Chapter 4
Environmental Consequences

This chapter examines and discusses the environmental consequences associated with the No-Action and Proposed Action alternatives. Under the No-Action Alternative, the Applicants would not acquire control of the EJ&E rail line, land, or related assets. This chapter does not assess mitigation that could eliminate or minimize some of the potential environmental consequences that would result from the Proposed Action.

Under the Proposed Action, the Applicants would reroute some of its trains from its existing routes through Chicago to the EJ&E rail line. The Applicants would also acquire control and use East Joliet Yard and Kirk Yard. Kirk Yard is a major automated classification yard where arriving trains are separated into individual rail cars and sorted into new departing trains. Kirk Yard has locomotive and rail car maintenance and repair facilities.

The Applicants' Proposed Action includes new construction of connecting trackage to improve train flow from the EJ&E rail line to CN's existing lines through Chicago, as well as double track of existing single-track portions of the EJ&E to increase its capacity and flexibility.

The Applicants propose new connections at the following locations:

- Munger, Illinois (near Wayne, Illinois)
- Joliet, Illinois
- Matteson, Illinois
- Griffith, Indiana
- Ivanhoe, Indiana
- Kirk Yard, Indiana (Gary, Indiana).

The Applicants propose double track at the following locations:

- From, Diamond Lake Road (near Leithton, Illinois) to Gilmer Road (near Mundelein, Illinois)
- From East Siding (near Eola) to Walker (near Plainfield), Illinois
- From East Joliet, Illinois, to Frankfort, Illinois.

The specific resources discussed in Chapter 4 and the sections in which they are discussed are as follows:

- **Section 4.1, Rail Operations,** describes the potential effects of the Proposed Action on the operation of existing freight and passenger rail traffic on the EJ&E rail line, and the effects of the combined existing and new rail traffic on the EJ&E rail line.
- **Section 4.2, Rail Safety,** describes how the Proposed Action could affect the safety of the EJ&E rail system, including rail/rail and highway/rail at-grade crossings, the potential for derailments, and the transport of hazardous materials. This section also discusses the potential effects of the Proposed Action on pedestrians, non-motorized vehicles, and equestrian uses within the EJ&E corridor.

- **Section 4.3, Transportation Systems,** discusses the potential effects on local and regional highway systems, navigation, and airports.
- **Section 4.4, Hazardous Waste Sites,** presents the potential effects of the Proposed Action on hazardous waste sites.
- **Section 4.5, Land Use,** describes the potential effects of the Proposed Action on land use patterns, development trends, land use plans, zoning regulations, prime farmlands, and public lands within the Study Area. SEA gives particular attention to the compatibility of the existing rail lines to existing and planned land uses.
- **Section 4.6, Socioeconomics, and Section 4.7, Environmental Justice,** relate to the communities and people within the Study Area. **Section 4.6, Socioeconomics,** describes the potential effects of the Proposed Action on population demographics, economics, employment, tax base, housing, and community facilities in the Study Area. **Section 4.7, Environmental Justice,** describes the potential effects on low-income populations, minority populations, and vulnerable age groups.
- **Section 4.8, Energy,** discusses the potential effects on energy use and transport of energy resources and recyclable commodities.
- **Section 4.9, Air Quality and Climate,** presents the potential effects on air emissions, including a description of air toxics and the potential relationship of the Proposed Action on climate change.
- **Section 4.10, Noise and Vibration,** presents the potential effects of noise and vibration along the CN and EJ&E rail lines.
- **Section 4.11, Biological Resources,** presents the potential effects on threatened and endangered species as well as on wildlife resources in the Study Area.
- **Section 4.12, Water Resources,** describes the potential effects of the Proposed Action on water quality, groundwater, wetlands, floodplains, and surface waters.
- **Section 4.13, Cultural Resources,** presents the potential effects on cultural resources, identified historic districts and historic properties, and archeology within the Study Area.

4.1 Rail Operations

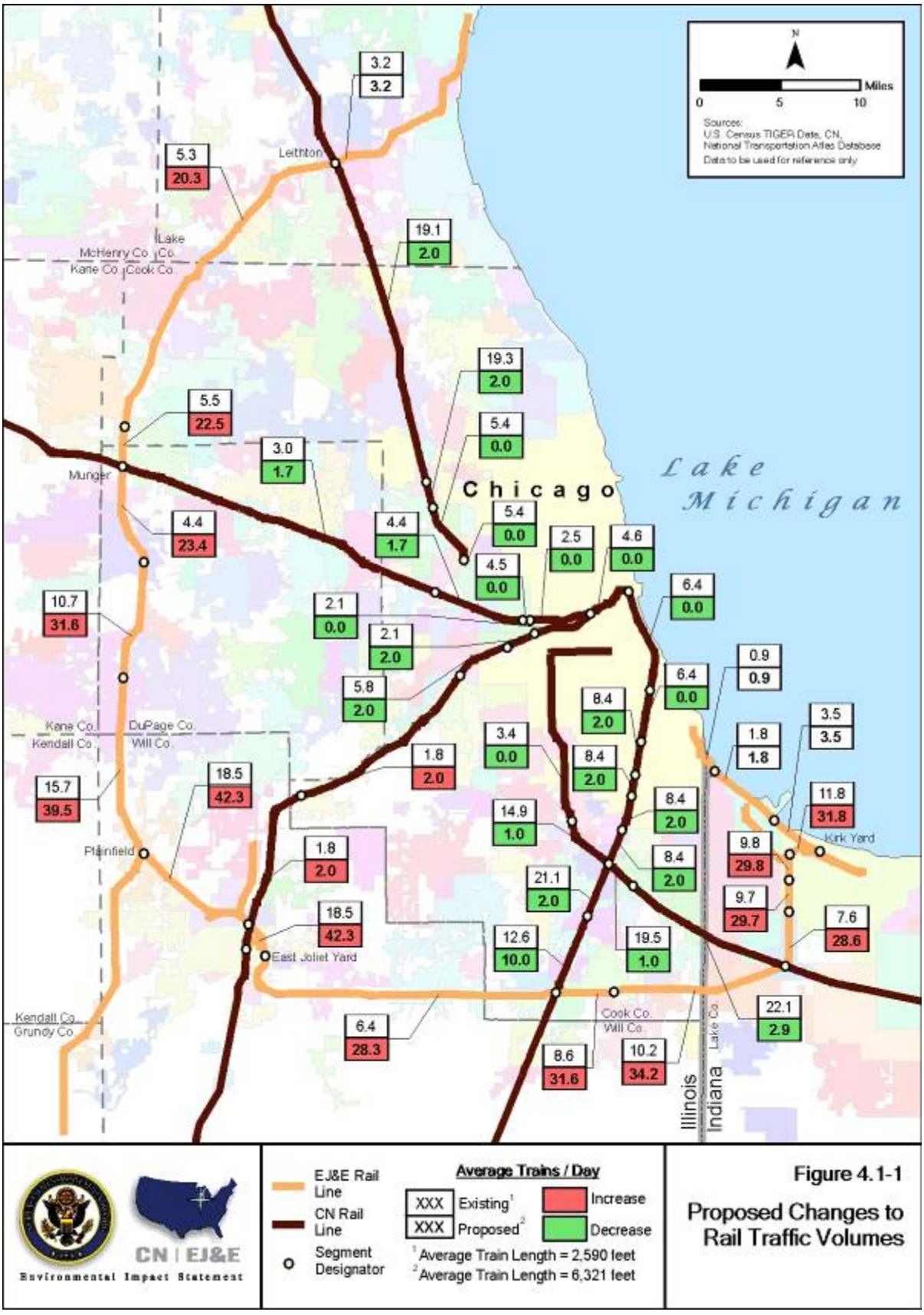
The term "rail operations" refers to the manner and methods by which a railroad uses its trackage to move freight and passenger trains from their origins to their destinations, delivers and picks up freight cars from individual customers, sorts trains at classification yards, and interacts with other railroads' operations. Rail operations are outlined in an Operating Plan that describes the volume, frequency, physical characteristics, and purpose of the trains that a railroad intends to operate on a given rail line or lines. The Applicants submitted an Operating Plan as part of their application (Applicants 2007a).

Under the Proposed Action, the Applicants would divert some of the trains it currently operates through Chicago to the EJ&E rail line, as shown in Figure 4.1-1. This section describes the potential rail operation effects of the Proposed Action on existing freight rail operations on the EJ&E rail line, and other railroads' existing and proposed freight and passenger rail operations that either cross the EJ&E rail line or make use of the EJ&E rail line. The rail operations discussions included in this text are as follows:

1. A description of SEA's methodology that introduces terms and tools used throughout this analysis of rail operations.
2. A description of the No-Action Alternative.
3. A description of the Proposed Alternative, and the proposed changes in freight rail operations and constructions that change existing EJ&E trackage.
4. An analysis of whether the Applicants' proposed maximum train volume for the EJ&E rail line is likely to be significantly exceeded by the year 2015. This number is important because it affects other areas such as highway/rail at-grade crossings, and air and noise emissions.
5. An analysis of the capability of the EJ&E rail line to accommodate the Applicants' proposed maximum train volume and fulfill the Applicants' Operating Plan after the Applicants' proposed constructions are completed. This is important because other railroads freight trains make use of the EJ&E rail line under existing agreements with EJ&E, and because other railroads' freight and passenger trains frequently must cross the EJ&E rail line at rail/rail at-grade crossings. If the EJ&E rail line is limited in capability, effects on other railroads may increase.
6. An analysis of the effects of the Proposed Action on passenger rail service, including intercity (long-distance) passenger train service and commuter rail passenger train service. This is important because the EJ&E rail line crosses passenger rail corridors at rail/rail at-grade crossings, and because passenger rail service is proposed for future implementation on portions of the EJ&E rail line.

4.1.1 Methodology

SEA considered the effects of the Applicants' proposed Operating Plan by examining the existing EJ&E rail line and rail operations, and the rail operations that would likely occur after the Applicants complete the proposed constructions and institute the Operating Plan. To analyze the existing EJ&E rail line and operations, SEA conducted a hi-rail inspection of the EJ&E rail line to observe the arrangement and condition of trackage, studied engineering diagrams and records of the EJ&E rail line, made extensive site visits to observe existing rail operations, and conducted interviews with EJ&E operating personnel. SEA also reviewed standard railroad industry information sources such as Federal Railroad Administration (FRA) publications and maps.


N
Miles
0
5
10
Sources:
U.S. Census TIGER Data, CN,
National Transportation Atlas Database
Data to be used for reference only
Leithton
Lake
McHenry Co.
Kane Co.
Cook Co.
Munger
Chicago
Lake Michigan
Kane Co.
Kendall Co.
DuPage Co.
Will Co.
Plainfield
East Joliet Yard
Kirk Yard
Kendall Co.
Grundy Co.
Cook Co.
Will Co.
Lake Co.
Illinois
Indiana
3.2
3.2
5.3
20.3
19.1
2.0
19.3
2.0
5.5
22.5
5.4
0.0
3.0
1.7
4.4
23.4
4.4
1.7
5.4
0.0
2.5
0.0
4.6
0.0
4.5
0.0
6.4
0.0
10.7
31.6
2.1
0.0
2.1
2.0
5.8
2.0
6.4
0.0
0.9
0.9
8.4
2.0
3.5
3.5
1.8
1.8
3.4
0.0
8.4
2.0
1.8
2.0
11.8
31.8
15.7
39.5
18.5
42.3
14.9
1.0
8.4
2.0
9.8
29.8
1.8
2.0
8.4
2.0
21.1
2.0
9.7
29.7
7.6
28.6
18.5
42.3
12.6
10.0
19.5
1.0
6.4
28.3
22.1
2.9
8.6
31.6
10.2
34.2
CN | EJ&E
Environmental Impact Statement
EJ&E Rail Line
CN Rail Line
Segment Designator
Average Trains / Day
XXX Existing[1]
XXX Proposed[2]
Increase
Decrease
[1] Average Train Length = 2,590 feet
[2] Average Train Length = 6,321 feet
Figure 4.1-1
Proposed Changes to Rail Traffic Volumes

SEA considered the following characteristics of the EJ&E rail line and rail operations at present, and as SEA understands they would exist after Applicants' proposed constructions and implementation of the Operating Plan:

- Number of main tracks
- Locations of crossover tracks between main tracks, and their maximum speed capability
- Siding spacing and length, and their maximum speed capability for entrance and exit
- Locations where tracks of different railroads cross the EJ&E rail line (rail/rail at-grade crossings)
- At rail/rail at-grade crossings, or junctions between the EJ&E rail line and other railroads, whether the crossing or junction is interlocked.
- Maximum authorized track speeds
- Method of Operation (i.e., how trains are dispatched and separated)
- Types and characteristics of signaling systems used to dispatch and separate trains
- Passenger station locations
- Times and frequency of freight train service
- Times and frequency of passenger train service
- Typical speeds of freight and passenger trains
- Locations where industries are switched by freight trains
- Locations where freight trains are switched, classified, originated, terminated, or serviced.

To analyze the reasonableness of the Applicants' proposed train volumes for the EJ&E rail line, SEA performed an independent economic forecast of likely North American rail traffic growth to the year 2015 and compared it to the maximum train volume proposed by the Applicants. This forecast assumes that rail traffic through Chicago will be representative of North American rail traffic growth, i.e., it would neither be significantly greater or lesser. Economic forecasts of this nature provide broad trends but do not necessarily forecast the rail traffic growth on an individual rail line such as the EJ&E. Accordingly, SEA also examined global and North American trends in commodity flows and rail traffic to determine if there were likely to be rail traffic patterns or flows that might create unforeseen demand for the transportation service provided by the EJ&E rail line, and thus increase maximum train volume beyond that proposed by the Applicants.

To analyze the effects of the Applicants' proposed maximum train volume on the existing freight trains that use the EJ&E rail line, and existing passenger trains that cross the EJ&E rail line, SEA conducted interviews with CN personnel, focusing on the criteria and methodology the Applicants used to prepare the Operating Plan. SEA then performed independent analyses of the capacity of the EJ&E rail line after proposed constructions are completed. Three types of analysis were performed:

- *A "bottleneck analysis."* This is a qualitative analysis of the most constrained portion of a railroad system. Bottlenecks typically are a combination of trackage configuration, train volume, and local characteristics of rail operations that consume most or all of capacity of the trackage. The number of trains that can operate through a rail line's bottleneck in a given period of time caps the effective maximum number of trains that can operate on the remainder of the rail line. In this case, SEA determined from

observation that the most constrained portion of the EJ&E rail line is the segment in Joliet, Illinois.

- *A Line Occupancy Index analysis.* Line Occupancy Indexes (LOIs) are an empirical analysis of a rail line's nominal trains-per-day capacity. It consists of dividing a rail line into segments of like capacity, applying to each segment a maximum practical capacity based on its number of main tracks and other characteristics, and comparing that capacity to the proposed capacity. The ratio between the practical capacity and the proposed capacity is the LOI, and is expressed as a percentage, e.g., an LOI of 50 implies that the rail line segment is hosting 50 percent of its maximum practical train capacity. Generally LOIs greater than 70 percent are considered impractical by the rail industry.
- *A Rail Traffic Controller analysis.* Rail Traffic Controller (RTC) is an industry-standard software model that simulates rail operations on a given rail line. The RTC model outputs "delay ratios," the cumulative percentage of time that all of the trains using a given rail line are stopped waiting for other trains, compared to the amount of time the trains would require if they never stopped to wait for other trains. For example, if one train running on a rail line needed 10 hours to travel the line from end to end without stops, and ten trains used the rail line, then in a "no delay" scenario the cumulative time would be 100 hours (10 x 10). If the RTC model calculated that in reality each train waited for one hour, thus requiring 11 hours end to end, then the cumulative time would be 110 hours and the delay ratio would be 10 percent. Generally delay ratios greater than 20 percent are considered impractical by the rail industry.

To analyze the effects of the Proposed Action on passenger rail service in the EJ&E service territory, SEA reviewed existing commuter and intercity passenger rail schedules and services of the three agencies that at present operate passenger trains across the EJ&E rail line, and have proposed new or expanded passenger rail operations that would cross the EJ&E rail line or in some cases make use of portions of the EJ&E rail line. SEA met with representatives of the three agencies to discuss their existing passenger rail service and their proposed new or expanded passenger rail service. These meetings included discussions of how the Proposed Action would affect each agency's respective passenger train services, both existing and proposed.

SEA examined in particular the effects the Proposed Action may have on passenger train schedules of railroads affected by the EJ&E rail line. Passenger train schedules are arranged around morning and evening rush hours, weekdays, and convenient times for people to travel, whereas freight trains operate occur around the clock, seven days a week, and may not be arranged around any regular event such as the typical workday. Passenger train schedules are fixed and ideally vary little, whereas freight train schedules are often approximate and fluctuate according to day of week, time of year, economic fluctuations, and varying needs of shippers.

4.1.2 No-Action Alternative

Under the No-Action Alternative, the Applicants would not acquire the EJ&E rail line, land, and related assets. Applicants would not implement their proposed constructions or Operating Plan. Applicants would not operate CN freight trains on the EJ&E rail line except for CN freight trains that can be handled through CN's trackage rights it holds on the EJ&E rail line. Applicants would continue to operate trains through the Chicago Terminal District as they do at present. Applicants would continue to use CN's Glenn, Hawthorne, Schiller Park, and Markham yards to switch and classify freight cars, and would not add rail car classification or switching functions to EJ&E's Kirk Yard and East Joliet Yard. Therefore, the No-Action Alternative would not affect existing freight train service of the EJ&E or other freight railroads, except insofar as CN chose to exercise its trackage rights on the EJ&E rail line.

Under the No-Action alternative, Metra and NICTD commuter passenger trains that operate on CN rail line segments, and commuter and intercity passenger trains that operate on rail lines that cross CN and EJ&E rail lines would continue to operate as they currently do. This would include at-grade and grade-separated rail/rail crossings. Commuter passenger rail service would continue to operate within the framework of current agreements with CN and other freight carriers. Therefore, the No-Action Alternative would not affect existing commuter passenger rail service.

Metra has proposed new "STAR Line Service" on the EJ&E rail line and new "SouthEast Service" that would cross the EJ&E rail line at Chicago Heights, Illinois. In addition, Metra has proposed service expansions on the UP Northwest Line and the UP West Line that cross the EJ&E rail line at rail/rail at-grade crossings in Barrington, Illinois and West Chicago, Illinois, respectively. Under the No-Action Alternative, discussions and advanced planning would continue between EJ&E and Metra. Therefore, the No-Action alternative would not affect the implementation of Metra's proposed new STAR Line service on EJ&E rail line segments, nor would it affect Metra's proposed service expansions on the UP Northwest and West lines.

NICTD has proposed new service between Chicago and Valparaiso, Indiana using rail line segments controlled by CN, including the line segment that crosses the EJ&E rail line at a rail/rail at-grade crossing in Griffith, Indiana. NICTD has also proposed new service between Chicago and Lowell, Indiana, using a CSX rail line segment that would cross the CN rail line at Maynard near Munster, Indiana. Under the No-Action Alternative, discussions and advanced planning would continue between CN, EJ&E, and NICTD. Therefore, the No-Action Alternative would not effect the implementation of NICTD's proposed new service to Valparaiso and Lowell.

Under the No-Action Alternative, Amtrak intercity passenger trains that operate on CN rail lines and intercity passenger trains that operate on rail lines that cross CN and EJ&E rail lines would continue to operate as they currently do. This would include rail/rail at-grade and rail/rail grade-separated crossings. Intercity passenger rail service would continue to operate within the framework of current agreements with CN and with other freight carriers. Therefore, the No-Action Alternative would not affect existing intercity passenger rail service.

4.1.3 Proposed Action

4.1.3.1 Changes in Freight Rail Operations

This section describes current EJ&E freight rail operations and rail line, and Applicants' proposed freight rail operations and rail line after Applicants' complete their proposed constructions. Freight rail operations include freight trains of other railroads that use the EJ&E rail line, and freight trains and passenger trains of other railroads that cross the EJ&E rail line. Passenger trains that cross the EJ&E rail line are included in this section because they influence the capability and capacity of the EJ&E rail line for freight operations, and conversely freight rail operations on the EJ&E rail line influences the capability and capacity of other rail lines that host passenger trains.

