Chapter 2. Alternatives

This chapter presents an overview of the process used to develop the reasonable alternatives considered for the 75th Street Corridor Improvement Project (CIP), presents details of the development and screening of the preliminary alternatives, and then provides a detailed description of the Build and No-Build alternatives.

2.1 Background to the Alternatives Development Process

2.1.1 Overview

In general, the alternatives for detailed evaluation in this study were developed through the following steps:

- Dividing the 75th Street CIP study area into several "improvement areas" based on geography and the ability to meet certain project needs.
- Developing a range of "preliminary alternates" to address the components of the project's Purpose and Need statement within each of several "improvement areas" of the 75th Street CIP study area.
- Screening those preliminary alternates using both qualitative and quantitative criteria to select the most effective alternates.
- Combining the remaining alternates that passed the screening process from each of the improvement areas into an overall "Build Alternative" for the entire project corridor.
- Defining a "No-Build Alternative" to serve as a baseline for evaluating the Build Alternative.

The impacts of these alternatives are then evaluated in Chapter 3 of this document. Figure 2-1 on the following page provides a graphic summary of the overall alternatives development process, and the analysis is described in detail in Sections 2.2 and 2.3.

2.1.2 System Management Alternative

In most major transportation studies, in addition to examining the No-Build Alternative, it is common to investigate changes to the management and operation of the existing transportation systems to determine if the overall performance can be improved substantially without the need for major capital expenditures. For the CREATE Program, the Chicago Transportation Coordination Office (CTCO) developed in the early 2000s a detailed computer model to simulate all train operations throughout the Chicago region. This model provided a tool to evaluate a variety of operational changes to the rail system. Model simulations conducted in 2001 indicated that a number of management and operational improvements to reduce delays in the rail system were feasible. These operating changes were implemented by the railroads and achieved some reductions in train delays. At the conclusion of the process, CTCO determined that any further improvements

in railroad operations would require physical improvements in the infrastructure.[1] Based on this determination, there are no further major system management improvements or operational changes that could be made to substantially address any of the transportation problems identified in Chapter 1. The CTCO has continued to review and make minor adjustments to rail operations in the region, in effect constituting an ongoing system management process. Projections of future rail operations in the study area used are based on the latest version of the CTCO computer model, made in May 2011.

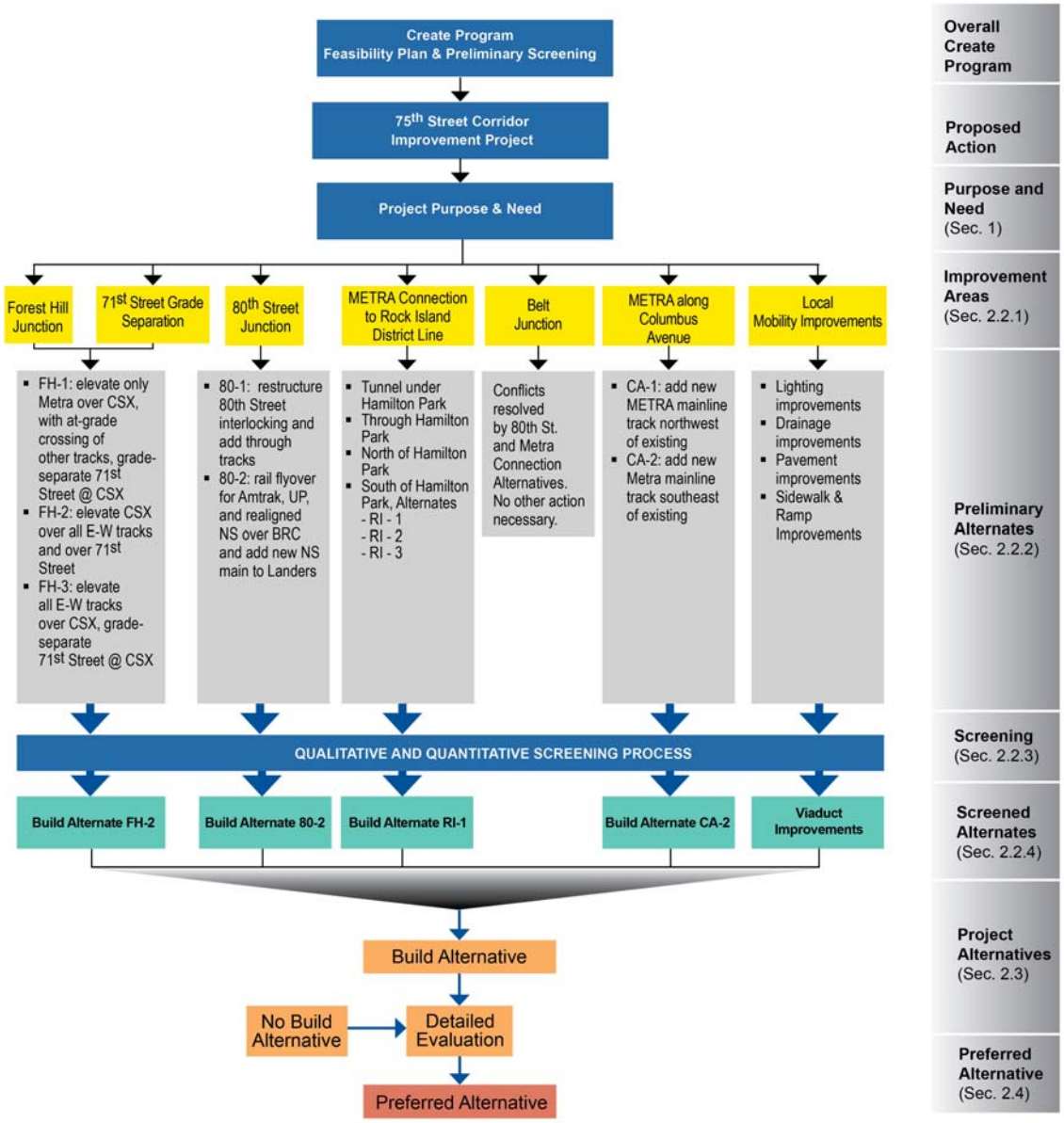

Figure 2-1: Alternatives Development and Screening Process

2.1.3 Study Design Year

Studies for major transportation improvements generally try to provide for changes that can be anticipated for some extended time into the future. This future planning horizon is called the study "design year." The design year for the 75th Street CIP is 2029. The CTCO's computer Train Model was used to simulate existing train operations for 2009 and to project rail traffic volumes for future "No-Build" and future "Build" conditions in the design year. Under the No-Build scenario, with the expected growth in rail traffic demand, the existing rail system is anticipated to reach capacity by the year 2024, with train volumes remaining constant thereafter. These Year 2029 estimated train volumes are used for the No-Build Alternative.

2.2 Development and Screening of Preliminary Build Alternates

The original *CREATE Final Feasibility Plan*[2] identified a list of component projects making up the CREATE program. The *CREATE Final Preliminary Screening*[3] report determined that component projects EW2, P2, and P3 (see Section 1.1.2 for details) were considered to be linked and should all be addressed in a single National Environmental Policy Act (NEPA) document. In 2009, Amendment 1 to the Final Preliminary Screening report[4] determined that component project GS19, the grade separation of 71st Street and the north-south CSX railroad tracks, was also environmentally linked to the other three component projects and that all four should be addressed in the same NEPA document. These four original CREATE component projects thus make up the 75th Street CIP.

Projects can be "Linked" for one of three reasons:

- When they cannot provide a stand-alone solution, or

- When the project does not have sufficient length and scope, or

- When they would restrict or affect the consideration of alternatives for other adjacent or related projects.

2.2.1 Improvement Areas

Although all four of the original CREATE component projects identified above are environmentally linked, they are not all in the same exact geographic location, nor do they all involve the same rail facilities. For this reason, they cannot all be addressed by a single proposed improvement in an individual area of the corridor. For example, providing just an overpass structure to carry 71st Street over the CSX tracks would address the 71st Street at-grade rail crossing problems, but it would do nothing to alleviate the rail-rail conflicts at Forest Hill Junction, Belt Junction, or 80th Street Junction. A combination of several different improvements is therefore needed to address all of the issues identified in the Purpose and Need statement for the 75th Street CIP (see Chapter 1).

In order to address these transportation needs, five separate areas within the corridor were identified where improvements were considered. These areas are referred to as "improvement areas." Figure 2-2 shows the general locations of these five improvement areas. In addition, improvements to local mobility were identified as a specific project need through the stakeholder involvement process. Improvements to address this project need would be focused not in one specific location or area, but

rather at railroad viaduct locations throughout the study area. Please note that the improvement areas do not necessarily represent construction sections or a construction phasing approach. Construction phasing is discussed in Section 2.6.3.

2.2.2 Development of Alternates

The study team, working in concert with the Project Study Group, developed a number of "preliminary alternates" to address the identified transportation problems within each improvement area. In general, the development of alternates within each area was intended to address specific transportation problems identified in the project's Purpose and Need statement (see Section 1.3). Table 2-1 lists the specific problems from the Purpose and Need statement that are addressed by the alternates within each improvement area.

"Alternates" are the several possible separate courses of action considered within each improvement area.

Table 2-1: Purpose and Need Statement Issues Addressed Within Each Improvement Area

Improvement Area	Purpose and Need Statement Issues Addressed
Forest Hill Junction / 71st Street Grade Separation	• Rail-rail conflicts at Forest Hill Junction • Highway-rail crossing problems at the 71st Street grade crossing • Passenger service reliability on the Metra SouthWest Service (SWS) Line
80th Street Junction	• Rail-rail conflicts at 80th Street Junction • Passenger service reliability on the Amtrak *Cardinal/Hoosier State* route • Rail-rail conflicts at Belt Junction
Metra Connection to Rock Island District (RID) Line	• Rail-rail conflicts at Belt Junction • Passenger service reliability on the Metra SWS Line • Rail-rail conflicts on the Norfolk Southern Chicago and Western Indiana (CWI) rail line • Passenger service reliability on the Amtrak *Cardinal/Hoosier State* route
Metra along Columbus Avenue	• Passenger service reliability on the Metra SWS Line
Belt Junction	• Rail-rail conflicts at Belt Junction • Passenger service reliability on the Metra SWS Line
Viaducts	• Local mobility problems at viaducts due to poor visibility, drainage, pavement and structural conditions

Local mobility is an element of the project's Purpose and Need statement that was identified by the public through the Illinois Department of Transportation (IDOT) Context Sensitive Solutions (CSS) process. The mobility problems identified by the local community are associated with the physical

condition of infrastructure at many railroad viaducts located throughout much of the study area, rather than in a single defined area.

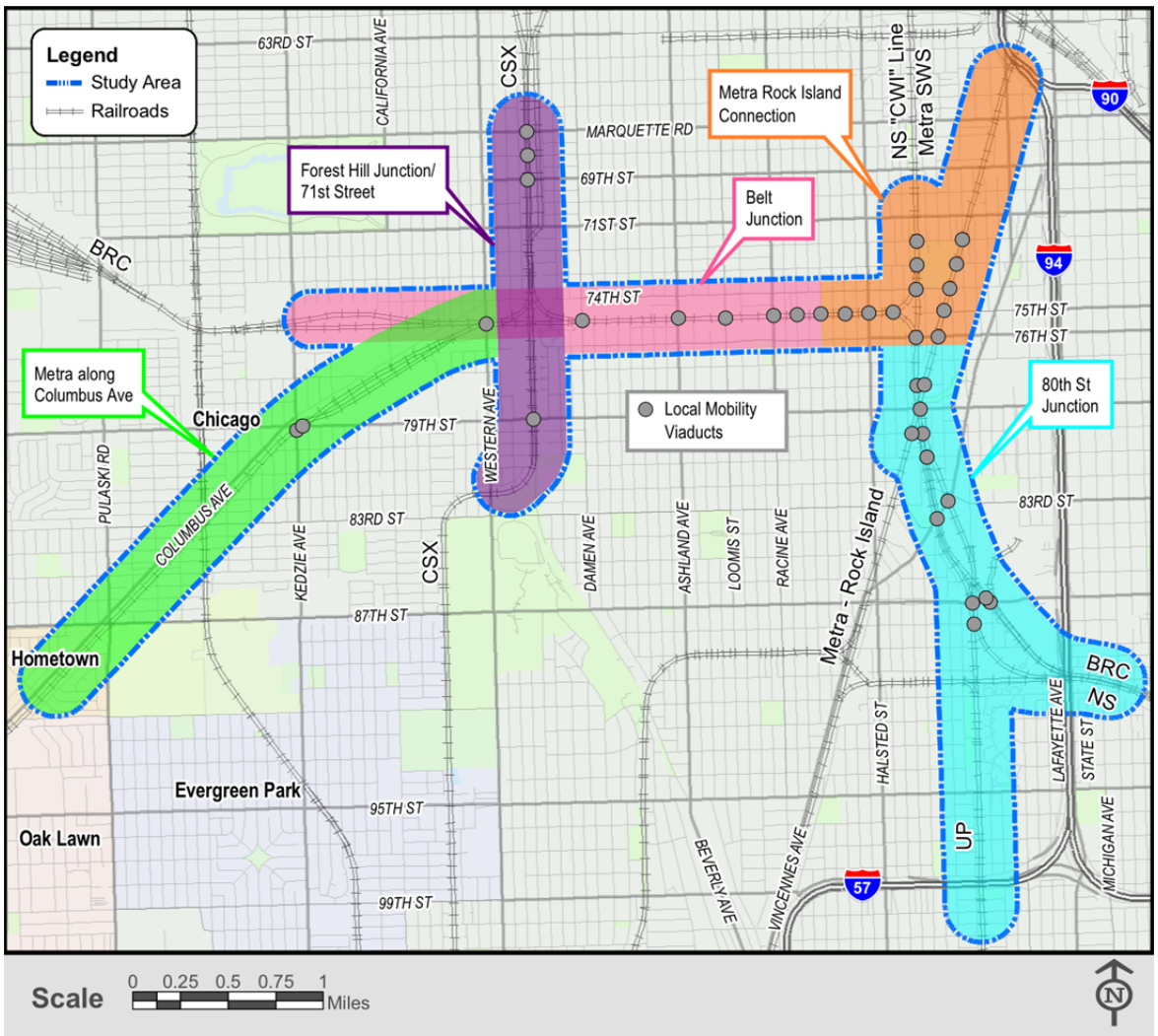

Figure 2-2: Improvement Areas Map

2.2.3 Screening Criteria

The first and foremost standard for evaluating the preliminary alternates was how well the alternate satisfied the specific elements of the project's Purpose and Need statement issue that it was intended to address. Those alternates considered but which were found not to address some element of the project Purpose and Need adequately were eliminated from consideration in the initial phase of developing preliminary alternates. Each of the preliminary alternates being compared were determined to be essentially equal in the degree to which they met the specific elements of the project's Purpose and Need statement, except where specifically noted in the evaluations that follow.

Other criteria used in the screening process included:

- The degree to which the alternate would improve railroad operations through the corridor.
- The amount and nature of new right-of-way acquisition that would be required.
- The planning-level construction cost of the alternate.
- The degree to which the alternate met railroad and roadway design criteria.
- Other identified impacts (positive or negative) of the specific alternate.

The principal screening criterion was how well each alternate satisfied the project Purpose and Need.

Not all of these criteria were applicable to each of the preliminary alternates. For instance, in some areas, none of the preliminary alternates would require any new right-of-way acquisition. Also, although only conceptual level engineering detail was generally available for the alternates at this stage of project development, this was sufficient to provide clear qualitative comparisons of the alternates. For example, the conceptual level engineering provides enough information to allow a determination that "Alternate 1 would require a much longer and more expensive bridge" even though there is not yet the detailed engineering to conclude that "the bridge for Alternate 1 would be 47 feet longer."

The "other identified impacts" criteria were applied in some instances where information was available on a particular impact category that would demonstrate a potential difference (positive or negative) in impacts among the alternates. For instance, since diamond crossings are a known source of greater noise above and beyond the normal wheel-rail noise, a preliminary alternate that would eliminate an at-grade diamond crossing would provide a benefit over an alternate that did not eliminate the diamond crossing. The elimination of the diamond crossing was thus used as part of the evaluation criteria in the instance where a diamond crossing existed, even though detailed noise modeling had not yet been performed during the screening process. In general, preliminary alternates were removed from further consideration only in those cases where the preliminary alternate appeared to not address the issues in the project's Purpose and Need statement or was considered clearly inferior to one or more of the other alternates in most of the screening criteria.

2.2.4 Description of Alternates and Alternate Screening

The preliminary alternates for each improvement area were developed in accordance with the design criteria shown in Table 2-2. These standards helped to determine the feasibility of alternates as they were being developed.

Table 2-2: Design Criteria for Development of Preliminary Alternates

Design Element	Design Criteria
Metra Design Speed (standard)	79 MPH
Metra Design Speed (crossovers/switches)	40 MPH
Freight Design Speed (CSX, UP)	40 MPH
Freight Design Speed (BRC, NS, all wyes)	25 MPH

Design Element	Design Criteria
Freight Design Speed (yards)	10 MPH
Metra Maximum Grade	2%
Freight Maximum Grade	1%
Roadway Maximum Grade	8%
Vertical Clearance over RR	23'-0" (minimum)
Vertical Clearance over Roadway (new and replaced bridges)	14'-9" (minimum)
Vertical Clearance over Roadway (existing bridges)	14'-0" (minimum)
Horizontal Clearance from Track Centers	9'-0" pref., 8'-0" (minimum)[5]
Metra Clearance between Track Centers	14'-0" pref., 13'-6" (minimum)
Freight Clearance between Track Centers	15'-0" pref., 13'-6" (minimum)
Metra Double-Track New ROW[6]	66'

Sources: AREMA, IDOT BDE, Jacobs, Metra

The following paragraphs present the preliminary alternates developed in each of the five improvement areas of the 75th Street CIP and discuss the initial screening evaluation of each of those alternates.

2.2.4.1 Forest Hill Junction / 71st Street Area

Two north-south CSX railroad tracks currently cross four east-west tracks at Forest Hill Junction (see Figure 2-3, and Figure 2-2 which shows the relationship of this area to the entire project), including two owned by the Belt Railway Company of Chicago (BRC) and two owned by Norfolk Southern (NS). The NS tracks are also used by Metra's SWS. One half-mile north of Forest Hill Junction, the CSX tracks also cross 71st Street at-grade. Figure 2-4 shows a schematic of the existing tracks.

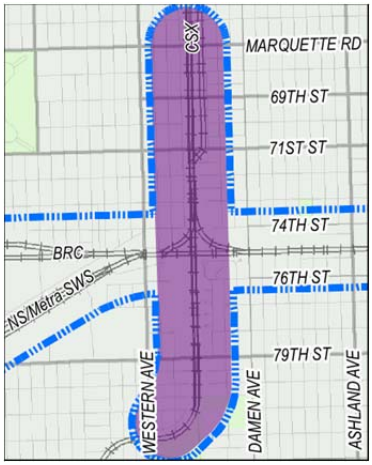

Figure 2-3: Forest Hill Junction / 71st Street

Analysis indicated that it would prove impractical to lower the CSX tracks under one conflict location and raise them at the other conflict location, or vice versa. This is due to the proximity of the two conflict points (only approximately 2,575 feet apart) and the adverse operating conditions the steep grades would cause. (The resulting grade would be more than 1.2%, compared to a freight rail maximum grade criterion of just 1.0%.) The Forest Hill Junction and 71st Street grade separation are, therefore, addressed as a single improvement area for the development of alternates. The alternates developed to address these conflicts (denoted here by the "FH" prefix) are:

Forest Hill Junction and the 71st Street Grade Crossing were treated as a single area because any alternate chosen to address one of the conflicts has an effect on the alternates considered to address the other problem.

FH-1. Elevate only east-west Metra tracks over north-south CSX tracks, keep at-grade crossing of other freight tracks and CSX, and elevate 71st Street over CSX.

FH-2. Elevate north-south CSX tracks over all east-west tracks (Metra, NS, and BRC) and over 71st Street.

FH-3. Elevate all east-west tracks over the CSX tracks, and elevate 71st Street over CSX.

