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Red-Purple Bypass Project

Environmental Assessment and Section 4(f) Evaluation

May 19, 2015

Federal Transit Administration

Chicago Transit Authority

DEPARTMENT OF TRANSPORTATION
UNITED STATES OF AMERICA

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Environmental Assessment and Section 4(f) Evaluation

for the

Red-Purple Bypass Project

Chicago, Illinois

prepared by the

U.S. Department of Transportation
Federal Transit Administration

and the

Chicago Transit Authority

pursuant to:

National Environmental Policy Act of 1969 (42 USC § 4332) and
Section 4(f) the United States Department of Transportation Act of 1966
(49 USC § 303)

5-13-2015
Date of Approval

Marisol Simón
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U.S. Department of Transportation
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Date of Approval

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List of Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
APE	area of potential effects
dB	decibels
dBA	A-weighted decibels
BMP	best management practice
CDOT	Chicago Department of Transportation
CFR	Code of Federal Regulations
CHRS	Chicago Historic Resources Survey
CIG	Capital Investment Grant
CMAP	Chicago Metropolitan Agency for Planning
CTA	Chicago Transit Authority
DHHS	Department of Health and Human Services
DPD	City of Chicago Department of Planning and Development
EA	environmental assessment
EDR	Environmental Data Resources, Inc.
EIS	environmental impact statement
EJ	environmental justice
ESA	environmental site assessment
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HAER	Historic American Engineering Record
HARGIS	Historic and Architectural Resources Geographic Information System
IDNR	Illinois Department of Natural Resources
IDOT	Illinois Department of Transportation
IHPA	Illinois Historic Preservation Agency
IL HABS	Illinois Historic American Building Survey
L_{eq}	equivalent continuous sound level

L_{dn}	day-night average sound level
LIDAR	light detection and ranging
L_v	vibration velocity level
MOA	Memorandum of Agreement
MFR	multifamily residence
mph	miles per hour
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
PPV	peak particle velocity
RCRA	Resource Conservation and Recovery Act
RPM	Red and Purple Modernization Program
RTA	Regional Transportation Authority
SHPO	State Historic Preservation Officer
TOD	transit-oriented development
Uniform Act	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended
USC	United States Code
USDOT	U.S. Department of Transportation
UST	underground storage tank
USEPA	U.S. Environmental Protection Agency
VdB	root mean square vibration velocity in decibels relative to 1 microinch per second

Executive Summary

The Chicago Transit Authority (CTA) is undertaking an initiative to completely rebuild the northern portion of the Red Line from Belmont station to Howard station and the Purple Line from Belmont station to Linden station. The Red and Purple Modernization (RPM) Program would fully replace old, deteriorating infrastructure and stations along Chicago's busiest rail line, allowing CTA to substantially increase train capacity and improve service for generations to come.

The massive, multistage RPM program would be completed in phases, and would provide riders with all the benefits of modern service and infrastructure when complete. As part of the program, the Federal Transit Administration (FTA) and CTA have been analyzing proposed improvements to the line. Phase One of the RPM Program includes the Red-Purple Bypass Project and the Lawrence to Bryn Mawr Modernization Project. Within the RPM corridor, Phase One also includes corridor signal and power improvements as well as interim and advance infrastructure improvements, which are not anticipated to have any significant environmental impacts. CTA is developing preliminary designs for these interdependent projects while each undergoes separate environmental review. This Environmental Assessment (EA) addresses the Red-Purple Bypass Project.

Red-Purple Bypass Project

The Red-Purple Bypass Project would include construction of a bypass for the Brown Line at Clark Junction, just north of Belmont station, and the replacement of approximately 0.3 mile of associated mainline (Red and Purple line) tracks from Belmont station on the south to the stretch of track between Newport and Cornelia Avenues on the north. The fifth track bypass, just north of Belmont station, would separate northbound Brown Line trains that currently cross north- and southbound Red Line tracks as well as southbound Purple Line tracks.

The proposed project would improve capacity, travel time, ride quality, and safety in one of CTA's highest ridership corridors. The project would allow CTA to increase functional capacity to meet ridership demands while maintaining or improving the quality, speed, and passenger comfort of each ride and improving access to job markets and destinations. The capacity expansion would have the added benefit of bringing this critical infrastructure into a state of good repair, thereby improving efficiency and service reliability and extending the overall life of the transit system by 60 to 80 years.

Supporting information on the purpose and need for this project is provided in **Chapter 1**.

Alternatives Considered

The proposed project evaluated in this EA was developed and evolved through a multiyear planning process that began in 2009, as further described in **Section 2.1**. This EA compares the No Build Alternative and Build Alternative for the Red-Purple Bypass Project. The No Build Alternative is required as part of the National Environmental Policy Act of 1969 (NEPA) environmental analysis and is used for comparison to assess the relative benefits and impacts of

implementing the Red-Purple Bypass Project. It represents the future situation that would likely exist if the project were not implemented.

Major project elements of the Build Alternative are further detailed in **Section 2.3** and include the following:

- **Fifth Track Bypass** - The Build Alternative would provide a grade-separated junction allowing northbound Brown Line trains to cross unimpeded over and above the Red and Purple line tracks just north of Belmont station on a new aerial structure, resulting in increased capacity for all three lines while also improving travel time and overall system reliability and safety. A new track would be built to the east of the existing tracks, ramp up, and curve westward over the mainline tracks to merge onto the existing Brown Line track elevated structure just west of Sheffield Avenue. Based on conceptual engineering, the bypass track is expected to be approximately 40 to 45 feet above the existing ground level (up to 22 feet above the existing tracks) at its highest point.

- **Mainline Tracks** - The existing track geometry north of Clark Junction requires Red and Purple line trains on all four tracks to maneuver through two short-radius curves between School Street and Newport Avenue, partly beneath the location of the proposed new bypass tracks. As part of the Build Alternative, these existing short-radius curves would be realigned to eliminate unnecessary speed restrictions, improving train speeds, travel time, and ride quality. The modernized track structure would be wider than the existing track structure to meet modern design standards, including provisions for worker safety. To minimize noise and vibration impacts from faster and more frequent trains, the proposed structure would use a closed-deck aerial structure with direct-fixation track and welded rail. Noise barriers (approximately 3 to 5 feet in height) are proposed on both sides of the track deck for the full length of the project limits to reduce noise transmission at and below track level. At specific locations special trackwork, signals, signal equipment, and relay houses would be included.

Three conceptual stages for construction are proposed: early work, construction of the new bypass, and construction of the mainline tracks. Early work would include demolition of buildings and utility relocation in preparation for construction, among other tasks. This stage would not affect train operations in the project area. Construction of the new bypass and mainline track structure would result in some temporary operational changes, and service disruptions would be scheduled to occur during weekends and off-peak periods when possible, to limit impacts on riders. Contingent upon funding, construction of the Build Alternative could begin as soon as 2017 and would continue for approximately 48 to 52 months, including early work.

Preliminary construction costs for the Build Alternative were estimated based on conceptual engineering and will be refined through ongoing preliminary engineering. Anticipated capital costs for the project are approximately $570 million in year-of-expenditure dollars, inclusive of repair work to the Brown Line tracks east of Seminary Avenue.

Environmental Impacts and Measures to Avoid or Minimize Harm

Potential adverse environmental impacts, best management practices, and mitigation measures are detailed in **Chapter 3** of the EA and are summarized in **Table ES-1**.

Table ES-1: Summary of Impacts, Benefits, and Measures to Avoid or Minimize Harm

Resource Area	No Build Alternative	Build Alternative
Transportation *Section 3.1*	No impacts.	**Construction** ■ Temporary transit service disruptions to the Red, Purple, and Brown lines would occur. ■ Temporary traffic impacts would include short-term detours or lane restrictions. ■ Some on-street parking may be temporarily affected by measures taken to maintain traffic during construction. ■ Train and bus service disruptions during construction will occur during weekends and off-peak periods to the extent possible. **Permanent** ■ Permanent benefits for transit would result. ■ No permanent impacts on street traffic, public parking, pedestrians, or bicyclists would result. **Measures to Avoid or Minimize Harm** ■ CTA will provide notifications for temporary service changes to neighboring property owners, residents, businesses, and transit passengers. ■ A bus bridge (shuttle) will operate between Belmont and Addison or Southport stations during select weekends when work requires the Red or Brown line tracks to be out of service.
Displacements and Relocations of Existing Uses *Section 3.2*	No impacts.	**Permanent** ■ A total of 21 properties (16 buildings) would be required for permanent right-of-way acquisition: 6 commercial properties, 7 residential buildings, 3 mixed-use buildings, 2 private surface parking lots, and 1 vacant lot. ■ Implementation would result in acquiring air rights over two properties. **Measures to Avoid or Minimize Harm** ■ Displaced owners and tenants will be compensated and relocated according to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) and FTA guidelines. ■ CTA will work with businesses and owners to establish reasonable compensation for each property.
Land Use and Economic Development *Section 3.3*	No impacts.	**Construction** ■ Properties used for construction would temporarily shift from their current use, including commercial, residential, and mixed-use, to be used for construction activities. ■ Temporary adverse impacts on economic development would occur in the project area because of property displacements and associated project construction.

Resource Area	No Build Alternative	Build Alternative
Land Use and Economic Development (Cont'd) *Section 3.3*		**Permanent** ■ No major changes to land use and economic development conditions are expected, however, discrete localized changes may occur. ■ Portions of parcels remaining after construction could potentially be redeveloped with transit-related uses in cooperation with CTA. This potential redevelopment would be independent of the project, and would be consistent with surrounding land uses and City zoning standards. **Measures to Avoid or Minimize Harm** ■ CTA will work with the City of Chicago Department of Planning and Development (DPD), chambers of commerce, the alderman's office, and the community to develop a Neighborhood Redevelopment Plan to determine appropriate expansion to the existing transit-oriented development boundary so that it could include more of the potential redevelopment sites in the project area. ■ CTA will work with DPD to provide incentives to encourage transit-oriented redevelopment, consistent with local and regional development plans, as soon as construction activities allow.
Neighborhoods, Communities, and Businesses *Section 3.4*	No impacts.	**Construction** ■ Temporary construction impacts could include noise, dust, detours, temporary station closures, altered access to businesses and residences, negative visual and aesthetic changes, changes in emergency vehicle routing, construction vehicle emissions, and truck traffic throughout the corridor. **Permanent** ■ Community character near the project area would be temporarily and, perhaps, permanently affected by property displacements and potential vacancy of lots after construction. ■ The Build Alternative would improve mobility, including faster train speeds and passenger capacity expansion. ■ The Build Alternative would provide more reliable transit access to jobs in the project area and elsewhere on the CTA train system. ■ Access to nearby community resources would be enhanced as a result of the mobility improvements. **Measures to Avoid or Minimize Harm** ■ CTA will work with DPD, chambers of commerce, the alderman's office, and the community to develop a Neighborhood Redevelopment Plan. ■ CTA will work with DPD to provide incentives to encourage transit-oriented redevelopment as soon as construction activities allow.

Resource Area	No Build Alternative	Build Alternative
Historic and Archaeological Resources *Section 3.5*	Indirect adverse effect. Degradation of the track structure would interfere with the track continuing to serve its historic function.	**Permanent** ■ The project would result in adverse effects on three historic resources: the elevated track structure, the Vautravers Building (947–949 W. Newport Avenue), and the Newport Avenue Historic District **Measures to Avoid or Minimize Harm** ■ CTA, FTA, the Illinois Historic Preservation Agency, and the Advisory Council on Historic Preservation (ACHP) worked together to develop commitments that will protect the historic resources. ■ An interpretive display conveying the history and significance of the north Red and Purple lines is proposed. ■ Contingent on feasibility and cost, CTA has proposed to move the Vautravers Building approximately 29 feet to the west of the existing location.
Visual and Aesthetic Conditions *Section 3.6*	Temporary impacts may result from routing maintenance and minor repairs that would be required.	**Construction** ■ Temporary adverse impacts on the surrounding visual environment would occur due to construction work zones. **Permanent** ■ While visual changes would be perceivable once built, the resulting visual impacts are expected to be congruent with the inherent, established character and scale of the surrounding environment to the largest extent possible. **Measures to Avoid or Minimize Harm** ■ CTA will work with DPD, chambers of commerce, the alderman's office, and the community to develop a Neighborhood Redevelopment Plan. ■ During construction, CTA will attempt to maintain as much existing vegetation as practical.
Noise *Section 3.7*	No impacts.	CTA identified 56 noise-sensitive clusters within the project area. **Construction** ■ Temporary impacts on noise-sensitive receivers within 50 feet of construction activities would occur. **Permanent** ■ Before mitigation, moderate and severe noise on 6 receivers would occur where buildings would be very near the track or near major sources of noise such as special trackwork like crossovers. ■ At approximately 70 percent of the noise-sensitive receiver clusters analyzed for this EA, existing noise levels would be substantially reduced as a result of the Build Alternative because the existing open-deck steel structure would be replaced with a quieter, closed-deck, aerial structure. **Measures to Avoid or Minimize Harm** ■ Construction noise will be reduced with alternate operational methods, scheduling, equipment choice, and acoustical treatments and implementation of best management practices (BMPs).

Resource Area	No Build Alternative	Build Alternative
Noise (Cont'd) *Section 3.7*		■ CTA will implement mitigation to reduce noise to levels that are below impact thresholds. Options for mitigating permanent noise impacts include installing rail dampers and devices to minimize noise from crossovers, relocating special trackwork, and installing residential sound insulation.
Vibration *Section 3.8*	No impacts.	CTA identified 56 vibration-sensitive clusters within the project area. **Construction** ■ Construction vibration levels may exceed the vibration risk of damage criteria at some receivers that are within 15 feet of the construction. **Permanent** ■ Before mitigation, vibration impacts would occur at 6 vibration-sensitive receivers close to the project right-of-way due to the special trackwork and faster train speeds that are part of the Build Alternative. **Measures to Avoid or Minimize Harm** ■ Project contractors will use less vibration-intensive construction equipment or techniques to the extent possible near vibration-sensitive buildings. ■ CTA will implement mitigation to reduce vibration to levels that are below impact thresholds. Options for mitigating permanent vibration impacts include installing devices to minimize vibration from crossovers and installing rubber bearing pads.
Hazardous Materials *Section 3.9*	No impacts.	**Construction** ■ There would be the potential to encounter hazardous materials during construction. BMPs would be followed to reduce risk. **Permanent** ■ The Build Alternative would result in removal of asbestos and lead-based paint associated with reconstructed stations, as well as the cleanup and/or removal of contaminated material.
Environmental Justice *Section 3.10*	No impacts.	Environmental Justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income. No disproportionately high and adverse construction or permanent impacts are anticipated.
Indirect and Cumulative *Section 3.11*	No impacts.	The Build Alternative takes into account and is being coordinated with other ongoing and planned projects near the corridor. The impact of these projects in combination with the proposed Build Alternative would be largely beneficial to transit riders and the surrounding community.
Resources with Limited or No Impacts *Section 3.12*	No impacts.	The Build Alternative would have limited or no impacts on the following resource areas: air quality, water resources, biological resources, geology and soils, energy, and safety and security.

Public Input Requested

A 30-day comment period has been established to take formal comments. A copy of the EA is available on the CTA website (transitchicago.com/RPMProject) in plain text and pdf formats, at CTA headquarters (567 W. Lake Street, 2nd Floor, Chicago, IL 60661), and at the 44th Ward Alderman's Office (3223 N. Sheffield Ave, Chicago, IL, 60657). Hard copies of the EA are also available at the following libraries during the public review period:

- Merlo Library, 644 W. Belmont Avenue, Chicago, IL 60657
- Lincoln Belmont Library, 1659 W. Melrose Street, Chicago, IL 60657
- Harold Washington Library Center, 400 S. State Street, Chicago, IL 60605

A public hearing is scheduled to solicit comments from the community about findings presented in the EA. The location of the public hearing will be Americans with Disabilities act (ADA)-compliant and accessible by public transit. Comments received during the public hearing will be submitted to FTA and will be entered into the public record.

Written comments will also be accepted at any time during the public comment period via e-mail to RedPurpleBypass@transitchicago.com and U.S. mail to Chicago Transit Authority, Strategic Planning, 10th Floor, Attn: Red-Purple Bypass Project, 567 W. Lake Street, Chicago, IL 60661.

Chapter 1
Purpose and Need

The Chicago Transit Authority (CTA), as project sponsor to the Federal Transit Administration (FTA), proposes to construct a fifth track bypass just north of Belmont station where the CTA rail system Red, Purple, and Brown line tracks converge at an existing flat junction. Improvements as part of this project would also include reconstruction of approximately 0.3 mile of the mainline Red and Purple line tracks from Belmont station on the south to the segment of track between Newport and Cornelia Avenues on the north. This project, known as the Red-Purple Bypass Project, would modernize infrastructure and expand capacity, reduce passenger travel times, and improve system mobility and safety at one of the largest bottlenecks in the CTA rail system. CTA proposes to cover a portion of the project funding by applying for federal funds administered by FTA.

The National Environmental Policy Act of 1969 (NEPA) mandates the consideration of environmental impacts before approval of any federally funded project that may have significant impacts on the environment or where impacts have not yet been determined. FTA and CTA prepared this Red-Purple Bypass Project Environmental Assessment (EA) in accordance with NEPA and other applicable regulations, including Section 106 of the National Historic Preservation Act (NHPA), Section 4(f) of the United States Department of Transportation Act of 1966, joint guidance and regulations from FTA and the Federal Highway Administration (FHWA), and other agency regulations and guidelines.

The EA looks at the impacts of implementing the Red-Purple Bypass Project on the physical, human, and natural environments in the project area. FTA will issue a finding on the proposed project based on the significance of impacts identified during the NEPA process. FTA's finding will guide future planning and implementation of the project.

1.1 Project Background

CTA's Red Ahead Program is a comprehensive initiative for maintaining, modernizing, and expanding Chicago's most-traveled rail line, the Red Line. As part of the program, FTA and CTA have been analyzing proposed improvements to the line (see **Figure 1-1**).

The Red and Purple Modernization (RPM) Program is a series of proposed improvements to the North Red Line (from just north of the Belmont station to the northern terminus of the Red Line at the Howard station) and the Purple Line (from just north of Belmont station to the Village of Wilmette), as shown in **Figure 1-2**. These improvements would increase passenger capacity and modernize transit stations, track systems, and structures along the 9.6-mile RPM corridor from just north of Belmont station to the northern terminus of the Purple Line at Linden station, passing through the Lakeview, Uptown, Edgewater, and Rogers Park community areas, the City of Evanston, and the Village of Wilmette.

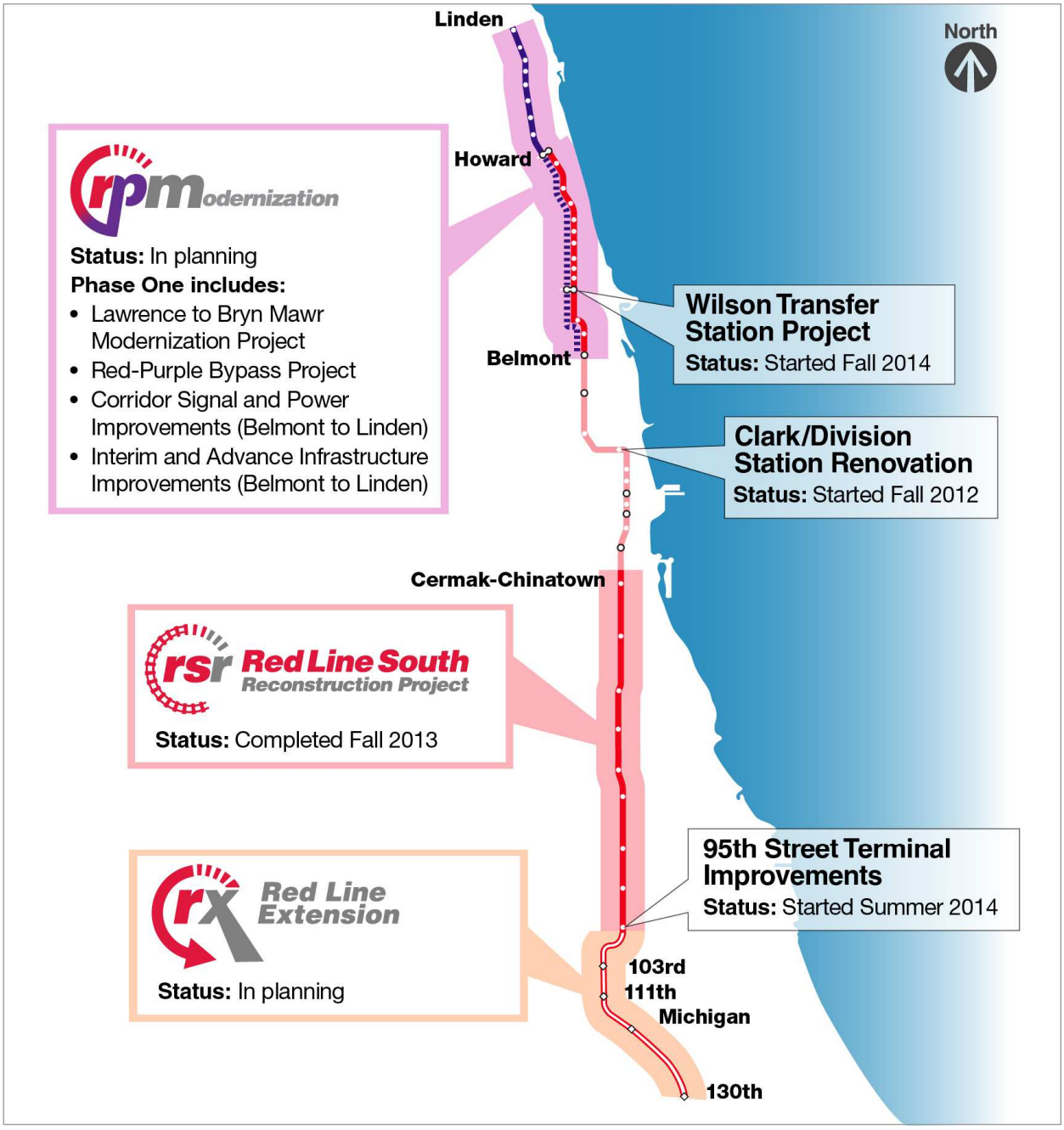
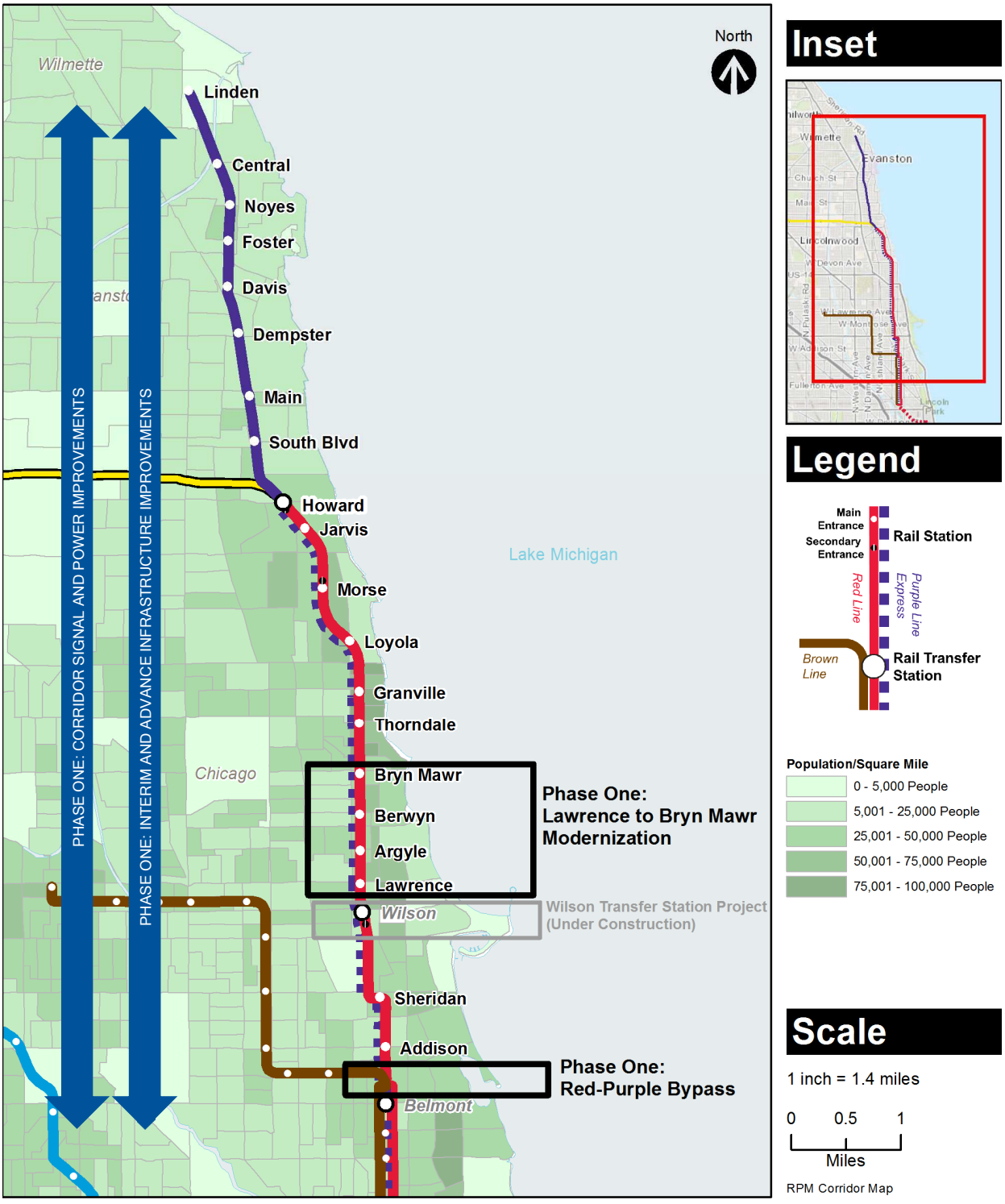


Figure 1-1: Red Ahead Program Overview



Source: U.S. Census Bureau 2012

Figure 1-2: Red and Purple Modernization Program Corridor Overview Map

1.1.1 RPM Phase One

The RPM Program is proposed as a massive, multistaged program to be completed in phases, allowing CTA to make the greatest number of improvements while meeting the public's expectations for timely delivery of the improvements. Phase One of the RPM Program is proposed to include two discrete projects within the 9.6-mile RPM corridor (see **Figure 1-2**):

- **Red-Purple Bypass** - This project includes construction of a bypass for the Brown Line at Clark Junction, just north of Belmont station, and the replacement of approximately 0.3 mile of associated mainline (Red and Purple line) tracks from Belmont station on the south to the stretch of track between Newport and Cornelia Avenues on the north.

- **Lawrence to Bryn Mawr Modernization** - This project includes modernization of four Red Line stations (Lawrence, Argyle, Berwyn, and Bryn Mawr) and aging CTA structures including tracks, embankment walls, viaducts, platforms, and stations from Leland Avenue on the south to near Ardmore Avenue on the north.

FTA and CTA decided to prepare separate EAs for both the Lawrence to Bryn Mawr Modernization Project and the Red-Purple Bypass Project. Previously, the agencies considered meeting federal environmental requirements by having one environmental impact statement (EIS) covering both projects. After careful review, however, FTA and CTA decided to pursue a more tailored environmental review of these projects to allow for a more efficient review process and to provide a more efficient construction schedule for improving some portions of the overall program area, benefitting thousands of riders. This approach is reasonable because both of these projects have independent utility and logical termini.[1] Additionally, this approach will not restrict consideration of alternatives for future RPM improvements. Moreover, this approach results in a more understandable schedule for the public.

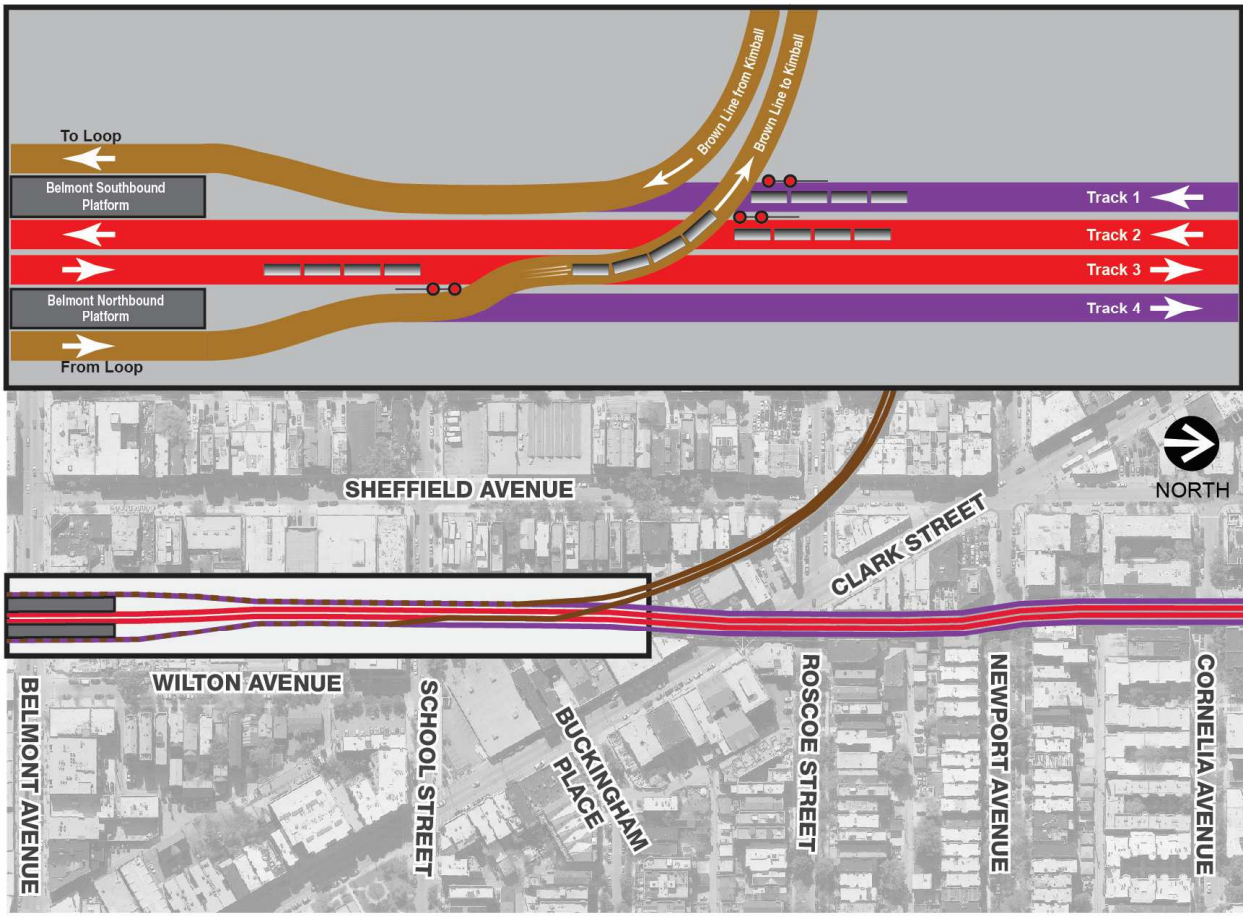
Other components of RPM Phase One would include corridor signal and power improvements in the CTA right-of-way or adjacent public right-of-way along the 9.6-mile RPM corridor. In addition, Phase One would include interim and advance infrastructure improvements, replacing aging and deteriorating infrastructure where necessary to keep the system in operable condition along the 9.6-mile RPM corridor. FTA and CTA are documenting these actions as listed, categorically excluded actions.[2] In addition, as a separate project, Wilson station is being reconstructed as a Red and Purple line transfer station and is a precursor to the Phase One improvements proposed; all impacts related to that project are documented in the approved *Wilson Transfer Station Project EA and Section 4(f) Evaluation* (CTA 2014e). FTA issued a Finding of No Significant Impact (FONSI) for the Wilson Transfer Station Project in June 2014. **Section 2.4** discusses subsequent phases of the RPM Program.

[1] Federal regulations require projects to have independent utility and logical termini (23 CFR § 771.111). Having "independent utility" means the project is a useable and reasonable expenditure even if no additional transportation improvements in the area are made. Having "logical termini" means the project is of sufficient length to address environmental matters on a broad scope.

[2] Categorical Exclusions, as defined in 23 CFR § 771.118 and 40 CFR § 1508.4, are actions that have been determined to not involve significant environmental impacts and therefore are not required to be documented in either an environmental assessment or environmental impact statement.

1.1.2 Red-Purple Bypass Project

This EA addresses one major element of the RPM Phase One Program, the Red-Purple Bypass Project. CTA proposes to construct a fifth track bypass just north of Belmont station to separate northbound Brown Line trains that currently cross north- and southbound Red Line tracks as well as southbound Purple Line tracks. The tracks conflict on the four-track system at an existing flat junction known as Clark Junction (see **Figure 1-3**). The project would also modernize approximately 0.3 mile of associated mainline tracks and track structure directly underneath the proposed bypass and north to near Cornelia Avenue. The mainline track improvements would straighten out slow curves in the existing Red and Purple lines that restrict train speeds. The improvements would also include a closed-deck track structure and noise barriers for both the new bypass and mainline track structures to minimize noise impacts from increased train operations proposed as part of the capacity improvements. The project would occur in the Lakeview community area and would extend from Belmont station on the south to the segment of track between Newport Avenue and Cornelia Avenue on the north. The western limit of the project is near Seminary Avenue, where the new bypass would tie into the existing Brown Line tracks. **Figure 1-4** provides a map of the project limits. The Red-Purple Bypass Project would increase passenger capacity through construction of new transit infrastructure and would allow more Red, Purple, and Brown line trains to pass through Clark Junction every hour. The remaining sections of this chapter emphasize the purpose and need for the project. **Section 2.3** contains additional detailed information on the proposed project.



Schematic – Not to Scale

Figure 1-3: Schematic of Current Conditions at Clark Junction

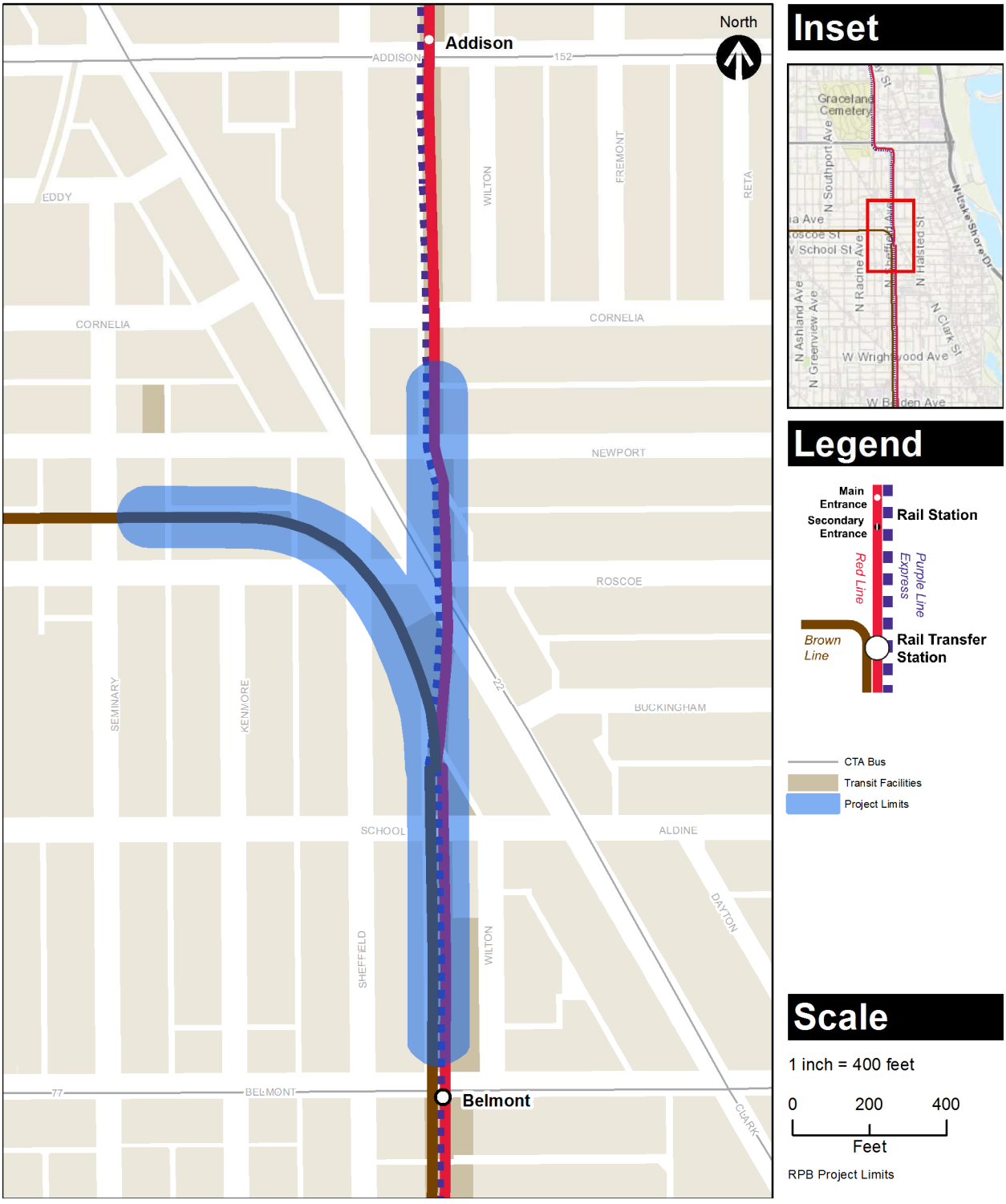


Figure 1-4: Red-Purple Bypass Project Limits

1.2 Needs to be Addressed

A number of problems identify the overall need for the Red-Purple Bypass Project. CTA ridership data and other operating statistics were analyzed to demonstrate needs for the project. **Appendix A** provides a reference list for all cited information. **Appendix B** provides additional CTA sources used for this analysis. The following key factors define the project's need:

- **A substantial number of transit passengers rely on the existing Red, Purple, and Brown lines to connect Chicago's North Side and northern suburbs with the Loop (Chicago's central business district) and the rest of the Chicago metropolitan area.** The North Red and Purple lines carry more than 24 percent of all CTA train trips and serve passengers in some of the densest neighborhoods of Chicago. Many of these passengers rely upon CTA to connect them to jobs and other destinations in downtown Chicago and the Loop, the second largest central business district in the United States (CTA 2014e, Cushman & Wakefield 2014). Nearly 145,000 passenger trips through Clark Junction occur every weekday, representing over 23 percent of all CTA weekday rail ridership (CTA 2013a).

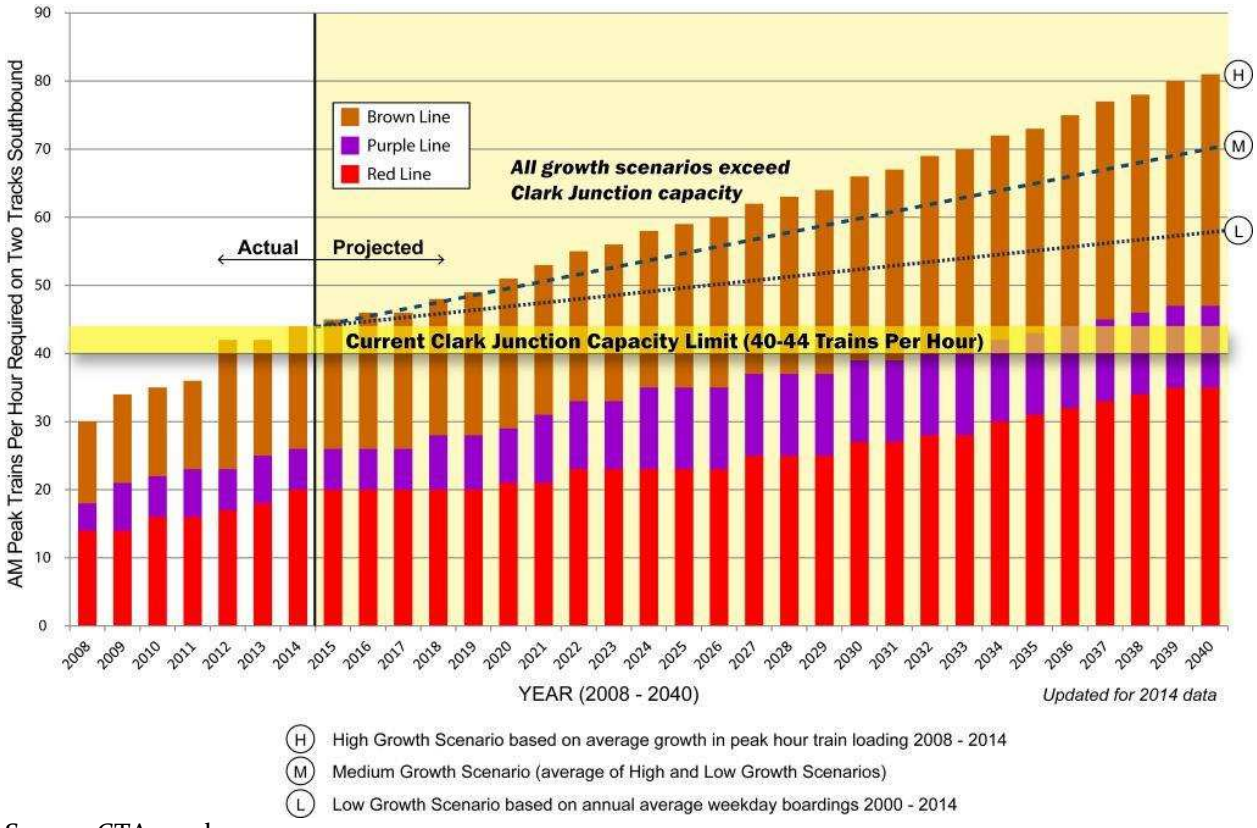
- **Peak ridership demand exceeds existing infrastructure capacity.** Clark Junction is the largest constraint in the RPM corridor, limiting capacity on all three lines that pass through this area. South of the junction, the segment includes two southbound and two northbound tracks shared by the Red, Purple, and Brown lines. At the junction, northbound Brown Line trains cross both the north- and southbound Red Line tracks and the southbound Purple Line tracks, limiting total train throughput to 20–22 trains per hour per track, or 40–44 trains per hour in each direction (CTA 2014g). General rail transit design guidance recommends that junctions be grade separated when trains operate as frequently as they do through Clark Junction (Transit Cooperative Research Program 2013).

  Based on an assumption of meeting current demand and an average capacity of 75 passengers per car, CTA would need to operate 42 trains per hour in the peak direction in the RPM corridor, already within the range of maximum possible throughput for Clark Junction, in order to minimize crowding (CTA 2013b). At least 40 percent of all Red, Brown, and Purple line trains traveling through this junction are delayed, which is symptomatic of the capacity constraint (CTA 2014d).

  CTA analyzed three scenarios for growth projections based on past ridership trends from 2000 through 2014. This 15-year analysis period was selected to reasonably project ridership trends assuming similar operational patterns in the transit system. While year-to-year ridership may fluctuate (increase or decrease) depending on a variety of factors, including both gasoline and fare prices among other economic factors and externalities, this forecasting provides a context for understanding larger trends in ridership growth over time and planning appropriately for those trends to serve public transportation needs. Under even the most conservative projections, demand at Clark Junction is expected to exceed capacity within the next 5 years.

  Peak-period demand has grown by almost 40 percent in the last 5 years. At this rate, by 2016, service demands will exceed Clark Junction capacity in the peak direction, and as a result,

train delays at the junction will continue to worsen, affecting service reliability on all three lines. **Figure 1-5** compares the current and projected demand for the RPM corridor to the capacity at Clark Junction assuming low, medium and high growth projections rates. These projections were developed using standard planning procedures (CTA 2014b).