Existing EJ&E Rail Operations and Trackage

Current EJ&E operations are described in detail in Section 3.1. These operations include passenger and freight trains of other railroads that use the EJ&E rail line or cross the EJ&E rail line. Existing EJ&E trackage is mapped schematically in Figure 4.1-2 in order to show trackage arrangement and relationships with other railroads. Existing EJ&E rail operations are listed in Table 4.1-1, that follows. The schematic map shows where the present-day EJ&E rail line is single track or double track, where other railroads join into or cross the EJ&E rail line, and where sidings are located.

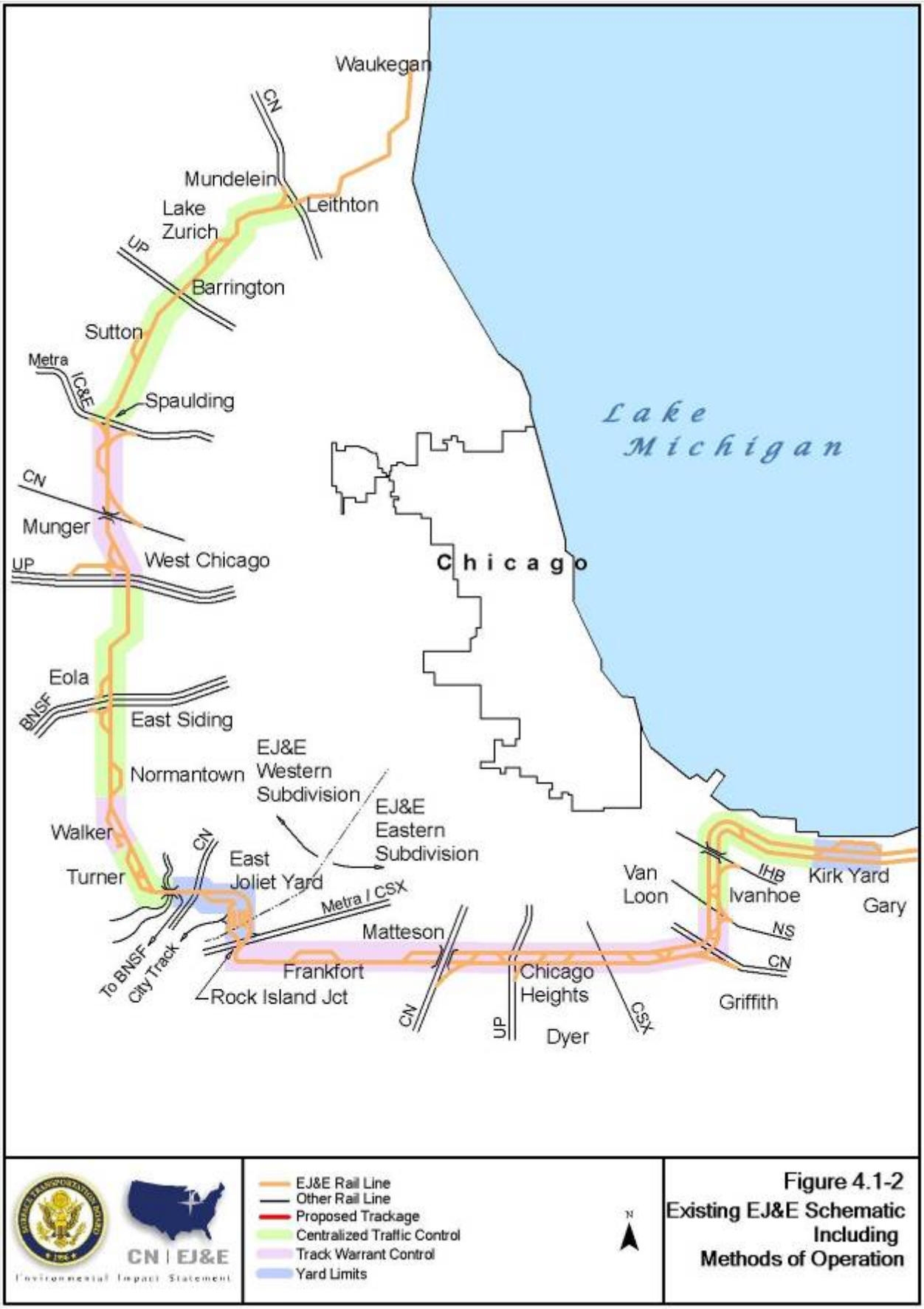


Figure 4.1-2
Existing EJ&E Schematic Including Methods of Operation

Table 4.1-1. Proposed Combined CN and EJ&E Train Volume							
Segment	From	To	Trains/day No-Action	Trains/day Proposed Action	Average number of Cars per Train	Average Tons per train	Average Train Length (feet)
14	Leithton	Spaulding	5.3	20.3	112	8,059	6,829
13	Spaulding	Munger	5.5	22.5	110	7,970	6,714
12	Munger	West Chicago	4.4	23.4	112	8,124	6,843
11	West Chicago	East Siding	10.7	31.6	108	8,041	6,494
10	East Siding	Walker	15.7	39.5	104	7,684	6,203
9	Walker	Bridge Junction	18.5	42.3	98	7,239	5,842
8	Bridge Junction	Rock Island Jct	18.5	42.3	93	6,967	5,552
7	Rock Island Jct	Matteson	6.4	28.3	109	8,101	6,684
6	Matteson	Chicago Hts	8.6	31.6	98	7,612	6,256
5	Chicago Hts	Griffith	10.2	34.2	94	7,254	6,012
4	Griffith	Van Loon	7.6	28.6	95	7,336	5,915
3	Van Loon	Ivanhoe	9.7	29.7	93	7,057	5,777
2	Ivanhoe	Cavanaugh	9.8	29.8	93	7,033	5,758
1	Cavanaugh	Gary	11.8	31.8	88	6,659	5,437
				Average:	**104**	**7,686**	**6,321**

Source: Letter from Paul A. Cunningham, Counsel for Canadian National Railway Company and Grand Trunk Corporation, Harkins Cunningham, LLP, to Victoria J. Rutson, Chief, Section of Environmental Analysis, Surface Transportation Board, in response to the Board's Information Request dated December 18, 2007, Exhibit A, February 15, 2008.

On a single-track railroad, trains can proceed in only one direction at a time. Sidings enable trains to operate in both directions – one train enters the siding enabling a train moving in the opposite direction on the main track to proceed. Double-track railroads enable trains to operate in both directions simultaneously, or can be used to increase the capacity of a railroad in a single direction. Sidings and double-track also enable a railroad to store trains or stage trains and still maintain capability to move trains on the main track, and to perform "runarounds," where a high-priority train passes a low-priority train.

The existing EJ&E rail line's main track employs three different Methods of (train) Operation. (The main track is the principal track on which trains run point to point.) These Methods of Operation are also shown on the schematic map in Figure 4.1-2. The Method of Operation is a means by which a railroad dispatches and controls trains on its main tracks in order to achieve safe and efficient operations. Generally only one Method of Operation is employed on each specific section of a railroad's main track, and all trains operating on that section comply with this Method of Operation and its prescribed operating rules. Railroads use different Methods of Operation on different main track segments to satisfy different needs for speeds, train volume, ability to efficiently switch industries and side tracks, and economic constraints. Methods of Operation and the

What are Methods of Operation?

A Method of Operation is how a railroad dispatches and controls trains on its main tracks in order to achieve safe and efficient operations

train operating rules that underlie them are regulated by the FRA and cannot be modified without application to and approval of the FRA. The three Methods of Operation employed at present on the EJ&E rail line are Yard Limits, Track Warrant Control (TWC) and Centralized Traffic Control (CTC). SEA notes that each of the Methods of Operation is approved by the FRA as safe and effective methods of train control.

Yard Limits. Under Yard Limits, trains may enter a main track and proceed at their own discretion. To achieve safety, trains are limited to "restricted speed," which is defined as "movement made at a speed that allows stopping within one half the range of vision short of trains, engines, men or equipment on or near the track, stop signals, or improperly lined switches or derails, and in no case exceeding 20 mph." The one-half the range of vision speed limit ensures that two trains approaching each other on the same track will not collide.

Yard Limits provides for highly flexible rail operations that are economical and efficient in a small area with frequent switching activities. Instituting Yard Limits requires no significant investment in infrastructure. However, *all* trains moving on a rail line governed by yard limits are restricted to not more than 20 mph, which greatly limits the volume of trains that can move in a day through a line segment so governed.

Track Warrant Control. Under Track Warrant Control (TWC), trains may enter the main track and proceed only when authorized by the train dispatcher through the device of a Track Warrant, a preprinted form. The dispatcher determines the starting and ending limits for each train, and then issues the warrant to each train verbally, typically via radio. When each train has reached the end of its authorized limits, it verbally releases the warrant so that the dispatcher can reissue authorization on that track to another train. Generally switches between tracks on a railroad governed by TWC are hand-operated by the train crew, typically requiring trains to stop to line a switch correctly before entering or leaving a side track. The requirement to stop to line switches is a major limit on a rail line's capacity for trains.

TWC is a highly economical and flexible Method of Operation for rail lines with low to medium train volumes that enables higher maximum train speeds than Yard Limits. The FRA allows train speeds of up to 49 mph (freight trains) and 59 mph (passenger trains) on a rail line operated with TWC that has no signaling system, track conditions and other safety considerations permitting. Instituting TWC requires a very low investment in infrastructure. TWC has an upper limit on train capacity that is in large part a function of a train dispatchers' workload, as the issuing, releasing, and management of the warrant system is time-consuming. Most railroads use electronic TWC dispatching systems that employ automatic conflict checks and will not allow a train dispatcher to issue warrants that create unsafe conditions.

Centralized Traffic Control. Under Centralized Traffic Control (CTC), trains may enter the main track and proceed when authorized by the train dispatcher through the use of "wayside signaling," fixed electronically controlled signals at the side of the track whose color, condition, and position indicate to a train crew information about their authorization to proceed, the maximum speed at which they move, and the condition of the track ahead. CTC uses remote-controlled switches, operated by the train dispatcher, to enable trains to move from one track to another without stopping to line switches by hand. Remote-control switches are installed at locations where the railroad expects to have trains changing tracks frequently, or where the railroad needs trains to enter and leave the main track quickly in order to not delay other trains.

CTC enables efficient and economical movement of a high number of trains, and the highest maximum train speeds of the three Methods of Operation employed by the EJ&E. However, it is the most costly to install and maintain and requires a substantial investment in infrastructure to implement. The FRA allows freight and passenger train speeds of up to 79 mph on railroads equipped with CTC, track conditions and other safety conditions permitting. CTC systems have

built-in electronic conflict checking that prevents signals from displaying indications that would authorize a train to proceed on conflicting routes or at unsafe speeds.

The EJ&E rail line currently uses Methods of Operation commensurate and typical in the rail industry for its train volume and service needs. At present, the EJ&E rail line has trackage arrangements, sidings, and double-track commensurate and typical in the rail industry for its train volumes and service needs. The schematic maps in Figure 4.1-2, below show the locations of existing sidings where trains can meet and pass, double-track segments, and connections with other railroads. Some of these connections are used for interchange of traffic or trains with other railroads.

Proposed EJ&E Freight Rail Operations and Trackage

The proposed EJ&E rail operations includes existing EJ&E trains and freight trains of other railroads that use the EJ&E rail line, and the trains the Applicants propose to reroute from its existing routes through Chicago to the EJ&E rail line if the Proposed Action occurs. CN's proposed rail operations also includes existing freight and passenger trains on rail lines that cross the EJ&E rail line. The Applicants propose constructions that would increase the capacity and operational flexibility of the EJ&E rail line at selected locations. These constructions are described in Section 2.2. EJ&E trackage including the proposed constructions is mapped schematically in Figure 4.1-3. The trackage is colored into segments of "like trackage." The schematic map is useful to analyze rail operations as it shows where the EJ&E rail line will be single track or double track, where other railroads join into or cross the EJ&E rail line, and where sidings are located. The map also shows the Applicants' proposed Method of Operation for each line segment. Single- and double-track line segments, and Methods of Operation, influence the maximum train volume capacity of a rail line.

Figure 4.1-1 above shows the Applicants' proposed changes to average daily train volumes on the EJ&E rail line and its existing rail lines in and near Chicago. A principal goal of the Applicants' proposed Operating Plan is to reroute between 15 and 24 trains from Applicants' existing rail lines through Chicago to the EJ&E rail line. At present, the Applicants' operate their trains through Chicago using rail lines they own or control, trackage rights on Chicago-area terminal railroads such as the Belt Railway of Chicago (BRC) and Indiana Harbor Belt Railroad (IHB), and trackage rights on other Class I railroads, in combinations that vary according to Applicants' needs and train volumes, and the needs and train volumes of other railroads. Applicants' main lines that intersect the EJ&E rail line are the Waukesha Subdivision at Leithton (near Mundelein, Illinois); the Freeport Subdivision at Munger (near Wayne, Illinois); the Joliet Subdivision at Joliet, Illinois; the Chicago Subdivision at Matteson, Illinois; and the South Bend/Elsdon Subdivision at Griffith, Indiana. These subdivisions radiate from Chicago and carry the Applicants' freight trains north, west, south, and east, between Chicago and other areas of the United States and Canada. Figure 4.1-4 shows the train flows between the Applicants' other lines and Chicago.

4.1.3.2 Constructions

The Applicants' have proposed constructions to increase the train volume capacity and efficiency of the EJ&E rail line, and to enable the Applicants' trains to more efficiently enter and exit the EJ&E rail line from Applicants' other rail lines. These constructions consist principally of 19 miles of additional main track (i.e., single to double track), 6 new tracks, totaling approximately 5 miles, to connect the EJ&E rail line to Applicants' existing rail lines and other railroads' rail lines, and installation of new wayside signaling systems or revisions to existing wayside signaling systems. Principal elements of the constructions are track, earth embankments to support track, bridges and other structures, and signaling systems. The design and quantity of these constructions are the result of an analysis conducted by CN's network planning department, which analyzed EJ&E's existing trackage arrangement, Methods of Operation, and rail operation patterns and requirements including trackage-rights trains, and the effects and requirements of Applicants' trains after the Proposed Action.

Figure 4.1-3
Proposed EJ&E Schematic Including Methods of Operation

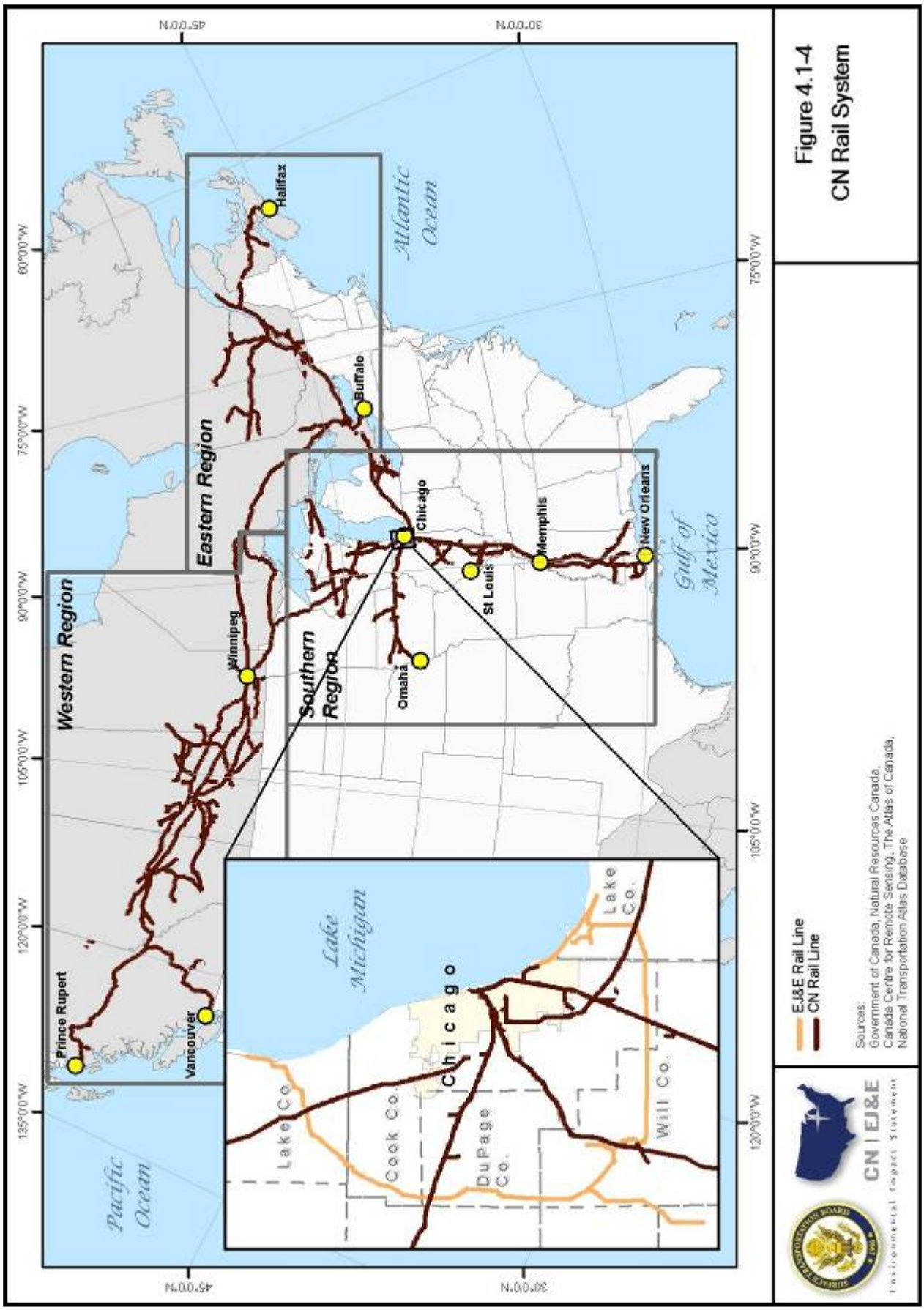


Figure 4.1-4
CN Rail System
Western Region
Eastern Region
Southern Region
Halifax
Buffalo
Chicago
Memphis
New Orleans
St Louis
Omaha
Winnipeg
Prince Rupert
Vancouver
Atlantic Ocean
Pacific Ocean
Gulf of Mexico
Lake Michigan
Lake Co.
Cook Co.
DuPage Co.
Will Co.
EJ&E Rail Line
CN Rail Line
Sources:
Government of Canada, Natural Resources Canada, Canada Centre for Remote Sensing, The Atlas of Canada, National Transportation Atlas Database
CN | EJ&E

Additional Double Track

Descriptions of the six proposed new connecting tracks and their configurations are found in Chapter 2, Section 2.4, and shown schematically on Figure 4.1-3, above. According to SEA's understanding of Applicants' Operating Plan, CN would construct approximately 19 miles of additional second main track (double track) and connections to six other rail corridors, totaling about 5 miles, on EJ&E to accommodate train flow within Chicago (see Chapter 2, Section 2.2.2). The Applicants proposed double track at the following locations:

Leithton and Diamond Lake Road to Gilmer Road. CN plans on adding a second main track to create double track along EJ&E rail line segment No. EJE-14. The length of this additional track would be approximately 3.8 miles, and would be installed in two segments. The first segment at Leithton (near Mundelein, Illinois) lies between the CN Waukesha Subdivision, from Allanson Road south to the intersection with EJ&E Western Subdivision mainline, near milepost 60.0, just west of the interlocking. Here, a second track would pair up with an existing connection between CN and EJ&E rail lines, and the siding at Diamond Lake Road on the EJ&E rail line. This would create a double-track segment approximately 8,900 feet long. The second segment (Diamond Lake Road to Gilmer Road) would begin at the east end of the Diamond Lake Siding near milepost 59.3. The Applicants proposed to extend the siding to create a double-track segment by installing a second track south of the existing EJ&E main line through Diamond Lake Road and Illinois Route 60/83, to just west of Gilmer Road at milepost 57.0. According to Table 4.1-1, above, a long train (8,000 feet or more) could be held on this second track, between Illinois Route 60/83 and Gilmer, without blocking either of the crossings. The track between Allanson Road and Gilmer Road would be configured so that the train movements between the CN and EJ&E rail lines would become the main track. According to the Applicants' Operating Plan, approximately 15 trains per day would be diverted from the CN Waukesha Subdivision onto the EJ&E rail line. SEA concluded that because of the increased number of trains moving between the CN rail line and the EJ&E rail line at Leithton the average train speed at Allanson road would decrease.

To accommodate Metra's North-Central schedule, it might be necessary to stage trains at this location to minimize or avoid delays to Metra's commuter trains.

