

Elgin O'Hare - West Bypass: Alternatives Development and Evaluation – Freight Rail Impacts

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Introduction

The Chicago region is a major junction for transcontinental freight systems, and a critical element of the continental land bridge connecting the Pacific and Atlantic coasts. Freight movement plays a significant role in the economic viability of the region and to local industries. Within the Elgin O'Hare – West Bypass (EO-WB) study area, eastern and western railroads meet and transfer loads; which is evident by the volume and frequency of freight traffic in the area. This region is also the location of many intermodal facilities where trucks collect to deliver or receive and distribute freight containers. Retaining the region's preeminence as the nation's rail hub is important to the Chicago area's economy. Failure to provide for the necessary facilities may, over the long term, result in railroads relocating many of their operations to other metro centers that can accommodate their needs. It is therefore critical that potential impacts to freight rail movement be minimized where possible.

There is an extensive freight rail infrastructure within the EO-WB study area with three major freight operators; the Canadian Pacific Railway (CPRR), Canadian National (CN) and the Union Pacific Railroad (UPRR). Also, the Northeastern Illinois Regional Commuter Railroad Corporation (NIRCRC), most commonly known as Metra, operates shared service with freight carriers along the Milwaukee District West (MDW) track. Whereas two new freeway corridors considered with the EO-WB study (the West Bypass and the IL 83 Freeway) are located in proximity to this freight infrastructure, a focused analysis of potential freight rail impacts was necessary.

This memorandum documents the analysis of potential freight rail impacts related to the North and South Connection Options for the West Bypass and the North Connection Options for the IL 83 Freeway corridors and includes a description of the freight rail infrastructure within each area of interest, analysis procedures, and evaluation findings. Results of this freight rail impact analysis were used to support the overall evaluation of design viability and potential impacts of the North and South Connection Options.

Existing Freight Rail Infrastructure

Within the study area, eastern and western railroads meet and transfer loads, with a large concentration of freight facilities located near O'Hare International Airport (O'Hare Airport). The area accommodates a high volume and frequency of freight traffic and is also the location

of many intermodal facilities, where trucks collect to deliver, receive, and distribute freight containers. Exhibit 1 illustrates the freight rail system with the study area and Exhibits 2 and 3 illustrate freight rail features within the North and South Connection areas as described below:

Mainline Rail Infrastructure

There are three Freight Rail Carriers - CPRR, CN and UPRR that operate within the North and South Connections. Freight Rail mainline and spur track infrastructure features include:

- UPRR mainline double track located adjacent to the 300' transportation corridor east of York Road on the west side of O'Hare Airport
- A north-south mainline double track located on the eastside of O'Hare Airport owned and operated by the CN
- CP mainline double track located adjacent to the 300' transportation corridor east of York Road on the west side of O'Hare Airport
- An east-west mainline double track Metra owned and CPRR operated located within the south connection area
- A north-south mainline double track owned and operated by the UPRR that crosses the CPRR Bensenville Yard
- Segments of the Northeastern Illinois Regional Commuter Railroad Corporation (NIRCRC) - Metra track is used by freight carriers

Rail Spurs

- Spur tracks service local industries along Elmhurst Road/York Road, IL 83 and south of the Bensenville Yard

Freight Rail Yards

Two freight rail yards with intermodal operations are located in the south connection area at CPRR Bensenville Yard and the UPRR Proviso North Yard. Within the Bensenville Yard there are three geographic areas that have unique and important freight operational characteristics:

West Bensenville Yard Area:

- West Yard - switches and classifies local freight
- Freight turn-over level less than that of the East Yard Area
- Houses one active railcar turntable
- Three rail carriers own trackage in area (CPRR, relocated UPRR, and Metra)
- B-17 Interlocking which facilitates train movements in and out of the yard and onto the mainline
- CPRR maintenance area
- Leased container trailer area

Central Bensenville Yard Area:

- Hump Lead, Departure Track, Arrival Track – provide access to the yards located in the east area
- Hump Tower – houses command operations for Bensenville Yard car classification operations
- Yard Office – houses regional CPRR operations employees
- Car Repair Shop & Yard – allows the CPRR to perform light maintenance and running repairs to rail cars
- UPRR – Milwaukee Subdivision Line provides a main north-south railroad from UPRR’s Proviso Yard to Milwaukee, WI
- UPRR Track is elevated over the Bensenville Freight Yard and is oriented in a north-south direction

