Appendix F

Freight and Passenger Rail Safety

F.1 Freight Operations Safety

This appendix provides technical information on the approach used in the analysis of the safety impacts that may result from the Proposed Acquisition (*Chapter 3, Section 3.2.1 Freight Rail Safety,* and *Section 3.2.2, Hazardous Materials, and 3.2.3 Passenger Rail Safety*).

F.1.1 Data Sources

OEA reviewed all accident/incident[1] data (herein referred to solely as "incident(s)") for the most recent full five years of available historic data (2015-2019), excluding 2020[2], from the Federal Railroad Administration (FRA) Accident/Incident database via the FRA's Office of Safety Analysis website[3]. For freight rail operations safety, OEA only examined "Group II"[4] data. Group I data are covered in *Chapter 3, Section 3.3, Grade Crossing Delay* and *Section 3.4, Grade Crossing Delay*.

The FRA's Office of Safety Analysis organizes and reports out a variety of information, including the number of incidents per year, yearly incident rates, and train miles all by railroad and year.

OEA used Group II data for three types of analyses:

1. Using the FRA-calculated historic incident rates, OEA calculated systemwide safety rates for the Proposed Acquisition and No-Action Alternative, for both KCS, CP, and the integrated system to be known as the CPKC network in the year 2027; and
2. Changes in incidents on a segment level for segments with an increase of eight or more trains per day.

1 See 49 CFR § 225.5 Definitions for inclusive definition

2 Year 2020 was excluded due to disruptions in rail traffic because of Covid-19 causing the year to be a statistical outlier.

3 The FRA Office of Safety Analysis website provides railroad safety information, including accidents/incidents, inventory, and highway-rail crossing data readily available to the public.

4 49 CFR § 225.19

(b) Group I – Highway-rail grade crossing accident/incident (Form FRA F 6180.57)

(c) Group II – Rail equipment. Rail equipment accidents/incidents are collisions, derailments, fires, explosions, acts of God, and other events involving the operation of on-track equipment (standing or moving) that result in damages higher than the current reporting threshold to railroad on-track equipment, signals, tracks, track structures, or roadbed, including labor costs and costs for acquiring new equipment and material.

F.1.2 Data

For the systemwide and segment specific safety analyses, OEA reviewed data from the FRA's Office of Safety Analysis website, specifically the following data organization outputs:

a. Train Accidents and Rates (Form 54)
   i. Reporting Railroad Codes:
      1. CP
      2. KCS
      3. CMQX
      4. DH
      5. DME
      6. GWWE
      7. STMZ
   ii. Region & State: All
   iii. Type of Accident/Incident: All
   iv. Type of Track:
      1. All for the Systemwide Analysis, which includes:
         a. Main
         b. Yard
         c. Siding
         d. Industry
         e. Not reported
      2. For the Segment Specific Analysis
         a. Main
   v. Track Class: All
   vi. Reporting Years: 2015 – 2019
   vii. *Data excludes accidents/incidents at highway-rail grade crossings*

Delaware & Hudson (DH), Dakota, Minnesota & Eastern (DME), Gateway Eastern Railway (GWWE), Texas Mexican Railway (STMZ) are absent from the data set either because they had no reportable Rail Equipment Accidents or report under their parent markings, CP or KCS. Central Maine & Quebec (CMQX) was removed from the dataset as it was purchased in November 2019 and no full reporting years as outlined above were available.

OEA reviewed and analyzed data to include years 2015 through 2019, and only for CP and KCS (collectively, the Applicants). Duplicate incident entries are produced when multiple pieces of equipment are involved in the same incident. These duplicate entries were identified in the "Accidents by State/Railroad" data output and are labeled by FRA as duplicates via the same Account Number. Since FRA counts duplicate incident entries only once in their calculation of the total incidents per year by railroad, OEA did not have to do any further manipulation to the data.

All data used in this analysis are specific to the U.S. only.

F.1.3 Approach

F.1.3.1 Systemwide Safety Effects Analysis Approach

OEA used FRA's reported annual incident rates for the entire system for each of the five analysis years. FRA calculated these annual incident rates using the equation as follows, and as described below:

$$Annual\ Rate = \frac{Number\ of\ Accidents/Incidents\ (Annually)}{Total\ Million\ Train\ Miles\ (Annually)}$$

The systemwide number of incidents in the FRA database includes incidents that have occurred on all track types. FRA determines systemwide million train miles annually by dividing the total train miles by railroad per year (main track train miles + yard switching miles) by one million.

Under the No-Action Alternative, OEA averaged the five years of data for both CP and KCS individually to determine the expected individual systemwide annual rates for CP and KCS, respectively, in the year 2027 (See **Table F.1-1**). Under the Proposed Acquisition, OEA took the average of CP's five-year average to determine the expected combined CPKC systemwide annual rate in the year 2027.

F.1.3.2 Rail Line Segment-Specific Safety Effects Analysis Approach

For the segment-specific safety analysis, OEA used FRA's reported annual incident rates for mainline incidents only for each of the five analysis years. FRA calculated these annual incident rates for mainlines using the equation as follows, and as described below:

$$Mainline\ Annual\ Rate = \frac{Number\ of\ Main\ Line\ Accidents/Incidents\ (Annually)}{Million\ Train\ Miles\ (Annually) - Yard\ Switching\ Miles}$$

For the segment-specific analysis, OEA calculated the incident rates for the segment-specific analysis using only incidents from the FRA database that occurred on mainlines (see **Table F.1-3**). FRA determines mainline million train miles annually subtracting the yard switching miles from the total train miles.

OEA calculated the five-year average rates for KCS and CP in the same manner as described in *Section F..1.3, Systemwide Safety Effects Analysis Approach*. OEA then applied each railroad's calculated No-Action Alternative mainline incident rate to each of their respective rail segments to calculate the expected risk by segment under the No-Action Alternative. OEA obtained Trains Per Day (TPD) and Segment Length (mi) from the Master Segment Table provided by the Applicants and multiplied by 365 days to calculate train miles per year – or annual train miles. OEA then divided this number by 1,000,000 to convert to million-annual-train-miles. This translates into the following formula:

$$i_{NA} = Mainline\ No\text{-}Action\ Rate \times \frac{(2027\ Without\ Merger\ TPD\ \times Segment\ Length\ \times 365\ Days)}{1{,}000{,}000}$$

OEA used CP's five-year incident rate and applied it to all rail segments under the Proposed Acquisition analysis.

Lastly, OEA converted the data from "incidence per year" to "years between incidence" as described below:

$$CP\ Years\ Between\ Incidence = \frac{1\ incidence}{CP\ Incidences\ per\ Year}$$

And

$$KCS\ Years\ Between\ Incidence = \frac{1\ incidence}{KCS\ Incidences\ per\ Year}$$

And

$$CPKC\ Years\ Between\ Incidence = \frac{1\ incidence}{CPKC\ Incidences\ per\ Year}$$

These calculations allowed OEA to evaluate the change in risk on a segment level between the Proposed Acquisition and the No-Action Alternative. **Table F.1-5** presents select segments (those with an increase of eight or more trains per day).