East Siding to Walker. Along EJ&E rail line segment No. EJE-10, the Applicants propose to construct approximately 6.9 miles of second main track to add to EJ&E's existing single main track and connect with the existing Normantown Siding and Walker Industrial Lead. Once completed, a 10.2 mile long double-track segment would allow trains to meet and pass between the north end of East Siding (near Eola, Illinois), milepost 21.1 and the existing crossover at Walker (near Plainfield, Illinois), milepost MP 10.9. This additional capacity would be needed between East Siding and Walker to accommodate CN's proposed rail traffic that would be added to the existing EJ&E rail traffic volume. This volume currently includes several EJ&E local trains that operate daily, plus trackage rights trains from BNSF and UP that enter and depart EJ&E's rail network at Eola and West Chicago, respectively. (See Chapter 3 for discussion about current EJ&E rail operations.) In addition, EJ&E performs considerable on-line switching along the Western Subdivision main line in the Walker area. Currently, the siding at Normantown allows trains up to 7,900 feet in length to be held for meets and passes with other trains, or for staging without blocking nearby road crossings. Once the double tracking is complete, trains up to 8,200 feet in length could be staged between Wolf Crossing and 111th Street, and between Liberty Street and Ogden Avenue. This location would be able to adequately handle both the average train length (6,203 feet), as well as the anticipated train length specific for the proposed CN rail traffic, estimated to be 7,875 feet. Due to the spacing of the at-grade crossings between East Siding and Walker, trains longer than 8,200 feet in length could not stop and remain intact without blocking one or more at-grade crossings.

According to the Applicants' conceptual level design plans, only one crossover is planned north of Liberty Street at East Siding to allow access to and from both main tracks to BNSF's Eola Yard. No other crossovers are included in the Applicants' plans. If the on-line rail-served industries located in the Walker vicinity are being switched, a process that appears to requires three to four hours each day, through trains would have limited ability to use the two main tracks as envisioned by the Applicants unless crossovers are installed approximately halfway between East Siding and Walker.

East Joliet to Frankfort. On segment EJE-7, the Applicants propose to construct approximately 9.8 miles of second main track between I-80 near Joliet, Illinois and South Owens Road (116th Street), connecting with an existing three-mile long siding near Frankfort, Illinois) to create a section of double track between East Joliet Yard and Sauk Trail Road, milepost 14.85. This added capacity afforded by the double tracking would accommodate CN's proposed traffic volume increase of approximately 22 through-trains per day. However, near the east end of the double track segment, there are only two locations where trains over 5,100 feet in length could be held between East Joliet and Frankfort without blocking one or more at-grade crossings. A train 7,800 feet in length could be held between Schoolhouse Road and South Owens Road (116th Street) and a train over 10,000 feet (to a maximum of 10,800 feet) in length could be held between South Owens Road and Center Road. As listed in Table 4.1-1, above, the Applicants' anticipated train length of 7,667 feet could be held near the east end of the East Joliet to Frankfort double-track segment. According to the Applicants' conceptual-level design plans of the proposed double tracking for this 12-mile segment, no crossovers are planned. Consequently, if a train longer than 5,100 feet is moved west towards Joliet from the Frankfort area, it would be necessary to keep this train moving without stopping, due to the fact there is no location outside of East Joliet Yard that can hold a train without temporarily blocking an at-grade crossing. East Joliet Yard can hold a train with a maximum length of 8,200 feet that extends north from the Rock Island Junction interlocking to just south of Woodruff Road on the single main track within the yard. The additional traffic could also be placed in the numerous tracks within the yard.

Connecting Tracks

Descriptions of the six proposed new connecting tracks and their configurations is found in Chapter 2, Section 2.4, and shown schematically on Figure 4.1-3. According to SEA's understanding of Applicants' Operating Plan, the most important new connecting tracks are at Matteson, Illinois, and Griffith, Indiana. At Matteson, at present an average of 1.2 trains per day use the existing connection track between the EJ&E rail line and CN's rail line in the southeast quadrant of the connection (see Figure 4.1-2). After the Proposed Action, through train traffic on the existing track would increase from an average of 1.2 trains per day to an average of 4.1 trains per day, and an average of 7.0 trains per day would use the new connection proposed to be built in the northeast quadrant. At Griffith, the number of trains would vary daily, and would be expected to average eight trains per day using the new connection proposed to be built in the northeast quadrant. At Munger, an average of one to two additional trains per day would use the proposed new connection in the southwest quadrant. At Joliet, an average of one to two additional trains per day would use the proposed new connection in the northeast quadrant. New connections at Ivanhoe and Kirk Yard would be used by switching movements only, according to the Applicants' Operating Plan.

SEA concluded that the proposed connections at Munger, Joliet, Ivanhoe, and Kirk Yard, because of the low number of train movements, would have only minor effects on rail operations and train speeds through the connections. The connection at Griffith and Matteson would both have a relatively large number of train movements through the connection. SEA concluded that at Griffith the volume of trains moving through the connection would not affect train speeds at any highway/rail at-grade crossing. At Matteson the change in the configuration of the EJ&E main track and the large number of train movements through the connection would lower the average train speed at the Main

Street highway/rail at-grade crossing from an average train speed under no action of approximately 36 mph, to an average train speed under the Proposed Action of 20 mph.

4.1.4 Analysis of Maximum Train Volumes under Proposed Action

During Scoping, EPA and others suggested that SEA independently determine the maximum number of trains that would be expected to operate on the EJ&E rail line. In the Final Scope of Study, SEA stated that it would project the reasonably foreseeable rail volumes for the year 2015. SEA requested the Applicants to provide their best estimate of the reasonably foreseeable train traffic levels. The Applicants responded with a detailed discussion of train traffic and concluded that the numbers provided in the Operating Plan represented their best estimate of future train traffic.

The Applicants' Operating Plan (Applicants 2007a) describes the Applicants' proposed train volumes and characteristics of trains on the EJ&E rail line after the Proposed Action. These volumes and characteristics are tabulated in Table 4.1-1.

SEA used two separate approaches to evaluate future train traffic that would reasonably be expected to operate on the EJ&E rail line under the Proposed Action. This section describes the first approach, which evaluated future train traffic from the perspective of demand. That is, what are the growth forces within the national economy that will affect the demand for more materials and commodities to be shipped via freight trains? This section describes SEA's estimate of future demand for rail services in an effort to determine if, from a demand standpoint, the Applicants' estimates are reasonable. Section 4.1.5 describes SEA's second approach, which was to evaluate the EJ&E rail line's capacity to determine if the train volumes projected under the Proposed Action would be constrained.

4.1.4.1 Economic Forecast of Rail Traffic Growth

SEA analyzed the Applicants' proposed train volume using independent economic forecasts of North American rail traffic growth, and global and North American trends in commodity flows. SEA used these forecasts to assess the volume of rail freight traffic under the Proposed Action that would likely demand rail transport by the Applicants' rail system through Chicago. This analysis, which is included in Appendix B, assumed that the train capacity of the EJ&E rail line was not a limiting factor and considered only the demand for rail freight transportation services. To generate this forecast, SEA assumed that because a majority of United States rail traffic passes through the Chicago/Midwest region, national rail growth rate projections would be representative of Chicago rail growth rate projections. SEA used accepted forecasts of national Gross Domestic Product (GDP) growth, and historic relationships of freight rail traffic growth to national GDP growth, and blended this growth rate with the growth rate projections of four other expert sources. The methodology and details of this approach are presented in Appendix B.

This economic forecast found a high probability that the daily average train volumes in the Applicants' proposed Operating Plan would not be exceeded by Year 3 after the constructions were completed. For Year 5 after completion of constructions, there is, on average, a 50 percent chance that actual train volumes would not exceed CN's forecast. The forecast further finds a high probability that if average daily train volume exceeds the Applicants' projections, it would only exceed the Applicants' projections by a small amount. Based on the economic forecast analysis, SEA concluded that the train volumes projected in the Applicants' Operating Plan are within a reasonable range.

4.1.4.2 National Growth Trends in Rail Commodity Flows

SEA evaluated known or reasonably foreseeable macro trends in freight movement and rail-carried commodity flows to verify if known regional rail freight growth trends might make the EJ&E rail

line's train volumes unrepresentative of national trends. These macro trends may influence the demand for rail transportation service by the Applicants' rail system through Chicago. For this analysis, SEA assumed that the train capacity of the EJ&E rail line was not a limiting factor.

Historical traffic growth comparing the years 1971-1972 and 1999-2000 are shown in Figure 4.1-5. From these figures, it can be seen that traffic growth is primarily east-west., and from the Gulf Coast to Chicago. Other large-scale trends that SEA identified based on the scoping comments and from the railroad literature that would influence national-scale traffic projections were:

1. Growth of containerized import-export trade between Asia and central and eastern United States population centers. This traffic can enter North America at Pacific, Atlantic, and Gulf Coast Ports, including the Ports of Prince Rupert and Vancouver, B.C., both served by the Applicants.
2. Growth of containerized domestic trade hauled by rail between central U.S. and eastern and western U.S. population centers. This traffic typically travels between population centers of 1 million or more.
3. Growth of coal moving between the Powder River Basin (PRB) of eastern Wyoming and southern Montana, and Midwestern, eastern, and southern power plants.
4. Growth of general carload freight for the industrial, automotive, and building materials commodities sectors.
5. Growth of rail-hauled freight at the expense of truck-hauled freight, as a result of increases in energy prices favoring the lower energy input required to move freight by rail than by truck.

SEA concluded that the Applicants' rail system through Chicago and specifically the EJ&E rail system would not be substantially affected by these potential sources of future rail traffic growth, for the following reasons:

1. The Applicants' proposed Operating Plan accounts for future Port of Prince Rupert Phase 1 container traffic.
2. Container traffic flows, both import-export and domestic, within the inland U.S. have a dominant east-west orientation. Rail traffic entering, leaving, and passing through Chicago also is dominated by east-west flows. A notable exception is the Applicants' former Illinois Central line from Chicago to Memphis and New Orleans, which is dominated by north-south traffic flows. The EJ&E rail line is not located to be advantageous for east-west traffic flows except in the West Chicago-Ivanhoe segment, where it could conceivably be used in the future as an alternative to rail traffic flows that currently use the BRC and IHB lines through central Chicago.
3. There is no expectation that substantial domestic or import-export traffic flows in the U.S. will occur in the future on a north-south orientation through Chicago. Container flows are primarily between large population centers and few large population centers exist to the north and northwest of Chicago. Lakes Michigan and Superior bar rail traffic to the northeast.
4. Trends in energy prices are providing incentive to shippers of international commerce to prefer rail haulage over ocean haulage. This favors ports located at the least ocean distance from overseas origins and destinations, provided port and inland rail infrastructure exists or can be inexpensively acquired at these ports.

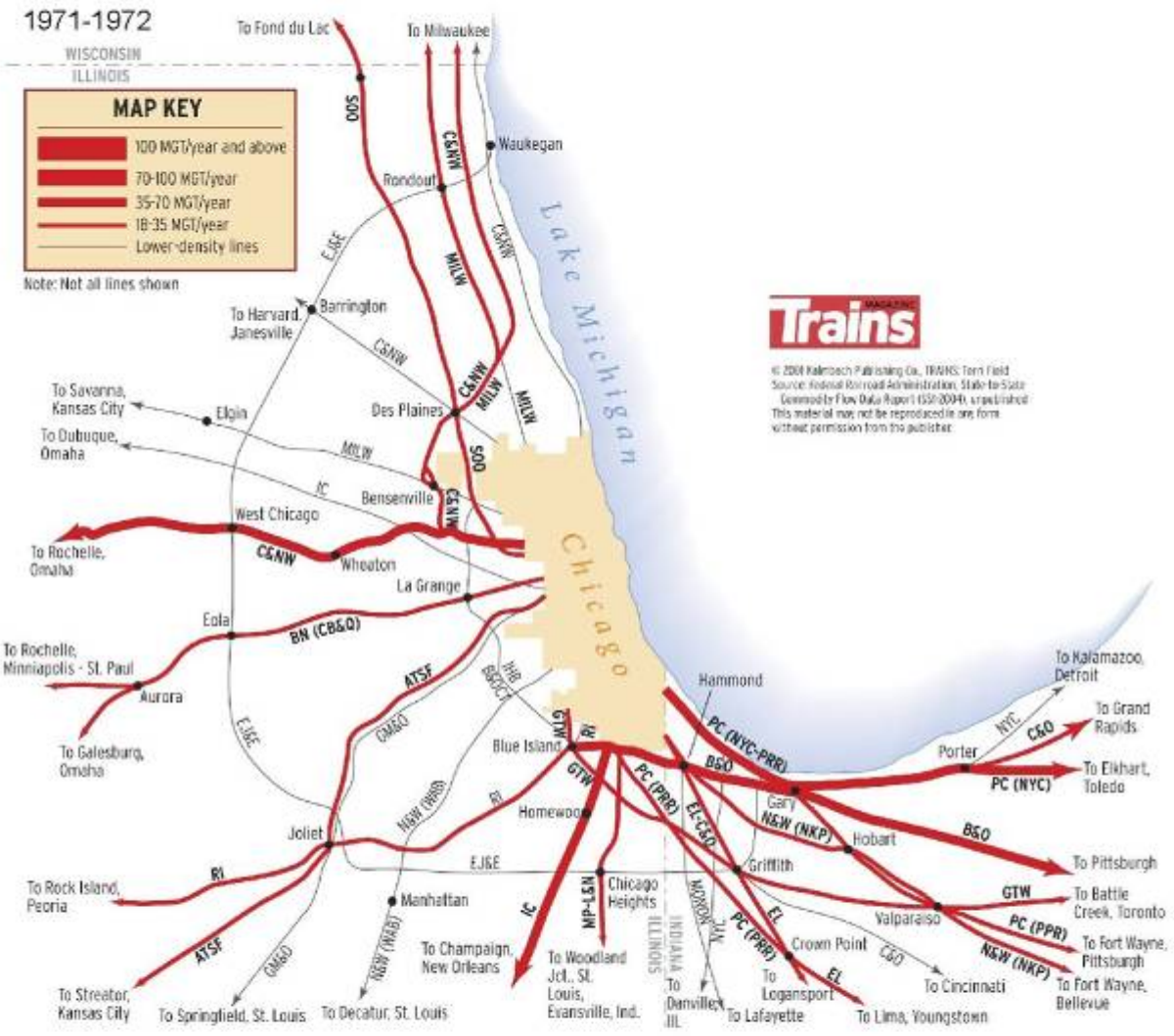


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Figure 4.1-5
Historic
Rail Traffic Patterns
in Chicago
Sheet 1 of 2

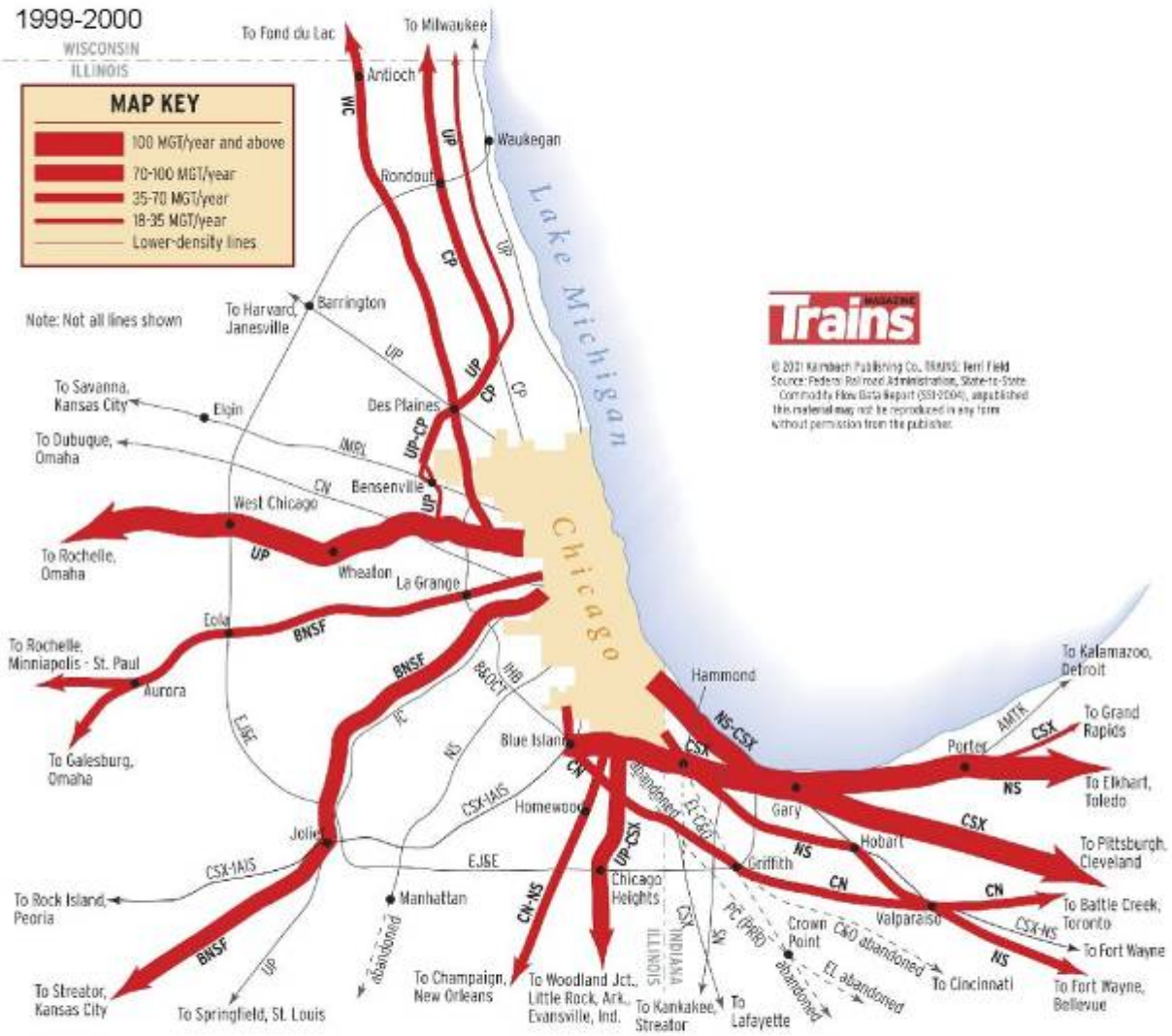

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Figure 4.1-5
Historic Rail Traffic Patterns in Chicago
Sheet 2 of 2

5. Powder River Basin (PRB) coal flows, should they increase, will likely continue to enter Chicago on the UP main line via Clinton, Iowa, and the BNSF main line via Burlington, Iowa. Coal flows moving through Chicago find their most economical outlet eastward on NS and CSX rail systems as an alternative to rail traffic flows that currently utilize the BRC and IHB lines through central Chicago. PRB coal flows traveling to consumption points significantly south of Chicago are more advantageously hauled via gateways such as Metropolis, Illinois, St. Louis, and Memphis, and are unlikely to enter Chicago.
6. General carload freight growth would likely align east-west, like coal and containerized traffic growth. The EJ&E rail line is potentially advantageous for these carload traffic flows from West Chicago to Ivanhoe. Growth in carload traffic on the EJ&E rail line between West Chicago and Leithton would require growth in commodity flows between western and central Canada and Chicago. In general, commodity traffic flows in this corridor that could move by rail already move by rail; i.e., the long distances between Chicago and the majority of origin and consumption points for this traffic to the north and northwest of traffic has historically favored rail haulage over truck haulage.
7. The lower energy inputs for rail than for truck may favor conversion of long-haul transportation from truck to rail. Substantial conversion has already occurred.

None of these traffic sources appears to be likely in the near future to create a substantial (10 percent per year or more) potential for traffic growth on the EJ&E's rail line. Based on its review of macro freight traffic trends, SEA did not identify any basis for modifying the economic growth forecasts in section 4.1.4.2 nor the Applicants' projected train volumes.

4.1.5 Analysis of the EJ&E Rail Line's Ability to Accommodate Applicants' Proposed Train Volumes

The Applicants' Operating Plan (Applicants 2007a) describes the Applicants' proposed train volumes and characteristics of trains on the EJ&E rail line after the Proposed Action. This section analyzes the capability of the EJ&E rail line to accommodate the Applicants' trains (which includes existing EJ&E trains), plus the passenger and freight trains of other railroads which may use a portion of the EJ&E rail line or cross the EJ&E rail line. This analysis is important as it determines the effects of the Proposed Action on other rail lines and the passenger and freight trains of other railroads. This analysis also implies a maximum practical train volume on the EJ&E rail line after the Proposed Action, which may be greater than or less than the Applicants' proposed train volumes.

