups in the study area as containing potential EJ populations, which is approximately 38 percent of the 217 total block groups in the study area. Among the 217 total block groups in the EJ study area, 165 contain receptors that would experience adverse noise impacts under the Proposed Acquisition. Out of these 165 block groups, 51 (or approximately 31 percent) are block groups containing potential EJ populations and 114 (or approximately 69 percent) were not identified as potential EJ populations. Further, out of the total 6,307 additional receptors that would experience adverse noise impacts under the Proposed Acquisition, 1,774 (or approximately 28 percent) are located within block groups with potential EJ populations, while 4,533 (or approximately 72 percent) are in non-EJ block groups.

OEA also examined the distribution of receptors that would experience adverse noise impacts as a result of the Proposed Acquisition at the community scale.[5] OEA identified a total of 70 incorporated areas within the EJ study area and then determined the percentage of adversely affected receptors in each of those 70 communities that were located within EJ block groups. For some communities—including Bensenville, Elgin, Savanah, and Lanark in Illinois; Columbus Junction, Fredonia, Muscatine, Seymour, and Washington in Iowa; Chillicothe and Excelsior Springs in Missouri; and Deweyville, Rose City, and Vidor in Texas—most of the adversely affected receptors are located within EJ block groups. However, for the vast majority of communities (56 out of 70 communities or 80 percent of the total), most of the adversely affected receptors are located in non-EJ block groups. **Table P.3-1** in **Appendix P** provides a table showing the 70 communities with receptors subject to adverse noise impacts under the Proposed Acquisition and the distribution of adversely affected receptors within each community in EJ and non-EJ block groups.

With respect to the additional areas identified as potential EJ populations through public outreach via the scoping process, direct outreach to community leaders, and/or through a review of public and subsidized housing data managed by HUD, the following was identified:

- Among the 17 local concentrations of potential EJ populations identified through direct outreach to community leaders, all but five are in areas that were already identified as potential EJ populations through the desktop analysis. Among the five, only the neighborhood of homes around 936 Williams Street in Excelsior Springs, Missouri (a portion of the homes within this neighborhood) would experience adverse noise impacts with the Proposed Acquisition (refer to **Table P.2-1**).
- OEA identified two subsidized housing facilities subject to an adverse noise impact with the Proposed Acquisition that are not within a block group that OEA identified as a potential EJ population. These facilities are 301 West Chariton Street, Moravia, Iowa, 52571 (two units) and 223 North Fairview Avenue, Ottumwa, Iowa, 52501 (four units).

Based on the distribution of adverse noise impacts throughout the study area, OEA concludes that adverse noise impacts would not be borne disproportionally by EJ populations. Most of the block groups in which adverse noise impacts would occur do not include EJ populations, and most of the receptors that would experience adverse noise impacts are in non-EJ block groups. Although the Proposed Acquisition would affect low-income populations and minority populations, including Native American tribes,

[5] Incorporated areas were the unit of analysis in this community-based analysis; unincorporated areas were not included.

impacts on those populations would be similar to or less than the impacts experienced by non-EJ populations.

3.13.3.2 No-Action Alternative

Under the No-Action Alternative, CP would not acquire KCS and rail traffic on rail lines and activities at rail yards and intermodal facilities would not increase as a result of the Proposed Acquisition. However, rail traffic could increase on CP and KCS lines as a result of changing market conditions, such as general economic growth, and activities at rail yards and at intermodal facilities could also increase. These changes would not involve authorization from the Board or environmental review by OEA under NEPA.

As discussed in *Section 3.6, Noise and Vibration*, OEA estimates that a total of 15,197 receptors in the study area would experience a noise level of 65 dBA or above under the No-Action Alternative. This is more than the estimated number of receptors in the study area that currently experience a noise level of 65 dBA or above (12,385), but less than the number of estimated receptors that would experience that noise level under the Proposed Acquisition (23,742). For reference purposes, among the estimated 2,812 receptors that would experience a noise level of 65 dBA or above due to organic growth in rail traffic under the No-Action Alternative, approximately 56 percent are within block groups potentially containing EJ populations and 44 percent are within non-EJ block groups. However, most of those receptors would not experience a 3 dBA increase in train noise under the No-Action Alternative and therefore would not meet OEA's definition of an adverse noise impact.

3.13.4 Conclusion

Based on OEA's analysis of the different types of potential adverse environmental impacts that could result from the Proposed Acquisition, OEA found that only noise impacts had the potential to be high and adverse. Under the Proposed Acquisition, there would be a total of 6,307 adversely affected receptors located in 165 block groups throughout the study area.

Among these 165 block groups, OEA identified 51 (or approximately 31 percent) as potentially containing EJ populations and 114 (or approximately 69 percent) as likely non-EJ populations. Further, an analysis of the 6,307 receptors that would experience adverse noise impacts under the Proposed Acquisition found that approximately 1,774 (or approximately 28 percent) are within block groups potentially containing EJ populations and 4,533 (or approximately 72 percent) are within non-EJ block groups.

Based on the distribution of adverse noise impacts throughout the study area, including the fact that most adversely affected receptors are located in block groups that are not majority low-income or minority, OEA concludes that those impacts would not be borne disproportionally by EJ populations.

OEA is recommending mitigation that would require the Applicants to conduct targeted outreach to minority and low-income communities that would experience adverse noise impacts to provide information about the process for establishing Quiet Zones and to assist interested communities in identifying supplemental or alternative safety measures, practical operational methods, or technologies that may enable the community to establish Quiet Zone (see *Chapter 4*, *Mitigation*, Mitigation Measure [MM]-EJ-01). Additionally, the Applicants have volunteered mitigation measures to minimize impacts to EJ populations. These measures include a commitment to making Operation Lifesaver programs available to affected communities, including schools and other organizations (Voluntary Mitigation [VM]-EJ-02). Operation Lifesaver is a non-profit education and awareness program that helps increase the public's awareness of the dangers around rail lines. The Applicants also committed to allocate a minimum of 15 percent of contractor bid evaluation weighting to the inclusion of minority and tribal owned businesses and employees on the proposed project team for the planned capital improvement contracts (VM-EJ-03).

3.14 Cumulative Impacts

This section describes the cumulative impacts of the Proposed Acquisition and other past, present, and reasonably foreseeable future projects and actions. The sections that follow describe the approach, affected environment, and environmental consequences for the cumulative impacts analysis. OEA considered the contribution of the Proposed Acquisition to cumulative impacts for each resource area. In its consideration, OEA analyzed the potential cumulative impacts of increased rail traffic that the Applicants predict would occur if the Board authorizes the Proposed Acquisition, the projected increase in activity at rail yards and intermodal facilities, and 25 planned capital improvements that the Applicants intend to add to support the projected increase in rail traffic.

3.14.1 Approach

CEQ developed the handbook, *Considering Cumulative Effects under the National Environmental Policy Act* (1997), to assist federal agencies in assessing cumulative impacts. OEA has followed these guidelines in its evaluation of whether cumulative impacts could result from impacts of the Proposed Acquisition and impacts of past, present, and reasonably foreseeable future projects and actions in the study area. Using publicly available geographic information systems data and other publicly available sources, OEA researched past, present, and reasonably foreseeable future projects and actions that could result in impacts that would coincide in time and space with impacts from the Proposed Acquisition.

3.14.1.1 Cumulative Impacts Study Area

OEA defined the study area and analysis period for cumulative impacts to include reasonably foreseeable projects and actions that could affect the same resource areas as the Proposed Acquisition. The cumulative impacts study area is defined for each impact topic that the Proposed Acquisition and planned capital improvements would affect. For the cumulative impact analysis, OEA considered reasonably foreseeable projects and actions that could occur by 2027, which is the analysis year that OEA used in this EIS. For impacts related to the 25 planned capital improvements, OEA also considered the conceptual timeline discussed in the Applicants' application for adding those improvements. Although the Applicants intend to add the planned capital improvements as needed based on increasing traffic, the operations projections presented in the application indicate that the Applicants could build the improvements in years one, two, and three following the Board's authorization of the Proposed Acquisition and that each capital improvement would take between half a day and three days to build.

3.14.2 Past, Present, and Reasonably Foreseeable Future Projects and Actions

OEA researched past, present, and reasonably foreseeable future projects and actions that could result in impacts that would coincide in time and space with impacts from the

Proposed Acquisition and the planned capital improvements. OEA identified and screened a number of projects for possible inclusion in the cumulative impacts analysis, including the following:

3.14.2.1 Expanded Amtrak Service

OEA is aware new Amtrak service is planned between Chicago and Rockford, Illinois by the Illinois Department of Transportation (IDOT).[1] The route would use the existing Metra Milwaukee District West (MD-W) line between Chicago and Elgin-Big Timber and would operate two daily roundtrips (four trips total) during weekday peak periods and on the weekend. OEA included this proposed planned IDOT intercity rail service in the cumulative impact analysis because it meets the criteria of being reasonably foreseeable, as it is in an advanced planning stage. The 2020 Illinois Statewide Transportation Improvement Program includes $275 million in implementation funds for the project, which differentiates it from the other potential future passenger rail projects in the study area.

On February 2, 2022, Amtrak provided the Board with a copy of an executed settlement agreement between Amtrak and CP that describes Amtrak's plans for increasing passenger service on certain rail lines within the combined CPKC system. Because Amtrak planned these increases in passenger rail service independent of the Proposed Acquisition, impacts associated with those plans are not direct or indirect impacts of the Proposed Acquisition. However, if Amtrak passenger service were to increase on the same rail lines where the Proposed Acquisition would result in increased freight rail traffic, then cumulative impacts could occur.

Based on the settlement agreement between Amtrak and CP, OEA understands that Amtrak intends to add up to three additional daily round-trip trains on the *Hiawatha* route between Chicago, Illinois, and Milwaukee, Wisconsin; introduce up to two daily new round-trip passenger trains on the Twin Cities-Milwaukee-Chicago (TCMC) route along portions of the existing long-distance Empire Builder route; introduce up to two daily round-trip passenger trains between New Orleans and Baton Rouge; and introduce up to two daily round trip passenger trains between Detroit, Michigan and Windsor, Ontario via the Detroit River Tunnel. OEA also understands that Amtrak intends to conduct a study including CP, NSR, UP, and relevant governmental agencies, with the goal of introducing a daily round-trip passenger service between Meridian, Mississippi and Dallas, Texas with the potential for a second daily round trip; however, planning for this potential increase in passenger rail service between Meridian and Dallas has not advanced to the point that the action is reasonably foreseeable.

Because the planned additional Amtrak service on the TCMC route would operate on a rail line between River Junction and St. Paul, Minnesota that would also experience an increase in the number of daily freight trains as a result of the Proposed Acquisition, OEA analyzed the cumulative impacts that could result from this increased traffic. OEA did not include potential planned passenger rail services in the other corridors in the cumulative impacts analysis because they would not result in increased passenger rail service on rail line

[1] Illinois Department of Transportation, Statewide Transportation Improvement Program, Fiscal Year 2021-2024.

segments where the number of freight trains per day would increase as a result of the Proposed Acquisition.

3.14.2.2 Metra Commuter Rail

Based on a review of the operating/trackage agreement between Metra and CP, OEA does not anticipate reasonably foreseeable changes to the Metra service in the study area by 2027. The current operating/trackage agreement between CP and Metra establishes windows of operation for respective services. While Metra has implemented pilot programs in recent years to increase off-peak commuter service on certain rail lines that are outside of the study area, because of the operating/trackage agreement between CP and Metra, an off-peak pilot program in their shared corridors has not been implemented and is not anticipated by 2027.

3.14.2.3 Dallas Area Rapid Transit (DART) Silver Line

The DART Silver Line is anticipated to begin operations in 2024 along the 26-mile "Cotton Belt Corridor," which extends between Dallas Fort Worth Airport and Shiloh Road in Plano, Texas. The alignment traverses seven cities: Grapevine, Coppell, Dallas, Carrollton, Addison, Richardson, and Plano. Operations would overlap with KCS freight trains on a small portion of its alignment near its western terminus. Silver Line trains would operate every 30 minutes during peak periods and hourly in the off-peak and on weekends. OEA did not include the DART Silver Line in the cumulative impacts analysis because it would not operate on a segment where the number of freight trains per day would increase as a result of the Proposed Acquisition.

3.14.2.4 Chicago O'Hare International Airport Development

O'Hare International Airport (O'Hare or the Airport) is located in Chicago, Illinois, and operated by the Chicago Department of Aviation (CDA). The Airport provides service to destinations in North and South America, Europe, Africa, Asia, and Oceania. O'Hare served approximately 54 million passengers in 2021 and was ranked as the world's fourth-busiest airport. O'Hare is completing an airport development project known as the O'Hare Modernization Program (OMP). The OMP began in 2005 and involved the reconfiguration of the airfield into a more efficient runway, terminal, and roadway system to reduce delay and increase runway capacity. The OMP included the construction of four new runways (Runway 9L-27R in 2008, 10C-28C in 2013, 10R-28L in 2015, and 9C-27C in 2020), the extension of two existing runways (9R-27L in 2021 and 10L-28R in 2008), the decommissioning of existing crosswind runways (14R-32L, 14L-32R, and 18-36), along with associated airport development. The extension of Runway 9R-27L in 2021 marked the completion of the runway development associated with the OMP. Full completion ("build out") of the OMP is anticipated at the end of 2022 when the extension of Runway 9R-27L is fully operational.

The CDA is also undertaking a capital development program known as O'Hare 21, which is a multi-dimensional, multi-phased umbrella for the long-term, 21st century vision of O'Hare. O'Hare 21 includes completion of the final phase of the OMP, aircraft gate improvement projects, the O'Hare Terminal Area Plan (TAP), and capital improvement projects outlined in a 15-year O'Hare Capital Improvement Plan. Collectively, these projects will expand travel options by increasing gate availability, reducing security wait times, improving the baggage screening process, and reducing airfield congestion and delays. OEA included the OMP and O'Hare 21 projects in the cumulative impact analysis because these are ongoing projects that have the potential to result in cumulative impacts when considered along with the Proposed Acquisition.

3.14.2.5 SOO Green Renewable Rail (SGRR) Electric Transmission Line Project

The SGRR project is a proposed buried electric transmission line that would extend from Mason City, Iowa to Plano, Illinois. The project is designed to bring high-capacity wind energy from Iowa into load centers outside of Chicago with the ability to deliver power across markets and feed into the eastern market of the PJM Regional Transmission Organization. The proposed project would run along existing CP tracks within the rail ROW from Mason City, Iowa to Davis Junction, Illinois. The project has the potential to intersect with two of the 25 planned capital improvements: the planned new siding at MP 24 near Bellevue, Iowa, and the planned new siding at MP 71 near Turkey River, Iowa. The exact siting of the SGRR project is yet to be determined, meaning that the electric transmission line could run along the same side of the CP track as the planned capital improvements or along the opposite side. The siting decision would have an effect on the level of cumulative disturbance anticipated during construction. OEA included the proposed SGRR electric transmission line project in the cumulative impact analysis because it is in an advanced planning stage and therefore meets the criteria of being reasonably foreseeable.

3.14.2.6 Cardinal – Hickory Creek (CHC) Electric Transmission Line Project

Independent Transmission Company Midwest and American Transmission Company propose to construct an approximately 100-mile, 345 kilo-Volt (kV) electric transmission line that would run between Dane County, Wisconsin and Dubuque County, Iowa. The CHC electric transmission line would cross the Mississippi River in the vicinity of the planned new siding at MP 71 near Turkey River. It is possible that the transmission line would span the CP rail line and would not involve any ground disturbance adjacent to the CP ROW. OEA included the proposed CHC electric transmission line project in the cumulative impact analysis because it is in an advanced planning stage and therefore meets the criteria of being reasonably foreseeable.

3.14.3 Resource Consideration

Pursuant to the CEQ Guidance document, *Considering Cumulative Effects Under the National Environmental Policy Act,* and its guidance to "count what counts," OEA analyzed only the topics for which other projects had geographic overlap. These topics included:

- Passenger Rail Safety;
- Grade Crossing Safety and Delay;
- Air Quality;
- Noise;

- Environmental Justice;
- Biological systems, specifically threatened and endangered species; and
- Water, specifically wetlands.

OEA did not consider the following topics further because there were no impacts from the Proposed Acquisition that could combine with adverse impacts from other past, present, and reasonably foreseeable future projects.

Truck-to-Rail Diversion: The Applicants forecast that the Proposed Acquisition would cause truck-to-rail diversions, thereby removing trucks from roadways. This diversion would not result in any adverse impacts on roadways and, therefore, no additional analysis of cumulative impacts is warranted.

Intermodal Facility Traffic: There are no other reasonably foreseeable traffic and roadway projects with geographic overlap with the intermodal facilities where truck traffic resulting from the Proposed Acquisition would exceed environmental analysis thresholds. Therefore, no additional analysis of cumulative impacts is warranted.