East Bensenville Yard Area

- “C” Yard – 34 track classification yard
- “D” Yard – Departure yard
- “A” Yard – Arrival yard
- “F” Yard – Marshalling yard
- Intermodal Facility adjacent to and south of “A” Yard
- Center of activity for the Bensenville Freight Yard
- Location of the majority of the Freight Yard storage tracks

Freight Rail Impact Analysis Procedures

Freight rail impacts were investigated in the vicinity of the following connection options: the two IL 83 Freeway North Connection Options (Options A and B), the five West Bypass North Connection Options (Options A through E), and the seven West Bypass South Connection Options (Options A through G). The evaluation began with a brainstorming effort to identify critical freight rail technical issues that could impede or impair freight movement and operations within the study area and throughout the region. These elements were then separated into five freight rail impact categories shown in Table 1.

TABLE 1

Freight Rail Impact Categories

Category	Description
Freight Operations Impacts	This refers to the impact to freight operations (e.g. the ability to conduct day-to-day operations for the movement of freight goods, movement within freight yards, for commuter rail service using freight tracks). This also includes items that may impede operations due to changes required at critical freight operating components such as ladder tracks, lead track, switches, interlocks etc.).
Construction Staging Impacts	This refers to impacts related to freight operations in preparation for and during construction (e.g. the ability to conduct day-to-day operations for the movement of freight goods, within freight yards, for commuter rail service using freight tracks).

TABLE 1

Freight Rail Impact Categories

Category	Description
Design Issues	This refers to impacts to freight rail due to roadway design requirements.
Freight Yard Impacts	This refers to impacts to freight yard infrastructure (e.g. the ability to conduct day-to-day operations due to changes of freight yard elements such as storage tracks, spur track, bypass tracks, access to offices, maintenance shops, and impacts due to a reduction in open areas of yard).
Economic Impacts to Freight Industry	This refers to impact to freight companies (e.g. the ability to conduct business as usual, the ability to expand freight movement both economically and physically

Each connection option was analyzed individually at each potential rail conflict location on the basis of the impact categories identified in Table 1. Subsequently, rail impacts along the entire length of the connection option were reviewed to assess the compounded effects of all the identified impacts. Both options for a IL 83 Freeway Connection would require minor track work and signal modifications for an industrial spur track and were not differentiators because each option would result in similar impacts. The range of options for the West Bypass North Connection raised similar freight rail issues across the range of connection options and were, in general, not differentiators. For the West Bypass South Connection Options, analyses revealed a wide range of freight rail impacts across the seven options considered. Therefore, a ranking system was used to compare the relative impacts of the connection options for each evaluation category, ranging from 1 (least impact) to 7 (most impact). The total composite score of each connection option was then calculated as the sum of the rankings for each category. Thus, connection options with higher total composite score would result in the greatest impacts to freight rail infrastructure and operations.

Freight Rail Impact Analysis Results

North Connection Options – IL 83 Freeway and West Bypass

There are no mainline freight rail tracks located within the corridors considered for the IL 83 Freeway North Connection (Options A and B). However, both options would result in comparable impacts to an industrial spur track which services the Elk Grove Village Centex Industrial Park. Minor track and signal modifications for an industrial spur track would be required for both Options A and B. Thus, the freight rail impacts evaluation indicated that there are no major freight rail impacts associated with the IL 83 Freeway connection options.

There are several freight rail facilities along the corridors considered for the West Bypass North Connection (Options A, B, C, D, and E): two double track freight rail mainlines (Canadian Pacific – Bryn Mawr Line and Union Pacific – Milwaukee Subdivision Line); one control interlocking – Bryn Mawr; and one small holding yard (UPRR – Bryn Mawr Yard). All connection options would impact the mainline infrastructure as well as freight operations associated with the construction of the proposed West Bypass tunnel structure under the CRR and UPRR mainlines and the UPRR Yard. Although the orientation of the tunnel would vary

between the options, the difference is minor and is not an obvious differentiator among the five options. In addition to the mainline impacts, a number of spur tracks will be impacted by the West Bypass Connection Options, with comparable impacts. Whereas the proposed West Bypass could result in freight rail impacts related to the proposed tunnel and spur track operations, impacts across the connection options would be comparable for the five West Bypass North Connection Options.