SEA analyzed the train capacity of the EJ&E rail line assuming that the Applicants' proposed constructions are completed, using information about the constructions provided by the Applicants. SEA used three types of train capacity analyses, all of which are standard railroad industry planning tools: bottleneck analysis, which chooses the point of maximum apparent congestion on a rail line and determines its capacity; the Line Occupancy Index, which compares the practical capacity of each segment of a rail line with the train volume proposed to be operated upon that segment; and the Rail Traffic Controller model, a software tool that simulates rail operations on a given line and calculates the delay ratio – the amount of time trains spend standing still waiting for a clear track ahead instead of moving. SEA compared the results of these analyses to the Applicants' Operating Plan to determine the effects the Operating Plan would have on passenger and freight trains that currently use or cross the EJ&E Rail Line. SEA also analyzed the results to determine if the EJ&E rail line would have spare or unused capacity that would enable an increase in average daily train volumes beyond what the Applicants proposed in their Operating Plan.

4.1.5.1 Bottleneck Analysis

SEA determined a reasonable way to consider if the Applicants' Operating Plan underestimated or overestimated the capacity of the EJ&E rail line was to perform a bottleneck analysis. Bottleneck analyses qualitatively determine the existence and location of bottlenecks: locations where the capacity to move trains cannot be readily or inexpensively increased. Bottlenecks determine the maximum train volume capacity on a rail line and can effectively strand unusable capacity on either side of the bottleneck. Not all rail lines have bottlenecks: if no bottlenecks exist then capacity is evenly distributed along the entire length of the line. Often, rail lines have multiple bottlenecks, and capital expenditure or modifications in train operations designed to reduce the constraints of one bottleneck only may shift the bottleneck to another location with slightly higher capacity.

To perform the bottleneck analysis, SEA obtained an understanding of Applicants' operational methodology by inspecting the EJ&E main line, reviewing track charts and timetables, reviewing the Applicants' Operating Plan and the plans for constructions, and discussing current operations with EJ&E operating personnel and proposed future operations with CN operating personnel. SEA reviewed all scoping letters and information from shippers pertaining to industries in the Study Area.

Based on traffic flow, operational issues, and physical constraints, SEA determined that one of the EJ&E rail line's bottleneck, after Applicants' proposed constructions, that was most appropriate to study would be an 11-mile segment of the EJ&E main line between Walker (near Plainfield, Illinois) and Rock Island Junction (near Joliet, Illinois)[1]. The segment is near the Des Plaines River Bridge (Bridge 198 located near milepost 1.7 on EJ&E's Western Subdivision). Although this segment is not the only bottleneck on the EJ&E main line, SEA chose it to evaluate in detail because of its density of rail operations, limited track capacity, and because it incorporates a movable bridge across the Des Plaines River, which opens an average of 17 times daily, according to discussions SEA conducted about bridge operating procedures and opening frequencies with U.S. Coast Guard and U.S. Army Corps of Engineers (USACE) representatives.

The 11-mile segment chosen for the bottleneck analysis contains several elements which in combination render it a bottleneck: the movable bridge across the Des Plaines River, intensive switching activities and slow main track speeds through the EJ&E's East Joliet Yard, multiple Methods of Operation which reduce train speeds and increase train dispatcher workload, coal trains moving to and from electric power plants in the vicinity, BNSF trackage rights trains, intensive switching of local industries, and other physical constraints. Each is discussed below. Figure 4.1-6 shows the principal features of this 11-mile segment.

[1] The rail segment across the Des Plaines River Bridge and through East Joliet Yard is one of several potential bottlenecks that SEA identified during the Bottleneck Analysis, LOI Analysis, and RTC Modeling. SEA did not evaluate how the Applicants could potentially expand capacity of the EJ&E rail line; instead SEA's analysis was intended only to evaluate the reasonableness of the Applicants' proposed Operating Plan. SEA does not intend to imply that the Applicants would only need to remove train volume capacity constraints at the Des Plaines River and East Joliet Yard in order to increase train volume on the EJ&E rail line. During its evaluation of the EJ&E rail line, SEA noted several other locations that could have been evaluated in the bottleneck analysis, such as Kirk Yard, the remaining sections of single-track between West Chicago and Kirk Yard, and the rail/rail at-grade crossing of the UP at West Chicago. However, because SEA's Bottleneck Analysis concluded that the Applicants propose to operate the EJ&E rail line segment at the Des Plaines River at or near its capacity, SEA did not expand the bottleneck analysis to other EJ&E rail line segments.

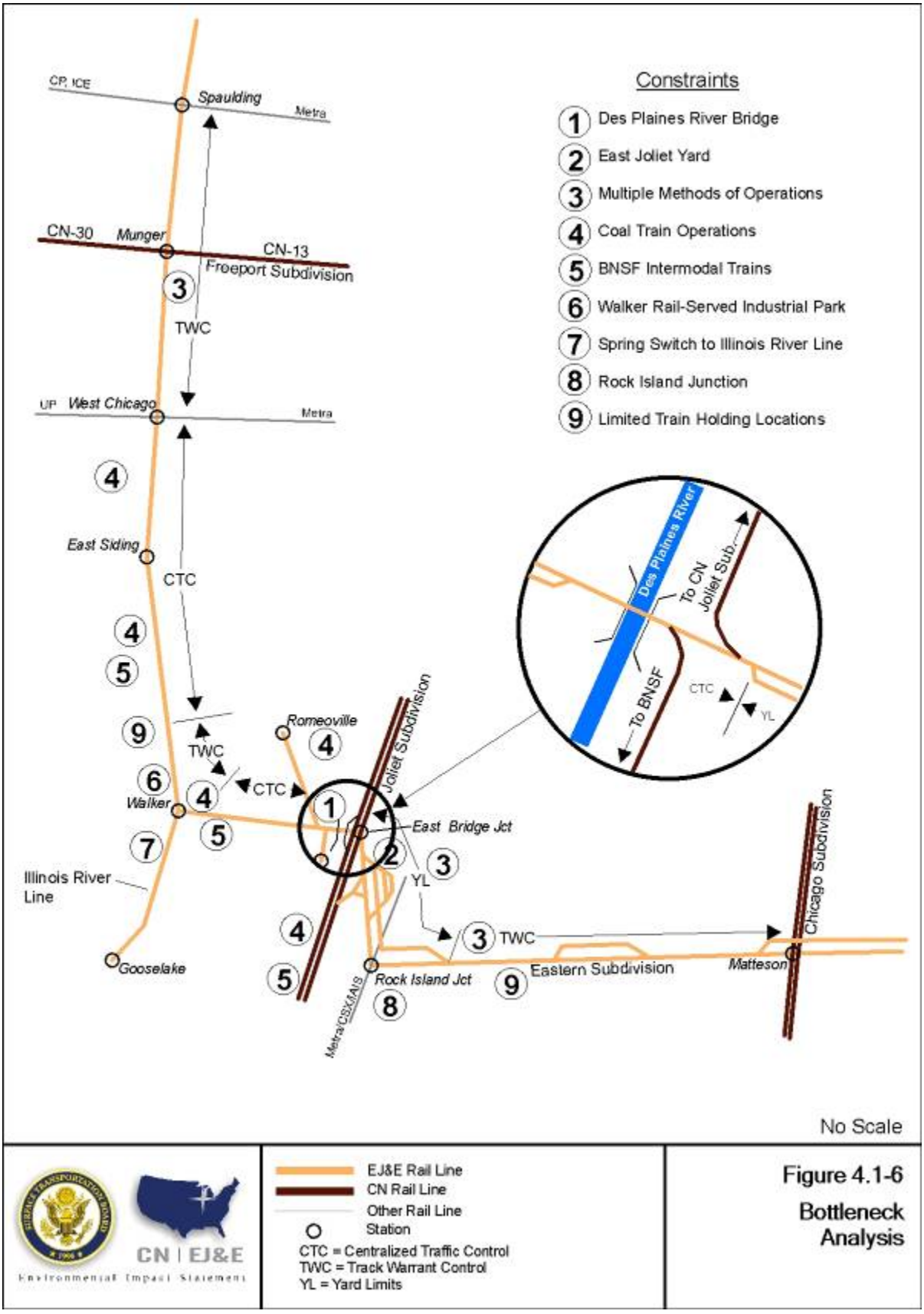


Figure 4.1-6
Bottleneck Analysis

Des Plaines River Bridge

To cross the Des Plaines River, the EJ&E rail line uses its Bridge 198, a single-track movable bridge that opens to clear river traffic. River traffic has the right-of-way, and if present, rail traffic must wait until the river traffic has passed under the bridge. Bridge 198 is a lift bridge; i.e., it lifts vertically to clear river traffic that cannot pass under the bridge. Bridge 198 remains open until a train arrives. If no river traffic is present or approaching, the bridge is lowered and the train continues. At present, Bridge 198 is remote-controlled from the EJ&E dispatcher's office in Joliet, using radar to detect vessels moving upstream or downstream. According to the USACE and EJ&E, Bridge 198 is opened an average of 17 times daily. The bridge mechanism requires two minutes to lower the bridge to the closed position, enabling rail traffic to pass, and two minutes to raise it to the open position, enabling river traffic to pass. Bridge movement frequency varies seasonally and is dependent on the volume and schedule of waterway traffic. During winter months the Des Plaines River is typically frozen for several months, during which the bridge is lowered enabling rail traffic to pass unhindered except by speed limits across the bridge and its single-track capacity.

When Bridge 198 is open, trains approaching the bridge must be held for a period of time. Adjacent locations where trains can be held without blocking highway/rail at-grade crossings or rail/rail at-grade crossings consist of East Joliet Yard, south and east of the bridge, which has yard tracks with maximum lengths of 8,120 feet, and Turner Siding, north and west of the bridge (between mileposts 5.5 and 3.8), which is in excess of 10,000 feet long (Applicants 2008a). Both locations can only hold stopped trains seeking to use the bridge if these tracks do not already contain trains or railroad cars. For example, if Turner Siding already holds a train or railroad cars, and all tracks at East Joliet Yard are also occupied, another eastbound/southbound train can only advance to Turner Siding so long as there is no westbound/northbound train also advancing on the main line at East Joliet.

East Joliet Yard

East Joliet Yard is a classification yard where EJ&E currently sorts or switches an average of 500 railroad cars per day. EJ&E conducts train movements within East Joliet Yard and on the main track parallel to East Joliet Yard using Yard Limits as its Method of Operation. EJ&E's operating instructions limits the maximum speed through and past the yard to 10 mph. This 10-mph speed restriction begins just west of the Des Plaines River Bridge at milepost 2.0 (EJ&E Western Subdivision) and extends to Washington Street at milepost 1.0 (EJ&E Eastern Subdivision), a total distance of 3 miles. The maximum authorized speed for trains is 45 mph west of East Joliet Yard and 40 mph east of East Joliet Yard.

Through trains not stopping at East Joliet Yard to switch rail cars typically use a through track located on the west side of East Joliet Yard. This track, which EJ&E calls the East End Lead, has several switches to other tracks. EJ&E operating instructions require trains departing the East End Lead must reline to the main track position any switches that the train crew has lined for other tracks, so that following trains that will use the East End Lead for through movement do not have to stop to line switches for through movement. On the east side of East Joliet Yard, EJ&E has upgraded a yard track to serve as a "runner," a railroad term for a track that is kept clear of stationary trains as much as possible so that through trains or movements can be accommodated at low speeds. Other yard tracks can also be used for through trains, but it is typically necessary for the train crew to stop the train and hand-throw switches to enter and exit the yard. Remote-controlled switches and signals controlled by the EJ&E train dispatcher are located at East Bridge Junction and at Rock Island Junction. These signals and switches assist in the movement of trains in and out of East Joliet Yard.

Switching at East Joliet Yard must be coordinated with through trains that might use the East End Lead or the runner, so that switching activities do not interfere with through train movement. Under

the Proposed Action, more than 15 through trains would pass through East Joliet Yard daily. This increase in through trains would be a substantial change in present yard operations. Currently, only one through train daily regularly operates through East Joliet Yard, a UP train moving between West Chicago to Chicago Heights or Griffith. All other trains currently operating at East Joliet Yard either originate from or terminate in East Joliet Yard, or diverge onto other railroads within Joliet. These diverging trains include between eight and nine BNSF trackage-rights trains and UP coal trains en route to South Joliet.

The Applicants' propose to increase the current average of 500 cars switched per day at East Joliet Yard to an average of 1,209 cars per day. This increase in switching volume could substantially affect the ability of through trains to pass through the yard unimpeded by switching activity.

Multiple Methods of Operation

EJ&E currently relies on multiple Methods of Operation to move trains over the EJ&E rail line, as was shown on Figure 4.1-2 at the beginning of this section. EJ&E employs Centralized Traffic Control (CTC) in disconnected segments: Leithton to Spaulding, West Chicago to Normantown, Turner to East Bridge Junction, and Cavanaugh to Kirk Yard. Yard Limits governs train movements through East Joliet Yard to Griffith, and between the Des Plaines River Bridge and Cavanaugh. In all other segments, EJ&E employs Track Warrant Control (TWC). Trains entering Yard Limits (the third Method of Operation) can do so without seeking authority from the train dispatcher (although often railroads require trains entering Yard Limits to discuss which track they will use with the train dispatcher or another person in charge in order to efficiently coordinate train movements and switching activities. Trains entering CTC can do so according to signal indication, which often requires very little time from the train dispatcher to initiate. However, trains entering TWC require a relatively lengthy interaction with the train dispatcher to obtain a track warrant, as it is verbally read to the crew and repeated back, and trains leaving TWC must similarly verbally release the warrant to the train dispatcher. Each transition from one Method of Operation to another increases train dispatcher workload and limits train volume capacity.

Coal Train Operations

Eight to ten times each week, loaded coal trains destined for Midwest Energy's Will County facility move from UP's West Chicago yard, over the Des Plaines River Bridge, and into EJ&E's East Joliet Yard. At the yard, the locomotives are uncoupled from the south/east end of the train, and move to the other end of the train so that the train can reverse direction with the locomotives leading. When ready, the train crew moves the loaded coal train at 10 mph over the Des Plaines River Bridge, then off the EJ&E main line and onto the EJ&E Romeoville Branch, via a remote-controlled switch. At milepost 0.5 on the Romeoville Branch, train speed is reduced to 6 mph due to restrictions imposed in an agreement between EJ&E and USFWS. The time consumed by a loaded coal train from the moment it first crosses the Des Plaines River bridge and enters East Joliet Yard, until the rear of the departing train clears the main line on the Romeoville Branch, at present requires between 45 and 55 minutes. During this period, the EJ&E main line cannot be used at this location by any other train. Once unloaded, the empty train reverses this procedure, again occupying the EJ&E main line for 45 to 55 minutes. In total, 16 to 20 hours, or 10 to 12 percent, of main line capacity is consumed each week by this single train.

A second Midwest Energy coal train destined for South Joliet also operates 8 to 10 times each week between West Chicago and East Joliet Yard, but it has less impact on main line capacity as this train enters East Joliet Yard on the East End Lead, which leads to a track that EJ&E calls the "City Track." After leaving the East End Lead on the City Track, the train crew must restore the switch behind them to the main line position before proceeding. If the East End Lead is occupied by another train when

the South Joliet coal train arrives, it must wait until the East End Lead is clear, blocking the main track.

Joliet-Area Coal Train Traffic–South Joliet and Paul Ales Branch

Currently, the EJ&E rail line handles two 135-car, loaded coal trains and two empty coal trains daily between West Chicago, Illinois, and Joliet, Illinois. One train moves directly from West Chicago to the City Track, located within East Joliet Yard, and then to an unloading facility at South Joliet. Once emptied, the train returns to West Chicago. The second train, which serves Midwest Energy's Will County facility, is first delivered to East Joliet Yard. The train crew then re-positions its locomotives from one end to the opposite end of the train and then pulls the loaded train from East Joliet Yard onto the Paul Ales Branch, which is located just west of the Des Plaines River Bridge. This repositioning move would not usually be an issue; however, from May 15 through September each year, the move must be made at 6 mph for a distance beginning approximately 0.5 mile from the main line switch to the end of track in order to reduce impacts on the Hine's emerald dragonfly. This movement requires approximately 30 minutes to clear the main line from the time when the train first obtains a signal indication allowing it to proceed from East Joliet Yard. The train proceeds across Bridge 198 at 10 mph until reaching 0.5 mile on the Paul Ales Branch. The last 3,000 feet of the coal train is still on the main line and moves onto the branch line at 6 mph. The mainline occupancy is then repeated as the empty train is brought off the branch line and into the yard. The crew runs the locomotives around the train and then can move the train at maximum authorized track speed to West Chicago. Total mainline time requires approximately 1 hour per day.

Discussions with the lock operator at Lockport indicate that roughly 4,500 boats move through the locks each year. As the locks are iced up for 3 months per year, about 15 to 16 tug/barge combinations per day move under the Des Plaines River Bridge each year. If the bridge opening requires 10 minutes for each raising and lowering, the bridge will be unavailable for train traffic for 2 to 3 hours daily.

Applicants anticipate that 42 trains per day would operate through this segment. Given that one hour per day would be used to handle the train that travels to the Paul Ales Branch and two hours each day will be used to handle navigation issues, 21 hours of each day would be available for train movement. However, since the main track speed is 10 miles per hour, and train movements are a combination of yard limits and Centralized Traffic Control (CTC), and there is only one main track available for meets and passes in East Joliet Yard, it might be difficult for Applicants to the handle the projected 42 trains each day through Joliet.

BNSF Intermodal Trains

BNSF operates six to seven high-priority intermodal trains daily on the EJ&E rail line between Eola, Illinois, and the east end of the Des Plaines River Bridge. These trains carry high-priority freight between the Pacific Northwest and BNSF's Joliet Logistics Park located south of Joliet. BNSF uses this 19-mile segment of the EJ&E rail line to reduce transit time by two hours or more compared to using its own routes through Chicago. In order for these trains to continue to obtain this advantage after the Proposed Action, Applicants' rail operations on the EJ&E rail line must afford them some level of priority.

Local Rail-Served Industries at Walker

Several rail-served industries are located adjacent to the EJ&E rail line at Walker, approximately 10 miles west of Joliet. At present EJ&E devotes approximately 3 to 4 hours each day servicing these local industries. Switching these industries takes place from the EJ&E main line. During switching operations, through trains are blocked from movement. The switching crew utilizes an "industrial lead track" in the vicinity of these industries to clear any through trains that arrive during switching

activities; i.e., the switching engine and any cars it has with it move onto this lead track to clear the main track. After the through train passes, the switching crew resumes use of the main track to complete its switching. The Applicants have indicated that they would connect the industrial lead track into a longer segment of double track that would extend from East Siding to Walker. The double track would increase main line capacity. However, for 3 to 4 hours each day, the additional main line capacity would be unusable as the switching crew would be consuming it.

Manual Switch on the Illinois River Line

EJ&E is currently operating two trains per day between East Joliet Yard and EJ&E's Illinois River Line, which is accessed by a "spring switch" off the main line just west of Plainfield. Spring switches are a type of switch that enables a train departing a side track and entering the main track to do so without stopping to line the switch for the side track, or returning it to main track position after passing. However, spring switches only afford this advantage in one direction; when a train wishes to move in the opposite direction, departing the main track and entering the side track, the spring switch must be hand-operated. Accordingly, at this location main line capacity is only significantly reduced when the outbound train for the Illinois River Line, moving from East Joliet Yard to Plainfield each morning, must stop and line the spring switch for movement onto the Illinois River Line. Once the train has cleared the main line switch, a member of the train crew must restore the switch to the normal position. This procedure only requires 15 to 20 minutes but occurs on the single-track segment between Walker and Turner, and thus could have a significant impact on main line train volume capacity.

Rock Island Junction with Metra

Approximately 46 Metra and 6 CSX freight trains daily operate over the rail/rail at-grade crossing of Metra and the EJ&E rail line at Rock Island Junction. This interlocking, controlled by Metra, is located at milepost 0.7 (EJ&E Eastern Subdivision) but is only 1,000 feet from the switches that define the southern (or eastern) end of East Joliet Yard. This very short distance enables only minimal switching activity to occur at the south end of the yard without occupying the crossing.

