

RED AHEAD
Moving Ahead to a Better Red



Lawrence to Bryn Mawr Modernization Project

Environmental Assessment and Section 4(f) Evaluation

April 29, 2015

Federal Transit Administration

Chicago Transit Authority



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Environmental Assessment and Section 4(f) Evaluation

for the

Lawrence to Bryn Mawr Modernization Project Chicago, Illinois

prepared by the

U.S. Department of Transportation
Federal Transit Administration

and the

Chicago Transit Authority

pursuant to:

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(49 USC § 303)

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Table of Contents

Executive Summary	ES-1
Lawrence to Bryn Mawr Modernization Project	ES-1
Alternatives Considered	ES-1
Environmental Impacts and Measures to Avoid or Minimize Harm.....	ES-3
Public Input Requested	ES-6
Chapter 1 Purpose and Need.....	1
1.1 Project Background.....	1
1.2 Needs to be Addressed	7
1.3 Project Purpose	10
1.4 Organization of the Document	10
Chapter 2 Alternatives Considered	12
2.1 Alternatives Development Process.....	12
2.2 No Build Alternative	16
2.3 Build Alternative	17
2.4 Subsequent Phases of the RPM Program.....	30
Chapter 3 Transportation	32
3.1 Regulatory Framework/Methods	32
3.2 Existing Conditions.....	32
3.3 Environmental Impacts	35
3.4 Measures to Avoid or Minimize Harm.....	42
Chapter 4 Environmental Resources, Impacts, and Mitigation Measures.....	44
4.1 Displacements and Relocations of Existing Uses	44
4.2 Land Use and Economic Development.....	50
4.3 Neighborhoods, Communities, and Businesses.....	56
4.4 Historic and Archaeological Resources.....	62
4.5 Visual and Aesthetic Conditions	70
4.6 Noise.....	80
4.7 Vibration	88
4.8 Hazardous Materials	94
4.9 Environmental Justice.....	100
4.10 Indirect and Cumulative.....	108

4.11	Resources with Limited or No Impacts.....	111
Chapter 5 Public and Agency Coordination		113
5.1	Public Outreach	113
5.2	Agency Coordination	115
5.3	Environmental Assessment Distribution and Public Comment Period	117
5.4	Next Steps.....	118
Chapter 6 Section 4(f) Evaluation		119
6.1	Supporting Information for this Section 4(f) Evaluation	119
6.2	Regulatory Framework	119
6.3	Organization of this Chapter.....	120
6.4	Identification of Section 4(f) Resources.....	121
6.5	Assessment of Use of Section 4(f) Resources.....	126
6.6	Avoidance Analysis	128
6.7	Least Overall Harm Analysis	135
6.8	All Possible Planning to Minimize Harm	143
6.9	Consultation and Coordination.....	146
6.10	Section 4(f) Determination Conclusions	146
Figures		
	Figure 1-1: Red Ahead Program Overview	2
	Figure 1-2: Red and Purple Modernization Program Corridor Overview Map.....	4
	Figure 1-3: Lawrence to Bryn Mawr Modernization Project Limits	6
	Figure 1-4: Photo Showing Passenger Crowding on North Red Line Train.....	8
	Figure 1-5: Photo Showing Current Condition of Embankment Wall	9
	Figure 1-6: Photo Showing Current Condition of Deteriorating Concrete Viaduct.....	9
	Figure 1-7: Environmental Assessment Document Organization.....	11
	Figure 2-1: February 2012 Changes in Alternatives Considered.....	15
	Figure 2-2: Lawrence to Bryn Mawr Modernization Build Alternative Map	18
	Figure 2-3: Photo of Existing Station Interior at Bryn Mawr Station and Conceptual Rendering of Proposed Station Interior Improvements	20
	Figure 2-4: Photo of Existing Platform (12-foot Width) and Conceptual Rendering of Proposed Platform-Level Improvements (22-foot Width) at Bryn Mawr Station	21
	Figure 2-5: Alley Spanning Concept	22
	Figure 2-6: Schematic of Existing Viaduct	23
	Figure 2-7: Photo Showing Existing Viaduct at Balmoral Avenue	23
	Figure 2-8: Photo Showing Existing Station and Viaduct and Conceptual Rendering of Proposed Viaduct and Station Improvements at Lawrence Station	24