Source: CTA 2014b

Figure 1-5: Clark Junction Projected Train Demand and Capacity Constraints

- **Passenger crowding is common on trains.** CTA has increased service to address crowding by adding more trains, including 14 more trains during morning peak periods and 12 more trains during evening peak periods on the Red, Purple, and Brown lines since early 2012 (CTA 2014c). CTA included this additional service in response to the Plan to Reduce Crowding, which targeted the heaviest loads on CTA service. The growth in demand in the RPM corridor resulted in routine periods during both the AM and PM peak period when trains left customers behind on platforms. For the Red and Brown lines these were daily occurrences. Nonetheless, CTA continues to be unable to meet the standard of 75 passengers per car during the peak, due to the high demand and growth in this corridor. As a result, crowding and passengers being left behind are regular operating occurrences (CTA 2013b).

- **Delays occur frequently at Clark Junction.** CTA regularly monitors "delay events," or additional travel times experienced by passengers due to train movement factors, and measures these events by making comparisons between actual travel time and unimpeded travel times. The current track configuration requires trains on three of four tracks to stop and

wait for Brown Line trains to cross—this interruption happens every 3 to 10 minutes between 5:30 AM and 7:00 PM (CTA 2014a). The delays caused by this capacity constraint create a ripple effect through the rest of the CTA train system. The delays affect at least 40 percent of all Red, Brown, and Purple line trains, which represent nearly 67,300 delay events totaling 448 train-hours in 1 year (CTA 2014d).

- **Overall train speeds are slow due to cross traffic and antiquated infrastructure.** Clark Junction is a product of the original design for the Ravenswood Branch. The mainline opened for service in 1900, and the Ravenswood Branch (including Clark Junction) opened in 1907. Clark Junction is extremely unusual in rail transit, as it is a flat junction where one train must cross three other tracks (see **Figure 1-6**).

  Most flat junctions require trains to cross only one other track. Because trains need to come to a full stop while waiting for other trains to pass, the train conflicts at Clark Junction affect speed, capacity, and reliability. Red and Purple line trains that could be traveling steadily at 25 miles per hour (mph) through the junction come to a complete stop when a Brown Line train needs to pass. Trains operate at slower speeds through this segment of tracks regardless of actual train conflicts due to the complex signaling required.

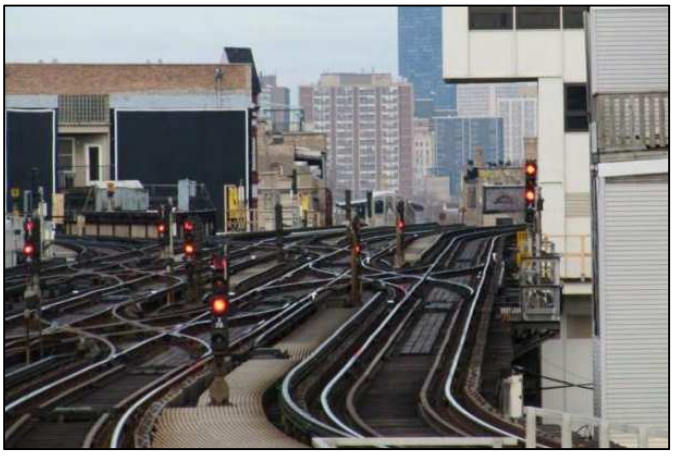


Figure 1-6: Photo of Clark Junction

In addition to the constraints imposed by Clark Junction, the four-track alignment north of Clark Junction between Belmont and Addison stations, which is approximately 2,000 feet long, includes a pair of short-radius, speed-restricted curves. These curves result in longer travel times (slow curves limit train speeds to 25 mph) and reduced passenger comfort. These speed-restricted curves would limit speeds for the Red and Purple lines even if the flat junction capacity constraint were removed. The existing track spacing at these locations also does not meet CTA track spacing requirements that are in place for safety reasons (i.e., providing adequate clearances for track maintenance and to meet minimum emergency access standards). With insufficient room for walkways under existing conditions, the impacts translate into delays during maintenance and inspection. Trains are held by flaggers as workers clear the tracks (because any space between tracks is insufficient for a train to pass with workers in this space). To clear one track, workers must stand in the pathways of other tracks. Current CTA design criteria call for track spacing and walkways that allow room for maintainers and inspectors to stand clear of tracks.

The conflicts at the junction and the speed-restricted curves combine to slow each train traveling between Addison and Belmont by over 1 minute on average. In 2013, over 93,000 passenger trips traveled through this section every weekday, which represents over 30 million annual trips. The combined factor of high ridership and slow speeds leads to over ½ million hours of extra travel time for Red and Purple line customers annually (CTA 2013a, CTA 2014h).

- **Existing infrastructure is substantially past its useful life.** A structure can be past its useful life for both functional and structural reasons. The functional needs for the project are defined by both the existing flat junction, which does not allow additional capacity, and the short-radius curves along the mainline track structure. The short-radius curves limit operating speeds and influence how quickly trains can operate north and south of the junction. Addressing functional infrastructure needs in the rail system would by extension address structural deficiencies due to age. The project area includes some of the oldest infrastructure in the CTA train system, dating back to 1900. The track structure includes the actual rail line tracks and structural support system, including steel beams and post foundations. The underlying structure, including many of the foundations, has never been fully replaced as part of state-of-good-repair improvements. The existing track structure has an FTA condition rating of 1.6 out of 5. (This rating means that the asset is past its useful life and should be prioritized for repair or replacement.) Under the FTA condition rating definition, the track structure reached the end of its useful life 37 years ago (Regional Transportation Authority [RTA] 2014).

- **Maintaining safe operating conditions becomes more difficult and costly as infrastructure continues to degrade.** Slow zones on the CTA train system are instituted in areas where train speeds are restricted to maintain safe travel. Slower train speeds mean that more time is required for each train to make its round trip, and longer round trips mean that more trains are needed to maintain the scheduled frequency of service, increasing operating costs. Steadily declining train operating speeds contribute to reduced efficiency and higher costs in transit service even where high ridership exists. When trains cannot run according to schedule, passenger loads are distributed unevenly, and service suffers. Slow zones through the Clark Junction corridor exacerbate delays caused by the flat junction and short-radius curves along the mainline track structure. In addition, these slow zones and degraded tracks have associated effects on other elements of the rail infrastructure system, such as increased wear on rail vehicles. The short-radius curves along the mainline also introduce significant centrifugal and braking forces that escalate track system deterioration. Under the FTA condition rating definition, maintenance needs increase after an asset reaches the end of its useful life, which this asset reached 37 years ago, as noted above (RTA 2014).

1.3 Project Purpose

The purpose of the Red-Purple Bypass Project is to improve capacity, travel time, ride quality, and safety in one of CTA's highest ridership corridors. The project would allow CTA to increase functional capacity to meet ridership demands while improving the quality, speed, and passenger comfort of each ride and improving access to job markets and destinations. The capacity expansion would have the added benefit of bringing this critical infrastructure into a state of good

repair, thereby improving efficiency and service reliability and extending the overall life of the transit system by 60 to 80 years.

The purpose and need for this project is consistent with the goals and objectives of the regional long-range transportation plan (Chicago Metropolitan Agency for Planning's *GO TO 2040 Plan*), and consistent with the region's Congestion Management Process (CMP) and TDM strategies. *GO TO 2040* outlines a series of recommendations for improving regional mobility that are consistent with the proposed project and which the proposed project supports. These recommendations for the regional transportation system include making strategic transportation investments that increase the region's commitment to public transit and prioritizing modernization of existing significant assets over system expansion plans. The region's CMP and associated TDM strategies seek to reduce demand for single-occupancy vehicle use on the regional transportation network. The RPM Program is consistent with these approaches and provides needed maintenance and modernization of existing public transit infrastructure to support more efficient ways to move a greater number of people throughout the region.

To support the region's expected growth and to improve the quality of transportation service for people and businesses, *GO TO 2040* identifies a small number of specific capital investments for expanding the capacity of regionally significant transportation facilities that can improve the capacity of the region's transportation system. The RPM Program is included in the region's financially constrained long-range transportation plan and has been adopted into the 5-year Transportation Improvement Program.

1.4 Organization of the Document

NEPA documents such as this EA must provide sufficient technical details to meet a range of legal requirements and are required to be organized in a specific way. **Figure 1-7** provides an overview of the chapters and the major topics covered in this document for ease in navigating through the document. References are cited throughout this document. A letter appears after an in-text citation when this document has used, as sources, two or more works by the same author from the same year. For the reader's convenience, the letter indicates which source from that year was cited. The full reference list is provided in **Appendix A**.

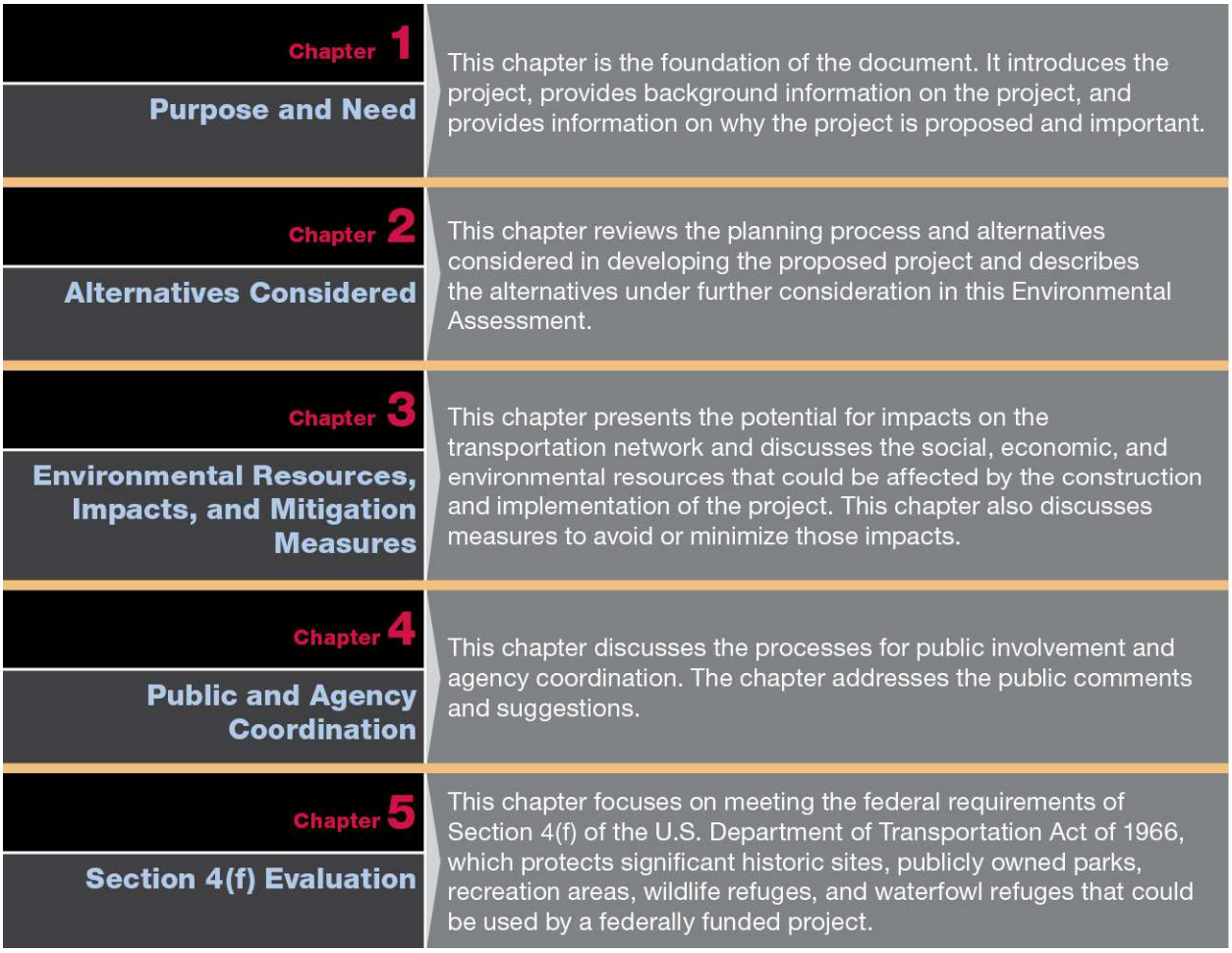


Figure 1-7: Environmental Assessment Document Organization

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Chapter 2
Alternatives Considered

This chapter summarizes the decision-making process that led to the alternatives evaluated in this EA, the No Build Alternative and the Build Alternative, and describes these alternatives.

2.1 Alternatives Development Process

The proposed Build Alternative was developed through a multiyear decision-making process that began in 2009 and included extensive public involvement. Efforts included the following:

- **2009–2010** - In 2009, CTA initiated improvements for the 9.6-mile corridor between Belmont and Linden stations with an early vision study (see the *Vision Study Summary Report* in **Appendix C-1**). This study helped identify the public's priorities and concerns and helped develop a comprehensive strategy for reconstructing and improving the infrastructure on the North Red and Purple lines.

  The vision study began with an evaluation of existing conditions in the RPM corridor. CTA hosted four open houses to obtain public input on corridor needs and to help identify goals and objectives for the RPM Program. Over 300 people attended the open houses and provided over 1,100 comments. CTA received additional public input through a Community Engagement Survey mailed out to over 11,000 residents and businesses within the RPM corridor.

  Based on the feedback received, CTA developed 20 alternatives for improvements to the RPM corridor. These 20 alternatives were narrowed to four based on passenger travel time savings, capacity, order-of-magnitude cost, and potential impacts. CTA also established top priorities by which these options would be evaluated: travel time, safety and passenger amenities, intermodal connectivity, Americans with Disabilities Act (ADA) access at stations, increasing passenger capacity, and nurturing community development. These priorities also helped to shape the purpose and need for improvements to the 9.6-mile corridor.

- **2011–2013** - Following the vision study evaluation process, an EIS public and agency scoping process for the 9.6-mile RPM corridor considered six alternatives: the No Build Alternative, a Basic Rehabilitation Alternative, a Basic Rehabilitation with Transfer Stations Alternative, a Modernization 4-Track Alternative, a Modernization 3-Track Alternative, and a Modernization 2-Track Underground Alternative. This effort built upon the alternatives developed during the vision study process and identified possible environmental impacts of the alternatives. In response to public feedback, CTA undertook an in-depth research and conceptual design process to identify a refined alternative that would provide key benefits to the RPM corridor while minimizing property displacements and other environmental impacts (including noise, historic resources, community, and transportation impacts). The bypass at Clark Junction (that is, the grade separation of the northbound Brown Line from the Red and

Purple lines, replacing the existing flat junction) was introduced at public open house meetings in February 2012.

- **2013–Present** - In late 2013, FTA and CTA developed a phased, tailored approach for improving the RPM corridor, allowing CTA to make the greatest number of improvements while minimizing impacts on the surrounding community. CTA conducted an early, extensive public outreach effort in spring and summer 2014 to obtain specific public and agency input regarding the RPM Phase One projects and their potential environmental impacts. Based on the RPM corridor-wide public outreach, public sentiment was overwhelmingly supportive of constructing a Build Alternative that would increase train capacity, reduce travel times and improve reliability, straighten existing curves in the system to increase train speeds, and replace aging infrastructure to provide uninterrupted service.

Throughout the development of the Build Alternative for the Red-Purple Bypass Project, CTA considered a series of alternatives to address the existing capacity constraint at Clark Junction. These alternatives reflected public comments regarding alternate solutions to address capacity constraints at Clark Junction, reduce property displacements, and minimize community disruption. The alternatives considered to increase capacity through Clark Junction are described briefly below.

- **Underground Tunnel** - During very early concept development CTA examined an underground tunnel alternative. The middle two tracks currently carrying the Red Line would descend into the tunnel immediately north of Belmont station. For operational reasons, Purple Line trains would merge with Red Line trains into the tunnel permanently as part of this option. The tunnel would require a grade transition or "ramp" (from the elevated tracks to underground, along a segment of right-of-way just north of the Belmont station) that would block School Street. The tracks would then transition back up to elevated tracks. The closest possible transition location would be the area just north of Irving Park Road (adjacent to Graceland Cemetery). Launching pits for tunnel-boring machines would require substantial construction staging sites (approximately 700 feet long by 140 feet wide or approximately two blocks in length) resulting in property displacements at both ends of the tunnel. Construction of underground rail transit facilities typically costs considerably more than for elevated facilities and construction would last much longer. Placing facilities underground would not eliminate impacts on the surrounding community, because construction staging sites would be larger than for aboveground facilities, and ventilation and emergency exit facilities would also be required. While this alternative would provide capacity and travel time improvements once fully built and operational, it was eliminated from consideration during early project development due to the environmental impacts and property displacements that would be associated with the larger area required, the potential for substantial service disruptions during construction, and the cost and schedule impacts. The tunnel was also eliminated because it could not be constructed in phases (i.e., a tunnel cannot be placed in service until the entire tunnel is complete).

- **Track 4 Bypass** - Track 4 is the easternmost rail track passing through Belmont station, currently used by the northbound Purple and Brown line trains, as shown on **Figure 1-3**. This option would merge the northbound Red and Purple line trains onto a single northbound track south of Belmont station. The northbound Brown Line track would ramp upward just north of Belmont station and then curve to the west. This alternative would have marginally fewer property impacts on the west side of Wilton Avenue south of School Street than the Build Alternative but would have more property impacts along Clark Street near Roscoe Street. Future capacity would be constrained from the merge point of the Red and Purple line tracks through Belmont station. As the key need for this project is to increase passenger capacity, the Track 4 bypass was eliminated from further consideration in this EA because it would introduce a new capacity constraint.

- **Bypass using (Red Line) Center Tracks** - This alternative would remove the existing conflict between the Red and Brown line trains by creating a bypass for the two center tracks (Tracks 2 and 3) above the Brown Line track curve. Because the distance from the north end of the Belmont station platform to the existing crossing would be insufficient for the vertical clearance required for the ramp, the northbound Brown Line track curve would need to be moved north of its current location. Moving the Brown Line track curve north would result in property displacements along Clark Street and Sheffield Street. During construction of this alternative, all Red, Purple, and Brown line trains would be placed on a single track in each direction. The combined number of trains per hour (44 total trains in each direction during peak periods) would be almost twice the existing capacity at Clark Junction. Analysis demonstrated that severe delays for Red, Purple, and Brown line passengers would occur throughout the duration of construction. Ridership on the Red, Purple, and Brown lines is so high that a bus bridge (shuttles) would not sufficiently accommodate passenger needs. Because of the severity of operational impacts, the bypass using center tracks alternative would not meet the purpose and need for the project and was eliminated from further consideration in the EA.

CTA determined that construction of a fifth track bypass, which is described below, would best meet the purpose and need of the project to expand capacity of the existing infrastructure and remove the major constraint at Clark Junction.

CTA also conducted an extensive analysis to identify properties required for permanent right-of-way and construction to minimize these impacts where possible. CTA conducted detailed LIDAR surveys (very accurate land surveys that use lasers to collect thousands of data points) at track level and supplementary ground-level surveys to produce building footprint data. CTA's design criteria require that right-of-way limits for new track alignments include space for construction, maintenance, and emergency access to the new track structure. CTA considered variances to the design criteria to the extent that these variances would not impede safe and efficient construction and maintenance of the structures. The construction areas that have been identified for the Build Alternative provide adequate space for permanent right-of-way and construction needs. CTA evaluated parcels on a case-by-case basis such that construction sites would be suitable in shape and size for construction. Portions of the land acquired for permanent right-of-way would be

needed for the final track realignment, and the remainder would become available for redevelopment after construction. Redevelopment would include transit-related uses and would be developed with CTA independently of this project.

To further reduce the property impacts required to modernize the mainline track structure, CTA considered other displacement-reducing alternatives based on public input, such as "stacking" the tracks. This alternative would place the two Purple Line tracks on a two-level structure above the two Red Line tracks just north of Clark Junction. "Stacking" the Purple Line tracks over the Red Line tracks (i.e., double-decker tracks) was suggested during public outreach efforts as a potential means to narrow the mainline (north-south) right-of-way requirements in the vicinity of Newport Avenue. Analysis of this configuration showed that this alternative would not avoid property impacts, particularly where the structure would transition from a single-level structure to a two-level structure. Stacking the tracks would expand the project limits (both the width and length of the project) and therefore would require more property displacements than those identified as part of the Build Alternative. In addition, stacking the tracks would also prevent inter-operability between the Red and Purple line trains, which would result in substantial service disruptions during track maintenance. This alternative was eliminated from further consideration because it would cause substantial operational issues and not reduce property displacements. In fact, there would be greater property impacts anticipated from this alternative than from the proposed Build Alternative.

Chapter 5 contains a discussion of the extensive analysis undertaken and alternatives considered to avoid or minimize historic resource effects resulting from the Build Alternative.

2.2 No Build Alternative

The No Build Alternative is a required alternative as part of the NEPA environmental analysis and is used for comparison purposes to assess the relative benefits and impacts of implementing the Red-Purple Bypass Project. The No Build Alternative would maintain the status quo, and would not expand system capacity.

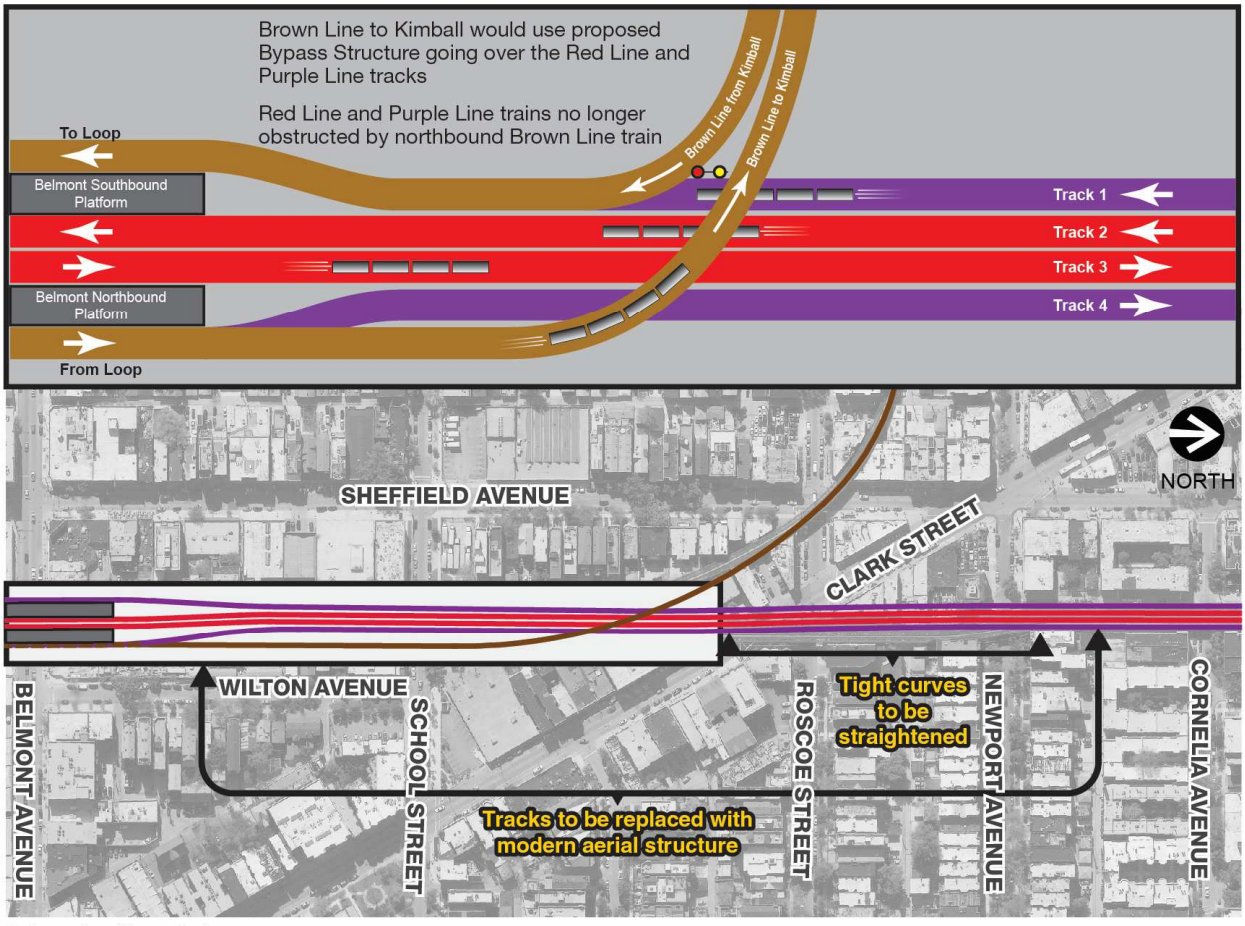
The No Build Alternative represents future conditions if the Red-Purple Bypass Project were not implemented. The alternative would include typical repairs to Clark Junction and the associated mainline tracks based on historic funding levels needed to keep the lines functional. Typical repairs include footing replacement, structural steel repair or replacement, tie replacement, rail replacement, traction power replacement and upgrades, signal component replacement, and signal upgrades.

Capital expenditures would be minor compared to the Build Alternative. Functional improvements under the No Build Alternative would be insufficient to respond to ridership demand and would not modernize the system. Some expenditure would be made to keep the system operating; however, service quality and effective capacity would decline over time, and maintenance costs would rise due to continued aging of the infrastructure. The No Build Alternative would not involve substantial changes to the existing infrastructure or major

construction activities. Travel times would likely continue to increase and service reliability would continue to degrade in order to safely operate on deteriorating infrastructure.

2.3 Build Alternative

The Build Alternative, shown in **Figure 2-1**, consists of constructing a fifth track bypass for the northbound Brown Line and reconstructing approximately 0.3 mile of the mainline Red and Purple line tracks from Belmont station on the south to the stretch of track between Newport and Cornelia Avenues on the north. The improvements would address current and future ridership demands, decrease travel times, raise overall system reliability and safety, reduce noise levels, and provide a modern track structure with a renewed useful life of 60 to 80 years while supporting future growth and development in the project area and beyond. The Build Alternative would allow for up to eight additional trains to pass through Clark Junction every hour, representing a nearly 30 percent increase in peak-period capacity. Conceptual engineering plans are provided in **Appendix C-2**.



Schematic – Not to Scale

Figure 2-1: Schematic of the Red-Purple Bypass Project Build Alternative

2.3.1 Major Elements of the Build Alternative

The two major elements of the Red-Purple Bypass Project include construction of a fifth track bypass at Clark Junction and modernization of approximately 0.3 mile of mainline tracks, as described below.

Fifth Track Bypass

Currently, northbound Brown Line trains must cross the north- and southbound Red Line tracks and the southbound Purple Line track at Clark Junction. This flat junction configuration causes signal delays because Red, Purple, and Brown line trains must wait for each other to pass through the junction before proceeding. The Build Alternative would provide a grade-separated junction allowing northbound Brown Line trains to cross unimpeded over and above the other tracks on a new aerial structure, resulting in increased capacity for all three lines while also improving travel time and overall system reliability and safety. A new track would be built to the east of the existing tracks, ramp up, and curve westward over the mainline tracks to merge onto the existing Brown Line track elevated structure just west of Sheffield Avenue. Based on conceptual engineering, the bypass track is expected to be approximately 40 to 45 feet above the existing ground level (up to 22 feet above the existing tracks) at its highest point.

The proposed structure would use a closed-deck, aerial structure with direct-fixation track and a welded rail system.[3] With direct-fixation track, rails are mounted to specially designed concrete blocks fixed to the concrete deck. Noise barriers (approximately 3 to 5 feet in height) are proposed on both sides of the track deck for the full length of the bypass to reduce noise transmission at and below track level. The bypass structure would include special trackwork,[4] signals, signal equipment, and relay houses that would allow northbound Brown Line trains to be routed up and over the Red and Purple line tracks, reconnecting with the existing Brown Line tracks west of Sheffield Avenue. The new bypass track would be constructed with minimal service disruptions for Red, Purple, and Brown line passengers. **Figure 2-2** shows a picture of the existing four-track system at Belmont station facing north and an artistic conceptual rendering of the proposed bypass.

[3] On the existing open-deck structure, each piece of rail is bolted to the next piece to form the track on which trains run. Although the gap at each joint is small, when wheels pass over the gap, noise is generated. Welded rail refers to the way rail is joined to form the track. The individual pieces of rail are welded together to form one uninterrupted rail. The rail may be continuous rail for fairly long distances, or it may contain a few joints for one or more reasons, such as expansion joints along structures, insulated joints needed to electrically separate track segments for signaling purposes, or construction joints at the beginning and end of the project where the new track joins to the existing track.

[4] "Special trackwork" refers to areas of the tracks where crossovers or turnouts would be added to allow trains to move from one track to another.

Figure 2-2: Photo and Artistic Conceptual Rendering of Proposed Red-Purple Bypass, Facing North from Belmont Station

Mainline Tracks

The existing mainline tracks are directly underneath the location of the proposed bypass. These tracks date back to the turn of the 20th century and have not been fully replaced since then. The existing track geometry north of Clark Junction requires Red and Purple line trains on all four tracks to maneuver through two short-radius curves between School Street and Newport Avenue, partly beneath the location of the proposed new bypass tracks. These short-radius curves restrict train speeds; increase travel time, noise levels, and rail wear; and reduce passenger comfort with undesirable side-to-side movements. As part of the Red-Purple Bypass Project, these existing short-radius curves would be realigned to eliminate unnecessary speed restrictions, improving

train speeds, travel time, and ride quality. If not improved, these speed-restricted curves would limit speeds for the Red and Purple lines even after the flat junction capacity constraint is removed. The existing open-deck, steel structure with jointed rail, which is over 115 years old, would be modernized from Belmont station on the south to the segment of track between Newport and Cornelia Avenues on the north. The modernized track structure would be wider than the existing track structure to meet modern design standards, including provisions for worker safety. To minimize noise and vibration impacts from faster and more frequent trains, the proposed structure would use a closed-deck aerial structure with direct-fixation track and welded rail. Noise barriers (approximately 3 to 5 feet in height) are proposed on both sides of the track deck for the full length of the project limits to reduce noise transmission at and below track level. At specific locations special trackwork, signals, signal equipment, and relay houses would be included.

2.3.2 Construction Staging and Implementation Schedule

Stages of Construction

CTA developed a conceptual staging plan for construction with the goal of limiting impacts on passengers during peak periods. The plan follows three conceptual stages for construction:

1. Early work such as demolition of buildings and utility relocation in preparation for construction

2. Construction of the bypass for the northbound Brown Line and a temporary southbound Brown Line track

3. Construction of the mainline tracks, starting with the west two tracks and finishing with the east two tracks

The first stage of construction (early work) would not affect train operation in the project area. Additional details on the second and third conceptual stages (presented below) would be refined through detailed engineering.[5] These stages take into account construction tasks and limit disruption to transit service where possible during these construction activities. Additional details about impacts on transit operations during construction are presented in **Section 3.1.3**.

The second stage of construction would include construction of elements adjacent to the existing track structure. These elements could include the majority of the bypass structure and a temporary track to serve southbound Brown Line trains during construction. The temporary track would be located west of Track 1 (the westernmost track), over the alley that serves properties on the east side of Sheffield Avenue. The work envisioned in the second stage would not, for the

[5] A number of variations are possible with this conceptual staging plan. The impacts and durations with this conceptual plan provide sufficient detail to assess environmental impacts with the variations. For instance, a contractor may propose to reduce the temporary trackwork that would increase the construction duration (within the stated 48–52 month window). This sort of variation would not change passenger boarding at Belmont station, peak-period train operations, the need to hold trains while beams are placed overhead, or the need for a limited number of weekend bus bridges (shuttles) while track tie-ins are made or while switches are installed.

most part, include removal of any existing tracks from service, and service would operate on Red, Purple, and Brown lines similar to current operation. During this stage, the following construction tasks would require temporary operational changes:

- The temporary southbound Brown Line track would be tied into Track 1 during a limited number of weekends, when Purple Line express trains are not in service. The southbound Brown Line trains would either need to be rerouted to share the northbound Brown Line tracks at the junction and southbound Red Line tracks at Belmont station, or a bus bridge (shuttles) between Belmont station and Southport station would be provided.

- Construction of the bypass structure itself over the mainline tracks could require some tracks to be taken out of service and rail service patterns to change. Rail service during this period would provide connections similar to current ones.

- While beams for the bypass structure are lifted over the existing tracks, trains on the existing tracks would be held short of Clark Junction until the beam is secured into place. The beam lifts would be scheduled during non-peak hours.

- A new switch at the north end of the Belmont station platform, which would tie the current northbound Brown Line track into the bypass structure, would be installed during a limited number of weekends. The northbound Brown Line trains would be rerouted to share the northbound Red Line track, with negligible impacts on service.

- A new switch, which would tie the bypass structure into the existing Brown Line tracks, would be installed during a limited number of weekends. A bus bridge (shuttle) between Belmont and Southport stations would be provided.

For construction on the mainline tracks, the third major stage of construction, the conceptual staging plan includes two sub-stages: a western stage and an eastern stage. These two sub-stages would occur after the bypass is operational. Each sub-stage would include construction of two new tracks simultaneously while north- and southbound Red and Purple line trains would operate together on the remaining two active tracks (one southbound and one northbound track). The northbound Brown Line trains would use the bypass and the southbound Brown Line trains would use the temporary track over the Sheffield Avenue alley. Weekend track shifts or a bus bridge (shuttle) between Belmont station and Southport station (for the Brown Line), or Addison station (for the Red Line) may be required on a temporary basis to tie in tracks or install special trackwork.

Construction Sites

Construction would take place within existing CTA right-of-way and properties to be acquired to accommodate the proposed track alignment as well as the operation and maintenance of the Built Alternative. Properties to be acquired are discussed in **Section 3.2**. Combined, these properties would result in an area sufficient in size to support construction of the project, while limiting street closures and other construction-related impacts in the neighborhood.

Implementation Schedule

Contingent upon funding, construction of the Build Alternative is anticipated to begin as early as 2017; construction activity would last approximately 48 to 52 months including early work. This early work would include preparing the project area for construction (i.e., utility relocation and demolition) as well as separate signal and interim track improvements (see discussion of other Phase One improvements in **Section 1.1.1**). Construction staging described here is based on conceptual engineering completed to date and represents a maximum envelope for evaluating environmental impacts. Preliminary engineering for this project is ongoing. After completion of preliminary engineering, the proposed project would be a design-build project, which would allow the greatest flexibility in addressing construction needs and use of innovative strategies to reduce construction timelines and/or costs. As such, timelines for construction may be reduced. The timelines provided in this EA reflect the maximum construction duration for the evaluation of impacts.

As with all CTA construction projects, public outreach would be conducted throughout construction to alert passengers, residents, and business owners to any operational and accessibility changes and inform them of upcoming work. **Section 3.4** presents additional information about neighborhood and community impacts during construction and describes the efforts to minimize impacts. **Section 4.4** of this document provides details on the next public outreach steps.

2.3.3 Project Costs and Funding Considerations

Preliminary capital construction costs for the Red-Purple Bypass Project were developed based on conceptual engineering considerations and will be further refined through ongoing preliminary engineering. Anticipated capital costs for the Red-Purple Bypass Project are approximately $570 million in year-of-expenditure dollars, inclusive of repair work on the Brown Line tracks east of Seminary Avenue.

CTA intends to seek Capital Investment Grant (CIG) program funding from FTA for the Red-Purple Bypass Project. The CIG program, more commonly known as the New Starts, Small Starts, and Core Capacity program, involves a multiyear, multistep process that project sponsors must complete before a project is eligible for funding. The steps in the process and the basic requirements of the program can be found on FTA's website at www.fta.dot.gov.

FTA must evaluate and rate proposed projects seeking funding from the CIG program based on a set of project justification and local financial commitment criteria specified in law. The criteria evaluate the merits of the project and the local sponsor's ability to build and operate it along with the existing transit system. FTA assigns ratings from low to high based on information that project sponsors submit on the project cost, benefits, requested amount of CIG program funds, and overall financial plan. Projects must receive a medium or better overall rating to advance through the steps in the process and be eligible for funding from the program. During the process, information concerning costs, benefits, and impacts is refined and the ratings are updated to reflect new information.

While federal funding would pay for a substantial portion of project costs, state and local funds would still be needed to pay for more than half of project costs. CTA is continuing to work with federal, state, and local agencies and elected officials to secure the necessary funding to keep this project moving forward with the support of the community.

CTA is investigating the potential for cost-saving strategies through alternate construction and financing methods. One potential approach for saving costs is a public-private partnership. If pursued, this funding mechanism would take the form of an agreement between CTA and a private entity. The private business venture would take on more responsibilities earlier in the project development process than in the typical process. The main advantage of a public-private partnership is that it would allow CTA to harness the expertise and efficiencies of the private sector to provide a public service. The exact funding mechanism will be determined after preliminary engineering and will be included as part of the financial supporting information provided to FTA at the time of a grant application for the project.

2.4 Subsequent Phases of the RPM Program

As discussed in **Section 1.1.1**, Phase One of the RPM Program includes the Red-Purple Bypass Project and the Lawrence to Bryn Mawr Modernization Project as well as corridor signal improvements and modernization from Belmont station to near Loyola station, and continued interim capital improvements to the track and rail structures.

Subsequent phases of the RPM Program have not yet been identified. CTA will determine subsequent phases of the RPM Program using factors consistent with the selection of Phase One improvements:

1. Consistency with Federal Regulations - The ability to construct discrete projects within the RPM corridor with logical termini that assist in providing the greatest capacity improvements throughout the RPM corridor as a whole

2. Schedule - Timeframes and consideration of operational impacts on passengers

3. Project Costs and Funding Considerations - The ability to secure federal, state, and local funding

CTA recognizes the need for improving and modernizing the entire RPM corridor comprehensively and will continue to engage the public and stakeholders through the phased development of the RPM Program. The Red and Purple lines are an integral part of the CTA transit system. CTA is committed to making improvements within the RPM corridor to ensure passenger safety and maintain a state of good repair for the entire 9.6-mile corridor.

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Chapter 3
Environmental Resources, Impacts, and Mitigation Measures

One of the primary purposes of NEPA is to provide the public and decision-makers with relevant information on the potential environmental impacts of a proposed project. This chapter describes existing conditions and the impacts of both the No Build Alternative and the Build Alternative (construction and operation) on different aspects of the social, cultural, and natural environment. The following major topics (called resource areas) are considered: transportation; displacements and relocations; land use and economic development; neighborhoods and communities; historic and archaeological resources; visual and aesthetic conditions; noise and vibration; hazardous materials; environmental justice (EJ); indirect and cumulative impacts; air quality; water and biological resources; geology and soils; energy; and safety and security. For some resource areas, the full technical analysis required under NEPA and other federal, state, and local laws required detailed analysis; for those cases, technical memoranda or other supporting documents were developed and are included in **Appendix D.** This chapter summarizes the findings of the resource evaluations.

Each resource area discussion includes an overview of the resource area, a description of the major considerations and laws or regulations governing the analysis, a description of the impact analysis method, a summary of existing conditions, and anticipated temporary construction and permanent environmental impacts from the No Build and Build Alternatives. Within this NEPA document, resource areas are discussed in terms of impacts being either "beneficial" or "adverse." Where adverse impacts are noted, standard measures (often described as "best management practices" or BMPs) to avoid or minimize impacts are discussed. Additional mitigation measures are described where needed to minimize impacts.

3.1 Transportation

This section documents the existing transportation system and the potential impacts of the Red-Purple Bypass Project.

3.1.1 Regulatory Framework/Methods

CTA conducted the transportation analysis in compliance with current FTA guidelines, NEPA regulations, and the Moving Ahead for Progress in the 21st Century Act. CTA also studied local resources to understand the existing transportation network and other planned or programmed projects in the project area. These resources included the CMAP *GO TO 2040 Plan*, City of Chicago transportation and community plans, and Illinois Department of Transportation (IDOT) studies.

CTA assessed potential impacts on travel and the transportation system related to the duration of construction based on construction planning at the time of analysis. The analysis takes into account potential impacts on the local transportation system including construction and

permanent impacts on transit facilities and service, traffic patterns, parking and loading zones, and pedestrian and bicycle accessibility. In the event of an adverse change, CTA identified mitigation measures to minimize impacts and reduce them to a level less than significant under NEPA.

3.1.2 Existing Conditions

Within the project area, CTA operates the Red, Purple, and Brown lines. Red Line trains operate 24 hours a day. Purple Line express trains operate in the project area during weekday peak periods (approximately 5:30 to 11:15 AM and 2:30 to 8:00 PM). Brown Line trains operate all day except between 2:30 and 4:00 AM. Service frequencies vary by line and time of day. The Red Line operates approximately every 3 to 6 minutes during weekday peak hours, the Purple Line Express operates approximately every 8 to 12 minutes during weekday peak hours, and the Brown Line operates approximately every 3 to 8 minutes during weekday peak hours. Train service is slightly less frequent on the Red and Brown lines during weekday off-peak hours, providing Red Line service every 6 to 8 minutes and Brown Line service every 7 to 12 minutes. Purple Line Express service is only provided during weekday peak hours. Weekend service on the Red and Brown lines is similar to off-peak weekday service, and is adjusted to meet passenger demands at different times of day. The CTA website provides full schedules (by day of week/time) for each of the lines (CTA 2014a).

Within the project limits, the Red, Purple, and Brown line tracks intersect at a flat junction, known as Clark Junction (see **Figures 1-3 and 1-6**), just north of Belmont station. As discussed in **Section 1.2**, the current configuration is the most limiting capacity constraint in the RPM corridor. The Clark Junction configuration limits total train throughput to 21–23 trains per hour per track, or 42–46 trains total in a single direction. In addition to the constraints imposed by Clark Junction, the four-track alignment north of Clark Junction (between Belmont and Addison stations, which is approximately 2,000 feet long) includes a pair of short-radius, speed-restricted curves partly beneath the location of the proposed new bypass tracks; these curves result in longer travel times and reduced passenger comfort. The existing track spacing at these locations does not meet CTA track spacing requirements that are in place for safety reasons (i.e., providing adequate clearances for track maintenance and to meet minimum emergency access standards).

CTA bus routes that traverse the project area (shown on **Figure 1-4**) include #22 Clark and #154 Wrigley Field Express. Additional buses near the project area include #8 Halsted, #77 Belmont, #151 Sheridan, and #152 Addison, as well as Pace bus routes #282 Schaumburg - Wrigley Field Express and #779 Yorktown - Wrigley Field Express.

The streets in the vicinity of the project area have one or two traffic lanes, parallel on-street parking, and sidewalks on both sides of the street. Clark Street also has bicycle lanes in both directions.

3.1.3 Environmental Impacts

The following sections summarize the potential transportation impacts of the No Build and Build Alternatives.

No Build Alternative

Under the No Build Alternative, the project would not be constructed and no impacts on transportation conditions would occur. There would be no major construction associated with the No Build Alternative; therefore, no construction-related transportation impacts would occur. Infrastructure would continue to degrade and the capacity constraint at Clark Junction would not be addressed, resulting in decreased service reliability and an inability to accommodate expected increases in ridership demand within the project area.

Build Alternative

Construction Impacts

Transit Impacts

Potential impacts on the transit network during the 48 to 52 months of construction activity would consist of temporary transit service disruptions along the Red, Purple, or Brown lines, as described in **Section 2.3.2**. Service disruptions will be scheduled to occur during weekends and off-peak periods when possible, to limit impacts on passengers. A bus bridge (shuttle) will operate between Belmont station and Southport station when the bypass track is tied into the existing Brown Line track. The westbound bus bridge (shuttle) will likely run west from Belmont station along Belmont Avenue and then north on Southport Avenue to Southport station. Eastbound service will likely run north on Southport Avenue, turn east on Addison Street, and then south on Clark Street to Belmont Avenue. A bus bridge (shuttle) will also be required for Red Line service between Belmont and Addison stations on a temporary basis when tying in tracks or installing special trackwork. The bus bridge (shuttle) will likely operate on Sheffield Avenue, Addison Street, Halsted Street, and Belmont Avenue. Detailed operational plans for bus bridges will be developed closer to construction to provide the most efficient services for passengers affected by construction of the bypass.