Lack of Suitable Train Parking Locations East of East Joliet Yard

Westbound through trains moving from Kirk Yard, Griffith, Chicago Heights, and Matteson would be able to operate on the new double track proposed by the Applicants to be installed between Rock Island Junction (near Interstate 80) and the existing siding at Frankfort. However, once a westbound train exceeding 5,000 feet in length moves beyond Schoolhouse Road, there are no further locations where this train can stop to wait for other trains to clear railroad/railroad crossings, or for switching activities to be completed, until it reaches East Joliet Yard and not block one or more highway/rail at-grade crossings Given the congestion of the yard/main line interface at East Joliet Yard, westbound main line capacity is effectively limited by the availability of a through track at East Joliet Yard, i.e., trains cannot pass Schoolhouse Road until it is known they can complete movement without stopping all the way to East Joliet Yard without incurring risk of blocking highway/rail at-grade crossings. A complicating factor is that Metra effective controls the entrance to the south/east end of East Joliet Yard via the interlocking at Rock Island Junction. This condition creates a "clear-ahead time" of 20 to 30 minutes that limits main line capacity.

Summary of Bottleneck Analysis

SEA evaluated each of the issues discussed above, reviewed the Applicants' Operating Plan, and discussed the constraints on the 11-mile segment with Applicants' operating personnel. SEA concluded that should the Board approve the Proposed Action, the Applicants' Operating Plan would consume all or nearly all of the main line capacity at this bottleneck. The bottleneck analysis

indicates that the volume of through trains on the EJ&E rail line is unlikely to exceed the train volume proposed by the Applicants.

4.1.5.2 Line Occupancy Index Analysis

Line Occupancy Indexes (LOIs) are a empirical analysis tool that compares a rail line's nominal (or "standard") train capacity for its number of main tracks, method of operation, and maximum track speeds, with the actual number of trains that will occupy the rail line. LOIs typically break the rail line into segments having similar features and Methods of Operation, such as double-track sections and single-track sections. A rail line or line segment with an LOI of 50 implies the line is hosting 50 percent of its maximum practical train capacity. LOI values can be categorized as follows:

What is the Line Occupancy Index (LOI)?
Line Occupancy Index (LOI) is a ratio between the theoretical train capacity of a line segment and the projected actual train use of a line segment. An LOI of 60 is at the upper end of practical capacity.

- Values between 0 and 39 indicate that the rail line segment has adequate capacity for additional train traffic and to perform track, structure, and signal maintenance.
- Values between 40 and 69 indicate that the rail line segment is reaching an upper threshold for adding more train traffic, and maintenance activities will need to be carefully scheduled to avoid excessive interruption to train traffic.
- Values between 70 and 100 indicate that the rail line segment has exceeded its practical capacity and maintenance activities will likely result in interruption to train traffic, or rerouting of train traffic to other lines, or temporary reductions in rail service levels offered to shippers, or all three.

While rail lines with LOIs greater than 70 are operated successfully, generally they are considered impractical by the rail industry as they allow insufficient time for track maintenance, and have insufficient spare capacity to make up for unforeseen rail service interruptions and fluctuations in rail traffic. Rail line capacity that is not used one day is lost forever, and if the trains that were to operate that day appear the next day, along with the next day's trains, a rail line with a high LOI may not have the ability to make good the lost capacity for a considerable period of time. In addition, trains that cannot be accepted on a rail line with a high LOI must wait somewhere, in turn using up additional capacity and effectively increasing the LOI for adjoining rail lines for a considerable distance

SEA determined a reasonable way to further consider if the Applicants' Operating Plan underestimated or overestimated the capacity of the EJ&E rail line as a whole would be to perform an LOI analysis. Using the Applicants' Operating Plan (which includes existing trackage rights trains), SEA performed an independent Line Occupancy Index (LOI) for the EJ&E main line. (According to the Applicants' Safety Integration Plan, the Applicants performed what appears to be a similar analysis to an LOI, which Applicants term a "Return Grid Capacity Analysis.") SEA's LOI Line Segment Map is shown in Figure 4.1-7 below.

Based on its review of the Applicants' Operating Plan, SEA made the following assumptions for its LOI analysis:

- EJ&E rail traffic and trains would continue to operate as at present, including local switching, local trains to serve shippers, and yard movements and yard switching.
- Existing trackage-rights trains would continue to operate. These consist eight to nine BNSF trains per day between Eola and Joliet, and two BNSF trains per day between Eola and Leithton; six to eight UP trains per day from West Chicago to Joliet, two UP between West Chicago and either Chicago Heights or Griffith, and two UP trains per day between

West Chicago and Cavanaugh; and two CPR trains per day between West Munger and Spaulding. UP trackage-rights trains include a coal train operating to Romeoville that on average cycles to Romeoville once every 17 hours, and a coal train operating to South Joliet that also on average cycles to South Joliet once every 17 hours.

- Six CSX trains would cross the EJ&E rail line daily at Rock Island Junction, along with the currently scheduled Metra trains crossing at Rock Island Junction.
- Seventeen close-open cycles of the Des Plaines River Bridge would occur daily, each causing 15 minutes of lost main line capacity.
- CN traffic would operate a through-train once every 2 hours south from Leithton and west from Kirk Yard to comprise a total of 24 trains per day. The LOI analysis assumed the average train length of 6,321 feet as described in the Applicants' proposed Operating Plan, and assumed six of these trains would be 10,000 feet long with the remaining trains commensurately shorter.
- The Applicants' proposed constructions were completed.

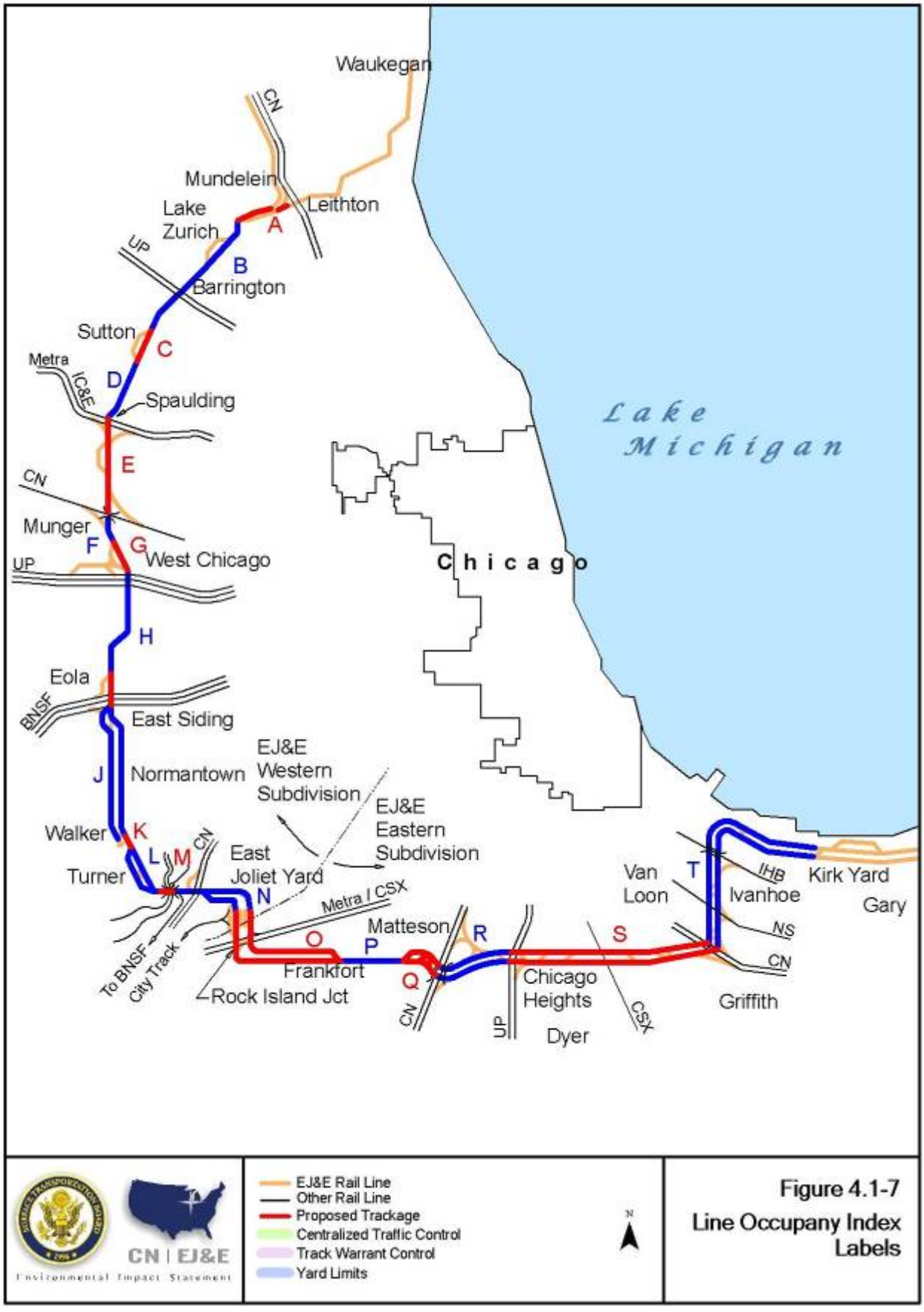


Figure 4.1-7
Line Occupany Index Labels

- EJ&E currently controls its trains using three different methods of operation - CTC, TWC, and YL. For the results of the LOI analysis to be more accurate, the Method of Operation must be consistent across the segment. However, some of segments presented in the Application are controlled using two or more methods of operation. Therefore, to comply with the rules of an acceptable LOI analysis, SEA had to use slightly different segments for the LOI analysis, which are shown in Figure 4.1-7, above. The different segments were used only for the LOI analysis, and are not used elsewhere in the Draft EIS.

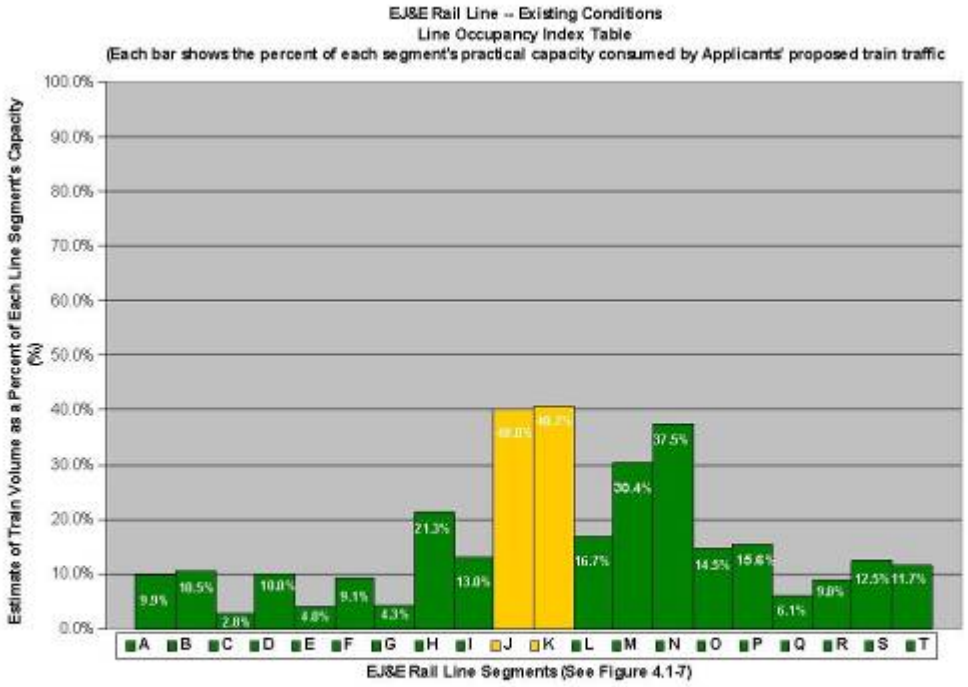
SEA validated the assumptions used for its LOI analysis by reviewing existing conditions with only EJ&E trains operating. For the LOI analysis, SEA partitioned the EJ&E rail line into distinct segments and calculated the amount of time per train required to traverse each segment. Then SEA multiplied this time by the number of trains projected in the Applicants' Operating Plan. The LOI analysis focused primarily on train speed and length, track speed, number of tracks, and other related factors that may affect capacity, such as the amount of switching work to be performed while occupying the main line, or the number of Des Plaines River Bridge openings. SEA also incorporated other factors in the LOI analysis, such as priority of trains, efficiencies of each type of Method of Operation employed, the assumption that several following trains can be moving through a segment simultaneously, two and sometimes three trains can be moving through an interlocking at the same time, and practical versus theoretical capacity. Results of the LOI analysis are shown in Table 4.1-2, below, and graphically represented in Figure 4.1-8.

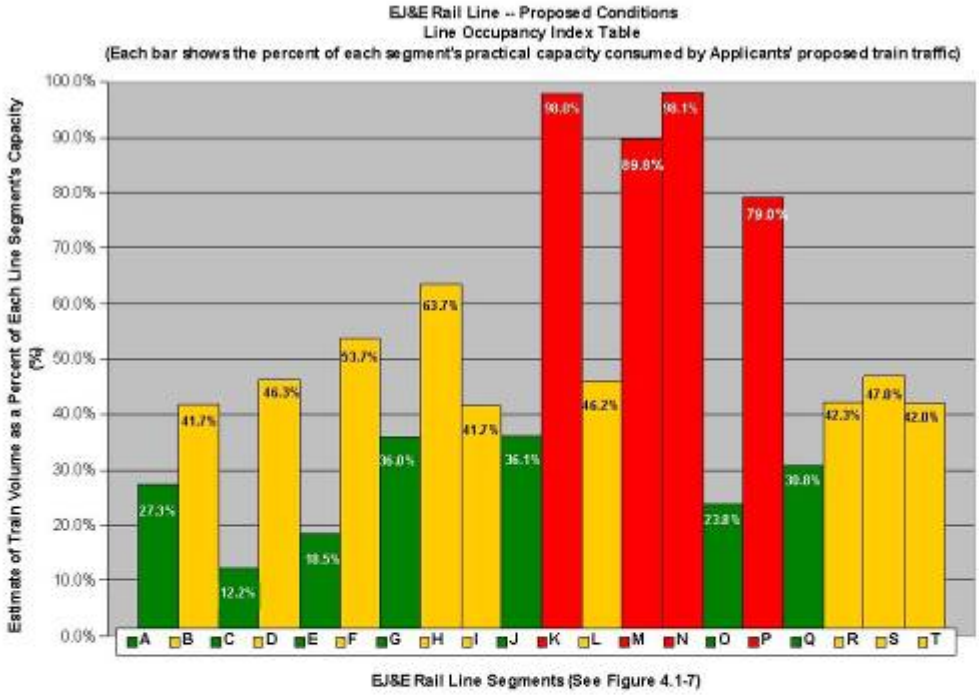
What are interlockings?

A junction controlled by wayside signaling where trans change from one track to another (within one railroad system) or a junction at the confluence of two or more different railroads controlled by wayside signaling. The name "interlocking" means the signaling system is interlocked in such a way that two trains cannot be given conflicting routes simultaneously.

The LOI analysis confirmed SEA's findings in the bottleneck analysis in section 4.1.5.2, that is, that under the Proposed Action there would be several segments of the EJ&E rail line that would operate at or near capacity. On these line segments, there is little capacity beyond the train numbers reflected in the Applicants' Operating Plan, for the Applicants or other railroads to coordinate trackage-rights operations or to ensure non-interference of Applicants' trains with the freight and passenger trains of other railroads crossing the EJ&E rail line at railroad/railroad crossings.

SEA therefore concluded that the Applicants' Operating Plan would consume nearly all of the main line capacity on the EJ&E rail line, after Applicants' constructions are completed. Accordingly, the volume of through trains on the EJ&E rail line would likely not exceed the train volume proposed by the Applicants. In addition, SEA concluded that the EJ&E rail line would be unlikely to have the practical capacity to accommodate additional freight or passenger trains of other railroads, and the Applicants' Operating Plan could have insufficient capacity to allow for non-interference with the existing trains of other railroads that cross the EJ&E rail line without incurring delays to Applicants' trains.





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A: Leithton to Gilmer Road
B: Gilmer Road to W. Sutton
C: W. Sutton to E. Sutton
D: E. Sutton to W. Spaulding
E: W. Spaulding to E. Spaulding
F: E. Spaulding to Hawthorne Lane
G: Hawthorne Lane to W. Chicago
H: W. Chicago to W. Eola
I: W. Eola to W. East Siding
J: W. East Siding to Walker
K: Walker to Turner
L: Turner to East Bridge Jct.
M: East Bridge Jct. to CP 198
N: CP 198 to Rock Island Jct.
O: Rock Island Jct. to Frankfort
P: Frankfort to Richton
Q: Richton to Matteson
R: Matteson to Chicago Heights
S: Chicago Heights to Griffith
T: Griffith to Kirk Yard

Figure 4.1-8
Line Occupany Index Histograms

4.1.5.3 Rail Traffic Controller Model

The Rail Traffic Controller (RTC) model was used to analyze the Proposed Action under several different scenarios. The RTC model is an industry-standard dispatching model that uses realistic acceleration and deceleration rates for a given train tonnage and horsepower-per-ton ratio, adheres to permanent speed restrictions on the railroad, and accounts for actual ascending and descending grades. The RTC train dispatch simulation software is used to determine running times, meet and passes and infrastructure requirements on a segment of rail line or a network of segments. The model is constructed using the existing physical plant of a railroad, which includes the horizontal and vertical alignment, location of turnouts, interlockings, and highway grade crossings. Trains are inserted into the model and their important characteristics specified. The model then performs a simulation using this specified physical plant and train data including estimated starting times (known as "run") to seek the best fit for the chosen schedule.

The RTC model was constructed for the EJ&E rail line to include the track and connection modifications proposed by CN in its application (Applicants 2007a). Several important details of the proposed modifications, such as location of wayside signaling control points, were not specified by CN; therefore, SEA made assumptions concerning the location of the control points in light of typical railroad industry practice. The methodology and details of the RTC model are discussed more fully in Appendix B.

SEA made the following assumptions for the RTC model:

1) Passenger trains have precedence at rail/rail at-grade crossings, and freight trains on the EJ&E main line must wait for them to pass.

2) Passenger train occupancy time at rail/rail at-grade crossings was based on Metra's and Amtrak's most recent schedule.

3) Freight trains crossing the EJ&E main line at rail/rail at-grade crossings are evenly spaced throughout the 24-hour period.

4) The number of freight trains crossing the EJ&E main line at rail/rail at-grade crossings was based on information provided by various railroad operating personnel in the Chicago area and is an estimated 2008 average.

5) Freight trains crossing the EJ&E main line at rail/rail at-grade crossings were given precedence over trains on the EJ&E main line.

6) Bridge lifts at Joliet are 20 per day based on 15 minutes and are evenly spaced over 24 hours.

7) It was assumed that all EJ&E connections to CN and other railroads at which trains leave the EJ&E main line, as well as East Joliet and Kirk Yards, would promptly accept trains at the time the train is presented, enabling the train to leave the EJ&E rail system without delaying other trains. This assumption implies that yard activity in and around East Joliet and Kirk yards would not interfere with the movement of through-trains at East Joliet Yard or trains entering and exiting Kirk Yard.

The essential output of the RTC model is a "delay ratio." This number is the numeric comparison between the ideal transit time across a rail system by a single unimpeded train, multiplied by the number of trains anticipated to operate in a day, and the likely transit time of all the trains after adjusting for their interactions.

The delay ratio captures the lost time in a rail operation – the time trains spend waiting for a clear track ahead. High delay ratios indicate a rail system that is overloaded with trains, or that trains are of excess length or insufficient horsepower for the system, or all three. High delay ratios show a

railroad system that operates at close to capacity and may be unduly sensitive to any mechanical malfunction, track maintenance activity, or weather condition that may interrupt or slow train traffic. General industry practice is to avoid an increase in train volumes that leads to a delay ratio of 20 or greater.

SEA modeled five different cases, beginning with the Applicants' Operating Plan. These cases, which are described in Table 4.1-2, project different operating situations and train volumes. The results indicate that Case 1, the Applicants' Operating Plan, would have the lowest delay ratio, and as more trains are added, the delay ratio increases, in some cases drastically.