Figure 2-9: Schematic of Existing Embankment Wall Track Support	25
Figure 2-10: Schematic of Proposed Track Structure and Embankment between Stations (top) and at Stations (bottom)	26
Figure 2-11: Conceptual Construction Staging Diagram	28
Figure 3-1: Existing Walk Times for Pedestrians Within the Project Area	34
Figure 3-2: Difference in Walking Time for Southbound Passengers During Construction Stage A.....	39
Figure 3-3: Difference in Walking Time for Southbound Passengers During Construction Stage B.....	40
Figure 4-1: Overview of Potentially Displaced Properties	46
Figure 4-2: Current Land Uses in the Project Area.....	53
Figure 4-3: Current Zoning in the Project Area	54
Figure 4-4: Lawrence Station Opening, February 1923.....	58
Figure 4-5: Argyle Station in the 1940s.....	58
Figure 4-6: Historic Area of Potential Effects Boundary and NRHP-Eligible Resources	65
Figure 4-7: Photos of Lawrence, Argyle, Berwyn, and Bryn Mawr Stations	72
Figure 4-8: Photos of Deteriorating Structures	73
Figure 4-9: Photos of Deteriorating Embankment Walls.....	73
Figure 4-10: Embankment Wall on East Side of Track near Balmoral Avenue (left) and Embankment Wall on East Side of Track near Winona Street (right) with Shoring/Plating Repairs for Structural Support.....	74
Figure 4-11: Photo of Existing Platform (12-foot Width) and Conceptual Rendering of Proposed Improvements (22-foot Width) at Bryn Mawr Station (Facing South)	76
Figure 4-12: Bryn Mawr Viaduct and Station Entrance: Photo and Conceptual Rendering.....	77
Figure 4-13: Alley Spanning Concept.....	78
Figure 4-14: Locations of Noise-Sensitive Receiver Clusters with Noise Impacts Before Mitigation	85
Figure 4-15: Locations of Vibration-Sensitive Receivers with Vibration Impacts Before Mitigation	92
Figure 4-16: Identified Hazardous Materials Sites of Concern.....	97
Figure 4-17: Low-Income Populations.....	103
Figure 4-18: Minority Populations.....	104
Figure 6-1: Area of Potential Effects Boundary and NRHP-Eligible Resources	123
Figure 6-2: Photo of the CTA Elevated Track Structure.....	126
Figure 6-3: Views of Argyle Station Circa 1985 and 2012	127
Figure 6-4: Photo of CTA-Owned Retail Building at Argyle Station	127
Figure 6-5: Photos of CTA-Owned Retail Building at Bryn Mawr Station	128

Tables

Table ES-1: Summary of Impacts, Benefits, and Measures to Avoid or Minimize Harm	ES-3
Table 4-1: Property Displacements	47
Table 4-2: Displacements for Construction	49
Table 4-3: Community Area Population Profile	57
Table 4-4: Project Area Profile	57
Table 4-5: Individually Eligible Properties in the Area of Potential Effects	66
Table 4-6: Existing Historic Districts in the Project Area	66
Table 4-7: Section 106 Effects Determinations	67
Table 4-8: Existing and Predicted Noise Levels and Moderate and Severe Impacts at Noise-Sensitive Receiver Clusters	84
Table 4-9: Existing and Predicted Vibration Levels and Impacts at Vibration-Sensitive Receiver Clusters	91
Table 4-10: Linguistic Isolation by Station and Community Area	108
Table 6-1: Resources Eligible for or Listed on the National Register of Historic Places in the Area of Potential Effects	122
Table 6-2: Least Overall Harm Comparisons to the Build Alternative	143