During construction of the mainline tracks, Red and Purple line trains would continue to operate, but would operate on the same two tracks. There may be periods where rail service patterns would need to change; however, the modified rail service would provide a level of capacity comparable to current conditions and connections similar to those with today's service. Passengers accessing Belmont station from Belmont Avenue during construction would experience no changes.

Traffic Impacts

Construction of new foundations and columns and placement of new beams for the bypass and modernized track structure would cause temporary impacts along roadways and alleys beneath the existing and proposed structure. Temporary traffic impacts would include short-term detours or lane restrictions. During construction of structures above School Street, Roscoe Street, Newport Avenue, Clark Street, and Sheffield Avenue, temporary street closures would be required. Temporary alley closures would also be required during construction of structures over these existing alleys. Access may be limited to the alley serving the east side of Sheffield Avenue between Belmont Avenue and Roscoe Street due to the placement of the temporary southbound

Brown Line track; however, a Maintenance of Access Plan will be put into place and will allow for access to adjacent properties.

Parking Impacts

Some on-street parking may be temporarily affected by measures taken to maintain traffic during construction. Construction workers will be required to park in designated off-street parking areas to limit parking impacts on the general public from construction activities.

Pedestrian and Bicyclist Impacts

The majority of construction would take place within the existing CTA right-of-way and properties acquired for the project and would not affect pedestrians or bicyclists. Temporary sidewalk and bicycle lane closures, as well as roadway lane narrowing and other activities, would be required where construction does take place near the public way, in order to provide a safe work zone. Given the dense street grid in the project area, temporary detours for pedestrians, bicyclists, drivers, and CTA bus transit would add very little travel distance and time.

Permanent Impacts

The Build Alternative would result in permanent transportation benefits by increasing capacity through Clark Junction and increasing train speeds through the project area. The bypass would allow up to eight additional trains to pass through Clark Junction per hour, which would be almost 30 percent more during peak periods than today. The new transit infrastructure would remove the speed-restricted curves within the project limits and replace the existing rail infrastructure, leading to improved train efficiency and service reliability, effectively extending the useful life of the system. The Build Alternative would result in shorter travel times for passengers riding the Red, Purple, and Brown lines.

The Build Alternative would not result in permanent adverse impacts related to street traffic, public parking, pedestrians, or bicyclists.

3.1.4 Measures to Avoid or Minimize Harm

Measures to minimize or mitigate transportation impacts during construction are provided below.

To minimize impacts on transit passengers during construction, the following BMPs will be implemented:

- Construction-related service disruptions will be scheduled to occur during weekends and/or off-peak periods.
- CTA will provide notifications of any service changes to transit passengers as well as neighboring property owners, residents, and businesses.
- A bus bridge (shuttle) will be operated between Belmont and Southport stations during select weekends when work requires the Brown Line tracks to be out of service.

- A bus bridge (shuttle) will be operated between Belmont and Addison stations during select weekends when work requires the Red Line tracks to be out of service.

To minimize impacts on roadways and parking during construction, the following BMPs will be implemented:

- Detailed Maintenance of Traffic plans will be developed during subsequent engineering and design in coordination with IDOT, the City of Chicago Department of Transportation (CDOT), and the City of Chicago Office of Emergency Management and Communications to ensure safety during construction and to ensure that emergency vehicle access is not impeded.

- CTA, the City of Chicago, and/or the project contractor will provide notifications of roadway and sidewalk blockages to neighboring property owners, residents, and businesses by posting signs along streets, in nearby CTA stations, and in applicable CTA trains and buses. Descriptions of alternate routes will be provided.

- CTA will develop a Maintenance of Access Plan for adjacent properties that could be affected because of limited access to alleys or alley closures. The plan will lay out how CTA, the City of Chicago, and/or the project contractor will coordinate deliveries and/or garbage collection when construction over or adjacent to alleys temporarily affects access.

- The contractor will limit roadway detours and blockages that could affect peak-hour traffic during Chicago Cubs baseball games at Wrigley Field and during special events in the immediately adjacent neighborhoods.

- CTA will require the contractor to provide designated off-street parking areas for workers to maintain on-street parking availability for the general public.

3.2 Displacements and Relocations of Existing Uses

Displacements and relocations of residents or businesses may occur when land and/or structures are needed to accommodate construction or the permanent footprint of a project. This section describes the CTA right-of-way expansion needed for the project, including acquisition of private property for permanent right-of-way, air rights, or easements.

3.2.1 Regulatory Framework/Methods

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended ("Uniform Act," 42 United States Code [USC] § 4601, et seq.) mandates that relocation services and payments be made available to eligible residents, businesses, and non-profit organizations displaced as a direct result of any project undertaken by a federal agency or with federal financial assistance. The Illinois Eminent Domain Act sets forth the procedure for acquiring property through eminent domain, with similar provisions for reimbursements and relocation as the Uniform Act. The Metropolitan Transit Authority Act (70 Illinois Compiled Statutes § 3605(10)) provides CTA with the authority to use eminent domain to acquire property.

While there are no specific NEPA thresholds for assessing displacement impacts, compliance with the Uniform Act includes provisions for uniform and equitable treatment of persons displaced from their homes or businesses by establishing uniform and equitable land acquisition policies to address impacts.

3.2.2 Existing Conditions

The Build Alternative would occur within the Lakeview community area. While this community area contains a number of smaller neighborhoods (Wrigleyville, Lakeview East, and others), the real estate market is approximately bounded by Diversey Parkway on the south, Irving Park Road on the north, Lake Shore Drive on the east, and Ashland Avenue and Lincoln Avenue on the west.

The existing CTA right-of-way in the project area is generally very narrow with buildings immediately adjacent, often on both sides of the tracks. Due to this constraint, any expansion of CTA right-of-way for track reconstruction, realignment, modernization and safety improvements, or the specific improvements proposed under the Build Alternative, would require acquisition of property and demolitions of buildings.

3.2.3 Environmental Impacts

The following sections summarize the potential displacement and relocation impacts of the No Build and Build Alternatives.

No Build Alternative

The No Build Alternative would not displace any properties; no temporary construction or permanent displacement or relocation impacts would occur.

Build Alternative

The Build Alternative would displace 21 properties (16 buildings). To accommodate a new fifth track flyover, straighten out the mainline curves, and provide noise barriers for increased train frequencies, the right-of-way must be expanded beyond its current configuration and properties must be acquired for the Build Alternative.

These acquired properties would consist of commercial, residential, and mixed-use buildings, vacant lots, and private surface parking lots. CTA identified potential property impacts from the Red-Purple Bypass Project based on the proposed additional track structure requirements and alignment needs, as well as consideration of construction needs. Properties required for construction of the project were reviewed with the City of Chicago Department of Planning and Development (DPD) for consistency with zoning as well as community land use and development plans.

In public meetings during development of the Build Alternative, citizens and businesses expressed concerns about construction and permanent property impacts resulting from the project. Citizens requested that CTA look at ways to reduce permanent property displacements resulting from the project.

CTA undertook an in-depth research and conceptual design process to identify ways to reduce property displacements based on feedback received from the public. CTA conducted an extensive analysis to identify properties required for permanent right-of-way and construction to minimize these impacts where possible. CTA conducted detailed LIDAR surveys (very accurate land surveys that use lasers to collect thousands of data points) at track level and supplementary ground-level surveys to produce building footprint data. CTA's design criteria require that right-of-way limits for new track alignments include space for construction, maintenance, and emergency access to the new track structure. CTA considered variances to the design criteria to the extent that these variances would not impede safe and efficient construction and maintenance of the structures. CTA evaluated parcels on a case-by-case basis to identify construction sites that would be suitable in shape and size for construction. The property displacements that have been identified for the Build Alternative would provide adequate space for permanent right-of-way and construction needs.

Figure 3-1 shows the affected properties and **Table 3-1** provides additional information. **Appendix D-1** contains additional information on each parcel, including tax property index numbers.

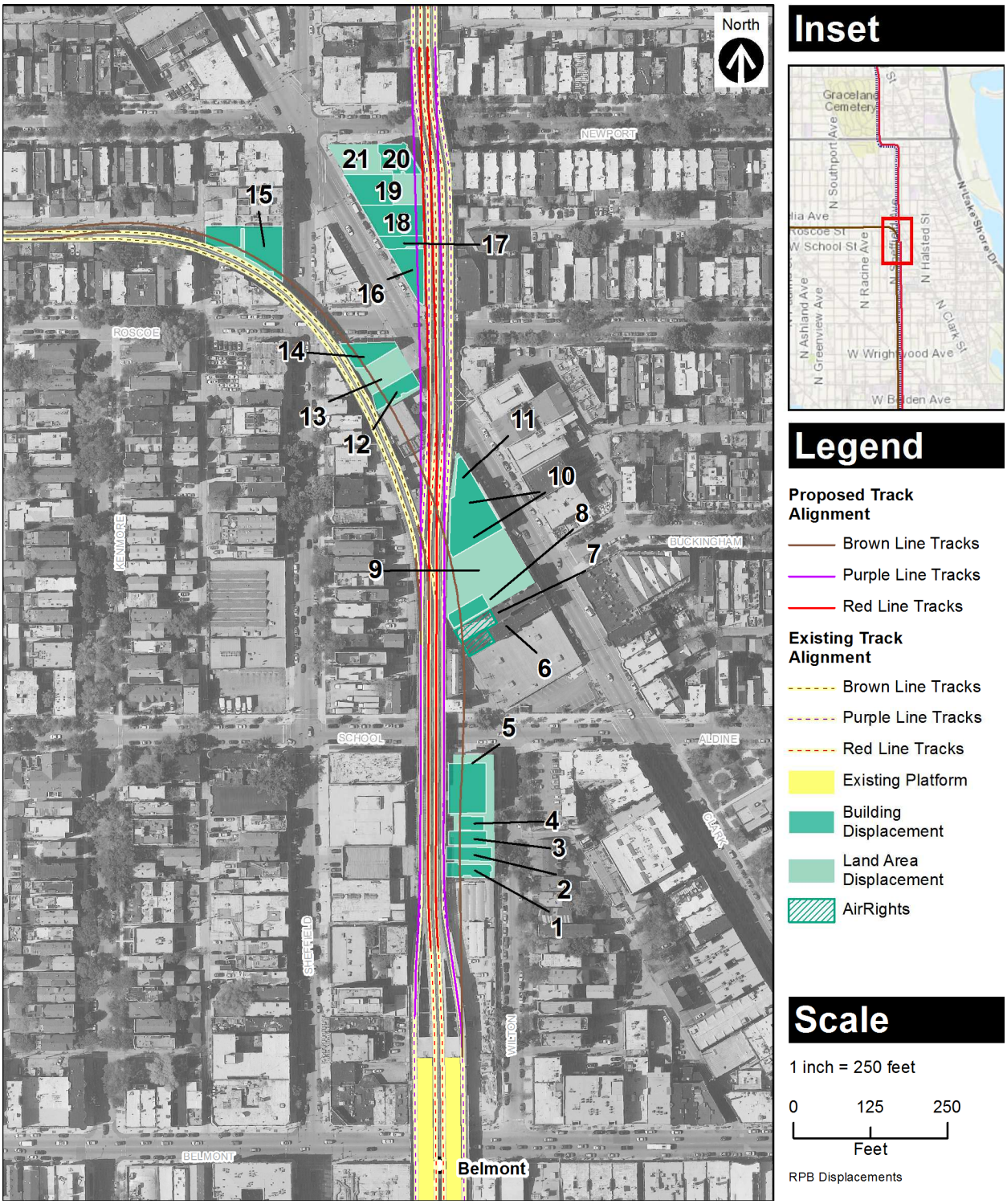


Figure 3-1: Overview of Potentially Displaced Properties

Table 3-1: Property Displacements

Map ID #	Address	Current Use	Type of Acquisition
1	3240 N. Wilton Avenue	Two-Story Residential Apartment Building (Multiple Units)	Full Land Acquisition and Demolition of Primary Building
2	3242 N. Wilton Avenue	Two-Story Residential Apartment Building (Multiple Units)	Full Land Acquisition and Demolition of Primary Building
3	3244 N. Wilton Avenue	Three-Story Residential Apartment Building (Multiple Units)	Full Land Acquisition and Demolition of Primary Building
4	3246 N. Wilton Avenue	Two-Story Residential Apartment Building (Multiple Units)	Full Land Acquisition and Demolition of Primary Building
5	3252 N. Wilton Avenue	Five-Story Residential Condominium (Multiple Units)	Full Land Acquisition and Demolition of Primary Building
6	3324 N. Clark Street	Mixed-Use Commercial and Residential (Multiple Units)	Air Rights - Approximately 6% of Land on Rear of Property
7	3326 N. Clark Street	Residential Apartment Building (Multiple Units)	Air Rights - Approximately 14% of Land on Rear of Property, over Parking Lot
8	3328 N. Clark Street	Residential Apartment Building (Multiple Units)	Partial Land Acquisition and Demolition of Rear Building (Rear Building Only)
9	3330 N. Clark Street	Vacant Lot	Full Land Acquisition
10	3334–3342 N. Clark Street	Three-Story Commercial Building	Full Land Acquisition and Demolition of Primary Building
11	3346–3348 N. Clark Street	Two-Story Commercial Building	Full Land Acquisition and Demolition of Primary Building
12	3366 N. Clark Street	Three-Story Mixed-Use Commercial/Residential Building (vacant storefront)	Full Land Acquisition and Demolition of Primary Building
13	3368 N. Clark Street	Surface Parking Lot	Full Land Acquisition
14	947-955 W. Roscoe Street	Two-Story Mixed-Use Commercial/Residential Building	Full Land Acquisition and Demolition of Primary Building
15	3406 N. Sheffield Avenue	Two-Story Commercial Building (under reconstruction)	Full Land Acquisition and Demolition of Primary Building
16	3401–3409 N. Clark Street	Two-Story Commercial Building	Full Land Acquisition and Demolition of Primary Building
17	3413 N. Clark Street	Three-Story Mixed-Use Commercial and Residential Building	Full Land Acquisition and Demolition of Primary Building
18	3415–3419 N. Clark Street	One-Story Commercial Building	Full Land Acquisition and Demolition of Primary Building
19	3421 N. Clark Street	One-Story Commercial Building	Full Land Acquisition and Demolition of Primary Building
20	947–949 W. Newport Avenue	Three-Story Residential Building	Full Land Acquisition and CTA's Preferred Option is to Relocate the Building if Feasible and Prudent
21	3427 N. Clark Street	Surface Parking Lot	Full Land Acquisition

Construction Impacts

Construction impacts discussed in this section pertain only to temporary construction impacts. Discussion of property displacements for construction is included in the discussion of permanent impacts because properties displaced during construction would have a permanent impact.

Permits will be obtained for all temporary construction easements through the City of Chicago Department of Buildings. All buildings and lots required for the project will be demolished and/or cleared to accommodate construction activities and for equipment and materials storage before and during construction, which would minimize the need for street closures and other on-street community disruption during construction. Properties will be fenced off and secured for safety reasons. After construction, remaining portions of the parcels required for construction could be assembled and potentially redeveloped. Any redevelopment of remaining parcels will be independent of the Red-Purple Bypass Project, but will be consistent with surrounding land uses and zoning as well as with local plans, goals, and objectives. CTA will continue to maintain properties acquired until properties are leased or sold.

Permanent Impacts

A total of 21 properties would be required for permanent right-of-way acquisition, as indicated in **Table 3-1**. Implementation of the Build Alternative would result in acquiring air rights over two properties (Map ID #: 6 and 7, 3324 and 3326 N. Clark Street, respectively) due to track realignment and construction of the bypass. Only a small portion of the lot area would be required; the function or use of the properties would not change.

Sixteen total commercial, residential, or mixed-use buildings would be subject to land acquisition and building demolition to accommodate permanent right-of-way needs; acquisitions would include six commercial buildings, seven residential buildings, and three mixed-use buildings. The number of buildings described below is based on property tax databases and field verification efforts and will be further verified through the acquisition process after the NEPA environmental phase of this project.

- **Commercial Properties** (Map ID #: 10, 11, 15, 16, 18, and 19) - Six commercial properties would be needed for permanent right-of-way expansion:

  - 3334–3342 N. Clark Street (Map ID #10) - This three-story, commercial building includes Moksha Yoga Center Inc.; Cassava Bread, LLC; Gordon In Lakeview Salon & Spa; Susan Donovan, CPA; North Side Housing And Supportive Services, Inc.; The Pure Mix; Luxe Basics, LLC; Invision; and C/Fan Designs.

  - 3346–3348 N. Clark Street (Map ID #11) - This two-story, commercial building includes Bolat African Cuisine.

  - 3406 N. Sheffield Avenue (Map ID #15) - This two-story, former commercial property is currently vacant and is under reconstruction.

- 3401–3409 N. Clark Street (Map ID #16) - This two-story, mixed-use building is under construction and includes The Big Cheese Wrigleyville, LLC; Fiesta Cantina; Sombrero Cantina; and six residential units.

- 3415–3419 N. Clark (Map ID #18) - This one-story, commercial building includes Beer on Clark and Clark Street Beach.

- 3421 N. Clark Street (Map ID #19) - This one-story, commercial building includes Gold Crown Liquors.

- **Residential Properties** (Map ID #: 1, 2, 3, 4, 5, 8, and 20) - Seven residential buildings would be needed for permanent right-of-way expansion: a two-story, single-family building (3240 N. Wilton Avenue), a three-story building with 2 residential units (3242 N. Wilton Avenue), a four-story building with 4 residential units (3244 N. Wilton Avenue), a three-story building with 3 residential units (3246 N. Wilton Avenue), a five-story building with 14 residential units and 15 parking spaces (3252 N. Wilton Avenue), a three-story building with 6 residential units (947–949 W. Newport Avenue),[6] and a partial land acquisition and demolition of the rear residential building with 4 residential units (3328 N. Clark Street).

- **Mixed-Use Properties** (Map ID #: 12, 14, and 17) - Full acquisition of three mixed-use buildings would be needed for the permanent right-of-way expansion:

  - 3366 N. Clark Street (Map ID #12) - This three-story, mixed-use building includes a vacant commercial unit and five residential units.

  - 947-955 W. Roscoe Street (Map ID #14) - This two-story, mixed-use building includes Johnny O'Hagan's and one residential unit.

  - 3413 N. Clark Street (Map ID #17) - This three-story, mixed-use building includes Beggars Pizza and two residential units.

- **Vacant or Surface Parking Lot Properties** (Map ID #: 9, 13, and 21) - Three additional properties would require full land acquisition: one vacant lot and two private surface parking lots. The vacant lot is at 3330 N. Clark Street; the building on this lot was destroyed by a fire in 2013. The two parking lots are at 3368 and 3427 N. Clark Street.

During construction, existing CTA right-of-way and properties acquired for the project would be used for construction activities and materials storage to minimize street closures within the project area. The exact area of each property needed for the final track realignment would be determined as part of the design-build phase of the project given the complexity of engineering details. Portions of the land acquired for permanent right-of-way would be needed for the final

[6] CTA is studying the viability and prudency of relocating the entire Vautravers Building as part of Section 106 mitigation documented in a draft Memorandum of Agreement (see **Section 3.5** of the EA for further details on impacts on historic resources). The building and property would still need to be acquired, and residents would need to be relocated.

track realignment; the remainder of property would become available for potential redevelopment after construction. Potential redevelopment would include transit-related uses and would be developed with CTA.

The potential redevelopment would be independent of the project and would be required to be consistent with surrounding land uses and zoning designations as well as with local plans, goals, and objectives. Coordination with the City of Chicago DPD and Department of Buildings is ongoing to ensure proper coordination of potential redevelopment of these sites after construction and to further assist businesses in meeting relocation needs. Without mitigation, displacement impacts would be adverse; however, through implementation of the mitigation measures identified below, displacement impacts would be minimized to a level less than significant under NEPA.

3.2.4 Measures to Avoid or Minimize Harm

To address the impacts for all private property acquisitions, the following requirements in compliance with the Uniform Act will apply:

- Just compensation, measured by the fair market value of the property, as determined by CTA through an appraisal process, will be provided to the affected property owner.

- Relocation assistance will be provided following FTA guidelines (49 Code of Federal Regulations [CFR] § 24 and FTA Circular 5010.1D, revised August 27, 2012), which will include payments for moving costs, tangible personal property loss as a result of relocation or discontinuance of operations, reestablishment expenses, and costs associated with finding a replacement site.

Additional mitigation measures to address displacement and relocation impacts include the following:

- CTA has undertaken early outreach to all potentially affected property owners by contacting each owner and lessee (based on available public records). CTA's Uniform Act public outreach specialists provided property owners and lessees with a single point of contact to answer specific questions regarding relocation rights, requirements, and processes and anticipated timelines. Outreach will continue through project development as a one-stop resource for potentially displaced residents and/or businesses. **Section 4.1.3** provides additional information on property displacement outreach.

- CTA, in coordination with the City of Chicago and the local alderman's office, will provide informational resources, permitting support, and points of contact for displaced business owners to find suitable sites for relocation. Reference information and points of contact for displaced business owners will be made available on the CTA project website, and through other outlets, as deemed appropriate through coordination with the City of Chicago, the Ward 44 alderman's office, and local chambers of commerce.

- Before construction, CTA will work with DPD, chambers of commerce, the alderman's office, and the community to create a Neighborhood Redevelopment Plan for land near CTA stations and facilities in the community.

3.3 Land Use and Economic Development

This section reviews the compatibility of the project with existing and planned land uses and zoning designations. It also considers the consistency of the project with other land use and economic development plans for areas near the project. The section takes into account proposed property displacements and relocations (described in **Section 3.2**).

3.3.1 Regulatory Framework/Methods

Regional and local planning bodies govern land use and zoning regulations. Within Chicago, CMAP acts as the regional planning body and defines the regional planning principles, while the City of Chicago regulates land use policies and zoning within its local jurisdictional boundaries. Existing land use, zoning, and relevant land use and economic development plans were evaluated for the area within ¼ mile of the project alignment to determine compatibility with the proposed project. The City of Chicago also recently increased incentives for development near transit stations through a transit-oriented development (TOD) ordinance (amendments to the Chicago Zoning Ordinance, Title 17), which was reviewed for consistency with the Build Alternative. This ¼-mile buffer was used to represent a reasonable walking distance for an existing transit route in a dense, urban environment. The project could directly or indirectly affect land uses and economic development plans within this ¼-mile buffer.

For this EA, a land use change due to the project would result in an impact if it would: be incompatible with surrounding land uses; encourage land use and development inconsistent with local plans, goals, and objectives; or inhibit allowable development that might otherwise have occurred.

An economic development impact may result if there are direct or indirect taxation changes; substantial displacements of businesses and individuals, defined in this analysis as those of a magnitude that would preclude relocation in the immediate area due to lack of available real estate; disruption of business activities; or impacts that would influence regional construction costs.

CTA conducted an analysis to determine whether the Build Alternative would cause land use and economic impacts. This analysis included reviewing existing land use plans and zoning maps and using field observations of the project area to determine consistency of the project with the goals and policies presented in the regional and local land use plans of the City of Chicago and CMAP, including the following:

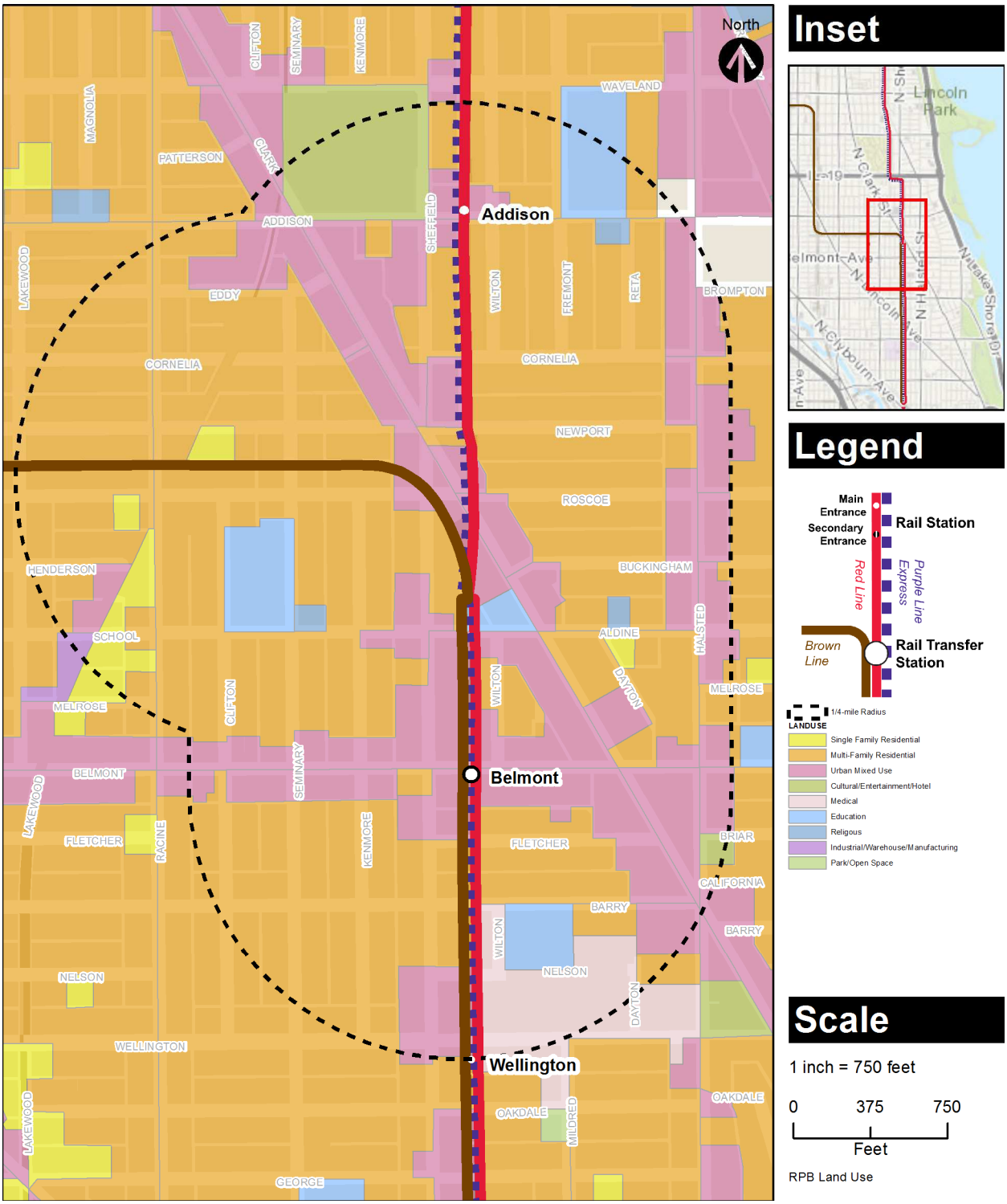
- CMAP *GO TO 2040 Comprehensive Regional Plan* (2010)
- Cook County Long Range Transportation Plan, *Connecting Cook County* (in development)

- Cook County *Comprehensive Economic Development Strategy Report* (2009)
- CTA and City of Chicago *Transit-Friendly Development Guide* (2009)
- City of Chicago *The Lakefront Plan of Chicago* (1972)
- City of Chicago, Chicago Park District, and Forest Preserve District of Cook County *Cityspace: An Open Space Plan for Chicago (1998)*
- 44th Ward Community Directed Development Council *44th Ward Master Plan (2006)*

A qualitative evaluation covered the potential benefits and impacts associated with TOD, livability, access to jobs, and local economic activity. **Appendix D-2** provides additional details on the applicable land use and economic development plans included in this analysis. As part of the community outreach for the project, CTA reviewed near-term development activities, and plans to verify that there would not be indirect impacts from the Build Alternative on planned development.

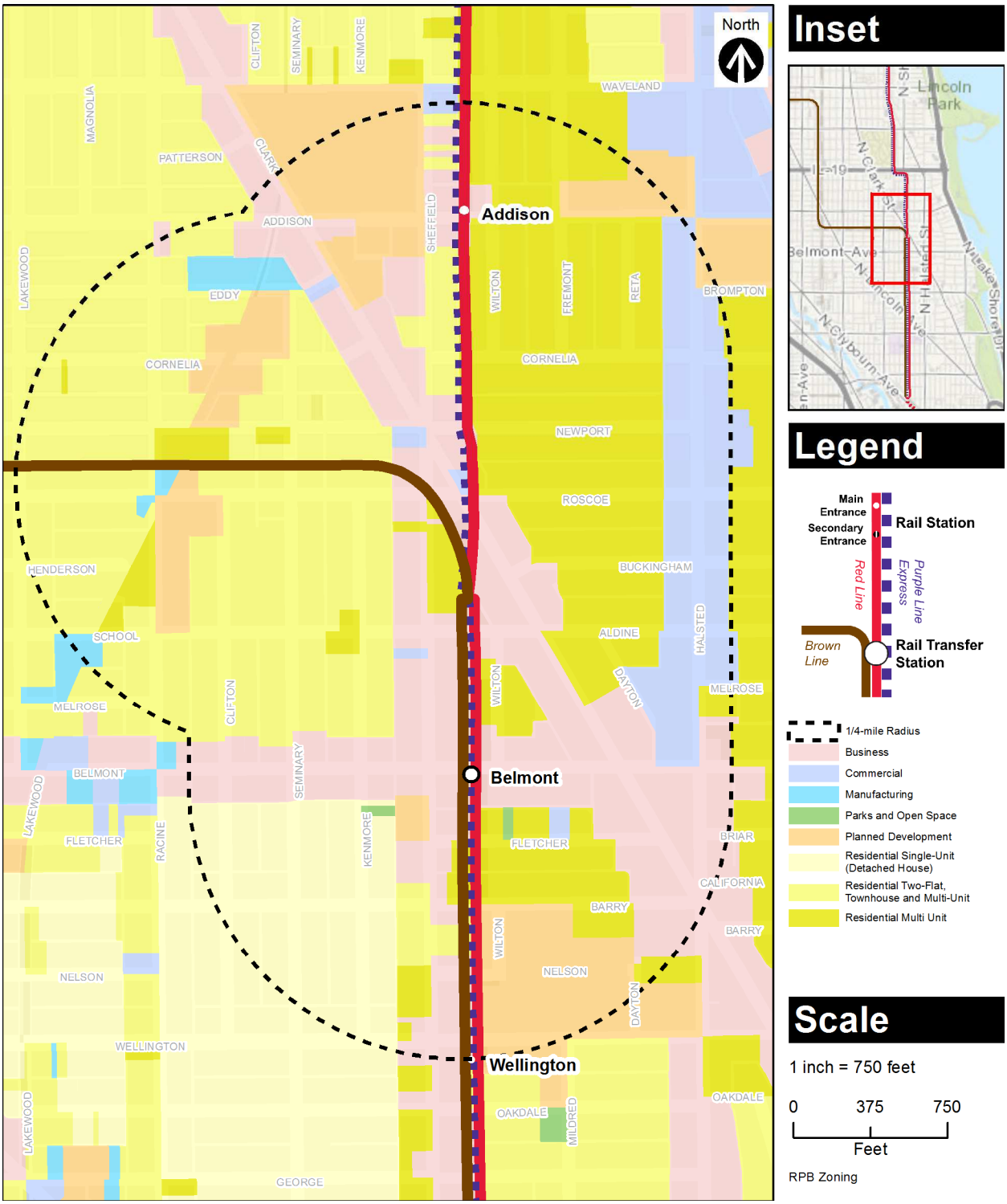
3.3.2 Existing Conditions

The land use and zoning in the project area is transit-supportive. Because Clark Junction dates back to 1907, local zoning has adapted and development has taken advantage of the benefits of transit. The majority of land uses adjacent to the project area are multifamily residential and urban mixed-use. The area is a social district with many bars and restaurants, and is also an extension of the Wrigleyville neighborhood just north of the project limits, the location of Wrigley Field, home of the Chicago Cubs Major League Baseball team. **Figures 3-2 and 3-3** show current land use and zoning designations for parcels within ¼ mile of the project alignment.



Source: CMAP 2005

Figure 3-2: Current Land Uses in the Project Area



Source: City of Chicago 2012

Figure 3-3: Current Zoning in the Project Area

3.3.3 Environmental Impacts

The following sections summarize the potential land use and economic development impacts of the No Build and Build Alternatives.

No Build Alternative

Under the No Build Alternative, the project would not be constructed and therefore there would be no land use or economic impacts.

Build Alternative

Construction Impacts

Construction of the Build Alternative would displace 16 buildings. Properties used for construction would temporarily shift from their current use, including commercial, residential, and mixed-use, to be used for construction activities.

Construction of the Build Alternative would have a temporary adverse impact on economic development in the project area because of property displacements (including commercial, residential, and mixed-use properties) and associated project construction. Construction activities would occur in the project area, but would not substantially influence regional construction costs given the large size of Chicago's construction industry. The Build Alternative would provide construction employment; the increased construction employment would offset some of the jobs temporarily affected by business displacements.

The acquisition of private property for public use would temporarily reduce property tax revenues. Impacts would be temporary pending redevelopment of parcels acquired and would not be substantial given the small number of parcels proposed for acquisition.

Permanent Impacts

The Build Alternative is not expected to result in major changes to land use in the project area, however, some localized changes may occur. Portions of the land acquired for permanent right-of-way would be needed for the final track realignment, and the remainder would become available for potential redevelopment after construction. Potential redevelopment would include transit-related uses and be developed with CTA. The potential redevelopment would be independent of the project and would be required to be consistent with surrounding land uses and zoning designations as well as with local plans, goals, and objectives. The potential redevelopment may result in a net increase in commercial and/or residential units in Lakeview. Under the City of Chicago Zoning Ordinance, development of the transit-oriented uses could result in more than 190 additional residential units based on parcel sizes and zoning allowances.

The City of Chicago recently increased incentives for quality development near transit stations, including within the project area, through its TOD ordinance. While the existing ordinance does not cover all sites identified for permanent right-of-way and construction based on current designations, CTA and DPD would coordinate with the Ward 44 alderman's office and the public on the potential for expanding boundaries of this existing ordinance to encompass any potential redevelopment sites, as appropriate, before completion of construction. If the City of Chicago

TOD ordinance is applied to the potential redevelopment sites, it would allow for increased height, increased floor area ratio allowance, and reduced parking requirements. The incentives would translate to opportunities for increased commercial space and residential units.

The Build Alternative is not expected to result in major permanent impacts on economic development in the project area beyond the construction impacts noted above. Mitigation measures for construction related land use and economic development impacts due to property displacements and efforts to minimize redevelopment time are discussed in **Section 3.3.4**. No adverse changes in taxation policy or levels would occur as a result of the project. The Build Alternative would not result in a permanent disruption of business activities, nor would it permanently affect regional construction costs.

The Build Alternative may result in permanent economic development opportunities, enhanced by potential redevelopment sites for transit-related uses at remaining parcels after construction. Potential redevelopment could create new, denser land uses near transit, consistent with zoning allowances and local plans. **Figures 3-12 through 3-16 (Section 3.6)** show existing conditions, conditions following construction without redevelopment, and an artistic conceptual rendering of potential redevelopment that could occur after construction at a variety of locations within the project area.[7] Land values could increase over current conditions due to the enhanced transit service.

3.3.4 Measures to Avoid or Minimize Harm

Mitigation measures are proposed to minimize the duration of land use and economic development impacts from construction of the Build Alternative, resulting in an impact level less than significant under NEPA:

- Before construction, CTA will work with DPD, chambers of commerce, the alderman's office, and the community to develop a Neighborhood Redevelopment Plan to determine appropriate expansion to the existing TOD ordinance boundary so that it could potentially include more of the potential redevelopment sites in the project area.

- Remaining portions of parcels required for the project will become available for potential redevelopment following construction. Potential redevelopment will include transit-related uses and be developed with CTA independently of the project. CTA will work with DPD to provide incentives to encourage any potential redevelopment, consistent with regional and local development plans, as soon as construction activities allow. The incentives will minimize the duration of temporary construction impacts and encourage mixed-use, pedestrian–friendly development. Incentives could include public/private partnerships, density bonuses, reduced development fees, reduced parking requirements, and/or expedited permitting. This measure could spur development that supports regional and local plans after the project is

[7] The conceptual renderings of potential redevelopment show examples of what could be developed on sites in the project area. The buildings shown are based on the size of properties remaining after construction of the Build Alternative and the examples shown would be consistent with the existing zoning in the surrounding area.

complete by easing the path to construction for developers on parcels required for construction.

3.4 Neighborhoods, Communities, and Businesses

This section discusses project impacts on the surrounding neighborhood, community, and businesses. The analysis considered the surrounding community character and cohesion, mobility, and community resources, such as schools, parks, and community centers near the project corridor.

3.4.1 Regulatory Framework/Methods

The U.S. Department of Transportation (USDOT) and IDOT both have Community Impact Assessment manuals, which CTA used to look at potential neighborhood, community, and business impacts of the project (USDOT 1996, IDOT 2007). The analysis considers the following types of impacts:

- **Community Character and Cohesion** - Impacts due to commercial and residential displacements and changes in land use, visual/aesthetics, noise levels, and population/demographics. Community character is an attribute of a geographic area with identifiable characteristics that make it unique. Community cohesion is an attribute of a geographic area where segmentation or division of the area would reduce its desirability to current and future residents.

- **Mobility** - Overall community impacts of changes in transportation options, station access, travel patterns, parking, physical barriers, and access for emergency service providers.

- **Community Resources** - Impacts on key facilities in the project area that play an important role in shaping and defining the community, such as landmarks, parks, community centers, and other places that serve as focal points or provide community services.

The neighborhood, community, and business impact analysis involved creating detailed demographic and community profiles based on existing community area boundaries and were further delineated for areas within ¼ mile of the project area, which represents a typical walking distance within a transit corridor. The analysis also identified any key community resources within ¼ mile of the project area. Field investigations were conducted to identify any physical, social, or perceived barriers within the established community. In addition, the analysis considered other potential visual, noise, and environmental impacts that could affect the surrounding neighborhood.

Impacts on businesses were evaluated based on an independent market analysis that was conducted for the Lakeview community area to determine potential impacts from project property displacements, and consideration of the duration of construction proposed (Jones Lang LaSalle 2013). Mitigation measures are proposed to offset identified impacts, with an emphasis on community and transit-supportive solutions to address temporary construction impacts. **Appendix D-1** provides the market assessment report conducted for the surrounding community.

Appendix D-3 provides detailed information on community profiles and demographics, as well as maps and information about community resources.

3.4.2 Existing Conditions

The project area is within the Lakeview community area, which contains dense, urban development with a diverse population. CTA trains have served Lakeview since 1900. By providing convenient access to downtown Chicago, CTA rail has helped induce new commercial and residential development. **Table 3-2** provides an overview of Lakeview's demographics.

Table 3-2: Lakeview Community Area Profile

Category	Lakeview Community Area Total	City of Chicago Total
Population	96,539	2,698,831
Households	52,568	1,033,022
Employment	21,321	1,252,656
% Minority Population	20	67
% Elderly Population	7	10
% Renter-Occupied Households	63	52
% Owner-Occupied Households	37	47
Median Home Value	$ 434,188	$ 269,200
Average Household Size (# persons)	1.84	2.56
Average Gross Rent per Month	$ 1,283	$ 885

Source: U.S. Census Bureau 2012

The major north-south arterials in Lakeview (Sheffield Avenue, Clark Street, Halsted Street, and Broadway) serve as the primary commercial districts for the adjacent neighborhoods within Lakeview. The major east-west arterials (Belmont Avenue and Addison Street) serve as secondary commercial districts. The remaining streets within the project area are both commercial and residential. The community character of the area is associated with Wrigley Field, home of the Chicago Cubs, and contains numerous bars, restaurants, and boutique shops. Clark Street is the primary commercial corridor through the project area. Residential uses in the area are primarily multifamily. There are no parks or community facilities within or adjacent to the proposed project limits. **Appendix D-3** provides additional details on the location of all parks and community facilities within ¼ mile of the project area.

More detailed demographic and ridership information for the area within ¼ mile of the project area was gathered to further describe the project area neighborhood and community character. **Table 3-3** provides a summary. Much of the population living within ¼ mile of the project limits relies on transit. Belmont station is a major transfer station providing access to many areas of the city through the Red, Purple, and Brown lines. There are 11,727 people living within ¼ mile of the project area, representing 5,501 households and 4,005 jobs (U.S. Census Bureau 2012). In addition, over 145,000 weekday train trips occur through Clark Junction (CTA 2014b). While Lakeview comprises a number of distinct neighborhoods, the project area (generally Central Lakeview) is

somewhat less cohesive, acting as a transition between the Wrigleyville neighborhood to the north and the Lakeview East neighborhood east of the project area.

Table 3-3: Project Area Profile

Demographic Factor	Project Area (within ¼ mile)	Density (number per acre)
2012 Population	11,727	49.2
2012 Households	5,501	23.1
2011 Jobs	4,005	16.8
2012 Households with No Vehicles Available	1,447 (26% of project area total)	6.1
Average Commute Time	33.5 minutes (based on zip code)	--

Source: U.S. Census Bureau 2012

3.4.3 Environmental Impacts

The following sections summarize the potential neighborhood and community impacts of the No Build and Build Alternatives.

No Build Alternative

Under the No Build Alternative, no major construction activities would occur and therefore there would be no neighborhood, community, or business impacts.

Build Alternative

Construction Impacts

The Build Alternative would result in temporary adverse impacts on the surrounding neighborhoods, communities, and businesses due to construction activities. Construction activities, which could have impacts on the surrounding community and businesses, are anticipated to last approximately 48 to 52 months. Temporary construction impacts could include noise, vibration, dust, temporary utility disruption, detours, altered access to businesses and residences, negative visual and aesthetic changes from demolition and construction, changes in emergency vehicle routing, construction vehicle emissions, and truck traffic throughout the project area. Parcels used for construction may affect the community street life and cohesion, which in turn could affect businesses within the project area. Temporary detours, alleyway closures, and partial lane closures would reduce mobility throughout the project area.

Construction would take place within existing CTA right-of-way and properties acquired to accommodate the expanded right-of-way required for the project. Combined, these properties are sufficient in size to support construction of the project, while limiting street closures and other construction-related impacts in the neighborhood. Through the mitigation measures discussed in **Section 3.4.4**, temporary impacts on neighborhoods, businesses, and communities due to construction would be addressed. No impacts on community resources are anticipated to result from construction, because the resources lie outside the project area. Temporary detours or road

closures would have minimal impact on community resources because other routes would provide continued access during construction.

Permanent Impacts

The neighborhood adjacent to the bypass has developed around the existing rail infrastructure and rail is part of the community context. Community character near the project area would be temporarily and, perhaps, permanently affected by property displacements and potential vacancy of lots after construction.

None of the proposed displacements are community gathering places. Based on the market assessment conducted for the community area (see **Appendix D-1**), Lakeview is an established infill submarket with strong economic demand drivers for redevelopment. Additional mitigation measures are proposed in **Section 3.4.4** for both before and after construction, to address the impacts of property acquisition on community cohesion and to minimize the duration of vacant land remaining in the community after construction.

The Build Alternative would improve mobility, including faster train speeds and passenger capacity expansion. The Build Alternative would provide more reliable transit access to jobs in the project area and elsewhere on the CTA train system. Access to nearby community resources would be enhanced as a result of the mobility improvements.

3.4.4 Measures to Avoid or Minimize Harm

During construction, CTA and the project contractor will implement construction BMPs for coordination with city services, maintenance of access, advertisements for businesses in the construction areas, directions to alternate services, screening of construction sites, erosion and dust control, maintenance of equipment, temporary noise barriers, vibration monitoring, and hazardous materials handling.

Before construction and before issuance of construction permits, CTA will develop and implement a Construction Outreach and Coordination Plan. The plan will include specific programs to assist local businesses and residents affected by construction. CTA Government and Community Relations staff will work with the Ward 44 alderman's office to provide continued outreach to affected neighborhoods and communities during construction.

The following mitigation measures are proposed to minimize impacts during construction:

- CTA will work with community chambers of commerce and/or development corporations to help develop advertising plans to strengthen local visibility and patronage for businesses affected by temporary access changes during construction.