Table 4.1-2. Delay Ratios

Case #	Case Description	Delay Ratio
1	Applicants' Operating Plan - all CN trains on EJ&E rail line at 6,321 feet long	28
2	Same as Case 1 with Romeoville Coal Train operated	32
3	Same as Case 2 with six 10,000-foot trains operated	60
4	Same as Case 3 with increased Metra and UP traffic at West Chicago	77
5	Same as Case 4 but with all trains on EJ&E at 6,321 feet long	58

Another common output of an RTC model is the "stringline" diagram. This diagram is a visual graph that shows, on the y-axis or left-hand side of the graph, the EJ&E rail line between Leithton (at the top of the graph) and Kirk Yard (at the bottom of the graph). The time of day is shown along the bottom of the graph beginning at midnight on the left hand side of the graph and extending to midnight the next evening on the right-hand side of the graph. Each line on the stringline diagram represents a train moving either from Leithton to Kirk Yard (which slopes downward from left to right), or from Kirk Yard towards Leithton (which slopes upward from left to right). A horizontal segment in the line means that the train would be stopped at the location indicated on the left axis of the graph, and the train is making no forward progress. Where the sloping lines cross indicates where trains meet and pass each other as they traverse the rail line.

The stringline diagram shown in Figure 4.1-9 indicates that under the Proposed Action, trains would experience major delays at several locations along the EJ&E rail line. The addition of more trains would serve only to increase those delays and further reduce the efficiency of the system. SEA concluded from this analysis that under the Applicants' Operating Plan, the EJ&E rail line would be operated at or very near to capacity, and that there is little, if any, room for growth in the anticipated daily train volumes.

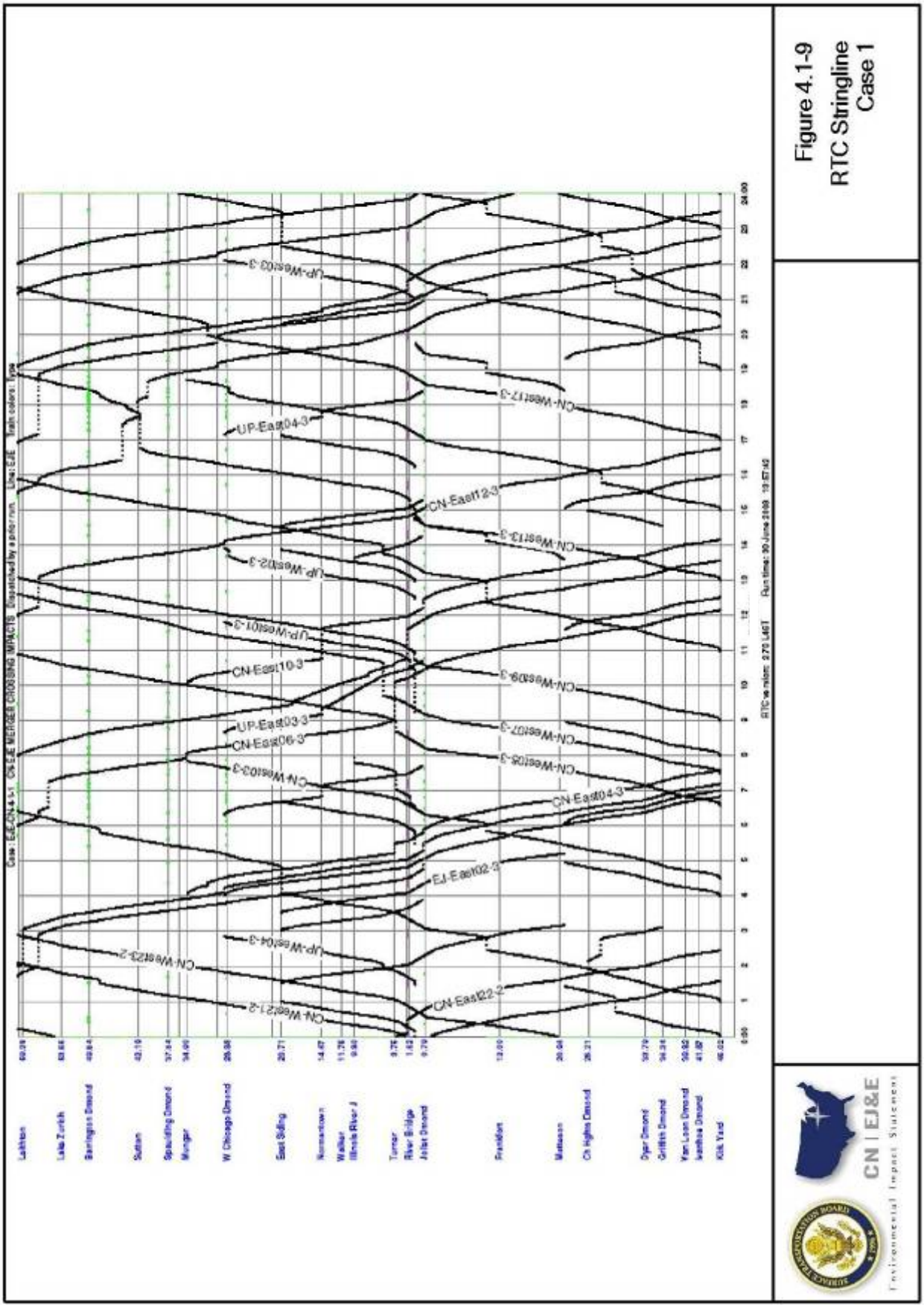
Figure 4.1-9
RTC Stringline
Case 1
CN | EJ&E
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UP-West03-3
UP-East04-3
CN-West17-3
CN-East12-3
CN-West13-3
UP-West02-3
UP-West01-3
CN-East10-3
CN-West09-3
UP-East03-3
CN-East06-3
CN-West07-3
CN-West05-3
CN-West03-3
CN-East04-3
EJ-East02-3
UP-West04-3
CN-West23-2
CN-West21-2
CN-East22-2
Lathrop
Lake Turnin
Barrington Ground
Sutton
Spaulding Ground
Munger
W Chicago Ground
East Siding
Normantown
Walker
Illinois River J
Turner
River Bridge
Joliet Ground
Frankfort
Matteson
Ch Hights Ground
Dyer Ground
Griffith Ground
Kensington Ground
Hammond
Kirk Yard

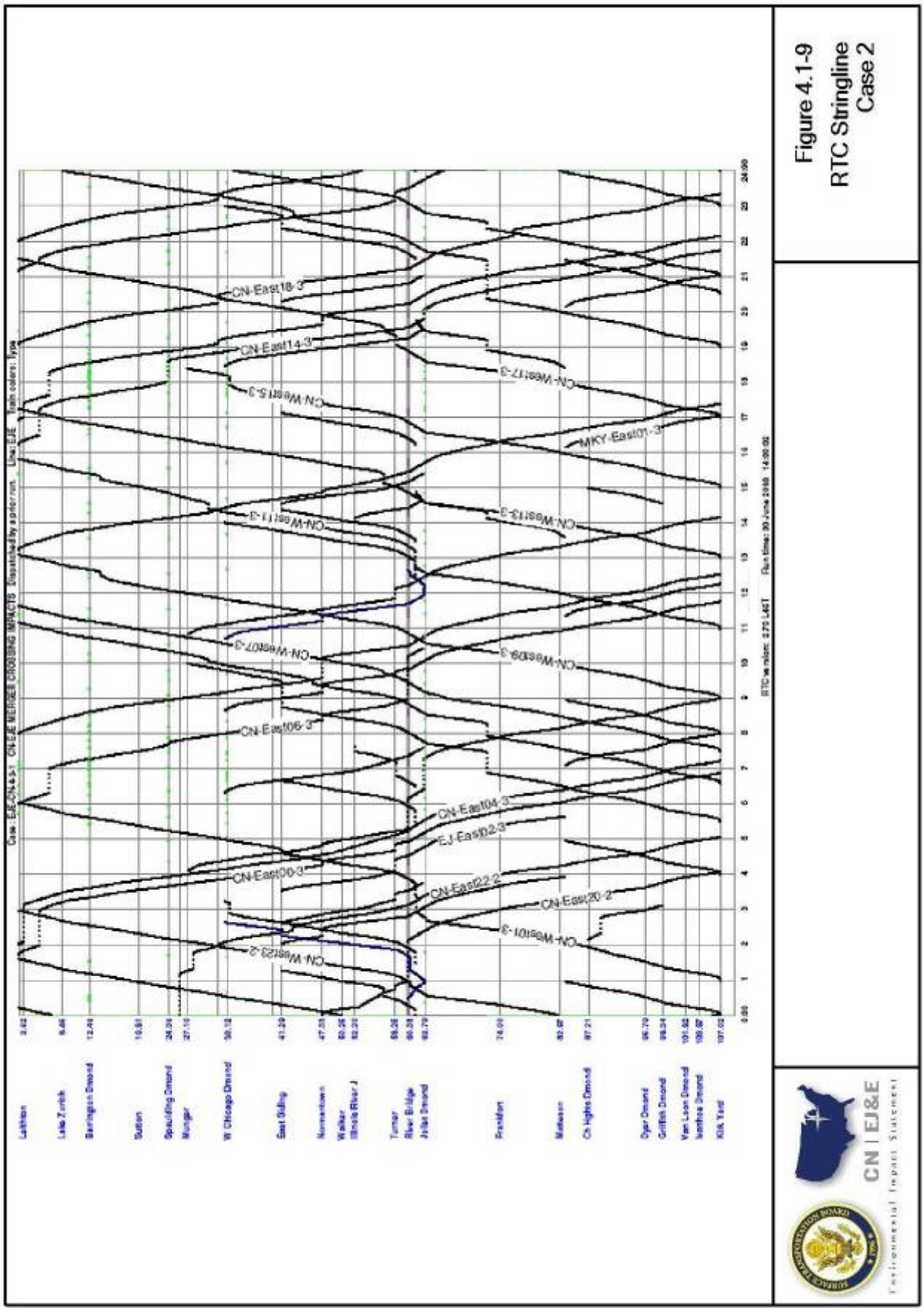
Figure 4.1-9
RTC Stringline
Case 2
CN | EJ&E
Environmental Impact Statement

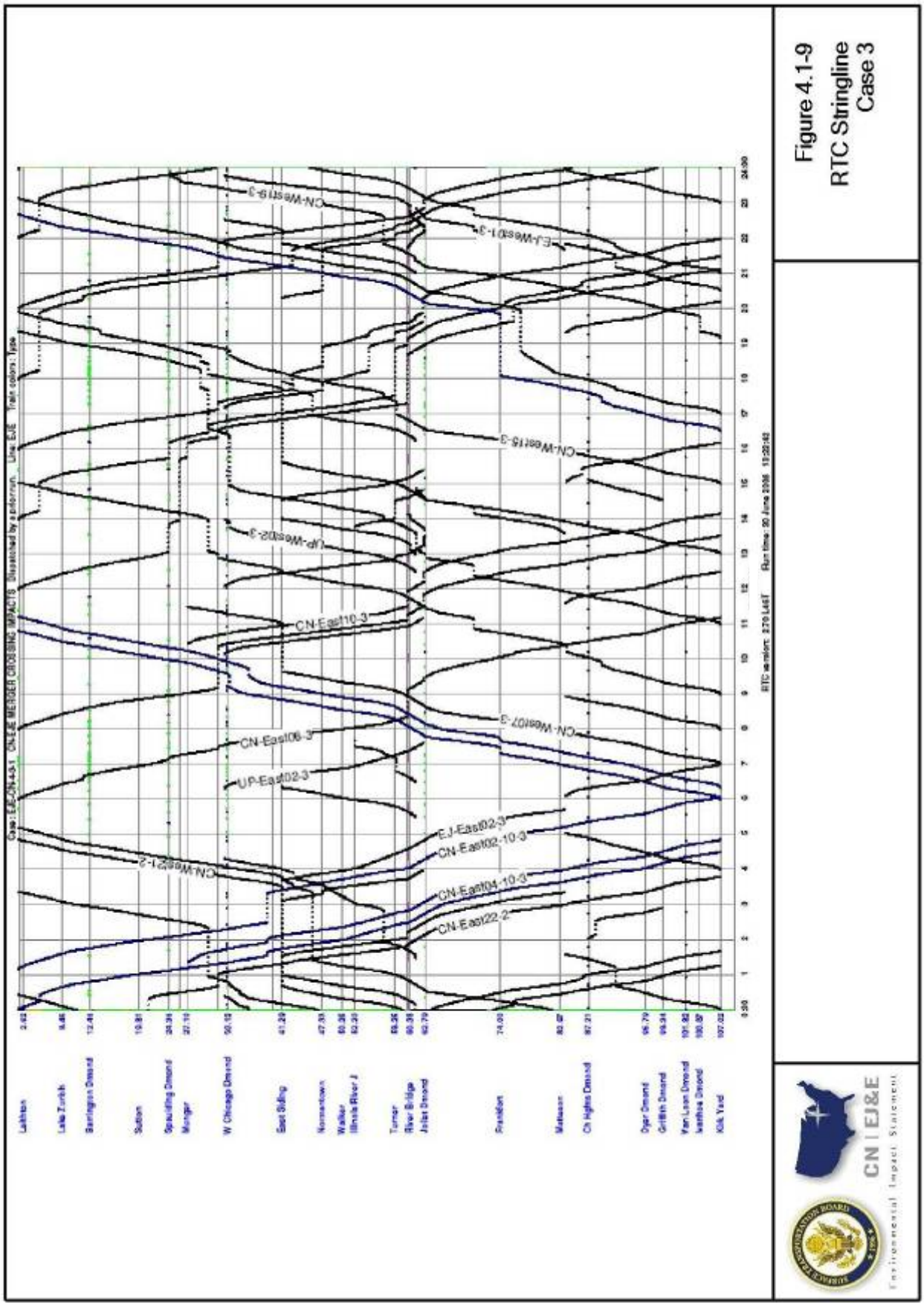

Figure 4.1-9
RTC Stringline
Case 3

CN | EJ&E
Environmental Impact Statement

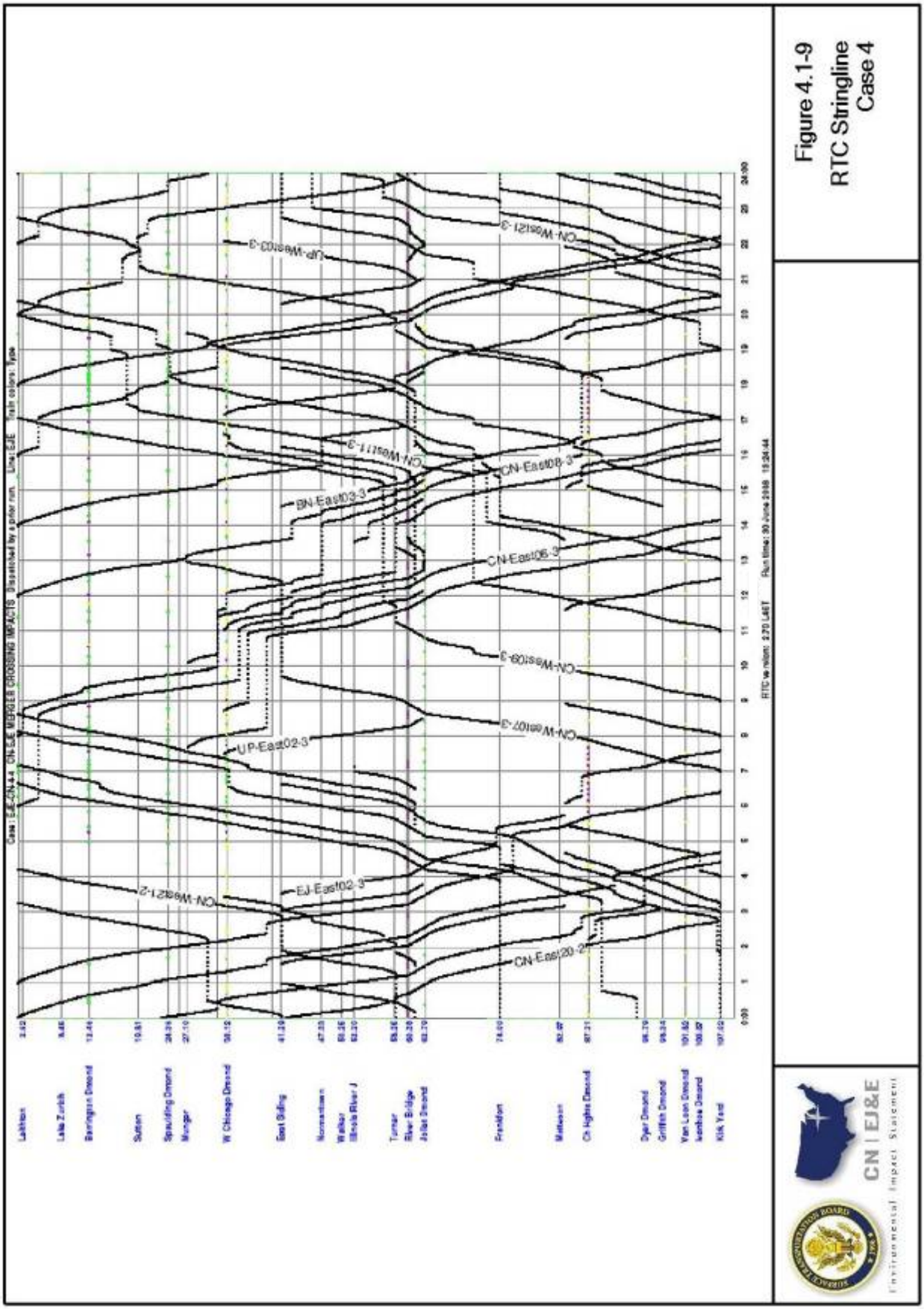
Figure 4.1-9
RTC Stringline
Case 4
CN | EJ&E
Environmental Impact Statement
Lathrop
Lake Zurich
Barrington Dsnd
Sutton
Spaulding Dsnd
Munger
W Chicago Dsnd
East Siding
Normantown
Walker
Illinois River J
Turner
River Bridge
Joliet Dsnd
Frankfort
Matteson
Ch Hghts Dsnd
Dyer Dsnd
Griffith Dsnd
Van Loan Dsnd
Ivanhoe Dsnd
Kirk Yard
CN-West21-2
EJ-East02-3
UP-East02-3
CN-West07-3
CN-West09-3
CN-East05-3
BN-East03-3
CN-West11-3
CN-East08-3
UP-West03-3
CN-West21-3
CN-East20-2

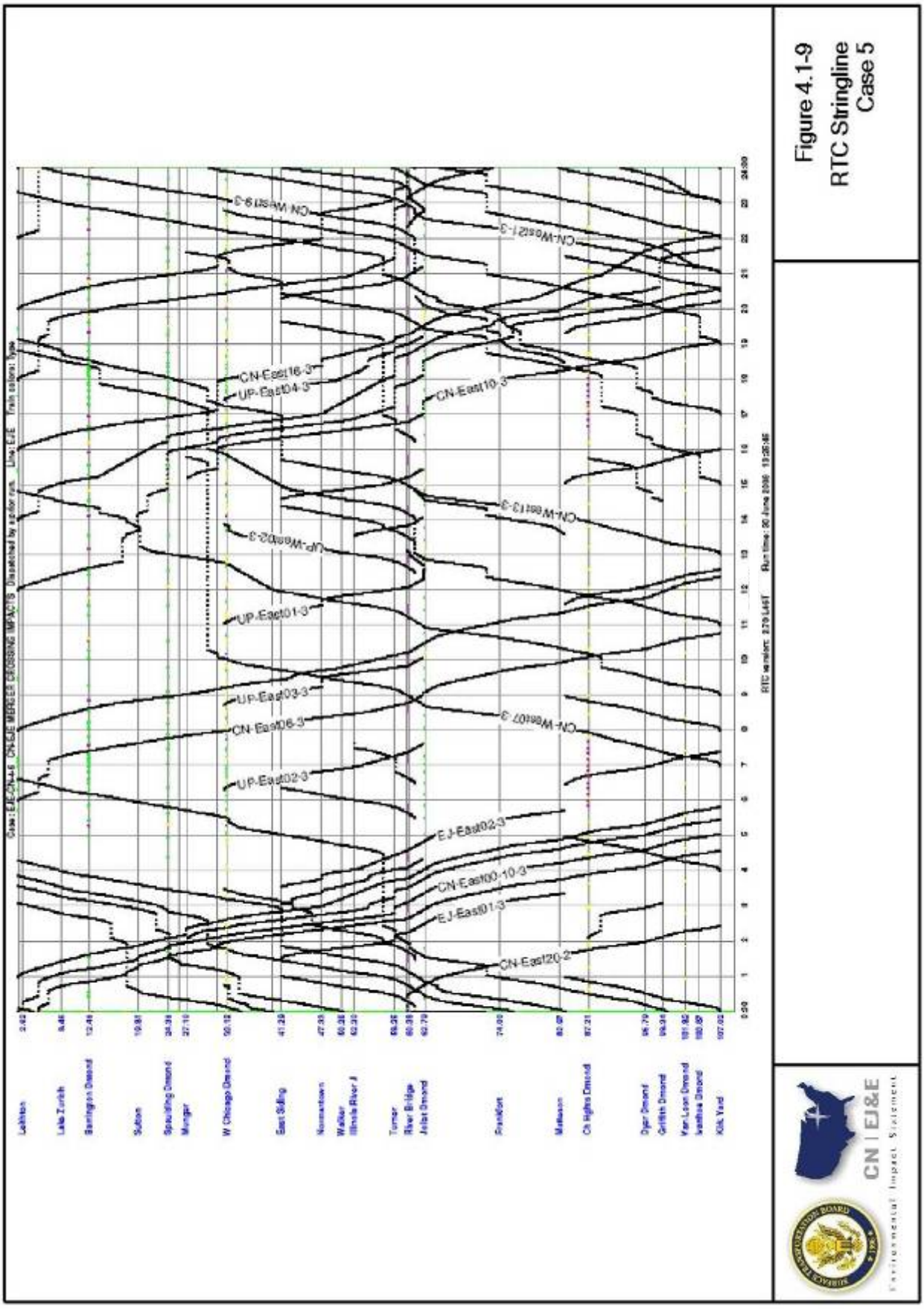

Figure 4.1-9
RTC Stringline
Case 5

Summary Evaluation of the Applicants' Proposed Operating Plan

Under the No-Action Alternative, CN would not acquire control of the EJ&E rail line, and no additional rail traffic would be diverted onto the EJ&E rail line. CN would continue to move its existing rail traffic through downtown Chicago and would continue to conduct its classification activities at the Belt Railway of Chicago (BRC) Clearing Yard (located between Chicago and Bedford Park, Illinois) or at other yards. The EJ&E rail line would continue to serve its local and regional customers and would continue to cooperate with its various interchange partners (see Chapter 2, Section 2.1.3, EJ&E Rail System). No construction would occur at the proposed connection locations, nor would the double track be constructed.