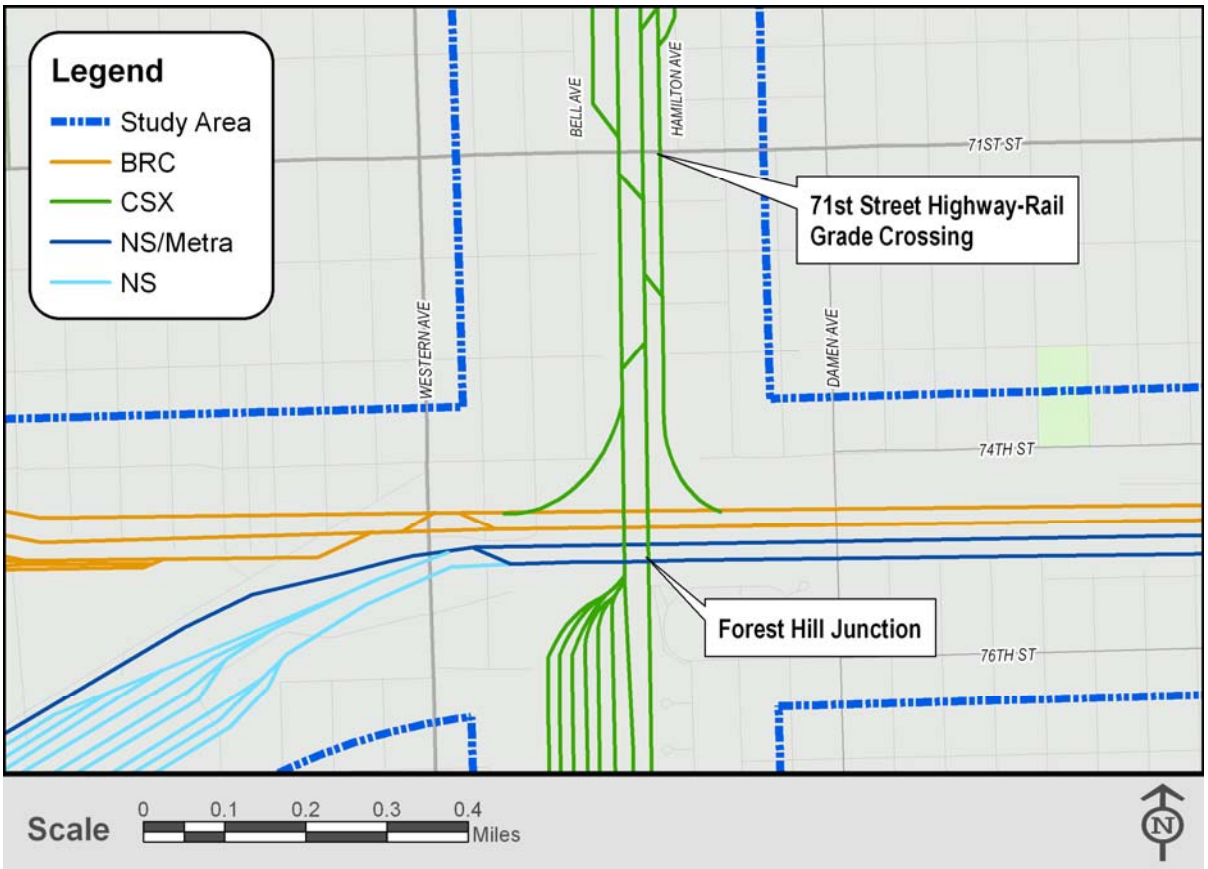

Figure 2-4: Existing Track Schematic – Forest Hill Junction

Alternate FH-1 would raise only the two east-west Metra tracks over the two north-south CSX railroad tracks (see Figure 2-5). The two Metra tracks would begin to rise on the west near Western Avenue at a 2% maximum grade, reach a maximum height of approximately 30 feet above the existing tracks (thus providing a vertical clearance of 23 feet over Forest Hill Junction), and then return down to meet the existing track level east of Damen Avenue. The remaining east-west BRC and NS tracks would still cross the CSX tracks at-grade. To provide room for the piers for the new structure carrying the Metra tracks, the NS tracks along the south side of the 75th Street corridor would have to be moved about 4 feet closer to the southern boundary of the railroad property along 76th Street. The Metra trains that currently operate along these southernmost tracks would be moved to the new structure in the center of the corridor, about 33 feet further to the north. This would reduce the number of trains operating along the tracks closest to 76th Street. Figure 2-6 shows Alternate FH-1 in the 75th Street corridor compared to the existing conditions.

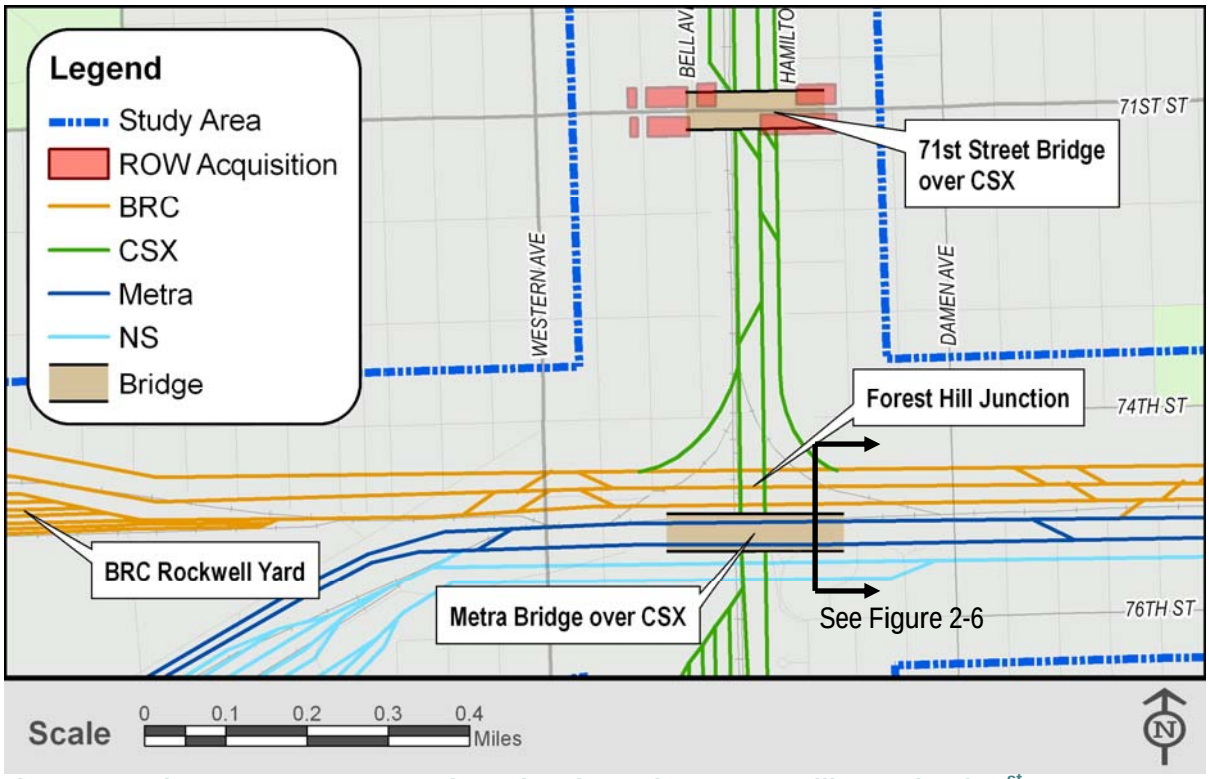

Figure 2-5: Alternate FH-1 Proposed Track Schematic – Forest Hill Junction / 71st St.

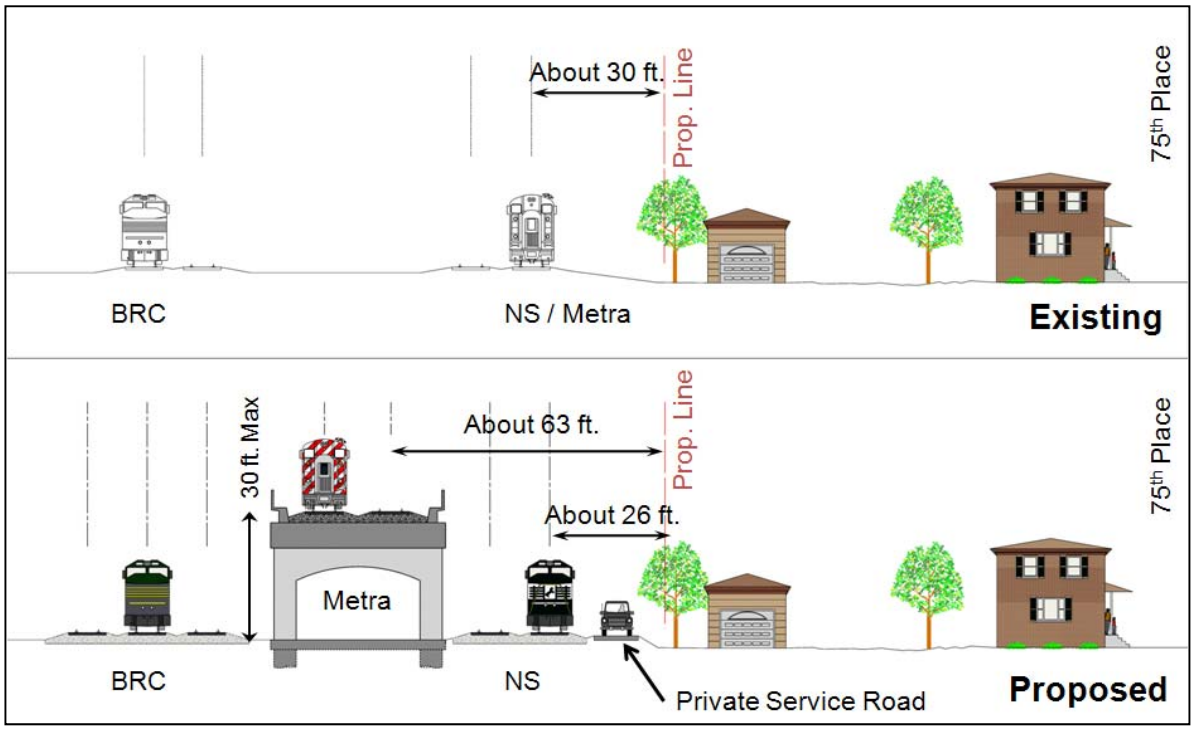

Figure 2-6: Alternate FH-1, Looking East along 75th Street Corridor from Forest Hill Junction

At 71st Street, a new roadway bridge with a 7% grade on the approaches would be constructed over the CSX tracks with the touch-down points 765 feet on either side of the railroad tracks.[7] A total of 48 single family homes and one auto-service business along both sides of 71st Street would have to be acquired to allow construction of this 71st Street overpass. Access to 71st Street would be eliminated from Bell Avenue and Hamilton Avenue, with cul-de-sacs constructed at those locations.

Alternate FH-2 would raise the two north-south CSX tracks over the four east-west tracks at Forest Hill Junction and over 71st Street (see Figure 2-7). From south to north, the tracks would begin rising 350 feet north of 79th Street, continue to a maximum height of 32 feet above Forest Hill Junction, and then head down to meet the existing track 140 feet north of 69th Street. At 71st Street, the top of the rail elevation would be 19.5 feet above the height of the existing roadway. The roadway would also be lowered slightly to improve the roadway profile, which would increase the vertical clearance to 16'-6". Between the two bridge structures over Forest Hill Junction and 71st Street, the CSX tracks would be constructed on either a new embankment or a continuation of the bridge. Two "wye" connection tracks would also be constructed from the east-west BRC tracks in the 75th Street corridor to tie into the north-south CSX tracks. This connector track would be on embankment rising from the elevation of the existing tracks at 75th Street to an elevated level near 72nd Street along the east side of the new structure (see Figure 2-8). Access from the north to the CSX Forest Hill Yard would be lost as a result of the new flyover.

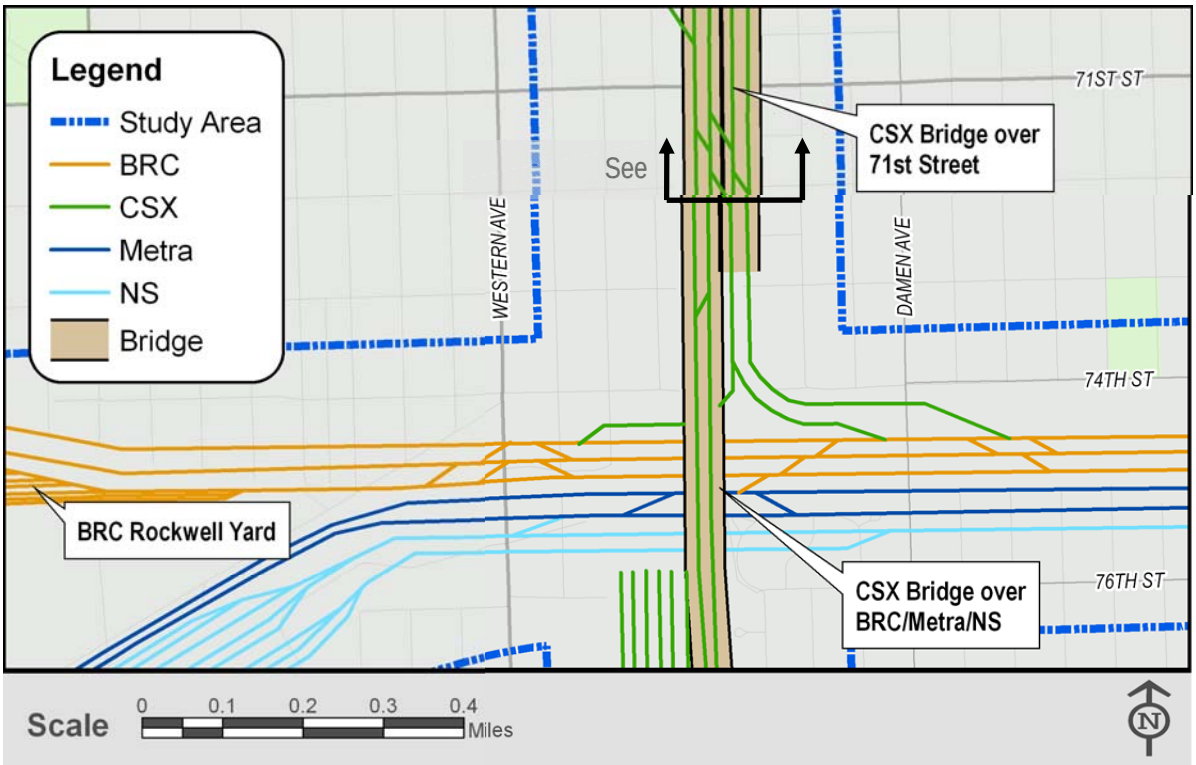

Figure 2-7: Alternate FH-2 Proposed Track Schematic – Forest Hill Junction / 71st St.

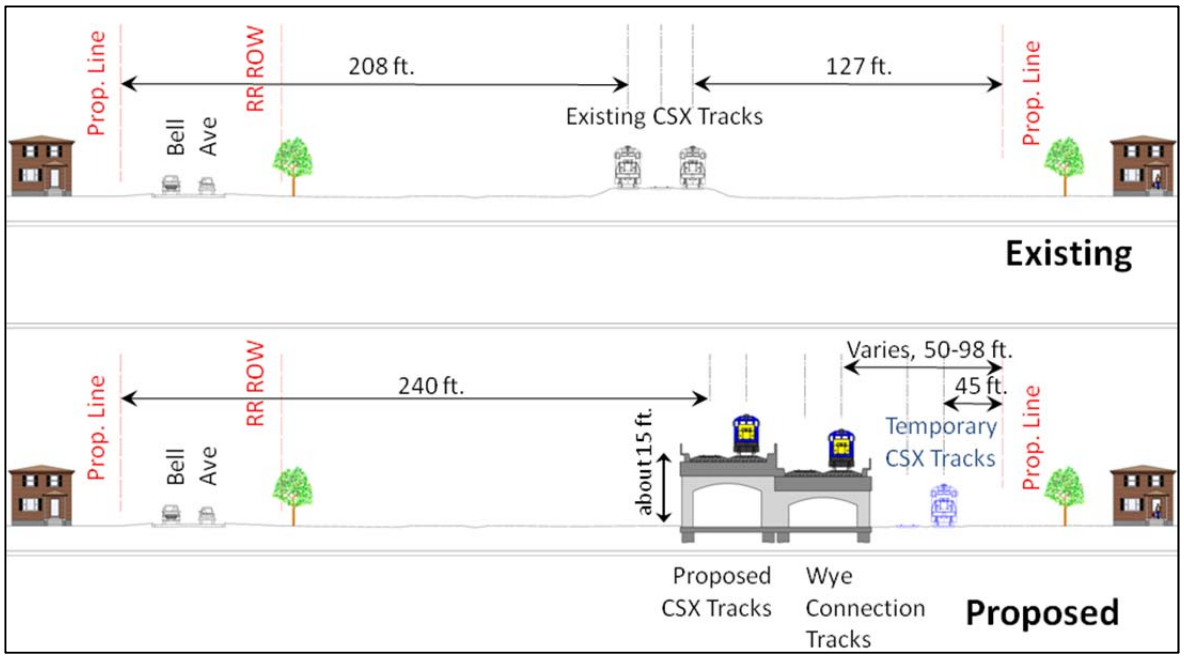

Figure 2-8: Alternate FH-2 and Existing Conditions, Looking North along CSX near 72nd Street

It would be necessary to construct two temporary tracks to the east of the new structure to allow the CSX to operate while the new structure is being built. These two temporary tracks would be removed once the new structure is complete and in service. The land to be used for the temporary tracks is within right-of-way already owned by CSX and the City of Chicago. A 100-foot wide strip of land (6.02 acres) that is currently owned by the City of Chicago would be used for the temporary tracks between 75th Street and 79th Street. The permanent alignment would acquire a 20-foot wide strip of the 100 feet (1.17 acres total) of right-of-way. Alternate FH-2 is compared to Alternate FH-1 in Table 2-3 below.

Table 2-3: Alternate Screening – Forest Hill / 71st Street

Screening Criteria	Alternate FH-1	Alternate FH-2
Rail Operations	Eliminates all passenger-freight conflicts at Forest Hill Junction, but does not eliminate freight-freight conflicts.	Eliminates all rail conflicts at Forest Hill Junction. Cuts off north access to lightly used CSX Forest Hill Yard.
Right-of-Way	Requires acquiring 48 single family homes and one auto-service business	Uses 6.02 acres of City of Chicago right-of-way for temporary alignment and 1.17 acres of City of Chicago right-of-way for permanent alignment.
Other	Access to 71st Street would be eliminated at Bell Avenue and Hamilton Avenue. Noise issues due to Forest Hill Junction diamond crossing would remain	Access to 71st St. from Bell and Hamilton remains open. All noise from diamonds eliminated.

Alternate FH-3 considered raising not just the two Metra tracks, but all east-west railroad tracks over the north-south CSX tracks at Forest Hill Junction. However, if the east-west freight tracks are

elevated, trains on these tracks would not be able to access either the NS's Landers Yard or the BRC's Rockwell Yard from the east. Elimination of the eastern access to the yards would limit the size of the trains that could operate, make the operation of the yards infeasible, and increase conflicts with Metra. In addition to these severe impacts on freight and passenger rail operations, the structure would have to be wider than those in Alternates FH-1 and FH-2, and thus more expensive, to carry the greater number of tracks. **Because this alternate offers no unique advantages compared to Alternate FH-1, but has higher costs and adverse impacts on rail operations, it was dropped from further consideration.**

Only Alternate FH-2 would eliminate the loud noise and all the delays from the rail conflicts at the diamond crossing at Forest Hill Junction

Alternate FH-1 would be comparable to FH-2 in cost, but would not eliminate freight rail conflicts at Forest Hill Junction or the noise resulting from the diamond crossing at this location. It would also require acquisition of 48 single-family homes and one auto service business near 71st Street and eliminate access to two local streets. **Based on this additional analysis, Alternate FH-1 was dropped from further consideration and only alternate FH-2 was advanced for more detailed consideration.**

2.2.4.2 80th Street Junction

The BRC, CSX, NS, Union Pacific Railroad Company (UP), and Amtrak rail operations all must traverse the 80th Street Junction interlocking (see Figure 2-10). The small number of tracks through the junction and the arrangement of the tracks make it impossible in most cases for more than one train to move through the junction at a time. Alternates to improve rail operations in this area are focused in the north-south rail corridor between approximately 91st Street and 79th Street, but some may include improvements and track additions as far west as Landers Yard. While these alternates must be considered in the design of the improvements in the other areas, particularly Belt Junction and the Landers Yard area, they can be evaluated independently, and will not affect the screening of alternates in the other improvement areas. The two alternates for the 80th Street Junction area (indicated by the "80-" prefix) are:

80-1. Provide two additional through tracks and reconfigure the 80th Street interlocking; provide a new NS track from 77th Street north and west to Landers Yard.

80-2. Provide two additional through tracks through 80th Street Junction; move Amtrak, CSX, and UP operations to an existing NS bridge over the BRC north of 87th Street; construct a new NS main track north and west to Landers Yard; and provide a new bridge for the UP tracks over 88th Street.