South Connection Options – West Bypass

There is extensive freight rail infrastructure within the West Bypass South Connection (Options A, B, C, D, E, F and G). This includes an east-west double track mainline (owned by Metra and operated by the CPRR), a north-south double track (owned and operated by the UPRR), and the CPRR Bensenville Yard Facility. There is also a substantial amount of industrial freight service to local industries south of the Bensenville Yard area. All seven connection options impact the freight rail infrastructure and operations to varying degrees.

Starting from the north end of the West Bypass South Connection, all seven options will require a large tunnel under the relocated UPRR tracks, the Milwaukee District/West Line (Metra), the CPRR lead tracks for the Bensenville rail yard, and the B-17 Interlocking. The complexity of this crossing is high and maintenance of railroad operations thru the B-17 Interlocking directly over the proposed tunnel is critical for all rail operators. However, the tunnel configuration and the impacts on the B-17 Interlocking are the same for all seven options.

Proceeding southeast from the proposed West Bypass tunnel, each connection option would follow a different corridor to a proposed connection with I-294. As noted previously, the relative freight rail impacts of each connection option were compared using a ranking of 1 (least impact) to 7 (most impact) for each evaluation category considered. Table 2 lists the relative rankings and composite scores for the South Connection Options. A summary of the relative freight rail impacts for the West Bypass South Connection Options is also included below.

TABLE 2
South Connection Impact Summary with Respect to Freight Rail

Impacts to Freight Rail	South Connection Alignment Options						
	A	B	C	D	E	F	G
Freight Operational Impacts	1	3	4	2	5	7	6
Construction Staging Impacts	1	3	4	2	5	7	6
Design Issues	1	3	4	2	5	7	6
Freight Yard Impacts	1	4	3	2	6	7	5
Economic Impacts to Freight Companies	1	4	3	2	6	7	5
Overall Composite Score	5	17	18	10	27	35	28

1 = least impacts

7 = most impacts

- **South Connection - Option A**

This option is located along a north-south corridor just to the east of County Line Road. After leaving the CPRR Bensenville Yard, this option would result in no further impacts to the freight rail system. From a freight rail perspective, Option A is the least impactful and most desirable of the South Connection Options.

- **South Connection - Options B, C and D**

South Connection Options B, C, and D are grouped together due to their similar alignment footprints around the Union Pacific – Milwaukee Subdivision Line track area. The options have large impacts to the Union Pacific – Milwaukee Subdivision Line and the CPRR’s industrial spurs directly to the east of the Union Pacific – Milwaukee Subdivision Line. However, these impacts do not appear to be fatal to the Freight Rail Industry.

Option B is located along a north-south corridor just to the west of the UPRR – Milwaukee Subdivision Line. Option B would directly impact the industrial spurs serviced from the UPRR – Milwaukee Subdivision Line to the Industrial Park to the west. Temporary track work would be required to maintain service to the remaining businesses left after construction of the West Bypass. This temporary work is necessary for construction staging. This option has a larger comparative economic impact as compared to Options C and D due to the displacement of many of the large industrial companies the UPRR services. Option B also would result in greater freight yard impacts as compared to Options C and D due to conflicts with the many UPRR industrial spurs. Option B also has greater freight operational, construction, and design impacts than Option D also due to the large impacts on the UPRR industrial spurs.

Option C is located along a north-south corridor directly over the UPRR – Milwaukee Subdivision tracks between Green Street and I-294. Option C would require construction of an approximately 3,000 foot bridge structure directly over the UPRR – Milwaukee Subdivision tracks. The feasibility of two construction methods was evaluated in this area – rerouting freight rail traffic during construction onto a temporary mainline double track, or maintaining freight rail traffic on the existing tracks during construction of the overhead bridge.

For the temporary freight rail relocation scenario, the feasibility of construction of a temporary mainline double track offset approximately 100’ to the east was evaluated. Analyses revealed that a temporary railroad bridge would be required to carry the UPRR over Green Street, and that two additional industrial buildings would be displaced to accommodate the temporary track. Also, due to the physical constraints of the existing UPRR bridge over the Bensenville rail yard and the Bypass construction area, the horizontal temporary track geometry would be restricted and would require a reduction in train operating speeds from 40mph to 20 mph. This reduction in speed was determined to be

unacceptable to the UPRR based on early discussions regarding the feasibility of the West Bypass connection options. The UPRR - Milwaukee Sub Line is a very important north-south mainline for the UPRR with 30 - 40 trains a day. Reduced speeds would have substantial impacts system-wide.