Under the Proposed Action, the number of trains operating on the EJ&E rail line would increase, and the number of trains operating on the CN rail lines inside the EJ&E arc would generally decrease. The proposed increase in train traffic from existing levels would not occur immediately upon acquisition of the EJ&E rail line but, according to the Applicants, would increase incrementally as the Applicants construct capacity improvements to the EJ&E rail system that they view necessary and as they adjust their operating methods, including training employees and reorganizing day-to-day operations.

SEA used three independent techniques to evaluate the Applicants' Operating Plan. These techniques included a bottleneck analysis, the Line Occupancy Index, and a Rail Traffic Controller model. Conclusions from these analyses are as follows:

- SEA has concluded that the train traffic projections provided by the Applicants in their Operating Plan are reasonable projections to use as the best estimate of future train traffic on the affected EJ&E and CN rail line segments in 2015, and that these projections, while optimistic, present a reasonable basis on which to conduct the environmental impacts analysis.
- SEA has concluded that under the Proposed Action, the Applicants' Operating Plan the EJ&E rail line would be operated at or very near to capacity, and that there is little, if any, room for growth in the anticipated daily train volumes.

4.1.7 Effects of Proposed Action on Commuter Capacity and Passenger Rail Service

SEA evaluated the potential effects of the Proposed Action on existing and future passenger rail operations. The analyses included commuter passenger trains operated by Metra and Northern Indiana Commuter Transportation District (NICTD), and intercity passenger trains operated by Amtrak. Metra has plans to improve its operations within four corridors in the Chicago area. SEA considers the following Metra improvements to be reasonably foreseeable future conditions:

- Increased frequency on the UP-Northwest (UP-NW) corridor, which crosses the EJ&E rail line at Barrington.
- Increased frequency on the UP-West (UP-W) corridor, which crosses the EJ&E rail line at West Chicago.
- Implementation of Metra's STAR Line commuter service between milepost (MP) 7.0 and MP 42.0 on EJ&E's Western Division.
- Implementation of Metra's Southeast Service between Chicago and Crete, which crosses the EJ&E rail line at Chicago Heights.

4.1.7.1 Methodology

SEA identified three agencies that operate passenger rail service in the EJ&E service territory and have proposed new or expanded passenger rail service on or across rail line segments affected by the Proposed Action. SEA reviewed the existing commuter and intercity passenger rail schedules and met with representatives of the three agencies to discuss their existing passenger rail service as well as their proposed new and expanded passenger rail operations. These meetings also included discussions regarding how the Proposed Action would affect each agency's respective passenger train service, including existing and proposed service expansions.

SEA identified rail line segments where freight trains share the line with existing passenger trains, and where the shared line would experience an increase of one or more freight trains per day under the Proposed Action. SEA also identified locations where existing passenger rail operations cross at-grade with rail line segments that would experience an increase of one or more freight trains per day under the Proposed Action.

Unlike passenger train schedules, which are fixed and vary little, freight train schedules vary widely depending on a number of factors including the requirements of rail shippers and other variables. Additionally, freight train operations generally occur throughout each 24-hour period whereas passenger rail operations are mostly concentrated during morning and evening commuter rush hours. For affected rail line segments, SEA analyzed the potential effects of additional freight train traffic on current passenger train volumes and on new and expanded passenger train operations that are expected to be implemented in the reasonably foreseeable future. SEA considered the following factors that can affect rail operations:

- Number of main tracks
- Maximum authorized train speeds
- Method of train control
- Types of signaling systems used for train control
- Siding spacing and capacity
- Locations of crossover tracks and maximum speed of crossovers
- Passenger station locations
- Locations where tracks of railroads cross at-grade with another railroad
- Where different railroad lines junction or cross at-grade, whether the junction or crossing is interlocked, and which railroad controls the interlocking
- Times and frequency of freight service
- Times and frequency of passenger rail service
- Uniformity of freight train speeds, relative to passenger train speeds
- Implementation schedule of CREATE Program rail improvements that relate to affected rail line segments and operations

SEA examined the capacity of each affected rail line segment and each at-grade crossing. SEA then added the anticipated increases in freight train service that would result from the Proposed Action to determine the ability of the rail line segments and rail/rail at-grade crossings to accommodate these higher freight train volumes.

Current operating agreements between the Applicants and Metra, NICTD, and Amtrak preclude any reductions in passenger service; these agreements also include provisions for ensuring that the passenger service operators meet acceptable levels of on-time performance. Thus, any effect from increased freight operations due to the Proposed Action could only occur after the expiration of a current agreement and as a result of negotiations between the passenger service operator and the host railroad, namely either the Applicants or EJ&E.

4.1.7.2 No-Action Alternative

Under the No-Action Alternative, the Applicants would not acquire the EJ&E rail line and freight trains on CN and EJ&E rail line segments would continue to operate as they currently do. Under this alternative, Metra and NICTD commuter passenger trains that operate on CN rail line segments and commuter passenger trains that operate on rail lines that cross CN and EJ&E rail line segments would continue to operate as they currently do. This would include at-grade and grade separated rail/rail crossings. Commuter passenger rail service would continue to operate within the framework of current agreements with CN and various other freight carriers. Therefore, the No-Action Alternative would not affect existing commuter passenger rail service.

Metra has proposed new STAR Line service on rail line segments controlled by EJ&E and new southeast service that would cross the EJ&E rail line at Chicago Heights. In addition, Metra has proposed service expansions on the UP Northwest Line and the UP West Line that cross the EJ&E rail line at-grade in Barrington and West Chicago, respectively. Under the No-Action Alternative, discussions and advanced planning would continue between EJ&E and Metra. Therefore, the No-Action alternative would not affect the implementation of Metra's proposed new STAR Line service on EJ&E rail line segments, nor would it affect Metra's proposed service expansions on the UP Northwest and West lines.

NICTD has proposed new service between Chicago and Valparaiso, Indiana using rail line segments controlled by CN, including the line segment that crosses the EJ&E rail line at-grade in Griffith. NICTD has also proposed new service between Chicago and Lowell using a CSX rail line segment that would cross the CN rail line at Maynard near Munster. Under the No-Action Alternative, discussions and advanced planning would continue between CN, EJ&E, and NICTD. Therefore, the No-Action Alternative would not affect the implementation of NICTD's proposed new service to Valparaiso and Lowell.

Under the No-Action Alternative, Amtrak intercity passenger trains that operate on CN rail line segments and intercity passenger trains that operate on rail lines that cross CN and EJ&E line segments would continue to operate as they currently do. This would include at-grade and grade-separated rail crossings. Intercity passenger rail service would continue to operate within the framework of current agreements with CN and with other freight carriers. Therefore, the No-Action Alternative would not affect existing intercity passenger rail service.

4.1.7.3 Proposed Action

Following are descriptions of the current and proposed operations of the two commuter rail service operators that would be affected by the Proposed Action. SEA's analysis methods and results are next described, followed by summaries of potential impacts that the Proposed Action would have on commuter passenger rail service.

Existing Metra Service on Rail Line Segments Controlled by CN

Metra's existing Heritage Corridor service operates six weekday trains on the CN's Joliet and Freeport subdivisions between Joliet and 16th Street in Chicago. North of 16th Street, these Metra trains use trackage owned by Amtrak to enter Chicago Union Station. Table 4.1-3, below, lists the six CN rail line segments used by Metra Heritage Corridor trains, along with the changes in freight train traffic that would occur as a result of the Proposed Action. Ten daily Amtrak trains also use these rail line segments. As listed in Table 4.1-3, below, freight train traffic would decrease along four of these segments and would increase along two segments. The increases would be minor: less than one train per day. Because freight train traffic would either decrease or increase by less than one train per day, the Proposed Action would not affect existing Metra Heritage Corridor service.

Table 4.1-3. CN Line Segments with Metra Service				
CN Segment No.	Location	Current Daily CN Freight Trains	Proposed Daily CN Freight Trains	Current Daily Metra Trains
9	16th Street to Bridgeport	4.6	0.0	6 Heritage Corridor
14	Bridgeport to Lemoyne	2.1	0.0	6 Heritage Corridor
15	Lemoyne to Glenn Yard	2.1	2.0	6 Heritage Corridor
16	Glenn Yard to Argo	5.8	2.0	6 Heritage Corridor
17	Argo to Lemont	1.8	2.0	6 Heritage Corridor
18	Lemont to Joliet	1.8	2.0	6 Heritage Corridor
21	Tower B-12 to Schiller Park	19.3	2.0	22 North Central
22	Schiller Park to Leithton	19.1	2.0	22 North Central

Source:

Metra's existing North Central service operates 22 weekday trains on the CN's Waukesha Subdivision between Mundelein, Illinois and Tower B-12 in Franklin Park, Illinois. East of Tower B-12, these Metra trains use trackage owned by Canadian Pacific (CPR), Metra and Amtrak to enter Chicago Union Station. Table 4.1-3, above, lists the two CN rail line segments used by Metra North Central service trains, along with the changes in freight train traffic that would occur as a result of the Proposed Action. Because freight train traffic on CN line segments with Metra service would decrease, the Proposed Action would not affect existing Metra North Central service. Metra currently does not currently operate commuter trains on any EJ&E rail line segments.

Existing and Expanded Metra Service on Rail Lines That Cross Affected EJ&E Rail Line Segments

Metra trains currently operate on four railroad lines that cross the EJ&E rail line at-grade, as noted in Table 4.1-4, below. At these locations, known as interlockings, the tracks physically cross each other using rail/rail at-grade crossings. Trains on only one route can pass through these locations at any given time. Table 4.1-4, below, lists the existing EJ&E freight train traffic and the anticipated changes in freight train traffic that would occur as a result of the Proposed Action for the EJ&E rail line segment that crosses each Metra route. Table 4.1-4 also lists approximate existing freight train traffic on the routes crossed, as well as existing Metra traffic on the routes crossed.

Table 4.1-4. EJ&E And Metra Rail/Rail At-Grade Crossings							
Location	Railroad That EJ&E Crosses	Metra Route Crossed	Tracks	Current Daily Freight Trains	Proposed Daily Freight Trains	Current Weekday Metra Trains On Route Crossed	Current Daily Freight Trains On Route Crossed
Barrington	UP (Metra)	UP Northwest Line	UP 2 EJ&E 1	5.3	20.3	56	12
Spaulding	IC&E (Metra)	Milwaukee District West Line	IC&E 2 EJ&E 1	5.5	22.5	50	15
West Chicago	UP (Metra)	UP West Line	UP 3 EJ&E 1	10.7	31.6	52	35
Joliet-Rock Island Tower	Metra (CSXT, IAIS)	Rock Island District	Metra 2 EJ&E 2	6.4	28.3	47	10
Chicago Heights	UP (CSXT)	Proposed Southeast Service	UP 2 EJ&E 2	8.6	31.6	0	20

The railroad that controls a rail/rail at-grade crossing has the authority to determine which train movements will have priority over other movements. EJ&E currently controls the interlockings at Barrington and West Chicago with Union Pacific Railroad (UP) trackage crossing at the rail/rail at-grade crossing. EJ&E freight train movements during the weekday morning and afternoon rush hour periods of peak Metra operations are held to a minimum. During non-peak hours, EJ&E gives priority for Metra commuter trains to operate through the interlockings. UP also operates substantial freight train traffic at these locations, especially at West Chicago. If UP freight trains are delayed, this can have a cascading effect of delaying Metra trains operating within the same corridor. Close coordination is required between EJ&E and UP to ensure that passenger and freight train traffic efficiently coexist. SEA met with representatives of Metra on January 10, 2008. At this meeting, Metra expressed special concern that the increase in CN freight train numbers and train lengths could have the potential to cause major disruptions to both existing and proposed expanded Metra commuter train operations at the crossings with EJ&E at Barrington and West Chicago.

SEA calculated the approximate times that proposed CN, Metra commuter, and UP freight trains would occupy the interlockings at Barrington and West Chicago. These times were calculated by considering the amount of time that each type of train could be expected to occupy the interlocking, thus preventing train movement on the intersecting route. These times for proposed CN freight trains on the EJ&E rail line were calculated to include the transit times for a CN freight train from the closest available location where that CN freight train could wait for an opportunity to cross the diamond, while remaining clear of any highway/rail at-grade crossing. For the UP and Metra trains that operate on two tracks at Barrington and three tracks at West Chicago, the analysis assumed that only one UP or Metra train would occupy the crossing at any given time.

SEA calculated occupancy times using 20 minutes for each proposed CN freight train, 5 minutes for each Metra train, and 10 minutes for each UP freight train. SEA considers these occupancy times to be conservative, resulting in an analysis that provides a reasonable estimate of train occupancy.

As shown in Table 4.1-5, below, the total occupancy time for all trains at the Barrington interlocking under the Proposed Action would be 13.3 hours in a 24-hour period. Therefore, CN would have approximately 10.7 hours per 24-hour period in excess of the calculated occupancy time of 6.7 hours to run the proposed CN freight trains at this location. Metra is in the process of securing federal funding through the FTA New Starts process to implement significant capital improvements on the UP-Northwest Line. SEA considers potential expansion of Metra's UP-Northwest Line service to be a reasonably foreseeable future action. When implemented, these improvements would allow the number of weekday Metra trains at Barrington to increase from the current 56 to approximately 66 per weekday. These 10 additional Metra trains would occupy the Barrington interlocking for an additional 0.8 hours per 24-hour period. These additional Metra trains would reduce the excess time available to run the proposed CN freight trains from 10.7 hours to 9.9 hours per 24-hour period.

Table 4.1-5. Train Occupancy Times For EJ&E And Metra Rail/Rail At-Grade Crossings (24-Hour Period)							
Location	Proposed CN Freight Trains	Total Time Occupied For Proposed CN Freight Trains (Hours)	Current Weekday Metra Trains On Route Crossed	Total Time Occupied For Current Weekday Metra Trains (Hours)	Current Freight Trains On Route Crossed	Total Time Occupied For Current Freight Trains On Route Crossed (Hours)	Total Time Crossing Is Occupied In 24-Hour Period (Hours)
Barrington	20.3	6.7	56	4.6	12	2.0	13.3
Spaulding	22.5	7.4	50	4.2	15	2.5	14.1
West Chicago	31.6	10.4	52	4.3	35	5.8	20.6
Joliet-Rock Island Tower	28.3	9.3	47	3.9	10	1.7	14.9

The total occupancy time for all trains at the West Chicago interlocking is 20.6 hours in a 24-hour period (see Table 4.1-5, above). Therefore, CN would have approximately 3.4 hours per 24-hour period in excess of the calculated occupancy time of 10.4 hours to run the CN freight trains under the Proposed Action at this location. Metra is in the process of securing federal funding through the FTA New Starts process to implement major capital improvements on the UP-West Line. SEA considers potential expansion of Metra's UP-West Line service to be a reasonably foreseeable future action. When implemented, these improvements would allow the number of weekday Metra trains at West Chicago to increase from the current 52 to approximately 67. These 15 additional Metra trains would occupy the West Chicago interlocking for an additional 1.3 hours per 24-hour period. These additional Metra trains would reduce the excess time available to run the proposed CN freight trains from 3.4 hours to 2.1 hours per 24-hour period.

At the Spaulding interlocking, Metra trains operate on trackage owned by CPR, which controls the interlocking at Spaulding. As shown in Table 4.1-5, above, the total occupancy time for all trains at the Spaulding interlocking is 14.1 hours in a 24-hour period. Therefore, CN would have approximately 9.9 hours per 24-hour period in excess of the calculated occupancy time of 7.4 hours to run the CN freight trains at this location under the Proposed Action.

At the Joliet-Rock Island Tower interlocking, Metra trains operate on Metra-owned trackage and Metra controls the interlocking. As shown in Table 4.1-5, above, the total occupancy time for all trains at the Joliet-Rock Island Tower Interlocking is 14.9 hours in a 24-hour period. Therefore, CN would have approximately 9.1 hours per 24-hour period in excess of the calculated occupancy time of the 9.3 hours to run the CN freight trains at this location under the Proposed Action.

During the January 10, 2008, meeting between SEA and Metra, Metra did not note any concerns that the increased CN freight trains proposed as part of the Proposed Action would have the potential to cause disruptions to existing Metra commuter train operations at the Spaulding or Joliet-Rock Island tower interlockings. Metra does not have any planned service expansions for the Metra routes at these two locations.

In their proposed Operating Plan and in subsequent documentation, the Applicants state that they would work with Metra and the host freight operators to coordinate operations and adjust operating windows so that the needs of all users can be met. The proposed Operating Plan notes CN's longstanding working relationship with Metra and CN's willingness to build on that relationship to

further Metra's goal of extended commuter train service while at the same time accommodating CN's need for efficient freight train movements.

Based on the results of the analysis described above, SEA concluded that it would be physically possible for CN to operate the increased train numbers proposed as part of the Proposed Action without adversely effecting existing and proposed Metra trains at the four locations that were evaluated. SEA has determined that CN and Metra would need to work together closely and coordinate to ensure the efficiency of increased CN freight trains while maintaining the high level of on-time performance for existing and proposed expanded Metra trains at these four locations.

Proposed Metra Service on Affected EJ&E Rail Line Segments

As discussed in Section 3.2.1, Metra has extensively evaluated the feasibility of its proposed STAR Line, an outer circumferential commuter rail route that would use major portions of EJ&E corridor to provide suburb-to-suburb service and connect the spokes of the Metra system. The STAR Line is envisioned to ultimately operate on three different segments of the EJ&E rail line. Metra has completed a number of planning studies relative to initiation of the STAR Line. Metra has already received federal funding from the FTA for preliminary activities and for conducting an Alternatives Analysis. Metra is currently working on an Alternatives Analysis that will be completed and submitted to the FTA in late 2008. Once the Alternatives Analysis is submitted, Metra envisions that the project will progress toward a Full Funding Grant Agreement from the FTA. This would be followed by completion of the required environmental documents and then the ultimate design and implementation of the initial segments of the proposed STAR Line. SEA considers potential implementation of Metra STAR Line to be a reasonably foreseeable future action.