Figure 2-9: 80th Street Junction

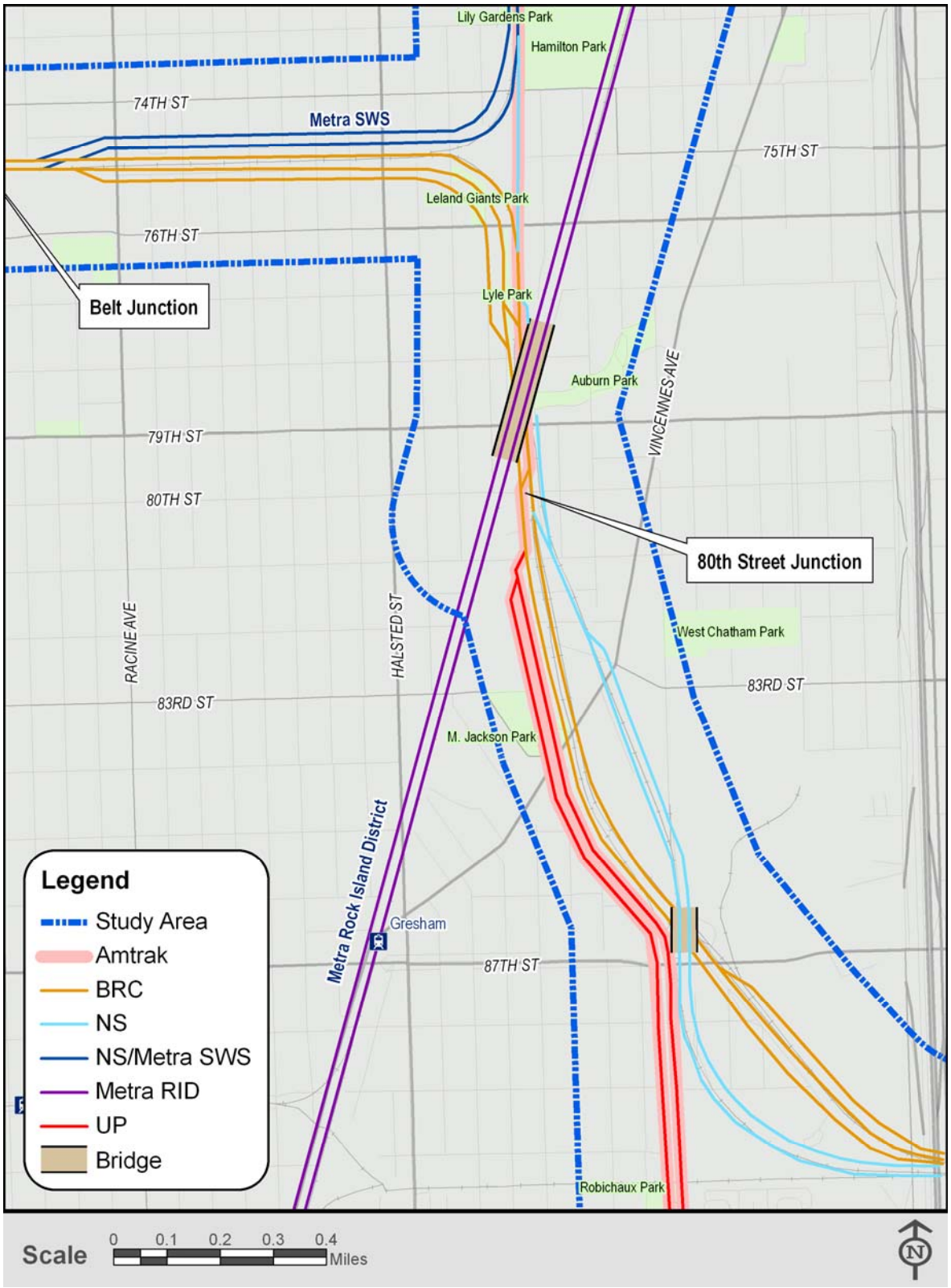

Figure 2-10: Existing Track Schematic – 80th Street Junction

Alternate 80-1 would restructure the 80th Street interlocking and provide an additional BRC through track and a NS track through 80th Street Junction. With the exception of two new crossovers for the NS tracks, no changes would be made south of Vincennes Avenue. Although the added tracks would improve capacity and allow more than one train to pass through the junction, the existing crossing conflicts between the BRC, NS, and UP would remain essentially unchanged. This alternate would provide a new NS main track through Belt Junction along the south side of the 75th Street corridor to Landers Yard, but it would not eliminate the 80th Street Junction conflicts for the NS trains to reach the new track. A track schematic of Alternate 80-1 is shown in Figure 2-11.

An interlocking is an arrangement of switches and signals that are so interconnected that their movements are operated as a single unit.

Figure 2-12 shows the proposed locations of the added tracks in the 80th Street corridor just south of 79th Street. All changes with Alternate 80-1 would occur within the existing railroad right-of-way.

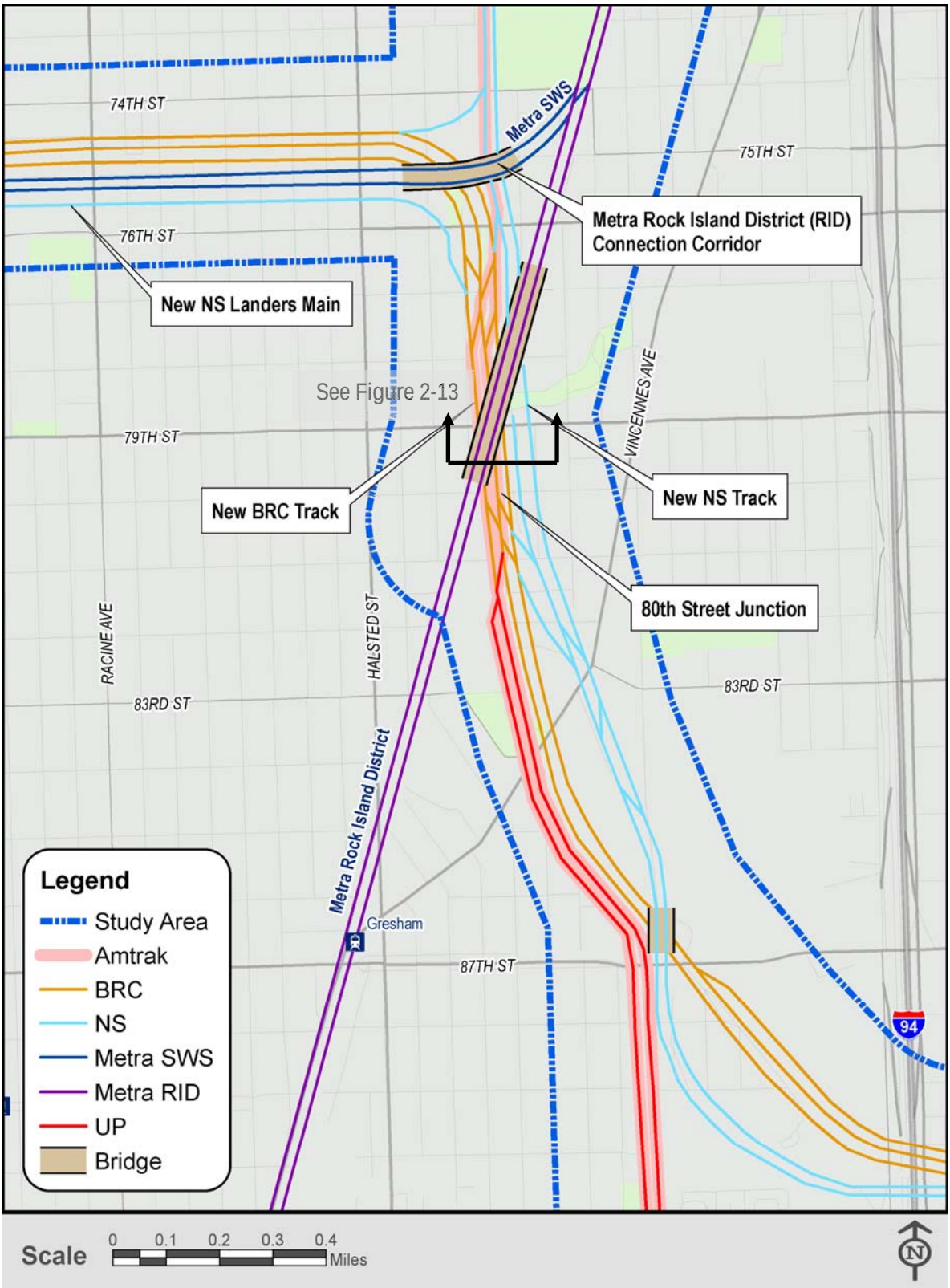

Figure 2-11: Alternate 80-1 Proposed Track Schematic – 80th Street Junction

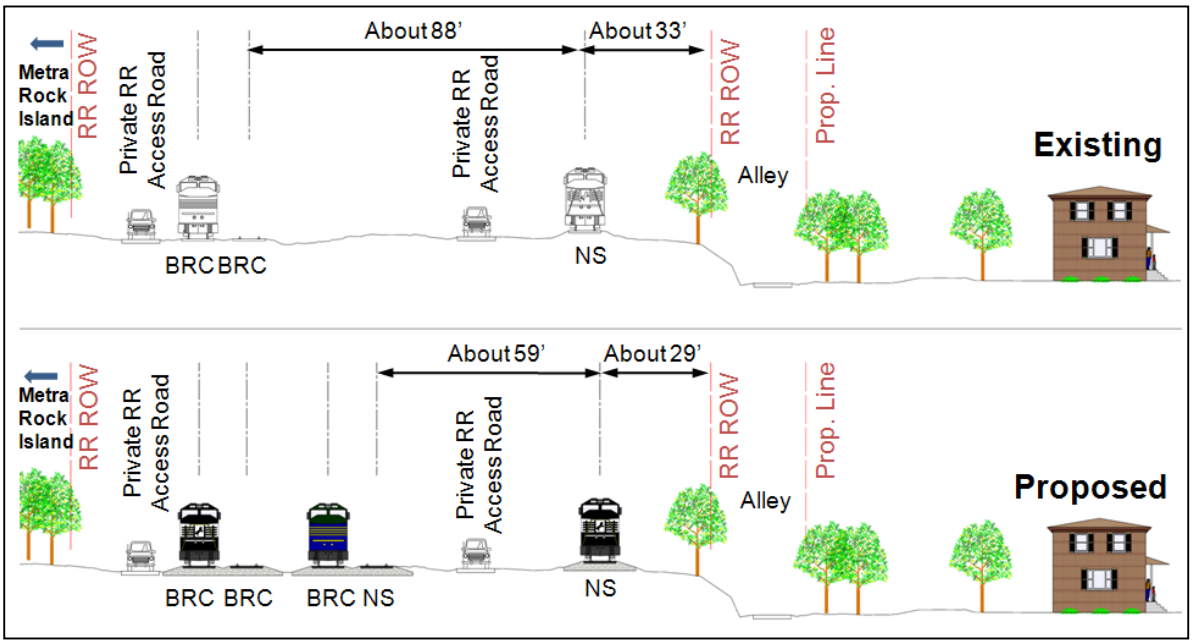

Figure 2-13: Alternate 80-1 and Existing Conditions, Looking North near 79th Street

Figure 2-12: Existing NS bridge over BRC

Alternate 80-2 would realign the UP railroad tracks to use the existing NS bridge over the BRC tracks north of 87th Street (see bridge in Figure 2-12). The existing bridge has unused room for two additional tracks and would only require rehabilitation work. Bridges over 87th Street, Vincennes Avenue, 81st Street, and 80th Street would be rehabilitated to accommodate the realignment, and a new bridge carrying the two UP tracks would be constructed over 88th Street where a bridge previously existed (see track schematic in Figure 2-14). Additionally, a new "Landers Main" track for the NS would be constructed to the west and south of the existing BRC tracks from a point east of the Dan Ryan Expressway (I-94) all the way to Landers Yard, eliminating the need for NS trains to weave across the BRC tracks to access the Yard. A new BRC track would also be constructed through 80th Street Junction.

By providing flyovers using existing bridges and a new structure, Alternate 80-2 eliminates freight rail crossing conflicts at both 80th Street Junction and at Belt Junction.

The new Landers Yard Main track for the NS, combined with the realignment of Amtrak, BRC, and UP operations, would effectively eliminate the need for the freight railroads to cross paths to travel through 80th Street Junction as they now must. Some NS and UP trains would still need to merge onto the BRC tracks at 80th Street Junction. However, with the number of tracks running through 80th Street Junction increasing from three to five, possible delays caused by these merging movements would be minor. Crossovers for all tracks would still be present to allow for greater operational flexibility.

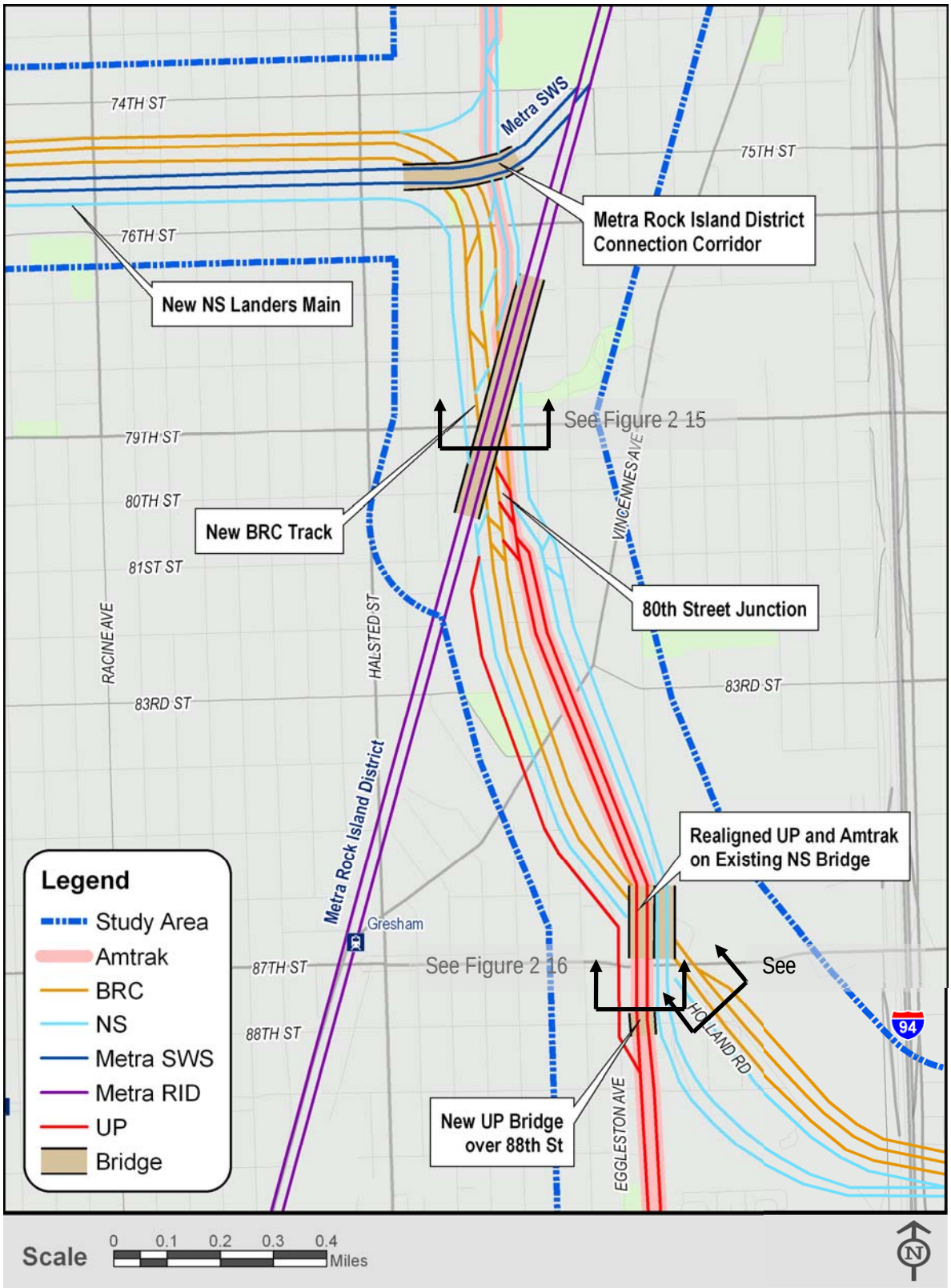

Figure 2-14: Alternate 80-2 Proposed Track Schematic – 80th Street Junction

Nearly all of the track improvements associated with Alternate 80-2 would be constructed within the existing railroad rights-of-way. The exception is an area of vacant industrial land between two sets of railroad tracks south of 81st Street and north of 87th Street. This property was previously owned by the Chicago and Western Indiana railroad, and more recently has been used primarily for illegal dumping of construction debris. A total of 12.8 acres of land would be acquired from 17 parcels to allow the construction of two Union Pacific railroad tracks and service roads. Near 79th Street, two new tracks would be added in the center of the current rail right-of-way, and the easternmost NS track would be shifted approximately four feet closer to the alley along the east side of the corridor (see Figure 2-15). Construction of the new NS track to Landers Yard would require widening of the existing embankment along the east and north sides of Leland Giants Park. The new Landers Yard track adjacent to Leland Giants Park would be located within existing railroad right-of-way, but a construction permit would be required from the Chicago Park District to allow access to the construction site. Approximately 0.12 acres of land between the existing right-of-way line and the proposed railroad retaining wall would be transferred to the Chicago Park District.

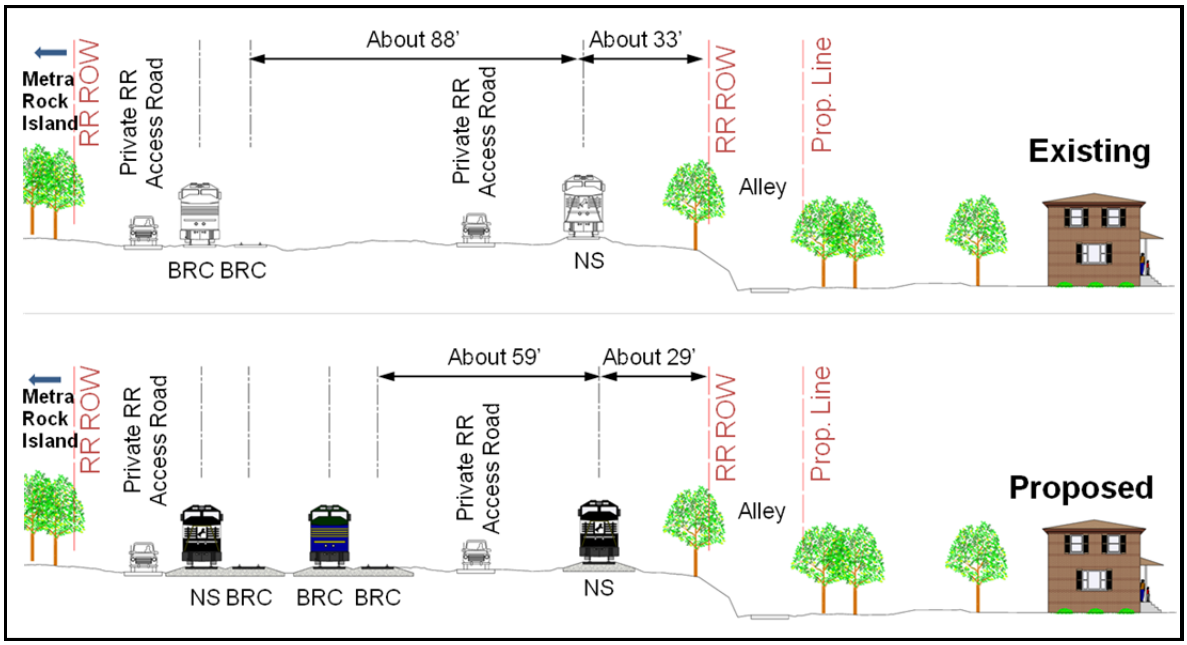

Figure 2-15: Alternate 80-2 and Existing Conditions, Looking North near 79th Street

At about 88th Street, east of Eggleston Avenue (see Figure 2-16), two new tracks would be added in the center of the right-of-way, but the tracks nearest to the west right–of-way line would remain at that same distance from the nearest residences. Near 88th Street and South Holland Road (see Figure 2-17), one new track would be added to the west side of the existing tracks, approximately 13 feet closer to the South Holland Road right-of–way.