F.1.4 Safety Analysis

F.1.4.1 Systemwide Safety Effects Analysis

OEA calculated the five-year average rates for all Class 1 railroads based off of the FRA's 2015-2019 reported data. **Table F.1-1** below presents the annual and average rates.

Table F.1-1. US Class 1 Incident Rates 2015-2019

Railroad	2015	2016	2017	2018	2019	5-Year Average
CP	1.70	1.61	1.56	1.06	1.26	1.44
BNSF	2.28	2.09	2.01	2.14	2.21	2.15
CN	2.67	1.63	2.06	2.90	2.68	2.39
NS	2.21	2.6	2.33	2.76	3.31	2.64
CSX	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
UP	3.29	3.25	3.41	3.85	4.76	3.71
All Class 1	**2.69**	**2.38**	**2.60**	**2.83**	**2.80**	**2.66**

Source: https://safetydata.fra.dot.gov/officeofsafety/publicsite/summary.aspx

Under the No-Action Alternative, OEA calculated the year 2027 systemwide incident rates for both CP (1.44) and KCS (3.35), as described in *Section F.1.3, Systemwide Safety Effects Analysis Approach.*

Under the Proposed Acquisition, OEA calculated the year 2027 systemwide incident rate for CPKC (1.44), as described in *Section F.1.3, Systemwide Safety Effects Analysis Approach*.

Table F.1-2 below presents the forecasted 2027 systemwide incident rates.

Table F.1-2. Forecasted 2027 Systemwide Incident Rates

Railroad	No-Action Alternative	Proposed Acquisition
CP	1.44	-
KCS	3.35	-
CPKC	-	1.44

F.1.4.2 Rail Line Segment-Specific Safety Effects Analysis

For the rail line segment-specific safety analysis, OEA calculated the annual mainline incident rates for both railroads for the previous five years as outlined above in *Section F.1.3, Rail Line Segment-Specific Safety Effects Analysis Approach.* OEA then analyzed the data on rail line segments expected to see an increase of eight or more trains per day. **Table F.1-3** below presents the annual and average rates.

Table F.1-3. 2015-2019 Main Line Incident Rates

Year	Incidents	Million-Train-Miles	Incident Rate
Canadian Pacific Railway			
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
Five-year average	**6.**	**8.93**	**0.74**
Kansas City Southern Railway			
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**
Five-year average	**11**	**8.74**	**1.25**

Under the No-Action Alternative, OEA calculated the year 2027 mainline incident rates for both CP (0.74) and KCS (1.25). OEA then applied these CP and KCS mainline incident rates to each segment, depending on their respective associated railroad, as described in *Section F.1.3. Rail Line Segment-Specific Safety Effects Analysis Approach.*

Under the Proposed Acquisition, OEA applied the five-year average CP mainline incident rate to each segment under the Proposed Acquisition, again as described in *Section F.1.3, Rail Line Segment-Specific Safety Effects Analysis Approach*. **Table F.1-4** below presents the assumed 2027 segment-specific incident rates.

Table F.1-4. Assumed 2027 Segment-Specific Incident Rates

Railroad	No-Action Alternative	Proposed Acquisition
CP	0.74	-
KCS	1.25	-
CPKC	-	0.74

Table F.1-5 presents the outcome of the rates in **Table F.1-4** being applied to rail line segments expected to see an increase of eight or more trains per day under both the No-Action Alternative and the Proposed Acquisition.

Table F.1-5. Incident Rates on CP and KCS Segments with ≥8 Trains Per Day of Merger Related Growth

Between	And	Segment Code	Segment Length	No-Action	Proposed Action	Anticipated Change	Projected Years between incidents No Merger	Projected Years between incidents: Merger
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

Table F.1-5. Incident Rates on CP and KCS Segments with ≥8 Trains Per Day of Merger Related Growth

Between	And	Segment Code	Segment Length	No-Action	Proposed Action	Anticipated Change	Projected Years between incidents No Merger	Projected Years between incidents: Merger
Shreveport, LA	Frierson, LA	K-SHRE-04	21.8	0.25	0.21	(0.04)	4.02	4.72
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
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
Frierson, LA	Leesville, LA	K-BEAU-01	91.4	0.45	0.53	0.09	2.24	1.88

F.2 Freight Hazardous Materials Transport

F.2.1 Data Sources

OEA reviewed hazardous material release records provided by the Applicants in Information Request 2. These data contain records of all hazardous material releases, including locomotive fueling and maintenance-related spills. OEA sorted the data by release location type (main, rail yard), and by locomotive/non-locomotive related releases. Since locomotive fueling and service-related releases do not directly corollate with the increase of hazardous material carloads being transported by the railroad, OEA excluded those release data from the calculations.

OEA additionally used Group II data for the analyses:

- Changes in release rates of hazardous materials on main lines and in rail yards.

F.2.2 Data

For hazardous materials transport safety, OEA reviewed data from the Applicants, specifically:

- Hazardous material release
  - On mains
  - In yards
- Excluding: Hazardous material release from locomotives

All data used in this analysis are specific to the U.S. only.

F.2.3 Approach

F.2.3.1 Mainline Hazardous Materials Safety Effects Analysis Approach

OEA calculated annual mainline release rates for each of the five analysis years for CP, KCS, and a combined historical average of the two networks, using the following equation:

$$Annual\ Release\ Rate = \frac{Number\ of\ Mainline\ Releases\ (Annually)}{Hazardous\ Material\ Carmiles\ (Annually)}$$

The historical release rate data from 2015 to 2019 were generally flat and near zero. OEA chose a five-year average to represent year 2027. OEA took an average of each of the rates (CP and KCS) for each of the five analysis years, as shown in **Table F.2-1**, to get the averaged mainline release rates for CP and KCS under the No-Action Alternative, and for CPKC under the Proposed Acquisition, which OEA assumed would be the same as the five-year release rate for CP.

OEA applied each railroad's No-Action Alternative release rate to each of their respective rail line segments in order to calculate the expected risk without the Proposed Acquisition. OEA

applied the No-Action Alternative mainline release rates, as described above, to the 2027 No-Action Alternative hazmat car-miles.

To determine the release rates under the Proposed Acquisition, OEA applied the five-year mainline release rate for CP, as shown in **Table F.2-1**, to the same segments as in the No-Action Alternative analysis. OEA applied the CP mainline average release rate to the 2027 Proposed Acquisition hazmat carloads count, multiplied by the segment length, to calculate car-miles.

Lastly, OEA converted the data from "releases per year" to "years between releases" as described below:

$$CP\ Years\ Between\ Releases = \frac{1\ release}{CP\ Releases\ per\ Year}$$

And

$$KCS\ Years\ Between\ Releases = \frac{1\ release}{KCS\ Releases\ per\ Year}$$

And

$$CPKC\ Years\ Between\ Releases = \frac{1\ release}{CPKC\ Releases\ per\ Year}$$

These calculations allowed OEA to evaluate the change in release rates, at a segment level, between the Proposed Acquisition and the No-Action Alternative. **Table F.2-2** below presents all segments with an annual increase of one or more hazardous material carloads.