Energy: OEA determined that the Proposed Acquisition would not adversely affect the transportation of energy commodities or overall energy efficiency. Therefore, no additional analysis of cumulative impacts on energy is warranted.

Cultural Resources: OEA determined that the Proposed Acquisition would have No Adverse Effect on cultural resources (historic and archaeological) listed in or eligible for listing in the National Register within the project APE. Therefore, no additional analysis of cumulative impacts on cultural resources is warranted.

3.14.4 Cumulative Impacts from Increased Rail Traffic

Cumulative impacts could potentially result from the Proposed Acquisition, reasonably foreseeable rail projects, and the build out of the OMP because the Proposed Acquisition would result in increased train operations on certain segments along the combined CPKC rail network. OEA identified six topics with potential operational cumulative impacts. These are described below.

3.14.4.1 Passenger Rail Safety

As discussed in *Section 3.1, Freight and Passenger Rail Safety*, the probability of an incident occurring on any particular rail line depends, in part, on the volume of rail traffic on that rail line. Therefore, OEA expects that the projected increase in rail traffic resulting from the Proposed Acquisition would increase the probability of an incident occurring on some rail lines compared to the No-Action Alternative. Other reasonably foreseeable future projects that could result in increased rail traffic could, along with the Proposed Acquisition, contribute to cumulative rail safety impacts.

The Proposed Acquisition would result in a projected increase of eight freight trains per day along the Metra MD-W line between Chicago and Elgin-Big Timber, which is part of the route between Chicago and Rockford on which IDOT plans new intercity passenger rail service. As discussed in *Section 3.1, Freight and Passenger Rail Safety*, however, the probability of rail collisions involving passenger and freight trains is very low. OEA expects that the projected addition of eight freight trains and the reasonably foreseeable addition of two new round-trip passenger trains would still result in a very low probability of rail collisions. **Table 3.14-1** shows the "Proposed Acquisition with Cumulative Impacts (Amtrak trains)" for C-ELGI-01 and C-ELGI-02, the two segments where the new Amtrak Chicago-Rockford service would run.

The Proposed Acquisition could also result in a projected increase of between 3.6 and 6.0 freight trains per day on all or portions of five rail segments between River Junction, Minnesota and St. Paul, which is part of the TCMC route between Chicago and the Twin Cities via Milwaukee on which Amtrak plans additional passenger rail service (see **Figure 3.1-2**). The Proposed Acquisition would not result in an increase in daily freight trains on the remainder of the TCMC route between Chicago and River Junction. As discussed in *Section 3.1, Freight and Passenger Rail Safety,* the probability of rail collisions involving passenger and freight trains is very low on the five segments between River Junction and St. Paul which overlap with part of Amtrak's planned TCMC service. OEA expects that the projected addition of 3.6 to 6.0 freight trains and the reasonably foreseeable addition of up to two new round-trip passenger trains would still result in a very low probability of rail collisions. **Table 3.14-1** shows the "Proposed Acquisition with Cumulative Impacts (Amtrak trains)" for B-TWIN-01, C-MEPA-01, C-RIVE-01, C-RIVE-02 and C-MARQ-01, the five segments where part of the additional Amtrak TCMC service would run.

Table 3.14-1. Cumulative Rail Safety Impacts

Rail Line Segment			Incidents per 100 Years			Years Between Incidents		
Between	**And**	**Segment Code**	**No-Action Alternative**	**Proposed Acquisition**	**Proposed Acquisition, with Cumulative Impacts (Amtrak trains)**	**No-Action Alternative Predicted Interval between Collisions (years)**	**Proposed Acquisition Predicted Interval between Collisions (years)**	**Proposed Acquisition, with Cumulative Impacts (Amtrak trains)**
Bensenville Metra Station, IL	Randall Road, IL	C-ELGI-01	0.202	0.272	0.310	495	368	322
Tower B12, IL	Bensenville Metra Station, IL	C-ELGI-02	0.063	0.074	0.082	1,576	1,345	1,226
St. Paul Yard, MN	Northtown, MN	B-TWIN-01	0.038	0.055	0.056	2,660	1,828	1,794
Hoffman St Paul, MN	Fordson Jct, MN	C-MEPA-01	0.003	0.012	0.032	39,003	8,083	3,130
Newport, MN	Minneapolis, MN	C-RIVE-01	0.041	0.067	0.084	2,433	1,489	1,189
River Jct, MN	Newport, MN	C-RIVE-02	0.400	0.691	0.929	250	145	108
Marquette, IA	River Jct, MN	C-MARQ-01	0.005	0.017	0.028	20,022	6,017	3,554

3.14.4.2 Grade Crossing Safety

As discussed in *Section 3.2, Grade Crossing Safety*, the Proposed Acquisition could affect safety at roadway/rail crossings at-grade crossings (grade crossings) on rail lines where increased rail traffic resulting from the Proposed Acquisition would meet or exceed the threshold for environmental review of eight or more additional trains per day.

Among the rail line segments where the projected increase in rail traffic resulting from the Proposed Acquisition would meet the thresholds for environmental review, the only segments where reasonably foreseeable future projects and actions could increase rail traffic are passenger trains on segments C-ELGI-01 and C-ELGI-02, which extend from Elgin, Illinois to Franklin Park, Illinois and comprise Metra's MD-W line. The grade crossing safety analysis included the projected passenger train volumes in estimating the predicted crashes for both the No-Action Alternative and the Proposed Acquisition. The Proposed Acquisition would result in a projected increase of eight freight trains per day on these two segments and they would also be part of the route between Chicago and Rockford on which IDOT proposes new Amtrak service. Therefore, cumulative impacts on grade crossing safety could occur at grade crossings along those rail lines. **Table 3.14-2** summarizes all crossings and the predicted cumulative grade crossing safety impacts of the Proposed Acquisition and the reasonably foreseeable addition of Amtrak service (four additional passenger trains per day) on segments C-ELGI-01and C-ELGI-02. All sites show a predicted increase in crashes, ranging from an increase of 0.004 to 0.0017 crashes per year. These changes in predicted crashes equate to an increase in one additional crash every 2,500 years (for increase of 0.0004) and one additional crash every approximately 600 years (for increase of 0.0017).

Table 3.14-2. Grade Crossing Safety

City	Street	Crossing ID	AADT	No-Action Alternative		Proposed Acquisition		Cumulative Impacts	
				Predicted Total Crashes (crashes/year)	Years Between Predicted Crashes (years)	Predicted Total Crashes (crashes/year)	Years Between Predicted Crashes (years)	Predicted Total Crashes (crashes/year)	Years Between Predicted Crashes (years)
Bartlett	Gifford Road	372214T	4921	0.0353	28.3	0.0367	27.3	0.0373	26.8
Bartlett	Naperville Road	372210R	15539	0.0432	23.1	0.0446	22.4	0.0453	22.1
Bartlett	Oak Avenue	372206B	10677	0.0925	10.8	0.0950	10.5	0.0961	10.4
Bartlett	Prospect Avenue	371997M	3896	0.0338	29.6	0.0351	28.5	0.0357	28.0
Bartlett	Spaulding Road	372212E	1933	0.0294	34.0	0.0306	32.6	0.0312	32.0
Bartlett	Western Avenue	372207H	791	0.0243	41.1	0.0254	39.4	0.0259	38.6
Bensenville	Addison Street	372172J	1608	0.0283	35.3	0.0295	33.9	0.0301	33.3
Bensenville	Center Street	372171C	459	0.0215	46.4	0.0225	44.4	0.0230	43.5
Bensenville	Church Road	372174X	7696	0.0417	24.0	0.0431	23.2	0.0437	22.9
Bensenville	York Road	372170V	18696	0.0514	19.5	0.0528	18.9	0.0534	18.7
Elgin	Chicago Street	372240H	16755	0.1525	6.6	0.1562	6.4	0.1579	6.3
Elgin	Elgin Av	372231J	208	0.0309	32.3	0.0324	30.8	0.0331	30.2
Elgin	Highland Avenue	372241P	6957	0.0872	11.5	0.0896	11.2	0.0907	11.0
Elgin	Illinois Route 25	372217N	19450	0.0448	22.3	0.0462	21.6	0.0469	21.3
Elgin	Kimball Street	372242W	23433	0.0530	18.9	0.0544	18.4	0.0550	18.2
Elgin	Mclean Boulevard	372246Y	21559	0.1198	8.3	0.1223	8.2	0.1234	8.1
Elgin	National Street	372239N	7997	0.0386	25.9	0.0400	25.0	0.0406	24.6
Elgin	Raymond Street	372235L	3427	0.0330	30.3	0.0343	29.2	0.0349	28.7
Itasca	Catalpa Avenue	372182P	1608	0.0283	35.3	0.0295	33.9	0.0301	33.3
Itasca	Prospect Avenue	372179G	9075	0.0395	25.3	0.0408	24.5	0.0415	24.1

Table 3.14-2. Grade Crossing Safety

City	Street	Crossing ID	AADT	No-Action Alternative		Proposed Acquisition		Cumulative Impacts	
				Predicted Total Crashes (crashes/year)	Years Between Predicted Crashes (years)	Predicted Total Crashes (crashes/year)	Years Between Predicted Crashes (years)	Predicted Total Crashes (crashes/year)	Years Between Predicted Crashes (years)
Itasca	Rohlwing Road	372184D	22379	0.0458	21.8	0.0472	21.2	0.0479	20.9
Itasca	Walnut Street	372180B	1723	0.0317	31.6	0.0329	30.4	0.0335	29.8
Medinah	Medinah Road	372191N	7064	0.0445	22.5	0.0459	21.8	0.0465	21.5
Roselle	Park Street	372194J	689	0.0236	42.4	0.0247	40.6	0.0252	39.8
Roselle	Prospect Street	372195R	373	0.0563	17.8	0.0581	17.2	0.0589	17.0
Roselle	Roselle Road	372196X	12521	0.1068	9.4	0.1093	9.1	0.1105	9.1
Schaumburg	Rodenburg Road	372202Y	13240	0.0421	23.8	0.0435	23.0	0.0441	22.7
Wood Dale	Ash Avenue	372176L	230	0.0183	54.6	0.0192	52.1	0.0196	51.0
Wood Dale	Irving Park Road	372177T	29174	0.0477	21.0	0.0491	20.4	0.0498	20.1
Wood Dale	Wooddale Road	372178A	8612	0.0527	19.0	0.0541	18.5	0.0548	18.3

Although OEA concludes that the Proposed Acquisition and other reasonably foreseeable future actions and projects would result in an increase in the number of crashes at certain grade crossings, OEA expects that the number of crashes at grade crossings on other railroads in the United States and on roadways could decrease as the result of the diversion of truck to rail and the diversion of rail traffic from other railroads to the combined CPKC network.

3.14.4.3 Grade Crossing Delay

As discussed in *Section 3.3*, *Grade Crossing Delay*, the Proposed Acquisition could affect vehicular delay at grade crossings on rail lines where increased rail traffic resulting from the Proposed Acquisition would meet or exceed the threshold for environmental review. Other reasonably foreseeable actions and projects that would increase rail traffic on those rail lines could, along with the Proposed Acquisition, contribute to cumulative impacts on grade crossing delay. As noted above, however, the only rail line segments where cumulative impacts are possible are segments C-ELGI-01 and C-ELGI-02 on Metra's MD-W line. **Table 3.14-3** summarizes crossings with an AADT of 2,500 or more and the predicted cumulative grade crossing delay impacts of the Proposed Acquisition and the reasonably foreseeable addition of Amtrak service on segments C-ELGI-01and C-ELGI-02 in terms of the average daily delay per vehicle at each affected crossing and the LOS of each affected crossing. As the table shows, all of the grade crossings on segments C-ELGI-01 and C-ELGI-02 would continue to operate at LOS A under the Proposed Acquisition, and the addition of four daily Amtrak trains would not change the LOS for those grade crossings.

Table 3.14-3. Grade Crossing Delay

City	Street	Crossing ID	AADT	No-Action Alternative		Proposed Acquisition		Cumulative Impacts	
				Average Delay per Vehicle in 24-hour Period (seconds)	LOS	Average Delay per Vehicle in 24-hour Period (seconds)	LOS	Average Delay per Vehicle in 24-hour Period (seconds)	LOS
Bartlett	Gifford Road	372214T	4921	1.5	A	2.2	A	2.3	A
Bartlett	Naperville Road	372210R	15539	2.3	A	3.5	A	3.6	A
Bartlett	Oak Avenue	372206B	10677	1.5	A	2.3	A	2.3	A
Bartlett	Prospect Avenue	371997M	3896	1.4	A	2.1	A	2.2	A
Bensenville	Church Road	372174X	7696	1.4	A	2.2	A	2.2	A
Bensenville	York Road	372170V	18696	1.5	A	2.2	A	2.3	A
Elgin	Chicago Street	372240H	16755	1.7	A	2.5	A	2.6	A
Elgin	Highland Avenue	372241P	6957	1.4	A	2.1	A	2.2	A
Elgin	Illinois Route 25	372217N	19450	1.8	A	2.7	A	2.8	A
Elgin	Kimball Street	372242W	23433	1.5	A	2.3	A	2.4	A
Elgin	Mclean Boulevard	372246Y	21559	1.6	A	2.4	A	2.5	A
Elgin	National Street	372239N	7997	1.6	A	2.5	A	2.5	A
Elgin	Raymond Street	372235L	3427	1.5	A	2.4	A	2.4	A
Franklin Park	25th Avenue	372138C	14441	5.5	A	5.2	A	5.2	A
Franklin Park	Edgington Street	372137V	3398	5.4	A	5.1	A	5.2	A
Itasca	Prospect Avenue	372179G	9075	1.5	A	2.2	A	2.3	A
Itasca	Rohlwing Road	372184D	22379	1.9	A	2.9	A	2.9	A
Medinah	Medinah Road	372191N	7064	1.3	A	2.0	A	2.1	A
Roselle	Roselle Road	372196X	12521	1.4	A	2.1	A	2.2	A
Schaumburg	Rodenburg Road	372202Y	13240	2.1	A	3.1	A	3.2	A
Wood Dale	Irving Park Road	372177T	29174	2.2	A	3.4	A	3.5	A
Wood Dale	Wooddale Road	372178A	8612	1.3	A	2.0	A	2.1	A

Although OEA concludes that the Proposed Acquisition and other reasonably foreseeable future actions and projects would result in a slight increase in grade crossing delay at certain grade crossings, OEA also expects that the amount of delay at crossings on other railroads in the United States and on roadways could decrease as the result of the diversion of trucks to rail and the diversion of rail traffic from other railroads to the combined CPKC network.

3.14.4.4 Air Quality and Climate Change

As discussed in *Section 3.7, Air Quality and Climate Change*, OEA estimated emissions for NO_x, VOCs, PM_{10}, $PM_{2.5}$, SO_2, CO, CO_2e, CH_4, N_2O, and HAPs. Although OEA expects that the Proposed Acquisition might result in a net decrease in air emissions if considered on a system-wide basis, the Proposed Acquisition would change the distribution of emissions at the local level because freight would be diverted from trucks and other rail lines onto the CPKC rail lines in the study area. Under the Proposed Acquisition, county-level emissions of criteria pollutants, HAPs, and GHGs would increase due to the projected changes in rail traffic and activity at rail yards and intermodal facilities. NO_x is the air pollutant of greatest concern from locomotive emissions. The annual NO_x emissions associated with the Proposed Acquisition would exceed EPA's *de minimis* thresholds within the Chicago Ozone Nonattainment Area, the Houston-Galveston-Brazoria Ozone Nonattainment Area, and the Beaumont-Port Arthur Ozone Maintenance Area. Emissions of other criteria pollutants would be well below the applicable *de minimis* thresholds.

As part of the cumulative impacts analysis, OEA evaluated the additional locomotive emissions that would occur from increased Amtrak service on Metra's MD-W line between Chicago and Elgin-Big Timber. OEA assumed that the four additional Amtrak trains on this route would use the Siemens Charger locomotives with Tier 4 emissions certification. **Table 3.14-4** presents the estimated locomotive emissions from the additional Amtrak trains. As the table shows, OEA expects that the additional Amtrak trains would not be a major source of emissions. Within the Chicago Ozone Nonattainment Area, the additional Amtrak trains would add only approximately one ton of NO_x per year to the NO_x emissions that would result from the Proposed Acquisition.