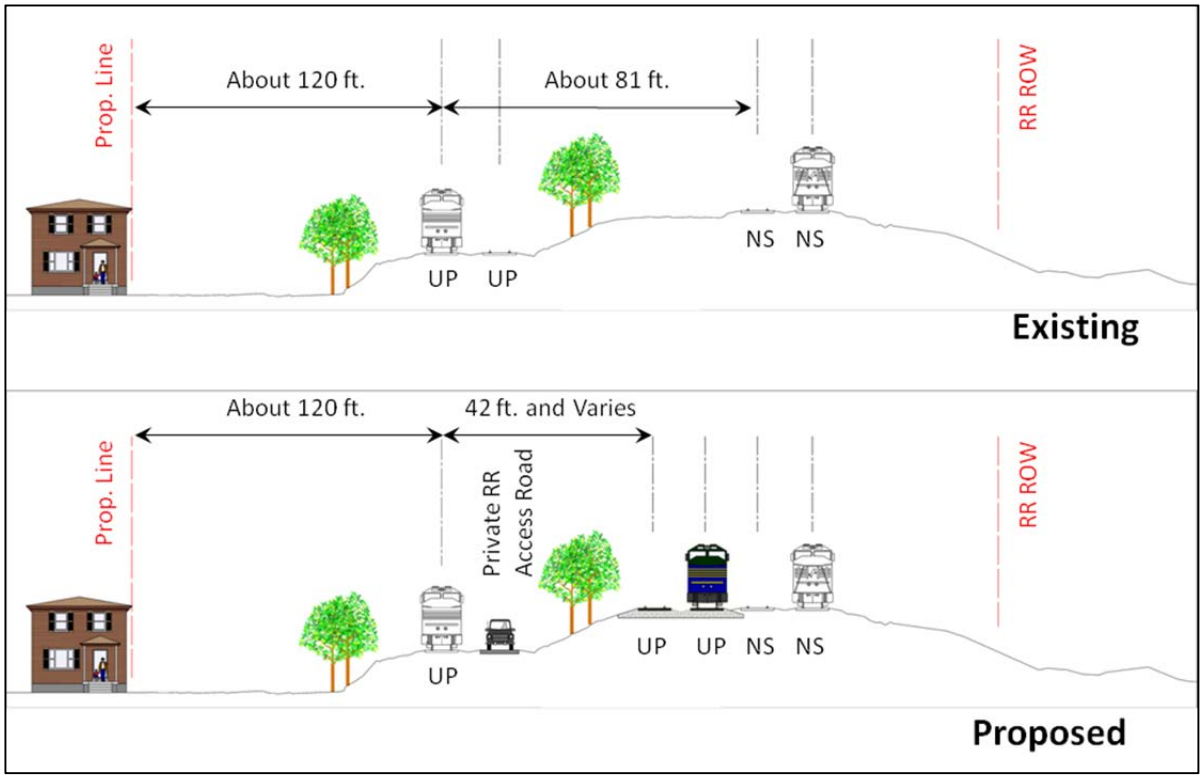

Figure 2-16: Alternate 80-2 and Existing Conditions, Looking North along UP and NS Tracks near 88th Street

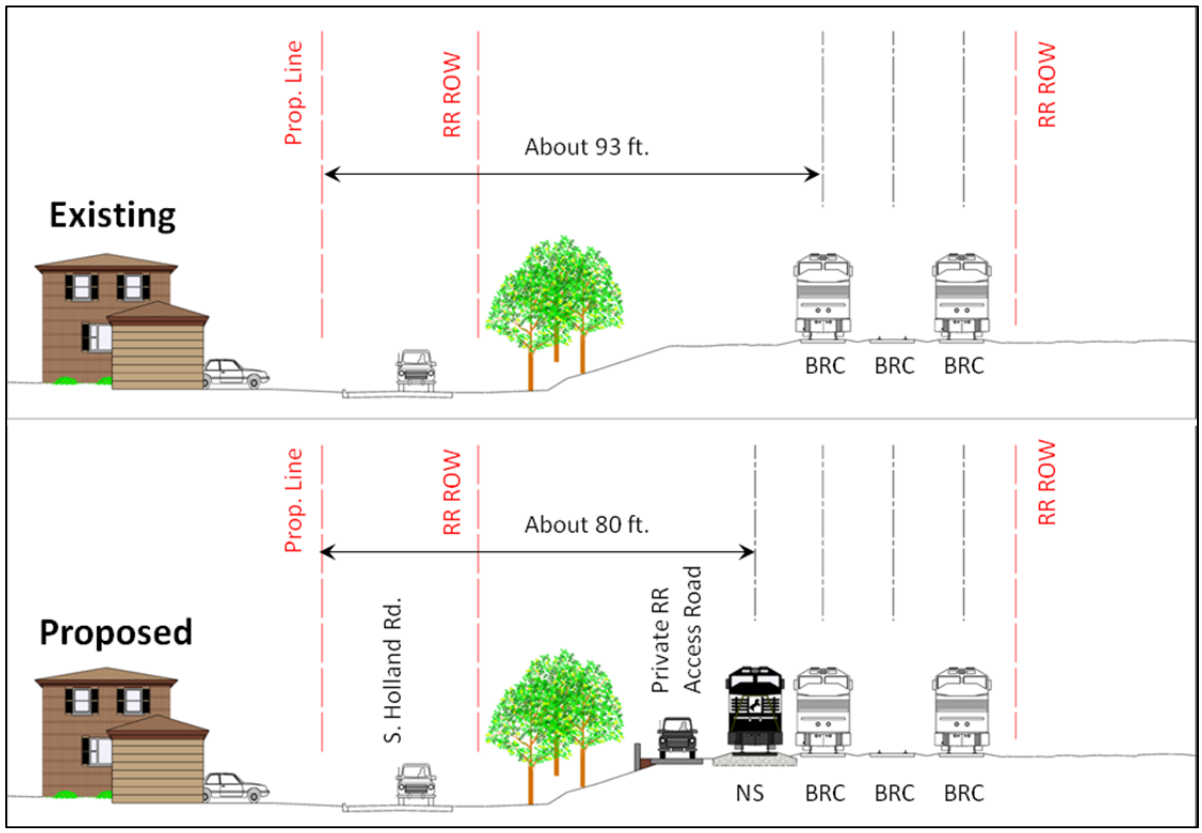

Figure 2-17: Alternate 80-2 and Existing Conditions, Looking North along BRC Tracks near 88th Street

In addition to eliminating crossing conflicts through the 80th Street Junction, the track realignments of Alternate 80-2 will also allow the BRC, NS and UP trains to each enter Belt Junction on the side of the 75th Street Corridor from which their routes exit. The UP, proposed with Alternate 80-2 to be on the north side at Belt Junction, travels north along the CSX tracks. The BRC, in the center tracks through Belt Junction, continues west toward Rockwell Yard. The NS, on a proposed new main track along the south side of the 75th Street corridor, continues to the southwest to Landers Yard. Thus the track changes with Alternate 80-2 eliminate any need for freight lines to cross through Belt Junction. (Conflicts between Metra's SWS and freight operations in Belt Junction would still remain, but these are addressed in the following section on the Metra Connection to the RID Line.)

Alternate 80-1 does not eliminate the crossing conflicts at 80th Street Junction, but adds additional track capacity through the junction. Alternate 80-2 eliminates all freight crossing conflicts at both 80th Street Junction and at Belt Junction. Because of its superior performance in improving railroad operations, Alternate 80-2 was advanced to the Build Alternative, and Alternate 80-1 was dropped from further consideration.

2.2.4.3 Metra SWS Connection to Rock Island District Line

Currently Metra SWS and NS movements must cross the BRC, CSX, and UP freight movements at Belt Junction to get from the south side of the 75th Street corridor to the north side. From Belt Junction, inbound trains continue north to downtown Chicago along the Norfolk Southern's CWI rail line (see Figure 2-18). The Metra SWS encounters additional at-grade conflicts and delays along the CWI line with the NS "Chicago Line," the east-west NS corridor just south of Pershing Road, and freight movements at the rail yard south of 47th Street (see Figure 1-9).

Figure 2-18: Metra RID Connection Area

A grade-separated Metra connection to the CWI line would eliminate the Metra conflicts with freight rail through Belt Junction, but it would not address the conflicts between Metra and freight rail operations north along the CWI line. These conflicts create delays for Amtrak, Metra, and NS trains (see Section 1.3.1). The only practical option to avoid these additional conflicts on the CWI line is to relocate the Metra SWS Line to the RID Line. The Metra RID Line is located just east of the 75th Street corridor, and proceeds northeast to 63rd Street, and then north generally parallel to the CWI tracks. The RID Line now carries mostly Metra passenger trains through this area, so relocating the Metra SWS to this route to downtown Chicago would eliminate conflicts between the SWS and all Class I freight operations. Removing the SWS trains from the CWI line would reduce delays for the Amtrak and freight operations that would remain on that line, as these trains currently must wait for Metra SWS trains to pass. The relocation would bring the Metra SWS into downtown Chicago at LaSalle Street Station rather than at Union Station, where it currently terminates. This would provide the added benefit of freeing up space at Union Station, which lacks adequate capacity to accommodate additional trains, particularly during rush hours, while LaSalle Street Station has available capacity for the additional SWS trains.

An alternate that connects the Metra SWS to the RID Line would thus address Metra conflicts with freight trains at Belt Junction and provide the further benefit of avoiding conflicts with freight train operations further north along the CWI line. There are several possible corridors where this connection to the RID could be made (see Figure 2-19). These are:

- Tunnel under Hamilton Park
- Overhead Structure through Hamilton Park
- Overhead Structure North of Hamilton Park
- Overhead Structure South of Hamilton Park

The particular features of each of these corridors and the specific alternates developed within each are discussed in the following paragraphs.

Tunnel under Hamilton Park – This alternate would require moving Metra from its existing elevation on embankment above the roadways to one beneath the existing street network. Accounting for the necessary structural thicknesses and the required minimum clearances, the tunnel alternate would require a minimum 45-foot change in elevation assuming a cut-and-cover method of construction. The maximum grade of railroad tracks for Metra operations is 2%. It would therefore take a distance of at least 2,250 feet (0.43 miles) to transition Metra tracks from the existing elevation to a tunnel, and a similar distance again to ascend from the tunnel back up to the existing embankment. All streets crossing the Metra tracks over this distance would be blocked by the tunnel structure. Along the 75th Street corridor, this could include Union Avenue, Halsted Street, and Peoria Street. Returning from the tunnel up to the elevation of the RID Line would close 71st Street, 72nd Street, and the 73rd Street pedestrian underpass to Hamilton Park.

Construction by the cut-and-cover method would require the demolition of all buildings in the path of the tunnel. To avoid impacts to ground-level buildings, which is a prime goal of a tunnel alternate, it would need to be even deeper. The exact depth would depend upon geological conditions that have not been tested as a part of this planning-level study. However, increasing the depth of the tunnel would at a minimum increase the transition lengths, require additional street closures (e.g., Morgan Street and 70th Street), and be more costly. In either case, the street closures would have a substantial impact on local residents, businesses, Chicago Transit Authority (CTA) bus operations, and emergency services.

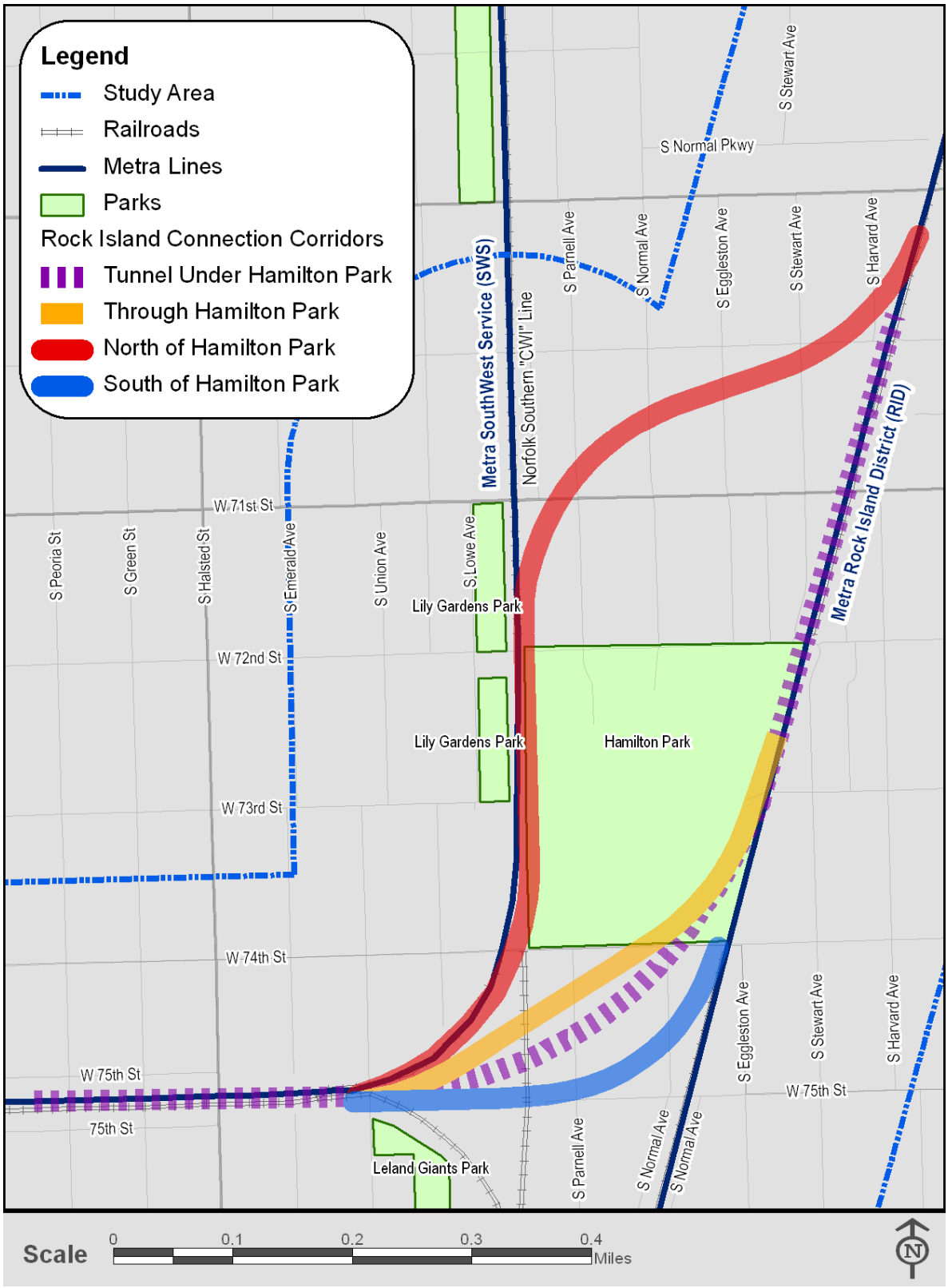

Figure 2-19: Metra Rock Island District Connection Corridor Locations

Additionally, the tunnel would require regular air intake and exhaust structures to move adequate fresh air into the tunnel and to remove the diesel exhaust. These structures would require large fans to move the air, and would create point sources of both noise and air pollution. Construction of a tunnel of over a mile in length would also cost substantially more than any of the other alternates. **Due to the potential greater impacts, particularly the major permanent street closures that would be required, combined with the high cost, the tunnel alternate was dropped from further consideration.**

Through Hamilton Park – To minimize impacts to the residential neighborhoods north and south of the park, it would be physically possible to construct several different alternate alignments on overhead structure through Hamilton Park to connect Metra's SWS to the RID Line (see Figure 2-19). However, as a public park, Hamilton Park is a valuable and irreplaceable community resource. Hamilton Park has also been recognized as a historic resource and placed on the National Register of Historic Places. Its historic significance is due to being part of the original park program in Chicago and having been designed by the Olmsted brothers, who designed a number of major parks, including Central Park in New York City.

As a publically-owned park and historic site, Hamilton Park is protected by Section 4(f) of the 1966 Department of Transportation Act, which prohibits the use of public park lands or historic sites for transportation projects unless it can be shown that there are no prudent and feasible alternatives, or it is determined that the impacts are minimal. (See the discussion in Section 3.5 of this document for additional details on Hamilton Park.) The study team met with the Chicago Park District (Park District) to discuss the project, and the Park District concluded that any of the "Through Hamilton Park" alternates would have a major impact on the park and would not be acceptable to the Park District. The study team also met with the Illinois Historic Preservation Agency (the State Historic Preservation Office) to review potential impacts to Hamilton Park, and they also concurred that any of the alternates located principally within the park would likely constitute an adverse effect on the park. Since other feasible alternates are available, **the "Through Hamilton Park" alternates were dropped from further consideration.**

North of Hamilton Park – For this group of alternates, inbound Metra SWS trains would turn north from the 75th Street corridor to run parallel to the NS CWI line along the west side of Hamilton Park and then diverge from the CWI line near 72nd Street and connect to the Metra RID Line near 69th Street (see Figure 2-19) . This would allow the SWS trains to avoid the conflicts with freight movements further north on the CWI line. The track would be on new overhead structure for almost the entire distance from Peoria Street to the RID tracks.

Because the RID Line angles away from the CWI line as it extends to the north, any new connection between the two lines would need to get longer the further north it is located. For this reason, any alternates crossing over to the RID Line north of Hamilton Park would need to be nearly three times longer than any crossing south of the park. All of this extra length would have to be constructed on an expensive overhead structure through a residential neighborhood, and costs and residential

impacts would thus be nearly triple those of any other above-ground alternates. Approximately 60 properties would have to be acquired in the neighborhood north of Hamilton Park. **Given the potential for much greater impacts and higher costs, the North of Hamilton Park alternates were dropped from further consideration.**

South of Hamilton Park – The group of alternates that would connect to the RID Line south of Hamilton Park would require either no or only a minimal property acquisition from the park. Three alternates were developed. These alternates - identified by the "RI-" prefix - are all similar in design, but follow slightly different alignments through the neighborhood south of Hamilton Park (see Figure 2-20.)

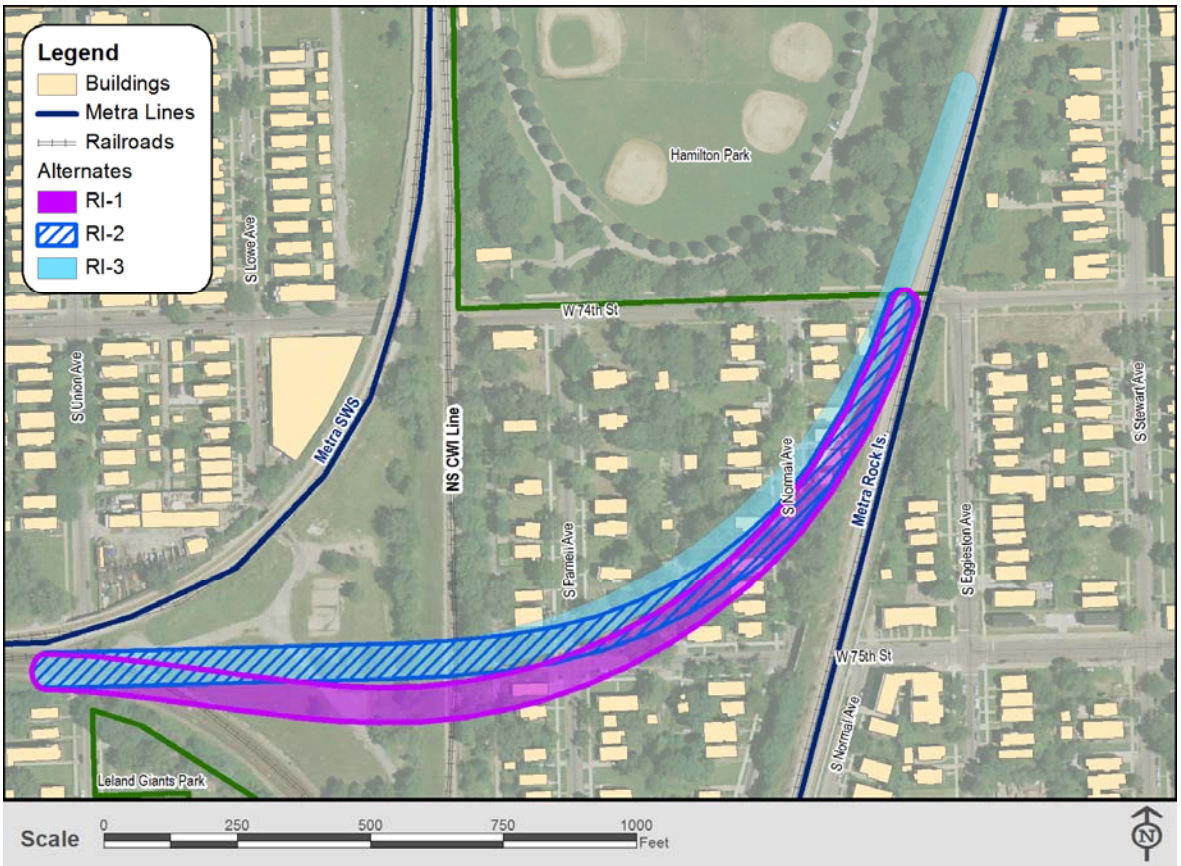

Figure 2-20: Alternates RI-1, RI-2, and RI-3, Metra Rock Island District Connection

All of these alternates would create a flyover bridge for Metra's SWS over the three BRC tracks near Union Avenue, continue east over two north-south NS tracks of the CWI line, and connect to the Metra RID Line between 74th Street and 72nd Street. The eastbound approach to the flyover bridge would begin rising at a 2% maximum grade near Sangamon Street, reach an ultimate height of 31 feet on a 340-foot long bridge above the BRC tracks, and then decline over a distance of approximately 1,800 feet to match the track level of the RID tracks. Figure 2-21 shows the new overhead Metra structure in the 75th Street corridor just east of Halsted Street, near Emerald Avenue. Note that this figure also shows the proposed NS main track to Landers Yard along the south side of

the corridor. The proposed new NS track is an element of Alternate 80-2, and would be approximately 46 feet closer to the residences along the south side of the corridor than the present nearest track.