F.2.3.2 Yard Hazardous Materials Safety Effects Analysis Approach

OEA calculated annual yard release rates for each of the five analysis years for CP and KCS, as shown in **Table F.2-3**, using the following equation:

$$Annual\ Rate = \frac{Number\ of\ Yard\ Releases\ (Annually)}{Cars\ Processed\ per\ Day\ (Annually)}$$

OEA took an average of each of the rates (CP and KCS) for each of the five analysis years, as shown in **Table F.2-4**, to get the averaged rail yard release rates for CP and KCS under the No-Action Alternative.

To calculate the expected risk without the Proposed Acquisition, OEA applied each railroad's No-Action Alternative rail yard release rate to each of their respective rail yards. The No-Action Alternative rail yard release rates for CP and KCS, as described above, were respectively applied to the CP or KCS 2027 No-Action Alternative cars processed per day, multiplied by 365:

$$CP\ Releases\ per\ Year = (CP\ Release\ Rate) \times 2027\ No\text{-}Action\ Alternative\ Cars\ Processed\ per\ Day \times 365\ Days$$

And

$$KCS\ Releases\ per\ Year = (KCS\ Release\ Rate) \times 2027\ No\text{-}Action\ Alternative\ Cars\ Proccessed\ per\ Day \times 365\ Days$$

OEA applied the five-year average release rate for CP to the same rail yards to the 2027 Proposed Acquisition cars processed per day, and multiplied by 365 to get annual cars processed under the Proposed Acquisition:

$$CPKC\ Releases\ per\ Year = (CP\ Release\ Rate) \times 2027\ Proposed\ Acquisition\ Cars\ Processed\ per\ Day \times 365\ Days$$

Lastly, OEA converted the data from "releases per year" to "years between releases" as described below:

$$CP\ Years\ Between\ Releases = \frac{1\ release}{CP\ Releases\ per\ Year}$$

And

$$KCS\ Years\ Between\ Releases = \frac{1\ release}{KCS\ Releases\ per\ Year}$$

And

$$CPKC\ Years\ Between\ Releases = \frac{1\ release}{CPKC\ Releases\ per\ Year}$$

These calculations allowed OEA to evaluate the change in release rates at all rail yards between the Proposed Acquisition and the No-Action Alternative. **Table F.2-5** below presents all yards with merger related growth.

F.2.4 Hazardous Materials Transport Analysis

F.2.4.1 Mainline Hazardous Materials Safety Effects Analysis

For the mainline hazardous materials release safety analysis, OEA calculated the release rates as described above and shown in **Table F.2-1.** Additionally, OEA analyzed the data on rail line segments with any Proposed Acquisition-related increase in hazardous materials transport. **Table F.2-2** lists the results sorted by segment miles and filtered by merger related growth greater than or equal to one carload per year.

On average, over the five years period from 2015 to 2019, there has been only one hazardous material release for approximately every 37.8 million miles a hazmat car traveled (See *Chapter 3, Section 3.2.2.2, Affected Environment* for more information). These near zero trends are expected to continue in the future, although the trends would change some due to the overall increase in expected hazmat carloads under the Proposed Acquisition.

Table F.2-1. 2015-2019 Average Mainline Release Rates

Year	Releases	Hazmat Car miles	Release Rate
Canadian Pacific Railway			
Five-year Average	5.4	207,217,406	2.61E-08
Kansas City Southern Railway			
Five-year Average	2.8	102,790,252	2.72E-08

Table F.2-2. Rail Line Segments with Acquisition-Related Hazardous Material Carload Growth

Segment Information			Hazardous Material Carloads Per Year					Projected Releases per Year	
Segment	Railroad	Segment Length	Base Hazmat Carloads	Organic Growth Hazmat Carloads	2027 No Merger Hazmat Carloads	Merger Related Growth Hazmat Carloads	2027 With Merger Hazmat Carloads	2027 No Action Alternative	2027 Proposed Acquisition
C-PORT-01	CP	10.58	126,707	33,451	160,157	39,030	199,188	0.04	0.05
C-PORT-02	CP	20.80	126,707	33,451	160,157	39,030	199,188	0.09	0.11
C-PORT-03	CP	99.20	138,322	36,517	174,838	39,210	214,048	0.45	0.55
C-PORT-04	CP	23.75	148,881	39,304	188,185	39,381	227,566	0.12	0.14
C-CARR-01	CP	139.60	151,476	39,990	191,465	39,346	230,811	0.70	0.84
C-ELLA-01	CP	48.00	102,278	27,001	129,280	39,237	168,517	0.16	0.21
C-ELLA-02	CP	9.97	98,654	26,045	124,699	39,291	163,990	0.03	0.04
C-ELLA-03	CP	6.36	96,660	25,518	122,178	39,291	161,469	0.02	0.03
C-ELLA-04	CP	69.57	96,477	25,470	121,948	39,291	161,239	0.22	0.29
C-NOYE-01	CP	76.60	46,089	12,168	58,257	720	58,977	0.12	0.12
C-DELA-01	CP	19.10	30,882	8,153	39,034	720	39,754	0.02	0.02
C-DELA-02	CP	77.00	30,882	8,153	39,034	720	39,754	0.08	0.08
C-DELA-03	CP	92.30	30,882	8,153	39,034	720	39,754	0.09	0.10
C-PAYN-01	CP	15.43	182,305	48,128	230,433	40,064	270,497	0.09	0.11
C-PAYN-02	CP	97.10	180,538	47,662	228,200	40,115	268,316	0.58	0.68
C-PAYN-03	CP	4.10	186,165	49,147	235,312	40,351	275,663	0.03	0.03
C-PAYN-04	CP	1.10	183,453	48,431	231,884	40,249	272,133	0.01	0.01
C-MNS-01	CP	9.10	26	7	33	102	135	<0.01	<0.01
C-DULU-01	CP	0.30	313	83	395	26	422	<0.01	<0.01
C-DULU-02	CP	4.30	886	234	1,120	79	1,200	<0.01	<0.01
C-DULU-03	CP	0.30	1,564	413	1,977	81	2,058	<0.01	<0.01

Table F.2-2. Rail Line Segments with Acquisition-Related Hazardous Material Carload Growth