Table 3.14-4. Summary of Cumulative Emissions Estimates in Chicago Nonattainment Areas

			Acquisition-related Emissions (tons/yr)		**Amtrak Emissions (tons/yr)**		**Total Emissions (tons/yr)[1]**		**Local MPO Emissions Budget (tons/yr)[1]**	
Nonattainment Area	**State**	**Pollutant**	**NO_X**	**VOC**	**NO_X**	**VOC**	**NO_X**	**VOC**	**NO_X**	**VOC**
Chicago Ozone Nonattainment Area	Illinois	O_3: Serious	112.8	4.9	1.2	0.1	114.0	5.0	54,850	21,950

Source: CMAP 2018

Notes:

[1] Annual budget of NOx and VOC extrapolated from tons per day budget in respective Long Range Transportation Plans assuming 365 days per year.

NOx = Nitrogen oxides; VOC = Volatile organic compounds; O3 = Ozone.

For the purposes of a cumulative impacts analysis, OEA looked at the emissions inventories of State Implementation Plans to capture the cumulative nature of potential emissions impacts from multiple sources. Guided by these emissions inventories, states develop emission budgets for various sources to determine the cumulative volume of pollutants. OEA projects that Acquisition-related NO_X emissions, coupled with the Amtrak emissions, would be less than one percent of the emissions budget for the Chicago Ozone Nonattainment Area. Therefore, OEA concludes that the cumulative impacts on air quality and increase Amtrak service would be minimal.

For the purposes of climate change, OEA followed the CEQ guidance by considering GHG emissions as a proxy for assessing the Proposed Acquisition's impact on climate change. OEA expects that the Proposed Acquisition would result in an overall decrease in GHG emissions of approximately 127,113 tons of CO_2e per year by removing approximately 64,000 trucks from roadways to rail each year—a beneficial cumulative impact. OEA expects that climate change would affect the 25 planned capital improvements, but that the Applicants would incorporate climate change resiliency into final engineering and design of the capital improvements consistent with the Applicants' proposed voluntary mitigation measure (VM), VM-21 (see *Chapter 4, Mitigation*).

3.14.4.5 Noise

As discussed in *Section 3.6, Noise and Vibration*, the Proposed Acquisition could result in increased noise along rail lines where increased rail traffic resulting from the Proposed Acquisition would meet or exceed the threshold for environmental review of eight or more additional trains per day or a doubling of traffic measured in GTM, as set forth at 49 C.F.R. § 1105.7(e). OEA concluded that there were no adverse vibration impacts on receptors for the study area; therefore, OEA did not analyze vibration in the study of cumulative impacts.

Reasonably foreseeable projects and actions that could result in increased noise in the study area could, along with the Proposed Acquisition, contribute to cumulative noise impacts that could potentially adversely affect noise-sensitive receptors (receptors), such as residences, schools, hospitals, nursing homes, and places of worship. The Proposed Acquisition would result in a projected increase of eight freight trains per day on rail line segments CELGI-01 and C-ELGI-02 along the Metra MD-W line between Elgin and Franklin Park. This is part of the route between Chicago and Rockford on which IDOT proposes new Amtrak service (**Table 3.14-5**). IDOT proposes four passenger trains as part of its expansion of Amtrak service between Chicago and Rockford. As shown in **Table 3.14-5**, there would be 561 receptors within the 65 Ldn noise contour with the Proposed Acquisition and 564 receptors within the 65 Ldn noise contour including the additional Amtrak passenger trains in the cumulative condition. There would be no cumulative noise impacts as there would be no increase in the number of receptors within the 65 Ldn noise contour with a 3 dBA noise increase.

Table 3.14-5. Potential Cumulative Noise Receptors between Chicago and Elgin

	Receptors within the 65 Ldn Noise Contour			
Rail Line Segments	**Existing Conditions**	**No-Action**	**Proposed Acquisition**	**Cumulative**
Bensenville, IL to Elgin, IL	189	237	561	564

Based on the Draft Environmental Assessment (EA) for the TAP, the noise contours for the OMP and O'Hare 21 projects overlap with the noise contours for the Proposed Acquisition (Draft TAP EA 2022). CDA established the O'Hare Residential Sound Insulation Program (RSIP) under the OMP wherein more than 85 percent of the receptors within the OMP airport noise contour have been sound insulated (CDA 2022). The remaining receptors have not been sound insulated but are potentially eligible for sound insulation as part of the CDA's ongoing RSIP. The Draft TAP EA identifies 227 residential housing units that would be exposed to adverse noise impacts with the airport project; 224 have been previously sound insulated by the CDA, and the other three are included in the CDA's ongoing RSIP for the OMP. Since these receptors are already insulated for aircraft noise or are eligible for insulation as part of the CDA's ongoing RSIP, no cumulative noise impacts are anticipated.

The Applicants have proposed voluntary mitigation to minimize the potential noise impacts. Applicants' voluntary mitigation, if imposed by the Board, would require the Applicants to fund the improvements necessary to allow any potentially affected community with an existing Quiet Zone to maintain that designation should the increase in Acquisition-related train traffic cause that community to fall out of compliance with Federal Railroad Administration regulations (VM-17).

3.14.4.6 Environmental Justice

One rail line segment (Bensenville to Elgin) that would experience increases in rail traffic resulting from the Proposed Acquisition is located near O'Hare Airport. Adverse noise impacts would occur under the Proposed Acquisition in a portion of three census block groups that OEA identified as potential EJ populations along this rail line segment. Portions of these three EJ block groups also fall within the 65 dBA Ldn noise contour of the OMP and the O'Hare 21 projects (Draft TAP EA 2022). The noise contours of these two projects overlap with noise contours for the Proposed Acquisition. Receptors located in the EJ block groups are included in the CDA's O'Hare RSIP under the OMP. Since these receptors located in EJ block groups are already insulated for aircraft noise or are eligible for insulation as part of the CDA's ongoing RSIP, no cumulative noise impacts are anticipated for EJ populations.

3.14.5 Cumulative Impacts from the Planned Capital Improvements

The proposed SGGR and CHC electrical transmission line projects could overlap geographically with the planned new sidings at MP 24 near Bellevue, Iowa and MP 71 near the Turkey River in Iowa. Therefore, cumulative impacts could potentially result from those planned capital improvements and the construction of the SGGR and CHC electric transmission line projects.

The Applicants' planned capital improvements would involve clearing, grubbing, and grading, and to a lesser extent some excavating, as well as placing fill material for additional track within the footprint of each capital improvement. The extent of such impacts would vary based on the affected environment, and the extent of clearing, grubbing, and earthmoving required for construction. OEA identified two topics with potential cumulative impacts. These are described below.

3.14.5.1 Biological Resources

Two proposed electrical transmission line projects could potentially overlap geographically with one or more of the planned capital improvements within the rail ROW. If this were to occur, then cumulative impacts on biological resources could result, but OEA expects that these cumulative impacts would be minor and would be minimized by the Applicants' voluntary mitigation measures and OEA's additional recommended mitigation measures set forth in *Chapter 4, Mitigation*. OEA identified suitable bat habitat for the Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*) at the planned capital improvements where the two proposed electrical transmission lines projects could potentially overlap. OEA concluded the Proposed Acquisition *may affect but is not likely to adversely affect* the Indiana and northern long-eared bat; therefore, OEA anticipates no cumulative impacts to the federally protected bats.

3.14.5.2 Water Resources

The planned capital improvements, in addition to the two reasonably foreseeable energy projects, could affect wetlands, particularly at the planned capital improvements at MP 71 near Turkey River in Iowa. Both the SGRR and CHC electric transmission line projects would be constructed in the same location or vicinity as the planned new siding. The capital improvement at this location has the potential to impact the largest acreage of wetlands. The large wetland system is immediately east of the track that runs for almost the entire length of the planned capital improvement footprint. Cumulative impacts to wetlands could occur depending on the siting of the SGRR and CHC projects. However, the CHC project, as currently designed, would not impact wetland resources in this location and the SGGR project is a buried electric cable, which would only result in temporary wetland impacts; therefore, cumulatively, impacts to wetlands would be minor.

3.14.6 Conclusion

Along with other reasonably foreseeable actions and projects in the study area, the Proposed Acquisition would contribute to cumulative impacts on passenger rail safety, grade crossing safety, grade crossing delay, noise, air quality, biological resources, and water resources.

Cumulative impacts on rail safety, grade crossing safety, grade crossing delay, noise, and air quality would occur due to the combination of increased freight rail traffic resulting from the Proposed Acquisition and increased passenger rail traffic resulting from expanded Amtrak service on rail line segments C-ELGI-01 and C-ELGI-02 between Elgin and Franklin Park in Illinois. The Proposed Acquisition could also result in cumulative impacts to segments between River Junction, Minnesota and St. Paul, which is part of the TCMC route between Chicago and the Twin Cities via Milwaukee on which Amtrak plans additional passenger rail service. These cumulative impacts would be low and would be minimized by the Applicants' proposed voluntary mitigation measures and OEA's additional recommended mitigation measures, as set forth in *Chapter 4, Mitigation*.

Cumulative impacts could also occur as a result of the Proposed Acquisition and the reasonably foreseeable SGRR and CHC electric transmission line projects because those transmission line projects could overlap geographically with the planned new sidings at MP 24 in Bellevue and at MP 71 near the Turkey River. To the extent that both the planned new sidings and the SGRR and CHC projects could impact wildlife habitat, wetlands, or other water resources, cumulative impacts would occur. These cumulative impacts would be minimal and would be minimized by the Applicants' proposed voluntary mitigation measures and OEA's additional recommended mitigation measures, as set forth in *Chapter 4, Mitigation*.

3.15 Short-Term Uses versus Long-Term Productivity of the Environment

This section addresses the environmental consequences of both the short-term uses of environmental resources and the long-term productivity of the environment (40 C.F.R. §1502.16) related to the Proposed Acquisition. In this context, short-term uses are generally related to construction impacts, while long-term productivity is typically related to operational impacts.

The Proposed Acquisition would result in increased rail traffic along some rail lines, and changes in operational activity at some rail yards and intermodal facilities. If the Board authorizes the Proposed Acquisition, the Applicants also plan to add 25 capital improvements, including new passing sidings, siding extensions, double track, and facility working track within the rail right-of-way. This section describes the short-term uses and associated long-term productivity for each resource if the Board authorizes the Proposed Acquisition.

Under the No-Action Alternative, CP would not acquire KCS. Therefore, rail traffic on rail lines and activity at rail yards and intermodal facilities would not change as a result of the Proposed Acquisition and the Applicants would not build the 25 planned capital improvements as a result of the Proposed Acquisition. However, rail traffic on rail lines and activity at rail yards and intermodal facilities could change in the future under the No-Action Alternative as a result of changing market conditions, such as general economic growth. In addition, CP or KCS could make capital improvements along their rail lines in the future without seeking Board authority.

3.15.1 Noise

The 25 planned capital improvements would result in noise impacts associated with short-term use of resources. The use of construction equipment for the planned capital improvements would generate temporary increases in noise at the locations where improvements are planned. Changes in rail traffic on the combined CPKC rail system would involve noise impacts to long-term productivity. Although OEA expects the Proposed Acquisition would not cause individual passing trains to become substantially louder, the increased number of trains on some rail lines would increase the day-night average noise level along those lines over the long term. The Applicants have proposed voluntary mitigation measures to minimize noise and vibration impacts and OEA is recommending additional mitigation measures, as set forth in *Chapter 4, Mitigation*.

3.15.2 Air Quality

OEA anticipates short-term impacts to air quality related to the planned capital improvements. During construction, criteria pollutants, hazardous air pollutants, greenhouse gases, and fugitive dust emissions could increase. OEA anticipates this increase would be temporary, and it would cease immediately once the Applicants completed the planned capital improvements.

Measured at the national or global scale, OEA expects that the Proposed Acquisition would not result in an overall increase in air pollutant emissions, including GHG emissions, and could result in an overall decrease in emissions due to the expected diversion of freight from truck to rail transportation and the resulting removal of approximately 64,000 trucks per year from highways. However, because the Proposed Acquisition would divert trains from other railroads to the CPKC network, OEA expects that localized emissions of air pollutants, especially nitrogen oxides, from locomotives would increase along certain specific rail line segments. This change in local emissions would have impacts on long-term productivity because it would continue indefinitely into the future. However, the Applicants anticipate that the CPKC rail fleet would become cleaner over the coming years because the Proposed Acquisition would result in an excess of locomotives which would allow for optimal use of newer, more fuel-efficient trains, which would reduce impacts to air quality. The Applicants have also proposed voluntary mitigation measures to minimize air quality impacts, as set forth in *Chapter 4, Mitigation*.

3.15.3 Energy

Short-term energy use would consist of construction equipment and vehicles temporarily consuming diesel and gasoline fuel during the planned capital improvement construction. In the long-term, OEA expects that the Proposed Acquisition would have a beneficial impact on energy efficiency by diverting freight transportation from truck to rail, which would reduce fuel consumption by an estimated 7.97 million gallons per year compared to the No-Action Alternative.

3.15.4 Biological Resources

The planned capital improvements may require some tree clearing, grading, and placing fill material. Constructing the planned capital improvements would therefore remove and alter some vegetation and wildlife habitat. Short-term use of the land could result in temporary adverse impacts to plants, wildlife, protected species, and wildlife habitat. There may be minimal impacts to long-term productivity as a result of removing and altering some vegetation and wildlife habitat within the right-of-way. The Applicants have proposed voluntary mitigation measures to minimize impacts to biological resources, as set forth in *Chapter 4, Mitigation*.

3.15.5 Water Resources

Based on conceptual design information and OEA's conservative assumptions about how the Applicants would construct the 25 planned capital improvements, OEA estimates that the capital improvements could temporality or permanents impact up to a total of approximately 16 acres of wetlands across the 25 locations. This would impact long-term wetland productivity through permanent losses due to filling and/or development, as well as adverse impacts to wetland function. If any of the capital improvements would require a permit under Section 404 of the Clean Water Act from the Corps, then this permit could require the Applicants to restore or replace wetlands and wetland functions over time through mitigation, which would reduce or prevent impacts to long-term productivity. OEA also anticipates approximately 1.5 acres of stream impacts under the Proposed Acquisition, as a result of crossings and fill. Long-term productivity could be impacted due to permanent changes to impacted streams. However, the impacted area is relatively small. The Applicants have proposed voluntary mitigation measures to minimize impacts to water resources, as set forth in *Chapter 4, Mitigation*.

3.16 Irreversible and Irretrievable Commitment of Resources

This section addresses irreversible or irretrievable commitment of resources (40 C.F.R. § 1502.16), which is defined as impacts on or losses of resources that cannot be recovered or reversed. An irreversible commitment of resources typically applies to impacts related to the use of nonrenewable resources, such as fossil fuels, or resources that are renewable only over long periods of time, such as soils, and the subsequent loss of future options related to their use. An irretrievable commitment of resources generally applies to a loss of production, harvest, or use of natural resources, in which the production lost is not retrievable, but the action is not irreversible. The use of farmland for non-agricultural purposes, for example, would constitute an irretrievable commitment of resources.

The Proposed Acquisition would result in increased rail traffic at some locations and changes in operational activity at some rail yards and intermodal facilities. Operating locomotives on rail lines and trucks and other equipment at rail yards involves the use of fuels made from nonrenewable resources. However, because changes in rail traffic and operational activities at rail yards would be caused by the diversion of rail traffic from other rail lines and from trucks, those changes would not result in new irreversible or irretrievable commitments of resources. If the Board authorizes the Proposed Acquisition, the Applicants also plan to add 25 capital improvements, including new passing sidings, siding extensions, double track, and facility working track within the rail right-of-way. The planned capital improvements would require the irretrievable commitment of resources, including materials for construction and fuel used during construction.

3.16.1 Energy

Construction activities associated with the planned capital improvements would consume diesel and gasoline fuel to power construction equipment and vehicles. Using fuel for construction would occur over a limited time span. However, once the Applicants have completed the Proposed Acquisition and associated planned capital improvements, operating trains on the integrated CPKC rail system would continuously require diesel fuel. Both construction activities and rail operation would therefore require the irreversible commitment of a nonrenewable resource, fossil fuels.

However, overall, OEA anticipates that the Proposed Acquisition would have a beneficial impact on energy efficiency. A substantial amount of freight transportation along the rail network route would be diverted from truck to rail and the remainder of the increased traffic would be diverted from other rail lines. The diversion of freight from truck transportation to rail would reduce consumption of diesel fuel by 7.97 million gallons per year, compared to the No-Action Alternative, which would partially or entirely offset the irreversible use of fossil fuels related to the Proposed Acquisition.

3.16.2 Biological Resources

The planned capital improvements would predominantly occur within previously disturbed areas of the ROW. However, some tree clearing, grading, and placing fill material would be necessary outside of these previously disturbed areas, to accommodate some of the planned capital improvements. Constructing the planned capital improvements would irreversibly remove and alter some vegetation and wildlife habitat, including habitat for the endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*). The loss of vegetation and habitat through permanent conversion into structures associated with the rail network would represent an irreversible commitment of biological resources. Wildlife collisions with construction equipment and vegetation temporarily impacted by the planned capital improvements that does not recover would also constitute irreversible commitments of biological resources.