Initial STAR Line service is proposed to operate on the Outer Circumferential Segment (OCS) which would include the EJ&E rail line between Hoffman Estates (at a location known as Prairie Stone) at about EJ&E MP W-42.3 near the Northwest Tollway (I-90) underpass on Line Segment EJE-13, and Joliet at about EJ&E MP W-6.1 just west of the Division Street road crossing on Line Segment EJE-9. Initial STAR Line Service would also include the Northwest Corridor Segment (NWCS). The NWCS segment would begin at a new connection with the EJ&E line at Hoffman Estates to new trackage within the Northwest Tollway right-of-way that would extend to Mannheim Road. Just east of Mannheim Road, the NWCS would use the CN Line Segments CN-21 and CN-20 to a new station at Chicago O'Hare International Airport.

Metra has not identified initial total numbers of weekday proposed STAR Line trains. Metra has proposed 30 minute peak hour and 60 minute non-peak hour headways on the OCS segment that would operate on the EJ&E rail line. Metra has proposed 15 minute peak hour and 30 minute non-peak hour headways on the NWCS.

Metra has proposed that initial STAR Line service would use diesel multiple unit (DMU) rolling stock. DMUs are diesel-powered self-contained passenger train cars that can operate as a single powered unit or various combinations of powered and unpowered trailing units. For small commuter passenger loadings, DMUs have several advantages over locomotive-drawn trains, including faster acceleration, increased fuel economy, lower overall operating costs, and the flexibility of operating powered and unpowered units. The STAR Line service is planned to be a mixed-use type of service where freight and passenger trains operate on the same tracks under the control of a train dispatcher. This method of coexisting, mixed-use operations has been successfully used for a number of years on shared ROW for all other diesel-operated Metra lines in the Chicago area. Because the proposed STAR Line passenger trains would mingle with freight trains, the DMUs, or any other type of equipment, would need to meet FRA car-strength standards (usually referred to as "FRA compliant.")

Metra has identified the proposed capital improvements that would be necessary in order to implement Metra's initial segment of STAR Line service on the OCS. The improvements identified

were based on an initial capacity assessment of the existing EJ&E rail line portion of the OCS. This initial assessment considers only the EJ&E freight trains currently operating; increases in freight trains proposed as part of the Proposed Action were not considered in the Metra Study because it predates the Application. The Metra Study acknowledges that a detailed capacity study would need to be completed prior to implementation. A computer-based study of this type would model the existing rail corridor with freight trains and proposed passenger trains. This analysis would identify the locations and extent of capital improvements that would be needed to safely and efficiently handle both freight and passenger trains. Typically, this analysis would be performed by the sponsoring agency (Metra), but the host railroad would also be closely involved and would have to provide final approval of any analysis done by Metra. Hence, if the Proposed Action is approved and implemented, Metra and the Applicants would ultimately have to agree to jointly implement a program of capital improvements that would include the cost sharing responsibility for each party.

The Metra Study identified the following preliminary listing of capital improvements that would be needed on the EJ&E rail line prior to initiating the OCS portion of the STAR Line:

- Connect existing sidings to create two mainline tracks between Joliet (EJ&E MP W-6.1) and Eola (MP EJ&E MP W-20.1) with associated crossovers
- Construct a second mainline track between Eola (EJ&E MP W-20.1) to a point just south of West Chicago (EJ&E MP W-28.0)
- Upgrade the existing mainline track between Joliet and Hoffman Estates
- Construct a new siding between EJ&E MP W-37.6 and MP W-39.1
- Install a Centralized Traffic Control signaling system with bi-directional signaling
- Upgrade existing at-grade crossing protection devices
- Construct nine passenger stations with low-level platforms
- Construct a maintenance facility at Hoffman Estates

Table 4.1-6, below, lists the anticipated changes in freight train traffic for the EJ&E rail line segments that Metra has proposed to use for initial STAR Line service. In the proposed Operating Plan, CN proposes new construction on some proposed STAR Line segments to facilitate movements of increased freight train traffic. CN also proposes to create a second mainline track by connecting the existing East Siding, Normantown Siding and Walker Siding. This would create a segment with two mainline tracks between East Siding near Eola at EJ&E MP W-21.1 and Walker at EJ&E MP W-11.0. CN believes that the addition freight train traffic proposed as part of the Proposed Action would require two mainline tracks along this segment. The Proposed Action addresses only CN train traffic changes; it does not consider implementation of Metra STAR Line commuter trains.

Table 4.1-6. Proposed CN Train Traffic Changes On EJ&E Initial STAR Line Segments

EJ&E Segment No.	Location	Current Daily Freight Trains	Proposed Daily Freight Trains
14	Leithton to Spaulding	5.3	20.3
13	Spaulding to Munger	5.5	22.5
12	Munger to West Chicago	4.4	23.4
11	West Chicago to East Siding	10.7	31.6
10	East Siding to Walker	15.7	39.5
9	Walker to Bridge Junction	18.5	42.3

Metra has also identified two additional EJ&E rail line segments for future expansion of STAR Line service. The STAR Line North segment would connect with the initial STAR Line service at Hoffman Estates and provide service north to Waukegan. The STAR Line East segment would connect with the initial STAR Line service at Joliet and provide service east to Lynwood. The freight

train traffic would increase as part of the Proposed Action on many of these EJ&E rail line segments. If the Proposed Action is approved, future planning for these two STAR Line segments would need to consider the needs of Metra and CN.

Metra has expressed special concern that the increases in CN freight train traffic and train lengths as a result of the Proposed Action would adversely affect Metra's implementation schedule and infrastructure costs for initial STAR Line service between Hoffman Estates and Joliet. Metra and CN have discussed this issue since the Application was filed, but to date no formal agreement has been reached between Metra and CN regarding the STAR Line. CN has expressed a willingness to work with Metra to explore alternatives for the proposed STAR Line service. CN has cited the Metra Heritage Corridor service and Metra North Central service on existing CN lines as examples of the cooperative effort that Metra can expect from CN in working toward STAR Line implementation (Applicants 2007a).

Full funding for implementation of Metra STAR Line service has not yet been secured. Because the Proposed Action would not preclude the implementation of the STAR line service, and Metra has a history of Metra working collaboratively with the freight railroads, including CN, SEA has concluded that the Proposed Action would not adversely affect potential implementation of STAR Line Service on the EJ&E rail line.

Proposed Metra Service on Rail Lines That Cross Affected EJ&E Rail Line Segments

Metra also has performed studies related to initiation of a new commuter rail service—the South East Service—that is proposed to operate on the UP and CSXT corridor between Union Station and Crete in Will County. This service would provide a viable transit alternative for residents of southern Will County. Initial service is proposed to consist of six inbound and six outbound trips per weekday. Metra is in the process of securing Federal funding through the FTA New Starts process to implement South East Service. SEA considers potential implementation of Metra South East Service to be a reasonably foreseeable future action.

The proposed South East Service would cross EJ&E rail line segment number EJE-5A at MP E-25.2 in Chicago Heights. EJ&E currently controls the interlocking at Chicago Heights. Table 4.1-7, below, lists the existing EJ&E freight train traffic and the anticipated changes in CN freight train traffic at Chicago Heights that would occur as a result of the Proposed Action.

Table 4.1-7. Train Occupancy Times for EJ&E And Proposed Metra SouthEast Service – Rail/Rail At-Grade Crossings (24-Hour Period)

Location	Proposed CN Freight Trains	Total Time Occupied for Proposed CN Freight Trains (Hours)	Proposed Weekday Metra Trains on Route Crossed	Total Time Occupied for Proposed Weekday Metra Trains (Hours)	Current Freight Trains on Route Crossed	Total Time Occupied for Current Freight Trains on UP Route Crossed (Hours)	Total Time Crossing is Occupied in 24-Hour Period (Hours)
Chicago Heights	31.6	10.4	12	1.0	20	3.3	14.7

During the January 10, 2008, meeting between SEA and Metra, Metra expressed concern that the increases in CN freight train traffic and train lengths under the Proposed Action could potentially disrupt the proposed Metra South East Service commuter train operations at the Chicago Heights interlocking.

To assess this issue, SEA calculated the approximate times that proposed CN freight trains, new Metra South East Service trains, and UP freight trains would occupy the Chicago Heights interlocking. These times were calculated by considering the amount of time that each type of train would be expected to occupy the interlocking, thus preventing train movement on the intersecting route. These times for proposed CN freight trains on the EJ&E lines were calculated to include the transit times from the closest available safe parking spot for a CN train clear of any highway/rail at-grade crossings. The analysis assumed that only one train would occupy the crossing at any given time. Occupancy times were calculated using 20 minutes for each proposed CN freight train, 5 minutes for each proposed Metra train, and 10 minutes for each UP freight train.

As shown in Table 4.1-7, above, the total occupancy time for all trains, including proposed Metra trains, at the Chicago Heights interlocking would be 14.7 hours in a 24-hour period. Therefore, CN would have approximately 9.3 hours per 24-hour period in excess of the calculated occupancy time of 10.4 hours to run the proposed CN freight trains at this location under the Proposed Action.

Based on the results of the analysis described above, SEA concluded that it would be physically possible for CN to operate the increased train traffic proposed as part of the Proposed Action without adversely affecting proposed Metra South East Service trains at the Chicago Heights interlocking. At the same time, SEA determined that it would be important for CN and Metra to work together closely and coordinate to ensure the efficiency of increased CN freight trains while maintaining a high level of on-time performance for proposed Metra South East Service trains at this location.

Existing NICTD Service Affected by the Proposed Action

NICTD operates the South Shore Line electrified commuter passenger train service between South Bend and Randolph Street Station in Chicago. NICTD operates 37 trains per weekday on the South Shore Line. NICTD trains operate on NICTD right-of-way between South Bend and a rail junction point near the intersection of Kensington Avenue and South Cottage Grove Avenue in Chicago. NICTD trains cross the CN Chicago Subdivision using at-grade crossing rail/rail at-grade crossings and then enter and use the Metra Electric District route to Randolph Street Station. CN controls the Kensington interlocking. Applicants have stated that, under the Proposed Action, CN freight train traffic would decrease from 8.4 to 2.0 trains per day at the Kensington interlocking.

NICTD and CN have been working collaboratively on modifications to the Kensington interlocking that would replace the existing rail/rail at-grade crossings with a series of crossovers to allow NICTD trains to cross the CN tracks. SEA met with representatives of NICTD on January 18, 2008. At this meeting, NICTD expressed concern that that the Proposed Action could adversely affect the implementation of the modifications at the Kensington interlocking. However, CN has expressed a willingness to continue working toward implementation of improvements at the Kensington interlocking.

NICTD trains do not cross any other EJ&E or CN rail line segments at-grade, nor do NICTD trains operate on the EJ&E rail line or on any lines controlled by the Applicants. Because train traffic would decrease at the Kensington interlocking and Applicants are willing to work with NICID to implement improvements of the interlocking, SEA concluded that the Proposed Action would not likely adversely affect existing NICTD commuter trains.

Proposed NICTD Service Affected by the Proposed Action

NICTD is also considering two new West Lake Corridor commuter rail services between Chicago and communities in northwest Indiana. Trains for both proposed services would use existing Metra and NICTD trackage through Kensington to Hammond. At Hammond, the trains would enter a former rail corridor that is currently inactive and controlled by NICTD. This corridor would be restored for active NICTD service from Hammond south to Maynard, near Munster. At Maynard, NICTD trains

operating between Chicago and Valparaiso would use the CN's South Bend Subdivision between Munster and Valparaiso; this service would cross the EJ&E rail line at Griffith. At Maynard, service between Chicago and Lowell would use CSXT trackage between Munster and Lowell. This service would cross the CN's South Bend Subdivision at Maynard and the EJ&E rail line at Dyer.

SEA met with representatives of NICTD to discuss concerns that the increases in CN freight train traffic and train lengths as a result of the Proposed Action could adversely affect NICTD's implementation schedule and infrastructure costs for the initial West Lake Corridor commuter service. SEA learned that NICTD has prepared two planning documents relative to these proposed West Lake Corridor commuter services. These documents identify purpose and need for the proposed services and describe both rail and bus alternatives for the proposed services. To date, however, NICTD has not committed to the rail alternative, nor have any funding sources been identified to further planning and implementation of the proposed services. No agreements have been negotiated between NICTD and CN for the proposed services. Based on these factors, SEA determined that potential implementation of NICTD West Lake Corridor commuter service is not a reasonably foreseeable future action. Therefore, the potential effects of this commuter service is not assessed in this Draft EIS.

4.1.8 Effects on Intercity Passenger Rail Service

4.1.8.1 Existing Amtrak Service on Rail Line Segments Controlled by the Applicants

Amtrak currently operates six daily trains on CN's Chicago Subdivision between Matteson and 16th Street in Chicago. Table 4.1-8, below, lists reductions in freight train traffic for CN rail line segments as a result of the Proposed Action. These segments collectively extend between Harvey on the CN Chicago Subdivision and Bridgeport on the CN Freeport Subdivision. The traffic counts on four of these line segments would be reduced to zero (0) freight trains as a result of the Proposed Action. Because traffic counts would decrease to zero freight trains on CN rail line segment No. 8, under the Proposed Action CN would cease freight train operations on the segment that includes the Air Line.

Table 4.1-8. CN Rail Line Segments With Amtrak Service

CN Segment No.	Location	Current Daily CN Freight Trains	Proposed Daily CN Freight Trains	Current Daily Amtrak Trains
1	Matteson to Markham	12.6	10.0	6
2	Markham to Harvey	21.1	2.0	6
3	Harvey to Riverdale	8.4	2.0	6
4	Riverdale to Wildwood	8.4	2.0	6
5	Wildwood to Kensington	8.4	2.0	6
6	Kensington to 94th St.	8.4	2.0	6
7	94th St. to 67th St.	6.4	0	6
8	67th. St to 16th St.	6.4	0	6
9	16th St. to Bridgeport	4.6	0	6
14	Bridgeport to Lemoyne	2.1	0	10
15	Lemoyne to Glenn Yard	2.1	2.0	10
16	Glenn Yard to Argo	5.8	2.0	10
17	Argo to Lemont	1.8	2.0	10
18	Lemont to Joliet	1.8	2.0	10

SEA met with representatives of Amtrak, which expressed concern that the removal of freight trains from the CN Chicago Subdivision, specifically from the Air Line, could adversely affect existing Amtrak operations on these line segments. Amtrak has stated that CN's intent to cease freight train operation on the Air Line as a result of the Proposed Action could threaten its ability to operate the six daily Amtrak trains that use this route.

The CREATE Program has identified a potential alternative to the use of the Air Line—the Grand Crossing Route, which would allow Amtrak and CN trains that use the Air Line to use a new route that would be created by building a new connection track between the CN and NS rail lines that intersect at Grand Crossing near 75th Street in Chicago. Amtrak trains would move from CN to NS at this location to proceed north and head directly in to Union Station, without the reverse movement required when using the Air Line route. Thus, this new connection would ultimately remove both CN and Amtrak trains from 75th Street North, including the Air Line. Removal of train traffic from this corridor and the ultimate redevelopment in downtown Chicago that could occur after the removal of the Air Line has long been a primary goal of the CREATE Program. Amtrak's major concern is that, should the Proposed Action occur, CN would have little motivation to participate in planning and potential funding for the Grand Crossing route since CN freight trains would stop using the Air Line. Amtrak would then become the major reason for the Grand Crossing route to occur.

The Air Line is owned jointly by CN (50 percent), BNSF (25 percent), and UP (25 percent). As such, CN could not unilaterally abandon the Air Line without input from BNSF and UP, as well as Amtrak. In addition, any abandonment would require Board approval and no such approval has been requested, nor is it under consideration in this Proposed Action. The Applicants' Operating Plan acknowledges that should CN freight train operations on the Air Line cease under the Proposed Action, Amtrak would become the only regular user. In a letter to Amtrak dated March 10, 2008, CN has agreed to allow Amtrak to continue to operate on the Air Line indefinitely. CN has also agreed to maintain the Air Line at its current operating condition. The only traffic would be the six daily Amtrak trains. However, CN has agreed to cap the costs to Amtrak for CN to maintain the line at its current level, with the costs to be adjusted only for inflation, until such time that a viable alternative for Amtrak trains can be found. No formal agreement has been reached to date between CN and Amtrak to keep the Air Line in service for any definite period of time.

Freight train traffic would decrease on the CN Chicago Subdivision segments upon which Amtrak currently operates. CN has specifically agreed to keep these subdivision segments in service until such time that an alternative Amtrak routing can be implemented. Therefore, SEA concluded that the Proposed Action would not adversely affect existing Amtrak service that operates on the CN Chicago Subdivision.

Amtrak also currently operates 10 daily trains on CN's Joliet and Freeport subdivisions between Joliet and 16th Street in Chicago. These trains include eight Lincoln Service trains and two Texas Eagle Trains. Table 4.1-8, above, lists the five CN rail line segments used by these Amtrak trains with the changes in freight train traffic that would occur as a result of the Proposed Action. Six weekday Metra Heritage Corridor service trains also use these rail line segments. Three of these segments would experience decreases in freight train traffic, and two segments would experience minor increases in freight train traffic of less than one train per day. Because freight train traffic on these five segments would either decrease or marginally increase by one or more freight trains per day, SEA concluded that the Proposed Action would not adversely affect existing Amtrak service that operates on the CN Joliet Subdivision.

Amtrak currently does not operate intercity passenger trains on any EJ&E rail line segments. Amtrak does not propose to initiate new service on the EJ&E arc or on any other lines controlled by the CN in the reasonably foreseeable future.

4.1.8.2 Existing Amtrak Service on Rail Lines That Cross Affected EJ&E Rail Line Segments

The Amtrak Hoosier State service operates four round-trip trains per week and the Amtrak Cardinal service operates three round-trip trains per week. These trains collectively number 14 trains per week for an average of two Amtrak train movements per day on the CN Elsdon Subdivision between Thornton Junction and Maynard, near Munster. The Applicants have stated that CN freight train traffic would decrease from 22.1 to 2.9 trains per day on this subdivision segment. At Maynard, these Amtrak trains enter the CSXT corridor that crosses the EJ&E via at-grade crossing rail/rail at-grade crossings in Dyer, Indiana. Freight train traffic at Dyer would increase from 10.2 to 34.2 trains per day under the Proposed Action. Dyer is an automatic interlocking where the presence of a train on one route allows that train to proceed if the intersecting route is clear of another train. That is, neither railroad controls the interlocking through direct human intervention: train movements are controlled on a first-come, first-served basis.

SEA calculated the approximate times that proposed CN freight trains, CSX freight trains, and Amtrak trains would occupy the Dyer interlocking. These times were calculated by considering the amount of time that each type of train could be expected to occupy the interlocking, thus preventing train movement on the intersecting route. These times for proposed CN freight trains on the EJ&E rail line were calculated to include the transit times from the closest available safe parking spot clear of any highway/rail at-grade crossings. SEA assumed that only one train would occupy the crossing at any given time. Occupancy times were calculated using 20 minutes for each proposed CN freight train, 5 minutes for each Amtrak train, and 10 minutes for each CSXT freight train.

As shown in Table 4.1-9, below, the total occupancy time for all trains, including Amtrak trains, at the Dyer interlocking would be 13.3 hours in a 24-hour period. Therefore, CN would have approximately 10.7 hours per 24-hour period in excess of the calculated occupancy time of 13.3 hours to run the proposed CN freight trains at this location.

Table 4.1-9. Train Occupancy Times For EJ&E And Amtrak Rail/Rail At-Grade Crossings (24-Hour Period)

Location	Proposed CN Freight Trains	Total Time Occupied for Proposed CN Freight Trains (Hours)	Average Daily Amtrak Trains on Route Crossed	Total Time Occupied for Proposed Weekday Metra Trains (Hours)	Current Freight Trains on Route Crossed	Total Time Occupied for Current Freight Trains on UP Route Crossed (Hours)	Total Time Crossing is Occupied in 24-Hour Period (Hours)
Dyer	34.2	11.4	2	0.2	10	1.7	13.3

Based on the results of the analysis described above, SEA concluded that it would be physically possible for CN to operate the increased train numbers proposed as part of the Proposed Action without adversely affecting Amtrak trains at the Dyer interlocking.

Amtrak currently operates 16 daily trains on the CP corridor that cross the EJ&E rail line via at-grade crossing rail/rail at-grade crossings in Rondout. These include 14 daily Hiawatha Service trains and the two daily Empire Builder trains. Because the Proposed Action would not increase freight train traffic at Rondout, SEA concluded that the Proposed Action would have no impact at this location.

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