- CTA will work with DPD, chambers of commerce, the Ward 44 alderman's office, and the community to promote redevelopment plans and policies that append or update existing neighborhood plans and business district plans. This will be done in concert with development of a Neighborhood Redevelopment Plan, and will ensure that proposed redevelopment is consistent with neighborhood and community character.

- CTA will manage construction stages with the contractor to maintain access, or provide alternate access to businesses, residences, and community facilities affected by temporary access changes during construction.

- CTA will require the contractor to provide off-street parking for workers to maintain on-street parking availability for the general public.

- CTA will provide alternate transit service options when construction will affect transit, with enhanced service modifications during special community events and festivals.

- CDOT will implement traffic detours, as necessary, when construction would affect traffic.

The following mitigation measure is proposed to minimize impacts after construction:

- CTA will work with DPD, the Ward 44 alderman's office, and developers to provide incentives to encourage any potential redevelopment, consistent with regional and local development plans, as soon as construction activities allow. The incentives will minimize the duration of vacant land impacts and encourage mixed-use, pedestrian–friendly development. Incentives could include public/private partnerships, density bonuses, reduced development fees, reduced parking requirements, and/or expedited permitting (see **Section 3.3**).

3.5 Historic and Archaeological Resources (Section 106 Consultation)

This section summarizes findings under Section 106 of the National Historic Preservation Act (NHPA) and in coordination with the State Historic Preservation Officer (SHPO) of the Illinois Historic Preservation Agency (IHPA) and consulting parties to the Section 106 process.

The structure of this section is slightly different than other sections within the EA to fully document the process and consultation required under Section 106. In addition, the term "effects" is used in this section rather than "impacts" because of the unique requirements and terminology related to historic resources. **Appendix D-4** contains additional information on this analysis. **Section 4.2.2** summarizes Section 106 coordination efforts to date.

3.5.1 Regulatory Framework/Methods

Cultural and historic resources are protected by various federal regulations; Section 106 of the NHPA requires federal agencies to consider effects on historic resources from their actions and to balance preservation needs with the need for the action. As provided in 36 CFR § 800, the Section 106 process "seeks to accommodate historic preservation concerns with the needs of federal undertakings through consultation" (36 CFR § 800.1(a)). The goal of the consultation is to identify historic properties potentially affected by the undertaking, assess project effects, and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties.

For the assessment of historic and archaeological resources, CTA conducted a four-step process following requirements of 36 CFR § 800:

1. **Define the Area of Potential Effects** - FTA first determined an area of potential effects (APE) for cultural/historic resources. The APE is defined as the geographic area within which the project may cause alterations in the character or use of historic properties. Development of the APE involved site visits and a review of aerial maps and conceptual engineering drawings for the Build Alternative. Considering that the project area is heavily urbanized and the proposed alternative generally follows the existing CTA alignment, the APE boundaries were based on the area directly affected by construction, the height of the proposed structures, and the presence of visual obstructions (such as buildings and trees) that might block views of the proposed improvements. Generally, the APE contains parcels that are adjacent to either side of the existing rail line, plus a buffer to account for potential indirect effects. The SHPO reviewed the proposed APE and provided concurrence on July 9, 2014.

2. **Identify Historic and Archaeological Resources** - The APE was then field surveyed for historic architectural resources that meet National Register of Historic Places (NRHP) criteria. Further research using the Historic and Architectural Resources Geographic Information System (HARGIS) and city records was conducted to determine whether there were documented findings of archaeological resources within the APE. NRHP criteria are defined in 36 CFR § 60.4 and apply to districts, sites, buildings, structures, or objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association with one or more of the following four criteria:

   - *Criterion A* - Events that have made a significant contribution to the broad patterns of American history on a federal, state, and/or local level
   - *Criterion B* - Lives of persons significant in the history of the city, state, and/or the United States
   - *Criterion C* - Distinctive characteristics of a type, period, or method of construction, or the work of a master, or high artistic values, or a significant and distinguishable entity whose components may lack individual distinction
   - *Criterion* D - Information important in prehistory or history

   CTA identified properties listed on the NRHP, local landmarks, and Chicago Historic Resources Survey (CHRS) "Red" and "Orange"-rated[8] buildings (properties with locally designated historic importance). CTA conducted background research to assist this process, using the Historic Architectural Resources Geographic Information System and city records, fire insurance and other historic maps, the Chicago Landmarks Historic Resources Survey, previous architectural studies in the area, and other relevant scholarly publications.

[8] The CHRS is a color-coded ranking system used to identify historic and architectural significance relative to age, degree of external physical integrity, and level of possible significance. The two highest color codes are "Red" and "Orange." These types of local historic resources are subject to the City of Chicago's Demolition-Delay Ordinance. "Red" or "Orange"-rated properties were identified as possessing some architectural feature or historical association that made them potentially significant in the context of the surrounding community.

3. **Assess Effects on Historic and Archaeological Resources** – FTA and CTA assessed effects for each evaluated resource that was listed in the NRHP or determined eligible for listing. The effects analysis referenced other technical memoranda prepared for the project (for topics such as displacements, noise, and visual impacts) and focused on how the Build Alternative may alter the characteristics that qualify properties for inclusion in the NRHP.

4. **Resolve any Adverse Effects** - FTA and CTA developed mitigation measures through consultation with the SHPO and other consulting parties to address adverse effect determinations. These mitigation measures are documented in a Memorandum of Agreement (MOA) that will be executed before FTA issues the final NEPA decision document. The Draft MOA is included in **Appendix D-4**. The signed MOA will be included in the final NEPA decision documentation for this project.

A number of parties could have a consultative role in a project considered an "undertaking" under Section 106. The consulting parties for this project included the IHPA, which acts as the SHPO for Illinois; the City of Chicago Historic Preservation Division; Preservation Chicago; Landmarks Illinois; and Friends of the Parks. In addition, FTA and CTA provided the Miami Tribe of Oklahoma with all Section 106 consultation materials and invited them to attend consultation meetings. FTA and CTA mailed preliminary eligibility and effects finding materials to all consulting parties on August 26, 2014. A meeting was held on September 25, 2014 to review the eligibility and preliminary effects findings and a 30-day comment period was initiated to solicit input into the determinations. **Appendix D-4** provides full details on the Section 106 assessment and consultation process carried out for the project. **Appendix D-4** includes the SHPO's concurrence with the eligibility and effects determinations described above, comments received as part of the 30-day comment period, and subsequent correspondence including responses to those comments.

Following SHPO's concurrence with the eligibility and effect determinations for the project, FTA and CTA notified the Advisory Council on Historic Preservation (ACHP) on January 20, 2015 to share determinations and invite their organization to join the Section 106 consultation process. ACHP accepted the invitation to participate in the Section 106 process on March 25 2015. Formal correspondence with ACHP is included in **Appendix D-4**.

3.5.2 Existing Conditions (Section 106 Eligibility Determinations)

Figure 3-4 is a map of the APE and NRHP-eligible resources and districts. Within the limits of the APE for the project, CTA surveyed 167 individual resources. A total of nine resources were determined to meet eligibility criteria for inclusion in the NRHP: eight individually eligible resources (including the CTA elevated track itself) and one historic district (Newport Avenue Historic District). **Table 3-4** lists the individually eligible properties within the APE. **Appendix D-4** provides the historic background of the project area, a full description of the analyzed resources, and a discussion of historic resources that are locally designated.

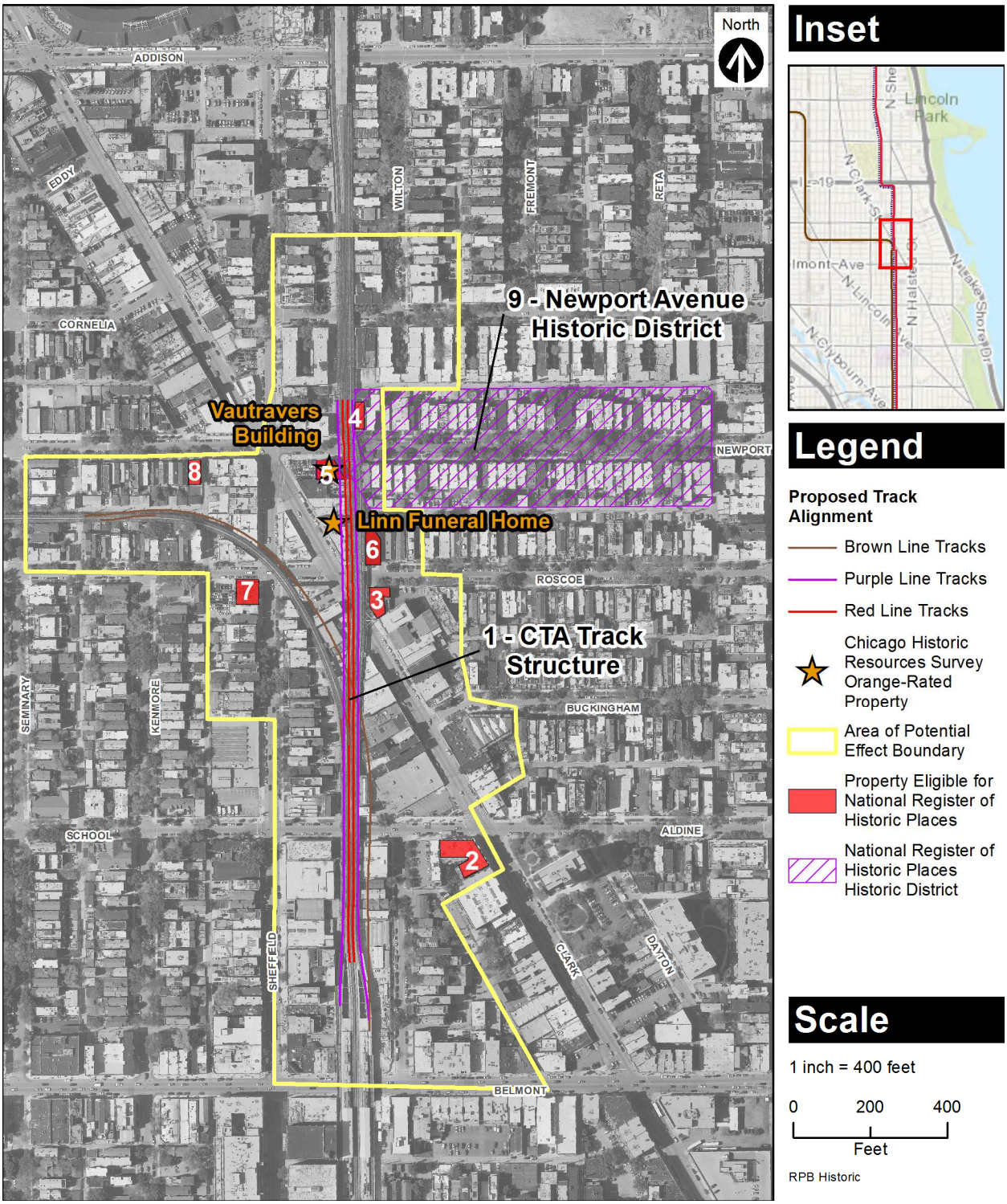


Figure 3-4: Historic Area of Potential Effects Boundary and NRHP-Eligible or Potentially NRHP-Eligible Resources

Table 3-4: Individually Eligible Properties in the Area of Potential Effects

Map ID	Address	Year Built	Description	NRHP Status
1	N/A (CTA Track Structure)	1900	Elevated Track (CTA)	NRHP Eligible
2	3264–3266 N. Clark Street	1889	Queen Anne Mixed-Use Building	NRHP Eligible
3	3365–3369 N. Clark Street	1898	Eclectic Mixed-Use Building	NRHP Eligible
4	938 W. Newport Avenue[1]	1905	Queen Anne Greystone Flat	NRHP Eligible
5	947–949 W. Newport Avenue[1]	1889	Vautravers Building	NRHP Eligible
6	934 W. Roscoe Street	1889	Slaymaker Gallery	NRHP Eligible
7	3356 N. Sheffield Avenue	1896	Queen Anne Mixed-Use Building	NRHP Eligible
8	1015 W. Newport Avenue	1891	Multifamily Residential Building	NRHP Eligible

CTA = Chicago Transit Authority; NRHP = National Register of Historic Places; N/A = Not Applicable
[1] Contributing to Newport Avenue Historic District

In addition to NRHP-listed and eligible resources, there are nine CHRS "Orange"-rated properties that exist within the APE; **Appendix D-4** describes the CHRS properties further. Only two of the CHRS properties would be affected by the project: the Vautravers Building (also NRHP-eligible), and the former location of the Linn Funeral Home. Both of the properties are identified in **Figure 3-4** and are discussed in more detail in the following section.

According to an IHPA records review (HARGIS), there are no known archaeological sites within approximately 2 miles of the APE.

3.5.3 Environmental Effects (Section 106 and Chicago Historic Resources Survey Determinations)

Section 106 Determinations

Section 106 regulations state that if there are historic properties in the APE that may be affected by a federal undertaking, the agency official will assess adverse effects, if any, in accordance with the Criteria of Adverse Effect described in 36 CFR § 800.5. As stated in the regulation, an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic resource that qualify the resource for inclusion in the NRHP in a manner that would diminish the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association (36 CFR § 800.5(a)(1)). Effects can be direct, indirect, or cumulative. The following sections summarize the potential effects on historic resources that are eligible for NRHP listing. Effects are not separated into construction and permanent categories, because adverse effects on historic resources would be permanent regardless of whether they occur during or after construction of the project.

No Build Alternative

The No Build Alternative would not directly result in adverse effects on historic and cultural resources. The No Build Alternative would not, however, allow the track infrastructure to be upgraded and would instead require continued interim maintenance repairs, which would only temporarily alleviate the disrepair of the structure and would not increase capacity through Clark Junction. Degradation of the aging track structure would interfere with the Red, Purple, and

Brown line infrastructure continuing to serve its historic function as a passenger rail transportation facility.

Build Alternative

Of the nine eligible historic resources identified in the APE, three individually eligible NRHP resources would be adversely affected by the Build Alternative: the elevated track structure itself (Map ID #1), the Vautravers Building (Map ID #5), and the Newport Avenue Historic District. Properties identified as not affected or not adversely affected are generally farther from proposed construction (e.g., bypass construction, curve straightening). Although the properties may be subject to some disruptions during construction, the characteristics that qualify them for inclusion on the NRHP would not be adversely affected. **Table 3-5** presents effects determinations for all NRHP-eligible resources.

Table 3-5: Section 106 Effects Determinations

Map ID	Address	Effect per 36 CFR § 800
1	N/A (CTA Elevated Track Structure)	Adverse Effect: Reconstruction/Modernization of Structure
2	3264–3266 N. Clark Street	No Effect
3	3365–3369 N. Clark Street	No Adverse Effect
4	938 W. Newport Avenue	No Adverse Effect
5	947–949 W. Newport Avenue	Adverse Effect: Relocation or Demolition
6	934 W. Roscoe Street	No Adverse Effect
7	3356 N. Sheffield Avenue	No Adverse Effect
8	1015 W. Newport Avenue	No Adverse Effect
N/A	N/A (Newport Avenue Historic District)	Adverse Effect: Loss of Contributing Element

CFR = Code of Federal Regulations; CTA = Chicago Transit Authority; N/A = not applicable

Figure 3-5 shows the historic resources for which there are adverse effect findings, which are summarized below.

CTA Elevated Track Structure

Vautravers Building
947-949 W. Newport Avenue

Newport Avenue Historic District

Figure 3-5: Photos of Section 106 Adversely Affected Historic Resources

- **CTA Elevated Track Structure** - The NRHP-listed track structure is a four-track, elevated, steel frame structure with an open wood-tie deck, and is eligible under Criterion A for its

contribution to the development of Chicago's North Side and under Criterion C as a good example of turn-of-the-century riveted steel plate technology. In the Build Alternative, the elevated track structure would be adversely affected by replacement of portions with a modern aerial structure, affecting the integrity of historic materials and workmanship.

- **Vautravers Building (947–949 W. Newport Avenue)** - This three-story apartment building, built in 1889, is individually eligible for NRHP listing under Criterion C for its architectural features. In the context of Section 106, the Vautravers Building would be adversely affected because the building lies within the footprint of the Build Alternative alignment, requiring it to be demolished, or relocated. [9]

- **Newport Avenue Historic District** - The Newport Avenue Historic District, on Newport Avenue between Halsted Street and Clark Street, is eligible for the NRHP under Criteria A and C. This resource would be adversely affected because the Vautravers Building is a contributing element to that district. No other resources contributing to the district would be affected.

Other Historic Impacts on Chicago Historic Resources Survey Properties

In addition to NRHP-eligible properties required to be analyzed under NEPA and Section 106, there are two historic resources related to City designations that would be affected by the project. One of these resources is not subject to "effects determinations" under Section 106 but is noted here to fully assess the impacts of the Build Alternative on historic resources. Because both resources are "Orange"-rated in the CHRS, they are protected by the Demolition-Delay Ordinance; additional coordination with the City will be required before disturbance. **Appendix D-4** contains additional details on the City historic resources.

- The Vautravers Building is on the Chicago Landmarks List as a contributing element of the Newport Avenue Historic District and is on the CHRS as an "Orange"-rated resource. The Vautravers Building was also determined to be individually eligible for NRHP listing, so was included in the "effects determination" under Section 106 (see discussion above).

- The former Linn Funeral Home (3415 N. Clark Street, now known as "Beer on Clark" and "Clark Street Beach") is also identified on the CHRS as an "Orange"-rated resource. This resource is neither listed on nor eligible for the NRHP due to extensive alterations, and it no longer exhibits sufficient historic integrity due to the extent of exterior alterations completed since the CHRS survey. Because this resource no longer exhibits sufficient historic integrity and is not a contributing resource to the historic district, it is not subject to an "effects determination" under Section 106. The former Linn Funeral Home would be demolished as a result of the Build Alternative. **Figure 3-6** shows photos of the resource circa 1970 and 2012, illustrating the extent of renovations.

[9] CTA is studying the viability and prudency of relocating the entire Vautravers Building as part of Section 106 mitigation documented in a draft Memorandum of Agreement. Relocation approximately 29 feet to the west is the CTA preferred option, pending results of viability and prudency study that will happen once the building is acquired.

Figure 3-6: Photos of Linn Funeral Home Circa 1970 (Left) and 2012 (Right)

Analysts also examined the potential for the project to result in indirect effects on historic properties (i.e., changes in the visual setting, the noise environment, and construction or operational vibration that would alter the characteristics that qualify eligible properties for the NRHP). Generally, visual and auditory changes in the environment would not affect the characteristics that qualify each resource for inclusion on the NRHP. Due to the proximity of construction to historic resources, there would be some risk related to vibration impacts from construction; however, construction noise and vibration mitigation are proposed to address the potential for impacts (see **Sections 3.7 and 3.8**).

Additional discussion of the Section 106 adverse effect findings, as required under Section 4(f) of the Department of Transportation Act of 1966, is included in **Chapter 5**.

3.5.4 Measures to Avoid or Minimize Harm

Section 106 Resolution of Adverse Effects

FTA and CTA, in consultation with IHPA, determined that there is no reasonable alternative to the proposed project improvements that meets the project purpose and need, and together the agencies developed a Draft MOA to resolve the adverse effects on historic resources (**Appendix D-4**). FTA and CTA held a meeting with IHPA and consulting parties on March 24, 2015 to obtain additional comments on proposed measures to avoid or minimize harm to historic resources noted above. Based on input from the consulting parties, treatment measures were refined to minimize and mitigate adverse effects. The Draft MOA incorporates the treatment measures and contains stipulations that will be carried out in consultation with all signatories of the document. A copy of the Draft MOA is provided in **Appendix D-4**. Circulation of the Draft MOA for signature will finalize the MOA and will be done following the public comment period on this EA. The final, signed MOA will be included in the final NEPA decision document.

The existing track structure would be subject to an adverse effect from implementation of the project: it would be reconstructed as a modern aerial structure. The Red and Purple line structures are dynamic elements within a functioning transportation system that must continue to be rehabilitated, modified, and replaced in order to meet safety requirements and continue their historic role in the transit network. This effect cannot be avoided or minimized because the purpose of the project is to modernize the rail line. To mitigate effects, CTA will prepare

documentation for the existing track structure to convey its significance in the development of northern Chicago. CTA will also develop an interpretive display to convey the significance of the North Red Line track structure, highlighting the technology and material components associated with the elevated track structure. In addition, as part of the project contractor selection process, CTA will incorporate a selection criterion that provides additional points for proposals that consider the aesthetic qualities of the historic elevated track structure in their designs.

The Vautravers Building, and by extension its contribution to the Newport Avenue Historic District, would be subject to an adverse effect because of the Build Alternative. Designers examined a variety of conceptual design options to avoid affecting the Vautravers Building (e.g., constructing a tunnel, shifting the mainline alignment to the east, or narrowing the cross-section) but each option would result in greater impacts on the community and/or would adversely affect other nearby historic resources. To minimize effects, designers also considered relocating the building to a different lot, salvaging the western portion of the building, or preserving key architectural elements for reuse. Each of the avoidance and minimization options was presented to consulting parties for consideration during the Section 106 process.

Based on a high-level feasibility analysis discussed during the Section 106 consultation on September 25, 2014, it was determined that salvaging only a portion of the Vautravers Building on the west side of the structure would not be a feasible mitigation option. Because approximately three of the six units within the building would be removed to accommodate the alignment as part of the Build Alternative, the remainder of the building would have an awkward shape and configuration, resulting in compromised functionality. Based on CTA's recent experience with keeping a portion of a historic building, the remaining portion of the structure would be difficult to lease/sell, resulting in no long-term solution for a responsible party to maintain the structure in good condition. IHPA and consulting parties agreed that the other potential mitigation measures under consideration (full relocation or preserving key architectural elements) were more reasonable options for mitigating effects on the building. Provisions are documented in the Draft MOA (**Appendix D-4**) requiring CTA to examine the feasibility of (1) relocating the building to an adjacent lot (the preferred option of CTA) or (2) preserving architectural features if relocation of the building is not determined to be feasible.

Local Landmark and Chicago Historic Resources Survey Properties

The Vautravers Building is listed as a Chicago Landmark contributing to the Newport Avenue Historic District. Any alteration, relocation, or demolition of a Chicago Landmark resource requires that a permit process be completed through the Commission on Chicago Landmarks, in coordination with the City Council. CTA will coordinate, as appropriate, with the Commission on Chicago Landmarks after completion of the NEPA decision document. Documentation will be developed independently of the NEPA process to meet local requirements.

In addition, the Vautravers Building and former Linn Funeral Home are rated "Orange" in the CHRS. Any demolition of the CHRS-rated properties would be subject to the City of Chicago 2003 Demolition-Delay Ordinance, which establishes a 90-day hold period before demolition. CTA will

coordinate, as appropriate, with the City of Chicago Historic Preservation Division to satisfy requirements of this ordinance before construction of the project.

3.6 Visual and Aesthetic Conditions

This section discusses the proposed physical improvements of the project that would result in changes to the surrounding visual environment.

3.6.1 Regulatory Framework/Methods

For the purposes of this analysis, CTA assessed visual and aesthetic impacts by first analyzing existing visual resources surrounding the proposed track structure (both the bypass and the mainline Red and Purple line tracks), including any sensitive views, and assessing existing visual character and quality of the surrounding environment. CTA identified sensitive views through research and field observations as well as public comments received as part of CTA's early planning and spring 2014 outreach efforts (see **Chapter 4**). CTA then considered changes to the visual environment that would result from the Build Alternative. The analysis included an assessment of any changes to the viewsheds (areas visible to the human eye from a fixed vantage point) or other sensitive views that would affect the essential character or context of the visual environment and any other visual quality impacts. CTA proposed mitigation measures where it determined any adverse visual impacts were likely. CTA performed the analysis to be consistent with State of Illinois Public Act 093-0545. The act requires projects to take the context of the project area into consideration and promotes the preservation and enhancement of scenic quality. The act also requires consideration of land use, zoning, and other relevant City of Chicago ordinances or guidance governing the visual integrity and quality of the project area and any potential for degradation of the existing visual character or quality of the surrounding community areas. In addition, the act requires the consideration of any potential changes to the visual environment that could create new shade or shadow effects.

3.6.2 Existing Conditions

The visual character of the project area is a mixed-use neighborhood. The surrounding visual landscape is an urban area with primarily one- to three-story buildings. The area is somewhat diverse, with commercial, residential, and mixed-use buildings near each other. The elevated track structure is the dominant visual feature within the project area, particularly at Clark Junction, where the track structure comprises a large portion of the viewshed at street level. This prominent visual feature and surrounding built environment also compromise and obscure the visual continuity of the streetscape.

Within the project area, the mainline track structure generally runs north-south approximately 150 feet east of Sheffield Avenue and 150 feet west of Wilton Avenue. The Brown Line track diverges westbound from the mainline tracks at Clark Junction in the vicinity of Clark Street, Sheffield Avenue, and Roscoe Street. The surrounding buildings, including some that are directly adjacent to the track structure, have views of the existing track structure or tracks, depending on their height. **Figure 3-7** shows the visual environment along Clark Street.

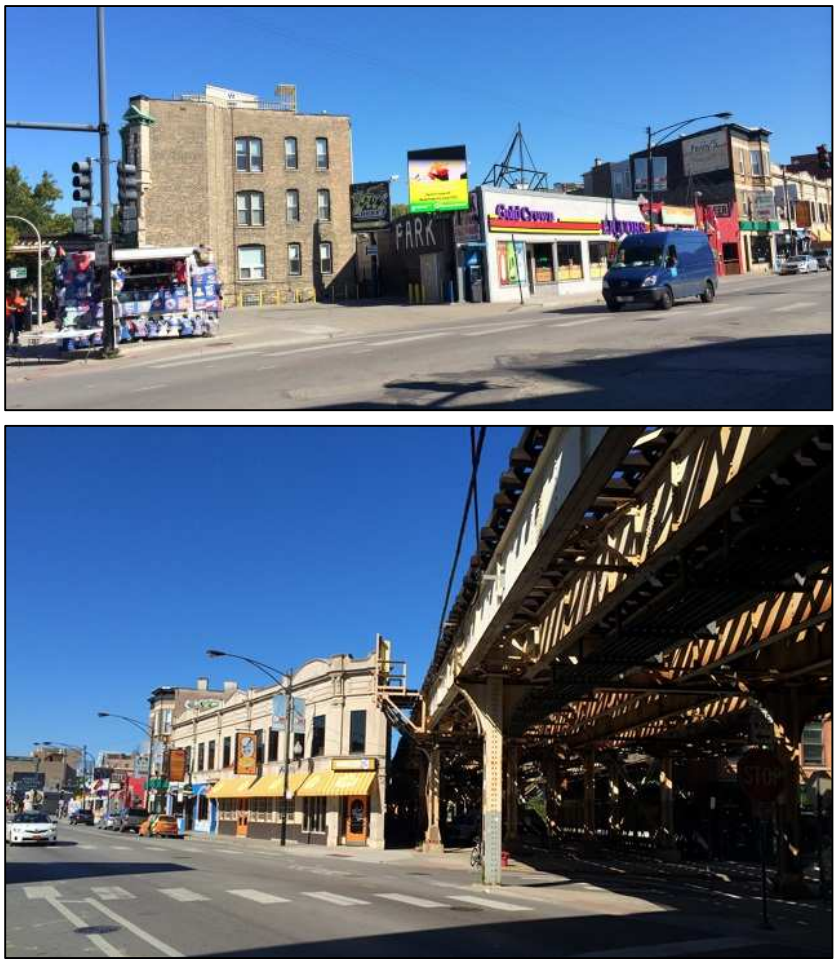


Figure 3-7: Photos of Clark Street - Clark Street at Newport Avenue, Facing East (Top), Clark Street at Roscoe Street, Facing North (Bottom)

Sensitive views within ¼ mile of the project area include Wrigley Field, which is north of the project limits and partially obscured by the existing built environment. Another sensitive view nearby is the Newport Avenue Historic District, which is predominantly east of the mainline track structure and contains high visual intactness and unity. The edges of this historic district, from a visual perspective, appear to be marked by the track structure itself, and visual quality of the historic district itself is not diminished as a result of the shielding that the track structure provides.

The visual quality of the project area as a whole is largely based on the visual power and prominence of the elevated track structure. Approaching the project area from the south, the Red, Purple, and Brown line tracks are part of a single elevated steel structure, supported by steel columns with the tracks approximately 20 feet from the ground.

Just north of Belmont station, the original tracks and open-deck system are in place. As shown in **Figure 3-8**, there is a clear demarcation from the new to the original track structure. This existing condition compromises visual quality, particularly diminishing coherence and visual unity. The track structure on the right side of the photo is the original Red and Purple line track structure, exemplified by the numerous thin steel columns, wooden rail ties, and lack of noise barriers. The track structure on the left side of the photo was upgraded as part of the Brown Line Expansion Project from 2006 to 2009, evidenced by the thick concrete columns, steel aerial structure, and concrete noise barriers at track level. As shown in **Figure 3-9**, the view from the ground up to the tracks is also different between the original and new track structure.

Figure 3-8: Photo Showing Transition between Newer Track Structure (Left) and Original Track Structure (Right) Just North of Belmont Station

Figure 3-9: Photos of Open-Deck Track Structure (Left) and Closed-Deck Track Structure (Right), Viewed from Below

Unlike other areas of the RPM corridor, in the vicinity of Clark Junction, there is no continuous alley running along the track structure although there are open areas adjacent to the track structure. As shown in **Figure 3-10**, many of the areas beneath the track structure are used by local residents for parking and gardening. Where older, open-deck track structure still exists, visual quality underneath the structure is diminished by debris from the tracks above.

Figure 3-10: Photo of Area beneath Track Structure Used for Parking

3.6.3 Environmental Impacts

The following sections summarize the potential visual and aesthetic impacts for the No Build and Build Alternatives.

No Build Alternative

The No Build Alternative would have no permanent visual and aesthetic impacts. Temporary impacts may result from routine maintenance and minor repairs that would be required. These temporary impacts would include visual impacts such as the presence of construction fencing and equipment during repairs.

Build Alternative

The major visual and aesthetic changes proposed as part of the Red-Purple Bypass Project include the following:

- **Fifth Track Bypass** - To provide for the bypass, a Brown Line track would cross over the Red and Purple line tracks, clearing the tracks by approximately 22 feet (two stories) at its highest point.

- **Modern, Closed-Deck Structure and Noise Barriers** - The proposed modern structure would have a closed deck, with noise barriers (approximately 3 to 5 feet high) on both sides of the track deck. The new deck would be similar to the deck at the existing Belmont station and just north of the station, where noise barriers and a closed-deck structure were implemented as part of the Brown Line Expansion Project. The existing support structure (which uses riveted steel) would be replaced by a modern concrete or steel structure similar to the type implemented as part of the Brown Line Expansion Project. See the left side of **Figure 3-8** for an example of a support structure that is similar in appearance to the one proposed in the Build Alternative. As part of the project contractor selection process, CTA will incorporate a

selection criterion that provides additional points for proposals that consider the aesthetic qualities of the historic elevated track structure in their designs.

- **Property Displacements** - Property displacements would be required to accommodate the bypass, modernized mainline track structure, and construction. After construction, the remainder of property will become available for potential redevelopment after construction. Potential redevelopment will include transit-related uses and be developed with CTA independently of this project.

Construction Impacts

Construction of the Build Alternative would result in temporary adverse impacts on the surrounding visual environment due to construction work zones. Construction would primarily occur within the existing CTA right-of-way or on property acquired for the project, which would minimize both visual impacts and neighborhood and community impacts during construction.

Permanent Impacts

Several changes to the visual environment of the rail infrastructure are proposed as part of the Build Alternative.

The bypass would cross over the Red and Purple line tracks, clearing them by approximately 22 feet at its highest point, as shown in **Figure 3-11**. The bypass would reduce in height after clearing the junction and would tie in with the existing Brown Line just west of Sheffield Avenue.

Figure 3-11: Photo and Artistic Conceptual Rendering of Proposed Red-Purple Bypass, Facing North from Belmont Station

Views of the proposed improvements from ground level are shown in **Figures 3-12 through 3-16**.

Figure 3-12: Proposed Improvements with and without Redevelopment from Belmont and Wilton Avenues, Facing Northeast

Figure 3-13: Photo and Artistic Conceptual Rendering of Proposed Red-Purple Bypass with and without Redevelopment at School Street and Wilton Avenue, Facing Southwest

Figure 3-14: Photo and Artistic Conceptual Rendering of Proposed Red-Purple Bypass with and without Redevelopment at Clark Street and Buckingham Palace, Facing Northwest

Figure 3-15: Photo and Artistic Conceptual Rendering of Proposed Red-Purple Bypass with and without Redevelopment at Clark Street near Roscoe Street, Facing Northwest

Figure 3-16: Photo and Artistic Conceptual Rendering of Proposed Red-Purple Bypass with and without Redevelopment at Clark Street and Newport Avenue, Facing South

The new bypass would create some changes in views from the street and local buildings. To an extent, it would not be out of place in the context of the local community, because the bypass and modernized mainline tracks would be located in an existing rail corridor. Trains already operate in an aerial configuration in the area and the track structure occupies a large portion of the viewshed in the project area. While visual changes would be perceivable once built, the resulting visual impacts are expected to be congruent with the inherent, established character and scale of the surrounding environment to the largest extent possible.

The existing open-deck structure would be replaced with a modern, closed-deck aerial structure with noise barriers that would provide beneficial improvements to the visual environment through the replacement of deteriorating infrastructure with modern structures. Similar upgrades to a modern closed-deck track structure are already present in the project area from previous Brown Line Expansion Project improvements, and changes would provide greater visual congruence of the track structure within the project area. See **Figure 3-11** for existing conditions that show the Brown Line Expansion Project improvements as well as a conceptual rendering of the Build Alternative. See the left side of **Figure 3-8** for an example of a support structure that is similar in appearance to the one proposed in the Build Alternative.

Property displacements would be required to accommodate expanded permanent right-of-way, modernized mainline track structure, and construction staging. This would temporarily change views of the track structure from street level pending redevelopment. The remainder of property not used for permanent right-of-way would become available for potential redevelopment after construction. Existing visual conditions as well as conditions following implementation of the project (with and without redevelopment) are shown in **Figure 3-12** through **Figure 3-16**. Redevelopment would occur independently of this project.

New materials, colors, and detailing would be selected with the intention of being aesthetically pleasing and complementary with surroundings. To the extent possible, final design would be consistent with the context of the surrounding community.

To minimize potential safety and security impacts, the area beneath the new closed-deck structure will be well lit and designed to minimize dark spaces. The lighting will be similar to lighting used underneath the elevated track throughout the city and impacts would not be substantially different than existing conditions in this urban, developed, and primarily commercial corridor.

3.6.4 Measures to Avoid or Minimize Harm

Before construction, CTA will work with DPD, chambers of commerce, the Ward 44 alderman's office, and the community to develop a Neighborhood Redevelopment Plan that identifies opportunities for development near CTA stations and facilities in the community. The plan will outline desirable future redevelopment in terms of size, scale, and materials to ensure consistency with visual quality desired by the community.

During construction, CTA is committed to the following measures to minimize visual impacts:

- CTA will use light shielding, where possible, to limit light trespassing from night lighting needed for construction activities. BMPs and debris-free construction areas will mitigate temporary visual impacts from construction sites.
- CTA will work with the community to further detail elements to minimize potential visual and aesthetic impacts during construction. These details will be noted in the Construction Outreach and Coordination Plan for the project.
- CTA will use construction sites for construction machinery and materials storage as much as possible to minimize visual disruption to the surrounding neighborhoods and businesses.

After construction, CTA will maintain all remaining property acquired for the project until such time that it may be redeveloped.

3.7 Noise

This section describes the predicted noise impacts of the Red-Purple Bypass Project. Noise is "unwanted sound," generally measured in terms of loudness. The loudness, or magnitude, of noise determines its intensity and is measured in decibels (dB). The overall noise level from transit sources is described in A-weighted decibels (dBA). The A-weighted decibel scale was developed to better approximate the sensitivity of human hearing. Because the decibel is based on a logarithmic scale, a 10-dB increase in noise level is generally perceived as a doubling of loudness, while a 3-dB increase in noise is just barely perceptible to the human ear. **Appendix D-5** contains additional details about noise impacts.

3.7.1 Regulatory Framework/Methods

CTA analyzed noise impacts from the project in accordance with the FTA (2006) *Transit Noise and Vibration Impact Assessment* guidance manual. The FTA guidance manual sets forth the basic concepts, methods, and procedures for evaluating the extent and severity of the noise impacts resulting from transit projects.

The Red-Purple Bypass Project would upgrade an existing rail corridor where three train lines converge and are currently generating relatively high levels of noise. FTA thresholds for noise impacts depend on existing noise levels. As existing noise levels increase, the allowed increase in transit noise exposure decreases. Because existing noise levels from CTA operations are quite high, noise impacts may be caused by relatively small increases in noise or vibration exposure.

For this assessment, CTA first identified noise-sensitive receivers in the project area. The FTA *Transit Noise and Vibration Impact Assessment* guidance manual recommends a screening distance of 350 feet to delineate the study area for a rapid rail transit project in an area with intervening buildings. This noise-sensitive receiver identification process therefore used a distance of 350 feet. In addition, FTA defines three different land use categories for identifying noise-sensitive receivers:

- Category 1 - Tracts of land set aside for serenity and quiet, such as outdoor amphitheaters, concert pavilions, and historic landmarks

- Category 2 - Buildings used for sleeping, including residences, hospitals, hotels, and other areas where nighttime sensitivity to noise is of utmost importance

- Category 3 - Institutional land uses with primarily daytime and evening uses including schools, libraries, churches, theaters, museums, cemeteries, historical sites and parks, and certain recreational facilities used for study or meditation

The identified noise-sensitive receivers were then grouped into clusters when the receivers were determined to be similar distances from the existing and proposed future tracks and where the CTA operating conditions, such as train speed, were determined to be similar. All noise-sensitive receiver clusters identified in the project area are shown on a map in **Appendix D-5** for reference.

The second step in the noise assessment was to determine existing noise conditions. Noise measurements were taken at representative sites in the project area to establish the existing noise conditions at the clusters of noise-sensitive receivers. CTA then used these measurements to determine the impact thresholds at each cluster of noise-sensitive receivers.

The third step in the noise assessment was to develop a noise prediction model. CTA collected detailed noise measurements at locations outside the project area to use for modeling purposes. These measurements were performed along the existing CTA elevated structure where the structure type was determined to be similar to the proposed structures. The measurements were taken to use as reference noise levels in the noise prediction model. Models of the noise were developed based on the data generated through measurement of the similar structure types in the CTA train system.

The fourth step in the noise assessment was to predict future noise levels and identify predicted noise impacts. The models were used to predict future levels at each cluster of noise-sensitive receivers. By comparing existing and predicted noise levels, CTA determined locations where predicted noise increases would constitute an impact. The FTA noise criteria are delineated into two categories of impacts: moderate and severe. The moderate impact threshold defines areas where the change in noise would be noticeable, but might not be sufficient to cause a strong, adverse community reaction. The severe impact threshold defines the noise limits above which a substantial percentage of the population would be highly annoyed by new noise.

The final step in the noise assessment was to recommend mitigation measures. CTA identified feasible mitigation measures where predicted noise levels exceeded the moderate or severe FTA impact thresholds. As noted in the FTA guidance manual, mitigation measures should be considered when moderate impacts are predicted and implemented when severe impacts are predicted unless there are compelling reasons why mitigation would not be feasible.[10] CTA's

[10] Determinations of whether mitigation would be feasible and prudent were based on "noise reduction potential, the cost, the effect on transit operations and maintenance, and … any new environmental impacts which may be caused by the measure" (FTA 2006).

analysis identified feasible noise mitigation measures that would reduce noise levels to below FTA's moderate impact threshold at all locations where the predicted noise levels exceeded the moderate or severe FTA noise impact threshold.

Potential noise impacts resulting from construction were also assessed using the procedures and criteria in the FTA guidance manual. Additional information on construction noise impact thresholds is in **Appendix D-5**.

3.7.2 Existing Conditions

There are 56 clusters of noise-sensitive receivers within 350 feet of the alignment including residences, one school (Truman College Lakeview Learning Center, which is east of the Red and Purple line track structure along Clark Street just north of School Street) and one church (North Side Mosque of Chicago, just south of the Brown Line tracks at Kenmore Street and Roscoe Street). Six of the residences identified as noise-sensitive receivers are potential property displacements. The noise-sensitive receivers include a number of multifamily residences along the Red, Purple, and Brown lines throughout the project area. All clusters of noise-sensitive receivers are shown on a map and individual noise-sensitive receivers are identified in **Appendix D-5**.

The dominant noise source in the project area is train noise from the existing Red, Purple, and Brown lines. Just north of Belmont station, trains currently run on an open-deck, steel, elevated structure with jointed rail. The Belmont station is a closed-deck, aerial structure with direct-fixation tracks and jointed rail. The closed-deck structure extends about 200 feet north of the station. Red Line trains operate 24 hours a day. Purple Line trains operate in the project area during weekday peak periods, between approximately 5:30 and 11:15 AM and 2:30 and 8:00 PM. Brown Line trains operate all day except between 2:30 and 4:00 AM.

CTA conducted two types of noise measurements to document existing noise exposure at noise-sensitive receivers within 350 feet of the alignment: long-term (24-hour) unattended measurements and short-term (1-hour) attended measurements. The long-term measurements were conducted at five representative noise-sensitive receivers throughout the project area. Short-term measurements were conducted at an additional five sites in the project area. The measurement sites were chosen to represent different noise environments throughout the project area. Measurement sites included noise-sensitive receivers near the Belmont station, near crossovers and other special trackwork, and at noise-sensitive receivers where existing intervening buildings that may shield existing train noise would be removed as part of the Build Alternative. The long- and short-term noise measurements confirmed that train noise is the dominant noise source in the project area. The short-term measurements were used to determine the source of the variation in noise levels and to develop a procedure to estimate the existing noise levels at representative noise-sensitive receivers where long-term noise measurements were not conducted.

The estimated existing train noise level is within 1 dB of the measured train noise level at all but one long-term measurement site. The estimated noise level overestimates the measured noise level at site LT-2 (along Wilton Street just south of School Street) by 2.2 dB because of an

intervening row of buildings blocking the line-of-sight to the tracks. The estimated existing noise levels range from L_{dn}[11] 67.0 dBA at the farthest noise-sensitive receivers to L_{dn} 87.4 dBA at the closest noise-sensitive receivers. **Appendix D-5** contains detailed results of the existing noise measurements.

3.7.3 Environmental Impacts

The following sections summarize the potential noise impacts of the No Build and Build Alternatives.

No Build Alternative

There is no predicted change in noise levels for the No Build Alternative. The noise levels for the No Build Alternative would not change over existing conditions and no noise impact would be predicted. At 17 of the 56 noise-sensitive receivers identified for this analysis, existing noise already exceeds allowable FTA noise threshold increases, and no noise reduction would occur as a result of the No Build Alternative.

Build Alternative

The noise analysis for the Build Alternative is based on the following components as described in **Section 2.3.1**: a bypass for the northbound Brown Line, and modernization of the mainline tracks from Belmont station to between Newport and Cornelia Avenues. A closed-deck, aerial structure with noise barriers along the edges of the structure and welded rail were assumed to be part of the project based on early analysis of existing noise and consideration of the proposed capacity increases under the Build Alternative. The noise barriers would be about 3 to 5 feet in height and would extend along both sides of the track structure through the entire project area. The predicted noise reduction provided by the noise barrier is 6.5 dB, and was predicted using noise measurement data from a structure similar to what is proposed for the project.

Construction Impacts

The construction noise analysis considers the temporary noise impacts that construction would cause. Construction of a modern closed-deck structure would require the use of heavy earthmoving equipment, pneumatic tools, and other equipment. Impact pile-driving is not currently proposed as part of construction of the project.