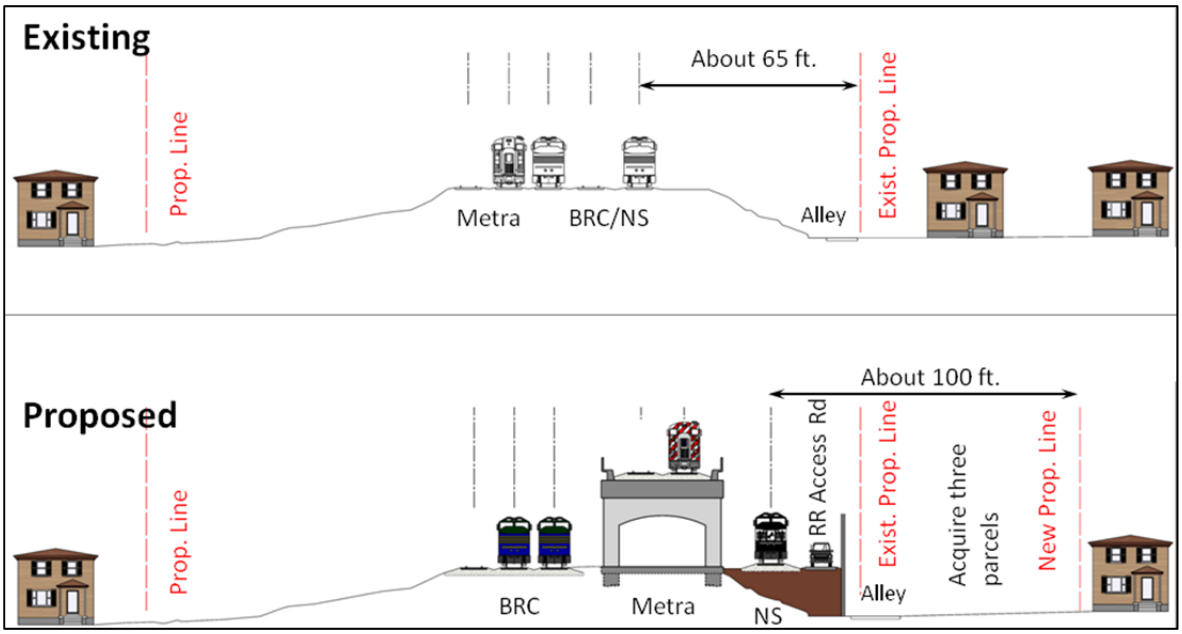

Figure 2-21: Alternates RI-1, RI-2, and RI-3 and Existing Conditions, Metra Rock Island District Connection, Looking East near Halsted Street

The general alignments for these three alternates are shown on Figure 2-20. The following is a brief description of each of these alternates:

RI-1. Metra flyover bridge on 40 MPH reverse curve, connecting to RID at 74th Street. This alternate was designed as the most direct connection to the RID Line that would meet Metra design criteria and not require taking property from Hamilton Park.

RI-2. Metra flyover bridge on 36 MPH curve, connecting to RID at 74th Street. This alternate was developed as a modification of Alternate RI-1 that would avoid taking the church property at 7500 S. Parnell. (It was not possible to develop an alignment that avoided both the church and any taking of Hamilton Park while still meeting Metra design criteria.)

RI-3. Metra flyover bridge on 40 MPH curve, connecting to RID north of 74th Street. Would impact the southeast corner of Hamilton Park. This alternate was designed to minimize the taking of residential properties to the greatest extent possible, while minimizing, but not avoiding, taking property from Hamilton Park.

The number of buildings impacted, number of parcels to be acquired, number of dwelling units remaining adjacent to the new structure, and amount of Hamilton Park land to be acquired varies for each alternate. These impacts for the three "South of the Park" alternates are compared in Table 2-4 and Table 2-5.

Table 2-4: Property Impacts – South of Hamilton Park Alternates

Property Impacts by Land Use[8]	Metra Rock Island District Connection Alternates					
	RI-1		RI-2		RI-3	
	Parcels	Area (ac)	Parcels	Area (ac)	Parcels	Area (ac)
Park	0	0	0	0	1	0.03
Vacant Land - Publicly Owned	0	0	1	0.15	1	0.15
Vacant Land - Privately Owned	6	0.76	6	0.75	7	0.91
Residential - Occupied	15	1.55	16	1.71	14	1.56
Residential - Unoccupied	1	0.15	0	0	0	0
Institutional (i.e., Church)	1	0.09	0	0	0	0
Total	23	2.56	23	2.61	23	2.65

Source: Jacobs Engineering, January 2014

Table 2-5: Screening Evaluation Matrix – South of Hamilton Park Alternates

	Evaluation Category (Unit of Measurement)	Metra Rock Island District Connection Alignment Alternates South of Hamilton Park		
		RI-1	RI-2	RI-3
Design	Design Speed (MPH)	40	36	40
	Meets Metra Design Criteria	Yes	No	Yes
	New Embankment Required (ft)	251	251	283
	New Structure Required (ft)	1,332	1,291	1,410
Impacts	Total New ROW Acquired (acres)	2.56	2.61	2.65
	Park Land to be Acquired (acres)	0	0	0.032
	Temporary Construction Permit in Hamilton Park	Yes	Yes	Yes
	ROW Taking from National Register Listed Property (i.e., Hamilton Park)	No	No	Yes
	Dwelling Units to be Acquired	27	26	21
	Parcels to Remain Adjacent to New Structure	3	3	4
	Dwelling Units to Remain Adjacent to New Structure	0	7	8
	Church to be Acquired	1	0	0
	Possible Public Road Closure (Union Ave)	1	1	1

Source: Jacobs Engineering, January 2014

Alternates RI-1 and RI-2 are located entirely south of Hamilton Park, and require no property acquisition from the park. Both alternates would require a temporary construction permit from the Park District to allow construction of a new retaining wall on railroad right-of-way at the extreme southeast corner of the park. In coordination meetings with the Park District, they indicated that with an acceptable restoration plan for the disturbed areas the temporary construction work could be completed under a construction permit (see Section 3.13.2.3 for additional details). The two alternates have generally similar right-of-way requirements, impacts to residential properties, and costs. The main differences are impacts to a church at 7500 South Parnell Avenue, dwelling units to

remain adjacent to the new bridge structure, and design speed. These issues are discussed in the following paragraphs.

Alternate RI-1 would require acquisition of the I Care Christian Center Ministries church (see Figure 2-22), but Alternate RI-2 would not. While the initial intent of the study team was to investigate alignment alternates that would avoid a taking of the church, close coordination with the local community led in a different direction. At the September 2011 CAG meeting, the pastor of the church indicated to the study team that he would not be averse to relocating the church. The following month, at the October 27, 2011 public meeting, the pastor and approximately 20 of church members commented that they preferred Alternate RI-1 – that would take the church – because they did not want the church to be left immediately adjacent to the new rail flyover structure.

Figure 2-22: I Care Christian Center Ministries church, 7500 S Parnell Ave.

Other residents at the public meeting also expressed concern about being left in close proximity to the new rail structure. In Alternate RI-1, the three parcels to be left immediately adjacent to the new structure are all vacant lots. This provides a greater buffer distance from the new structure to the residences that will remain. In Alternate RI-2, the three parcels remaining nearest to the new structure include one vacant lot, one single family home, and a six-unit apartment building at 7456 S. Parnell Avenue.

The design speed of the new track is a concern for Metra. Alternates RI-1 and RI-3 would have a 40-mph design speed, but the required curve for RI-2 would allow only a 36-mph design speed. Metra's criteria for this location specifies a 40-mph design speed, and the lower speed would adversely affect Metra operations through this section, so a variance would have to be obtained to allow the lower design speed. Also related to the alignment is how the structure relates to the intersection of 75th Street & Parnell Avenue. Alternate RI-1 crosses diagonally from the southwest corner to the northeast corner. This diagonal overhead crossing would require bridge piers very close to the existing roadway which could limit sight distances for vehicles traveling through the intersection. Alternates RI-2 and RI-3 would be located entirely north of 75th Street and would not affect the intersection.

Alternate RI-3 would permanently impact the southeast corner of historic Hamilton Park, requiring approximately 0.03 acres of park property. No public comments regarding this use of Hamilton Park or Hamilton Park as a historic resource were received either at or after the October 27, 2011 public meeting. Alternate RI-3 impacts two fewer residential buildings and five fewer dwelling units than RI-2, and would avoid taking the I-Care Christian Center Ministries church. Four parcels and eight

dwelling units would be left immediately adjacent to the proposed overhead rail structure, including two single family homes and the multi-family apartment building at 7456 S. Parnell Avenue. The estimated cost is generally similar for all three alternates.

A Range of Alternatives public meeting was held on October 27, 2011 and attended by 232 persons. Forty of the attendees commented on the South of the Park alternates for the Metra RID Connection. Of those, 28 preferred Alternate RI-1, 1 preferred Alternate RI-2, and 8 preferred Alternate RI-3. (No further comments were received following the meeting.)

As Alternate RI-2 does not meet Metra design criteria, had almost no public support at the public meeting, and has the greatest combined total of residential dwelling units either taken or left immediately adjacent to the flyover structure, **RI-2 was not recommended and was dropped from further consideration.** Alternate RI-1 meets Metra design criteria, has the lowest combined total of residential dwelling units to either be acquired or left immediately adjacent to the new rail flyover structure, has by far the greatest public support, and avoids any permanent taking of property from Hamilton Park**. Alternate RI-3 was therefore dropped from further consideration and Alternate RI-1 was advanced for more detailed evaluation.** Alternate RI-1 is shown in Figure 2-23**.**

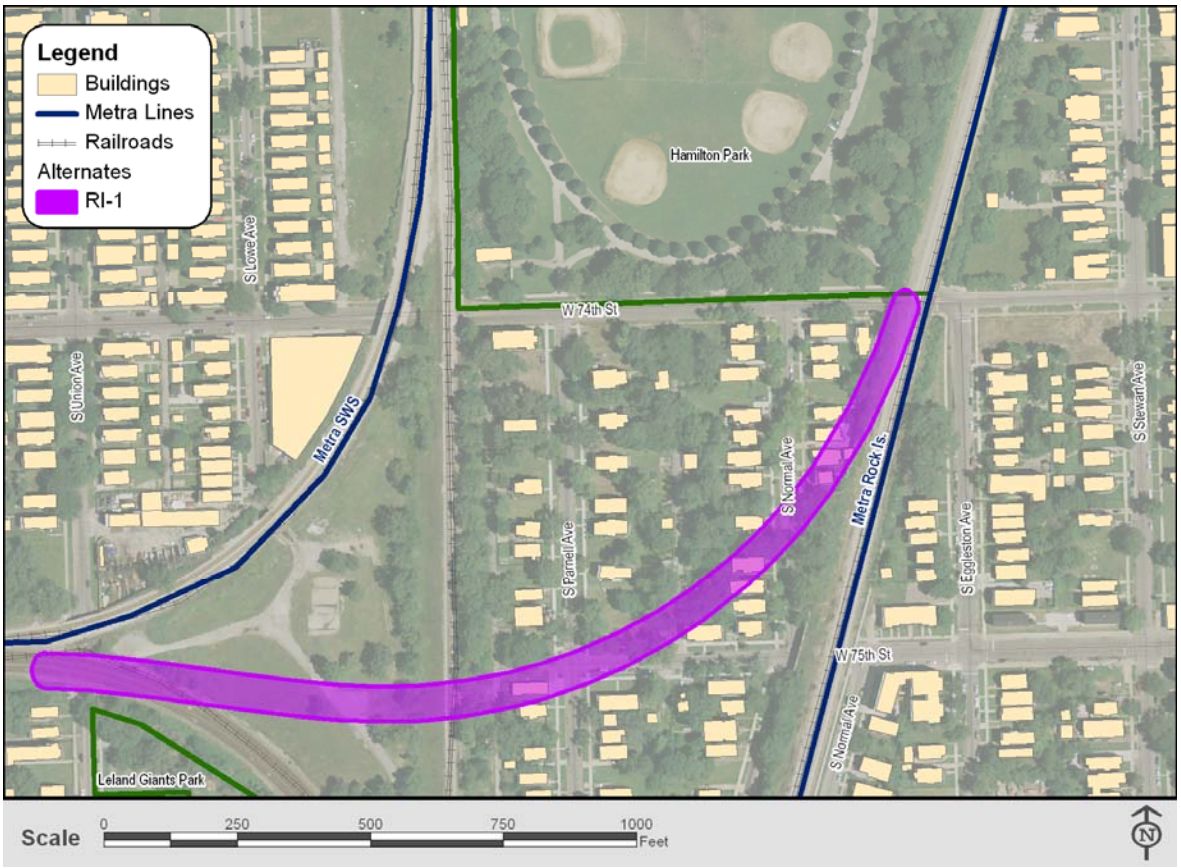

Figure 2-23: Alternate RI-1, Metra Rock Island District Connection

Union Avenue Viaduct Options – Any of the "South of the Park" alternates would require major changes to the Union Avenue viaduct because the new tracks for the 80th Street alternate and the new structure to carry the two Metra tracks over the BRC tracks make it impossible to use the existing viaduct. The existing structure (see Figure 2-24) provides only an 11'-10" vertical clearance over the roadway, while current standards call for a minimum clearance of 14'-9". Two options for addressing this situation were considered:

Figure 2-24: Union Avenue Viaduct

- Option 1: Close Union Avenue at the railroad embankment, fill the existing bridge opening with embankment, provide street cul-de-sacs on each side of the closure, and make Union Avenue a two-way street for the first block away from the cul-de-sacs (see Figure 2-25).
- Option 2: Provide a new viaduct at Union Avenue and lower the street to provide the required vertical clearance.

A third option was also considered to close Union Avenue to vehicles, but maintain a pedestrian underpass. Based on community input regarding security concerns at existing pedestrian underpasses in the area, this option was dismissed.

Option 2 would require reconstruction of the street beneath the structure, provision of a new sewer to drain the lowered area beneath the bridge, and require closing the street for approximately one year of construction. The roadway beneath the bridge would be reduced in width to 20 feet with 8-foot wide curb-attached sidewalks to allow a much shorter (and therefore less expensive) bridge to be constructed overhead. Current traffic through the existing viaduct is relatively low - approximately 500 vehicles per day and 125 pedestrians per day.[9] The east-west railroad tracks in the 75th Street corridor mark the boundary between elementary school districts and between police districts, so a closure would not affect those services. Table 2-6 summarizes the principal differences between the two options.

Table 2-6: Union Avenue Design Options Comparison

Category	Design Option 1: Close Union Avenue	Design Option 2: Construct New Viaduct
Railroad operations	Meets rail operations needs	Meets rail operations needs
Planning level estimated construction cost ($2011)	Approximately $1,000,000	Approximately $9,000,000
Maintenance costs	Lower	Higher
Traffic impacts	Permanent closure	Temporary closure (approx. one year) for construction

Category	Design Option 1: Close Union Avenue	Design Option 2: Construct New Viaduct
Park access	Reduces access to Leland Giants Park from north	Maintains existing access
Transit access	Reduces access to CTA #75 from the south	Maintains existing access
Elementary School access	No impacts	No impacts
High School access	Increases travel distance to Robeson High School for 7500 block of S. Union by ¼ mile maximum	No impacts
Library access	No impacts	No impacts
Emergency services (i.e., police and fire)	No impacts	No impacts
Provision of public services	Negligible impacts	No impacts
Safety	Improvement due to removal of viaduct	Improvement due to new viaduct and other infrastructure
Community cohesion	Reduction in interaction	No impacts
Physical aspects	Increased barrier to travel (see access to destinations above)	Reduced barrier to travel due to new viaduct infrastructure
Visual impacts	Subjective and dependent on final design treatments	Improved due to new viaduct infrastructure

Both options were presented at the October 27, 2011 public meeting. A total of 13 comments were received about the Union Avenue design options, with seven favoring Option 1, five favoring Option 2, and one supporting either option. The study team coordinated these options with the Chicago Department of Transportation, which expressed no objection to either of the options.

Extensive public outreach was conducted for this project, but there was not a clear stakeholder consensus for one of the two Union Avenue viaduct options. Considering this input, **Option 1 was recommended as the preferred option, as it would reduce project construction costs by approximately $8 million and reduce future maintenance costs.** This recommendation is also consistent with the recommendation of a June 2006 street closure report that found that the community impacts of a closure would be relatively minor, while the costs would be substantially lower. The study team also consulted with the Chicago Park District and the Alderman whose ward includes the location, and both concurred with the recommendation of Option 1.

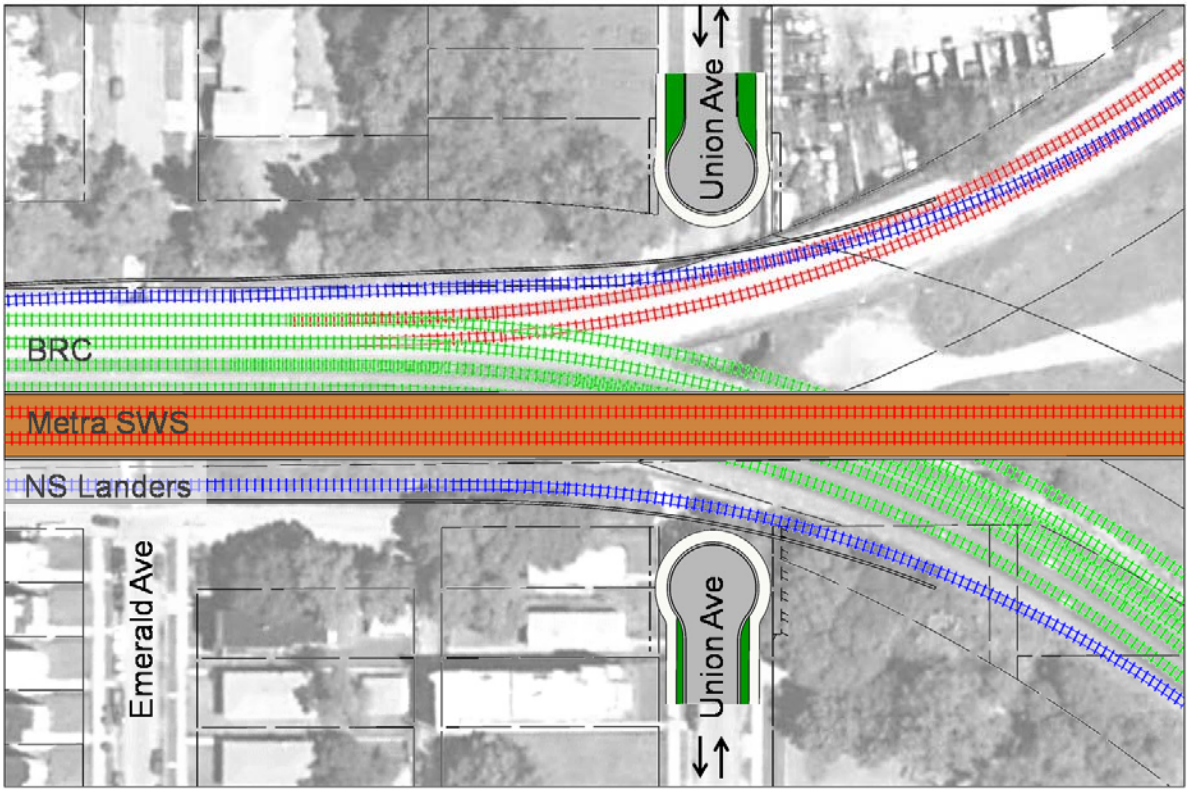

Figure 2-25: Union Avenue Viaduct – Option 1 : Cul-de-sac

2.2.4.4 Belt Junction

The improvements at 80th Street Junction and the Metra connection to the Rock Island will completely eliminate rail conflicts at Belt Junction.

As discussed in Section 2.2.4.2, the recommended alternate to address conflicts at 80th Street Junction (Alternate 80-2) will also eliminate the current conflicts between the freight movements on BRC tracks and the NS freight trains attempting to get to Landers Yard. The only other rail conflicts in the Belt Junction area are then those between freight trains operating on the BRC tracks and the Metra SWS passenger trains attempting to move from the south side of the 75th Street corridor to the north toward downtown Chicago. As described in Section 2.2.4.3 above, the Metra SWS Connection to the RID Line alternate will provide a flyover structure for the Metra operations to eliminate all Metra conflicts with freight operations through Belt Junction. Thus, with implementation of the recommended alternate in the 80th Street Junction and any of the alternates for a Metra flyover connection to the RID Line, all rail conflicts in Belt Junction – both freight and passenger – would be eliminated. No further construction would be required in Belt Junction beyond the work proposed for the 80th Street and Metra Connection alternates.

2.2.4.5 Metra along Columbus Avenue

Metra currently operates on a single track for 2.0 miles between the Ashburn Interlocking (north of 83rd Street) to approximately Western Avenue, generally parallel to Columbus Avenue along the northwest side of Landers Yard (see Figure 2-26 and the existing track schematic in Figure 2-27). The single track section reduces the reliability of Metra service, as discussed in Section 1.3.3. While the alternates to add a second track for Metra in this area must be considered in the design of the improvements in the other areas, particularly the Forest Hill and 80th Street areas, these alternates can be evaluated independently, and will not affect the screening of alternates in the other improvement areas. The two alternates considered in the Metra along Columbus Avenue area (denoted by the "CA" prefix) are:

Figure 2-26: Metra along Columbus Avenue

CA-1: Add a second mainline track from the Ashburn Interlocking to Western Avenue to the *northwest* side of the existing Metra track adjacent to Landers Yard.