The Proposed Acquisition may cause impacts to wildlife as a result of increased noise, vibration, and human presence during construction activities, which could impede behaviors like breeding and foraging, or cause animals to disperse. This would lead to an irretrievable commitment of biological resources. Increases in rail traffic associated with the Proposed Acquisition could lead to both irretrievable and irreversible commitments of biological resources. Increased train traffic could result in increased wildlife mortality related to collisions. The increase in noise and vibrations associated with increased train traffic could also lead to disturbance of nearby wildlife, causing distress, dispersal, and disruption of biological processes.

Some irreversible and irretrievable commitments of biological resources are inevitable, given the conditions outlined above. To minimize these impacts, OEA is recommending the mitigation measures set forth in *Chapter 4, Mitigation*.

3.16.3 Water Resources

OEA has determined that across all of the planned capital improvements, impacts would total approximately 16 acres of wetlands and 1.5 acres of streams. The wetland impacts are related to filling in wetlands to accommodate improvements. The loss of wetlands through permanent conversion into roadbed, ballast, ties, and rail would result in the irreversible commitment of these wetlands, as well as associated fishes, plant communities, and protected species. The anticipated stream impacts are related to fill and crossings (such as, impacts from bridge abutments and culverts). Filling or altering streams to accommodate the planned capital improvements would also constitute an irreversible commitment of resources.

Chapter 4
Mitigation

This chapter describes mitigation measures that, if imposed by the Board, would avoid, minimize, or compensate for environmental impacts of the Proposed Acquisition. The regulations implementing NEPA require that agencies consider mitigation that could reduce the environmental impacts of their actions, but NEPA does not mandate the form or adoption of any mitigation (40 C.F.R. § 1508.1(s)). In this case, the Applicants have voluntarily asked the Board to impose a number of mitigation measures, and OEA is ~~preliminarily~~ recommending additional mitigation measures based on the results of OEA's environmental analysis and public and agency consultation. If the Board decides to grant the Applicants' request for authority for CP to acquire KCS, the mitigation measures set out in this chapter could become conditions of the Board's decision.

4.1 Conditioning Power of the Board

The Board has the authority to impose conditions to mitigate environmental impacts, but that authority is not limitless. Any mitigation measure the Board imposes must relate directly to the transaction before the Board, must be reasonable, and must be supported by the record before the Board. OEA's consistent practice has been to recommend mitigation only for those impacts that would result directly from a proposed transaction. The Board does not require mitigation for pre-existing environmental conditions, such as the effects of existing rail operations. Other agencies are mentioned in OEA's ~~preliminary~~ final recommended mitigation because certain mitigation measures would require the Applicants to consult, apply for a permit from, or obtain approval from these agencies.

4.2 Voluntary Mitigation and Negotiated Agreements

OEA encourages applicants seeking Board authority to propose voluntary mitigation to address the potential environmental impacts of their proposals. In some situations, voluntary mitigation could replace, supplement, or extend further than mitigation measures the Board might otherwise impose. Applicants often have knowledge about issues associated with a proposed acquisition because of project planning and consultation with regulatory agencies during the planning process. As a result, applicants can volunteer mitigation that often is above and beyond or in addition to regulatory requirements. The Board's practice is to require compliance with any voluntary mitigation agreed to by applicants in any final decision authorizing the proposed transaction.

OEA also encourages applicants to negotiate mutually acceptable agreements with affected communities and other government entities. Negotiated agreements could be with neighborhoods, communities, counties, cities, regional coalitions, states, and other entities. ~~In this case, if the Applicants inform the Board that any such negotiated agreements have~~

~~been reached, the Board will require compliance with the terms of the agreements as environmental conditions in any final decision authorizing the Proposed Acquisition.~~

In this case, the Applicants have informed OEA that, to date, they have entered into agreements with the following communities:

- City of Davenport, Iowa
- City of Bettendorf, Iowa
- City of Muscatine, Iowa
- City of LeClaire, Iowa
- City of Clinton, Iowa
- City of Washington, Iowa
- City of Fruitland, Iowa
- Village of Hampshire, Illinois
- Village of Pingree Grove, Illinois
- City of Liberty, Missouri

OEA recommends that the Board impose a condition requiring the Applicants to comply with the terms of these agreements as environmental mitigation in any final decision authorizing the Proposed Acquisition. The Applicants also have submitted extensive voluntary mitigation. For example, voluntary mitigation measures submitted by the Applicants include commitments to install and fund ITS Interconnect for Advanced Warning Signs at strategic locations, Positive Train Control wireless technology tie-ins at crossings adjacent to Metra platforms and a predictive mobility system, interconnected with existing railroad crossing signals, that will deliver advanced notice of blocked crossings to citizens, police, fire, and rescue operations, and others for Chicago-area communities (VM-~~-~~-Community-03). The Applicants submitted these voluntary mitigation measures in a letter to OEA on November 8, 2022, and clarified the extent of their commitments in a subsequent letter dated January 12, 2023. OEA recommends that the Board impose conditions requiring compliance with both voluntary mitigation and the agreements negotiated with communities in any final decision authorizing the Proposed Acquisition.

4.3 ~~Preliminary Nature of~~ The Mitigation Process

OEA's ~~preliminary~~ final recommended mitigation measures are based on information available to date, consultation with appropriate agencies, and the environmental analysis presented in ~~this~~ the ~~Draft~~ Environmental Impact Statement (EIS). The Board could impose these ~~preliminary~~ final recommended mitigation measures in addition to the Applicants' voluntary mitigation measures. ~~OEA emphasizes that the identified mitigation measures are preliminary and invites public and agency comments on these proposed mitigation measures. For OEA to assess the comments effectively, it is critical that the public be specific regarding any desired mitigation and the reasons why the suggested mitigation would be appropriate.~~

OEA has made its final recommendations on mitigation to the Board in this Final EIS after having considered all agency and public comments on the Draft EIS. OEA has included all voluntary mitigation measures submitted by the Applicants during the EIS process in its recommendations to the Board. After the conclusion of the EIS process, the Board will make its final decision regarding the Proposed Acquisition and any conditions it might impose. In making its decision, the Board will consider the ~~this~~ Draft EIS, the Final EIS, all public and agency comments received, and OEA's final recommended mitigation.

4.4 Mitigation Measures

The following sections provide the Applicants' voluntary measures (VM) and OEA's final recommended ~~preliminary~~ mitigation measures (MM) for each affected resource. OEA has not edited the VMs to match the style of the ~~Draft~~ EIS with the exception of the numbering convention. Where mitigation measures from one resource area apply to another resource, the mitigation number is referenced but the text of the measure is not repeated.

The mitigation measures in the Final ~~Draft~~ EIS address all environmental issue areas analyzed except energy. OEA has concluded that the Proposed Acquisition would not have adverse impacts on energy and, therefore, does not recommend any ~~preliminary~~ mitigation measures for this resource area. OEA also does not address the No-Action Alternative in this chapter because the Board would not be taking an action and this alternative would result in no change in impacts from those already occurring in the existing environment.

4.5 General Mitigation Measures

4.5.1 Applicants' Voluntary Mitigation Measures

The Applicants voluntarily propose the following general mitigation measures. As used in the Applicants' voluntary mitigation measures, the term "potentially affected communities" means those jurisdictions through which the Applicants' right-of-way (ROW) passes and in which traffic increases resulting from the Proposed Acquisition would exceed the Board's environmental review thresholds. As used in the Applicants' voluntary mitigation measures, the term "capital improvements" refers to the 25 planned Capital Improvement Projects identified in the Applicants' application and discussed throughout this ~~Draft~~ EIS.

VM-General-01. The Applicants will continue to engage in good faith with potentially affected communities along the combined network, listen to their input related to the proposed merger and strive to reach negotiated agreements to address merger-related impacts.

VM-General-02. The Applicants will follow all applicable Federal Railroad Administration (FRA) and Occupational Safety and Health Administration construction and operational safety regulations to minimize the potential for incidents during construction of the Capital Improvement Projects and operation of the combined network.

4.5.2 OEA's Final ~~Preliminary~~ Recommended Mitigation

OEA ~~preliminarily~~ recommends the following additional general mitigation measures:

MM-General-01. If there is a material change in the facts or circumstances upon which the Board relied in imposing specific environmental mitigation conditions, and upon petition by any party who demonstrates such material change, the Board shall consider revising its final mitigation, if warranted and appropriate.

MM-General-02. The Applicants shall submit quarterly reports to OEA on the progress of, implementation of, and compliance with all Board-imposed environmental mitigation measures. The reporting period for these quarterly reports shall begin on the date of the Board's final decision authorizing the acquisition and continue for five years, or one year after the Applicants have completed capital improvements related to the acquisition, whichever is longer. The Applicants shall submit copies of the quarterly reports within 30 days following the end of each quarterly reporting period and distribute the reports to appropriate federal and state agencies, as specified by OEA.

MM-General-03. To minimize the potential for impacts on biological resources, water resources, hazardous materials release sites, and cultural resources, the Applicants shall, to the greatest extent possible, confine construction activities related to the planned capital improvements to the area within the existing ROW.

4.6 Freight and Passenger Rail Safety

4.6.1 Applicants' Voluntary Mitigation Measures

The Applicants voluntarily propose the following measures to mitigate impacts to rail operations safety:

VM-Rail-01. The Applicants will comply with FRA and Pipeline and Hazardous Materials Safety Administration regulations applicable to the safe and secure transportation of hazardous materials.

VM-Rail-02. The Applicants will comply with the Safety Integration Plan (SIP), prepared pursuant to 49 C.F.R. Part 1106, which may be modified and/or updated as necessary to respond to evolving conditions and/or new information. In the event of a reportable hazardous materials release, the Applicants will notify appropriate federal, state, and local agencies, as required under applicable law.

VM-Rail-03. The Applicants will conduct Transportation Community Awareness and Emergency Response Program (TRANSCAER) workshops (training for communities through which dangerous goods are transported) in potentially affected communities that request this training. The Applicants will conduct the workshops in English and, upon request, Spanish. Training will include support for appropriate access to the AskRail app and its use to facilitate rapid, real-time access for qualified responders to information about hazardous materials in rail transportation.

VM-Rail-04. The Applicants will offer to fund the participation in railroad focused emergency response training at the Association of American Railroads' Security and Emergency Response Training Center in Pueblo, Colorado, of two qualified firefighters providing service within each of the potentially affected communities.

VM-Rail-05. The Applicants will leverage CP's extensive emergency response equipment assets by reviewing coverage of those assets across CPKC. The Applicants will either redistribute existing assets or add new equipment assets to improve emergency response capabilities relating to the potentially affected communities on CPKC.

VM-Rail-06. The Applicants will abide by their commitments to Amtrak in their agreement dated December 17, 2021. In general, the Applicants will support the efforts of Amtrak and the Southern Rail Commission to establish Amtrak service between New Orleans and Baton Rouge, and study the potential for Amtrak service between Meridian, Mississippi and Dallas, Texas. Additionally, Applicants will work with Amtrak to increase the frequency on the Hiawatha service between Chicago and Milwaukee; extend Hiawatha service from Milwaukee to Saint Paul and create a second round-trip on the Twin Cities-Milwaukee-Chicago corridor; and establish passenger service through the Detroit River Tunnel, connecting Detroit to Windsor, Ontario in order to facilitate passage service between Detroit and Windsor connecting to VIA Rail.

4.6.2 OEA's ~~Preliminary~~ Final Recommended Mitigation

~~As discussed in *Section 3.1, Freight and Passenger Rail Safety*, OEA did not identify any adverse effects related to freight and passenger rail safety that would warrant mitigation. Therefore, OEA does not recommend additional mitigation at this time, beyond what is currently proposed by the Applicants.~~

OEA recommends the following additional mitigation measure to address freight and passenger rail safety impacts:

MM-Rail-01. The Applicants shall comply with the SIP prepared under 49 C.F.R. Part 1106 and 49 C.F.R. § 244.9, which may be updated as necessary, and shall continue to coordinate with FRA in implementing the SIP during the operations integration period. The ongoing safety integration process shall continue until FRA has informed the Board that the integration of Applicants' operations has been safely completed.

4.7 Grade Crossing Safety and Delay

4.7.1 Applicants' Voluntary Mitigation Measures

The Applicants voluntarily propose the following measures to mitigate impacts on safety and delay at roadway/rail at-grade crossings (grade crossings):

VM-Grade Crossing-01. Although the Applicants have not identified any grade crossings that would require mitigation based on precedent established in other approved mergers, the

Applicants will, upon request, work 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 at-grade crossings.

VM-Grade Crossing-02. ~~The Applicants will operate under U.S. Operating Rule No. 526 (Public Crossings), which provided that public crossings must not be blocked longer than 10 minutes unless it cannot be avoided and that, if possible, rail cars, engines, and rail equipment may not stand closer than 200 feet from a roadway/rail at-grade crossing when there is an adjacent track.~~The Applicants will 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-03. The Applicants will consult with potentially affected communities to improve visibility at roadway/rail at-grade crossing by clearing vegetation where practicable.

VM-Grade Crossing-04. Where practicable, the Applicants will investigate the potential to create alternative access for properties whose sole access will be blocked more than once per week by a train stationary longer than 10 minutes at a single location.

VM-Grade Crossing-05. For the construction of additional track through road crossings within the limits of the Capital Improvement Projects, where practicable, the Applicants will consult with local transportation officials regarding detours and associated signs, as appropriate, or attempt to maintain at least one open lane of traffic, as practicable, to allow the quick passage of emergency and other vehicles.

VM-Grade Crossing-06. The Applicants will notify Emergency Services Dispatching Centers for potentially affected communities of all crossings blocked by trains that are stopped and may be unable to move for a significant period of time.

4.7.2 OEA's ~~Preliminary~~ Final Recommended Mitigation

~~As discussed in *Section 3.2, Grade Crossing Safety* and *Section 3.3, Grade Crossing Delay*, OEA did not identify any substantial adverse effects related to grade crossing safety and delay. Therefore, OEA does not recommend additional mitigation at this time, beyond what is currently proposed by the Applicants.~~

OEA recommends the following additional mitigation measure to address impacts related to grade crossing safety and delay:

MM-Grade Crossing-01. The Applicants shall consult with appropriate state Departments of Transportation and other appropriate agencies, including the Illinois Commerce Commission for grade crossings in Illinois, prior to constructing, relocating, upgrading, or modifying grade crossings as part of the acquisition, including grade crossing warning devices, and shall abide by those agencies' reasonable requirements for the design of grade crossings and associated warning devices.

4.8 Noise and Vibration

4.8.1 Applicants' Voluntary Mitigation Measures

The Applicants voluntarily propose the following measures to mitigate noise and vibration impacts:

VM-Noise-01. The Applicants will fund the improvements necessary to allow any potentially affected community with an existing Quiet Zone to maintain that designation should the increase in merger related train traffic cause that community to fall out of compliance with FRA regulations.

VM-Noise-02. While building the Capital Improvement Projects, the Applicants will work with their construction contractors to minimize, where practicable, construction-related noise disturbances between the hours of 2100 and 0700 local time.

VM-Noise-03. In the construction of the Capital Improvement Projects, the Applicants will, where practicable and consistent with safe and efficient operating practices, use continuously welded rail in order to reduce wheel/rail wayside noise.

4.8.2 OEA's ~~Preliminary~~ Final Recommended Mitigation

OEA recommends the following additional mitigation measures to reduce noise and vibration impacts:

MM-Noise-01. To minimize noise and vibration, the Applicants shall maintain rail and rail beds according to American Railway Engineering and Maintenance-of-Way Association standards.

MM-Noise-02. The Applicants shall comply with FRA regulations establishing decibel limits for train operations.

MM-Noise-03. The Applicants shall consider lubricating curves where doing so would both be consistent with safe and efficient operating practices and significantly reduce noise for residential or other noise sensitive receptors.

MM-Noise-04. The Applicants shall employ safe and efficient operating procedures that, in lieu of, or as complement to, other noise mitigation measures can have the collateral benefit of effectively reducing noise from train operations. Such procedures may include:

- Inspecting rail car wheels to maintain wheels in good working order and minimize the development of wheel flats;
- Inspecting new and existing rail for rough surfaces and, where appropriate, grinding these surfaces to provide a smooth rail surface during operations;
- Regularly maintaining locomotives and keeping mufflers in good working order; and

- Removing or consolidating switches that the Applicants determine are no longer needed.

MM-Noise-05. The Applicants shall promptly respond to community inquiries concerning the establishment of Quiet Zones and assist communities in identifying supplemental or alternative safety measures, practical operational methods, or technologies that may enable the community to establish Quiet Zones in accordance with FRA's final rule on the "Use of Locomotive Horns at Highway-Rail Grade Crossings."