Segment Information			Hazardous Material Carloads Per Year					Projected Releases per Year	
Segment	Railroad	Segment Length	Base Hazmat Carloads	Organic Growth Hazmat Carloads	2027 No Merger Hazmat Carloads	Merger Related Growth Hazmat Carloads	2027 With Merger Hazmat Carloads	2027 No Action Alternative	2027 Proposed Acquisition
C-DULU-04	CP	1.90	678	179	857	1	858	<0.01	<0.01
C-DULU-05	CP	5.90	678	179	857	1	858	<0.01	<0.01
B-DULU-01	CP	132.20	2,594	685	3,279	79	3,358	0.01	0.01
B-TWIN-01	CP	17.50	107,480	28,375	135,854	43,571	179,425	0.06	0.08
C-STPA-01	CP	5.30	443	117	560	15	575	<0.01	<0.01
C-WITH-01	CP	6.90	469	124	593	15	608	<0.01	<0.01
C-WITH-02	CP	12.31	443	117	560	15	575	<0.01	<0.01
C-MEPA-01	CP	2.98	-	-	-	32,682	32,682	-	<0.01
C-RIVE-01	CP	4.90	190,295	50,238	240,533	31,456	271,989	0.03	0.03
C-RIVE-02	CP	114.50	200,798	53,011	253,809	41,014	294,823	0.76	0.88
C-OWAT-01	CP	28.40	300	79	379	9	388	<0.01	<0.01
C-OWAT-02	CP	44.10	378	100	478	19	497	<0.01	<0.01
C-OWAT-03	CP	51.30	209	55	264	9	273	<0.01	<0.01
C-TRAC-01	CP	27.10	6,708	1,771	8,479	111	8,589	0.01	0.01
C-TRAC-02	CP	72.10	5,306	1,401	6,707	125	6,832	0.01	0.01
C-TRAC-03	CP	24.90	3,247	857	4,104	68	4,172	<0.01	<0.01
C-WASE-01	CP	53.17	6,570	1,734	8,304	97	8,401	0.01	0.01
C-WASE-02	CP	42.93	5,488	1,449	6,937	97	7,034	0.01	0.01
C-MARQ-01	CP	22.50	71,079	18,765	89,844	40,810	130,654	0.05	0.08
C-MARQ-02	CP	38.50	71,079	18,765	89,844	40,810	130,654	0.09	0.13
C-MARQ-03	CP	98.00	129,465	34,179	163,644	41,668	205,312	0.42	0.52

Table F.2-2. Rail Line Segments with Acquisition-Related Hazardous Material Carload Growth

Segment Information			Hazardous Material Carloads Per Year					Projected Releases per Year	
Segment	Railroad	Segment Length	Base Hazmat Carloads	Organic Growth Hazmat Carloads	2027 No Merger Hazmat Carloads	Merger Related Growth Hazmat Carloads	2027 With Merger Hazmat Carloads	2027 No Action Alternative	2027 Proposed Acquisition
C-TOMA-01	CP	4.30	131,449	34,703	166,152	112	166,264	0.02	0.02
C-TOMA-02	CP	2.60	229,176	60,502	289,679	242	289,921	0.02	0.02
C-TOMA-03	CP	60.00	74,708	19,723	94,431	85	94,516	0.15	0.15
C-TOMA-04	CP	40.80	75,255	19,867	95,123	53	95,176	0.10	0.10
C-MP-01	CP	30.20	35,958	9,493	45,451	28	45,479	0.04	0.04
C-MP-02	CP	1.40	2,920	771	3,691	9	3,700	<0.01	<0.01
C-WATE-01	CP	3.50	41,493	10,954	52,447	46	52,493	<0.01	<0.01
C-WATE-02	CP	43.20	73,495	19,403	92,898	63	92,961	0.10	0.10
C-WATE-03	CP	31.60	73,756	19,472	93,228	129	93,357	0.08	0.08
C-WATE-04	CP	2.70	73,743	19,468	93,211	119	93,331	0.01	0.01
C-WATE-05	CP	11.20	74,369	19,633	94,002	119	94,122	0.03	0.03
C-WATE-06	CP	1.10	34,114	9,006	43,121	17	43,138	<0.01	<0.01
C-CM-01	CP	25.10	163,672	43,209	206,881	323	207,204	0.14	0.14
C-CM-02	CP	14.60	159,891	42,211	202,102	321	202,424	0.08	0.08
C-CM-03	CP	15.10	159,409	42,084	201,493	302	201,795	0.08	0.08
C-CM-04	CP	11.20	71,879	18,976	90,855	302	91,157	0.03	0.03
C-CM-05	CP	0.60	71,879	18,976	90,855	302	91,157	<0.01	<0.01
C-CM-06	CP	20.50	69,011	18,219	87,230	199	87,430	0.05	0.05
C-CM-07	CP	1.30	952	251	1,203	20	1,222	<0.01	<0.01
C-SHEL-01	CP	135.70	13,492	3,562	17,054	1	17,055	0.06	0.06
C-MACI-01	CP	116.70	26,507	6,998	33,505	13	33,518	0.10	0.10

Table F.2-2. Rail Line Segments with Acquisition-Related Hazardous Material Carload Growth

Segment Information			Hazardous Material Carloads Per Year					Projected Releases per Year	
Segment	Railroad	Segment Length	Base Hazmat Carloads	Organic Growth Hazmat Carloads	2027 No Merger Hazmat Carloads	Merger Related Growth Hazmat Carloads	2027 With Merger Hazmat Carloads	2027 No Action Alternative	2027 Proposed Acquisition
C-CHIC-01	CP	0.70	49,432	13,050	62,482	2,864	65,345	<0.01	<0.01
C-CHIC-02	CP	61.50	56,623	14,949	71,572	11,225	82,796	0.11	0.13
C-CHIC-03	CP	38.70	36,244	9,568	45,813	11,175	56,987	0.05	0.06
C-ROCK-01	CP	30.90	-	-	-	419	419	-	<0.01
C-ROCK-02	CP	14.90	-	-	-	34	34	-	<0.01
C-ELGI-01	CP	23.00	47,888	12,642	60,530	10,977	71,507	0.04	0.04
C-ELGI-02	CP	4.60	290,956	76,812	367,768	3,797	371,565	0.04	0.04
C-ELGI-03	CP	6.30	158,098	41,738	199,836	841	200,677	0.03	0.03
C-ELGI-04	CP	1.00	39,082	10,318	49,400	184	49,583	<0.01	<0.01
M-CHIC-01	CP	3.50	33,528	8,851	42,379	118	42,497	<0.01	<0.01
M-CHIC-02	CP	25.50	144,864	38,244	183,107	655	183,762	0.12	0.12
S-CHIC-01	CP	6.90	40,742	10,756	51,498	798	52,296	0.01	0.01
S-CHIC-02	CP	20.80	40,742	10,756	51,498	798	52,296	0.03	0.03
S-CHIC-03	CP	60.40	40,742	10,756	51,498	798	52,296	0.08	0.08
S-CHIC-04	CP	63.10	40,742	10,756	51,498	798	52,296	0.08	0.09
S-HUNT-01	CP	11.90	16,177	4,271	20,448	798	21,246	0.01	0.01
S-DETR-01	CP	17.00	40,742	10,756	51,498	798	52,296	0.02	0.02
S-DETR-02	CP	43.00	40,742	10,756	51,498	798	52,296	0.06	0.06
S-DETR-03	CP	31.00	40,742	10,756	51,498	798	52,296	0.04	0.04
C-DAVE-01	CP	17.50	26,829	7,083	33,912	43,859	77,771	0.02	0.04
C-DAVE-02	CP	33.22	23,379	6,172	29,550	44,466	74,016	0.03	0.06