CA-2: Add a second mainline track from the Ashburn Interlocking to Western Avenue, entirely *southeast* of the existing Metra track. (See Figure 2-28 for Alternate CA-2. At this drawing scale, the minor differences between the two alternates are not discernible, so CA-1 is not shown in this view.)

The two alternates are identical south of Landers Yard, where they would use existing bridges over 79th Street and Kedzie Avenue, run alongside the existing Wrightwood Station, and continue south to the existing two-track section near the Ashburn Metra station. Either alternate would be constructed entirely within existing railroad right-of-way. With either alternate, the existing at-grade pedestrian crossing of the NS tracks at S. St. Louis Avenue, just south of Columbus Avenue, would be removed and replaced by a new at-grade pedestrian crossing on the east side of the crossing of the CN tracks, just a block northeast of the Metra Ashburn Station. See Figure 2-28 for the location of the proposed crossing. A second train station platform for the new track would be constructed at the Wrightwood Station. The two alternates are essentially identical except in the area where the new track will run adjacent to Landers Yard along Columbus Avenue.

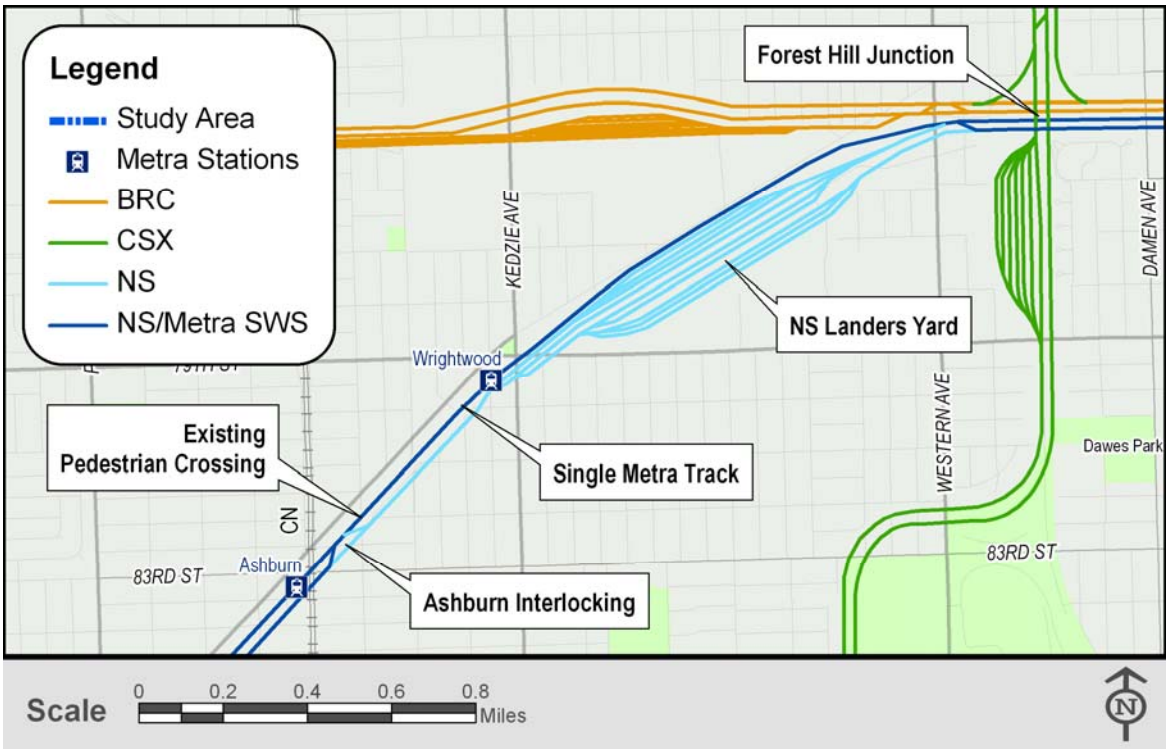

Figure 2-27 : Existing Track Schematic – Metra along Columbus Avenue

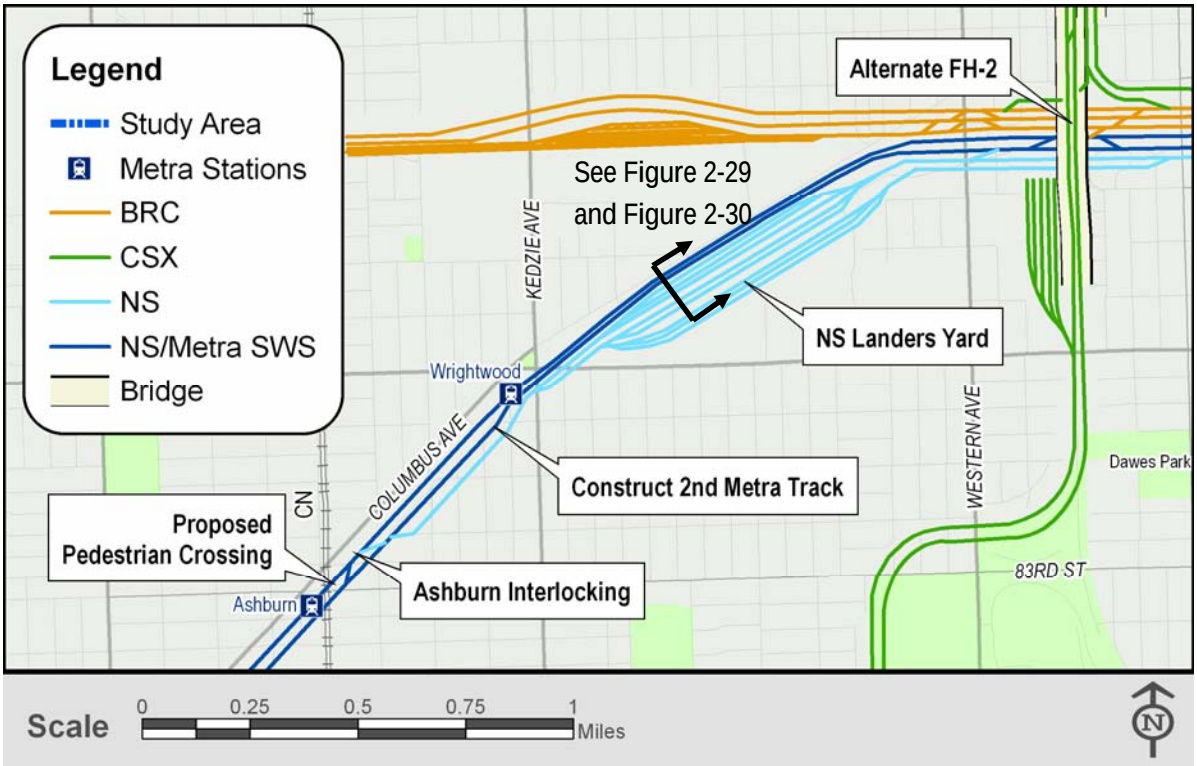

Figure 2-28: Alternate CA-2, Proposed Track Schematic – Metra along Columbus Avenue

Alternate CA-1 would add a new Metra track northwest of the existing track adjacent to Landers Yard. The track would be within the existing railroad right-of-way, but not in conformance with Metra standards. The Metra trains would be located as close as 13 feet from the roadway edge-of-pavement (see Figure 2-29). The proximity to the roadway raised several concerns:

- There would be a potential for errant vehicles to leave the roadway and stop on railroad tracks, which would need to be prevented with a barrier wall.
- Southwest-bound Metra trains could cause visibility problems for approaching northeast-bound drivers on Columbus Avenue. Metra trains contain three headlights, one of which is 15 feet high and oscillates. There would be a danger that oncoming drivers would be disoriented and veer away from the approaching train, into the opposing traffic on Columbus Avenue. Screening traffic from these train lights would require some kind of very tall wall or glare screen, which could cause conflicts with the positioning of roadway lighting and could be expensive to construct and maintain.
- Trains would be less than 15 feet from the roadway for over a half-mile (2,730 feet). The limited horizontal clearance to the roadway coupled with a barrier wall separation, and a fence separation from the NS Landers Yard tracks would severely limit access for railroad maintenance activities on the Metra track.
- Roadway lighting and railway signals would need to be mounted on the barrier wall separating the tracks from the roadway. With little room on either side of the wall, maintenance of these units would require lane closures on Columbus Avenue.

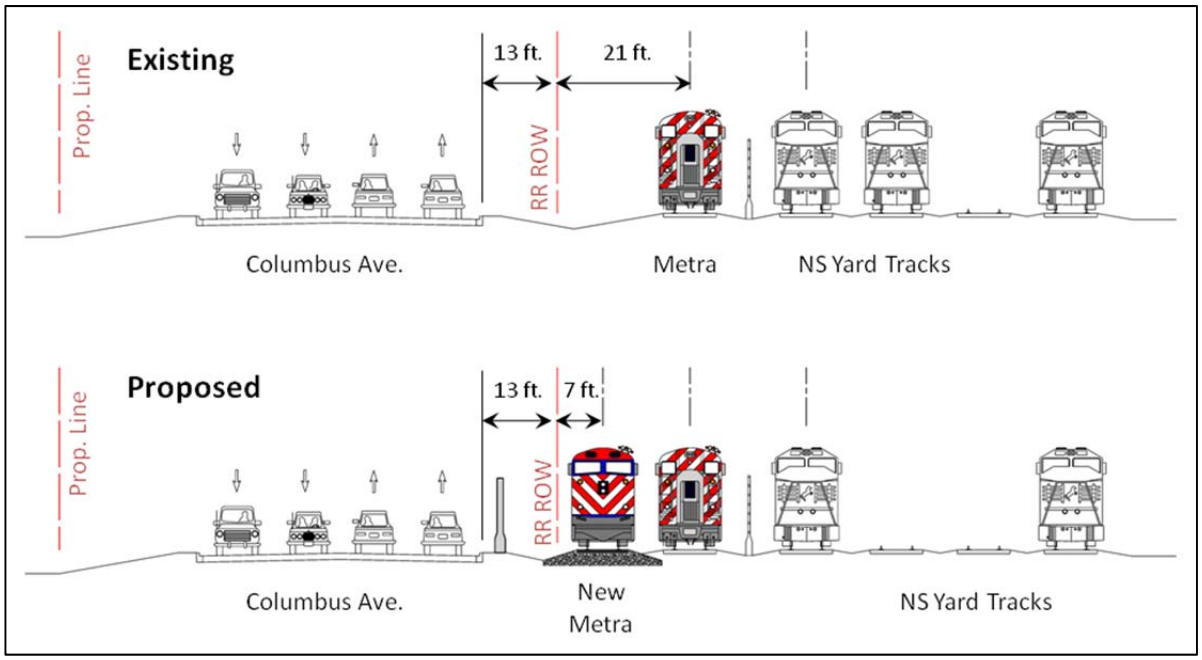

Figure 2-29: Alternate CA-1 and Existing Conditions, Looking Northeast along Columbus Avenue

Alternate CA-2 would add a second track southeast of the existing Metra track in the vicinity of Landers Yard. This alternate would keep the nearest Metra trains at approximately the same distance from the existing roadway as they are now (see Figure 2-30). This alternate would require the reconstruction and reconfiguration of portions of the tracks in NS's Landers rail yard. **Due principally to the safety concerns with moving Alternate CA-1 nearer to the Columbus Avenue right-of-way, that alternate was eliminated from further consideration, and only Alternate CA-2 was advanced for further evaluation.**

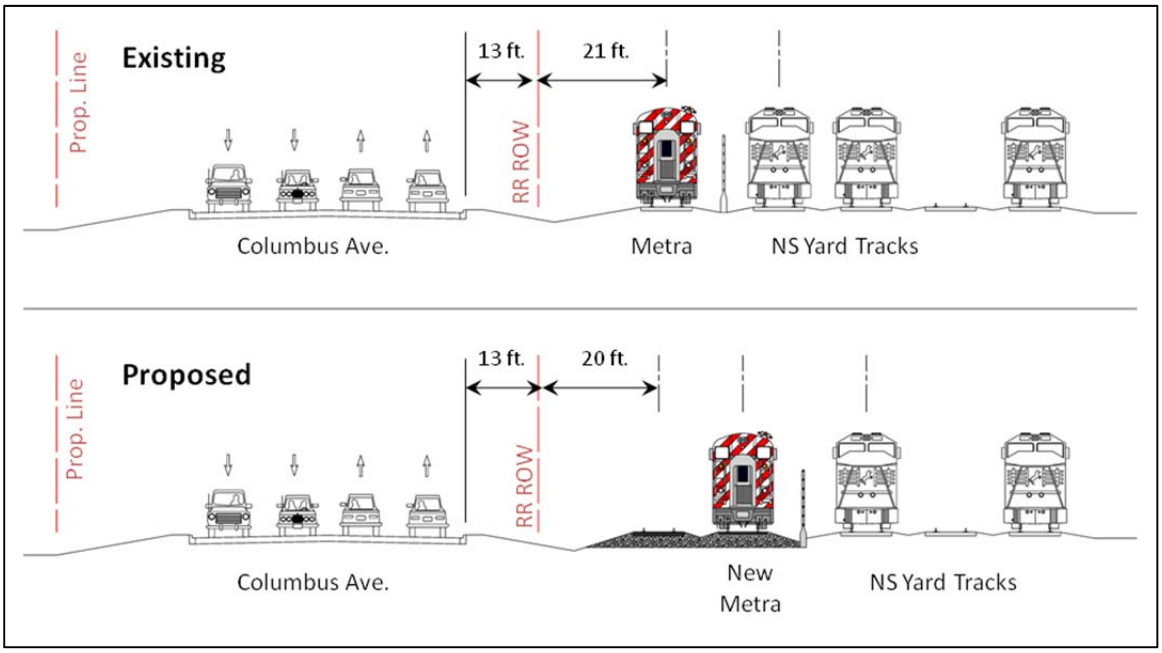

Figure 2-30: Alternate CA-2 and Existing Conditions, Looking Northeast along Landers Yard

2.2.4.6 Local Mobility

As discussed in Section 1.3.3, the numerous rail lines in the study area create physical barriers to vehicular, bicycle, and pedestrian mobility. There are often conditions that impede or discourage travel at the crossings under railroad viaducts. Residents of the community consistently identified low visibility due to lighting conditions, poor drainage, crumbling concrete, and poor pavement conditions on roadways and sidewalks as important safety issues that impact mobility within the study area.

The study area includes 48 locations where railroad bridges cross over roadways or pedestrian passages. A total of 37 viaduct locations were surveyed to document deficiencies in the lighting, drainage, roadway, sidewalks, and general structural conditions, as identified in the project's Purpose and Need statement. The 11 viaduct locations that were not surveyed include two over expressways (I-94 and I-57), two over expressway frontage roads with limited pedestrian demand (State Street and Lafayette Avenue), one over a private access roadway to railroad property (Lowe Avenue), and

six that have been recently reconstructed by Metra on the RID Line. Figure 2-31 shows the locations of the 37 viaducts surveyed.

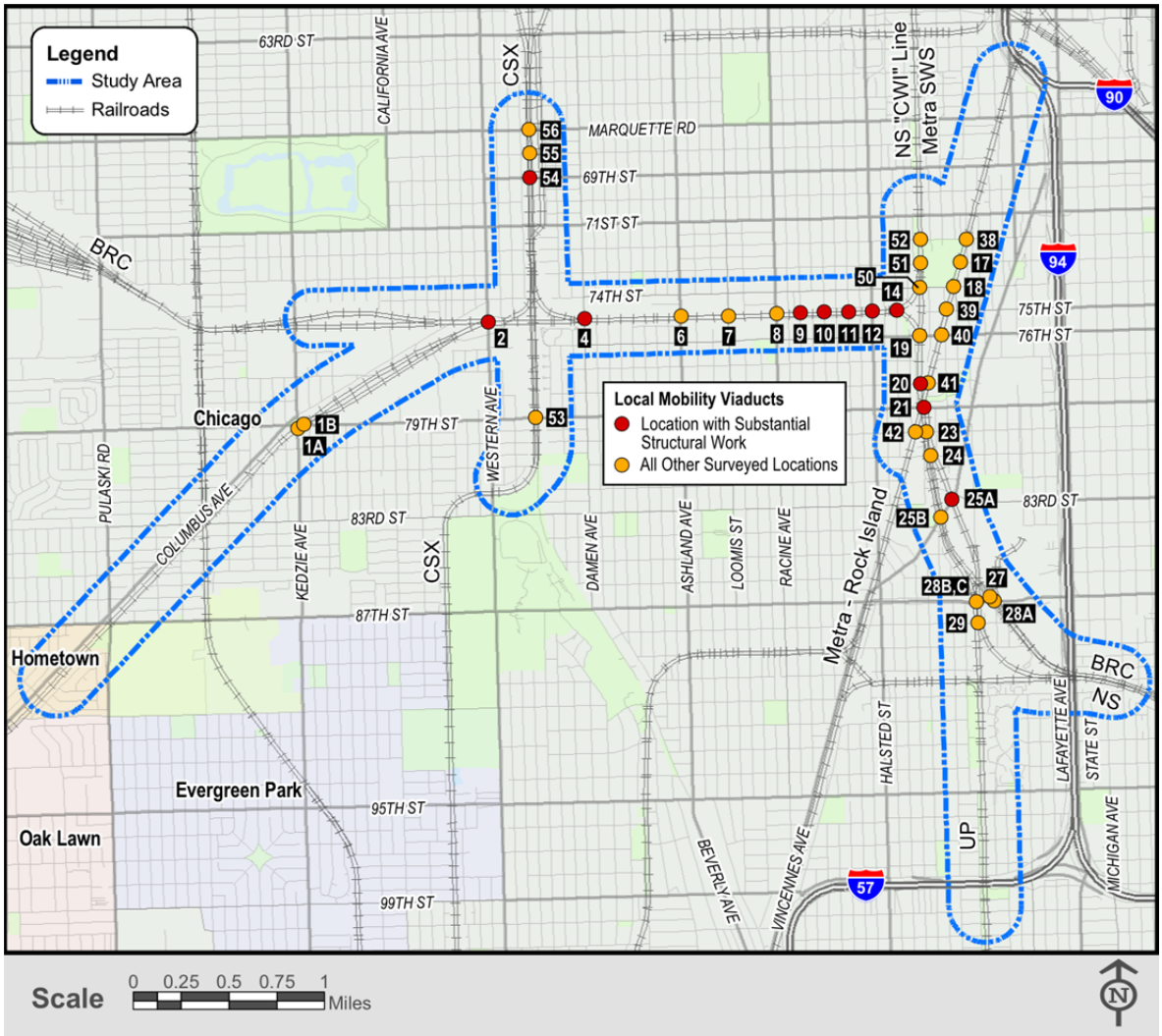

Figure 2-31: Viaducts Included in Local Mobility Study

Some of the deficiencies noted in the survey were routine problems resulting from deferred maintenance, such as burned out lights under bridges or clogged drainage inlets on roadways (see Table 2-7).

Table 2-7: Viaduct Maintenance Needs Summary, Non-Project-Eligible

Category	Scope
Lighting	Replace 108 non-functioning light fixtures
Drainage	Clean inlet and sewer line, and TV-inspect lines at 19 locations
Bridge Structure	Remove loose concrete at 12 locations and make surface repairs at 2 locations

Maintenance work *will not* be eligible for funding as a part of the 75th Street CIP. However, based on community concerns and the results of the viaduct surveys, the City of Chicago, in cooperation with IDOT, has undertaken a stepped-up maintenance program on these viaducts to correct some minor deficiencies and identify the nature and extent of any more serious problems. This maintenance work is ongoing with limited funding from the City of Chicago.

In addition to the maintenance work items discussed above, the viaduct survey found many deficiencies that could be addressed through reconstruction or replacement and which *would* be eligible for funding as a part of the 75th Street CIP. A description of work items that could be incorporated into the project is as follows:

- Full replacement of viaduct lighting systems from existing orange sodium vapor lighting to white metal-halide lighting. This is the new standard for the City of Chicago.
- Roadway resurfacing or reconstruction where the pavement condition is rated below 6 out of 10 using the Pavement Surface Evaluation and Rating (PaSER) rating system,[10,11] or where the pavement is brick.
- Sidewalk reconstruction where the condition is rated as fair or poor (as opposed to excellent or good).
- Sidewalk ramp construction where current Americans with Disabilities Act (ADA) guidelines[12] are not met.
- Sewer reconstruction where cleaning proves to be insufficient to remedy the drainage problems.
- Inlet and catch basin construction where they are missing or collapsed.
- Bridge and abutment waterproofing where there are leaks.