4.9 Air Quality and Climate Change

4.9.1 Applicants' Voluntary Mitigation Measures

The Applicants voluntarily propose the following measures to mitigate air quality and climate change impacts:

VM-Air-01. The Applicants commit to developing Green House Gas (GHG) reduction targets for the combined network and request verification as appropriate from the Science Based Targets initiative (SBTi). As reference, CP's current SBTi approved target is a 38.3 percent reduction in well-to-wheels GHG emissions (on an intensity basis) from locomotive operations by 2030 compared to a 2019 base year. CP has also committed to committed to 27.5 percent GHG reduction (on an absolute basis) by 2030 compared to a 2019 base year for non-locomotive Scope 1 and Scope 2 emissions. KCS has a SBTi target to reduce Scope 1 and 2 GHG emissions by 42 percent by 2034.

VM-Air-02. The Applicants commit to undertaking a combined network in-depth climate scenario analysis aligned to Task Force on Climate-related Financial Disclosures (TCFD) recommendations to understand how a changing climate may impact CPKC. The Applicants further commit to improving the resiliency of the combined network to the physical risks of climate change through its capital program.

VM-Air-03. As part of the ongoing reconfiguration of Bensenville Yard (a non-merger related project being undertaken as part of the development of the Illinois Tollway's Elgin O'Hare Western Access Project), the Applicants commit to undertake studies to identify ways to reduce the GHG emissions (and by extension, also reduce other air emissions) at Bensenville Yard.

VM-Air-04. The Applicants will comply with U.S. Environmental Protection Agency (EPA) emissions standards for diesel-electric railroad locomotives when purchasing and rebuilding locomotives.

VM-Air-05. The Applicants will develop an anti-idling policy for use in potentially affected communities on the combined network. The policy will capture both idling of construction equipment used on the Capital Improvement Projects as well as ongoing operations.

VM-Air-06. To minimize fugitive dust emissions created during the construction of the Capital Improvement Projects, the Applicants will implement appropriate fugitive dust suppression controls, such as spraying water or other approved measures.

VM-Air-07. The Applicants will work with the contractors selected to construct the Capital Improvement Projects to make sure that construction equipment is properly maintained and that mufflers and other required pollution-control devices are in working condition in order to limit construction-related air emissions.

VM-Air-08. Where vegetation clearing has taken place during the construction of the Capital Improvement Projects, the Applicants will begin revegetation as soon as practicable to minimize impacts of wind erosion and fugitive dust. Where immediate revegetation is not practicable, the Applicants will implement alternative stabilization measures such as matting, mulching, or hydroseeding.

4.9.2 OEA's ~~Preliminary~~ Final Recommended Mitigation

As discussed in *Section 3.7, Air Quality and Climate Change*, OEA did not identify any substantial adverse effects related to air quality and climate change that could be addressed by mitigation measures within the Board's authority to impose. Therefore, OEA does not recommend additional mitigation beyond what is currently proposed by the Applicants in their voluntary mitigation.

4.10 Cultural Resources

4.10.1 Applicants' Voluntary Mitigation Measures

The Section 106 process of the National Historic Preservation Act is complete. Therefore, voluntary mitigation measure VM-Cultural-01 previously proposed by the Applicants is unnecessary and OEA is not recommending that the Board impose the condition (see *Section 3.9, Cultural Resources*).

~~The Applicants voluntarily propose the following measures to mitigate impacts to cultural resources:~~

~~**VM-Cultural-01**. The Applicants will abide by the terms of any agreement negotiated pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations that addresses the potential impact(s) of the Capital Improvement Projects on cultural resources.~~

4.10.2 OEA's ~~Preliminary~~ Final Recommended Mitigation

As discussed in *Section 3.9, Cultural Resources*, OEA concludes that the Proposed A~~a~~cquisition would not adversely affect any historic properties listed in or eligible for listing in the National Register of Historic Places (National Register). OEA recommends the following additional mitigation measures to minimize impacts on cultural resources:

MM-Cultural-01. Prior to beginning any construction activities related to the 25 planned capital improvements, the Applicants shall prepare a construction monitoring plan that addresses the following:

- Training procedures to familiarize construction personnel with the identification and appropriate treatment of historic properties;
- Monitoring of construction activities by a qualified professional archaeologist;
- Provisions for monitoring and coordination for work within tribal reservation boundaries;
- Provisions for the unanticipated discovery of archaeological sites or associated artifacts during construction activities, including procedures for notifying OEA and the appropriate State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO), pursuant to 36 C.F.R. § 800.13(b) in the event of an unanticipated discovery; and
- Provisions for complying with the Native American Graves Protection and Repatriation Act (25 U.S.C. § 3001-3013) and other applicable federal, state, and local laws and regulations in the event of inadvertent discoveries of an unanticipated discovery of unmarked human remains during construction activities.

The Applicants shall provide the construction monitoring plan to OEA and appropriate THPOs for review no later than 30 days prior to the start of any construction activities related to the 25 planned capital improvements and shall abide by the provisions of the plan, including any revisions by OEA and appropriate THPOs, during construction activities.

MM-Cultural-02. The Applicants shall abide by their commitments to design and engineer the 25 planned capital improvements to remain within existing rail ROW, to maintain the existing rail footprint in locations immediately adjacent to archaeological sites that OEA has identified as eligible for listing on the National Register, and to not perform any construction activities related to the 25 planned capital improvements within the boundaries of National Register-eligible archeological sites identified by OEA.

4.11 Hazardous Material Release Sites

4.11.1 Applicants' Voluntary Mitigation Measures

The Applicants voluntarily propose the following measures to mitigate hazardous material release site impacts:

VM-Haz. Material Sites-01. The Applicants will require its construction contractor(s) to implement measures to protect workers' health and safety and the environment in the event that undocumented hazardous material are encountered during construction of the Capital Improvement Projects. The Applicants will document all activities associated with the previously undocumented contamination and will notify the appropriate state agencies according to applicable regulations. The Applicants will use disposal methods which comply with applicable solid and hazardous waste regulations.

VM-Haz. Material Sites-02. Prior to the start of construction for each Capital Improvement Project, the Applicants will develop a site-specific spill prevention, control and response plan. This plan will specify measures to prevent the release of petroleum products or other hazardous materials during construction activities and contain such discharges if they occur.

VM-Haz. Material Sites-03. In the event of a spill over the applicable reportable quantity during the construction of a Capital Improvement Project, the Applicants will comply with its site-specific spill prevention, control and response plan and applicable federal and state regulations pertaining to spill containment, appropriate clean-up, and notifications.

VM-Haz. Material Sites-04. During the construction of the Capital Improvement Projects, the Applicants will ensure that gasoline, diesel fuel, oil, lubricants, and other petroleum products are handled and stored to reduce the risk of spills contaminating soils or surface waters. If a petroleum spill occurs as a result of construction, and exceeds specific quantities or enters a waterbody, the Applicants (or its agents) will be responsible for promptly cleaning up the spill and notifying responsible agencies in accordance with federal and state regulations.

VM-Haz. Material Sites-05. The Applicants will require contractors to dispose of waste generated on the Capital Improvement Projects in accordance with all applicable federal, state, and local regulations.

4.11.2 OEA's ~~Preliminary~~ Final Recommended Mitigation

OEA recommends the following additional mitigation measures to mitigate hazardous material release site impacts:

MM-Haz Material Sites-01. The Applicants shall notify EPA prior to undertaking any capital improvements related to the acquisition within the EPA Orongo-Duenweg Mining Belt Superfund site.

MM-Haz Material Sites-02. The Applicants shall notify the Iowa Department of Natural Resources prior to undertaking any capital improvements related to the acquisition that could affect the Archer Daniels Midland Corn Processing Facility Industrial Waste Landfill near the Camanche, Iowa site.

MM-Haz Material Sites-04. The Applicants shall use established standards for recycling or reuse of construction materials, such as ballast and rail ties, during the construction of capital improvements related to the acquisition. When recycling construction materials is not a viable operation, the Applicants shall use disposal methods that comply with applicable solid and hazardous waste regulations.

MM-Haz Material Sites-05. For capital improvements related to the acquisition, the Applicants shall follow American Society of Testing and Materials E1527-05, Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process in areas where potential contamination could be encountered. If the Applicants encounter contamination (or signs of potential contamination) during these activities, Applicants shall perform a Phase 2 environmental investigation. Should findings of a Phase 2 environmental investigation identify contamination in soil and/or groundwater, the Applicants shall coordinate with relevant state agencies on regulatory obligations and comply with those agencies' reasonable requirements for avoiding impacts related to soil and/or groundwater contamination.

4.12 Biological Resources

4.12.1 Applicants' Voluntary Mitigation Measures

The Applicants voluntarily propose the following measures to mitigate impacts to biological resources:

VM-Biological-01. In alignment with CP's Environmental Policy, the Applicants commit to implementing methods to promote No Net Loss of sensitive habitats (e.g., aquatic areas, wetlands, riparian areas, native prairie, old growth forest) when constructing the Capital Improvement Projects.

VM-Biological-02. Where practicable, the Applicants will clear vegetation in preparation for the Capital Improvement Projects before or after the breeding bird nesting season, specific to each project location, to avoid inadvertent removal of active nests (nesting adults, young, or eggs) and to ensure compliance with the Migratory Bird Treaty Act. If clearing is required during a respective location's nesting season, the Applicants will consult with OEA and the local office of the U.S. Fish and Wildlife Service (USFWS) on appropriate nest survey methods for that area.

VM-Biological-03. The Applicants will not conduct construction related tree removal for the Capital Improvement Projects during the active season for the Indiana bat and the northern long-eared bat (April 1 to October 31).

VM-Biological-04. During the construction of the Capital Improvement Projects, the Applicants will take steps to reduce the unnecessary removal of bat habitat outside of active bat season by limiting tree removal to only the areas necessary to safely construct and operate the new siding or second track, marking the limits of tree clearing through the use of flagging or fencing, and ensuring that construction contractors understand clearing limits and how they are marked in the field.

VM-Biological-05. If construction of the Capital Improvement Projects would require removal or alteration of bridges, culverts, or other structures that provide suitable habitat for the northern long-eared bat or the Indiana bat during the active season for those species (April 1 to October 31), the Applicants will first conduct an inspection for the presence of, or evidence of use by, bats. The inspection will be completed by a qualified biologist. If the inspection finds bats or evidence of bats, then the Applicants will not commence work on the structure until coordinating with OEA and USFWS to determine appropriate follow-up or mitigative actions. The inspection must be completed during the same year that the work takes place.

VM-Biological-06. Where practicable, the Applicants will conduct any culvert or bridge removal as part of the Capital Improvement Projects outside of the roosting period of bat species, specific to each project location. Where practicable, if bridge or culvert removal is required during the bat roosting period where the individual Capital Improvement Project is located, the Applicants will consult with OEA and the local USFWS office on appropriate methods to determine if bats are using the bridge or culvert as a roost.

VM-Biological-07. During construction of the Capital Improvement Projects, the Applicants will direct any temporary lighting away from suitable habitat for the northern long-eared bat or the Indiana bat during the active season for those species (April 1 to October 31). The Applicants will use downward-facing, full cut-off lens lights for any temporary lighting used during the construction of the Capital Improvement Projects.

VM-Biological-08. If the Capital Improvement Projects would involve installing any new, or replacing any existing, permanent lights, the Applicants will use downward-facing, full cut-off lens lights (with the same intensity of less for replacement lighting).

VM-Biological-09. During construction of the Capital Improvement Projects, temporary barricades, fencing, and/or flagging will be used in sensitive habitats to contain construction related impacts to the area within the construction ROW. To the extent possible, staging areas will be located in previously disturbed sites and not in sensitive habitat areas.

VM-Biological-10. The Applicants will limit ground disturbance to only the areas necessary for the construction of the Capital Improvement Projects.

VM-Biological-11. The Applicants will use construction methods and seed mixes that minimize introduction and spread of noxious weeds on the Capital Improvement Projects. Noxious weed control will include combinations of mechanical and herbicide spray methods.

VM-Biological-12. The Applicants will ensure that any herbicides used in ROW maintenance to control vegetation are approved by EPA and are applied by licensed individuals who will limit application to the extent necessary for safe rail operations. Herbicides will be applied so as to prevent or minimize drift off of the ROW onto adjacent areas.

VM-Biological-13. As applicable to each of the individual Capital Improvement Projects, the Applicants will protect bald and golden eagles by adhering to the Bald and Golden Eagle Protection Act. In addition, the Applicants will follow the USFWS National Bald Eagle Management Guidelines, as applicable.

4.12.2 OEA's ~~Preliminary~~ Final Recommended Mitigation

OEA recommends the following additional mitigation measures to mitigate impacts to biological resources:

MM-Biological-01. For capital improvements related to the acquisition, the Applicants shall not knowingly include any federally- or state-listed invasive weed species in seed mixes for revegetating disturbed areas within the rail ROW.

MM-Biological-02. During final design and engineering of capital improvement projects related to the acquisition, the Applicants shall reexamine the USFWS list of threatened or endangered species. If the list has changed to include newly listed species or newly designated critical habitat, or if new information reveals that listed species or critical habitat could be affected by the capital improvements, the Applicants shall consult with OEA and USFWS regarding avoidance, minimization, and mitigation measures and shall implement the measures developed in consultation with OEA and USFWS.

MM-Biological-03. The Applicants shall apply the mitigation measures identified in VM-Biological-03, VM-Biological-04, VM-Biological-05, VM-Biological-06 and~~,~~ VM-Biological-07 to any planned capital improvements potentially affecting the habitat of the Tricolored bat, which USFWS has proposed for listing as Endangered.

MM-Biological-04. The Applicants shall implement Special Protective Measures and karst Best Management Practices if the construction of the planned capital improvements occurs in areas with karst features in Benton County, Arkansas and McDonald County, Missouri, to avoid potentially affecting the endangered Benton County Cave Crayfish, Hell Creek Cave Crayfish, and Ozark Cavefish.

4.13 Water Resources

4.13.1 Applicants' Voluntary Mitigation Measures

The Applicants voluntarily propose the following measures to mitigate impacts to water resources:

VM-Water-01. The Applicants commit to remaining compliant with 33 C.F.R. Part 117 Drawbridge Operation Regulations.

VM-Water-02. As applicable for each of the Capital Improvement Projects, the Applicants will request Clean Water Act Water Quality Certification from the jurisdiction where the respective project is located.

VM-Water-03. As applicable for each of the individual Capital Improvement Projects, the Applicants will obtain an authorization from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act before initiating project-related construction activities in jurisdictional waters of the U.S.

VM-Water-04. As applicable to each of the individual Capital Improvement Projects, the Applicants will require its construction contractor(s) to follow all water quality control conditions identified in all permits including the Water Quality Certification from the respective jurisdiction and Section 404 Permits issued by USACE.

VM-Water-05. Prior to initiating construction at a Capital Improvement Project location, the Applicants will develop a site-specific Stormwater Pollution Prevention Plan which will incorporate Best Management Practices as well as site specific measures to control erosion and reduce the amount of sediment and pollutants entering surface waters, ground waters, and waters of the U.S.

VM-Water-06. For Capital Improvement Project locations which will involve construction activities in proximity to surface water, prior to the start of construction the Applicants will develop a site-specific water quality monitoring plan and implement this monitoring plan throughout construction.

VM-Water-07. The Applicants will minimize impacts to wetlands where practicable in the final design of the individual Capital Improvement Projects. Applicants agree to compensate for the loss of any wetlands through any one, or a combination of: purchasing credits from an authorized wetland mitigation bank, restoring a previously existing wetland or other aquatic site, enhancing an existing aquatic site's function, preserving an existing aquatic site, and/or creating a new aquatic site.

VM-Water-08. The Applicants will design all Capital Improvement Project drainage crossing structures to pass a 100-year storm event.

VM-Water-09. The Applicants will consider the passage of aquatic organisms in the design of culverts and bridges required for the Capital Improvement Projects, where practicable.

VM-Water-10. As applicable to each of the individual Capital Improvement Projects, the Applicants will comply with applicable in-water work windows and timing restrictions for the protection of fish species.

VM-Water-11. During the construction of Capital Improvement Projects, the Applicants will require all contractors to conduct daily inspections of all equipment for any fuel, lube oil, hydraulic or antifreeze leaks. If leaks are found, the Applicants will require the contractor to immediately remove the equipment from service and repair or replace it.

VM-Water-12. During the construction of the Capital Improvement Projects, the Applicants will prohibit construction vehicles from driving in or crossing streams at other than established crossing points.

VM-Water-13. During the construction of the Capital Improvement Projects, the Applicants will take reasonable steps to ensure contractors use fill material appropriate for the project area.

4.13.2 OEA's ~~Preliminary~~ Final Recommended Mitigation

OEA recommends the following additional mitigation measures to mitigate impacts to water resources:

MM-Water-01. During the final engineering and design of the 25 capital improvements, the Applicants shall design culverts and bridges so as to maintain existing surface water drainage patterns to the extent practicable and not cause or exacerbate flooding.