Table F.2-2. Rail Line Segments with Acquisition-Related Hazardous Material Carload Growth

Segment Information			Hazardous Material Carloads Per Year					Projected Releases per Year	
Segment	Railroad	Segment Length	Base Hazmat Carloads	Organic Growth Hazmat Carloads	2027 No Merger Hazmat Carloads	Merger Related Growth Hazmat Carloads	2027 With Merger Hazmat Carloads	2027 No Action Alternative	2027 Proposed Acquisition
C-DAVE-03	CP	4.48	23,379	6,172	29,550	44,466	74,016	<0.01	0.01
C-NITR-01	CP	19.80	2,099	554	2,653	315	2,968	<0.01	<0.01
C-OTTU-01	CP	24.61	19,884	5,249	25,133	43,984	69,117	0.02	0.04
C-OTTU-02	CP	82.49	21,384	5,645	27,029	43,857	70,886	0.06	0.15
C-LARE-01	CP	61.20	32,208	8,503	40,711	43,714	84,425	0.06	0.13
C-LARE-02	CP	41.10	31,230	8,245	39,475	43,616	83,091	0.04	0.09
C-KACI-01	CP	51.60	11,954	3,156	15,110	44,522	59,631	0.02	0.08
C-KACI-02	CP	42.10	16,473	4,349	20,822	49,394	70,216	0.02	0.08
K-PITT-01	KCS	124.50	17,716	4,677	22,392	48,313	70,705	0.08	0.23
K-MEXI-01	KCS	97.20	4,862	1,284	6,146	142	6,288	0.02	0.02
K-MEXI-02	KCS	67.90	4,862	1,284	6,146	142	6,288	0.01	0.01
K-ROOD-01	KCS	88.40	7,170	1,893	9,062	142	9,204	0.02	0.02
K-GODF-01	KCS	40.10	4,758	1,256	6,014	142	6,156	0.01	0.01
K-ESLT-01	KCS	32.90	3,715	981	4,696	36	4,732	<0.01	<0.01
K-HEAV-01	KCS	107.80	15,643	4,130	19,773	43,850	63,623	0.06	0.18
K-HEAV-02	KCS	90.40	17,337	4,577	21,915	41,100	63,014	0.05	0.15
K-HEAV-03	KCS	11.60	17,337	4,577	21,915	43,316	65,230	0.01	0.02
K-SHRE-01	KCS	94.60	17,403	4,594	21,997	42,481	64,478	0.06	0.16
K-SHRE-02	KCS	37.10	41,310	10,906	52,216	46,399	98,615	0.05	0.10
K-SHRE-03	KCS	83.20	21,326	5,630	26,957	46,627	73,583	0.06	0.16
K-SHRE-04	KCS	21.80	132,977	35,106	168,083	47,439	215,522	0.10	0.12

Table F.2-2. Rail Line Segments with Acquisition-Related Hazardous Material Carload Growth

Segment Information			Hazardous Material Carloads Per Year					Projected Releases per Year	
Segment	Railroad	Segment Length	Base Hazmat Carloads	Organic Growth Hazmat Carloads	2027 No Merger Hazmat Carloads	Merger Related Growth Hazmat Carloads	2027 With Merger Hazmat Carloads	2027 No Action Alternative	2027 Proposed Acquisition
K-SHRE-05	KCS	15.50	71,032	18,752	89,784	4,007	93,791	0.04	0.04
K-GREE-01	KCS	30.30	14,782	3,903	18,685	1,430	20,115	0.02	0.02
K-GREE-02	KCS	171.50	17,572	4,639	22,211	869	23,080	0.10	0.10
K-ALLI-01	KCS	22.00	156	41	198	417	615	<0.01	<0.01
K-ALLI-02	KCS	45.00	156	41	198	417	615	<0.01	<0.01
K-ALLI-03	KCS	9.10	235	62	297	417	714	<0.01	<0.01
K-DALL-01	KCS	18.10	5,579	1,473	7,052	298	7,350	<0.01	<0.01
K-BEAU-01	KCS	91.40	62,609	16,529	79,138	48,997	128,135	0.20	0.31
K-BEAU-02	KCS	50.60	59,424	15,688	75,112	48,991	124,102	0.10	0.16
K-BEAU-03	KCS	47.00	62,355	16,462	78,817	50,364	129,181	0.10	0.16
K-BEAU-04	KCS	20.10	23,832	6,292	30,124	34,367	64,491	0.02	0.03
U-BEAU-01	KCS	120.00	8,082	2,134	10,216	5,374	15,590	0.03	0.05
K-LACH-01	KCS	16.40	25,446	6,718	32,164	606	32,769	0.01	0.01
K-LACH-02	KCS	17.70	12,801	3,379	16,181	145	16,325	0.01	0.01
K-ROSE-01	KCS	12.20	101,187	26,713	127,901	13,586	141,487	0.04	0.04
K-ROSE-02	KCS	74.80	99,915	26,377	126,292	11,852	138,144	0.26	0.27
U-VICT-01	KCS	12.80	31,964	8,438	40,402	11,617	52,019	0.01	0.02
U-VICT-02	KCS	82.80	31,964	8,438	40,402	11,617	52,019	0.09	0.11
K-LARE-01	KCS	10.10	98,506	26,005	124,511	1,216	125,727	0.03	0.03
K-LARE-02	KCS	144.00	190,626	50,325	240,951	25,637	266,589	0.95	1.00
K-ALEX-01	KCS	120.00	24,325	6,422	30,746	2,330	33,077	0.10	0.10

Table F.2-2. Rail Line Segments with Acquisition-Related Hazardous Material Carload Growth

Segment Information			Hazardous Material Carloads Per Year					Projected Releases per Year	
Segment	Railroad	Segment Length	Base Hazmat Carloads	Organic Growth Hazmat Carloads	2027 No Merger Hazmat Carloads	Merger Related Growth Hazmat Carloads	2027 With Merger Hazmat Carloads	2027 No Action Alternative	2027 Proposed Acquisition
K-ALEX-02	KCS	10.90	24,651	6,508	31,158	2,330	33,489	0.01	0.01
K-NEWO-01	KCS	96.50	41,793	11,033	52,826	2,504	55,330	0.14	0.14
K-NEWO-02	KCS	76.60	41,793	11,033	52,826	2,504	55,330	0.11	0.11
K-VICK-01	KCS	23.60	44,882	11,849	56,731	3,576	60,307	0.04	0.04
K-VICK-02	KCS	14.20	44,621	11,780	56,401	3,576	59,978	0.02	0.02
K-VICK-03	KCS	55.70	43,592	11,508	55,100	2,975	58,074	0.08	0.08
K-VICK-04	KCS	71.50	41,962	11,078	53,040	1,047	54,087	0.10	0.10
K-MERD-01	KCS	44.70	44,543	11,759	56,303	220	56,523	0.07	0.07
K-MERD-03	KCS	30.90	30,777	8,125	38,903	5,070	43,973	0.03	0.04
K-ARTE-01	KCS	84.00	29,356	7,750	37,107	16	37,122	0.08	0.08
K-ARTE-02	KCS	13.30	10,376	2,739	13,116	14	13,130	<0.01	<0.01
K-ARTE-03	KCS	46.50	3,246	857	4,103	3	4,106	0.01	<0.01
K-ARTE-04	KCS	49.80	2,138	564	2,702	1	2,704	<0.01	<0.01
K-TUSC-01	KCS	90.10	12,684	3,349	16,032	13	16,045	0.04	0.04
K-ABER-01	KCS	16.40	7,587	2,003	9,590	13	9,603	<0.01	<0.01

F.2.4.2 Yard Hazardous Materials Safety Effects Analysis

For the rail yard hazardous materials release safety analysis, OEA calculated the release rates as described above, and analyzed the data for all rail yards. **Table F.2-4** presents the results.