Two alternates were developed to address these identified project-eligible work items at the viaducts. *Alternate LM-1* would correct the identified deficiencies at all 36 surveyed viaducts within the study area. Union Avenue, the remaining surveyed viaduct, would be closed. The scope of work is based on meeting current policy standards (e.g., lighting, ADA ramps) or a minimum performance standard (e.g., roadway pavement, sidewalks, drainage, bridge structures). Table 2-8 lists the viaduct improvements included within Alternate LM-1.

Table 2-8: Viaduct Work Elements Included in Alternate LM-1

Viaduct		Improvement Elements						
Map No.	Street	Pavement	Sidewalk	ADA Ramps	Lighting	Inlet & Sewer	Bridge Drainage	Substantial Structural Work Required
1A	Kedzie Ave - South of 79th St	-	-	x	x	-	-	-
1B	79th St - East of Kedzie Ave	-	x	-	x	-	-	-

Viaduct		Improvement Elements						
Map No.	Street	Pavement	Sidewalk	ADA Ramps	Lighting	Inlet & Sewer	Bridge Drainage	Substantial Structural Work Required
2	Western Ave	-	-	x	x	--	-	x
4	Damen Ave	-	-	-	x	x	-	x
6	Ashland Ave	-	-	x	x	-	-	-
7	Loomis Blvd	x	-	-	x	x	x	-
8	Racine Ave	x	-	-	x	x	x	-
9	Aberdeen St	-	-	-	x	--	x	x
10	Morgan St	-	-	x	x	-	-	x
11	Peoria St	x	-	x	x	x	-	x
12	Halsted St	x	-	x	x	x	x	x
14	Union Ave	Viaduct to be closed						x
17	73rd St Pedway	-	x	x	x	-	-	-
18	74th St	x	x	x	x	x	-	-
19	76th St	-	x	x	x	-	x	-
20	78th St	x	x	-	x	x	x	x
21	79th St	-	-	x	x	-	x	x
23	80th St	x	-	x	x	x	x	-
24	81st St	x	x	x	x	x	x	-
25A	Vincennes Ave	x	x	x	x	x	x	x
25B	Vincennes Ave-North of 84th St	x	x	x	x	x	x	-
27	Holland Rd	-	-	-	x	-	-	-
28A	87th St-East of Holland Rd	-	-	-	x	-	-	-
28B &C	87th St-East of Eggleston Ave	-	-	-	x	-	x	-
29	88th St	-	-	x	x	-	-	-
38	72nd St	-	-	x	x	-	-	-
39	75th St	-	x	x	x	x	x	-
40	76th St	-	x	x	x	-	-	-
41	78th St	x	x	x	x	x	x	-
42	80th St	x	-	x	x	x	-	-
50	74th St	x	x	-	x	x	-	-
51	73rd St	-	-	x	x	-	-	-
52	72nd St	x	x	-	x	x	-	-
53	79th St	x	-	-	x	-	x	-

Viaduct		Improvement Elements						
Map No.	Street	Pavement	Sidewalk	ADA Ramps	Lighting	Inlet & Sewer	Bridge Drainage	Substantial Structural Work Required
54	69th St	-	-	x	x	x	-	x
55	68th St	x	-	x	x	x	-	-
56	Marquette Rd (67th St)	-	-	-	x	x	-	-

Source: Jacobs Engineering, December 2011

Alternate LM-2 would be less-comprehensive, correcting the identified deficiencies only at those viaducts which will require substantial structural work associated with the other track improvements making up the Build Alternative. Substantial structural work is anticipated at 11 of the 37 viaduct locations, as shown in Figure 2-31, and as listed in Table 2-9.

Table 2-9: Viaduct Work Elements Included in Alternate LM-2

Viaduct		Improvement Elements						
Map No.	Street	Pavement	Sidewalk	ADA Ramps	Lighting	Inlet & Sewer	Bridge Drainage	Substantial Structural Work Required
2	Western Ave	-	-	x	x	--	-	x
4	Damen Ave	-	-	-	x	x	-	x
9	Aberdeen St	-	-	-	x	--	x	x
10	Morgan St	-	-	x	x	-	-	x
11	Peoria St	x	-	x	x	x	-	x
12	Halsted St	x	-	x	x	x	x	x
14	Union Ave	Viaduct to be closed						x
20	78th St	x	x	-	x	x	x	x
21	79th St	-	-	x	x	-	x	x
25A	Vincennes Ave	x	x	x	x	x	x	x
54	69th St	-	-	x	x	x	-	x

Source: Jacobs Engineering, December 2011

Completing viaduct-related work in conjunction with other rail and structural work would improve cost-efficiencies in many cases. For example, where pier and abutment work is needed to upgrade the railroad bridges, repair or replacement of roadway, sidewalk, and drainage facilities could also be completed at those viaducts. Another possible cost-effective option could be the waterproofing of the top surface of a bridge deck at those viaducts where proposed new trackwork would require removal of the existing tracks above the bridge.

The impediments to local mobility caused by the conditions at the viaducts were identified by the community as a primary issue to address in the project. Based on this input and the results of the

viaduct conditions survey, the reduction of impediments to local mobility caused by the conditions at the viaducts was made part of the Purpose and Need statement of the project. Additionally, the inclusion of all 36 of the Local Mobility viaduct improvements as the recommended alternate would provide direct positive benefits to the communities in which the railroads operate. **Based on these considerations, Alternate LM-1 is recommended to advance for further evaluation.** At their meeting of December 14, 2011 the Project Study Group concurred with this recommendation.

2.3 Alternatives for Detailed Evaluation

The preceding paragraphs presented those alternates that advanced through the screening process for more detailed evaluation. Each of these alternates, however, addresses only the portion of the identified transportation problems within the specific "improvement area" of the 75th Street Corridor Improvement Project for which they were developed. A complete "Build Alternative" to address all aspects of the project's Purpose and Need statement throughout the entire study area must consist of a combination of the screened alternates from each of the individual improvement areas that make up the 75th Street corridor, as shown in Figure 2-32. Since only one alternate in each of the improvement areas advanced through the screening process, these are combined into only a single Build Alternative for the 75th Street CIP. The Build Alternative will be compared to a No-Build Alternative in which no major capital improvements would be made.

2.3.1 No-Build Alternative

The No-Build Alternative is included in the evaluation to serve as the baseline against which the Build Alternative is compared. The No-Build Alternative is the course of action in which none of the major transportation improvements considered in the 75th Street Corridor Improvement Project would be constructed. The No-Build Alternative, however, does assume that all of the other fiscally constrained major capital projects planned and programmed in the Chicago Metropolitan Agency for Planning (CMAP) *GO TO 2040 Comprehensive Regional Plan*[13] and the 2010-2015 Transportation Improvement Program (TIP)[14] by the design year of 2029 are in fact constructed.

Two major capital projects in the CMAP GO TO 2040 plan are related to the 75th Street CIP. One is the addition of a third track to the Metra RID Line from approximately 89th Street to 16th Street, which passes through the study area. The other is the West Loop Transportation Center, which would add capacity at Union Station, the current terminus of the Metra SWS Line. Neither of these projects are in the CREATE Program.

Several CREATE Program component projects are also either located within the study area (i.e., the GS11 Columbus Avenue and the GS21a 95th Street Grade Separation projects) or would impact train volumes in the study area (i.e., the WA10 Blue Island Junction project). The CREATE Program is not listed as a "major capital project" in the CMAP *GO TO 2040* Plan, but receives special mention as recommended "systematic improvements necessary to bring the transportation system up to a state of good repair." The CTCO Train Model of railroad operations for the No-Build Alternative assumes that none of the CREATE Program projects would be implemented.

2.3.2 Build Alternative

The following alternates, described in Section 2.2.4 of this document, are included in the Build Alternative:

- FH-2 – This alternate removes all rail conflicts at Forest Hill Junction and all highway-rail conflicts at 71st Street by elevating the north-south CSX tracks over the BRC, Metra SWS, and NS rail tracks, as well as over 71st Street. Passenger service reliability would be improved for the Metra SWS due to the elimination of conflicts with freight traffic at Forest Hill Junction. More details on this alternate are presented in Section 2.2.4.1 and Figure 2-7.
- 80-2 – This alternate eliminates crossing conflicts at 80th Street Junction by relocating the Union Pacific movements east of the BRC tracks and constructing a new NS track to Landers Yard west of the BRC tracks. These changes will also eliminate the freight conflicts through Belt Junction. Capacity through the 80th Street Junction area would be increased by constructing two additional through tracks. This also improves passenger service reliability for Amtrak trains passing through 80th Street Junction. More details are presented in Section 2.2.4.2 and Figure 2-14.
- RI-1 – This alternate eliminates Metra conflicts with freight movements through Belt Junction by constructing a flyover bridge for the Metra SWS over the BRC tracks near Union Avenue. The bridge would continue east above the CWI rail line to connect to the Metra RID Line south of 74th Street, thereby providing the added benefit of eliminating Metra conflicts with other freight movements north on the CWI line. Removing Metra trains from the CWI line would improve passenger service reliability for the relocated SWS and for Amtrak trains remaining on the CWI line. More details are presented in Section 2.2.4.3 and Figure 2-20.
- CA-2 – This alternate improves passenger service reliability by constructing a second track for the Metra Southwest Service to the east of the existing track, parallel to Columbus Avenue from approximately Ashburn Junction to Western Avenue. This alternate will require some reconstruction of tracks within the existing NS Landers Yard. More details are presented in Section 2.2.4.5 and Figure 2-28.
- LM-1 – The Build Alternative also includes Local Mobility improvements at 36 viaducts within the project area. This work would include all capital improvements to lighting, drainage, pavement, sidewalks, and structure condition necessary to meet or exceed a defined minimum condition level. See Section 2.2.4.6 and Figure 2-31 for additional details.

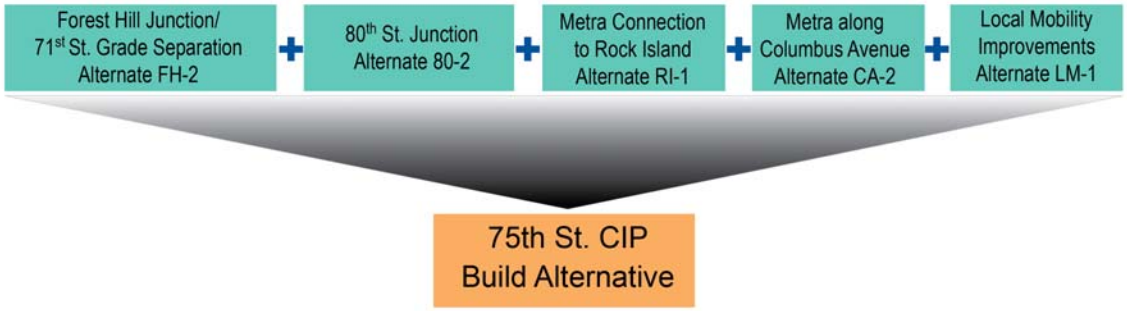

Figure 2-32: Composition of Build Alternative

2.4 Evaluation of the Build and No-Build Alternatives

2.4.1 Project Purpose and Need

The Build Alternative would meet all major elements of the project's Purpose and Need statement:

- Reduce Rail Line At-Grade Conflicts – The Build Alternative would eliminate all major rail line at-grade conflicts at Forest Hill Junction, Belt Junction, and 80th Street Junction, as well as rail conflicts between Metra SWS and freight operations north of the project area along the CWI line.
- Reduce Highway-Rail Crossing Problems – The Build Alternative would eliminate highway-rail conflicts at the 71st Street grade crossing. (Two other separate CREATE projects are planned to eliminate two other major grade crossing conflicts within the project area.)
- Reduce Local Mobility Problems – Improvements to 36 viaducts in the project area would improve local mobility by repairing or replacing roadway paving and drainage, repairing sidewalks and access ramps, and replacing lighting.
- Improve Rail Transit Passenger Service Reliability – The Build Alternative would improve Metra SWS reliability by providing a second Metra track along Columbus Avenue and by eliminating the potential conflicts with freight rail operations at Forest Hill Junction, Belt Junction, and along the CWI line north of the study area. The Build Alternative would also improve service reliability for the Amtrak *Cardinal/Hoosier State* route by eliminating conflicts at 80th Street Junction, and with the Metra SWS by moving those Metra operations to the RID Line.

The No-Build Alternative would not provide any improved rail or roadway facilities and would therefore not address any of the principal project needs. Existing safety and transportation efficiency problems related to these project needs would only worsen over time as rail transportation demand through the corridor continues to grow.

2.4.2 Rail System Performance

The Build Alternative would allow 23% more freight rail cars to move through the corridor than the No-Build Alternative in 2029.

By eliminating rail conflict points and providing additional through tracks, the Build Alternative would allow considerably more rail freight traffic through the project corridor than would be possible with the No-Build Alternative. As shown in Table 2-10, the Build Alternative would allow the corridor to carry 21% more freight trains per day through the study area than the No-Build Alternative, and 79% more than the current (2009) train volumes. The additional train volumes would provide an even greater percentage increase in the number of freight rail cars moved through the corridor. The Build Alternative would allow the number of freight rail cars to increase by 23% over the No-Build Alternative and 118% over the 2009 total volume.[15]

Table 2-10: Rail Freight Traffic through the Study Area

Route	Existing 2009	No-Build Alternative 2029	No-Build Increase Over Existing	Build Alternative 2029	Build Alternative Increase Over No-Build
Average Daily Freight Train Trips Through the Study Area, All Lines	84	124	48%	150	21%
Annual Freight Cars Through the Study Area, All Lines	1,918,440	3,412,257	78%	4,184,456	23%

Source: CTCO Train Model Output, May 27, 2011.

The Build Alternative would reduce travel times on the major rail freight routes by approximately 40% or more as compared to the No-Build Alternative.

Not only would the Build Alternative markedly improve the capacity of the freight rail lines in the project corridor, but it would allow that additional rail traffic to move through the corridor in much less time than presently required. The projected changes in train travel times for various routes through the corridor are shown in Table 2-11.

Table 2-11: Average Travel Time through the Study Area

Route	Map Nodes[a]	Existing 2009 (min:sec)	No-Build 2029 (min:sec)	Build 2029 (min:sec)	% Improvement Over No-Build
Freight					
Rockwell Yard to 95th St.	B to I	25:58	30:33	19:21	37%
Rockwell Yard to Dan Ryan	B to L	44:15	39:14	22:06	44%
Columbus Ave. to Dan Ryan	A to L	43:13	57:42	32:33	44%
79th St. to Marquette Rd. through Forest Hill Jct.	C to D	33:32	45:38	08:24	82%
Passenger (Metra SWS)					
Columbus Ave to No. of 69th St.	A to F/N	12:24	12:36	10:16	18%

[a]Map Nodes for this route are shown on Figure 2-33.

Source: CTCO Train Model Output, May 27, 2011.

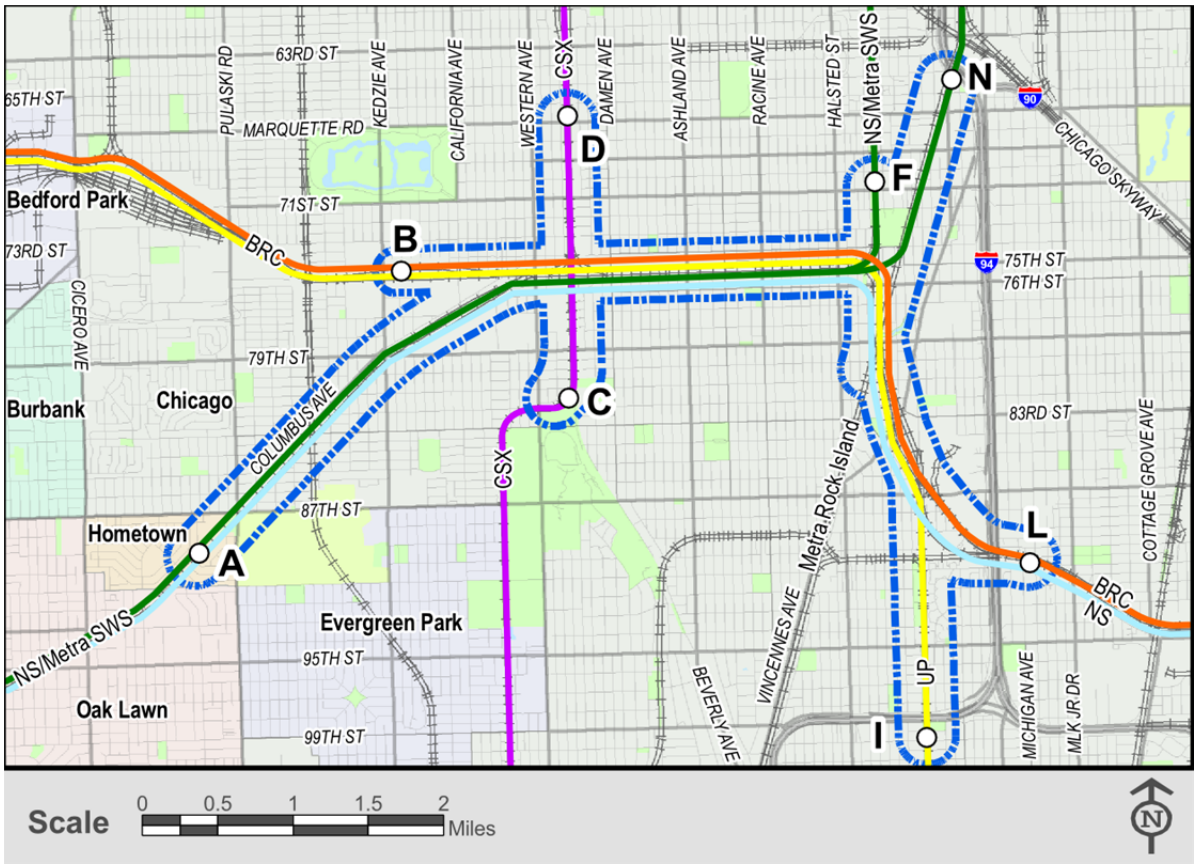

Figure 2-33: Routes for Typical Rail Travel Time Analysis

With the No-Build Alternative, none of the existing rail conflicts would be removed, and the existing delays for rail traffic would worsen as the demand for rail freight transportation increases over time. The CTCO Train Model indicates that the 75th Street corridor only has capacity to allow rail freight traffic to increase up to the year 2024, at which point no additional growth in train traffic could be accommodated.

2.4.3 Grade Crossing Elimination

The Build Alternative would also eliminate one of the major highway-rail grade crossings in the study area. The 71st Street crossing of the CSX tracks north of Forest Hill Junction currently carries an average annual daily traffic (AADT) volume of over 11,000 vehicles and has the crossing gates down for over 4 hours of each day, resulting in more than 80,000 hours of driver delay per year. The grade-separated crossing provided by the Build Alternative would eliminate this vehicle delay, while also eliminating the possibility of automobile-train crashes at the grade crossing.

The No-Build Alternative would make no change at the 71st Street grade crossing, and vehicle delay would increase over time from today's level due to both an increasing number of trains passing through the crossing and increasing vehicular traffic on 71st Street. The risk of further crashes at this crossing would also grow as the traffic through the crossing grows.

2.4.4 Local Mobility Improvements

The Build Alternative would make improvements at 36 viaducts within the study area. This work would improve mobility for vehicles, bicyclists, and pedestrians and make travel within the study area safer and more inviting. Closure of the existing viaduct at Union Avenue would create a minor impediment for the residents of the two blocks of Union Avenue between 74th and 76th Streets, but a slightly longer alternate route is available via Halsted Street just one full block (660 feet) to the west.

With the No-Build Alternative, there would be no program of improvements to the viaducts across the study area. Any repairs and upgrades would be handled through the City's current viaduct improvement program, as funding became available. Repairs or reconstruction of the rail viaducts would be accomplished by the railroads only as the needs arise and the required construction funds are identified.

2.5 Recommendation of Preferred Alternative

As discussed in Section 2.4.1 above, the Build Alternative fully meets all of the elements of the project's Purpose and Need statement, while the No-Build Alternative fails to address any of those needs. Both alternatives were advanced for detailed analysis, and the results of that analysis are presented in Chapter 3 of this document. That analysis indicates that the benefits of the Build Alternative clearly outweigh its adverse effects.

In addition, the Build Alternative has been developed and validated through an extensive stakeholder involvement program. The full range of alternates in each of the project's improvement areas were presented for review at a joint meeting of the Community Advisory Groups (CAGs) in a workshop

session on September 16, 2011. Based on the joint CAG's input and the results of the study team's alternates screening process, the Range of Alternatives was presented to the general public at a public meeting on October 27, 2011. Input from that meeting was then used in formulating the final refinements of the Build Alternative presented here.

Specific design elements of the Build Alternative affecting resources under the jurisdiction of the Chicago Department of Transportation and the Chicago Park District were reviewed with those agencies, and they concurred with those aspects of the Build Alternative. The Build Alternative was coordinated closely with all of the concerned stakeholders involved in the study, including the Community Advisory Groups, local elected officials, and other interested local groups, as described in Chapter 4.