MM-Water-02. The Applicants shall coordinate with the Federal Emergency Management Agency if construction of bridges, culverts, or embankments related to the 25 planned capital improvements would result in an unavoidable increase greater than 1 foot to the 100-year water surface elevations.

MM-Water-03. The Applicants shall obtain and comply with National Pollutant Discharge Elimination System (NPDES) permits for storm water discharges resulting from project-related construction activities at each of the capital improvements that meet the requirements for a NPDES.

4.14 Environmental Justice

4.14.1 Applicants' Voluntary Mitigation Measures

The Applicants voluntarily propose the following measures to mitigate impacts to Environmental Justice (EJ) communities:

VM-EJ-01. The Applicants will use CP's experience building relationships with First Nations in Canada to engage with federally recognized Indian tribes in the U.S.

VM-EJ-02. The Applicants will make Operation Lifesaver programs available to potentially affected communities, including schools and other organizations (Operation Lifesaver is a non-profit education and awareness program that helps increase the public's awareness of the dangers around rail lines).

VM-EJ-03. For the construction contracts for the Capital Improvement Projects, the Applicants commit to allocate a minimum of 15 percent of contractor bid evaluation weighting to the inclusion of minority and tribal owned businesses and employees on the proposed project team.

4.14.2 OEA's ~~Preliminary~~ Final Recommended Mitigation

OEA recommends the following additional mitigation measure to mitigate EJ impacts:

MM-EJ-01. The Applicants shall conduct proactive and targeted outreach to minority and low-income communities that would experience adverse noise impacts as a result of the acquisition to provide information about the process for establishing Quiet Zones. The Applicants shall assist interested communities in identifying supplemental or alternative safety measures, practical operational methods, or technologies that may enable the community to establish Quiet Zones in accordance with FRA's final rule on the "Use of Locomotive Horns at Highway-Rail Grade Crossings."

4.15 Community Agreements and Coordination

4.15.1 Applicants' Voluntary Mitigation Measures

VM-Community-01. The Applicants commit that the new CPKC will meet regularly with community representatives in the Houston area. If those communities experience merger-related impacts, CPKC will work with them on ways to address their concerns. CPKC will also participate alongside other railroads serving Houston—notwithstanding that it will own no track there—to work cooperatively with communities to address the impacts of rail operations in the region.

VM-Community-02. The Applicants will provide community leaders in Houston with ways to report issues. CP has a "Community Connect" webpage that provides contact information, answers frequently asked questions, and offers other resources that will remain active for the new CPKC system. CP also has a Public Safety Communication Centre that operates 24 hours a day, 365 days a year with trained communication officers who can be reached toll-free at 1-800-716-9132. Calls into that Centre, which includes the Community Connect line and CP's emergency lines, are tracked using sophisticated Computer Aided Dispatch (CAD) software. The communication officers in this Centre are trained to handle a range of issues, from a blocked crossing to a trespasser, and they regularly coordinate the involvement of other railroads as required for any specific incident.

VM-Community-03. The Applicants will work with certain Chicago area communities with which they have not been able to reach agreements—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—to mitigate potential acquisition-related environmental impacts. Specifically, they will work with them to accomplish:

- Subject to necessary FRA approvals and practicability, funding efforts towards the creation and implementation of quiet zones, including the costs of installation.
- Installing and funding a predictive mobility system, interconnected with existing railroad crossing signals, that will deliver advanced notice of blocked crossings to citizens, police, fire, and rescue operations, and others.
- Installing and funding ITS Interconnect for Advanced Warning Signs at strategic locations to give drivers information about occupied crossings, allowing them to make better on-the-spot decisions.
- Installing and funding Positive Train Control wireless technology tie-ins at crossings adjacent to Metra platforms, which will minimize the activation of crossing lights and gates.

With respect to the work described above, the Applicants anticipate that the Applicants or their subcontractors will perform the work. In the case of instances where work may be performed by others, the Applicants would reimburse reasonable and customary charges for such work. Because Metra owns the trackage that CP uses in these communities, Metra would have to approve the implementation of this mitigation measure. The Applicants would work with Metra, the communities, and any other relevant agencies to seek approval for this mitigation measure.

4.15.2 OEA's Final Recommended Mitigation

MM-Community-01. The Applicants shall comply with the terms of the agreements reached between the Applicants and the City of Davenport, Iowa; the City of Bettendorf, Iowa; the City of Muscatine, Iowa; the City of LeClaire, Iowa; the City of Clinton, Iowa; the City of Washington, Iowa; the City of Fruitland, Iowa; the Village of Hampshire, Illinois; the Village of Pingree Grove, Illinois; and the City of Liberty, Missouri.

MM-Community-02. If Applicants reach additional agreements with communities or other entities following publication of this Final EIS, the Applicants shall notify the Board, and the Board will impose a condition that requires the Applicants to comply with the terms of the agreement.

MM-Community-03. To facilitate compliance with VM-Community-01 and VM-Community-02, the Applicants shall establish a Community Liaison to consult with Houston area community leaders. The Community Liaison shall be available for public meetings and to conduct periodic outreach to mayors and appropriate local officials. The Applicants shall establish and staff the Community Liaison position for a period of five years following the Board's final decision authorizing the acquisition. The Applicants shall provide the name, telephone number, and email address of the Community Liaison to the Houston mayor and Harris County officials.

MM-Community-04. To facilitate compliance with VM-Community-03, the Applicants shall establish a Community Liaison to consult with leaders of Chicago area communities referenced in that mitigation measure (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). The Community Liaison shall be available for public meetings and to conduct periodic outreach to mayors and appropriate local officials. The Applicants shall establish and staff the Community Liaison position for a period of five years following the approval of the acquisition. The Applicants shall provide the name, telephone number, and email address of the Community Liaison to mayors and other appropriate local officials in each community listed above.

Chapter 5

References

5.1 Purpose and Need

Pew Research Center. 2021. “Mobile Fact Sheet.” Last modified April 7, 2021. https://www.pewresearch.org/internet/fact-sheet/mobile.

5.2 Proposed Action and Alternatives

Coate, D. 1999. Annoyance Due to Locomotive Warning Horns. Transportation Research Board, Transportation Noise and Vibration Subcommittee A1FO4. San Diego, CA. August 1-4, 1999.

Surface Transportation Board. 1998. *Final Environmental Impact Statement No. 980194, Conrail Acquisition* (Finance Docket No. 33388) by CSX Corporation and CSX Transportation Inc., and Norfolk Southern Corporation and Norfolk Southern Railway Company. July.

5.3 Existing Conditions, Impacts, and Mitigation

5.4 Freight and Passenger Rail Safety

Amtrak. n.d.a. "Amtrak Schedules & Timetables." Accessed January 24, 2022. https://www.amtrak.com/train-schedules-timetables.

Amtrak. n.d.b. "Empire Builder." Accessed January 24, 2022. https://www.amtrak.com/empire-builder-train.

Amtrak. n.d.c. "Sunset Limited." Accessed January 24, 2022.

https://www.amtrak.com/sunset-limited-train. Accessed January 24, 2022.

Amtrak Guide. n.d.d. Accessed January 28, 2022. https://amtrakguide.com/routes/. Accessed January 28, 2022.

American Railway Engineering and Maintenance-of-Way Association. 2020. *2020 Manual for Railway Engineering, Volume 4*.

Association of American Railroads. 2007. “National Rail Freight Infrastructure Capacity and Investment Study.”

Canadian Pacific Railway. 1985. Trackage Agreement by and between Richard B. Ogilvie, Trustee of the Property of Chicago, Milwaukee, St. Paul and Pacific Railroad Company, Debtor, and SLRCO, Inc. February 29, 1985.

City of Chicago. 2011. "Metra Lines." Last updated September 7, 2012. https://data.cityofchicago.org/widgets/q8wx-dznq.

Dallas Area Rapid Transit. n.d. “Silver Line Project.” Accessed February 2, 2022. https://www.dart.org/about/expansion/silverline.asp.

Federal Railroad Administration. 2022. "Rail Equipment Accident/Incident Data." Last updated January 21, 2022. https://data.transportation.gov/Railroads/Rail-Equipment-Accident-Incident-Data/85tf-25kj.

Federal Railroad Administration. 2020a. *Annual PTC Progress Report: The Kansas City Southern Railway Company*. Last Updated April 24, 2021. https://www.regulations.gov/document/FRA-2010-0059-0062.

Federal Railroad Administration. 2020b. *Annual PTC Progress Report: Canadian Pacific*. Last Updated April 24, 2021. https://www.regulations.gov/document/FRA-2010-0058-0063.

Federal Railroad Administration. 2019. “Accident Trends – Summary Statistics.” Accessed January 13,2022. https://safetydata.fra.dot.gov/officeofsafety/publicsite/summary.aspx.

Jordan, Haley. 2021. "Ride the rail from Rockford to Chicago." 23WIFR. July 20, 2021. https://www.wifr.com/2021/07/21/ride-rail-rockford-chicago.

Metra. 2021a. "Milwaukee District West Line Schedule Effective July 12, 2021." Last updated July 12, 2021. https://ridertools.metrarail.com/maps-schedules/train-lines/MD-W.

Metra. 2021b. "Proposed 2022 budget includes new day pass, no fare increase." October 13, 2021. https://metra.com/newsroom/proposed-2022-budget-includes-new-day-pass-no-fare-increase.

Metra. 2019a. "General Transit Feed Specification." Last updated January 20, 2022. https://transitfeeds.com.

Metra. 2019b. "Metra Fact Book 2019." https://metra.com/sites/default/files/assets/2019_fact_book.pdf.

Metra. 2017. "Milwaukee District West Line Schedule Effective January 29, 2017." Last updated July 12, 2021. https://ridertools.metrarail.com/maps-schedules/train-lines/MD-W.

Metra. 1993. "Metra/CP TRA Supplemental Agreement." May 27, 1993.

Metra Division of Strategic Planning and Performance. 2020. "Ridership Trends: Annual Report 2019." February, 2020. https://metra.com/sites/default/files/assets/planning/annual_report_2019_standalone.pdf.

Millitzer, Joe. 2021. "110 mph Amtrak trains may connect St. Louis and Chicago within 12-18 months." Fox 2 Now. December 13, 2021. https://fox2now.com/news/illinois/110-mph-amtrak-trains-to-connect-st-louis-and-chicago-within-12-18-months.

Minnesota Geospatial Commons. n.d. "Transit Routes." Accessed January 24, 2022. https://gisdata.mn.gov/dataset/us-mn-state-metc-trans-transit-routes.

Minnesota Department of Transportation. 2020. "Northstar Commuter Rail Extension Feasibility Assessment." July 31, 2020. https://www.leg.mn.gov/docs/2020/other/200990.pdf.

Mullins, William A., Adam J. Godderz, David L. Meyer, Adam S. Paris, and Jeffrey J. Ellis. 2021. "Docket No. FD 36500, Canadian Pacific Railway Limited et al. - Control – Kansas City Southern et al. Railroad Control Application Volume 2 of 4."

National Railroad Passenger Corporation. 2021. *Amtrak Connects US: Amtrak's Vision for Improving Transportation Access Across America*. May 27, 2021. http://media.amtrak.com/wp-content/uploads/2021/05/Amtrak-2021-Corridor-Vision-May27_2021.pdf.

National Transit Database. 2018. "Transit Agency Summary." Last updated 2018. https://www.transit.dot.gov/ntd/data-product/2018-service.

5.5 Grade Crossing Safety

Association of American Railroads. 2022. "Railroad Grade Crossing & Pedestrian Safety." April 2022.

Federal Railroad Administration. 2020. *New Model for Highway-Rail Grade Crossing Accident Prediction and Severity*, Report DOT/FRA/ORD-20/40. Washington, D.C.: Federal Railroad Administration.

5.6 Grade Crossing Delay

U.S. Department of Transportation. 2020. "FRA, Maps – Geographic Information Systems." https://railroads.dot.gov/maps-and-data/maps-geographic-information-system/maps-geographic-information-system.

5.7 Truck-to-Rail Diversion

Federal Highway Administration. 2013. *Signalized Intersections Informational Guide: Second Edition*. FHWA Safety Program.

FHWA. 2016. *Traffic Monitoring Guide*. Washington, D.C.

FHWA. 2018. "Simplified Highway Capacity Calculation Method for the Highway Performance Monitoring System: Appendix A. Generalized Service Volume Tables." Office of Highway Policy Information. Last modified March 20, 2018. https://www.fhwa.dot.gov/policyinformation/pubs/pl18003/chap04.cfm.

Transportation Research Board. 2016. *Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis*. Washington, D.C.: The National Academies Press.

U.S. Department of Transportation Bureau of Transportation Statistics. 2018. "Freight Analysis Framework Version 4." Bureau of Transportation Statistics. Accessed February 23, 2022. https://www.bts.gov/faf/faf4.

5.8 Intermodal Facility Traffic

Federal Highway Administration. 2013. *Signalized Intersections Informational Guide: Second Edition*. FHWA Safety Program.

FHWA. 2016. *Traffic Monitoring Guide*. Washington, D.C.

FHWA. 2018. "Simplified Highway Capacity Calculation Method for the Highway Performance Monitoring System: Appendix A. Generalized Service Volume Tables." Office of Highway Policy Information. Last modified March 20, 2018. https://www.fhwa.dot.gov/policyinformation/pubs/pl18003/chap04.cfm.

Transportation Research Board. 2016. *Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis*. Washington, D.C.: The National Academies Press.

U.S. Department of Transportation Bureau of Transportation Statistics. 2018. "Freight Analysis Framework Version 4." Bureau of Transportation Statistics. Accessed February 23, 2022. https://www.bts.gov/faf/faf4.

5.9 Noise and Vibration

Coate, D. 1999. Annoyance Due to Locomotive Warning Horns. Transportation Research Board, Transportation Noise and Vibration Subcommittee A1FO4. San Diego, CA. August 1-4, 1999.

Federal Railroad Administration. 1982. Handbook for the Measurement, Analysis and Abatement of Railroad Noise, Report DOT/FRA/ORD-82/02-H. Washington, D.C.: U.S. Department of Transportation.

Federal Transit Administration. 2018. *Transit Noise and Vibration Impact Assessment Manual*, *Report No. 0123*. Washington, D.C.: U.S. Department of Transportation.

Surface Transportation Board. 1997. *Proposed Conrail Acquisition, Draft Environmental Impact Statement*. Finance Docket No. 33388.

Surface Transportation Board. 1998. *Final Environmental Impact Statement No. 980194, Conrail Acquisition* (Finance Docket No. 33388) by CSX Corporation and CSX Transportation Inc., and Norfolk Southern Corporation and Norfolk Southern Railway Company. July.

Surface Transportation Board. 2015. *Tongue River Railroad Company Construction and Operation of a New Rail Line in Southeastern Montana Draft Environmental Impact Statement*. Finance Docket No. 30186.

Surface Transportation Board. 2021. *Uinta Basin Railway, Final Environmental Impact Statement*. Finance Docket No. 36284.

U.S. Environmental Protection Agency. 1979. *Background Document for Final Interstate Rail Carrier Noise Emission Regulation: Source Standards*, Report 550/9-79-21. Washington, D.C.: U.S. Environmental Protection Agency.

5.10 Air Quality and Climate Change

Air Quality

Arkansas Department of Environmental Quality. 2017. “Regional Haze SIP Revision for 2008-2018 Planning Period”. Office of Air Quality Policy and Planning Branch. October 2017.

Association of American Railroads (AAR). 2021. “Freight Railroads and Climate Change”. https://www.aar.org/wp-content/uploads/2021/02/AAR-Climate-Change-Report.pdf.

Canadian Pacific. 2021. CP Climate Strategy. Canadian Pacific: Calgary, Alberta, Canada.

Chicago Metropolitan Agency for Planning (CMAP). 2018. "On to 2050 Air Quality Conformity Analysis". October 2018.

Colorado State University. No Date. "Federal Land Manager Environmental Database – IMPROVE Date and Metadata." http://views.cira.colostate.edu/fed/Express/ImproveData.aspx. Accessed February 9, 2022.

Council on Environmental Quality (CEQ). 2016**.** Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews. Washington, D.C. August 1, 2016.

Environmental Protection Agency (EPA). 2009a. "Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act."

EPA. 2009b. "Emission Factors for Locomotives". Office of Transportation and Air Quality. EPA-420F-09-025. April 2009.

EPA. 2010. "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling". EPA-420-R-10-016. July 2010.

EPA. 2021a. "Emission Factors for Greenhouse Gas Inventories". April 1, 2021. Accessed February 9, 2022. https://www.epa.gov/sites/default/files/2021-04/documents/emission-factors_apr2021.pdf.