On average, between 2015 and 2019, there has been only one hazardous material release for approximately every 300,000 carloads processed in yards (See *Chapter 3, Section 3.2.2.2, Affected Environment* for more information). These near zero rate are expected to continue in the future, although the total number of releases would change due to the overall increase in expected hazmat carloads under the Proposed Acquisition.

Table F.2-3. 2015-2019 Historical Yard Hazmat Releases

Year	Releases	Carloads	Release Rate
Canadian Pacific Railway			
2015	16	1,085,863	1.47E-05
2016	9	987,005	9.12E-06
2017	10	1,071,967	9.33E-06
2018	6	1,138,855	5.27E-06
2019	14	1,113,237	1.26E-05
Kansas City Southern Railway			
2015	13	1,206,859	1.08E-05
2016	17	1,149,640	1.48E-05
2017	12	1,214,621	9.88E-06
2018	17	1,253,296	1.36E-05
2019	15	1,263,804	1.19E-05
Combined Systems			
2015	29	2,292,722	1.26E-05
2016	26	2,136,645	1.22E-05
2017	22	2,286,588	9.62E-06
2018	23	2,392,151	9.61E-06
2019	29	2,377,041	1.22E-05

Table F.2-4. Five-Year Averaged Yard Release Rates

Railroad	No-Action Alternative	Proposed Acquisition
CP	2.42E-06	-
KCS	4.50E-06	-

Table F.2-5. Rail Yards with Acquisition-Related Growth Greater than One Carload Processed Per Day

Yard Information			Cars Processed Per Day					Projected Releases Per Year	
Rail 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	0.41
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	1.59
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

Table F.2-5. Rail Yards with Acquisition-Related Growth Greater than One Carload Processed Per Day

Yard Information			Cars Processed Per Day					Projected Releases Per Year	
Rail Yard Name	Railroad	State	Base	Organic Growth	2027 No-Action Alternative	Acquisition-Related Growth	2027 Proposed Acquisition	2027 No-Action Alternative	2027 Proposed Acquisition
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
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

Table F.2-5. Rail Yards with Acquisition-Related Growth Greater than One Carload Processed Per Day

Yard Information			Cars Processed Per Day					Projected Releases Per Year	
Rail Yard Name	Railroad	State	Base	Organic Growth	2027 No-Action Alternative	Acquisition-Related Growth	2027 Proposed Acquisition	2027 No-Action Alternative	2027 Proposed Acquisition
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
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	2.07
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

F.3 Passenger Rail Operations Safety

This section presents the rail segments where freight trains and passenger train operations overlap within the combined CPKC system and the segments where the number of daily freight trains would increase as a result of the Proposed Acquisition. All segments where freight trains and passenger trains overlap are listed in **Table F.3-1**. The segments where freight trains and passenger trains overlap, in descending order of change in freight activity, are listed in **Table F.3-2**.

Table F.3-1. Rail Segments with Passenger Rail Service

Segment Number	Segment Code	Segment Begin MP	Segment Begin Station	Segment End MP	Segment End Station	Segment Length (Miles)	Owner	Passenger Service Type (Amtrak or Commuter)	Passenger Rail Corridor
147	K-BEAU-03	719	DE QUINCY, LA	766	BEAUMONT, TX	47.6	KCS	AMTRAK	New Orleans to Los Angeles via Houston
81	C-ELGI-01	17.3	BENSENVILLE METRA, IL	40.3	RANDALL ROAD, IL	23.0	NIRC	METRA	Chicago to Big Timber (Elgin)
149	U-BEAU-01	0	BEAUMONT, TX	120	ROSENBERG, TX	120.1	UP	AMTRAK	New Orleans to Los Angeles via Houston
82	C-ELGI-02	12.7	TOWER B12, IL	17.3	BENSENVILLE METRA, IL	4.6	NIRC	METRA	Chicago to Big Timber (Elgin)
40	C-RIVE-02	288	RIVER JCT, MN	402.5	NEWPORT, MN	114.5	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
51	C-MARQ-01	136.5	MN/IA MARQUETTE	158.998	RIVER JCT	28.40	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
34	B-TWIN-01	428	ST PAUL YARD, MN	445.5	NORTHTOWN, MN	14.7	BNSF	AMTRAK, METRO TRANSIT	Minneapolis - Big Lake, Chicago to Seattle
39	C-RIVE-01	402.5	NEWPORT, MN	407.4	MINNEAPOLIS, MN	16.5	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
38	C-MEPA-01	409	HOFFMAN ST PAUL, MN	412	FORDSON JCT, MN	4.9	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
33	B-DULU-01	445.5	NORTHTOWN	577.7	BOYLSTON	132.2	BNSF	AMTRAK, METRO TRANSIT	Minneapolis to Big Lake, Chicago to Seattle
54	C-TOMA-01	283.8	BRIDGE SWITCH	288.1	RIVER JCT WEST	4.3	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
55	C-TOMA-02	281.2	LA CROSSE	283.8	BRIDGE SWITCH	2.6	CPRS	AMTRAK	Chicago to Seattle via Minneapolis