Based on the analysis presented in this document, the stakeholder input provided throughout the study process, and the concurrences from the key stakeholders described above, the Build Alternative has been recommended as the Preferred Alternative. A joint meeting of the CAGs was held on January 12, 2012 and the Preferred Alternative was presented for the CAGs comment and further input. The CAGs expressed no objections to the recommended Preferred Alternative.

2.6 Description of Preferred Alternative

Principal features of the Preferred Alternative within each of the improvement areas are summarized in the following sections.

2.6.1 Physical Features of the Preferred Alternative

2.6.1.1 Major Rail Components

Forest Hill Junction – The Preferred Alternative would provide a new double-track elevated structure to carry the CSX mainline over the existing at-grade rail crossing at Forest Hill Junction and over the existing at-grade crossing of 71st Street. A total of 1.2 acres of vacant City of Chicago property adjacent to the existing CSX property would be required.

Forest Hill Junction

- 1.3 miles relocated track
- 4.4 miles new track
- 6,400 ft new elevated structure
- 17,200 cy new embankment
- 1.2 acres property acquisition

80th Street Junction – The Preferred Alternative would realign existing tracks and provide additional new tracks, including a new mainline track from the southeast portion of the study area to Landers Yard, to eliminate rail conflicts at both 80th Street Junction and Belt Junction. Vacant land bounded by the existing NS tracks, BRC tracks, 81st Street on the north, and 87th Street on the south would be acquired to construct two new UP tracks and adjacent service roads. Based on data from the Cook County Assessor, this land includes a total of 17 parcels

80th Street Junction

- 3.0 miles relocated track
- 6.8 miles new track
- 1 new railroad bridge
- 21 existing railroad bridges
- 12.8 acres property acquisition

totaling approximately 12.8 acres of land. All of these parcels lie north of Vincennes Avenue with the exception of one partial take of 3.3 acres of land from one parcel south of Vincennes Avenue.

Metra SWS Connection to Rock Island District Line – The Preferred Alternative would provide a new double-track flyover connection for the Metra SWS from the existing tracks in the 75th Street corridor to the existing RID Line tracks. The new connection would be located entirely on structure. Twenty-three parcels totaling approximately 2.6 acres would be acquired. Union Avenue would be closed at the 75th Street rail embankment and cul-de-sacs would be constructed on either side.

Metra SWS Connection
- **3.6 miles relocated track**
- **6.8 miles new track**
- **3,800 ft elevated structure**
- **2.6 acres property acquisition**

Metra Along Columbus Avenue – The Preferred Alternative would provide a new second through-track for Metra along the west side of Landers Yard and through the Wrightwood Station. Tracks in Landers Yard would need to be relocated to provide room for the new Metra track. No new right-of-way would be required.

Metra along Columbus Avenue
- **1.7 miles new track**
- **3.1 miles relocated yard track**
- **0 acres property acquisition**

2.6.1.2 Major Roadway Components

71st Street Grade Separation – The principal roadway element of the Preferred Alternative is the elimination of the existing at-grade crossing of the CSX tracks at 71st Street. The existing profile of 71st Street would be lowered by approximately 3 feet, which would provide a vertical clearance of 16’-6” beneath the new rail structure. There would be no change to the horizontal alignment or cross-section, and no new right-of-way would be required. A total length of approximately 660 feet of 71st Street would be reconstructed.

2.6.1.3 Viaduct Improvements

The Preferred Alternative would improve 36 viaducts within the study area. Improvements would include roadway resurfacing at 8 locations and roadway reconstruction at 8 locations; reconstruction of sidewalks at 13 locations and addition of 90 sidewalk ramps; replacement of complete lighting systems at all 36 locations to remain (the Union Avenue viaduct would be closed, see Section 2.2.4.3); reconstruction of drainage systems at 19 locations; and waterproofing of 13 bridge decks, reconstruction of 7 bridge abutments, and reconstruction of underdrains at 4 bridge locations. No new right-of-way would be required for the viaduct improvements.

2.6.2 Preliminary Cost Estimate and Project Funding

A planning level preliminary cost estimate has been prepared for the project. This preliminary cost estimate for the preferred alternative includes all costs associated with preliminary engineering and

environmental (NEPA) clearance, final engineering design, right-of-way acquisition, utility relocation and construction. Additional allowances have been provided for all professional services and temporary facilities necessary through project development and construction, including but not limited to: project and construction management, traffic control, surveys, inspections and testing. As the project is still in the preliminary design stage, contingencies have also been assigned to all capital cost items to account for potential changes in project scope and identification of additional standard industry railroad and rail transit unit costs have been used for the rail elements, and standard IDOT/CDOT unit costs have been used for the roadway elements. The preliminary total project cost is estimated to range from approximately $707 to $829 million dollars, expressed in Year 2013 dollars. In accordance with FHWA guidelines, the potential impacts of inflation were calculated by applying the compounded inflation rate to the projected cost of each project phase (preliminary engineering/NEPA clearance, final design/right-of-way acquisition/utility relocation, and construction) through the schedule midpoint of said phase. The effects of escalation on the price of labor and construction materials on the total project cost were calculated based on an annual inflation rate of 4.5%. The resultant forecast year of expenditure (YOE) cost of the project may range from approximately $862 to $1,014 million dollars.

As Phase I of the 75th Street CIP is currently underway and nearing completion, no escalation was applied to the estimated professional service costs for Phase I. The year of expenditure cost projections were developed based on the preliminary Phase II and III project schedule. Estimated YOE project costs for Phase II of the project (final design, right-of-way acquisition, and utility relocations) escalates the base year 2013 cost to the midpoint of the Phase II schedule for each project component (P2, P3, GS19 and EW2). Similarly, Phase III (construction) YOE costs are escalated to the schedule midpoint of each component as shown in Table 2-12.

Table 2-12: 75th Street CIP Schedule Assumptions by Project Component

Project Component	Phase	Begin	End	Midpoint
P2	I	Jan-2011	Nov-2014	Dec-2012
	II	Apr-2015	Aug-2017	Jun-2016
	III	Aug-2017	Nov-2020	Mar-2019
P3	I	Jan-2011	Nov-2014	Dec-2012
	II	Apr-2015	Aug-2017	Jun-2016
	III	Aug-2017	Aug-2019	Aug-2018
GS19	I	Jan-2011	Nov-2014	Dec-2012
	II	Apr-2015	Aug-2017	Jun-2016
	III	Aug-2017	Oct-2019	Sep-2018
EW2	I	Jan-2011	Nov-2014	Dec-2012
	II	Feb-2015	Oct-2017	Jun-2016
	III	Oct-2017	Oct-2021	Oct-2019

This project has been identified as a "major project" under the FHWA's rules for project approval and oversight stated in 23 USC 106. This designation is generally applied to projects with total estimated costs of $500 million or more. Among the requirements for major projects is that a Cost Estimate Review be prepared for the project. The objective of the Cost Estimate Review is to conduct an independent evaluation of the project cost estimate to verify its accuracy and reasonableness. The Cost Estimate Review will occur prior to publication of the Final EIS document.

A second major project requirement is that a Financial Plan be prepared for the project and approved before federal authorization for construction. This Financial Plan will identify all of the funding sources to be used for the project, along with an analysis of the projected cash flow and risk identification and mitigation factors.

Funding for final design and construction of the project would ultimately be drawn from a combination of sources, including the FHWA, IDOT, CDOT, Metra, and the participating private railroads that would benefit from the project. In some jurisdictions, including Chicago, alternative funding mechanisms are being considered for public infrastructure projects such as the 75th Street CIP. Some of these alternative funding mechanisms include the Transportation Infrastructure Finance and Innovation Act of 1998 (TIFIA), Section 129 Loans, State Infrastructure Banks (SIBs), Grant Anticipate Revenue Vehicle Bonds (GARVEE Bonds), and Public-Private Partnerships (PPPs). TIGER Discretionary Grants are also a possibility for funding portions of the project. The Financial Plan will evaluate all of these potential sources of funding.

2.6.3 Construction Phasing

As previously discussed, the goal is to phase the 75th Street CIP as one complete project, with all funding available prior to bidding, and a five-year construction schedule. However, MAP-21 (the federal transportation funding bill) allows projects to include a phasing plan that identifies fundable incremental improvements or phases that will address the purpose and the need of the project in the short term in the event there are insufficient financial resources to complete the entire project. Given the substantial total capital cost of the Preferred Alternative, it is very likely that funding for the entire project will not be provided in a single allocation, but will rather be provided over a number of years. Further, there are some restrictions on the extent and locations of work that can be carried on simultaneously in order to allow for the continuation of efficient railroad operations during the construction period. Based on these considerations, an initial conceptual construction phasing plan for the project consisting of four major phases has been developed. The specific sequence and duration of each of these phases will be adjusted to match the funding that is made available for the project as it is identified in future years.

Each of these major phases could be built and would function as a viable transportation facility with substantial transportation benefits even if the other phases were never constructed. Each of these major phases is therefore considered to have operational independence and meets some element(s) of

the project purpose and need. In order to meet all elements of the project purpose and need though, completion of all of the separate phases is necessary.

The four major phases of the overall project are:

- Metra Reliability Along Columbus Avenue - Construct track improvements along Columbus Avenue, in the southwest quadrant of the project, to provide double track operations for Metra's SWS in this section. (See Figure 2-34 for the general location of the construction phases.) This work could be done without bridge improvements and would be fully functional without any other work. This phase does not require right-of way acquisition. Recommended local mobility improvements would be included at three viaducts: Kedzie Avenue, 79th Street, and Western Avenue.
- 80th Street Junction - Construct track work improvements in the 80th Street Junction area, in the southeast quadrant of the project from 76th Street to the Dan Ryan. This improvement would provide some immediate benefits to rail operations and would not require completion of any other construction elements to be usable. The 80th Street Junction improvements would reduce freight rail conflicts at both 80th Street Junction and Belt Junction, and allow increased flexibility of train operations throughout the corridor by allowing freight trains to access any tracks through 80th Street Junction with minimal conflicts. Local mobility improvements at viaducts would be made at the 12 locations where trackwork would be undertaken:
    - 78th St. east of Wallace St.
    - 78th St. west of Fielding Ave.
    - 79th St. east of Wallace St.
    - 80th St. east of Lowe Ave.
    - 80th St. west of Parnell Ave.
    - 81st St. east of Wallace St.
    - Vincennes Ave. south of 83rd St.
    - Vincennes Ave. north of 84th St.
    - S. Holland Rd. north of 87th St.
    - 87th St. at S. Holland Rd.
    - 87th St. east of Eggleston Ave.
    - 88th St. east of Eggleston Ave.

    This phase would require the acquisition of only vacant land for right-of-way. The property acquisition must be completed prior to construction of this phase.
- Metra Rock Island Connection - Construct the RID Connection flyover for the Metra SWS. This would eliminate conflicts between Metra and freight rail operations through Belt Junction and north along the CWI line. Construction of this phase would require Metra to operate on one track in the construction area. Recommended local mobility improvements would be included at the following 17 viaducts, and the Union Avenue viaduct at 75th St. would be closed:
    - Damen Ave. at 75th St.
    - Ashland Ave. at 75th St.
    - Loomis Blvd. at 75th St.
    - Racine Ave. at 75th St.
    - Aberdeen St. at 75th St.
    - Morgan St. at 75th St.
    - Peoria St. at 75th St.
    - Halsted St. at 75th St.
    - 72nd St. east of Lowe Ave.
    - 72nd St. at Stewart Ave.
    - 73rd St. pedestrian underpass west of Hamilton Park

- 73rd St. pedestrian underpass east of Hamilton Park
- 74th St. west of Parnell Ave.
- 74th St. east of Normal Ave.
- 75th St. east of Normal Ave.
- 76th St. west of Parnell Ave.
- 76th St. at Normal Ave.

This phase requires the acquisition of 23 parcels of property containing 27 dwelling units and one church for right-of-way. The property acquisition must be completed prior to construction of this phase.

- Forest Hill Junction / 71st Street - Construct the CSX flyover at Forest Hill and the CSX grade separation over 71st Street. This improvement would eliminate all rail conflicts at Forest Hill Junction and would eliminate the at-grade highway-rail crossing at 71st Street. This construction element would not require any other phases to be constructed in order to provide full benefits. This phase would require the acquisition of 1.2 acres of former railroad right-of way currently owned by the City of Chicago. Recommended local mobility improvements would be included at four viaducts. All are located along the north-south CSX rail line between Damen Avenue and Western Avenue. The locations are Marquette Road, 68th Street, 69th Street, and 79th Street. A new viaduct would be created at 71st Street as a result of the grade separation.

Any construction phasing plan assumes that the viaduct improvements would be constructed within the same phase of construction as the track improvements in each particular area. At some of the viaducts, the improvement work required is not related to the rail work, and could be undertaken on an independent timeline as funding and other priorities might indicate. If other separate funding for the viaduct improvements should become available, it is also possible that work at some of the viaducts could be accelerated to take place in advance of the major elements of the 75th Street CIP.

Selection of an initial phase for construction would be influenced by the amount of funding available at the time as well as development of a construction package whose activities may be considered of independent operational utility in the event that funding for remaining phases is delayed. Each of the four major phases is expected to take a minimum of two years to complete, but multiple phases could be constructed concurrently if funding is available. With a continuous adequate stream of funding for the project, construction could begin in 2017 and be completed by the close of 2021. Any shortfalls or delays in funding could result in breaks between the separate phases of construction which could extend over a period of years in the worst case, thus extending the date for overall project completion further into the future.

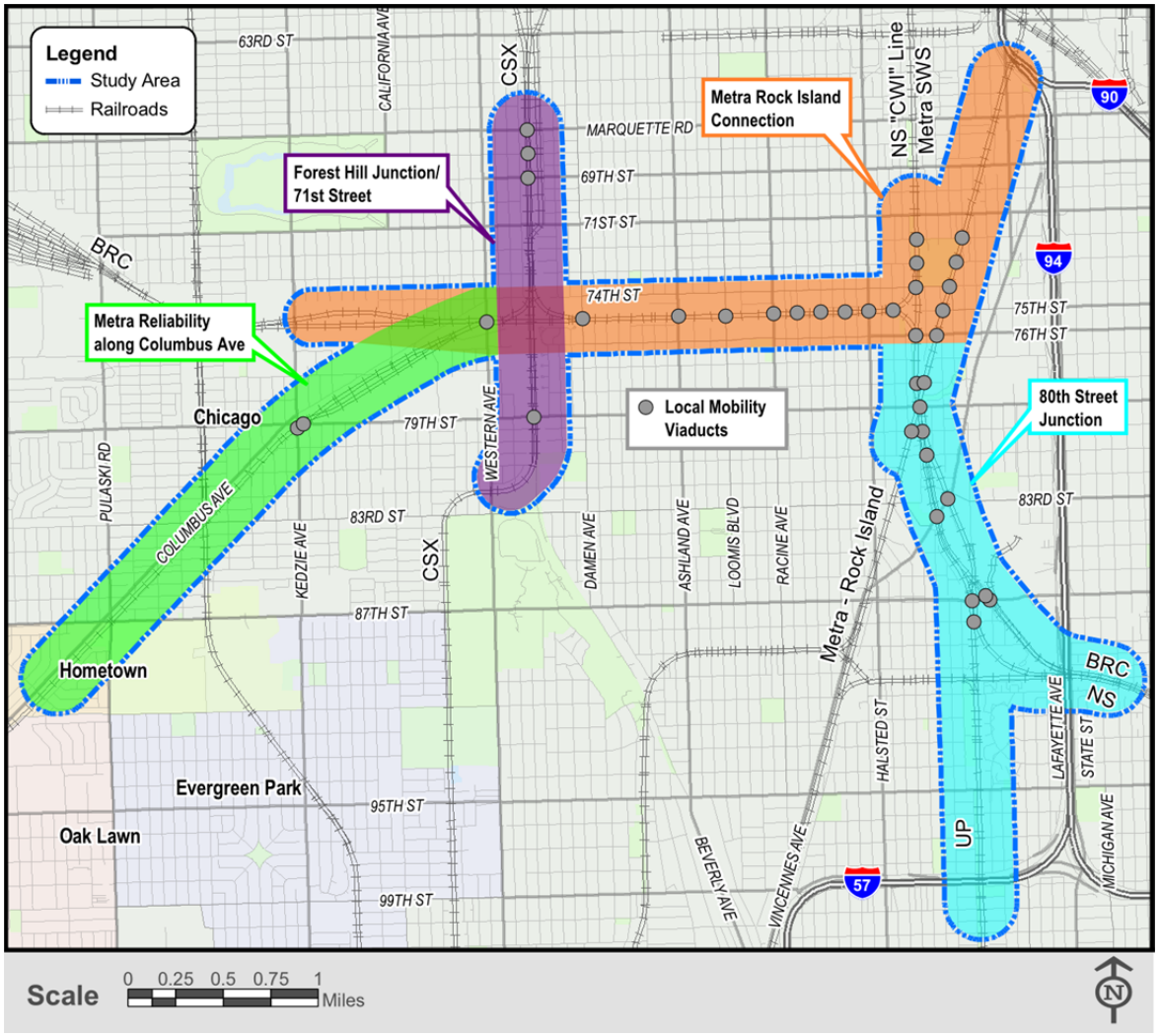

Figure 2-34: Construction Phasing

Because of the varied nature of the work, and in order to foster participation by both large and small contractors, including local disadvantaged businesses, it is very likely that each of the major phases will consist of a number of separate construction contracts. In addition, railroad track and signal construction will typically be completed by the specific owning railroads (except BRC and Metra) using their internal force account personnel and equipment. Final determination of the sequencing of the major phases and of the contracting plans within each phase for the 75th Street CIP will likely not be made until Phase II final design is complete and funding commitments are in place.

Under the FHWA's Major Project Requirements, an initial Financial Plan will be developed following completion of the NEPA process, during Phase II design. The Financial Plan must be approved prior to the authorization of federal funding for construction, and will be updated annually during construction. The Financial Plan will present the project's updated cost estimate and the projected revenues that are assumed to be available to the project.

Endnotes

[1] American Association of Railroads, Chicago Department of Transportation, Chicago Transportation Coordination Office, Federal Highway Administration, Federal Railroad Administration, Federal Transit Authority, and Illinois Department of Transportation. *CREATE Final Feasibility Plan*. August, 2005, p. 44. Print.

[2] American Association of Railroads, Chicago Department of Transportation, Chicago Transportation Coordination Office, Federal Highway Administration, Federal Railroad Administration, Federal Transit Authority, and Illinois Department of Transportation. *CREATE Program Final Feasibility Plan*. August, 2005. Print.

[3] American Association of Railroads, Chicago Department of Transportation, Chicago Transportation Coordination Office, Federal Highway Administration, Federal Railroad Administration, Federal Transit Authority, and Illinois Department of Transportation. *CREATE Final Preliminary Screening*. August, 2005. Print.

[4] American Association of Railroads, Chicago Department of Transportation, Chicago Transportation Coordination Office, Federal Highway Administration, Federal Railroad Administration, Federal Transit Authority, and Illinois Department of Transportation. *CREATE Final Preliminary Screening Amendment 1*. Publication. Nov. 2009. Print.

[5] AREMA Figure 28-1-1 shows a minimum horizontal clearance of 9'-0" on tangent track (increased for curved track), but Illinois state law allows 8'-0" according to AREMA Table 28-3-3. Individual railroads may have other unique standards.

[6] The 66' cross-section was developed to provide adequate space for two Metra tracks on bridge structure and adjacent space for maintenance activities.

[7] Civiltech. *Grade Separation Budgetary Cost Estimate, Grade Separation Number 19, 71st Street, Chicago*. Tech. Chicago: Illinois Department of Transportation, 2005. Print.

[8] All acquisitions assume that entire parcel would be acquired if impacted, with the exception of Hamilton Park.

[9] Baker Engineering, Inc. *CREATE EW2/P2/P3 Street Closure Report*. Tech. 2006. Print

[10] Walker, Donald. Tech. *Pavement Surface Evaluation and Rating - Asphalt PASER Manual*. Wisconsin Transportation Information Center, 2002. Web. 31 Oct. 2011. <http://www.dot.state.il.us/blr/p017.pdf>.

[11] Walker, Donald. Tech. *Pavement Surface Evaluation and Rating - Concrete PASER Manual*. Wisconsin Transportation Information Center, 2002. Web. 31 Oct. 2011. <http://www.dot.state.il.us/blr/p016.pdf>.

[12] United States Access Board. *Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way*. 26 July 2011. Web. 31 Oct. 2011. <http://www.access-board.gov/prowac/nprm.pdf>.

[13] *GO TO 2040 Comprehensive Regional Plan*. Full Version ed. Chicago: Chicago Metropolitan Agency for Planning, Oct. 2010. Print.

[14] "Transportation Improvement Program." Chicago Metropolitan Agency for Planning. Web. 08 Mar. 2011. <http://www.cmap.illinois.gov/tip>.

[15] The number of rail cars increases at a greater rate than the number of trains in the corridor because the Train Model projects a greater increase in the percentage of coal trains in the daily traffic, and coal trains are typically longer than other intermodal or general freight trains