EPA. 2021b. "Nonattainment Areas for Criteria Pollutants (Greenbook)". November 30, 2021. Accessed on December 15, 2021. https://www.epa.gov/green-book.

EPA. 2021c. "2017 National Emissions Inventory: January 2021 Updated Release, Technical Support Document" EPA-454/R-21-001. February 2021. https://www.epa.gov/sites/default/files/2021-02/documents/nei2017_tsd_full_jan2021.pdf

EPA. 2021d. "NAAQS Table". February 10, 2021. Accessed December 20, 2021. https://www.epa.gov/criteria-air-pollutants/naaqs-table.

EPA. 2021e. "De Minimis Tables". July 22, 2021. Accessed December 20, 2021. https://www.epa.gov/general-conformity/de-minimis-tables.

EPA. 2021f. "Clean Air Status and Trends Network (CASTNET)" December 21, 2021. Accessed December 20, 2021.https://www.epa.gov/castnet.

EPA. 2021g. "Caddo Valley (CAD 150)". November 12, 2021. Accessed December 20, 2021. https://www3.epa.gov/castnet/site_pages/CAD150.html.

EPA. 2021h. "Cherokee Nation (CHE 185)". November 12, 2021. Accessed December 20, 2021. https://www3.epa.gov/castnet/site_pages/CHE185.html.

EPA. 2021i. "Integrated Risk Information System". November 30, 2021. Accessed December 20, 2021. https://www.epa.gov/iris.

EPA. 2021j. "National Air Toxics Assessment". July 12, 2021. Accessed December 20, 2021. https://www.epa.gov/national-air-toxics-assessment.

EPA. 2021k. "Who Has to Obtain a Title V Permit?" March 26, 2021. Accessed February 9, 2022. https://www.epa.gov/title-v-operating-permits/who-has-obtain-title-v-permit.

EPA. 2021l. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2019. EPA 430-R-21-005. U.S. Environmental Protection Agency. Washington D.C. Available at: https://www.epa.gov/sites/production/files/2021-04/documents/us-ghg-inventory-2021-main-text.pdf

EPA. 2022. "Motor Vehicle Emissions Simulator (MOVES)". Version 3.0.3, January 3, 2022.

Federal Highway Administration. 2016. "Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents". HEPN-10. October 18, 2016.

Goldfuss, Christina. 2016. "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews". Council on Environmental Quality. August 1, 2016.

Houston-Galveston Area Council (HGAC). 2019. "2045RTP Regional Transportation Plan." April 10, 2019.

Intergovernmental Panel on Climate Change (IPCC). 2007. Fourth Assessment Report (AR4).

Kansas City Southern (KCS). 2021. "Kansas City Southern's Emissions Reduction Targets Approved by Science Based Targets initiative." May 6, 2021. Accessed February 9, 2022. https://investors.kcsouthern.com/news-releases/2021/05-06-2021-130144650?sc_lang=en.

Lindhjem, Christian. 2008. "Intermodal Yard Activity and Emissions Evaluations". 17th Annual International Emission Inventory Conference, June 2-5, 2008.

Liu, Z., P. Ciais, J.H. Schellnhuber. 2020. "Near-real-time Monitoring of Global CO2 Emissions Reveals the Effects of the COVID-19 Pandemic." Nature Communications 11, 5172. https://doi.org/10.1038/s41467-020-18922-7.

National Park Service (NPS). 2010. "Federal Land Managers' Air Quality Related Values Work Group (FLAG) Phase 1 Report – Revised". October 2010.

NPS. 2022. "Class I Areas". May 18, 2020. Accessed February 9, 2022. https://www.nps.gov/subjects/air/class1.htm.

North Central Texas Council of Governments (NCTCOG). 2018. "Mobility 2045" The Metropolitan Transportation Plan for North Central Texas." June 14, 2018.

The Port of Long Beach and The Port of Los Angeles. 2017. "Zero/Near-Zero Emissions Yard Tractor Testing and Demonstration Guidelines." September 2017.

Souten, Dave and Lindhjem, Christian. 2006. "Los Angeles- Hobart Railyard TAC Emissions Inventory." Environ International Corporation. December 2006.

South East Texas Regional Planning Commission-Metropolitan Planning Organization (SETRPC-MPO). 2019. "Jefferson-Orange-Hardin Regional Transportation Study; Transportation Conformity Report." July 18, 2019.

Stewart, Eger, Ogard, and Harder. 2003. "Twin Ports Intermodal Freight Terminal Study." University of Wisconsin and the U.S. Department of Transportation. July 15, 2003.

Sullivan, Timothy J. 2016. "Air Quality Related Values (AQRVs) in National Parks: Effects from Ozone; Visibility Reducing Particles; and Atmospheric Deposition of Acids, Nutrients and Toxics." National Park Service. April 2016.

Surface Transportation Board (STB). 1998. CN/IC Acquisition Draft Environmental Assessment. November 1998.

STB. 2021. Uinta Basin Railway Final Environmental Impact Statement. August 2021.

U.S. Department of Transportation (USDOT). 2017. "Table 4-23: Average Fuel Efficiency of U.S. Light Duty Vehicles." U.S. Department of Transportation, Bureau of Transportation Statistics. Last revised: April 14, 2017. https://www.bts.gov/archive/publications/national_transportation_statistics/table_04_23.

U.S. Global Change Research Program (USGCRP) 2018a. Fourth National Climate Assessment. Chapter 2: Our Changing Climate" November 2018. Accessed December 20, 2021. https://nca2018.globalchange.gov/chapter/2/.

USGCRP. 2018b. "Fourth National Climate Assessment. Summary Findings" November 2018. https://nca2018.globalchange.gov/#sf-1. Accessed December 20, 2021.

Western Governors' Association (WGA). 2006. "WRAP Fugitive Dust Handbook" September 7, 2006.

Wilson, Glen. 2021. "Verified Statement of Glen Wilson." In Docket No. FD 36500, Canadian Pacific Railway Limited et al. - Control – Kansas City Southern et al. Railroad Control Application Volume 1 of 4. Wilson V.S., page 304-316.

Climate Change and Adaptation

Agarwal, M. and S. Wickersham. 2010. Phone conversation with Manish Agarwal and Stephen Wickersham In "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

Alder, J.R. and S.W. Hostetler. 2013a. "USGS National Climate Change Viewer: Iowa." US Geological Survey. Accessed February 11, 2022. https://doi.org/10.5066/F7W9575T.

Alder, J.R. and S.W. Hostetler. 2013b. "USGS National Climate Change Viewer: Illinois." US Geological Survey. Accessed February 11, 2022. https://doi.org/10.5066/F7W9575T.

Alder, J.R. and S.W. Hostetler. 2013c. "USGS National Climate Change Viewer: Missouri." US Geological Survey. Accessed February 11, 2022. https://doi.org/10.5066/F7W9575T.

Alder, J.R. and S.W. Hostetler. 2013d. "USGS National Climate Change Viewer: Oklahoma." US Geological Survey. Accessed February 11, 2022. https://doi.org/10.5066/F7W9575T.

Alder, J.R. and S.W. Hostetler. 2013e. "USGS National Climate Change Viewer: Arkansas." US Geological Survey. Accessed February 10, 2022. https://doi.org/10.5066/F7W9575T.

Alder, J.R. and S.W. Hostetler. 2013f. "USGS National Climate Change Viewer: Louisiana." US Geological Survey. Accessed February 10, 2022. https://doi.org/10.5066/F7W9575T.

Alder, J.R. and S.W. Hostetler. 2013g. "USGS National Climate Change Viewer: Massachusetts." US Geological Survey. Accessed June 16, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013h. "USGS National Climate Change Viewer: Maine." US Geological Survey. Accessed June 16, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013i. "USGS National Climate Change Viewer: New Jersey." US Geological Survey. Accessed June 16, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013j. "USGS National Climate Change Viewer: New York." US Geological Survey. Accessed June 16, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013k. "USGS National Climate Change Viewer: Pennsylvania." US Geological Survey. Accessed June 16, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013l. "USGS National Climate Change Viewer: Vermont." US Geological Survey. Accessed June 16, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013m. "USGS National Climate Change Viewer: North Dakota." US Geological Survey. Accessed June 16, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013n. "USGS National Climate Change Viewer: South Dakota." US Geological Survey. Accessed June 16, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013o. "USGS National Climate Change Viewer: Texas." US Geological Survey. Accessed June 23, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013p. "USGS National Climate Change Viewer: Kansas." US Geological Survey. Accessed June 23, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013q. "USGS National Climate Change Viewer: Minnesota." US Geological Survey. Accessed June 22, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013r. "USGS National Climate Change Viewer: Wisconsin." US Geological Survey. Accessed June 22, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013s. "USGS National Climate Change Viewer: Michigan." US Geological Survey. Accessed June 22, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013t. "USGS National Climate Change Viewer: Indiana." US Geological Survey. Accessed June 22, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013u. "USGS National Climate Change Viewer: Ohio." US Geological Survey. Accessed June 22, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013v. "USGS National Climate Change Viewer: Mississippi" US Geological Survey. Accessed June 23, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013w. "USGS National Climate Change Viewer: Alabama." US Geological Survey. Accessed June 23, 2022. https://doi.org/10.5066/F7W9575T

Alder, J.R. and S.W. Hostetler. 2013x. "USGS National Climate Change Viewer: Tennessee." US Geological Survey. Accessed June 23, 2022. https://doi.org/10.5066/F7W9575T

American Railway Engineering and Maintenance-of-Way Association (AREMA). 2021. Climate Resilient Railroads: Vulnerability Assessment Methodologies and Solutions. Prepared by Hardesty & Hanover and Thornton Tomasetti for AREMA Virtual Conference 2021.

Anderson, Christopher J., David Claman, and Ricardo Mantilla. 2015. Iowa's Bridge and Highway Climate Change and Extreme Weather Vulnerability Assessment Pilot. Iowa State University, Institute for Transportation, Ames, IA,

Bipartisan Policy Center. 2009. Transportation Adaptation to Global Climate Change In "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

Canadian Pacific. 2020. Sustainably Driven: 2020 Corporate Sustainability Report. Canadian Pacific: Calgary, Alberta, Canada.

Canadian Pacific. 2021. CP Climate Strategy. Canadian Pacific: Calgary, Alberta, Canada.

Environmental Protection Agency (EPA). 2021. Climate Adaptation and EPA's Role. https://www.epa.gov/climate-adaptation

European Commission (EC). 2012. Impacts of Climate Change on Transport: A Focus on Road and Rail Transport Infrastructures In "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

Federal Transit Administration (FTA). 2011. Flooded Bus Barns and Buckled Rails: Public Transportation and Climate Change Adaptation In "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

ICF International (ICF). 2013. A Vulnerability and Risk Assessment of SEPTA's Regional Rail: A Transit Climate Change Adaptation Assessment Pilot In "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

Janowiak, Maria K., Anthony W. D'Amato, Christopher W. Swanston, Louis Iverson, Frank R. Thompson III, William D. Dijak, Stephen Matthews et al. 2018. New England and Northern New York Forest Ecosystem Vulnerability Assessment and Synthesis: A Report from the New England Climate Change Response Framework Project. US Forest Service Northern Research Station. General Technical Report NRS-173.

Livneh, Ben and Martin Hoerling. 2016. "Explaining Hydrologic Extremes in the Upper Missouri River Basin." NOAA Earth System Research Laboratory. Boulder, CO.

Metropolitan Transit Authority (MTA). 2012. "Overview of Subway and Bus Preparations, Impact, and Recovery" presentation for NYCT committee meeting In "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

National Oceanic and Atmospheric Administration (NOAA). 2022a. The Climate Explorer: Adair County, OK. "Days w/ maximum temp >100°F." Accessed November 17, 2022. https://crt-climate-explorer.nemac.org/climate_graphs/?lat=35.9127307&lon=-94.645035&id=days_tmax_gt_100f&city=Adair%2BCounty%2C+OK&county=Adair%2BCounty&area-id=40001&fips=40001&zoom=7

NOAA. 2022b. The Climate Explorer: Le Flore County, OK. "Days w/ maximum temp >100°F." Accessed November 17, 2022. https://crt-climate-explorer.nemac.org/climate_graphs/?lat=34.8622042&lon=-94.645035&id=days_tmax_gt_100f&area-id=40079&zoom=7&city=Le%2BFlore%2BCounty%2C+OK&county=Le%2BFlore%2BCounty&fips=40079

NOAA. 2022c. The Climate Explorer: Harris County, TX. "Days w/ maximum temp >100°F." Accessed November 17, 2022. https://crt-climate-explorer.nemac.org/climate_graphs/?county=Harris+County&city=Houston%2C+TX&fips=48201&lat=29.7604267&lon=-95.3698028&id=days_tmax_gt_100f

NOAA. 2022d. The Climate Explorer: Crawford County, KS. "Days w/ maximum temp >100°F." Accessed November 17, 2022. https://crt-climate-explorer.nemac.org/climate_graphs/?lat=37.45579900000001&lon=-94.81059549999999&id=days_tmax_gt_100f&city=Crawford%2BCounty%2C+KS&county=Crawford%2BCounty&area-id=20037&fips=20037&zoom=7

National Research Council (NRC). 2008. Transportation Research Board Special Report 290: Potential Impacts of Climate Change on U.S. Transportation In "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

New Jersey Transit Corporation (NJTC). 2012. Resilience of NJ Transit to Climate Impacts In "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM). 2002. Weather Information for Surface Transportation: National Needs Assessment Report In "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

Palin, Erika J., Irina Stipanovic Oslakovic, Kenneth Gavin, and Andrew Quinn. 2021. "Implications of climate change for railway infrastructure." WIREs Climate Change, 12, Issue 5: 1-41. https://doi.org/10.1002/wcc.728.

Peterson, T.C., M. McGuirk, T.G. Houston, A.H. Horvitz, and M.F. Wehner. 2008. Climate Variability and Change with Implications for Transportation In "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

Rossetti, M.A. 2002. "Potential Impacts of Climate Change on Railroads" from The Potential Impacts of Climate Change on Transportation Federal Research Partnership Workshop Summary and Discussion Papers In "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

Rossetti, M.A. 2007. Analysis of Weather Events on U.S. Railroads In "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

Rustad, Lindsey, John Campbell, Jeffrey S. Dukes, Thomas Huntington, Kathy Fallon Lambert, Jacqueline Mohan, and Nicholas Rodenhouse. 2012. Changing climate, changing forests: The impacts of climate change on forests of the northeastern United States and eastern Canada.

U.S. Climate Change Science Program (CCSP). 2008. SAP 4.7: Impacts of Climate Change and Variability on Transportation Systems and Infrastructure: Gulf Coast Study, Phase I In "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

U.S. Department of Transportation (USDOT). 2014. "Transportation Climate Change Sensitivity Matrix." U.S. Department of Transportation, Washington, D.C.

USGCRP. 2018. Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II. U.S. Global Change Research Program, Washington, DC, USA.

USGCRP. 2017. “Droughts, Floods, and Wildfires.” Climate Science Special Report: Fourth National Climate Assessment, Volume I. Global Change Research Program, Washington, DC, USA.

Wolfe, David W., Arthur T. DeGaetano, Gregory M. Peck, Mary Carey, Lewis H. Ziska, John Lea-Cox, Armen R. Kemanian et al. 2017. “Unique challenges and opportunities for northeastern US crop production in a changing climate.” Climatic Change 146: 231-245. https://doi.org/10.1007/s10584-017-2109-7

Zeman, M.C., J.R. Edwards, D.A. Lange, and C.P.L. Barkan. 2009. “Investigating the Role of Moisture in Concrete Tie Rail Seat Deterioration” from Proceedings of the 2009 Annual AREMA Conference In “Transportation Climate Change Sensitivity Matrix.” U.S. Department of Transportation, Washington, D.C.

5.11 Energy

Brown, Richard W., and Nathaniel S. Zebrowski. 2021. “Verified Statement of Richard W. Brown and Nathan S. Zebrowski.” In Docket No. FD 36500, Canadian Pacific Railway Limited et al. - Control – Kansas City Southern et al. Railroad Control Application Volume 2 of 4. Vol. 2: 1-76.

Elphick, Raymond A., and John F. Orr. 2021. “Operating Plan (Exhibit 13).” In Docket No. FD 36500, Canadian Pacific Railway Limited et al. - Control – Kansas City Southern et al. Railroad Control Application Volume 2 of 4. Vol. 2: 1-91.

Lindhjem, Christian. 2008. “Intermodal Yard Activity and Emissions Evaluations.” *ENVIRON International Corporation*. 1-15. https://www3.epa.gov/ttn/chief/conference/ei17/session11/lindhjem.pdf.