Table F.3-1. Rail Segments with Passenger Rail Service

Segment Number	Segment Code	Segment Begin MP	Segment Begin Station	Segment End MP	Segment End Station	Segment Length (Miles)	Owner	Passenger Service Type (Amtrak or Commuter)	Passenger Rail Corridor
56	C-TOMA-03	221.2	NEW LISBON	281.2	LA CROSSE	60	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
57	C-TOMA-04	180.4	PORTAGE	221.2	NEW LISBON	40.8	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
60	C-WATE-01	176.9	PORTAGE JUNCTION	180.4	PORTAGE	3.5	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
61	C-WATE-02	133.7	WATERTOWN	176.9	PORTAGE JUNCTION	43.2	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
62	C-WATE-03	102.1	DUPLAINVILLE	133.7	WATERTOWN	31.6	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
63	C-WATE-04	99.4	BROOKFIELD	102.1	DUPLAINVILLE	2.7	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
64	C-WATE-05	88.2	GRAND AVE	99.4	BROOKFIELD	11.2	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
65	C-WATE-06	87.1	CUTOFF	88.2	GRAND AVE	1.1	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
66	C-CM-01	62	STURTEVANT	87.1	CUTOFF	25.1	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
67	C-CM-02	47.4	WI/IL C&M	62	STURTEVANT	14.6	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
68	C-CM-03	32.3	RONDOUT	47.4	WI/IL C&M	15.1	CPRS	AMTRAK	Chicago to Seattle via Minneapolis
69	C-CM-04	21.1	NORTHBROOK	32.3	RONDOUT	11.2	NIRC	METRA, AMTRAK	Chicago to Seattle, Chicago to Fox Lake
70	C-CM-05	20.5	TOWER A20	21.1	NORTHBROOK	0.6	NIRC	METRA, AMTRAK	Chicago to Seattle, Chicago to Fox Lake

Table F.3-1. Rail Segments with Passenger Rail Service

Segment Number	Segment Code	Segment Begin MP	Segment Begin Station	Segment End MP	Segment End Station	Segment Length (Miles)	Owner	Passenger Service Type (Amtrak or Commuter)	Passenger Rail Corridor
71	C-CM-06	0	CHGO UNION STATION	20.5	TOWER A20	20.5	NIRC	METRA, AMTRAK	Chicago to Seattle, Chicago to Fox Lake
73	C-FOLA-01	32.3	RONDOUT	49.5	FOX LAKE	17.2	NIRC	METRA	Chicago to Seattle, Chicago to Fox Lake
83	C-ELGI-03	6.4	CRAGIN JCT	12.7	TOWER B12	6.3	NIRC	METRA	Chicago to Big Timber (Elgin)
84	C-ELGI-04	5.4	NORTH AVE	6.4	CRAGIN JUNCTION	1	CPRS	METRA	Chicago to Big Timber (Elgin)
86	M-CHIC-02	4.5	IL/IN BURNHAM/GIB	30	CRAGIN JUNCTION	25.5	CPRS	METRA	Chicago to Big Timber (Elgin)
87	S-CHIC-01	502.8	CP 502	509.7	ROCK ISLAND JCT	6.9	NS	AMTRAK	Chicago to New York City/Washington DC
88	S-CHIC-02	482	PORTER	502.8	CP 502	20.8	NS	AMTRAK	Chicago to New York City/Washington DC
89	S-CHIC-03	421.6	ELKHART	482	PORTER	60.4	NS	AMTRAK	Chicago to New York City/Washington DC
90	S-CHIC-04	358.5	BUTLER	421.6	ELKHART	63.1	NS	AMTRAK	Chicago to New York City/Washington DC
106	C-CANA-01	77.9	WHITEHALL	190.6	ROUSES POINT	112.7	CPRS	AMTRAK	New York City to Montreal
107	C-CANA-02	38.2	CPC 38	77.9	WHITEHALL	39.7	CPRS	AMTRAK	New York City to Montreal/Rutland
108	C-CANA-03	21.7	MOHAWK YARD	38.2	CPC 38	16.5	CPRS	AMTRAK	New York City to Montreal/Rutland
110	C-FRNO-01	468	MECHANICVILLE	482.5	MOHAWK YD	14.5	CPRS	AMTRAK	New York City to Montreal/Rutland

Table F.3-1. Rail Segments with Passenger Rail Service

Segment Number	Segment Code	Segment Begin MP	Segment Begin Station	Segment End MP	Segment End Station	Segment Length (Miles)	Owner	Passenger Service Type (Amtrak or Commuter)	Passenger Rail Corridor
111	C-FRNO-02	482.5	MOHAWK TD	484.8	SCHENECTADY	2.3	CPRS	AMTRAK	New York City to Montreal/Rutland
119	K-MEXI-01	393.6	KANSAS CITY	490.8	KANSAS CITY	97.2	KCS	AMTRAK	Chicago to Los Angeles via Kansas City
124	K-SPRI-03	193.4	COCKRELL	203.7	SPRINGFIELD	10.3	UP	AMTRAK	Chicago to New Orleans via St. Louis
126	K-GODF-01	28.1	GODFREY	68.2	ROODHOUSE	40.1	KCS	AMTRAK	Chicago to New Orleans via St. Louis
127	K-ESLT-01	252.1	GODFREY	285	EAST ST LOUIS	32.9	KCS	AMTRAK	Chicago to New Orleans via St. Louis
140	K-ALLI-01	54.1	METRO	76.1	ALLIANCE	22	BNSF	AMTRAK	Oklahoma City to Fort Worth
142	K-ALLI-03	0	ALLIANCE	9.1	LAVON JCT	9.1	KCS	DART	DART Silver Line
143	K-DALL-01	0	LAVON JCT	18.1	DALLAS	18.1	KCS	AMTRAK	Chicago to San Antonio
161	K-NEWO-02	788.4	BATON ROUGE	865	NEW ORLEANS	76.6	KCS	AMTRAK	Chicago to New Orleans via St. Louis

Table F.3-2. Descending Order of Change in Freight Activity

Segment Number	Segment Code	2019 Base			2027 No Merger			2027 With Merger			Change in Freight 2027 No Merger to With Merger
		Passenger	Freight	Total	Passenger	Freight	Total	Passenger	Freight	Total	
147	K-BEAU-03	0.85	8.67	9.52	0.85	9.32	10.17	0.85	20.29	21.14	10.97
81	C-ELGI-01	57	3.2	60.2	57	3.41	60.41	57	11.41	68.41	8
149	U-BEAU-01	0.85	8.47	9.32	0.85	9.25	10.10	0.85	16.82	17.67	7.57
82	C-ELGI-02	58	29.42	87.42	58	30.52	88.52	58	36.95	94.95	6.43
40	C-RIVE-02	2	16.16	18.16	2	17.06	19.06	2	23.06	25.06	6
51	C-MARQ-01	2	4.66	6.66	2	5.28	7.28	2	11.28	13.28	6
34	B-TWIN-01	14	16.66	30.66	14	17.51	31.51	14	23.1	37.10	5.59
39	C-RIVE-01	2	13.66	15.66	2	14.51	16.51	2	19.1	21.10	4.59
38	C-MEPA-01	2	1	3	2	1	3	2	4.59	6.59	3.59
33	B-DULU-01	14	0.65	14.65	14	0.67	14.67	14	0.67	14.67	0
54	C-TOMA-01	2	8.86	10.86	2	9.69	11.69	2	9.69	11.69	0
55	C-TOMA-02	2	17.09	19.09	2	18.51	20.51	2	18.51	20.51	0
56	C-TOMA-03	2	13.9	15.9	2	15.18	17.18	2	15.18	17.18	0
57	C-TOMA-04	2	13.76	15.76	2	15.04	17.04	2	15.04	17.04	0
60	C-WATE-01	2	7.78	9.78	2	8.66	10.66	2	8.66	10.66	0
61	C-WATE-02	2	11.49	13.49	2	12.37	14.37	2	12.37	14.37	0
62	C-WATE-03	2	11.49	13.49	2	12.37	14.37	2	12.37	14.37	0
63	C-WATE-04	2	11.49	13.49	2	12.37	14.37	2	12.37	14.37	0
64	C-WATE-05	2	12.64	14.64	2	13.52	15.52	2	13.52	15.52	0
65	C-WATE-06	2	8.91	10.91	2	9.79	11.79	2	9.79	11.79	0
66	C-CM-01	9	12.96	21.96	9	13.82	22.82	9	13.82	22.82	0
67	C-CM-02	9	11.81	20.81	9	12.67	21.67	9	12.67	21.67	0
68	C-CM-03	9	11.81	20.81	9	12.67	21.67	9	12.67	21.67	0
69	C-CM-04	79	11.11	90.11	79	11.97	90.97	79	11.97	90.97	0
70	C-CM-05	79	11.1	90.1	79	11.96	90.96	79	11.96	90.96	0