The predicted construction noise levels exceed the FTA daytime residential impact threshold of 90 dBA for noise-sensitive receivers within 50 feet of the construction activities and would result in adverse impacts on 25 of the 56 clusters of noise-sensitive receivers in the project area. The 50-foot boundary for potential construction impacts and noise-sensitive receivers are shown on **Figure 3-17**. There are three primary types of construction activities with a potential for impact at locations within 50 feet:

[11] L_{dn}, the day-night sound level, is a measure of community noise over a 24-hour period. In the calculation of L_{dn}, noise that occurs during the nighttime hours (10:00 PM to 7:00 AM) is given a weighting that causes one train during the nighttime hours to be equivalent to 10 trains during the daytime hours.

- Demolition, site preparation, and utilities (the equivalent continuous sound level [L_{eq}] for these activities is typically 91 dBA at 50 feet)
- Construction of structures, track installation, and paving activities (L_{eq} for these activities is typically 90 dBA at 50 feet)
- Miscellaneous activities after heavy construction of the structure that would likely be for a shorter period of time due to the less intensive nature of work, such as installation of railings and signs (L_{eq} for these activities is typically 90 dBA at 50 feet)

Appendix D-5 contains additional details on predicted noise levels for these types of work.

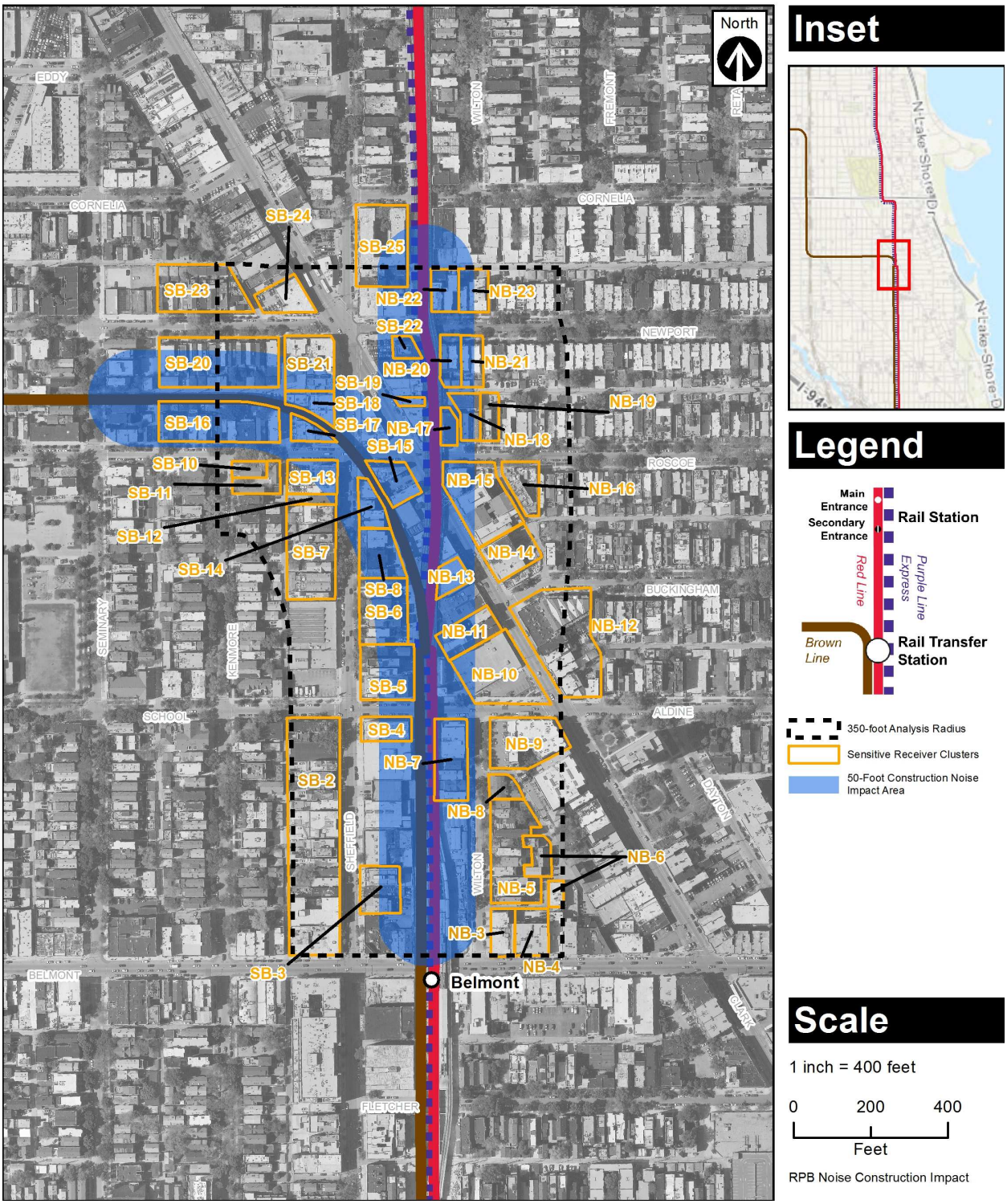


Figure 3-17: Construction Noise Impact Area (50 -Feet)

Permanent Impacts

At nearly 70 percent of the noise-sensitive receiver clusters, noise levels would be substantially reduced as a result of the Build Alternative because the existing open-deck steel structure would be replaced with a quieter, closed-deck, aerial structure. A list of all sensitive receiver clusters that would have a reduction in noise with the Build Alternative is provided in **Appendix D-5**.

Noise impacts that could result from the Build Alternative are predicted: (1) at locations where special trackwork would be installed, such as where turnouts are proposed to allow for trains to move onto and off of the new bypass track; and (2) due to the removal of several buildings identified under the Build Alternative. A map showing the locations of special trackwork, displacements, and noise impacts before mitigation is provided in **Appendix D-5**, Figure 6-2. The predicted noise levels also reflect noise increases that would result from increases in train speeds and additional train throughput.

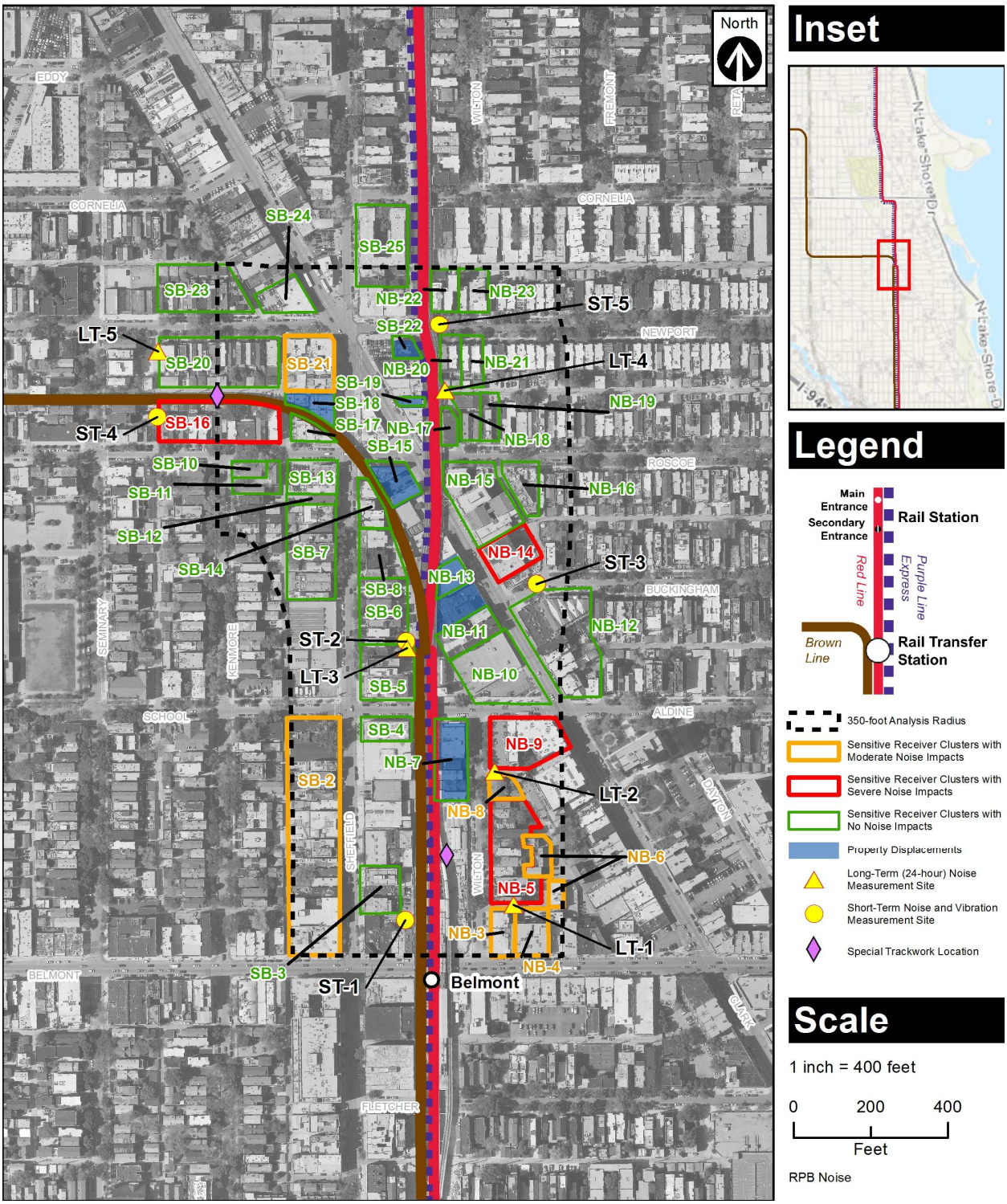
There were 56 noise-sensitive receiver clusters identified within 350 feet of the alignment, of which 6 clusters are predicted to have moderate permanent noise impacts and 4 clusters are predicted to have severe permanent noise impacts before mitigation, as presented in **Table 3-6** and shown on **Figure 3-18.** Of the other 46 noise-sensitive receiver clusters, 38 would experience a reduction in noise levels, 2 would have a predicted noise level below the FTA impact threshold, and 6 are existing noise-sensitive receiver clusters where the Build Alternative would displace properties.

Special trackwork is predicted to increase noise levels by up to 6 dB. New turnouts are proposed where the bypass track would tie in with the existing mainline tracks on the existing Belmont station structure and on the Brown Line at the west end of the project area. Near the turnouts, four noise-sensitive receiver clusters (NB-3, NB-4, NB-6, and SB-2) would be subject to a moderate impact before mitigation and two noise-sensitive receiver clusters (NB-5 and SB-16) would be subject to a severe impact before mitigation.

Removing buildings would cause noise levels to increase because the acoustic shielding the buildings provided would be removed. Impacts are predicted at four noise-sensitive receiver clusters where train noise levels would increase because of the removal of intervening buildings (to accommodate the new bypass structure). Noise-sensitive receiver clusters NB-8 and SB-21 would be subject to a moderate impact before mitigation and clusters NB-9 and NB-14 would be subject to a severe impact before mitigation.

Because existing noise levels are high at the noise-sensitive receivers, the allowable noise increases (using the FTA noise impact criteria) are very small. As shown in **Table 3-6**, the moderate noise impact threshold is less than 2 dB at all clusters where impact is predicted. There is only one cluster where the predicted future noise level would be more than 3 dB greater than the existing noise level.

Mitigation measures are proposed to reduce noise levels to below FTA impact thresholds for all clusters with predicted noise impacts. Proposed mitigation measures are presented in **Section 3.7.4**.



Inset

Legend

Main Entrance
Secondary Entrance
Rail Station
Red Line
Purple Line Express
Brown Line
Rail Transfer Station

350-foot Analysis Radius
Sensitive Receiver Clusters with Moderate Noise Impacts
Sensitive Receiver Clusters with Severe Noise Impacts
Sensitive Receiver Clusters with No Noise Impacts
Property Displacements
Long-Term (24-hour) Noise Measurement Site
Short-Term Noise and Vibration Measurement Site
Special Trackwork Location

Scale

1 inch = 400 feet

0 200 400

Feet

RPB Noise

Figure 3-18: Noise Measurement Locations and Locations of Clusters of Noise-Sensitive Receiver Clusters with Noise Impacts before Mitigation

Table 3-6: Existing and Predicted Noise Levels and Moderate and Severe Impacts at Noise-Sensitive Receiver Clusters

Noise-Sensitive Receiver Cluster ID	Noise-Sensitive Receiver Cluster Description	Existing Noise Level	Predicted Noise Level under Build Alternative	Change in Noise Level	FTA Allowable Noise Increase[1]		Level of Impact (before mitigation)
		(L_{dn} in dBA)	(L_{dn} in dBA)	(dB)	Moderate Impact (dB)	Severe Impact (dB)	
NB-3	MFR	65.9	68.0	2.1	1.3	3.5	Moderate
NB-4	MFR	69.5	71.8	2.2	1.1	2.8	Moderate
NB-5	MFR	72.6	75.5	2.9	0.7	2.4	Severe
NB-6	MFR	68.2	70.5	2.3	1.2	3.0	Moderate
NB-8	MFR	71.9	73.7	1.8	0.8	2.5	Moderate
NB-9	MFR	70.2	73.8	3.7	1.0	2.7	Severe
NB-14	MFR	72.8	75.7	2.8	0.7	2.4	Severe
SB-2	MFR	65.2	67.6	2.4	1.4	3.6	Moderate
SB-16	MFR	88.9	89.7	0.8	0.0	0.2	Severe
SB-21	MFR	79.1	80.2	1.1	0.2	1.4	Moderate

L_{dn} = 24-hour day-night level; dBA = A-weighted decibel; dB = decibel; FTA = Federal Transit Administration; MFR = multifamily residence

[1] Source: FTA 2006

See **Appendix D-5** for all other noise-sensitive receiver clusters. Below is a summary of other noise-sensitive receiver clusters:

- Reduction in noise levels - 38 clusters
- Predicted noise level below FTA impact threshold – 2 clusters
- Clusters where properties would be displaced - 6

3.7.4 Measures to Avoid or Minimize Harm

Predicted construction noise levels would exceed the limits provided in the FTA guidance manual, but will be reduced with alternate operational methods, scheduling, equipment choice, and acoustical treatments. The following BMPs will be implemented to minimize impacts from construction noise:

- Provide adequate advance notification to the public of construction operations and schedules.
- Whenever possible, conduct construction activities during the daytime and during weekdays.
- Where practical, erect temporary noise barriers between noise-generating construction activities and noise-sensitive receivers. Where possible, use movable noise barriers at sources of construction noise.
- Demonstrate in the Construction Management Plan the use of best available control technologies to limit excessive noise when working near noise-sensitive receivers.
- Detail and discuss in the Construction Management Plan the following:
    - The potential for noise-deadening measures for truck loading and operations

- Use of lined or covered storage bins, conveyers, and chutes with sound-deadening material
- Use of acoustic enclosures, shields, or shrouds for equipment and facilities
- The ability to install high-grade engine exhaust silencers and engine-casing sound insulation
- Ways to limit use of public address systems and minimize the use of generators or use whisper-quiet generators to power equipment

- If nighttime work becomes necessary, prohibit aboveground jackhammering. In addition, use spotters and smart backup alarms during nighttime work that automatically adjust (lower) the alarm level or tone based on the background noise level. When possible, avoid the use of air horns when work crews are on the tracks.

- Locate construction traffic and haul routes through non-noise-sensitive areas, where possible.

Mitigation measures for permanent increases in noise will be considered when moderate impacts are predicted; noise mitigation will be implemented where severe impacts are predicted unless there are compelling reasons why mitigation measures are not feasible.

As discussed, a closed-deck aerial structure, noise barriers along the edges of the structure, and welded rail are assumed to be part of the project. Lower noise levels associated with these features are taken into account in the predicted noise levels, and therefore these features are not considered as potential mitigation measures. Increasing the height of the noise barriers on the structure was also not considered as a potential mitigation measure, because the majority of the noise impacts would be at upper-story noise-sensitive receivers, where a higher noise barrier would not be effective at lowering noise levels. In addition, good wheel and track condition is assumed for both existing noise conditions and future noise conditions; therefore, changes to wheel or track maintenance are not considered as potential mitigation measures.

Several mitigation measures are possible and will be determined during subsequent engineering and design. The options listed below are in order of applicability and likelihood to be implemented. One or more of the following mitigation measures will be incorporated into the project to reduce noise levels at noise-sensitive receivers to below FTA noise thresholds:

- Monoblock or other low-impact frogs could be installed. A “frog” refers to the crossing point of two rails. Monoblock frogs are designed without bolted joints and rails, and result in a smoother running surface compared with traditional frogs. Monoblock frogs would reduce predicted noise levels at crossovers by 3 dB.

- Rail dampers could be installed. Rail dampers are tuned to absorb specific vibration frequencies, reducing the amount of noise radiated by the rail. The dampers are attached

directly to the rail between the ties. Rail dampers would reduce predicted noise levels by 2 or 3 dB.

- Removal or relocation of some of the proposed special trackwork. After the bypass structure is completed, some of the special trackwork currently in the bypass area may no longer be necessary. Removing the special trackwork would reduce predicted noise levels by 6 dB.

- High resilience (soft) fasteners could be installed on the remaining open-deck steel structure. Softer fasteners would reduce noise radiating off the structure. Further study would be necessary to determine amount of reduction provided by high-resilience fasteners.

- Residential sound insulation could be installed for upper-story receivers. Assessment of the existing sound insulation at noise-sensitive receivers will be conducted before construction to determine the noise reduction necessary to eliminate impact, and may show that additional sound insulation is not warranted.

CTA calculated predicted noise levels assuming monoblock frogs as potential noise impact mitigation measures; refer to **Appendix D-5** for information on the calculations. Using this mitigation measure, predicted noise levels could be reduced to below the severe or moderate impact threshold for all clusters of noise-sensitive receivers where impact is predicted except for one (cluster SB-21). Monoblock frogs were recommended as the mitigation measure because they would be most effective at mitigating noise from special trackwork at the source. If it is determined during subsequent engineering and design that it is not feasible or reasonable to use monoblock frogs due to engineering or cost constraints, alternative mitigation measures will be considered. Alternative mitigation measures for noise-sensitive receivers near special trackwork include residential sound insulation or removing or relocating special trackwork. Replacing jointed rail with welded rail and installing rail dampers would not be effective mitigation measures for noise-sensitive receivers near special trackwork. Note that three of the clusters where noise impacts are predicted due to the removal of buildings (NB-8, NB-9, and NB-14) are also near special trackwork.

There is one cluster of noise-sensitive receivers (SB-21) that is not near special trackwork, but where noise impacts are predicted as a result of removing an intervening building. Potential mitigation measures for this cluster of noise-sensitive receivers include installing high-resilience fasteners on the open-deck Brown Line tracks, installing rail dampers, or installing residential sound insulation. Further study of the noise increase at SB-21 will be conducted during subsequent engineering development and before construction to confirm which, if any, mitigation measures are required. The current study uses a conservative estimate for increase in noise levels due to removal of the intervening building based on FTA guidance. It provides sufficient mitigation options for reducing noise levels below FTA impact thresholds. A more detailed noise model of this noise-sensitive receiver, which will be conducted before construction of the project, will take into account how the noise level at the upper and lower floors of the remaining building would be affected by the removal of the intervening building. This more

detailed study may show that the projected noise levels for the remaining building would not exceed FTA impact thresholds and that noise mitigation would not be required.

3.8 Vibration

This section describes the predicted vibration impacts of the Red-Purple Bypass Project. Ground-borne vibration can be caused by the vibration of a transit structure, creating vibration waves that propagate through the soil and rock to the foundations of nearby buildings. The vibration of floors and walls may cause perceptible vibration, rattling of items such as windows or dishes on shelves, a rumble noise, or damage to buildings in extreme cases. Vibration is described in terms of velocity (L_v) and is measured in decibels (VdB), which is the root mean square vibration velocity relative to 1 microinch per second. **Appendix D-5** contains additional details about vibration impacts.

3.8.1 Regulatory Framework/Methods

CTA analyzed vibration impacts from the project in accordance with the FTA (2006) *Transit Noise and Vibration Impact Assessment* guidance manual. The FTA guidance manual sets forth the basic concepts, methods, and procedures for evaluating the extent and severity of vibration impacts resulting from transit projects. The Red-Purple Bypass Project would upgrade an existing rail corridor where three train lines converge and generate relatively high levels of existing vibration.

In conducting the analysis, CTA first identified vibration-sensitive receivers in the project area. FTA defines three land use categories to identify vibration-sensitive receivers:

- Category 1 - Buildings where vibration would interfere with operations
- Category 2 - Buildings used for sleeping, including residences, hospitals, hotels, and other areas where nighttime sensitivity to vibration is of utmost importance
- Category 3 - Institutional land uses with primarily daytime and evening uses including schools, libraries, churches, museums, cemeteries, historical sites, and certain recreational facilities used for study or meditation

Identified vibration-sensitive receivers are the same locations as the noise-sensitive receivers. The vibration-sensitive receivers were also grouped into same clusters used in the noise analysis. Vibration-sensitive receivers were grouped into clusters when the receivers were determined to be similar distances from the existing and proposed track locations and where the CTA operating conditions, such as train speed, were determined to be similar. The locations of all vibration-sensitive receiver clusters are provided in **Appendix D-5.**

The FTA vibration criteria levels are defined in terms of human annoyance for the different vibration-sensitive receiver land use categories and unlike noise impacts, the criteria only contain one threshold for identifying impacts. In general, the vibration threshold of human perceptibility is approximately 65 VdB. The FTA vibration impact threshold for Category 2 land uses, including residences, is 72 VdB. Where existing vibration levels exceed the FTA impact threshold, FTA

guidance is to identify an impact only where there is more than a 3 VdB increase in vibration level.

The second step in the vibration assessment involved establishing existing vibration conditions in the project area through measurements at representative vibration-sensitive receivers. The representative measurement sites were chosen to represent different track conditions, such as the closed-deck structure, the open-deck structure, and locations with special trackwork. These vibration measurement sites are labeled ST-1 through ST-5 and are shown on a map in **Figure 3-19.**

The third step in the vibration assessment was to develop a vibration prediction model and predict future vibration levels at the vibration-sensitive receivers. CTA collected detailed vibration measurements at locations outside the project area along existing CTA elevated sections with structure and operating conditions similar to those expected for the completed project. The measurements were used as references for modeling purposes to predict future vibration levels at the identified vibration-sensitive receivers. The final step in the vibration assessment was to recommend mitigation measures. CTA identified feasible mitigation measures for levels that exceed FTA vibration impact thresholds. As provided in the FTA guidance manual for vibration impacts, mitigation measures would be developed in the following cases: (1) where existing vibration levels are lower than FTA thresholds and the future vibration levels would be above those thresholds, and (2) when the existing vibration is already higher than the FTA threshold, and the future vibration would be more than 3 VdB greater than the existing vibration. The FTA vibration impact criteria are based on the maximum vibration level generated from a single train event in an occupied indoor space. For predicted vibration impacts, the goal was to reduce predicted vibration levels to below the applicable FTA vibration impact threshold.

CTA also assessed vibration impacts from construction using the procedures and criteria in the FTA guidance manual. The construction vibration impact threshold provided in the FTA guidance manual is the level at which there is a risk of damage for various structural categories. The primary concern for construction vibration is damage, not annoyance, so the structural categories depend on structure type and materials and are different than the land use categories defined for assessment of operational vibration. The risk of damage threshold for non-engineered timber and masonry buildings is a peak-particle velocity (PPV) of 0.2 inches per second.

3.8.2 Existing Conditions

Vibration measurements were performed at representative sites throughout the project area to determine existing vibration levels at vibration-sensitive receivers. Existing vibration levels of train events were measured over a period of 1 hour at the same five locations as the short-term noise measurements in the project area. The measurement site locations (ST-1 through ST-5) are provided in **Appendix D-5**.

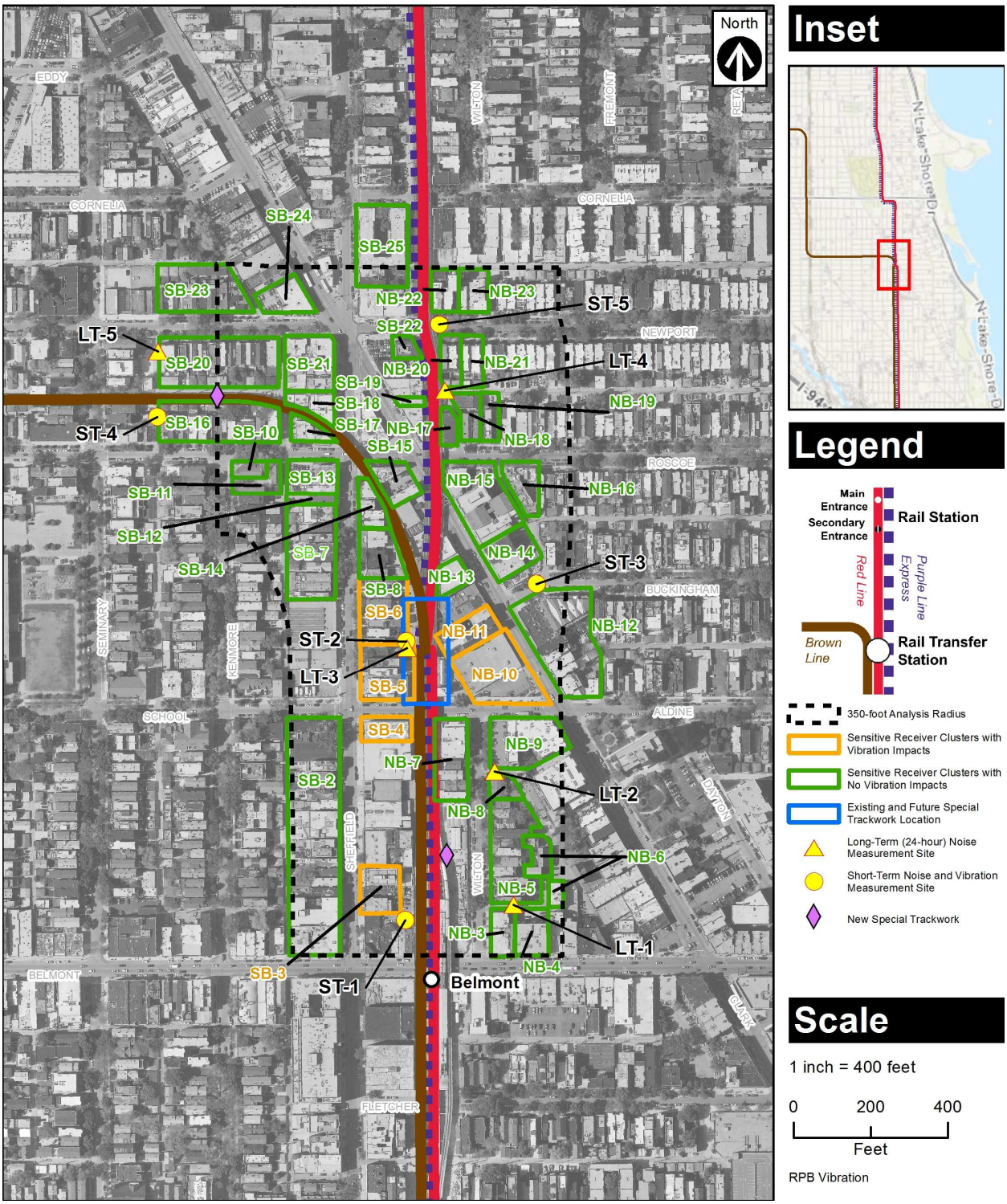


Figure 3-19: Vibration Measurement Locations and Locations of Clusters of Vibration-Sensitive Receivers with Vibration Impacts before Mitigation

The vibration measurements indicated that track and wheel conditions are important factors in determining existing vibration levels. Measured vibration levels from single train events varied by more than 5 VdB at some measurement locations. The average vibration level of the train events was used to quantify the existing vibration level. The existing vibration levels exceed the FTA impact threshold of 72 VdB for Category 2 land uses (residential and other similar nighttime vibration-sensitive locations) that are within 30 feet of the existing open-deck track structure and within 35 feet of the existing closed-deck structure for trains traveling 25 mph. These locations are depicted graphically in **Appendix D-5**.

3.8.3 Environmental Impacts

The following sections summarize the potential vibration impacts of the No Build and Build Alternatives.

No Build Alternative

There is no predicted change in vibration levels for the No Build Alternative and no vibration impact is predicted.

Build Alternative

The vibration impact analysis for the Build Alternative is based on the following components as described in **Section 2.3.1**: a bypass for the northbound Brown Line, and modernization of the mainline tracks from Belmont station to the segment of track between Newport and Cornelia Avenues. A closed-deck, aerial structure with noise barriers along the edges of the structure and welded rail were assumed to be part of the project based on early analysis of existing noise and consideration of the proposed capacity increases under the Build Alternative.

Construction Vibration Impacts

High-vibration activities during construction would include demolition of buildings, construction of aerial structures, pavement breaking, and ground compaction. Vibration impact thresholds are the levels at which there would be a risk for damage, not the level at which damage would occur.

Predicted vibration levels show that most equipment, including jackhammers, dozers, and drill rigs, could be operated at distances of 15 feet or greater from buildings without exceeding the risk of damage threshold of 0.2 inches per second PPV for non-engineered timber and masonry buildings. Construction vibration levels may exceed the vibration risk of damage criteria at some of the closest receivers that are within 15 feet of the construction. **Appendix D-5** contains additional details on predicted vibration levels for common pieces of construction equipment for the four different building categories identified in the FTA guidance manual.

Permanent Vibration Impacts

Changes in the permanent vibration levels because of the Build Alternative would result from changes in the track structure, the construction of the bypass structure closer to some receivers, and faster train speeds. Of the 56 vibration-sensitive receiver clusters identified within 350 feet of the alignment, 6 clusters are predicted to have vibration impacts that exceed the FTA impact threshold before mitigation, as presented in **Table 3-7** and on **Figure 3-19.** The predicted high

vibration levels at the vibration-sensitive receivers would be due to the special trackwork and faster train speeds as part of the Build Alternative. Special trackwork would increase vibration levels by up to 10 VdB. The bypass structure would be located closer to some residential uses than the existing infrastructure.

Table 3-7: Existing and Predicted Vibration Levels and Impacts at Vibration-Sensitive Receiver Clusters

Vibration-Sensitive Receiver Cluster ID	Vibration-Sensitive Receiver Cluster Description	Distance to Nearest Mainline Track Structure Column (feet)	Existing L_v (Band Max.)[1] (VdB)	Predicted L_v (Band Max.)[1] because of the Mainline Track Structure (VdB)	Predicted L_v (Band Max.)[1] because of the Bypass (VdB)	FTA Impact Threshold[2] (VdB)	FTA Threshold Exceedance (VdB)
NB -10	School[3]	46	70	79	70	78	1
NB-11	MFR	70	68	75	66	72	3
SB-3	MFR	47	71	73	61	72	1
SB-4	MFR	37	71	81	61	72	9
SB-5	MFR	12	76	85	63	79	6
SB-6	MFR	31	72	82	62	75	7

L_v = vibration velocity level; VdB = root mean square vibration velocity in decibels relative to 1 microinch per second; MFR = multifamily residence

[1] The band maximum is the vibration level from the maximum ⅓-octave band of the maximum noise level.

[2] Source: FTA 2006

[3] NB-10 is Truman College Lakeview Learning Center.

3.8.4 Measures to Avoid or Minimize Harm

Construction vibration levels may exceed the construction vibration damage criteria at some vibration-sensitive receivers. The following precautionary vibration mitigation strategies will be used to minimize the potential for damage to structures in the project area:

- A vibration-monitoring plan will be developed during subsequent engineering and design to ensure appropriate measures would be taken to avoid any damage to buildings during construction.

- Before beginning construction, any buildings where the predicted construction vibration level exceeds the damage risk criteria will be identified. A pre-construction survey at these buildings will include inspection of building foundations and photographs of existing conditions. The survey will be used to establish baseline, pre-construction conditions.

- Less vibration-intensive construction equipment or techniques will be used to the extent possible near vibration-sensitive buildings. Less vibration-intensive construction techniques may include non-vibratory compaction and drilled piles instead of impact pile-driving.

Permanent vibration impacts would occur as a result of the Build Alternative before mitigation. Good wheel and track condition is assumed for both existing vibration conditions and future vibration conditions; therefore, changes to wheel and/or track maintenance are not considered as potential mitigation measures.

All of the vibration-sensitive receivers where vibration impact is predicted are near the locations of special trackwork. The gaps associated with special trackwork can cause vibration levels to increase by 10 VdB. The following mitigation measures were considered for inclusion into the project to reduce vibration levels at vibration-sensitive receivers:

- Monoblock or other low-impact frogs could be installed, allowing for a smoother transition through special trackwork. Alternative designs for low-impact frogs, such as flange-bearing frogs, may also be used to reduce vibration levels from special trackwork. Monoblock or flange-bearing frogs would reduce predicted vibration levels by 5 VdB.

- Rubber bearing pads could be installed on the top of the columns to reduce vibration transmitted through the columns into the ground. The specific details of this approach and predicted vibration reduction would be investigated during preliminary engineering.

CTA calculated predicted vibration levels assuming monoblock frogs as potential vibration impact mitigation measures. Refer to **Appendix D-5** for information on the calculations. Monoblock frogs were chosen as the recommended mitigation measure because the vibration reduction from monoblock frogs has been documented and they are effective at reducing vibration at crossovers. Using this mitigation measure, vibration levels would be reduced to below the FTA threshold for three of the six affected clusters. At clusters (SB-4, SB-5, and SB-6), a monoblock frog would not reduce the predicted vibration level to below the impact threshold (see **Appendix D-5**). At these receivers, an alternative mitigation measure to reduce vibration levels, such as installation of rubber bearing pads on top of the columns, will be considered as a mitigation measure in addition to or in place of monoblock frogs to reduce predicted vibration levels to below the FTA impact threshold at all vibration-sensitive receivers. Preliminary studies show that rubber bearing pads on top of the columns would reduce vibration levels. The magnitude of the vibration reduction would, however, depend on details determined before construction. During preliminary engineering and before construction, CTA will determine whether rubber bearing pads will provide sufficient vibration reduction on their own, or whether they will be used together with monoblock frogs to reduce vibration to below the applicable FTA impact threshold.

3.9 Hazardous Materials

This section discusses the potential for encountering hazardous materials during project construction and implementation. Hazardous materials may include petroleum products, pesticides, organic compounds, heavy metals, asbestos-containing materials, lead paint, or other compounds that could harm human health or the environment. The nature and extent of contamination can vary widely; early detection, evaluation, and determination of appropriate remediation of hazardous materials are essential.

3.9.1 Regulatory Framework/Methods

Federal and state laws have been established for the protection of human health and the environment. At the federal level, the regulations include the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act; the Superfund Amendments and Reauthorization Act; the Clean Air Act; the Toxic

Substances Control Act; and the Federal Occupational Safety and Health Act. At the state level, regulations and programs include the Illinois Environmental Protection Act and the Illinois Occupational Safety and Health Program, with oversight by the Office of the State Fire Marshal. Locally, the City of Chicago Police Department, City of Chicago Fire Department, and Department of Public Health regulate and oversee issues related to hazardous materials.

A review of federal, state, and local regulatory databases was conducted by Environmental Data Resources, Inc. (EDR) to identify sites that currently or have historically handled, stored, transported, released, or disposed of hazardous or regulated materials, as these types of sites are potential sources of hazardous material contamination. In addition, CTA reviewed historical Sanborn® fire insurance maps, topographic and aerial maps, and other sources for the analysis (EDR 2012a, Historical Information Gatherers, Inc. 2012a, 2012b, 2012c).

Specific sites within ¼ mile of the project where hazardous materials are known or suspected to exist were evaluated for the potential for hazardous materials to be present. Each site was assigned a level of concern based on the following criteria:

- **High Concern** - Sites with known/probable soil, groundwater, or soil gas contamination that have not been remediated, or where remediation was incomplete or undocumented. Other considerations include the type and mobility of any contamination, distance to the project, and groundwater impacts.

- **Moderate Concern** - Sites with known/potential soil, groundwater, or soil gas contamination and where remediation is in progress or was completed with restrictions in place, or contaminants do not appear to pose a concern for the project. Sites may also be considered a Moderate Concern based on the type and intensity of former land use (e.g., chemical manufacturers, machine shops, gas stations), even if they did not otherwise have an environmental database listing.

- **Low Concern** - Sites where hazardous materials or petroleum products may have been or are stored, but where there is no known contamination associated with the site based on all available information. They may include hazardous material generator sites, sites with permitted air toxic emissions or sites with spills or leaks that were subsequently remediated and are no longer a concern.

Polychlorinated biphenyls, lead-based paint, and asbestos-containing material are likely to occur in transformers and buildings constructed before 1978–1979. The evaluation of potential impacts associated with these hazardous materials determined whether transformers and buildings potentially constructed before 1978–1979 were present.

3.9.2 Existing Conditions

EDR conducted a search of federal, state, and local environmental regulatory databases on February 13, 2012 to identify potential sites of concern within ¼ mile of the project limits (EDR 2012b). This search was updated on July 7, 2014 (EDR 2014). Using the impact analysis criteria

described above, CTA reviewed and classified the regulated sites identified by EDR as High, Moderate, or Low Concern based on their potential to act as a source of contamination to the project. In addition, the list of orphan sites (sites reported as potentially being within ¼ mile of the project limits, but which could not be mapped due to inadequate or incomplete address information) was reviewed and when possible, classified. The review identified no High Concern and four Moderate Concern sites (shown on **Figure 3-20**). All sites not identified as a High or Moderate concern were classified as Low Concern. **Appendix D-6** contains a full list of High, Moderate, and Low Concern sites and additional supporting maps and documentation.

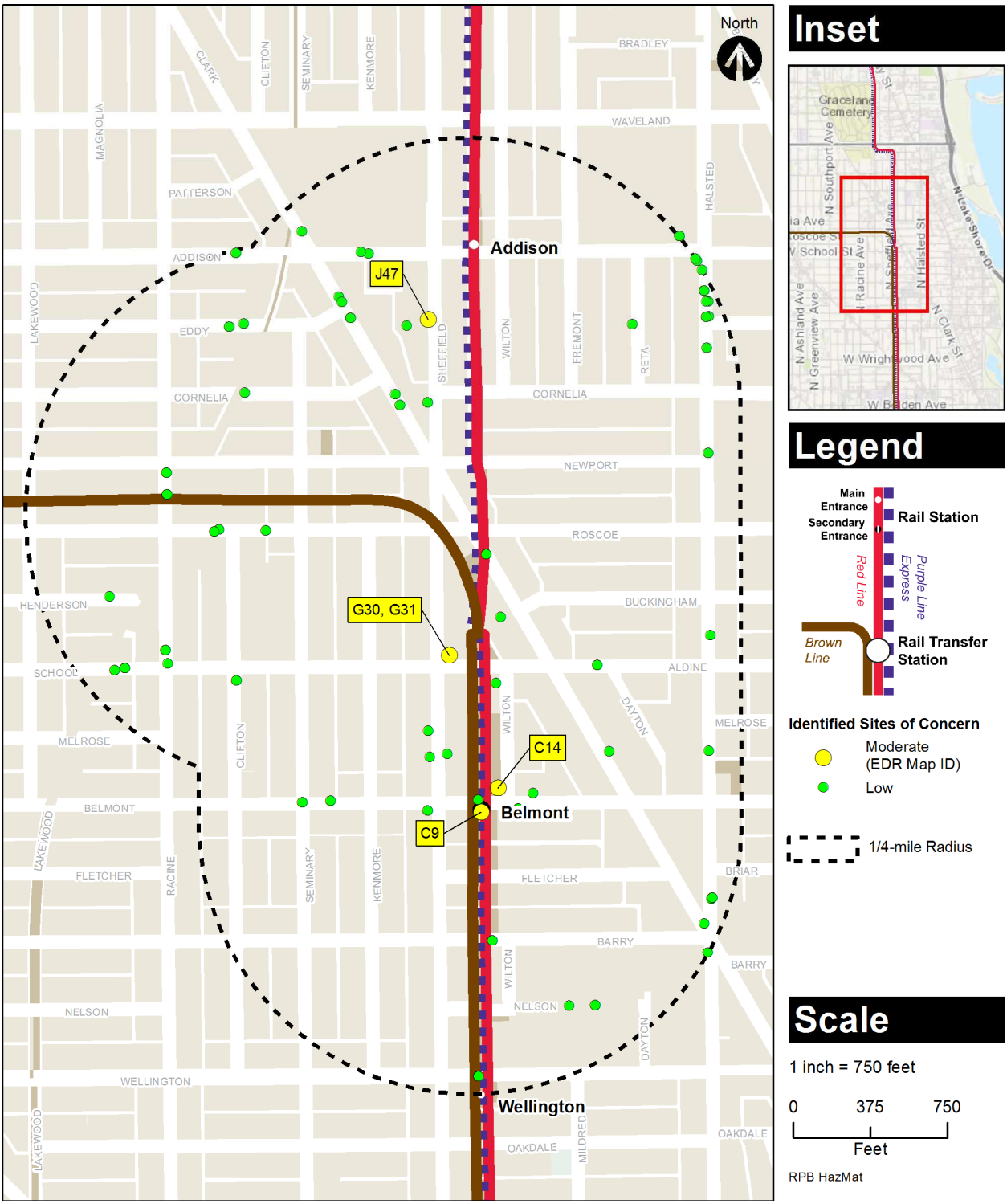


Figure 3-20: Identified Hazardous Materials Sites of Concern

Two underground storage tank (UST) sites were classified as Moderate Concerns due to their location within the CTA right-of-way. The two sites are CTA-owned property, with a 2,000-gallon heating oil UST that was removed in 2006 (EDR Map ID C14), and a 1,500-gallon heating oil UST identified as currently in use. Belmont station (EDR Map ID C9) is also listed as a RCRA Conditionally Exempt Small Quantity Generator, meaning it generates or stores a very small amount of hazardous materials on-site. The other two Moderate Concern sites were classified due their proximity to the project (adjacent) and listing as a UST and Leaking UST site or Site Remediation Program site with restrictions. EDR Map ID G30/G31 is listed as previously containing a 110-gallon gasoline UST, exempt from registration; this site is also listed as a Leaking UST and has received a No Further Remediation letter from the Illinois Environmental Protection Agency, indicating that remediation is considered complete. EDR Map ID J47 is a former industrial or commercial site; it has received a No Further Remediation letter from the Illinois Environmental Protection Agency with legal or administrative restrictions on land use and/or other activities to limit exposure to contamination.

Given the urban setting of the Red-Purple Bypass Project, the potential exists for the presence of typical urban fill throughout the entire project area. Typical urban fill normally contains elevated concentrations of polynuclear aromatic hydrocarbons and metals, which are present due to the urban setting that includes nearby roadways, railways, and industrial and commercial land uses. This type of contamination is not necessarily associated with a release from a specific site or source. Urban fill may also include building demolition debris, which was commonly used as fill material in excavations.

3.9.3 Environmental Impacts

The following summarizes the potential impacts from hazardous materials for the No Build and Build Alternatives.

No Build Alternative

No adverse construction or permanent impacts related to hazardous materials would occur as part of the No Build Alternative. Construction activities associated with the No Build Alternative, such as routine maintenance, could encounter and/or generate hazardous materials such as paints, solvents, fuels, and hydraulic fluids that may be accidentally released during construction; adherence to federal, state, and local regulations would avoid and minimize any construction-related impacts associated with the No Build Alternative.

Potential benefits of remediation associated with the Build Alternative would not occur with the No Build Alternative. The Red, Purple, and Brown lines would continue operating under the No Build Alternative, and transit operation has the potential to result in the release of hazardous materials and/or petroleum products into the environment from accidental spills. Spills would most likely occur during activities such as equipment and grounds maintenance. Materials typically used for these activities include fuel, oil, paints, solvents, cleaning agents, herbicides, and pesticides. There would be no changes in the existing types, usage, storage, or transport of hazardous materials during operation of the No Build Alternative. Existing procedures are already in place to address the proper storage and handling of hazardous materials during operations.