Mullins, William A., Adam J. Godderz, David L. Meyer, Adam S. Paris, and Jeffrey J. Ellis. 2021. “Docket No. FD 36500, Canadian Pacific Railway Limited et al. - Control – Kansas City Southern et al. Railroad Control Application Volume 1 of 4.” Vol. 1: 1-555.

Mullins, William A., Adam J. Godderz, David L. Meyer, Adam S. Paris, and Jeffrey J. Ellis. 2021. “Docket No. FD 36500, Canadian Pacific Railway Limited et al. - Control – Kansas City Southern et al. Railroad Control Application Volume 2 of 4.” Vol. 2: 1-516.

Mutén, Bengt. 2021. “Verified Statement of Bengt Mutén.” In Docket No. FD 36500, Canadian Pacific Railway Limited et al. - Control – Kansas City Southern et al. Railroad Control Application Volume 2 of 4. Vol. 2: 1-32.

The Port of Long Beach, and The Port of Los Angeles. 2017. “Zero/Near-zero Emissions Yard Tractor Testing & Demonstration Guidelines.”

https://sustainableworldports.org/wp-content/uploads/CAAP-Yard-Tractor-testing-and-demonstration-document.pdf.

Souten, Dave, and Christian Lindhjem. 2006. “Los Angeles – Hobart Railyard TAC Emissions Inventory.” *ENVIRON International Corporation.* 1-1-8.2. https://ww2.arb.ca.gov/sites/default/files/classic/railyard/hra/env_hob_ei122006.pdf.

U.S. Energy Information Administration. 2021. “Units and calculators explained: Energy conversion calculators.” Independent Statistics & Analysis U.S. Energy Information Administration. Last modified May 12, 2021. https://www.eia.gov/energyexplained/units-and-calculators/energy-conversion-calculators.php.

Wahba, Jonathan, and Mike Naatz. 2021. “Verified Statement of Jonathan Wahba and Mike Naatz.” In Docket No. FD 36500, Canadian Pacific Railway Limited et al - Control – Kansas City Southern et al. Railroad Control Application Volume 1 of 4. Vol. 1: 243-302.

5.12 Cultural Resources

Kansas City Gazette. 1896. “A New Country Opened up by the Building of the New Kansas City, Pittsburg & Gulf Railroad.” Kansas City Gazette. June 30, 1896.

Kansas City Southern Railway Co. 1912. *Eastern Oklahoma Along the Kansas City Southern Railway.* Kansas City: The Jos. O. Havens Co.

Kansas City Southern Railway Co. 1912. The Ozark Mountain Region of Missouri and Arkansas as it Appears Along the Line of the Kansas City Southern Railway. Kansas City: The Jos. O. Havens Co.

Kansas City Southern Railway. n.d. “The Kansas City Southern Lines.” KCS Historical Society. http://www.kcshs.org/schedule/subs/images/history/kcs_hist.htm?msclkid=b0fc1f7acfbd11ec92ad8d9261c99cbf.

Chicago Tribune. “Land of Prosperity and Progress.” Chicago Tribune. September 11, 1897.

The Deseret News. “Man Guided by ‘Hunches’ Dies.” Deseret News. September 28, 1928.

Lumbermens. 1901. “Lumberman’s Credit Reference: Louisiana.” Accessed May 12, 2022. https://www.ttarchive.com/Library/Lists/LA_1901_Lbr-Mills_Lumbermans-Credit-Reference.pdf.

Marvig, John. 2010. "Chicago, Milwaukee, St. Paul & Pacific Railway Biography: Biography of The Chicago, Milwaukee, St. Paul & Pacific Railway (1874-1986)." John Marvig Railroad Bridge Photography. Last modified 2022. www.johnmarvigbridges.org/MILW.html.

Oklahoma Historical Society. n.d. "Le Flore County." The Encyclopedia of Oklahoma History and Culture. Accessed April 20, 2022. https://www.okhistory.org/publications/enc/entry.php?entry=LE007.

Owen Publishing Company. 1878. *Owen's Gazetteer and Directory of Jackson County Iowa*. Davenport: Owen Publishing Company.

Parker, Nathan H. 1956. *Iowa 1856 State Map* [Map]. 8 miles to an inch. Chicago: Keen & Lee. Accessed March 24, 2022. http://www.historicmapworks.com/Map/US/38805/Iowa+1856+State+Map+17x24/Iowa+1856+State+Map/Iowa/.

Peters, Jackson. 1998. "The Milwaukee Road: America's Resourceful Railroad." Railroad History. Last modified 1998. www.Psmre.org/hist-milw.htm.

Rock Island Railroad. 1970. "Yard Clerical Manual."

Sanborn Map Company. 1914. *Sanborn Fire Insurance Map from Bellevue, Jackson County, Iowa* [Map] Scale not Given. Accessed March 24, 2022. https://www.loc.gov/item/sanborn02577_004/.

Sanborn Map Company. 1890. *Sanborn Fire Insurance Map from Clinton, Clinton County, Iowa* [Map] Scale not Given. Accessed March 24, 2022. https://www.loc.gov/item/sanborn02610_002/.

Sanborn Map Company. 1912. *Sanborn Fire Insurance Map from De Ridder, Beauregard Parish, Louisiana* [Map] Scale not Given. Accessed May 9, 2022. https://www.loc.gov/item/sanborn03300_001/.

Sanborn Map Company. 1904. *Sanborn Fire Insurance Map from De Queen, Sevier County, Arkansas* [Map] Scale not Given. Accessed May 9, 2022. https://www.loc.gov/item/sanborn00229_001/.

Sanborn Map Company. 1914. *Sanborn Fire Insurance Map from Guttenberg, Clayton County, Iowa* [Map] Scale not Given. Accessed March 24, 2022. https://www.loc.gov/item/sanborn02677_004/.

Sanborn Map Company. 1913. *Sanborn Fire Insurance Map from Heavener, Le Flore County, Oklahoma* [Map] Scale not Given. Accessed April 20, 2022. https://www.loc.gov/item/sanborn07120_001/.

Sanborn Map Company. 1891. *Sanborn Fire Insurance Map from Joplin, Jasper County, Missouri* [Map] Scale not Given. Accessed May 9, 2022. https://www.loc.gov/item/sanborn04718_003/.

Sanborn Map Company. 1901. *Sanborn Fire Insurance Map from Mena, Polk County, Arkansas* [Map] Scale not Given. Accessed May 9, 2022. https://www.loc.gov/item/sanborn00305_001/.

Sanborn Map Company. 1885. *Sanborn Fire Insurance Map from Ottumwa, Wapello County, Iowa* [Map] Scale not Given. Accessed March 24, 2022. https://www.loc.gov/item/sanborn02790_001/.

Sanborn Map Company. 1897. *Sanborn Fire Insurance Map from Pittsburg, Crawford County, Kansas* [Map] Scale not Given. Accessed May 9, 2022. .https://www.loc.gov/item/sanborn03060_003/.

Sanborn Map Company. 1897. *Sanborn Fire Insurance Map from Washington, Washington County, Iowa* [Map] Scale not Given. Accessed March 24, 2022. https://www.loc.gov/item/sanborn02861_003/.

Newton Evening Kansas Republican. 1916. “Stilwell of the Orient Railroad.” The Newton Evening Kansas Republican. June 12, 1916.

The Daily Mail. 1987. “The Port Arthur Project.” The Daily Mail (Wellington, Kansas). November 12, 1897.

Union Historical Company. 1880. *The History of Washington County, Iowa.* Des Moines: Union Historical Company.

U.S. Department of the Interior National Park Service. 1990. “The Advent and Development of Railroads in Iowa: 1855-1940.” *National Register of Historic Places Multiple Property Documentation Form*, July 23, 1990.

Werner, George C. 1976. “Chicago, Rock Island and Pacific Railroad.” Last modified 2016. www.tshanline.org/handbook/entries/chicago-rock-island-pacific-railroad.

Western Historical Company. 1879. *The History of Clinton County, Iowa.* Chicago: Western Historical Company.

Western Historical Company. 1878. *The History of Wapello County, Iowa.* Chicago: Western Historical Company.

5.13 Hazardous Material Release Sites

No references

5.14 Biological Resources

Luensmann, Peggy S. 2005. "Myotis sodalis." Fire Effects Information System. Accessed March 10, 2022. https://www.fs.fed.us/database/feis/animals/mammal/myso/all.html.

Missouri Department of Conservation. 2022. “Missouri Natural Heritage Review Website.” Accessed November 23, 2021. https://naturalheritagereview.mdc.mo.gov/content/home

Missouri Department of Conservation. n.d. “Phacelia (Miami Mist).” Missouri Department of Conservation. Accessed February 23, 2022. https://mdc.mo.gov/discover-nature/field-guide/phacelia-miami-mist.

U.S. Department of Agriculture. n.d. “Terrestrial Plants.” National Invasive Species Information Center. Accessed February 23, 2022. https://www.invasivespeciesinfo.gov/terrestrial/plants.

U.S. Fish and Wildlife Service. 2012. “Invasive Species.” U.S. Fish and Wildlife Service. Accessed February 24, 2022. https://www.fws.gov/program/invasive-species.

U.S. Fish and Wildlife Service. n.d. “ECOS: Environmental Conservation Online System.” U.S. Fish and Wildlife Service. Accessed February 1, 2022. https://ecos.fws.gov/ecp/.

U.S. Fish and Wildlife Service. n.d. “IPaC: Information for Planning and Consultation.” U.S. Fish and Wildlife Service. Accessed December 6, 2021. https://ipac.ecosphere.fws.gov/.

U.S. Fish and Wildlife Service. n.d. “Northern Long-Eared Bat (*Myotis septentrionalis*).” ECOS: Environmental Conservation Online System. Accessed March 10, 2022. https://ecos.fws.gov/ecp/species/9045.

U.S. Fish and Wildlife Service, Midwest Region. 2019. “Charadrius melodus: Piping Plover.” U.S. Fish and Wildlife Service. Accessed February 23, 2022. https://www.fws.gov/midwest/endangered/pipingplover/pipingpl.html#:~:text=Habitat%20%2D%20Piping%20plovers%20use%20wide,little%20grass%20or%20other%20vegetation.&text=There%20are%20three%20locations%20where,and%20along%20the%20Atlantic%20Coast.

Wiącek, Jaroslaw, Marcin Polak, Maciej Filipiuk, Maren Kucharczyk, and Janusz Bohatkiewicz. 2015. "Do Birds Avoid Railroads as Has Been Found for Roads?"

Environmental Management 56: 643-625. https://link.springer.com/article/10.1007/s00267-015-0528-7.

Wiącek, Jaroslaw, Marcin Polak, Maciej Filipiuk, and Maren Kucharczyk. 2019. "Does railway noise affect forest birds during the winter?" *European Journal of Forest Research* 138: 907-915. https://link.springer.com/content/pdf/10.1007/s10342-019-01212-3.pdf.

5.15 Water Resources

EPA. 2022. “How’s My Waterway?” Accessed February 20, 2022 from https://mywaterway.epa.gov/

The Nature Conservancy. 2022. “Places We Protect, Blue River, Kansas & Missouri.” Accessed February 1, 2022 from https://www.nature.org/en-us/get-involved/how-to-help/places-we-protect/blue-river-kansas-city/.

The Nature Conservancy. 2019. “Blue River Report Card.” Accessed February 1, 2022 from https://www.nature.org/content/dam/tnc/nature/en/documents/Blue-River-Report-Card.pdf.

USDA. 2022. “NRCS Web Soil Survey.” Accessed February 18, 2022 from https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

U.S. Army Corps of Engineers. 2022. “International Boundary Map, built by Pittsburgh District Geospatial Section.” Accessed February 18, 2022 from https://usace.maps.arcgis.com/apps/webappviewer/index.html?id=7344e62432694199af7790aa47a32fdd

U.S. Army Corps of Engineers. No date. “Section 10 Navigable Waters of the United States within the Kansas City District, Corps of Engineers Regulatory Boundary.” Kansas City District.

USGS. 2022. “Ground Water Atlas of the United States, Kansas, Missouri, and Nebraska HA 730-D.” Accessed February 20, 2022 from https://pubs.usgs.gov/ha/ha730/ch_d/.

USGS. 2022. “Ground Water Atlas of the United States, Oklahoma, Texas HA 730-E.” Accessed February 20, 2022 from https://pubs.usgs.gov/ha/ha730/ch_e/.

USGS. 2022. “Ground Water Atlas of the United States, Arkansas, Louisiana, and Mississippi HA 730-f.” Accessed February 20, 2022 from https://pubs.usgs.gov/ha/ha730/ch_f/.

USGS. 2019. Groundwater Availability in the Ozark Plateaus Aquifer System. Professional Paper 1854, Water Availability and Use Science Program. Prepared by B. Clark, L. Duncan, and K. Knierim.

USGS. 2022. "National Water Information System: Mapper." Retrieved February 20, 2022 from https://maps.waterdata.usgs.gov/mapper/.

White House. 1977a. Executive Order 11990—Protection of wetlands.

White House. 1977b. Executive Order 11988—Floodplain management.

5.16 Environmental Justice

Council on Environmental Quality (CEQ). 1997. "Environmental Justice Guidance Under the National Environmental Policy Act."

U.S. Census Bureau (U.S. Census Bureau). 2020. American Community Survey (ACS), 2019 Five-Year Estimates (2015-2019). December 10, 2020.

U.S. Census Bureau. 2021. "Frequently Asked Questions (FAQs) About Language Use." December 3. Accessed June 30, 2022. www.census.gov/topics/population/language-use/about/faqs.html.

U.S. Environmental Protection Agency (EPA). 2016. Promising Practices for EJ Methodologies in NEPA Reviews, Report of the Federal Interagency Working Group on Environmental Justice & NEPA Committee. Accessed June 30, 2022. https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf.

EPA. 2021a. "Learn About Environmental Justice." September 22, 2021. Accessed June 30, 2022. https://www.epa.gov/environmentaljustice/learn-about-environmental-justice.

EPA. 2021b. "Summary of Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." September 28. Accessed June 30, 2022. https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice.

EPA. 2022. "Frequent Questions about EJSCREEN." February 18, 2022. Accessed June 30, 2022. https://www.epa.gov/ejscreen/frequent-questions-about-ejscreen.

The White House. 1994. Executive Order 12898 of February 11, 1994. Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

The White House. 2021a. Executive Order 13985 of January 20, 2021. Advancing Racial Equity and Support for Underserved Communities Through the Federal Government.

The White House. 2021b. Executive Order 13990 of January 20, 2021. Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis.

The White House. 2021c. Executive Order 14008 of January 27, 2021. Tackling the Climate Crisis at Home and Abroad.

5.17 Cumulative Impacts

Amtrak. 2007. Feasibility Report on Proposed Amtrak Service Chicago-Rockford-Galena-Dubuque. Last Updated June 22, 2007. https://iowadot.gov/iowarail/pdfs/RCK-Feasibility.pdf.

Arkansas Department of Transportation. 2021. Statewide Transportation Improvement Program. https://www.ardot.gov/wp-content/uploads/2021/09/2021-2024_STIP_Final_General_Electronic_2.pdf.

Chicago Department of Aviation. 2022. Residential Sound Insulation Program O'Hare Property Locator. Accessed June 24, 2022. www.flychicago.com/community/SIP/Pages/ORDPL.aspx.

Federal Aviation Administration. 2005. O'Hare Modernization Final Environmental Impact Statement. https://www.faa.gov/airports/airport_development/omp/eis/feis.

Federal Aviation Administration. 2022. Draft Environmental Assessment and Draft General Conformity Determination for the Proposed Terminal Area Plan and Air Traffic Procedures at Chicago O'Hare International Airport. https://www.faa.gov/airports/great_lakes/TAPandATEA.

Illinois Department of Transportation. 2021. FY 2021-2024 Proposed Highway and Transit Improvement Program. https://idot.illinois.gov/Assets/uploads/files/Transportation-System/Reports/OP&P/STIP/2021-2024/FY%202021-2024%20STIP.pdf.

Missouri Department of Transportation. 2021. Statewide Transportation Improvement Program. https://www.modot.org/sites/default/files/documents/FullSTIP.pdf.

National Railroad Passenger Corporation. 2021. "Amtrak Connects US: Amtrak's Vision for Improving Transportation Access Across America." May 27, 2021. http://media.amtrak.com/wp-content/uploads/2021/05/Amtrak-2021-Corridor-Vision-May27_2021.pdf.

Oklahoma Transportation. 2022. Statewide Transportation Improvement Program, FFY 2022-2025. https://oklahoma.gov/content/dam/ok/en/odot/stip/STIPPRO_FULL.pdf.

State of Louisiana. 2018. Statewide Transportation Improvement Program. http://wwwsp.dotd.la.gov/Inside_LaDOTD/Divisions/Multimodal/STIP/Misc%20Documents/Current%202019,%202020,%202021,%202022%20STIP.pdf.

SURFACE TRANSPORTATION BOARD

1996