Table F.3-2. Descending Order of Change in Freight Activity

Segment Number	Segment Code	2019 Base			2027 No Merger			2027 With Merger			Change in Freight 2027 No Merger to With Merger
		Passenger	Freight	Total	Passenger	Freight	Total	Passenger	Freight	Total	
71	C-CM-06	79	1.73	80.73	79	1.73	80.73	79	1.73	80.73	0
73	C-FOLA-01	46	0.57	46.57	63	0.57	63.57	63	0.57	63.57	0
83	C-ELGI-03	58	12.31	70.31	58	12.62	70.62	58	12.62	70.62	0
84	C-ELGI-04	58	1.74	59.74	58	1.75	59.75	58	1.75	59.75	0
86	M-CHIC-02	58	6.8	64.8	58	7.12	65.12	58	7.12	65.12	0
87	S-CHIC-01	4	4.4	8.4	4	4.53	8.53	4	4.53	8.53	0
88	S-CHIC-02	4	3.4	7.4	4	3.53	7.53	4	3.53	7.53	0
89	S-CHIC-03	4	3.4	7.4	4	3.53	7.53	4	3.53	7.53	0
90	S-CHIC-04	4	3.4	7.4	4	3.53	7.53	4	3.53	7.53	0
106	C-CANA-01	2	5.51	7.51	2	5.63	7.63	2	5.63	7.63	0
107	C-CANA-02	4	6.22	10.22	4	6.34	10.34	4	6.34	10.34	0
108	C-CANA-03	4	6.22	10.22	4	6.34	10.34	4	6.34	10.34	0
110	C-FRNO-01	4	5.22	9.22	4	5.34	9.34	4	5.34	9.34	0
111	C-FRNO-02	4	8.57	12.57	4	8.57	12.57	4	8.57	12.57	0
119	K-MEXI-01	2	2.74	4.74	2	3.02	5.02	2	3.02	5.02	0
124	K-SPRI-03	10	0.14	10.14	10	0.14	10.14	10	0.14	10.14	0
126	K-GODF-01	10	1.57	11.57	10	1.60	11.60	10	1.60	11.60	0
127	K-ESLT-01	10	3.71	13.71	10	3.74	13.74	10	3.74	13.74	0
140	K-ALLI-01	2	0.83	2.83	2	0.89	2.89	2	0.89	2.89	0
142	K-ALLI-03	0	1.27	1.27	22	1.33	23.33	22	1.33	23.33	0
143	K-DALL-01	2	1.57	3.57	2	1.57	3.57	2	1.57	3.57	0
161	K-NEWO-02	2	5.84	7.84	2	5.87	7.87	2	5.87	7.87	0

Where daily freight train traffic is projected to increase by one or more freight train per day as a result of the Proposed Acquisition, OEA performed a quantitative analysis of collisions between passenger trains and freight trains on all rail line segments carrying both passenger trains and freight trains. The analysis excludes all other accident types. OEA evaluated data for an 11-year period between January 2008 and December 2018 (the most recent year passenger train miles data are available).

OEA determined that the national accident rate for collisions occurring between passenger trains and freight trains is 0.0047 collisions per million commuter and intercity passenger train miles. On rail line segments where daily freight train traffic would increase by one or more trains as a result of the Proposed Acquisition, OEA calculated a collision rate for the future with the Proposed Acquisition using the following formula:

$$A = TM_{WA} * CR/TM_{EC}$$

Where:

A	=	Rail Line Segment Predicted Annual Collision Rate
CR	=	National Collision Rate, which was determined to be 0.0047 collisions per million intercity and commuter train miles
TM_{EC}	=	Train Miles in Existing Conditions (2008-2018), which is a combination of freight and passenger train miles
TM_{WA}	=	Train Miles in the future with the Proposed Acquisition, which is a combination of freight and passenger train miles

OEA calculated the value of the Train Miles (TM) terms by assuming a 365-day operating year for freight trains and intercity (Amtrak) passenger train operations. OEA calculated train miles for commuter trains using a proportion, which reflects the number of weekdays (five), Saturdays (one), and Sundays (one) per seven-day week; OEA used this approach because Metra and Northstar operate a different schedule for different day(s) of the week. OEA multiplied the segment overlap length by the number of daily trains and then 365 (see formula below). In Metra's and Northstar's cases, OEA multiplied the weekday, Saturday, and Sunday respective number of trains per day (TPD) by the proportion of the week that each of the three types of day comprises.

$$\text{TM} = \frac{(\text{TPD} \times \text{Segment Length} \times 365 \text{ Days})}{1{,}000{,}000}$$

For the No-Action Alternative, OEA adjusted the national passenger train – freight train accident rate to account for increases in freight train traffic anticipated by 2027 in the absence of the Proposed Acquisition. OEA multiplied the national accident rate by the total train miles

under the No-Action Alternative divided by the total train miles in the existing condition to get the predicted annual collision rate for the No-Action Alternative. The total train miles reflect a combination of passenger train miles and freight train miles for each segment. OEA then multiplied the adjusted national passenger train – freight train collision rate by the annual total train miles on a rail line segment to get the "No-Action Alternative Predicted Interval between Collisions Expressed in Years."

For the future under the Proposed Acquisition, OEA followed a similar method as above, incorporating the change in the number of freight trains per day as a result of the Proposed Acquisition. OEA determined the change in the number of freight trains per day by subtracting the number of freight trains under the No-Action Alternative from the number under the Proposed Acquisition. The increment reflects the change in total train miles over a segment due to the increase in daily freight trains that would occur as a result of the Proposed Acquisition. OEA multiplied the national accident rate by the total train miles in the future under the Proposed Acquisition divided by the total train miles in the existing condition to get the predicted annual collision rate. OEA then multiplied that number by the total train miles on a segment basis. This predicted the "Proposed Acquisition Predicted Interval between Collisions Expressed in Years." OEA also calculated the percent change between the total train miles under the No-Action Alternative and the Proposed Acquisition.