Build Alternative

Construction Impacts

Construction impacts would relate primarily to the potential to encounter soil and/or groundwater containing hazardous materials during construction. The new closed-deck structure and track construction would require subsurface excavation throughout the majority of the project area. There would be the potential to encounter hazardous materials, whether from the sites identified in the database review, from the presence of urban fill, or from the existing rail corridor, which may have been previously contaminated. In addition, if groundwater is encountered during construction, there is the potential that it may contain hazardous materials as well. Moderate Concern sites (identified in **Appendix D-6**) are the greatest potential sources of hazardous material impacts.

One Moderate Concern site has been identified within the construction area (C-14), to be located between Belmont Avenue and Aldine Avenue/School Street. Although subsurface work is not expected in the construction area, there is the potential to disturb the soil and encounter hazardous materials.

The Build Alternative would include demolition of existing structures, including properties acquired for the project that were constructed before 1978 and 1979. The structures potentially include asbestos-containing material and lead-based paint that could result in a release of asbestos fibers and lead dust during construction. There is also the potential for hazardous materials involved with construction activities, such as paints, solvents, fuels and hydraulic fluids, to be accidentally released during construction.

Permanent Impacts

The project could result in benefits through the cleanup and/or removal of contaminated material (soil, groundwater and/or asbestos and lead-based paint particles) during construction. Existing procedures are already in place to address the proper storage and handling of hazardous materials during operations.

3.9.4 Measures to Avoid or Minimize Harm

Federal, state, and local laws and regulations regarding hazardous materials will be followed before and during construction. The following BMPs, at a minimum, will be implemented before and during construction to avoid and minimize the potential for impacts before and during construction:

- Phase I Environmental Site Assessments (ESAs) will be conducted of any property to be purchased as part of the Build Alternative in order to identify recognized environmental conditions and assess and limit environmental liability. Phase I ESAs will be completed to evaluate the presence of contamination and to develop appropriate measures to deal with hazardous materials during construction. Based on the Phase I ESA findings, a Phase II ESA could also be required before purchasing a property.

- Focused site assessments will be required for areas where earthmoving activities will occur and on properties purchased for the project. The assessments will include characterization and evaluation of the potential for encountering hazardous materials and contaminated soils.

- Asbestos, lead-based paint, and hazardous material surveys of buildings or structures will be required before reconstruction or demolition of any property, including CTA-owned properties or structures, to identify any asbestos, lead-based paint particles, and hazardous materials, such as polychlorinated biphenyl or mercury-containing equipment. Any hazardous materials identified will be abated and disposed of in accordance with federal, state, and local regulations.

The following specific and required plans will be developed before construction to further minimize or avoid the potential for hazardous material impacts:

- A Contaminated Material Management Plan that provides the procedures for identifying, characterizing, managing, storing, and disposing of contaminated soil and groundwater encountered during construction activities will be required. The plan will cover the entire project area, as it is assumed that all material has at least some level of contamination associated with it.

- Spill Control and Prevention Plans to address the use, storage, and disposal of materials such as asphalt, fuel, paint, solvents, and cleaning agents will be required. The Spill Control and Prevention Plans will provide BMPs to limit the potential for accidental releases of potentially hazardous materials.

- Construction Stormwater Pollution Control Plans, which describe methods to prevent or minimize stormwater runoff from encountering contaminated soil or other hazardous materials, will be required.

- Health and Safety Plans for construction activities will be developed by the contractors and approved by CTA before starting any work. The Health and Safety Plans will identify potential contaminants of concern, required personal protective equipment and procedures, and emergency response procedures.

Finally, during operation, CTA will adhere to all applicable federal, state, and local regulations, as well as existing system-wide hazardous material usage, storage, and disposal plans and procedures, further minimizing the potential for hazardous material impacts.

3.10 Environmental Justice

Environmental Justice (EJ) is the "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" (U.S. Environmental Protection Agency [USEPA] 2004). This section provides information on EJ analysis and outreach conducted for this project. **Appendix D-7** contains additional details.

3.10.1 Regulatory Framework/Methods

Federal agencies are required to consider the potential for disproportionately high and adverse impacts on low-income and minority populations that could result from all programs, policies, and activities (Executive Order 12898). A disproportionate impact is one that would negatively affect low-income and minority populations (EJ populations) to a greater extent than non-EJ populations. In accordance with FTA guidance, including the August 2012 FTA Circular 4703.1 (*Environmental Justice Policy Guidance for Federal Transit Administration Recipients*), the EJ process and analysis for the Red-Purple Bypass Project were designed to accomplish the following:

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental impacts, including social and economic impacts, on low-income and minority populations.

- Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.

- Prevent the denial of, reduction in, or substantial delay in the receipt of benefits by low-income and minority populations.

CTA performed the EJ analysis in accordance with related federal and Illinois laws and guidance including Title VI of the 1964 Civil Rights Act, Executive Order 12898, Executive Order 13166, State Bill 2193, and FTA Circulars 4703.1 and 4702.1B. **Appendix D-7** presents additional details regarding federal, state, and local EJ regulations.

CTA assessed the potential for direct and indirect or cumulative adverse impacts on EJ populations based on the following factors:

- Direct impacts would be permanent, result from implementation of the proposed project, and occur at the same time and place (40 CFR § 1508.8). A direct impact distance of 375 feet was applied in determining whether EJ or non-EJ populations would experience disproportionately high and adverse environmental or health impacts. This distance was applied based on expected direct impacts from construction and implementation of this project. This is the direct area around which construction activities would occur and where impacts due to construction would be most visible and noticeable for EJ and non-EJ populations alike.

- Indirect impacts are those caused by a project or plan, but which are separated from direct impacts by time and/or distance. Indirect impacts include induced growth and related environmental impacts, such as changes to land use patterns, population density or growth rates, and related impacts on air quality, water, and other natural systems. Cumulative impacts would be those that result from the incremental impact of the proposed project when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions (40 CFR § 1508.67). The area assessed for potential indirect or cumulative impacts on EJ populations affected by the Build Alternative was an area within ½ mile of the project. This distance was applied because the potential

mobility impacts or benefits of the proposed project and other planned projects are likely to be experienced by all people who live, work, and/or recreate within ½ mile of the project area, which is generally considered to be a walkable distance. **Section 3.11** of the EA provides additional information on indirect and cumulative impacts.

CTA used specialized outreach and field observations, along with census research, to establish the presence of low-income and minority populations. As part of early project planning, CTA identified organizations representing the interests of potential low-income or minority communities through a process of mapping project impacts, reviewing census data on potential low-income or minority groups, and leveraging existing CTA community relationships. CTA reached out to all of these organizations and offered opportunities for focused meetings with these groups to better understand their concerns. As part of spring 2014 outreach efforts, CTA provided these communities additional information on the RPM Phase One improvements and a point of contact for coordinating meetings. **Section 3.10.4** contains additional details on this specialized outreach.

CTA also analyzed year 2012 American Community Survey data for all census blocks within ½ mile of the proposed Build Alternative location. Low-income populations were identified by comparing income levels and Department of Health and Human Services (DHHS) poverty thresholds. Low-income populations were identified where the percentage of households with median income is below the DHHS poverty guidelines. The combination of non-white races and Hispanic/Latino populations was used to determine and describe the minority population in the project area.

In addition to information about EJ populations, CTA collected information about elderly and disabled populations. These additional data layers were collected in accordance with the laws of the State of Illinois. CTA identified distinct elderly populations using a 50 percent threshold in accordance with the State of Illinois Environmental Justice Act and confirmed the results through field observation. Disability statistics were compiled at the block group level to include individuals with a sensory, physical, or mental disability or other condition that limits activities of daily living. CTA then compared these statistics to citywide averages. Information on elderly and disabled populations was also overlaid onto the federally protected low-income and minority community areas to provide additional information on elderly populations and people with disabilities within the project area. Further information and maps of elderly and disabled populations are provided in **Appendix D-7**.

3.10.2 Existing Conditions

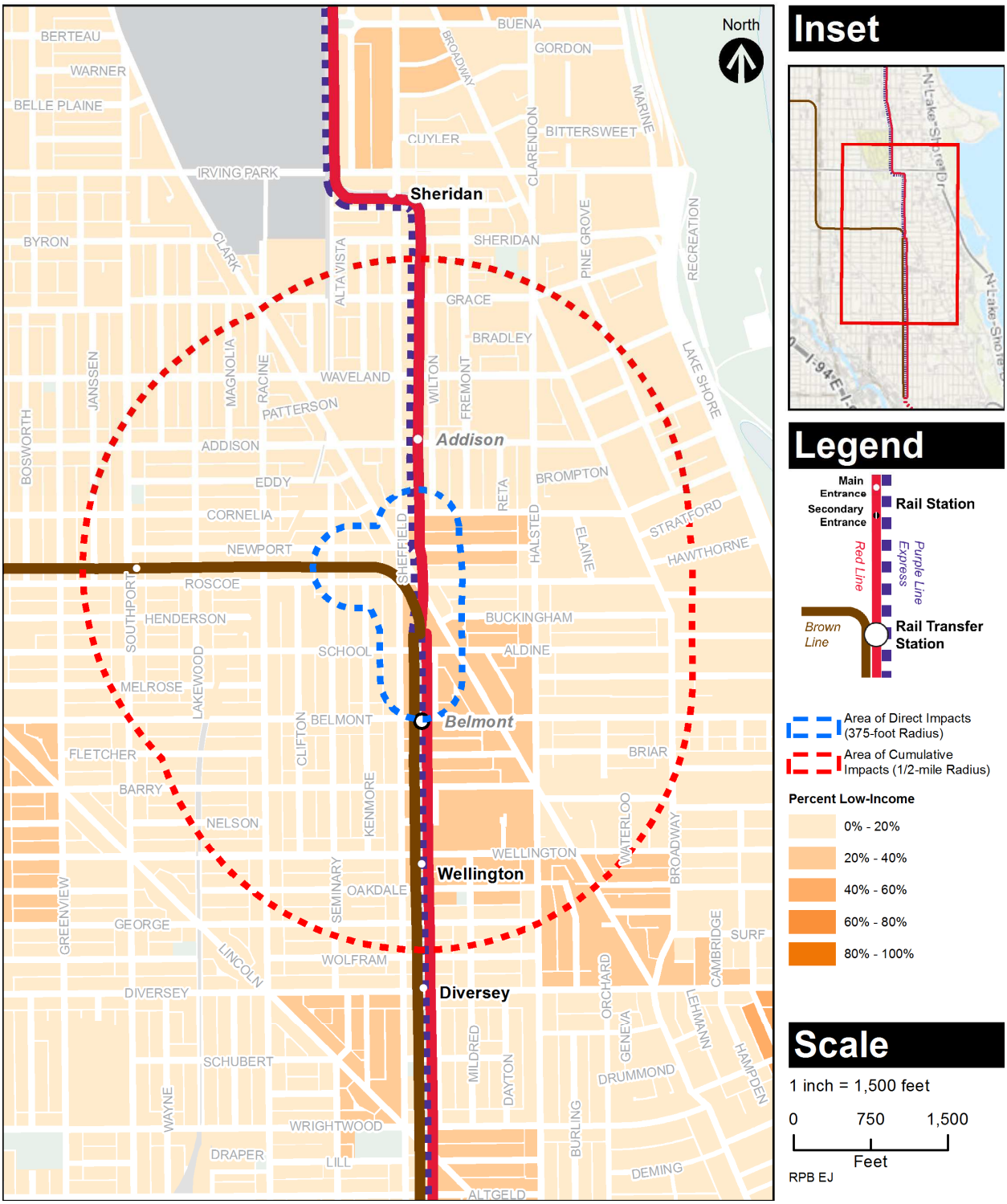
Figures 3-21 and **3-22** show, by census block group, EJ populations within the project area. The maps show several census blocks within ½ mile of the project area that include low-income or minority populations. **Appendix D-7** contains additional mapping and detailed tables.

Based on the DHHS poverty guidelines, 13.7 percent of the population within ½ mile of the project lives in a household with an income below the poverty level; this amount is much lower than the citywide average of 22.1 percent (U.S. Census Bureau 2012).

There are 36,792 people living within ½ mile of the project area. The most prevalent race is white (79.9 percent). Hispanic or Latino populations can be of any race including white and they make up 7.9 percent of the total population. Of the total population living within ½ mile of the project area, minority persons, who include all non-white races and white Hispanics/Latinos, make up 20.1 percent (U.S. Census Bureau 2012).

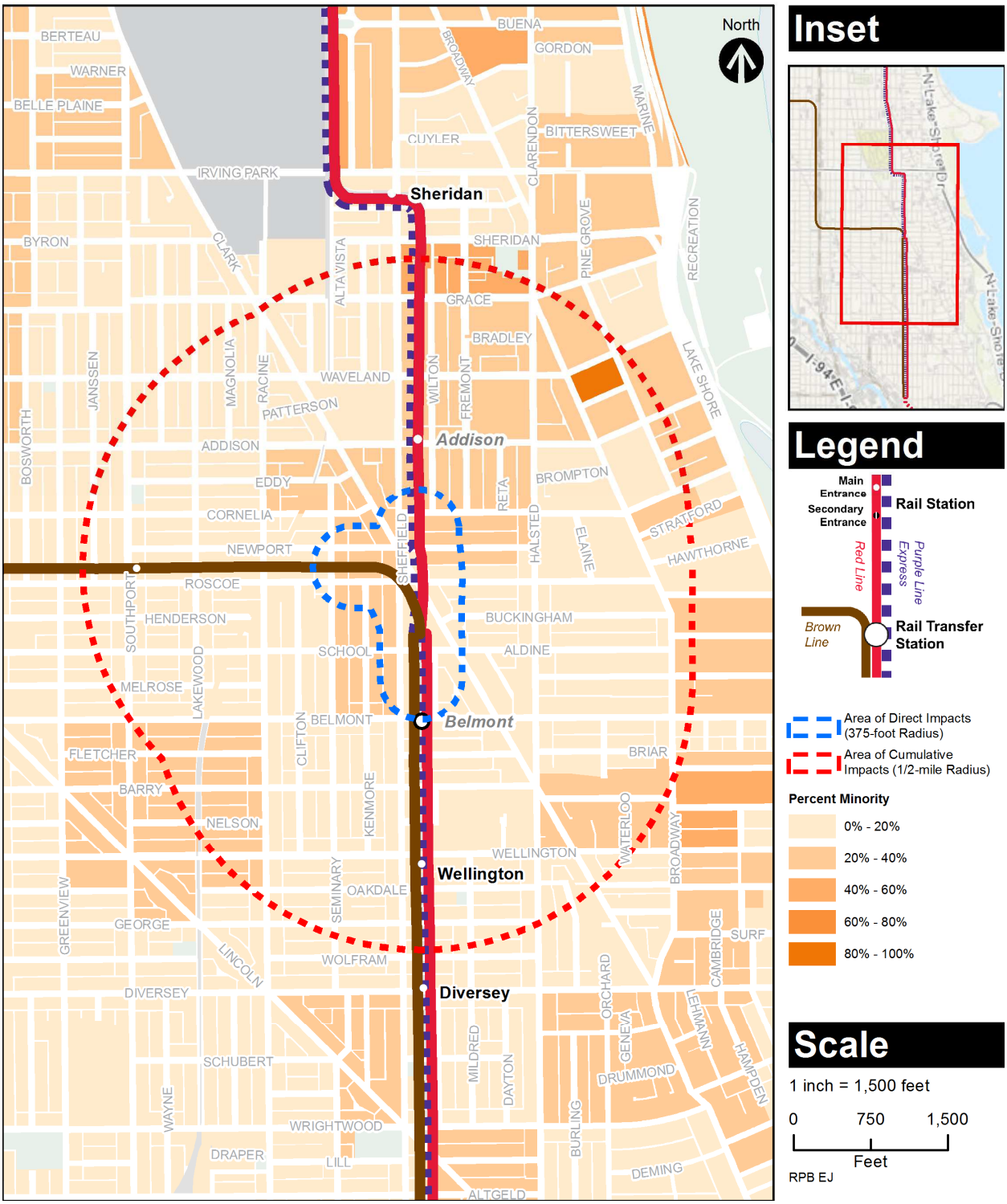
In addition, approximately 5 percent of those living within ½ mile of the project area are elderly, which is lower than the citywide elderly population of 10 percent. People with disabilities within ½ mile of the project area constitute 3 percent of the project area population, which is lower than the citywide disabled population of 11 percent (U.S. Census Bureau 2012).

Within the area of direct impacts (within 375 feet of the project alignment), one low-income block group near Belmont station was identified; 29.1 percent of the population in this block group is low-income, compared to the citywide average of 22.1 percent. While this block group contains people who earn slightly lower wages than the citywide average, the block group was not determined to contain a defined EJ community; rather, the additional demographic analysis conducted alongside field observations and local knowledge indicated that this area is predominantly a living area for young, post-college graduates who rent.



Source: U.S. Census Bureau 2012

Figure 3-21: Low-Income Populations



Source: U.S. Census Bureau 2012

Figure 3-22: Minority Populations

This conclusion was confirmed through the following additional demographic analysis of this block group and citywide averages (U.S. Census Bureau 2012):

- Approximately 67 percent of the population in this block group consists of renters versus the citywide average of 53.9 percent.
- People aged 20–34 in this block group make up approximately 63 percent of the population versus the citywide average of 27 percent.
- Over 75 percent of the population within this block group has a Bachelor's or Master's Degree compared with a citywide average of less than 30 percent.

Within the area of indirect or cumulative impacts (within ½ mile of the project alignment and outside the area of direct impacts), one low-income block group near Wellington station was identified; 29.1 percent of the population in this block group is low-income, compared to the citywide average of 22.1 percent. While this block group contains a higher percentage of low-income populations than the citywide average, additional demographic analysis and field observations show that this block group does not contain a defined EJ community; rather, because this block group is adjacent to the Advocate Illinois Masonic Medical Center Campus, the residents in this block group are likely students and employees associated with the hospital. This conclusion was confirmed through the following additional Census analysis of this block group and citywide averages (U.S. Census Bureau 2012):

- Approximately 78 percent of the population in this block group consists of renters versus the citywide average of 53.9 percent.
- Approximately 64 percent of the population in this block group is female versus the citywide average of 51.6 percent.
- Over 45 percent of the population within this block group has a Bachelor's or Master's Degree compared with a citywide average of less than 30 percent.
- Approximately 20 percent of the population within this block group has a professional school degree compared with the citywide average of 3.5 percent.

Within the area of indirect or cumulative impacts, two minority block groups north of the project area were identified. These block groups were found to be similar in composition to the adjacent block groups with regard to income, education, and age. Like the population near the Belmont station, the population in these areas consists mainly of younger, post-college workers living in areas with high rental availability. North of the project area near Sheridan Road, there is a block group in which 49.7 percent of the population is aged 20–34. North and east of the project area, between Addison Street and Waveland Avenue, there is a block group where 51.2 percent of the population is aged 20–34. Approximately 47 percent of the block group population near Sheridan station has a Bachelor's or Master's Degree, and approximately 40 percent of the population between Addison Street and Waveland Avenue has the same education level (versus 29.3 percent

citywide). The area has a large concentration of affordable rental locations that make the area attractive for younger, transient populations.

3.10.3 Environmental Impacts

This section describes the potential for disproportionate impacts and unevenness of benefits in the project area's EJ communities.

No Build Alternative

The No Build Alternative would not have adverse environmental impacts. No disproportionately high and adverse impacts would occur on low-income or minority populations. The No Build Alternative would also lack the benefits of the proposed project, including enhanced movement of passengers (mobility), economic development, and livability. Travel times would not improve, thereby limiting the mobility of passengers, many of whom are low-income and rely upon public transportation.

Build Alternative

Construction Impacts

The Build Alternative would result in temporary adverse construction impacts on neighborhoods surrounding the project. No disproportionately high and adverse impacts due to construction are anticipated, because impacts would be temporary and would be experienced by EJ and non-EJ communities alike. Construction would primarily occur within existing CTA right-of-way or on properties acquired for the project, which would limit street closures and other neighborhood and community impacts.

Construction would produce temporary noise and vibration impacts but these could be mitigated. Some minor air quality impacts as a result of fugitive dust and/or construction vehicle emissions may also be experienced. Construction BMPs and careful construction scheduling would minimize these adverse impacts. Construction impacts would be similar throughout the project area and would not disproportionately affect EJ populations.

The construction of the Build Alternative would cause temporary adverse impacts on the surrounding visual/aesthetic environment due to construction work zones. To minimize visual impacts and neighborhood, community, and business impacts during construction, off-street construction sites have been identified as part of the Build Alternative. During construction CTA would work to minimize visual impacts by using light shielding and debris-free construction BMPs, continuing outreach to the community, and using construction sites for pertinent machinery and materials storage to minimize visual disruption. The impacts would temporarily affect all people that live, recreate, or do business adjacent to the construction activities. Construction impacts related to visual and aesthetic conditions would be similar throughout the corridor, and would not disproportionately affect low-income or minority populations.

Permanent Impacts

The Build Alternative would not disproportionately affect low-income or minority populations. The project would actually benefit EJ populations and the regional population as a whole.

Improvements to the rail line configuration would result in improved travel times and improved access to community facilities, major activity centers, and employment. The project would increase capacity, train speeds, and reliability of the system. Noise and vibration impacts would be mitigated for all sensitive receivers with moderate or severe impacts within the project area, and there would be substantially reduced noise and vibration impacts compared to existing conditions in the majority of the project area as a result of installation of a closed-deck structure (see **Section 3.7 and 3.8** for further details). All populations throughout Chicago's North Side would experience the benefits of the Build Alternative. Mobility benefits would likely be more important to those passengers with disabilities, low-income populations, and the elderly. Many EJ populations share these characteristics and would likely value the relative importance of mobility improvement to a greater degree than would non-EJ populations, who may have more travel options available. The project would offer all populations, including minority and low-income populations, quicker, more reliable service along the Red, Purple, and Brown lines.

3.10.4 Specialized Outreach

CTA held public and community meetings near the project area, at locations easily accessed by transit for low-income and transit-reliant people. In addition, the open house meeting location was wheelchair accessible. CTA used both English and Spanish meeting notifications, and Spanish and sign language interpreters were available at the public open house. CTA also offered to make translators for additional languages available upon request at the open house.

CTA conducted specialized outreach to EJ populations to ensure awareness of the proposed project and most importantly, to provide opportunities for EJ populations to have meaningful participation in the review of the project and respective benefits and impacts. To provide these opportunities, CTA coordinated with community leaders, made targeted distribution of project information, and developed project materials in English and Spanish. CTA identified the following community groups within the project area and contacted them as part of the EJ and community group outreach:

- Teatro Vista (Latino community)
- Hispanocare (Spanish-speaking community)
- Serbian Cultural and Arts Center (Serbian community)

CTA contacted each of the groups by telephone and provided an opportunity for a presentation on the proposed project. All community groups received correspondence letters with project materials and contact information of CTA Government and Community Relations staff to reinforce awareness of project details and provide an ongoing point of contact at CTA for interested community groups to request a project presentation. **Appendix D-7** contains formal correspondence to all community groups.

In addition, CTA has promoted full and fair participation from all members of the public during the decision-making process for the Red-Purple Bypass Project. CTA's efforts included specialized

outreach to people who, as a result of national origin, have limited English proficiency. CTA evaluated the need for additional outreach by using 2006–2010 Census data and analyzing whether populations throughout the project were linguistically isolated because of challenges with reading, writing, and/or speaking English.

CTA's analysis indicated that there were very limited linguistically isolated households within the project area. Based on census data, more than 80 percent of the population in this area is white, and less than 8 percent of residents speak Spanish (well below the 23 percent average for the city of Chicago as a whole). To provide the greatest amount of opportunity for comments from potentially linguistically challenged members of the public, CTA provided Spanish language interpreters at the public meetings. Interpreters for other languages were also made available upon request at all public open houses and community meetings and the public hearing for the project. CTA also gave public notice of the availability of translation services in Russian and Chinese; however, no requests were received for additional translation services during the spring 2014 outreach. Sign language interpreters were also made available upon request.

3.11 Indirect and Cumulative

While the other sections of this EA provide analysis and findings on direct impacts of the project, NEPA also requires the consideration of the potential indirect and cumulative impacts of federally funded projects, as discussed in this section.

3.11.1 Regulatory Framework/Methods

Indirect impacts, also known as secondary impacts, are defined under 40 CFR § 1508.8. The impacts are caused by the project or plan, but are separated from direct impacts by time and/or distance (yet still in the foreseeable future). Indirect impacts include induced growth and related environmental impacts, such as changes to land use patterns, population density or growth rates, and related impacts on air quality, water and other natural systems. Cumulative impacts are defined under 40 CFR § 1508.7 as the combined result of the incremental direct and indirect impacts of a project or plan, the impacts of past and present actions, and impacts of reasonably foreseeable future actions by others on resources of concern.

The indirect and cumulative impacts analysis used the following guidance documents for determining the potential for impacts:

- *Consideration of Cumulative Impacts in EPA Review of NEPA Documents* (USEPA 1999)
- *Considering Cumulative Effects Under the National Environmental Policy Act* (Council on Environmental Quality 1997)
- *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis* (Council on Environmental Quality 2005)

- *National Cooperative Highway Research Program (NCHRP) Report 466 - Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* (Transportation Research Board 2002)

CTA used the eight-step method described in the NCHRP Report 466 to determine the potential indirect impacts of this project. The project area boundary for the analysis was based on all proposed elements of the project, including construction limits and proposed property acquisitions (described in **Section 3.2**). For the analysis, findings from the environmental resource analyses were reviewed to properly evaluate the potential for indirect impacts on land use, transportation, and economic development plans and goals, as well as to identify notable or sensitive resources within the surrounding communities such as community facilities, historic resources, and other vulnerable or unique resources within the project areas. A qualitative assessment of the potential for and impacts of induced growth that could result from this project was then determined. The factors relate to changes in growth and development expected as a result of the increases in transit accessibility from the project. Based on these factors, a determination was made on the potential and magnitude of impacts that could result from the project and whether those impacts would be consistent with surrounding growth, trends, and goals within the project area.

To identify the potential for cumulative impacts, an 11-step method identified in CEQ guidance was used to meet best practice methods for conducting this type of analysis. Areas within ½ mile of the project corridor (consistent with other analyses conducted for this EA) were used to evaluate the potential for cumulative impacts. CTA reviewed applicable current and future regional and local plans. In addition, the cumulative impacts assessment included an evaluation of the proposed staging of this project to assess any cumulative impacts associated with construction of the two RPM Phase One projects simultaneously.

The horizon year for assessing indirect and cumulative impacts is 2040, which represents the regional transportation and land use planning horizon for the region. Construction of the Red-Purple Bypass Project is anticipated to begin as early as 2017.

Reasonably foreseeable projects include projects identified in *GO TO 2040*, the Transportation Improvement Program, and known private development and redevelopment projects in the project area.

3.11.2 Environmental Impacts

This section identifies and assesses the potential indirect and cumulative impacts of the project.

Indirect Impacts

The area around the Red-Purple Bypass Project is highly urbanized and developed, with mature neighborhoods. After construction of the Build Alternative, new sites would become available for potential redevelopment consistent with existing and proposed land uses and zoning. Specifically, portions of the land acquired for permanent right-of-way would be needed for the final track realignment; the remainder of property would become available for potential redevelopment after

construction. These sites would include transit-related uses and would be developed independently of the project consistent with surrounding land uses and zoning designations as well as with local plans, goals, and objectives. The existing land use is transit-supportive and would continue to be after the project is built. The majority of land uses adjacent to the project area are multifamily residential and urban mixed-use.

Potential redevelopment of the properties may result in a net increase in square footage of commercial space and residential units; however, the growth would be consistent with planned growth and would not result in a substantial change in the population trends in an already dense neighborhood. Any growth that may occur would not have negative impacts on public services in the area.

Based on CTA's recent experience with the Brown Line Capacity Expansion Project and the economic vitality observed following it, land values could increase from current conditions due to the enhanced transit service. Nevertheless, some temporary losses to land values could also occur during construction and before redevelopment of acquired parcels. Based on the market assessment conducted for the project, development of portions of sites acquired for the Red-Purple Bypass Project that are remaining after construction is expected to meet strong demand from those in the development community wishing to serve unmet local demand and harness spending power in the Lakeview market (Jones Lang LaSalle 2013). As part of the mitigation efforts proposed for the project, CTA will work with DPD to provide incentives to encourage any potential redevelopment, consistent with regional and local development plans, as soon as construction activities allow. The incentives will minimize the duration of temporary impacts from the project and encourage mixed-use, pedestrian–friendly development. Incentives could include public/private partnerships, density bonuses, reduced development fees, reduced parking requirements, and/or expedited permitting. This measure could spur development that supports regional and local plans after the project is complete by easing the path to construction for developers on parcels required for construction.

The City of Chicago recently increased incentives for quality development near transit stations, including within the project area, through its TOD ordinance. CTA is continuing to work with DPD on joint development opportunities and will continue coordinating land use and development plans with this project through development of a Neighborhood Redevelopment Plan proposed as part of this project.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions within the project area were considered in this analysis. The project area and surrounding neighborhood experienced temporary construction impacts related to past improvements to the Brown Line. In conjunction with the past improvements to the Brown Line, the Build Alternative would result in beneficial cumulative impacts. The continual improvements to the rail transit system would result in improved mobility, accessibility, connectivity, and safety for transit passengers.

CDOT is planning improvements to North Lakeshore Drive near the project area. The preferred alternative for the North Lakeshore Drive Project is scheduled to be defined in 2017. Future projects planned for the area include private redevelopment within the neighborhood surrounding the project area, and potential redevelopment of the remaining areas after construction. The redevelopment would be similar to existing land uses in the area. The long-term benefits of the redevelopment in the area would be expected to offset the short-term construction impacts. The cumulative construction impacts from the project, the future redevelopment of the remaining displaced properties, and future phases of the RPM Program will be avoided or minimized through the City's permitting process (during subsequent engineering, design, and construction), which limit construction impacts such as traffic disruption, work hours, noise, vibration, emissions, and dust. Overall, these reasonably foreseeable future actions should prove to be beneficial and provide more efficient access to jobs, businesses, and other places of interest.

CTA plans to construct the Red-Purple Bypass Project in the same timeframe as the Lawrence to Bryn Mawr Modernization Project and other signal and interim track improvements as part of Phase One of the RPM Program. Construction staging plans for the Phase One projects take into account that these improvements would be constructed in the same timeframe. As such, passengers may experience delays when passing through construction zones for the RPM Phase One projects.

Future phases of the RPM Program would include rail transit system work to improve safety, decrease travel times, and increase capacity for the North Red and Purple lines. The future RPM Program activities, combined with other ongoing transit improvements on the Red Line, such as the Wilson Transfer Station Project (under construction) and the Red Line Extension Project (currently in planning and environmental analysis), would improve operations of the Red Line and provide for safer, faster access to more locations within the City of Chicago, which would result in a beneficial cumulative impact.

3.12 Resources with Limited or No Impacts

A number of other environmental resources typically examined under NEPA were determined to present limited or no impacts from the proposed project; these resources include air quality, water and biological resources, geology and soils, and energy. The following sections briefly summarize the findings of the analyses. **Appendix D-8** includes supporting documentation regarding resources with limited or no impacts.

3.12.1 Air Quality

The Build Alternative could result in some adverse impacts on air quality during construction. Impacts during construction would be primarily associated with fugitive dust and emissions from on-road and non-road vehicles. Because most state air quality agencies, including Illinois' Environmental Protection Agency (IEPA), have strict guidelines for controlling fugitive dust, diesel particulate emissions, and GHG emissions, these impacts would not be substantial and will be minimized through implementation of appropriate construction BMPs. The Build Alternative

would result in an overall beneficial impact on air quality by improving train speeds and reliability of the transit system, attracting new passengers who currently make trips in automobiles.

3.12.2 Water Resources

There would be no adverse impacts on water resources from the Build Alternative. No surface water bodies, wetlands, floodplains, or sole source aquifers are within the project area (Federal Emergency Management Agency 2008, USEPA 2014). There are no aspects of the project that would increase impervious surface area. Stormwater drainage may be affected by the proposed structure; however, the alterations would not greatly affect the direction of drainage. Dewatering activities during construction could temporarily affect local groundwater levels. Contaminated groundwater encountered will be disposed of properly in accordance with federal, state, and local regulations.

3.12.3 Biological Resources

No impacts on biological resources would occur from the Build Alternative. The project area is highly urbanized and does not contain appropriate habitat for any federal-listed threatened, endangered, proposed, or candidate species listed by U.S. Fish and Wildlife Service as occurring in Cook County, nor is there appropriate habitat for any state-listed species listed by the Illinois Department of Natural Resources (IDNR) as occurring in Cook County (IDNR 2014b, U.S. Fish and Wildlife Service 2014).

3.12.4 Geology and Soils

The Build Alternative would not result in adverse impacts on geologic or soil resources. The urban land soil type is reserved for highly disturbed soils that have resulted from human activities and have been altered over time through construction activities. Local topography is generally flat and bedrock is unlikely to be encountered during construction. The project will, in accordance with federal disposal guidelines, remove urban fill that is potentially contaminated with hazardous materials. Proper removal and disposal with tested materials, as needed, could be beneficial to human health and the environment.

3.12.5 Energy

The Build Alternative would not have an adverse impact on energy consumption in Cook County or the Chicago metropolitan area. Energy supplies primarily include sources of energy (e.g., electrical, gas/oil, solar) potentially consumed by the project. The one-time irreversible commitment of energy resources for construction would amount to less than 0.5 percent of the total annual energy consumption for Cook County, which is 530 trillion British thermal units (CNT Energy 2009). The proposed operating plan, which would increase actual train passenger capacity by over 10 percent in the peak direction during the peak period, would increase energy use by less than 0.9 percent of CTA's current energy use for rail transit.

3.12.6 Safety and Security

No construction-related safety and security impacts are anticipated under the Build Alternative. The Build Alternative would also not result in any permanent impacts on safety and security, and

is anticipated to result in safety and security benefits. The Build Alternative would modernize the system and remove a flat junction, thereby reducing the risk of major incidents—including collisions and derailments—and providing safety benefits for CTA passengers and employees. Modernizing the system would involve straightening out existing curves in the alignment and expanding right-of-way to meet modern safety standards, providing adequate clearances for track maintenance and allowing CTA to meet minimum emergency access standards. While CTA maintains a fail-safe signal system at Clark Junction for train crossing moves, removal of this flat junction would improve safety at the junction because trains would no longer need to cross one another. The project is being designed and will be operated consistent with federal, state, and local safety and security policies and guidance.

To minimize security risks related to trespassing or common criminal activities, the project design will minimize dark spaces and discrete locations beneath the closed-deck structure where criminal activity could occur. Lighting will minimize any remaining dark spaces. Fencing and cameras will be considered where security risks remain.

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Chapter 4
Public and Agency Coordination

In 2009, CTA initiated planning for the 9.6-mile corridor between Belmont and Linden stations with an early vision study. CTA held four public meetings as part of the vision study. The feedback received during those public meetings helped identify the public's priorities and concerns and helped develop a comprehensive strategy for reconstructing and improving the infrastructure on the North Red and Purple lines.

Based on the feedback received during the vision study, CTA further analyzed the alternatives and entered an EIS public and agency scoping process for the RPM corridor. CTA held four public meetings as part of EIS scoping in 2011. CTA further considered the public reaction and alternatives for the 9.6-mile corridor and held two public meetings during early 2012.

In consideration of the community input received, as well as additional analysis, FTA and CTA developed a phased, tailored approach for implementing the RPM corridor vision. Phase One of the RPM Program would include two projects within the 9.6-mile corridor, the Lawrence to Bryn Mawr Modernization Project and the Red-Purple Bypass Project. These two projects reflect the evolution of the alternatives for the RPM corridor through a process that incorporated public and technical input to result in two projects that would modernize the infrastructure while minimizing environmental impacts.

Public outreach for Phase One is discussed below. **Chapter 2** contains details on the alternatives development process. **Appendix E-1** summarizes outreach conducted throughout development of the RPM Program.

4.1 Public Outreach

CTA announced the RPM Phase One improvements to the public in April 2014. Throughout spring 2014, CTA held a number of focused community group meetings and held a public open house. These meetings were conducted to gather early input from the public on the proposed RPM Phase One improvements and determine areas of concern to be analyzed and documented within the EA. CTA held public and community meetings near the project area and at locations easily accessed by transit for low-income and transit-reliant people. In addition, the open house meeting location was wheelchair accessible. CTA used English and Spanish meeting notifications, and Spanish and sign language interpreters were available at the public open house. CTA also offered to make translators for additional languages available upon request at the open house. **Appendix E-2** summarizes the outreach conducted in spring 2014 and includes public comments received.

Several public comments supported the project, noting that the bypass would improve the flow of trains throughout Chicago's North Side and would provide faster, more convenient service for those traveling through the project area. Some commenters expressed concern about the alternatives CTA considered in developing the bypass, including alternatives with fewer property

displacements. Commenters also discussed potential impacts on the surrounding neighborhood and community from construction and as a result of property acquisitions.

The Mayor's Press Office and CTA Media Relations issued a press release announcing the RPM Program Phase One projects and public open house meeting on April 17, 2014. To share the information, CTA updated the RPM Program website; sent postcards to over 7,000 community members; sent e-Blasts to approximately 1,600 e-mail addresses; posted customer alert cards on rail cars, buses, and in project area CTA stations; and distributed flyers to libraries and local businesses. CTA contacted federal, state, and local elected officials and briefed them of the project status and open house meeting. CTA provided flyers with information about the RPM Phase One open house meetings to aldermen and other elected officials offices for distribution to community members.

4.1.1 Elected Official Briefings

CTA contacted U.S. and State of Illinois elected representatives during the week of April 17, 2014 to inform them of the scheduled open house meetings and provide an opportunity for a briefing about the RPM Phase One projects. CTA also contacted local elected officials (aldermen) during the week of April 17, 2014. CTA briefed interested aldermen on the RPM Phase One projects and provided information about the RPM Phase One open house meetings on April 17, 2014. **Appendix E-2** lists federal, state, and local elected officials who were contacted and offered an opportunity for a briefing.

4.1.2 Community Group Meetings

In addition to the public open house meeting, CTA conducted outreach to local community groups and coordinated with local aldermen to provide four community-focused meetings during April and June 2014. The focused community meetings provided additional opportunities for understanding specific community needs and concerns. CTA tailored the meeting formats to the audience and meeting type, ranging from more formal presentations with question-and-answer sessions, to informal overviews of the project, active listening sessions, and tours. **Appendix E-2** contains a list of community group meetings and meeting summaries.

Project Area Community Groups and Environmental Justice Communities

- Central Lakeview Merchants Association
- Teatro Vista
- Hispanocare
- Serbian Cultural and Arts Center

4.1.3 Property Displacement Outreach

CTA sent letters via regular U.S. mail and certified mail to property owners and lessees potentially affected by the property displacements required as part of the Red-Purple Bypass Project. In addition, CTA's Uniform Act public outreach specialists went door-to-door to hand deliver the letters and provide an explanation of the RPM Phase One projects, potential displacements, and provisions under the Uniform Act that would apply to any properties acquired for the RPM Phase One projects. Uniform Act public outreach specialists provided property owners and lessees with a single point of contact to answer specific questions regarding relocation rights, requirements,

and processes and anticipated timelines. **Appendix E-3** contains additional details of the property displacement outreach. Outreach will continue through project development to engage potentially displaced residents and/or businesses.

4.1.4 Spring 2014 Open House

CTA held a public open house on May 22, 2014. The open house provided attendees with an early opportunity to review the proposed project and provide input on project designs, costs, and environmental considerations. Project team members explained the information presented on exhibit boards and answered project-related questions. Attendees with specific questions about potential property displacements could discuss issues with Uniform Act public outreach specialists. Attendees could comment in writing during the open houses or submit their comments after the open house via e-mail or mail. Spanish translators, sign language interpreters, and a court reporter were available during the meeting.

A total of 169 community members attended the May 22, 2014 open house meeting. A total of 36 community members submitted written comments at that meeting and 18 community members submitted verbal comments to the court reporter. In addition, one mailed comment card and 73 e-mails were received between April 17, 2014 (project announcement date) and June 5, 2014 (two weeks after the open house meeting).

Appendix E-2 contains complete documentation of the spring 2014 outreach.

4.2 Agency Coordination

Agency outreach for the Red-Purple Bypass Project included coordination with a variety of federal, state, and local agencies as well as Native American tribes. Outreach efforts were conducted in compliance with NEPA and other applicable regulations, including Section 106 of the NHPA, Section 4(f) of the USDOT Act of 1966, joint guidance and regulations from FTA and FHWA, and other agency regulations and guidelines.

4.2.1 Federal, State, and Local Agency Coordination

FTA and CTA provided notice of RPM Program Phase One to the federal, state, and local agencies involved in the project to date. FTA provided federal agencies and Native American tribes with letters, project informational materials, and flyers regarding the spring 2014 open house meeting. CTA provided state and local agencies with letters and informational materials on the RPM Phase One projects and flyers on the spring 2014 open house meetings to solicit attendance and comment. Responses to the letters allowed FTA and CTA to confirm agency coordination and interest in the project. Below is a list of agencies contacted. **Appendix E-4** contains copies of correspondence.

In addition to the letters, CTA conducted a series of agency and elected officials briefings as part of the spring and summer 2014 outreach efforts, including coordination meetings with IDOT, CDOT, DPD, City of Chicago Department of Buildings, City of Chicago Historic Preservation Division, and the City of Evanston.

To ensure proper development of required mitigation and commitments for this project, CTA conducted regular agency coordination meetings with CDOT and DPD through development of the EA. The meetings provided an opportunity for early and ongoing agency coordination efforts. **Appendix E-4** contains a full list of the monthly meetings and attendees.

Federal Agencies	State Agencies	Local Agencies
■ Department of Health and Human Services ■ Department of Housing and Urban Development ■ Department of Interior, Office of Environmental Policy and Compliance ■ Federal Emergency Management Agency ■ Federal Railroad Administration ■ U.S. Army Corps of Engineers ■ U.S. Environmental Protection Agency ■ U.S. Fish and Wildlife Service	■ Illinois Commerce Commission ■ Illinois Department of Natural Resources ■ Illinois Department of Transportation ■ Illinois Housing Development Authority ■ Illinois Terrorism Taskforce	■ City of Chicago Department of Business Affairs and Consumer Protection ■ City of Chicago Department of Fleet and Facility Management ■ City of Chicago Department of Planning and Economic Development ■ City of Chicago Department of Public Health ■ City of Chicago Department of Transportation ■ City of Chicago Office of the Mayor ■ Chicago Park District ■ City of Evanston ■ Metra Rail ■ Metropolitan Water Reclamation District of Greater Chicago ■ Pace Suburban Bus Service ■ Regional Transportation Authority

4.2.2 Section 106 Coordination

The effort to identify, contact, and consult with various interested groups and agencies to identify historic properties and cultural practices during the environmental planning process has been documented for the Section 106 consultation process (see discussion of historic and archaeological resources in **Section 3.5**). The purpose of consultation was to identify historic resources and other concerns relating to the project's potential effects on historically important resources. Information was sought from individuals and organizations likely to have knowledge of potential resources in the project area. The consulting parties included the IHPA, the City of Chicago Historic Preservation Division, Preservation Chicago, Landmarks Illinois, and Friends of the Parks. Consultation meetings were held on September 25, 2014 and March 24, 2015 as described in **Section 3.5**. Moreover, on January 25, 2015, FTA and CTA sent correspondence on findings of the Section 106 consultation process to the Advisory Council for Historic Preservation (ACHP) and invited them to join the consultation process. On March 25, 2015, ACHP responded to the invitation and requested to join the Section 106 consultation process. FTA and CTA provided multiple opportunities throughout the development of this EA for additional focused one-on-one meetings and site visits with IHPA and consulting parties to provide opportunities for more focused dialogue on effects on historic properties and to resolve adverse effect determinations. **Appendix D-4** contains copies of correspondence and Section 106 consultation materials.