For the scenario maintaining freight operations along the existing mainline double track, the UPRR noted that they would consider the construction of an overhead highway structure over the mainline track, provided that a minimum vertical clearance of 23'-4" is provided, that the structure span the entire UPRR right-of-way (approximately 100'), and that the structure be constructed under live rail traffic. The UPRR felt that limited work windows for erecting steel and forming/pouring the deck over the UPRR right-of-way could be accommodated if traffic would allow. However, the UPRR will not guarantee and do not anticipate work windows to be greater than 4 hours in a 24 hour time period. Finish work on the deck can be done under traffic without a work window. These constrained and inconsistent construction work windows would effectively render construction of the bridge structure impractical, and result in high construction costs and increased construction duration.

Though Option C has a lesser economic impact on the freight companies and lesser freight yard impacts than Option B, the construction staging issues related to the West Bypass bridge result in higher potential freight rail impacts.

Option D would cross the UPRR - Milwaukee Subdivision Line via a bridge structure and then travel along a north-south corridor just to the east of the UPRR - Milwaukee Subdivision tracks. This bridge structure would need to comply with the same construction requirements (e.g. span ROW to ROW, minimum work windows, etc.) from the UPRR as the much longer bridge structure of Option C. However, given the much smaller crossing area, potential construction impacts for Option D are relatively lower than for Option C. Option D would result in some impacts to the industrial spurs serviced by the CPRR. However, it appears that new realigned industrial tracks could be constructed to maintain service to the businesses remaining after construction of the Bypass. Three new industrial spur alignments options were studied to ensure access could be maintained. The economic impact due to the displacement of industrial buildings is comparatively less than with Option B. Also, the construction and economic impacts are less than Option B due to the ability to establish new industrial spurs.

- **South Connection - Options E, F, and G**

These three options are grouped together due to their potential conflicts with the CPRR's Bensenville Freight Yard. Each of these options would cross over the Freight Yard at multiple locations and at a long skewed angle. These multiple crossings, in tandem with the tunnel crossing, cause a compounded loss of capacity and operational flexibility to the Bensenville Yard, resulting in design fatal flaws for Options E, F, and G.

Option E crosses the Freight Yard and the elevated UPRR – Milwaukee Sub mainline at a sharp skew angle relative to the yard. Option E’s crossing of the UPRR mainline bridge over CPRR tracks that connect the East Yard to the West Yard would result in substantial construction impacts due to required footprint and elevated crossing of the UPRR tracks. Also, the Bensenville Hump Yard ladder track would incur significant operational impacts during construction which would greatly reduce the yard classification capabilities.

Option F crosses the CPRR Bensenville Freight Yard, the elevated UPRR mainlines, and the Metra mainlines. Option F also has a long curved ramp structure that crosses over the Freight Yard and the Metra mainline for a third time. These additional crossings of the Freight Yard will create a greater loss of yard capacity than that of Options E and G. Also the additional crossings of the Metra Mainline will cause additional disruption to the commuter rail service. This option would result in the most freight rail impacts of all the South Connection Options.

Option G crosses the CPRR Bensenville Freight Yard, the elevated UPRR mainlines, and the Metra mainlines. The Option G crossings of the Freight Yard have a similar compounding effect as that of Option F. The crossing of the Metra mainline will cause additional disruption of the commuter service.

Recommendation and Conclusions

North Connection Options – IL 83 and West Bypass

Results of the freight rail evaluation for the North Connection Options (IL 83 Freeway Options A and B; West Bypass Options A, B, C, D and E) did not reveal any design fatal flaws from a freight rail perspective. Also, potential freight rail impacts are comparable for all options considered.

South Connection Options – West Bypass

Results of the freight rail evaluation for the South Connection Options (West Bypass) revealed design fatal flaws for Options E, F, and G (related to significant impacts to the CPRR Bensenville Freight Yard), and design fatal flaws for Option C (related to construction along the UPRR mainline double track). Of the remaining options, Option A would result in the least potential impacts to freight rail infrastructure and operations with Option D being the second least.