4.2.3 Tribal Coordination

In July 2012, FTA sent invitation letters to 11 Native American tribes to inform them of the Section 106 process and request assistance in identifying areas with potential cultural and/or religious significance. FTA sent letters to the following nations: the Ho-Chunk Nation, the Miami Tribe of Oklahoma, the Peoria Tribe of Indians of Oklahoma, the Sac and Fox Nation of Oklahoma, the Pokagon Band of Potawatomi Indians, the Prairie Band of the Potawatomi Nation, the Citizen Potawatomi Nation, the Forest County Potawatomi Nation, the Potawatomi Nation, the Sac and Fox Nation of Mississippi in Iowa, and the Sac and Fox Nation of Missouri. The Miami Tribe of Oklahoma responded, confirming participation in the Section 106 process; no response was received from the other tribes. In April 2014, FTA sent letters to the tribal agencies notifying them of the RPM Program Phase One projects and to confirm their interest in continuing to participate in the project; **Appendix D-4** contains copies of the letters. No responses were received. Throughout the Section 106 consultation, the Miami Tribe of Oklahoma was provided with materials and notice of all meetings.

4.3 Environmental Assessment Distribution and Public Comment Period

FTA issued a Notice of Availability for this EA to provide the public an opportunity to review and comment on the EA. All comments received during the 30-day public comment period, and response to those comments, will be incorporated into the final NEPA decision document. The EA was also sent to local agencies (CDOT and DPD) for comment. A copy of the EA is available on CTA's website (transitchicago.com/RPMProject) and at CTA headquarters (567 W. Lake Street, 2nd Floor, Chicago, IL 60661). Hard copies of the EA are available at the 44th Ward Alderman's Office (3223 N. Sheffield Ave, Chicago, IL, 60657) and the following libraries during the public review period:

- Merlo Library, 644 W. Belmont Avenue, Chicago, IL 60657
- Lincoln Belmont Library, 1659 W. Melrose Street, Chicago, IL 60657
- Harold Washington Library Center, 400 S. State Street, Chicago, IL 60605

A public hearing is scheduled to solicit comments from the community about findings presented in the EA. The public hearing was advertised through display ads in regional and local newspapers, an e-Blast, and through CTA press releases, flyers, and customer alert cards placed on CTA rail cars and buses in the project area. Additional details concerning the public hearing were also posted on the CTA website. The public hearing location is near the project area, ADA-compliant, and accessible by public transit. Comments received during the public hearing will be submitted to FTA and entered into public record. A summary of the public hearing and transcripts will be included in the final NEPA decision document. Written comments will be accepted at any time during the public comment period via e-mail to RedPurpleBypass@transitchicago.com and U.S. mail to Chicago Transit Authority, Strategic Planning, 10th Floor, Attn: Red-Purple Bypass Project, 567 W. Lake Street, Chicago, IL 60661.

4.4 Next Steps

After review of the public comments received during the 30-day comment period and at the public hearing, FTA will issue a finding on the proposed project based on the significance of impacts identified during the NEPA process. FTA's finding will guide future planning and implementation of the project.

CTA plans to continue to work with the community as the project moves forward. The preliminary engineering phase is expected to be completed in fall 2015. Additional community meetings will be coordinated through the Ward 44 alderman's office as further project details are known. CTA Government and Community Relations staff will continue to work with the alderman's office and community groups to develop engagement plans during construction. Full details on mitigation measures to minimize impacts from this project are provided within **Chapter 3** of this EA, and the final NEPA decision document will outline all commitments in greater detail.

Efforts to reduce the potential impacts of the project due to property displacements will include the following:

- **Compensation to Displaced Property Owners** - All displaced owners and tenants will be compensated and relocated according to the Uniform Act and FTA guidelines. Property owners will be paid not less than fair market value for their land and buildings.

- **Additional Support to Displaced Property Owners** - CTA, in coordination with the City of Chicago and the Ward 44 alderman's office, will provide informational resources, permitting support, and points of contact for displaced business owners to find suitable sites for relocation.

- **Neighborhood Redevelopment Plan** - After completion of the environmental phase and before construction, CTA will work with the DPD, Ward 44 alderman's office, chambers of commerce, and the surrounding community to develop a plan for redevelopment. This plan will identify development opportunities that would be near CTA stations and facilities in the community and will fit the context of the neighborhood.

Efforts to ensure community outreach, involvement, and adequate notice of construction impacts on the surrounding community and businesses within the project area will include the following:

- **Community Input Meetings** - CTA will lead meetings with local residents and business owners regarding the project and anticipated construction impacts.

- **Construction Outreach and Coordination Plan** - The plan will include specific programs to assist local businesses and residents affected by construction. The following are proposed as part of this plan:

    - **Task Force Development** - A task force will be established in coordination with local alderman and will provide a regular venue for business owners, community residents and

local elected officials to discuss their specific issues and concerns with CTA construction and Government and Community Relations staff.

- **CTA Small Business Outreach Program** - Small businesses within a designated distance of the project (to be determined through outreach efforts) will be eligible to benefit from CTA's Small Business Outreach Plan. CTA will also extend the same opportunity to businesses in the project area that would be subject to closures.

- **Dedicated Webpage** - CTA will continue to update and maintain a dedicated webpage to provide passengers with information regarding work planned, scheduling, progress of the overall program, and other pertinent construction details. In addition, as part of the Small Business Outreach Program, companies in the vicinity of the project could be promoted in a "Support These Businesses" section, which could include their logos, addresses, phone numbers, and website addresses. Specific details on the Small Business Outreach Program will be developed in coordination with the Ward 44 alderman's office and community stakeholders.

- **Construction Updates and Notifications** - CTA Government and Community Relations staff will continue to coordinate with local businesses before any street or sidewalk closure to notify them of issues and schedules affecting their operations. In addition, the same information will be provided to the Ward 44 alderman's office and flyers will be posted in the area and on the RPM Program website.

Efforts to minimize the impacts on riders and the surrounding community during construction include the following:

- **Minimizing Service Disruption** - Temporary service disruptions to the Red, Purple and Brown lines will be scheduled to occur during weekends and off-peak periods when possible, to limit impacts on passengers. Bus shuttle service during limited weekends will be provided, as needed, to ensure continual service for passengers.

- **Road Closures and Detours** - Detailed Maintenance of Traffic and Access plans will be developed to ensure safety during construction, continued emergency access, and to coordinate alternative access, garbage, and delivery services.

- **Off-Street Parking** - CTA will require the contractor to provide designated off-street parking areas for workers to maintain on-street parking availability for the general public.

Efforts will be undertaken through project development and construction to minimize disruption to communities and businesses during construction.

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Chapter 5
Section 4(f) Evaluation

Section 4(f) of the USDOT Act of 1966 is a federal law that established requirements for USDOT (including FTA) consideration of publicly owned parks/recreational areas that are accessible to the general public, publicly owned wildlife/waterfowl refuges, and publicly or privately owned historic sites of federal, state, or local significance in developing transportation projects. Section 4(f) prohibits use of these resources for transportation projects unless (1) it is proven that there is no feasible and prudent alternative to the use and the action includes all possible planning to minimize harm, or (2) the agency determines that the use of the property, including any measure(s) to minimize harm, will have a *de minimis* impact on the property.

This law, commonly known as Section 4(f), is now codified in 23 USC § 303 and 23 USC § 138, and is implemented by FTA through the regulation 23 CFR § 774. Additional guidance on the implementation of Section 4(f) may be found in FHWA's *Section 4(f) Policy Paper* (USDOT, FHWA 2012). FTA has formally adopted this guidance and this analysis was conducted consistent with the guidance.

Based on the evaluation in this EA, no public parklands, recreational areas, or wildlife and waterfowl refuges that are afforded protection by Section 4(f) would be "used" by the proposed project. Through the Section 106 process, however, (detailed in **Sections 3.5 and 4.2.2**) FTA, CTA, and IHPA identified NRHP-eligible historic resources within the project area that are afforded protection under Section 4(f) and are the subject of this analysis and chapter.

5.1 Supporting Information for this Section 4(f) Evaluation

Sections 1.2 and 1.3 summarize the purpose and need for the project. **Chapter 2** contains information on the planning process undertaken to develop alternatives to date and includes a detailed description of the Build Alternative.

5.2 Regulatory Framework

Section 4(f) protects specific resources of federal, state, or local significance that are proposed to be used for a transportation project. The term "use" in the Section 4(f) context is defined in 23 CFR § 774.17 and has very specific meaning. There are three potential types of Section 4(f) resource uses:

1. **Permanent Incorporation** - A permanent incorporation of a Section 4(f) resource occurs when a resource is permanently removed or integrated into a proposed transportation project. This incorporation may occur as a result of partial or full acquisition, permanent easement, or temporary easement.

2. **Temporary Occupancy** - A temporary occupancy of a Section 4(f) resource occurs when there is a short-term use of a resource that is considered adverse in terms of the preservationist purpose of the Section 4(f) statute. Under 23 CFR § 774.13, a temporary

occupancy of a resource does not constitute a "use" of a Section 4(f) resource when all of the following conditions are satisfied:

- The duration of use would be temporary (i.e., less than the time needed for construction of the project), and there would be no change in ownership of land.
- The scope of work would be minor (i.e., both the nature and magnitude of the changes to the Section 4(f) resource would be minimal).
- There would be no anticipated permanent adverse physical impacts, nor would there be interference with the protected activities, features, or attributes of the resource, on either a temporary or permanent basis.
- The land being used would be fully restored to a condition that is at least as good as that which existed before the project.
- There is documented agreement among appropriate federal, state, and local official(s) with jurisdiction over the Section 4(f) resource regarding the above conditions.

3. **Constructive Use** - A constructive use of a Section 4(f) resource occurs when a transportation project does not permanently incorporate land from the resource, but the *proximity* of the project results in impacts (e.g., noise, vibration, visual impacts, or property access) that substantially impair the activities, features, or attributes that qualify a resource for Section 4(f) protection. Factors for assessing substantial diminishment are provided in 23 CFR § 774.15.

Before approving a project that uses Section 4(f) resources, FTA must either determine that the project would have a *de minimis* impact on the property (as defined in 23 CFR § 774.17) or undertake an individual Section 4(f) evaluation to determine that there is no feasible and prudent avoidance alternative to that use, and that all measures to minimize harm to the resource have been undertaken. For historic sites, a *de minimis* impact means that FTA has determined (in accordance with 36 CFR § 800) that either no historic resource would be affected by the project or that the project would have "no adverse effect" on the historic resource.

Based on the findings of the Section 106 consultation for this project, IHPA concurred with three adverse effects findings (IHPA correspondence is included in **Appendix D-4**); therefore, based on these Section 106 findings and in accordance with 23 CFR § 774, Section 4(f) evaluation is required for the use of these historic resources by the proposed project.

5.3 Organization of this Chapter

The sections within this Section 4(f) evaluation consider potential Section 4(f) uses in accordance with all applicable regulations and guidance referenced in the previous chapters, and sections are organized to follow the major analysis processes outlined in FHWA's *Section 4(f) Policy Paper*. Each section provides appropriate citations, definitions, and evaluation criteria for each of these steps:

- **Section 5.4** - Identification of Section 4(f) Resources
- **Section 5.5** - Assessment of Use of Section 4(f) Resources
- **Section 5.6** - Avoidance Analysis
- **Section 5.7** - Least Overall Harm Analysis
- **Section 5.8** - All Possible Planning to Minimize Harm

The concluding sections of this chapter provide details on the consultation and coordination process undertaken (**Section 5.9**) and summarize the finding of this Section 4(f) evaluation (**Section 5.10**).

5.4 Identification of Section 4(f) Resources

Based on the evaluation in this EA, no public parklands, recreational areas, or wildlife and waterfowl refuges that are afforded protection by Section 4(f) would be "used" by the proposed project. Section 4(f) requirements for this project apply specifically to historic sites on, or eligible for, the NRHP (23 CFR § 774.17). Historic resources meeting this definition were identified during Section 106 consultation meetings for the entire 9.6-mile RPM corridor (held on November 7, 2012) and for the Red-Purple Bypass Project (held on September 25, 2014). This consultation is further described in **Section 3.5**.

Through the Section 106 process, FTA and CTA identified nine resources that meet eligibility criteria for inclusion in the NRHP and that lie within the designated area of potential effects (APE) for the project: eight individually eligible resources and one historic district (Newport Avenue Historic District). **Table 5-1** describes these resources, which are shown on **Figure 5-1. Section 3.5** contains additional details on the APE and eligibility criteria.

Table 5-1: Resources Eligible for or Listed on the National Register of Historic Places in the Area of Potential Effects

Map ID	Location	Year Built	Description	NRHP Status
1	Belmont Station to Montrose Avenue (CTA Track Structure)	1900	Elevated Track (CTA)	NRHP Eligible - Criteria A and C
2	3264–3266 N. Clark Street	1889	Queen Anne Mixed-Use Building	NRHP Eligible - Criterion C
3	3365–3369 N. Clark Street	1898	Eclectic Mixed-Use Building	NRHP Eligible - Criterion C
4	938 W. Newport Avenue[1]	1905	Queen Anne Greystone Flat	NRHP Eligible - Criterion C
5	947–949 W. Newport Avenue[1]	1889	Vautravers Building	NRHP Eligible - Criterion C
6	934 W. Roscoe Street	1889	Slaymaker Gallery	NRHP Eligible - Criterion C
7	3356 N. Sheffield Avenue	1896	Queen Anne Mixed-Use Building	NRHP Eligible - Criterion C
8	1015 W. Newport Avenue	1891	Multifamily Residential Building	NRHP Eligible - Criterion C
9	Newport Avenue Historic District	1890s–1920s	Historic District	NRHP Eligible - Criteria A and C

CTA = Chicago Transit Authority; NRHP = National Register of Historic Places

[1] Contributing to Newport Avenue Historic District

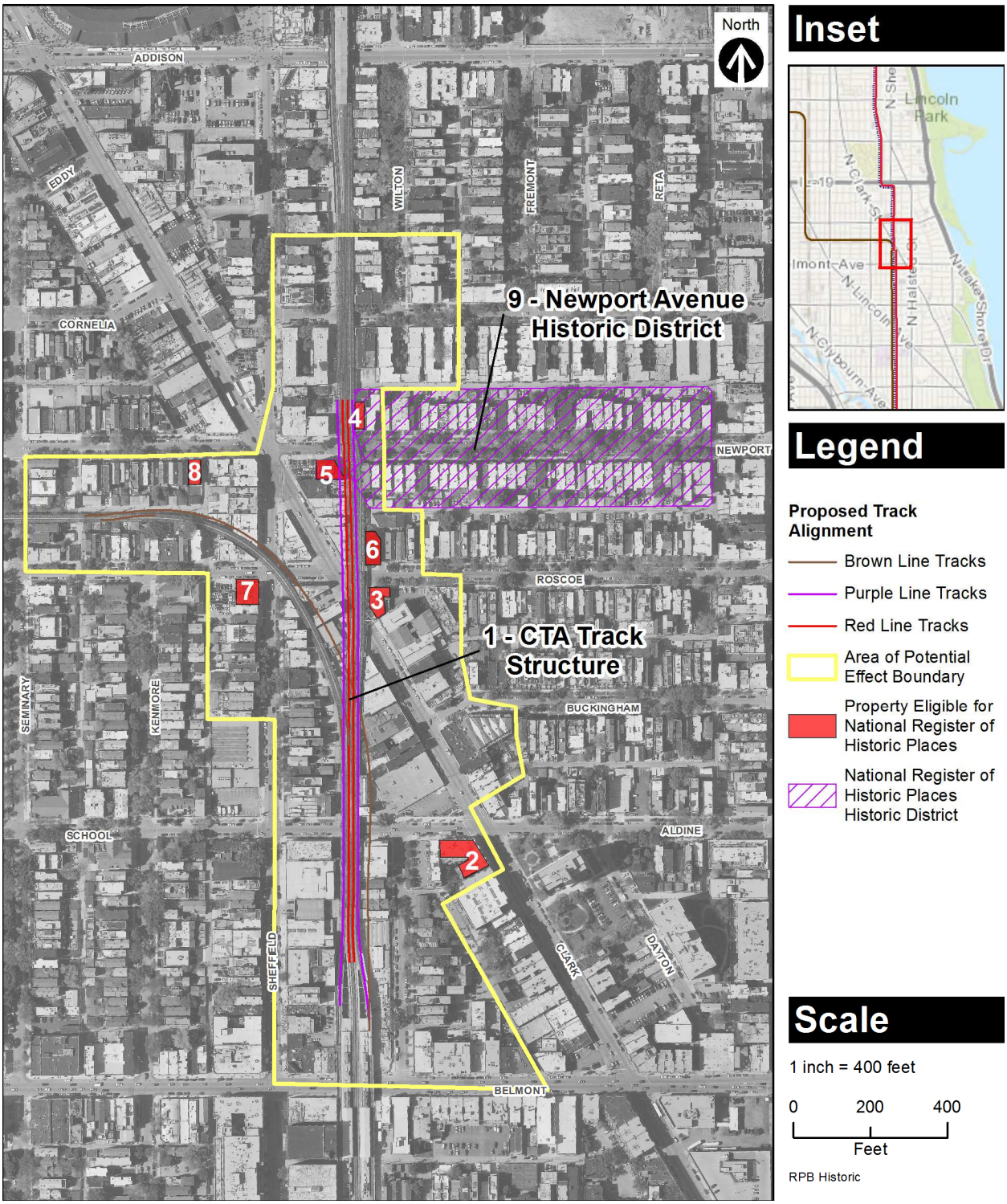

Figure 5-1: Historic Area of Potential Effects Boundary and NRHP-Eligible or Potentially Eligible Resources

5.4.1 Resources Not Further Evaluated for Section 4(f)

Under the Section 106 process, FTA and CTA determined that there would be a "no effect" finding for the resource at 3264–3266 N. Clark Street (Map ID #2) under the Build Alternative, because its location falls well outside of the permanent right-of-way and construction site. Indirect effects resulting from the project would not affect the characteristics that qualify this resource for inclusion on the NRHP; consequently, there would be no Section 4(f) use of this resource.

The Section 106 process also determined that the Build Alternative would have no adverse effect on five other resources that are individually eligible for the NRHP (Map ID #: 3, 4, 6, 7, and 8). Although these resources are near the project area, they are outside the permanent right-of-way and construction sites. The Build Alternative would not directly affect or incorporate land from these historic resources. The Build Alternative would not alter the architectural significance of these historic buildings, nor would it restrict access to these resources. The audible and visual changes resulting from the Build Alternative would not substantially interfere with the use of these historic resources; therefore, they would maintain their significance and continue to portray the characteristics that rendered them eligible for the NRHP. The Build Alternative would not substantially impair or diminish the aesthetic features or attributes of these resources. In addition, the threshold for an "adverse effect" under Section 106 is lower than that of a "constructive use" as defined under Section 4(f), meaning that there is no need to evaluate these resources for a constructive use under Section 4(f). The Build Alternative would not result in a Section 4(f) use of these historic resources, and they are not subject to further individual Section 4(f) evaluation in this chapter.

5.4.2 Resources Subject to Individual Section 4(f) Evaluation

Three NRHP-eligible resources are subject to further individual Section 4(f) evaluation. These resources are described in greater detail below. **Section 5.5** contains additional discussion of these resources and how they would be used by the project.

Resource 1 - CTA Elevated Track Structure

The NRHP-listed elevated Red and Purple line track structure is a four-track, elevated, steel frame structure with an open wood-tie deck running south to north from Belmont station to Montrose Avenue (see **Figure 5-2**). The steel frame structure, opened for service in 1900, is functional in design with little evidence of ornamentation. Approximately 0.3 mile of this structure is within the project limits, extending from Belmont station on the south to the segment of track between Newport Avenue and Cornelia Avenue on the north.

Figure 5-2: CTA Elevated Track Structure

The Red and Purple line elevated track structure is eligible under Criterion A for its contribution to the development of Chicago's North Side and under Criterion C as a good example of turn-of-the-century riveted steel plate technology.

Resource 2 - Vautravers Building (947-949 W. Newport Avenue)

The Vautravers Building, built in 1889, is a three-story apartment building that features rusticated limestone cladding, an arched entrance with a projecting limestone surround, and a bracketed copper cornice (see **Figure 5-3**). The pressed copper ornamentation is distinctive and the building overall has very good integrity. As a result, it is individually eligible for the NRHP under Criterion C for its distinctive architectural features. It is also a contributing element within the Newport Avenue Historic District.

Figure 5-3: Vautravers Building (Facing South)

Resource 3 - Newport Avenue Historic District

The Newport Avenue Historic District is on Newport Avenue between Halsted Street and Clark Street. The district, as shown in **Figure 5-4**, contains 67 buildings, most of which are Chicago three-flat buildings (apartment buildings with three units) built from the 1890s through the 1910s. The district also includes single-family residences from the early 1890s, as well as four six-flat buildings and small apartment buildings that were built through the 1920s. Together, these buildings exemplify the type of housing constructed in middle and working-class neighborhoods that developed in late 19th and early 20th century Chicago. The historic district's houses and apartment buildings, including the predominant three-flat buildings, exhibit a mix of stylistic influences. Such visual eclecticism is a characteristic of much late 19th and early 20th century architecture, especially those buildings found in Chicago's neighborhoods. Many small-scale Chicago buildings of this period are not pure examples of any one style, but incorporate ornamental motifs that recall particular styles. Residential buildings in the Newport Avenue Historic District exhibit elements of the Queen Anne, Eastlake, Romanesque, Classical Revival, and Arts and Crafts styles, which provide the buildings with their visual richness and character.

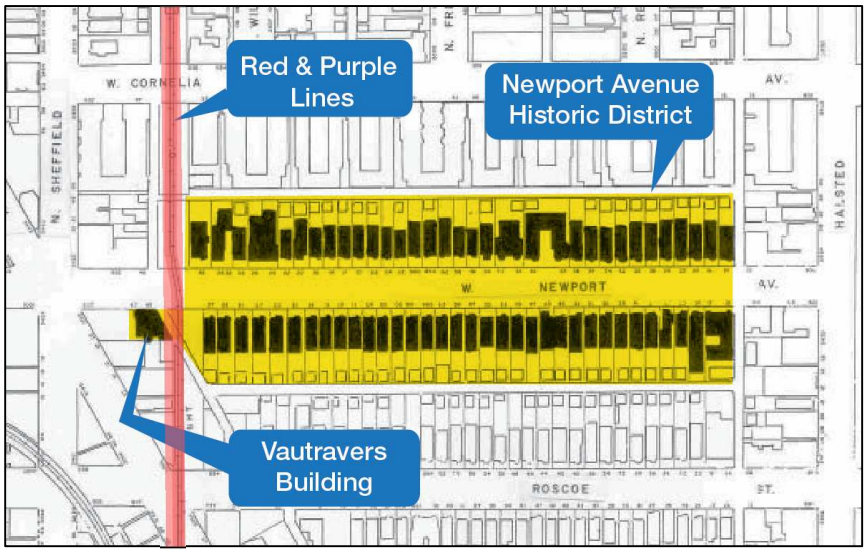

Figure 5-4: Newport Avenue Historic District

Two individually eligible NRHP resources contributing to the historic district were identified within the APE: 938 W. Newport Avenue and 947–949 W. Newport Avenue.

- The building at 938 W. Newport Avenue is individually eligible for listing in the NRHP and is a contributing resource to the Newport Avenue Historic District. The project would not be located on the property for the building; therefore, there would be no direct Section 4(f) use of this resource. A constructive use assessment is also not needed, because the threshold for the constructive use of a historic resource is higher than the threshold for an adverse effect finding under Section 106. This resource it is not discussed further in this evaluation.

- The Vautravers Building (947–949 W. Newport Avenue) is individually eligible for listing on the NRHP and is a contributing resource to the Newport Avenue Historic District. It is subject to additional evaluation under Section 4(f) and is discussed in **Section 5.4.2**.

Three other buildings contributing to the historic district were identified within the APE but are not individually NRHP-eligible or listed properties and were therefore not further assessed under the Section 106 process: 933 W. Newport Avenue, 934 W. Newport Avenue, and 937 W. Newport Avenue. These contributing buildings fall outside the permanent right-of-way and construction footprints of the project and are therefore not further individually considered in this Section 4(f) analysis.

5.5 Assessment of Use of Section 4(f) Resources

This section provides further details on each Section 4(f) resource, and explains appropriate determinations of "use" for each resource. Alternatives to avoid Section 4(f) use of these resources are described in **Section 5.6**.

5.5.1 CTA Elevated Track Structure

Approximately 0.3 mile of this resource—extending from Belmont station on the south to the segment of track between Newport Avenue and Cornelia Avenue on the north—would be reconstructed as part of the Red-Purple Bypass Project. The steel frame structure with open wood-tie deck would be replaced with a closed-deck, aerial structure with direct-fixation track and welded rail. Noise barriers (approximately 3 to 5 feet in height) are proposed on both sides of the track deck. The modernized track structure would be wider than the existing track structure and would straighten the existing curves, increasing train speeds and improving travel times through this segment.

During the Section 106 analysis it was determined that the track structure would be adversely affected because portions would be replaced with a modern aerial structure, compromising its historic integrity. For these reasons, FTA determined that further Section 4(f) evaluation of the elevated track structure was necessary.

Section 4(f) Use Determination - The demolition and reconstruction of the elevated track structure would result in a **permanent incorporation** of this historic resource into the project.

5.5.2 Vautravers Building

The Vautravers Building lies within the permanent right-of-way of the proposed Build Alternative. **Figure 5-5** shows the existing and proposed track alignment in relation to the Vautravers Building. Due to the narrow right-of-way and curved track alignment, the building is just 7 feet from the centerline of the nearest track, which does not meet CTA's minimum outside clearance design criteria. The distance between adjacent tracks (track spacing) at existing curves also does not meet CTA's minimum requirements. These design criteria and minimum requirements are in place for safety reasons.

The Build Alternative would include straightening this curve, eliminating the existing speed restrictions for the Red and Purple lines through this area and meeting minimum track spacing requirements. Sufficient track spacing would improve worker safety by providing adequate room for maintenance activities. Under existing conditions, there is insufficient room for walkways. This configuration translates into delays during maintenance and inspection. Flaggers hold trains as workers clear the tracks (because any space between tracks is insufficient for a train to pass with workers in this space). To clear one track, workers must stand in the pathways of other tracks. Current CTA design criteria call for track spacing and walkways that allow room for maintainers and inspectors to stand clear of tracks. In addition to improving train speeds, the Build Alternative would allow space to install noise barriers that would minimize noise and vibration impacts on the surrounding community.

As it is currently defined, the Build Alternative alignment would overlap with the building footprint by approximately 29 feet.

Section 4(f) Use Determination - The Vautravers Building would be adversely affected because the building lies within the footprint of the Build Alternative alignment, requiring it to be demolished, moved, or altered. As a result, there would be a **permanent incorporation** of this Section 4(f) resource into the project.

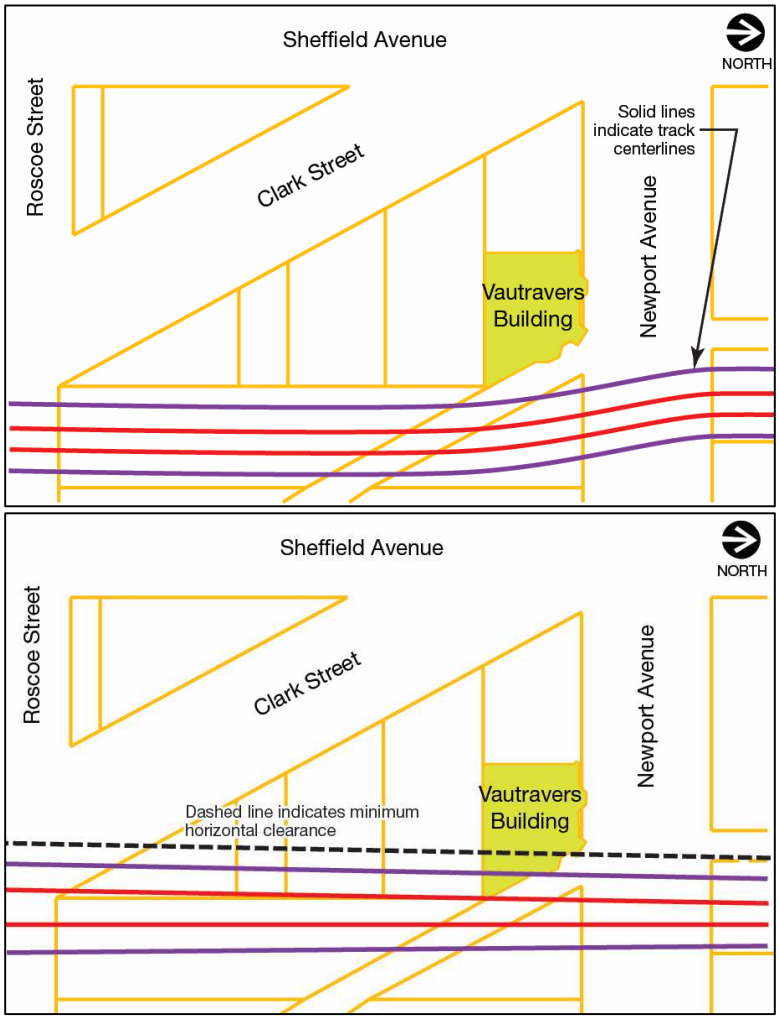

Figure 5-5: Existing (Top) and Proposed (Bottom) Realignment of Tracks near Vautravers Building

5.5.3 Newport Avenue Historic District

One building contributing to the Newport Avenue Historic District would be used by the project: the Vautravers Building (see **Section 5.5.2**). **Figure 5-4** shows the building location within the historic district; it is separated from the rest of the district by the Red and Purple line track structure. At least a portion of this resource would be permanently incorporated to accommodate the modernization of the track structure as proposed.

Section 4(f) Use Determination - The resulting loss of a resource contributing to the district (i.e., the Vautravers Building) would constitute a **permanent incorporation** of a resource within

the historic district under Section 4(f) use definitions. No other resources contributing to the district would be directly or indirectly affected by the Build Alternative. There would therefore be no further Section 4(f) use within the district.

5.6 Avoidance Analysis

Once Section 4(f) uses have been determined, it is necessary to consider any avoidance alternatives that would eliminate the need for use of Section 4(f) resources. Feasible and prudent avoidance alternatives are those that would avoid using any Section 4(f) resource and would not cause other problems of a magnitude that would substantially outweigh the importance of protecting the Section 4(f) resource (23 CFR § 774.17). Alternatives evaluated to avoid use of identified historic resources afforded protection under Section 4(f) include the No Build Alternative as well as a range of other alternatives, taking into account the following types of alternatives as identified in FHWA's *Section 4(f) Policy Paper*:

- **Location Alternatives** - A location alternative refers to the rerouting of the entire project along a different alignment.
- **Alternative Actions** - An alternative action involves actions that do not require construction or that consist of a different transit mode.
- **Alignment Shifts** - An alignment shift is the rerouting of a portion of the project to a different alignment to avoid the use of a specific resource.
- **Design Changes** - A design change is a modification of the proposed design in a manner that would avoid impacts.

After analysis of several alternatives, the No Build Alternative was determined to be the only alternative to actually avoid Section 4(f) use. The No Build Alternative is further evaluated for prudence below. It was determined that there are no build alternatives that would avoid the use of Section 4(f) resources; therefore, all other alternatives were evaluated as part of the least overall harm analysis presented in **Section 5.7**.

The No Build Alternative is further evaluated here under the feasible and prudent standards of Section 4(f). An alternative is determined feasible if it could be built as a matter of sound engineering judgment. Under 23 CFR § 774.17, factors are defined for determining alternatives to be not prudent. An alternative could be not prudent for any of the following reasons:

- Factor 1 - It would compromise the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need.
- Factor 2 - It would result in unacceptable safety or operational problems.
- Factor 3 - After reasonable mitigation, it would still cause one or more of the following:
    - Severe social, economic, or environmental impacts

- Severe disruption to established communities
- Severe, disproportionate impacts on low-income or minority populations
- Severe impacts on environmental resources protected under other federal statutes

- Factor 4 - It would result in additional construction, maintenance, or operational costs of an extraordinary magnitude.
- Factor 5 - It would cause other unique problems or unusual factors.
- Factor 6 - It would involve multiple factors in one through five above, that while individually minor, could cumulatively cause unique problems or impacts of extraordinary magnitude.

The No Build Alternative would avoid the use of any identified Section 4(f) resource by making no constructive alterations to the existing infrastructure. This alternative would include typical repairs to Clark Junction and the mainline track based on historic funding levels needed to keep the project area functional. Capital expenditures would be minor compared to the Build Alternative. It is not a prudent avoidance alternative under Factors 1, 2, and 4:

- **Factor 1** - *It would compromise the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need.* The No Build Alternative would not meet the purpose and need for the project. The Red and Purple line infrastructure in the project area is some of the oldest in the CTA system, dating back to 1900, and is past its useful life for functional as well as structural reasons. Typical and ongoing repairs would be insufficient to respond to functional capacity improvements that address ridership demand and would not upgrade the system to meet modern safety standards. Service quality and effective capacity would decline over time. Short-radius curves limiting train speeds would not be improved. Travel times would continue to increase and service reliability would continue to degrade due to reductions in train speed required to safely operate on deteriorating infrastructure.

- **Factor 2** - *It would result in unacceptable safety or operational problems.* The No Build Alternative would not modify the current track configuration at Clark Junction, which requires trains on three of four tracks to stop and wait for Brown Line trains to cross. Train throughput for Clark Junction would still be limited and travel speed and reliability would not be improved. The No Build Alternative would not address the infrastructure's severely antiquated functional configuration (115-year-old structure) that not only limits the ability to improve capacity, but also causes safety and operational issues. The existing track spacing does not meet CTA track spacing requirements in place for maintenance and operational safety reasons. The No Build Alternative would not allow CTA to meet current safety standards for track spacing, and the existing curves, which limit maximum allowable speeds and cause operational problems because of the short distance between platforms at Belmont and Addison stations, would remain. Travel times would continue to increase and service reliability would continue to degrade due to the reductions in train speed required to safely operate on antiquated infrastructure.

- **Factor 4** - *It would result in additional construction, maintenance, or operational costs of an extraordinary magnitude*. The cost of attempting to extend the useful life of the existing infrastructure would not be commensurate with any benefit that could be realized. Maintenance costs for typical repairs to keep the line structurally sound and safe (such as footing replacement, structural steel replacement, tie replacements, rail replacement, traction power replacement and upgrades, signal component replacement and signal upgrades) would continue to rise. The existing track structure has an FTA condition rating of 1.6 out of 5 (asset is past its useful life and should be prioritized for repair or replacement). Under the FTA condition rating definition, maintenance needs increase after an asset reaches the end of its useful life, which this asset reached 37 years ago (RTA 2014). Costs would rise due to frequency of maintenance required for structural and safety reasons and escalating costs for these piecemeal improvements, including the costs and impacts on passengers that occur during maintenance. These incremental improvements would not address functional capacity/operational issues, such as the flat junction configuration or short-radius curves on the mainline track, which limit speeds and increase wear and tear on the elevated track structure. Even assuming a full repair of the existing flat junction and mainline track completed all at once, which are not possible given constrained budgets, these improvements would only be patches for extending the useful life of the line. The No Build Alternative would extend the life of the infrastructure to meet immediate functional needs to keep the lines operational, while the Build Alternative would provide a 60- to 80-year improvement. The Build Alternative would also address functional capacity issues and a variety of factors related to the ability to maintain the structure over 60 to 80 years. These maintenance factors include differences in rail materials used, speed curve radii assumed, and wheel and track degradation, among other factors. The No Build Alternative would result in additional maintenance costs that would not return additional value to the facility and would become extraordinary in magnitude over time.

5.7 Least Overall Harm Analysis

CTA conducted a detailed analysis to identify a range of alternatives documented in this evaluation. As described in **Section 5.6**, there are no feasible and prudent alternatives that would avoid the use of the Section 4(f) resources. All of the potential alternatives that were considered during planning and development of the Build Alternative would use protected resources as defined in 23 CFR § 774.17. Due to the fact that there is no feasible and prudent avoidance alternative, FTA is required to select the alternative that causes the least overall harm in light of the statute's preservation purpose by balancing the factors at 23 CFR § 774.3(c)(1).

5.7.1 Descriptions of Alternatives Evaluated

The alternatives considered along with the Build Alternative for this least overall harm analysis are described below:

- **Alternative A - Build Alternative**

  The Build Alternative would include construction of a fifth track bypass just north of Belmont station to separate northbound Brown Line trains that currently cross north- and southbound

Red Line tracks as well as southbound Purple Line tracks. The project would also modernize approximately 0.3 mile of mainline tracks and structure directly underneath the proposed bypass and north to near Cornelia Avenue. The mainline track improvements would expand existing right-of-way to straighten out slow curves in the Red and Purple lines that limit train speeds to only 25 mph. The improvements would include a closed-deck track structure and noise barriers to minimize impacts from increased train operations proposed as part of the capacity improvements.

Section 4(f) uses under this alternative would include the elevated track structure, which would be modernized, and the Vautravers Building (and by extension, the Newport Avenue Historic District) due to expansion of the existing right-of-way for the capacity improvements.

- **Alternative B - Underground Tunnel Alternative**

  This alternative would include excavation and construction of a new, underground rail tunnel to address capacity constraints in the project area. This alternative would require substantially longer track infrastructure to make transitions from grade to subsurface (from the elevated tracks to underground just north of the Belmont station) that would block School Street. The tracks would transition back up and return to elevated tracks approximately north of Irving Park Road. Because the Underground Tunnel Alternative project limits would be longer, this alternative would result in greater impacts on more residences, businesses, and use of other Section 4(f) resources outside of the Build Alternative project limits. To construct an underground tunnel, tunnel-boring machines would be used for excavation. These machines are quite large; transporting one to the project area, which is a dense urban environment, would have impacts. Staging entrance/extraction pits (known as launching pits) for the tunneling machine would require creating trenches approximately 700 by 140 feet in area (about 2 blocks in length and roughly equivalent to twice the width of Clark Street today). Additional area is typically required around the pit in order to move equipment, bring in materials, and remove excavated earth. Clark Street, Roscoe Avenue, Newport Avenue and Cornelia Avenue would be closed for the majority of the time required to construct a tunnel.

  Section 4(f) uses under this alternative would include the elevated track structure, which would be completely or partially abandoned with this alternative action. Maintenance would be required for any portion of the abandoned elevated track structure to preserve the resource in place. The transition from the elevated structure to the underground tracks (called an incline) and due to construction would result in Section 4(f) uses of the following resources, at minimum, within the project limits: the Vautravers Building; the NRHP-eligible Slaymaker Gallery at 934–936 W. Roscoe Street; the greystone flat at 937 W. Newport Avenue, which contributes to the Newport Avenue Historic District; and the greystone flat at 938 W. Newport Avenue, which is individually eligible for the NRHP. The four-story apartment building at 937 W. Cornelia Avenue, at minimum, would also be required within the project limits. Other property impacts (non-historic) would be, at minimum, the same as the property impacts under the Build Alternative.

Substantial additional property impacts outside of the project limits identified under the Build Alternative would also be expected due to the larger project footprint and property displacements at both ends of the tunnel. Additional property impacts required at Addison station and Irving Park station (replacing Sheridan in this tunnel alternative) have not been calculated. Buildings required for ventilation, emergency egress, or substations have not been calculated. Other potential 4(f) uses or other impacts at Graceland Cemetery or land north of Irving Park Road (near Buena Park) have not been calculated. Extensive utility impacts would likely occur at the incline and launching pit. These utility impacts (and land required for utility relocations) have not been calculated.

The extensive area required for construction of an underground tunnel would also affect existing traffic circulation and could require street realignments or closures during construction. The incline required for the transition would extend from the north end of the existing Belmont station platform to Clark Street. School Street west of Wilton Avenue would be permanently closed due to the incline.

- **Alternative C - Stacking Tracks Alternative**

  This alternative would involve construction of a two-level structure above the existing tracks. Two Stacking Tracks Alternative concepts were analyzed:

  1. Concept 1 - This concept would place both the north- and southbound Purple Line tracks (Tracks 1 and 4) on a two-level structure above the two Red Line tracks. The two-level structure is feasible and could be built within CTA's current right-of-way; however, the ramp from existing track level to the level above the Red Line could not start until the Brown Line crosses the mainline tracks. The distance required for the ramp would not allow the stacking arrangement to start until north of Newport Avenue.

  2. Concept 2 - This concept would stack Track 4 (the northbound Purple Line track) on a two-level structure above Track 3 (the northbound Red Line track). This structure could not be built within CTA's existing right-of-way, because the structure required to support the stacked track would be wider than the space available. The ramp required to bring Track 4 back to existing grade would also extend to at least the middle of the Addison station platform, extending the project limits north to approximately Waveland Avenue.

  Stacking the tracks under either concept would expand the length and width of the project limits to accommodate transitions from the stacked-tracks configuration back to the elevated track structure. The transition (ramp up) along the mainline would need to be located north of the new bypass structure and would require at least 400 feet of track length north of Newport Avenue. A minimum of approximately 70 feet of right-of-way width would be required for this transition, compared to the existing right-of-way of approximately 50 feet.

  Section 4(f) uses under this alternative would include the elevated track structure, which would be substantially altered from its current single-level, elevated track design to create a double-decker design. This design would increase the scale of the visual change within the

project area, resulting in greater impacts on the community and surrounding neighborhood. Due to the additional right-of-way widths required for the transition and ramps, this alternative would still require use of the Vautravers Building, and by extension, the Newport Avenue Historic District. Because the right-of-way required would be greater than for the Build Alternative, there would also be use of the following additional Section 4(f) resources, at minimum, within the project limits: the NRHP-eligible Slaymaker Gallery at 934–936 W. Roscoe Street; the greystone flat at 937 W. Newport Avenue, which contributes to the Newport Avenue Historic District; and the greystone flat at 938 W. Newport Avenue, which is individually eligible for the NRHP. The four-story apartment building at 937 W. Cornelia Avenue, at minimum, would also be required within the project limits. Other property impacts (non-historic) would be, at minimum, the same as the property impacts and Section 4(f) uses proposed under the Build Alternative from Clark Street to near Newport Avenue. Multiple buildings on the west side of Wilton Avenue and immediately north of Cornelia Avenue would also be affected within the project limits.

Due to the proximity of the Addison station to Cornelia Avenue, Addison station reconstruction would be required under this alternative, extending impacts north of Waveland Avenue. Additional property impacts outside of the project limits identified under the Build Alternative would also be expected due to the larger project footprint. Additional properties required at Addison station have not been calculated. Additional properties required north of Waveland Avenue to transition back to a one-level structure have not been calculated.

In addition to these impacts, stacking the tracks would also prevent inter-operability between the Red and Purple line trains, which would result in substantial service disruptions during track maintenance.

- **Alternative D - Shift Mainline Alignment to the East Alternative**

  This alternative, shown in **Figure 5-6**, would realign the mainline tracks to the east of the existing track structure rather than to the west (as proposed under the Build Alternative). Like the Build Alternative, this alternative would modernize the mainline track and structures to meet modern track spacing and safety requirements, straighten short-radius curves in the existing alignment, and would include noise barriers (approximately 3 to 5 feet in height).

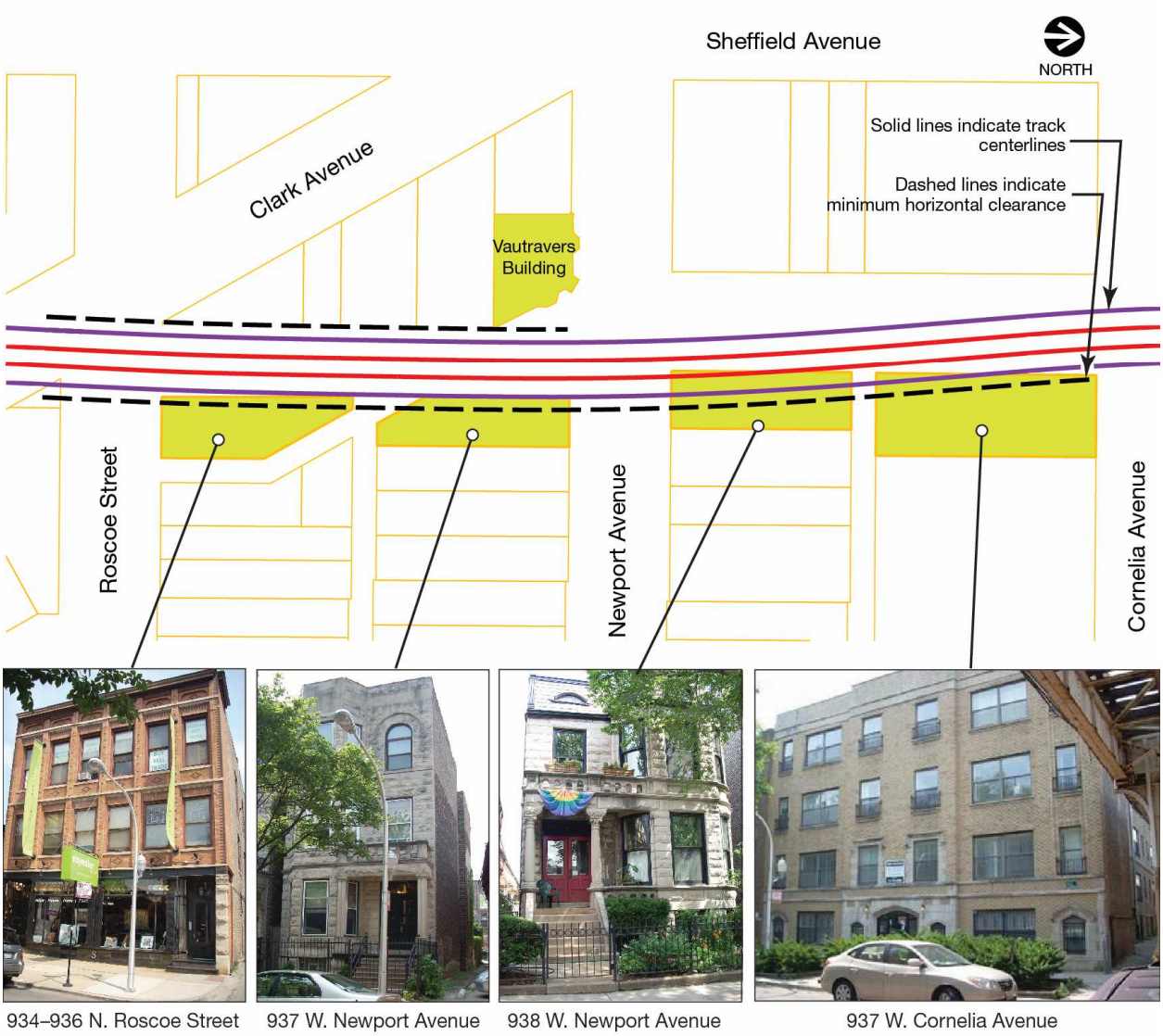

Figure 5-6: Shift Mainline Alignment to the East Alternative

Section 4(f) uses under this alternative would include the elevated track structure, which would be reconstructed and modernized. This alternative would avoid use of the Vautravers Building due to the realignment of the mainline tracks to the east rather than to the west (as proposed under the Build Alternative), but use of resources contributing to the Newport Avenue Historic District would still occur. To accommodate expanded right-of-way to the east, at least four additional buildings would be used under this alternative, including three buildings that are either individually eligible for listing on the NRHP or that contribute to the Newport Avenue Historic District, or both (as shown in **Figure 5-6**). These additional property displacements include the following: the NRHP-eligible Slaymaker Gallery at 934–936 W. Roscoe Street; the greystone flat at 937 W. Newport Avenue, which contributes to the Newport Avenue Historic District; the greystone flat at 938 W. Newport Avenue, which is

individually eligible for the NRHP and contributes to the Newport Avenue Historic District; and the four-story apartment building at 937 W. Cornelia Avenue.

- **Alternative E - Basic Rehabilitation of the Mainline**

  This alternative would create a new fifth track bypass for the northbound Brown Line track but would include only basic rehabilitation to the mainline track structure (a Section 4(f) resource). This alternative would not modernize the mainline track structure and would retain the steel open-deck frame structure and open wood-tie deck. Existing right-of-way would be kept and (like current conditions) no noise barriers would be installed. Operational improvements, including increased service and a steady 25-mph speed without train conflicts, would cause noise impacts that could not be mitigated without a closed-deck aerial structure and noise barriers, and as a result the impacts would be greater than with the Build Alternative. Mitigation options for these impacts would be limited. Because right-of-way would not be expanded, the alternative would not straighten existing curves along the mainline structure. With the unstraightened, speed-restricted curves, operations of Red and Purple line trains would continue to be limited to 25 mph rather than the 55 mph proposed under the Build Alternative. The Red and Purple line tracks would not meet modern track spacing requirements in place for safety reasons to provide adequate clearances for track maintenance and to meet minimum emergency access standards. Improvements would only consist of basic rehabilitation to keep the track structure in a state of good repair. Rehabilitation would still require replacement of historic steel members (turn of the century riveted steel plate technology) on the elevated track structure with modern, bolted members for structural integrity reasons.

  While there would be a permanent incorporation use of the elevated track structure, because the alternative would retain the historic materials and integrity of the structure, there would likely be a Section 4(f) *de minimis* finding for the elevated track structure. Because existing right-of-way would be kept, there would be no use of the Vautravers Building, and by extension, no use of the Newport Avenue Historic District.

- **Alternative F - Narrow Mainline Alignment and Modernize Tracks**

  This alternative would narrow the width of the proposed alignment under the Build Alternative. Under this alternative, the right-of-way would be expanded by 2 feet (rather than 6 feet as proposed as part of the Build Alternative). To meet minimum required safety standards without including noise barriers, the right-of-way would need to be approximately 52 feet wide—2 feet wider than under existing conditions. To meet all modern safety standards and provide for noise barriers, the right-of-way would need to be 56 feet wide—6 feet wider than under existing conditions. Keeping the current configuration would not allow space for noise barriers, would not provide adequate clearances for track maintenance, and would not meet minimum emergency access standards. While widening the right-of-way to be 52 feet wide would allow CTA to meet all modern safety standards, it would not allow for installation of noise barriers, which are required to mitigate noise impacts due to existing high level of noise in the project area and the proposed increase in train operations. Due to

continued right-of-way constraints, CTA would also not be able to completely straighten the existing short-radius curves that restrict train speeds to 25 mph and constrain speed improvements.

Like the Build Alternative, this alternative would still result in a Section 4(f) use of the elevated track structure, which would be reconstructed and modernized. Expanding the CTA right-of-way to meet minimum standards, even without including noise barriers, would require the right-of-way to be expanded by 2 feet on either the east or west side of the existing track structure, which would use either the Vautravers Building on the west side of the track structure or at least one other Section 4(f) resource on the east side of the track structure (937 W. Newport Avenue). This building is not individually eligible for listing on the NRHP but contributes to the Newport Avenue Historic District. Impacts on this building would result in use of the historic district, which is protected under Section 4(f). In addition, it is likely that at least one or both of the following properties would also be affected, if the right-of-way was to be expanded to the east, as they lie in the same plane as 937 W. Newport Avenue: the NRHP-eligible Slaymaker Gallery at 934–936 W. Roscoe Street and the greystone flat at 938 W. Newport Avenue, which is individually eligible for the NRHP and contributes to the Newport Avenue Historic District.

5.7.2 Least Overall Harm Analysis

The Section 4(f) regulations require a balancing of the following seven factors when determining which alternative would cause the least overall harm (23 CFR § 774.3(c)(1)):

1. Ability to mitigate adverse impacts on each Section 4(f) resource (including any measures that would result in benefits for the resource)

2. Relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) resource for protection

3. Relative significance of each Section 4(f) resource

4. Views of the officials with jurisdiction over each Section 4(f) resource

5. Degree to which each alternative meets the purpose and need for the project

6. After reasonable mitigation, the magnitude of any adverse impacts on resources not protected by Section 4(f)

7. Substantial differences in costs among the alternatives

CTA performed the least overall harm analysis, applying criteria in 23 CFR § 774.3(c)(1), by examining each of the seven key factors for the six alternatives considered in this Section 4(f) evaluation, as outlined below. **Section 5.7.3** provides a summary of this evaluation.

Factor 1 - Ability to mitigate adverse impacts on each Section 4(f) resource

The Build Alternative (Alternative A) would result in an adverse effect on three Section 4(f) resources: the elevated track structure, the Vautravers Building, and the Newport Avenue Historic District due to modernization of the mainline track and structures to meet modern track spacing and safety standards, and removal of short-radius curves in the mainline. In Alternative A, the elevated track structure would be adversely affected by replacement of portions of the track structure with a modern aerial structure, affecting the integrity of historic materials and workmanship. A closed-deck aerial structure with noise barriers is proposed under the Build Alternative to reduce noise levels to a level less than significant under NEPA given proposed increases in capacity and trains that would be operating. The Red and Purple line structures are dynamic elements within a functioning transportation system that must continue to be rehabilitated, modified, and replaced in order to meet safety requirements and continue their historic role in the transit network. This effect cannot be avoided or minimized to meet the purpose of the project—to improve capacity, increase speeds and modernize the rail system. To mitigate effects, CTA could prepare documentation for the existing track structure to convey its significance in the development of northern Chicago. The Vautravers Building, and by extension its contribution to the Newport Avenue Historic District, would be subject to an adverse effect because of Alternative A. To minimize adverse effects on the Vautravers Building, and by extension the Newport Avenue Historic District, three potential options were presented to consulting parties for input: relocating the building to a different lot, salvaging the western portion of the building, or preserving key architectural elements for reuse.

Based on a high-level feasibility analysis discussed during the Section 106 consultation on September 25, 2014, it was determined that keeping only a portion of the Vautravers Building on the west side of the structure (shaving off only a portion of the building) would not be a feasible mitigation option. Because approximately three of the six units within the building would be removed to accommodate the alignment as part of the Build Alternative, the remainder of the building would be an awkward shape and configuration, resulting in compromised functionality. Based on CTA's recent experience with keeping a portion of a historic building, the remaining portion of the structure would be difficult to lease/sell, resulting in no long-term solution for a responsible party to maintain the structure in good condition. IHPA and consulting parties agreed that the other potential mitigation measures under consideration (full relocation or preserving key architectural elements) provided more reasonable options to mitigate effects on the building. For these reasons, this mitigation measure was not carried forward. Relocating the building and preserving key architectural elements for reuse have been carried forward as potential mitigation measures for Alternative A.

The Underground Tunnel Alternative (Alternative B) or Stacking Tracks Alternative (Alternative C) would not avoid adverse effects on the Section 4(f) resources evaluated. Neither alternative would avoid use of the elevated track structure. Compared to Alternative A, Alternative B would also require a substantially longer track infrastructure (transitions from at-grade to subsurface). Elongating the track infrastructure would result in greater impacts on more residences and businesses, and would use other Section 4(f) resources outside of the Build Alternative project limits. Alternative C would also require use of the elevated tracks; these effects would

substantially alter the scale (double the height of the existing elevated track) and integrity (in terms of the design) of the elevated track structure, replacing it with a double-decker design. The range of mitigation measures available for these alternatives would be similar to the range for Alternative A.

Alternatives B and C would also not avoid adverse effects on the Vautravers Building, because both alternatives would require a larger (wider) project footprint for construction of either of these options. Construction staging sites under Alternative B would require a minimum of 140 feet of width to accommodate tunnel-boring machines and would likely need to be located at Newport Avenue due to the incline location. The required width would be approximately twice the existing width of Clark Street itself. Because the Vautravers Building is currently only approximately 40 feet from the right-of-way of Clark Street, it would still be affected by this alternative. In addition, because of the width required, there would be other impacts on properties between the existing track and Clark Street.

Like Alternative B, the project limits for Alternative C would also be greater than for the Build Alternative. Creating a double-decker structure would require transitions from the at-grade structure to the new double-decker structure. The transition (ramp up) along the mainline could not begin until after the new bypass structure is in place overhead and require at least 400 feet in length (north of Newport Avenue). A minimum of approximately 70 feet of width would be required for this transition, compared to the existing right-of-way of approximately 50 feet today; as such, this expanded width would still require use of the Vautravers Building and would require more significant property impacts due to the additional right-of-way required compared to Alternative A. The ability to move the Vautravers Building near to the existing location and Newport Avenue Historic District would be more limited because the right-of-way required would be greater than that proposed under Alternative A.

Under Alternatives B and C, adverse effects on the Newport Avenue Historic District would be more substantial because these alternatives would have larger project limits and would result in greater losses to individually eligible and contributing resources within the district. Mitigation would be required, and relocating more contributing buildings within the district would not be a viable mitigation measure due to limited space to accommodate any relocations within the district. In addition, Alternative C would require a complete change in the structure of the elevated track to a double-decker structure. Under Alternative C, visual and noise effects on the district are expected to be greater than under Alternative A.

The Shift Mainline Alignment to the East Alternative (Alternative D) would not avoid adverse effects on the Section 4(f) resources evaluated. This alternative would still involve modernization of the mainline track and structures to meet modern safety standards as well as removal of short-radius curves in the mainline that limit speed. This alternative would result in an adverse effect on the elevated track structure. Effects on the Vautravers Building (the only contributing resource to the district on the west side of the existing track structure) could be avoided but this alternative would result in a greater effect on the Newport Avenue Historic District. Shifting the alignment to the east would displace four buildings east of the proposed track structure,

including additional resources contributing to the district: the NRHP-eligible Slaymaker Gallery at 934–936 W. Roscoe Street; the greystone flat at 937 W. Newport Avenue, which contributes to the Newport Avenue Historic District; the greystone flat at 938 W. Newport Avenue, which is individually eligible for the NRHP and contributes to the Newport Avenue Historic District; and the four-story apartment building at 937 W. Cornelia Avenue. Mitigation measures, such as relocating contributing resources, would be limited because there is inadequate room to relocate these buildings within the district. Any relocation of resources would require buildings to be moved outside of the existing historic district, permanently altering their historic context within the district and resulting in greater effect on the intact portion of the district.

The Basic Rehabilitation Alternative (Alternative E) would still require use of the elevated track structure. Because it would largely retain the existing materials and design of the structure, a *de minimis* finding under Section 4(f) would likely be made. Mitigation efforts for the elevated track structure would be similar to mitigation proposed as part of the Build Alternative. There would be no use of the Vautravers Building under Alternative E, and by extension, no use of the Newport Avenue Historic District, because the right-of-way would be kept. Due to the proximity of both the Vautravers Building and the Newport Avenue Historic District, additional noise effects would be anticipated and mitigation options for the increase in noise from operating additional trains through the corridor would be more limited than under the Build Alternative. This alternative would lead to reduced use of Section 4(f) resources but would not meet the purpose and need for the project to improve travel times, capacity, ride quality, and safety. Existing slow curves that limit operational speeds and constrain travel times and ride quality in the project area would remain. Modern safety standards, including expansion of right-of-way for track spacing, would not be met. More information regarding the failure of Alternative E to fully meet the project's purpose and need is addressed under Factor 5, below.

The Narrow Mainline Alignment and Modernize Tracks Alternative (Alternative F) would still result in an adverse effect on the elevated track structure due to modernization of the mainline track and structures to meet modern track spacing and safety standards, as well as removal of short-radius curves in the mainline. These improvements are proposed because the purpose of the project is to improve travel times, capacity, ride quality, and safety. Due to more constrained right-of-way, it would not be possible to completely remove the existing short-radius, speed-restricted curves. These curves represent an additional speed constraint because speed restrictions (to 25 mph) would remain.

Alternative F would require expansion of the existing right-of-way to meet all modern safety standards—one main purpose of the project. Expanding the CTA right-of-way to meet minimum standards would require the right-of-way to be expanded by 2 feet on either the east or west side of the existing track structure, which would result in an adverse effect under Section 106 and use under Section 4(f) of either the Vautravers Building on the west side of the track structure or at least one other Section 4(f) resource on the east side of the track structure (937 W. Newport Avenue). This building is not individually eligible for listing on the NRHP but contributes to the Newport Avenue Historic District; therefore, the use of this building would constitute a Section 4(f) use of the historic district. If the alignment was expanded to the west and affected the

Vautravers Building, mitigation required would be the same as that under consideration in Alternative A. If the alignment were expanded to the east, this would potentially result in an even greater use of the Newport Avenue Historic District because it would require at least partial acquisition within the intact portion of the district. Like Alternatives B through D, any relocation of resources would require buildings to be moved outside of the existing historic district, permanently altering their historic context within the district and resulting in greater effect on the intact portion of the district.

In addition, under Alternative F, there would be no ability to mitigate potential noise impacts resulting from the proposed capacity expansion, because noise barriers would not be installed. Due to the proximity of both the Vautravers Building and the Newport Avenue Historic District, additional noise impacts would be anticipated and mitigation options for the increase in noise from operating additional trains through the corridor would be limited compared to options available under the Build Alternative.

Factor 2 - Relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) resource for protection

Alternative A would modernize the existing elevated track and allow the resource to continue its historic role in the transit network. With mitigation, the Vautravers Building would either be moved, or historic materials could be retained from the building. Effects on the Newport Avenue Historic District would be limited to the Vautravers Building, which is the only contributing resource west of the existing and proposed track structure.

The permanent severity of effect on the CTA elevated track structure from Alternatives B and C would be greater than the effect from Alternative A. Alternatives B and C would irreversibly change the integrity of the structure's design with construction of either a tunnel or a double-decker system that would be larger in both height and scale than the existing structure. Alternatives B and C would also result in incorporation of a greater portion of the Vautravers Building to accommodate the new and more extensive infrastructure. Alternatives B and C would also result in greater remaining harm to the Newport Avenue Historic District than Alternative A. Each of these alternatives would substantially alter the existing, intact Newport Avenue Historic District with additional effects on individually eligible and contributing resources due to the larger construction and permanent right-of-way required.

Alternative D would result in effects on the CTA elevated track structure that would be similar to those under Alternative A because it would require reconstruction of a modern, closed-deck aerial structure; however, these changes would maintain the scale of the existing structure and result in less visual impact on the surrounding community than Alternatives B and C. While Alternative D would avoid the Vautravers Building itself, it would cause greater effects on the Newport Avenue Historic District than Alternative A. This is because it would incorporate portions of two other resources contributing to the district, as well as a resource individually eligible for the NRHP and one other non-historic building.

Alternative E would result in less remaining harm to the elevated track structure than the Build Alternative, because the open-deck track structure and design would remain largely the same as under existing conditions. Right-of-way would not be expanded under this alternative, and as such, there would be no effect on the Vautravers Building and by extension, the Newport Avenue Historic District. Under this alternative, the capacity improvement at the flat junction would be addressed, but other speed/operational constraints along the mainline track would not be addressed. Safety improvements to bring the structure up to modern standards —another major project purpose —would not be addressed. Increased noise from any operational increases along the line would not be addressed with an open-deck structure without noise barriers, and mitigation to reduce these increased noise levels would be limited.

Alternative F would result in effects on the CTA elevated track structure that would be similar to those under Alternative A because it would require reconstruction of a modern, closed-deck aerial structure necessary to mitigate noise levels from the increase in transit service proposed. The right-of-way would need to be expanded by a minimum of 2 feet to meet minimum modern safety standards; this minimal widening would not allow for inclusion of noise barriers. Similar to Alternative D, Alternative F would result in an adverse effect on either the Vautravers Building on the west side of the existing tracks or to at least one other NRHP contributing resource (937 W. Newport Avenue) in the Newport Avenue Historic District to meet minimum expanded right-of-way requirements. Either option for right-of-way expansion would result in permanent incorporation of historic property. After mitigation, remaining harm to the Vautravers Building (if the right-of-way is expanded to the west) would be similar to the harm under Alternative A. Remaining harm to the Newport Avenue Historic District (if right-of-way is expanded to the east) would be similar to the harm under Alternative D because it would require permanent incorporation of the intact portion of the district. Mitigation to relocate the building on the east would be more constrained. In addition, because this alternative would not provide adequate space for noise barriers, there would be greater remaining permanent effects from increased noise on either the Vautravers Building and/or resources contributing to the Newport Avenue Historic District.

Factor 3 - Relative significance of each Section 4(f) resource

Each of the three Section 4(f) resources identified in this evaluation would be used by Alternatives A, B, and C. Alternatives B and C would cause even greater effects on Section 4(f) resources within and outside of the Build Alternative project limits and APE due to the extension of project limits required to accommodate more expansive construction and permanent right-of-way. Alternative B would result in greater effects on the Newport Avenue Historic District than Alternative A and would likely require use of at least two other Section 4(f) NRHP-listed resources (Buena Vista Historic District and Graceland Cemetery) that are outside the project limits for Alternative A due to the increase in project limits required. Alternative C would also require a greater project footprint than Alternative A in terms of both width and length and would therefore result in more substantial effects on the Vautravers Building and Newport Avenue Historic District.

Alternative D would have effects on the elevated track structure similar to those for Alternative A because both alternatives would modernize the track and structures to meet modern track

spacing and safety standards. Alternative D would avoid the use of the Vautravers Building, but would result in greater effects within the Newport Avenue Historic District and on other Section 4(f) protected resources within and outside of the Build Alternative project limits. A shift of the mainline to the east would displace at least four additional buildings east of the proposed track structure: the NRHP-eligible Slaymaker Gallery at 934–936 W. Roscoe Street; the greystone flat at 937 W. Newport Avenue that contributes to the Newport Avenue Historic District; the greystone flat at 938 W. Newport Avenue, which is individually eligible for the NRHP and contributes to the Newport Avenue Historic District; and the four-story apartment building at 937 W. Cornelia Avenue (not NRHP-eligible). A shift to the east would affect the Newport Avenue Historic District more directly and would affect other Section 4(f) historic resources on the east side of Newport Avenue.

Alternative E would still require use of the elevated track structure for reconstruction, but would retain the historic qualities of the rail structure (an open-deck structure with wood ties and no noise barriers). While this would reduce adverse effects under Section 106 for this structure, it would not meet the purpose and need of the project. While the structure is listed under NRHP for its historic qualities and workmanship, this type of structure is no longer representative of modern engineering practices. Further, the function of this historic line is transportation. IHPA has recognized that the Red and Purple line structures are dynamic elements within a functioning transportation system that must continue to be rehabilitated, modified, and replaced in order to meet safety requirements and continue their historic role in the transit network. This part of the railroad began service in phases starting in 1900. The surrounding areas, which consisted mostly of vacant land at the time the railroad was built, have grown into Chicago's most densely-populated neighborhoods. The Red line is now Chicago's busiest transit line, and is one of the busiest in the country. Modernization of the line is needed to improve capacity, travel speeds, and safety and respond to ridership demands. While this alternative would not directly affect the Vautravers Building or Newport Avenue Historic District, because these resources are immediately adjacent to the corridor, any improvements to the line that do not address noise would be likely to result in indirect effects on these resources. CTA and FTA recognize the importance of the Vautravers Building and mitigation is proposed to either move the building or retain historic elements of the building under the Build Alternative.

Alternative F would affect the elevated track structure like Alternative A would, because both the track and structures would be modernized to meet minimum track spacing and safety standards. Alternative F could avoid the use of the Vautravers Building, but would result in greater effects within the intact portion of the Newport Avenue Historic District. Expanding the right-of-way to the east would displace at least one additional building: the greystone flat at 937 W. Newport Avenue, which contributes to the Newport Avenue Historic District. Additional resources contributing to the district, including individually eligible buildings afforded distinct protection under Section 4(f), could be affected as well.

Factor 4 - Views of the officials with jurisdiction over each Section 4(f) resource

IHPA is defined as the "official with jurisdiction" over these historic resources (23 CFR § 774.17). IHPA has agreed with the Section 106 determinations of adverse effect for each of these resources

with relation to the Build Alternative. IHPA has recognized that the Red and Purple line structures are dynamic elements within a functioning transportation system and must continue to be rehabilitated, modified, and replaced in order to meet safety requirements and continue their historic role in the transit network. The Build Alternative would enhance capacity and speed and ensure continued vitality of this resource for the next 60 to 80 years. Given that the existing infrastructure is past its useful life for functional reasons, the other alternatives would either compromise the continuing vitality of this resource, result in greater effects on other historic resources, or result in effects on historic resources similar to those of the Build Alternative.

Factor 5 - Degree to which each alternative meets the purpose and need for the project

Only two alternatives fully meet the purpose and need for the project: Alternative A (the Build Alternative) and Alternative D (the Shift Mainline to the East Alternative). The degrees to which each alternative meets the purpose and need for the project are further discussed below.

Compared to Alternative A, Alternatives B and C would not fully meet the purpose and need for the project. Alternative B would require the Red and Purple lines to merge through a single two-track tunnel, which would reduce flexibility in addressing capacity constraints and adjusting service to meet future demand compared with Alternative A. In addition, compared to Alternative A, Alternatives B and C would require substantially longer construction duration, would require larger project limits, and would render the Red and Purple lines inoperable for major durations of the construction. One of the reasons FTA and CTA developed a phased, tailored approach to the RPM Program was to provide the greatest amount of infrastructure and passenger capacity improvements while also limiting impacts and disruption to passengers. Alternatives B and C would substantially disrupt rail passengers until construction was completed.

Alternatives A and D would similarly meet the purpose and need for the project by modernizing the existing track and structure to meet modern track spacing and safety standards, but Alternative D would result in a larger effect on historic resources and the surrounding community due to additional property impacts required to shift the mainline to the east.

Alternative E would allow the implementation of the new bypass but would not modernize the existing mainline track structure like the Build Alternative would. Alternative E would not meet modern safety standards for operational maintenance and emergency access. In addition, because of the limited right-of-way expansion, this alternative would not allow for straightening of the existing short-radius, speed-restricting curves in the system. These curves would limit speed improvements and would result in longer travel times and reduced passenger comfort. Because one of the main purposes of the project is to improve travel time, capacity, ride quality, and safety, Alternative E does not fully meet the purpose and need for the project.

Alternative F would allow the implementation of the new bypass structure and would modernize the existing system in the project area, but in contrast to Alternative A it would not fully meet modern safety standards for operational maintenance and emergency access. In addition, because of the limited right-of-way expansion, this alternative would not allow for full straightening of the existing short-radius, speed-restricting curves in the system. These curves would limit speed

improvements and would result in longer travel times and reduced passenger comfort. Because one of the main purposes of the project is to improve travel time, capacity, ride quality, and safety, Alternative F does not fully meet the purpose and need for the project.

Factor 6 - After reasonable mitigation, the magnitude of any adverse impacts on resources not protected by Section 4(f)

Alternatives B, C, D, and E would all result in greater resource impacts than Alternative A. All impacts would be less than significant after mitigation under Alternative A, the Build Alternative.

Alternative A would create a new fifth track flyover and modernize the mainline track structure in the project area. The new fifth track flyover would rise to approximately 22 feet (about two stories) at its maximum height. The height would slope to existing levels over a relatively short distance. Several changes to the visual environment of the rail infrastructure are proposed as part of the Build Alternative in an attempt to improve visual quality of the surrounding environment. New materials, colors, and detailing would be selected with the intention of being aesthetically pleasing and complementary with surroundings. The final design would be consistent with the context of the surrounding community. The existing open-deck structure would be replaced with a modern, closed-deck aerial structure with noise barriers. This would provide beneficial improvements to the visual environment through the replacement of deteriorating infrastructure with modern structures. Similar upgrades to a modern closed-deck track structure are already present in the project area from previous Brown Line Expansion Project improvements. Consequently, changes would provide greater visual congruence of the track structure within the project area. In addition, as part of the project contractor selection process, CTA would incorporate a selection criterion that provides additional points for proposals that consider the aesthetic qualities of the historic elevated track structure in their designs.

In Alternative A, the proposed closed-deck structure and noise barriers would minimize noise and vibration impacts. Additional measures are proposed for specific locations where special trackwork would be built, to further minimize noise and vibration impacts to a level less than significant under NEPA. This closed-deck structure with noise barriers, even without other location-specific mitigation efforts, would reduce noise along the majority of the project area. This would be a major benefit to the community and neighborhoods directly surrounding the project area, where many locations are currently experiencing noise levels that exceed FTA moderate or severe thresholds.

Placing facilities underground as part of Alternative B would not eliminate impacts on the surrounding community, because construction sites would be substantially larger than those proposed under Alternative A, resulting in greater displacements of both Section 4(f) properties and other properties to accommodate construction. Permanent ventilation and emergency exit facilities would be required. Alternative B would require substantially larger project limits that would result in impacts on more residences, businesses, and other environmentally protected resources outside of the Build Alternative project limits. The extensive area required for construction of a tunnel would affect traffic circulation in the project area and could require street realignments.

Likewise, Alternative C would expand the project limits and would require more property displacements than those identified under Alternative A. In addition, stacking the tracks would also prevent inter-operability between the Red and Purple line trains, which would result in substantial service disruptions during track maintenance.

Alternative D would result in loss of at least three additional, protected Section 4(f) resources and would displace at least one additional non-historic building. The effects on the Newport Avenue Historic District and surrounding community would be greater under Alternative D than Alternative A due to additional property impacts and greater disruption of an established community (the district and surrounding residential communities).

While Alternative E would avoid use of the Vautravers Building, and by extension, the Newport Avenue Historic District, a number of other adverse impacts would result. This alternative would not meet the purpose and need to modernize the system, improve capacity and travel times, and meet modern safety standards. Under Alternative E, noise barriers could not be installed within the available right-of-way. Due to the proximity of the elevated track to surrounding buildings (both historic and modern) and the proposed increase in service, impacts resulting from increased noise are expected to be greater and mitigation options would be limited.

Alternative F would result in the loss of at least one other contributing resource within the Newport Avenue Historic District to avoid using the Vautravers Building, and could potentially affect other individually eligible or contributing resources in the district due to expanded right-of-way required. The effects on the Newport Avenue Historic District and surrounding community would be greater under Alternative F than Alternative A due to greater disruption within the intact portion of the district and the established community. This alternative would not fully meet the purpose and need to improve capacity (increased speed allows more service to be provided) and improve travel times. Under Alternative F, noise barriers could not be installed within the available right-of-way. Due to the proximity of the elevated track to surrounding buildings (both historic and modern) and the proposed increase in service, impacts resulting from increased noise are expected to be greater and mitigation options would be limited.

Factor 7 - Substantial differences in costs among the alternatives

A magnitude of cost comparison was conducted for the alternatives evaluated in this analysis by calculating cost ratios (based on cost per mile for recently completed projects) using fiscal year 2014 through 2016 *FTA Proposed Allocation of Funds: Capital Investment Program Annual Reports* (FTA 2014–2016). Additional supporting information on these calculations is provided in **Appendix D-9**.

Alternatives B and C would cost substantially more than other alternatives considered due to the more expansive project limits, the costs to completely alter the existing infrastructure design, potential increases in construction costs for specialty equipment required (such as tunnel-boring machines), and the additional property displacements (including historic Section 4(f) resources that could require additional cost to move additional buildings). Costs for these alternatives would also be greater due to the need to maintain the abandoned elevated track structure.

Magnitude costs for Alternative B are approximately three times the cost of Alternative A. Alternative B could not be built in phases, would require lengthy construction timetables, and would result in costs of an extraordinary magnitude compared to Alternative A due to special engineering, equipment, methods, and material considerations involved with tunnel construction. Extensive redesign of horizontal and vertical track alignments would be required and would substantially increase the cost of the project. Additional permitting, pre-construction testing, and environmental studies would also be required. Construction of underground rail transit facilities typically also costs considerably more than elevated facilities, and would include utility relocation and the expenses related to land acquisition or commercial and residential displacements.

Magnitude costs for Alternative C are approximately twice the cost of Alternative A. This alternative would have a larger project footprint in both length and width than proposed for Alternative A, to accommodate transitions to and from stacked tracks to the existing elevated track structure and would require more property displacements than those identified under Alternative A.

The cost for Alternative D would be greater than the cost of Alternative A due to the additional property displacements on the west side of the existing track structure. Because of these additional effects on historic properties, mitigation costs of moving additional buildings in the historic district would be greater than those of Alternative A.

The costs for Alternative E would be similar to the costs for Alternative A in terms of construction. Alternative E would not provide the same level of mobility benefits as Alternative A in terms of enhanced safety, speed, and rider comfort. This alternative would also have more environmental impacts than Alternative A because noise barriers would not be included as part of the project to reduce increases in noise from capacity improvements.

The costs for Alternatives A and F would be similar in magnitude; property impacts and costs would be similar. Alternative F would not provide the same level of mobility benefits as Alternative A in terms of enhanced safety, speed, and rider comfort. This alternative would also have more environmental impacts than Alternative A because noise barriers would not be included as part of the project to reduce increases in noise from capacity improvements.

5.7.3 Least Overall Harm Determination

Table 5-2 summarizes the results of the least overall harm analysis.

Table 5-2: Comparison of Alternatives B-F to Alternative A for Least Overall Harm

Least Overall Harm Factor	**Alternative B** Underground Tunnel	**Alternative C** Stacking Tracks	**Alternative D** Shift Mainline to East	**Alternative E** Basic Rehabilitation	**Alternative F** Narrow Mainline and Modernize
1. Ability to mitigate adverse impacts on each Section 4(f) resource	Less ability than Build Alternative A	Less ability than Build Alternative A	Less ability than Build Alternative A	Greater ability than Build Alternative A	Ability similar to Build Alternative A
2. Relative severity of remaining harm	Greater than Build Alternative A	Greater than Build Alternative A	Similar to Build Alternative A	Less than Build Alternative A	Similar to Build Alternative A
3. Relative significance of each Section 4(f) resource	Greater Section 4(f) uses than Build Alternative A	Greater Section 4(f) uses than Build Alternative A	Greater Section 4(f) uses than Build Alternative A	Fewer Section 4(f) uses than Build Alternative A	Similar to Build Alternative A
4. Views of the officials with jurisdiction	IHPA has recognized that the Red and Purple line structures are dynamic elements within a functioning transportation system and must continue to be rehabilitated, modified, and replaced in order to meet safety requirements and continue their historic role in the transit network.				
5. Degree to which each alternative meets purpose and need	Does not meet purpose and need	Does not meet purpose and need	Meets purpose and need	Does not meet purpose and need	Does not meet purpose and need
6. Magnitude of adverse impacts not protected by Section 4(f)	Greater than Build Alternative A	Greater than Build Alternative A	Greater than Build Alternative A	Greater than Build Alternative A	Greater than Build Alternative A
7. Substantial differences in costs	Greater than Build Alternative A	Greater than Build Alternative A	Greater than Build Alternative A	Similar to Build Alternative A	Similar to Build Alternative A

Because there are no feasible and prudent avoidance alternatives to the Build Alternative, the seven factors above were considered to identify the alternative that would cause the least overall harm in light of the Section 4(f) preservation purposes. To reduce the overall harm, the Build Alternative (Alternative A) evolved through the planning process. The Build Alternative (Alternative A) is the only alternative besides Alternative D (Shift Mainline to East) that meets the purpose and need for the project. Compared to Alternative D, Alternative A would result in fewer and more limited physical effects on Section 4(f) resources, and would have fewer and more limited environmental impacts on other resources not protected by Section 4(f). Based on the

balancing of the least overall harm factors, the Build Alternative represents the alternative of least overall harm.

5.8 All Possible Planning to Minimize Harm

Section 4(f) requires a finding that the selected alternative includes all possible planning to minimize harm to Section 4(f) resources. "All possible planning" is defined in 23 CFR § 774.17, and states that a project must include documented consideration of all reasonable measures identified for minimizing and mitigating effects on Section 4(f) resources that would be used by the project. In evaluating the reasonableness of measures to minimize harm, FTA considered the following as defined in 23 CFR § 774.17:

- The preservation purpose of the statute
- The views of the official(s) with jurisdiction over the Section 4(f) resource
- The cost of the measures as a reasonable public expenditure in light of the adverse effects of the project on the Section 4(f) resource and the benefits of the measure to the resource
- Impacts or benefits of the measures for communities or environmental resources outside of the Section 4(f) resource

Through consultation with IHPA and consulting parties, FTA and CTA developed measures for the project to reduce the severity of effects, as well as to offset or mitigate adverse effects. The following is a summary of the stipulations developed to minimize and mitigate effects on Section 4(f) resources:

Elevated Rail Line - To minimize and mitigate effects on the elevated track structure, CTA is committed to the following:

- During the pre-construction project development process, CTA will solicit visual preferences regarding the elevated track structure from consulting parties. The feedback received will be included in the reference materials provided to firms bidding on the project. As part of the project contractor selection process, CTA will incorporate a selection criterion that provides additional points for proposals that consider the aesthetic qualities of the historic elevated track structure in their designs.
- CTA will develop an interpretive exhibit for installation within the project area discussing the history and context of the elevated North Red Line, specifically highlighting the technology and material components associated with the elevated track structure. The exhibit will be designed in consultation with a qualified historian or architectural historian who will assess the content and presentation to ensure that the important history and associations that contribute to the significance of the track structure are incorporated. The exhibit will be displayed in a publicly accessible space within 5 years of the final NEPA decision document.

- Before any demolition of the existing track structure within the project limits, CTA will prepare Historic American Engineering Record (HAER) documentation for the existing track structure within the project limits. CTA will coordinate in advance of construction activities with the National Park Service (NPS) to assess the appropriate level of HAER documentation. CTA will provide draft documentation to NPS to verify that it meets the specified standards and formats. Upon NPS approval, CTA will finalize the documentation for submittal through the HAER Program to the Library of Congress. One paper copy and one electronic copy of the final HAER documentation will be provided to IHPA.

Vautravers Building/Newport Avenue Historic District - To minimize adverse effects on the Vautravers Building, and by extension the Newport Avenue Historic District, three potential options were presented to consulting parties during the Section 106 consultation process for input: relocating the building to a different lot, salvaging the western portion of the building, and preserving key architectural elements for reuse.

Based on a high-level feasibility analysis discussed during the Section 106 consultation on September 25, 2014, it was determined that salvaging only a portion of the Vautravers Building on the west side of the structure would not be a feasible mitigation option. Because approximately three of the six units within the building would be removed to accommodate the alignment as part of the Build Alternative, the remainder of the building would retain an awkward shape and configuration, resulting in compromised functionality. Based on CTA's recent experience with keeping a portion of a historic building, the remaining portion of the structure would be difficult to lease/sell, resulting in no long-term solution for a responsible party to maintain the structure in good condition. IHPA and consulting parties agreed that the other potential mitigation measures under consideration (full relocation or preserving key architectural elements) provided more reasonable options to mitigate effects on the building.

To mitigate effects on the Vautravers Building and its contribution to the Newport Avenue Historic District, CTA is therefore committed to the following:

1. During the pre-construction project development process, CTA will examine the feasibility and cost implications of relocating the entire Vautravers Building. CTA, in coordination with FTA, will ultimately determine whether relocating the entire Vautravers Building is a viable option and a prudent expenditure. The determination of viability and prudence will be based on the following criteria:

    - The building can be moved without compromising the structural integrity to a degree that affects its function. This determination will be based on an on-site inspection by a structural engineer to determine whether the building's current condition can withstand a move, as well as whether its condition would be habitable afterwards.

    - The property (3427 N Clark Ave), onto which the building would have to be moved, can be acquired.

- The process of moving the building can be completed in a timely manner without an impact on the project construction schedule.

- The full cost of moving the building under these conditions, inclusive of all risks associated with moving the aging masonry building.

CTA will provide the results of this examination, as well as the proposed next steps, in a stand-alone written document to the IHPA and the consulting parties.

2. If FTA and CTA determine that relocation of the Vautravers Building represents a viable option and prudent expenditure, CTA and FTA are committed to the following:

   - CTA will move the Vautravers Building (i.e., the entirety of the building above the foundation) approximately 29 feet to the west, and place it on a new foundation. The work will be performed by a professional who has the demonstrated capability to move historic buildings.

   - CTA will solicit input from community stakeholders to determine whether any remaining open space surrounding the relocated Vautravers Building should be made available for redevelopment or preserved as open space upon completion of the project.

   - CTA will coordinate with the Commission on Chicago Landmarks to update the 2004 Landmark Designation Report prepared for the Newport Avenue District. The update will reflect an expansion of the district boundary on the western side, shifted west to include the entirety of the relocated Vautravers Building.

3. Otherwise, if FTA and CTA determine that relocation of the Vautravers Building does not represent a viable option or prudent expenditure, CTA and FTA are committed to the following:

   - CTA will solicit feedback from the IHPA and the consulting parties regarding which, if any, key architectural features of the Vautravers Building should be removed and preserved before demolition. The key architectural features could include copper detailing on the window bays, dentil molding, the stone archway, the stone pediment, and the stained glass transom above the entry door.

     CTA will solicit feedback on the use of any key architectural features preserved. Options to be considered would be physically incorporating the key architectural features into a potential redevelopment occurring on the block bounded by Newport Avenue, Clark Street, and the elevated Red and Purple line track structure, or making the features available to an architectural material preservation organization. CTA will incorporate appropriate commitment language into its solicitation package for development proposals.

- CTA will solicit feedback from the IHPA and the consulting parties regarding other aesthetic considerations, such as height, surface materials/treatments, and setbacks, for any redevelopment occurring on the block bounded by Newport Avenue, Clark Street, and the elevated Red and Purple line track structure. CTA will seek input from IHPA and the consulting parties before completion of a solicitation package for development proposals. CTA will incorporate appropriate commitment language into its solicitation package for development proposals.

- Before any demolition of the Vautravers Building, CTA will prepare Illinois Historic American Building Survey (IL HABS) documentation for the existing building. IL HABS documentation will be provided to IHPA for review and approval before any demolition.

- CTA will coordinate with the Commission on Chicago Landmarks to update the 2004 Landmark Designation Report prepared for the Newport Avenue District. The update will reflect that the Vautravers Building is no longer an element contributing to the district. The western boundary of the district will be shifted east of the track structure.

In addition to commitments noted above which were developed as part of the Section 106 consultation process, CTA is committed to the following additional planning effort as part of the final NEPA decision document to minimize disruption to neighborhoods and communities:

- Prepare a Neighborhood Redevelopment Plan. This plan would identify opportunities for development that would be near CTA stations and facilities in the community and would conform to fit the context of the neighborhood.

5.9 Consultation and Coordination

The Section 4(f) evaluation has involved consultation and coordination with agencies and the public. CTA conducted outreach efforts with area residents, property owners, and key stakeholders with respect to development of the Build Alternative and effects on historic resources. This effort has included coordination with IHPA and consulting parties as part of the Section 106 process for historic resources. On January 20, 2015, FTA and CTA sent correspondence on findings of the Section 106 consultation process to the Advisory Council for Historic Preservation (ACHP) and solicited their participation. ACHP responded on March 25, 2015, requesting to join the Section 106 consultation. Coordination and consultation with IHPA, ACHP, consulting parties and the public has continued throughout development of the EA.

IHPA and consulting party involvement has been extensive, including written and verbal coordination and communications, resource identification and evaluations, one-on-one meetings, and field reviews. FTA and CTA have consulted with IHPA, consulting parties, and the general public about effects on historic resources and measures to avoid and/or minimize effects on historic resources. This coordination will culminate in a signed MOA for the Section 106 process, a public hearing on the EA, and a final decision document for this NEPA analysis. A Draft MOA, developed in coordination with IHPA and consulting parties, is contained in **Appendix D-4** of the EA and provisions are summarized in **Section 5.8** of this Section 4(f) Evaluation.

In addition, to meet Section 4(f) coordination and review requirements, this evaluation is required to be reviewed and approved by FTA and made available to the Department of Interior for a 45-day review and comment period.

5.10 Section 4(f) Determination Conclusions

Based on the analysis above, FTA finds that there is no feasible and prudent avoidance alternative to the use of the CTA elevated track structure. There is also no feasible and prudent alternative to avoid use of the Vautravers Building/Newport Avenue Historic District. As described in **Section 5.7**, the Build Alternative represents the alternative of least overall harm. The Build Alternative includes all possible planning to minimize harm to the Section 4(f) resources resulting from use, as described in **Section 5.8**.

All project commitments for historic resources in the project area will be further detailed in the final, signed MOA and final NEPA decision document to ensure compliance is binding for provisions to minimize harm.