Appendices

Appendix A: References Cited

Appendix B: Build Alternative Supporting Documentation

B-1: Vision Study Summary

B-2: Conceptual Engineering Plans

Appendix C: Environmental Assessment Technical Memoranda

C-1: Individual Property Displacement Information Sheets

C-2: Land Use and Economic Development Technical Memorandum

C-3: Neighborhood and Community Impacts Technical Memorandum

C-4: Historic and Cultural Resources Technical Memorandum

C-5: Noise and Vibration Technical Memorandum

C-6: Hazardous Materials Technical Memorandum

C-7: Environmental Justice Technical Memorandum

C-8: Resources with Limited or No Adverse Impacts Technical Memorandum

Appendix D: Public and Agency Outreach

D-1: Spring 2014 Public Involvement Summary

D-2: Property Displacements Outreach

D-3: Agency Coordination

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.
EJ	environmental justice
EIS	environmental impact statement
ESA	environmental site assessment
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HPP	Historic Preservation Plan
IDOT	Illinois Department of Transportation
IHPA	Illinois Historic Preservation Agency
L _{eq}	equivalent continuous sound level

L _{dn}	day-night average sound level
L _{max}	maximum noise level
L _v	vibration velocity level
MFR	multifamily residence
MOA	Memorandum of Agreement
MOT	Maintenance of Traffic
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
PPV	peak particle velocity
Q&A	question-and-answer
RPM	Red and Purple Modernization
SFR	single-family residence
SHPO	State Historic Preservation Officer
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
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
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, paving the way for 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 Lawrence to Bryn Mawr Modernization Project and the Red-Purple Bypass 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 Lawrence to Bryn Mawr Modernization Project.

Lawrence to Bryn Mawr Modernization Project

The Lawrence to Bryn Mawr Modernization Project would include reconstruction of approximately 1.3 miles of the existing rail line from Leland Avenue on the south to near Ardmore Avenue on the north. The four stations (Lawrence, Argyle, Berwyn, and Bryn Mawr) in this segment of railroad would be completely reconstructed and would be expanded, modernized, and made accessible in accordance with Americans with Disabilities Act (ADA) standards.

The proposed project would provide continued high-speed transit service connecting Chicago's North Side and northern suburbs to the Loop and the rest of the Chicago metropolitan area and would expand capacity to meet growing ridership demand, while reducing train travel times and improving access to the system for people with disabilities. The capacity expansion would have the added benefit of bringing the aging rail infrastructure into a state of good repair, thereby improving efficiency and service reliability. Providing modern amenities at all stations, expanding passenger capacity, and enhancing speed and reliability would address safety and accessibility concerns and extend the useful life of the system. 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 Lawrence to Bryn Mawr Modernization Project.

No Build Alternative

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 rehabilitating or modernizing the Red and Purple lines. It represents the future

situation that would likely exist if the Lawrence to Bryn Mawr Modernization Project were not implemented.

Build Alternative

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

- **Stations** - The Lawrence, Argyle, Berwyn, and Bryn Mawr stations would be completely reconstructed. New features such as elevators, wider and longer platforms, and wider stairways would increase capacity, provide ADA accessibility, and improve passenger and emergency access.
- **Tracks** - The elevated track system from Leland Avenue to near Ardmore Avenue would be completely reconstructed. The proposed structure would be a closed-deck, aerial structure with direct-fixation track, welded rail, and noise barriers (approximately 3 to 5 feet in height) to reduce noise transmission at and below track level. Widening would take place over adjacent alleys along the east side of the alignment. Near the Aragon Ballroom, part of the widening would occur to the west of the existing alignment to avoid effects on this historic venue.
- **Viaducts** - The new, aerial support structure would increase the height of the existing track approximately 5 to 10 feet. Viaducts would be replaced and improvements would remove piers in the roadway throughout the project corridor, improving sightlines and safety for pedestrians, drivers, and bicyclists.
- **Embankment Walls** - Reconstruction of stations would involve removal of portions of the existing embankment walls and earth-fill to construct the new stationhouses.

Construction Staging

Off-street construction sites would be used throughout construction to minimize street closures. During construction, Red Line train trips will continue on 24-hour schedules and the frequency of Red and Purple line trains will generally be the same as it is currently. Two stages of track construction are anticipated for this project.

- **Stage A** - For approximately 18 months, the east two tracks would be reconstructed while Red and Purple line trains share the existing two western tracks. The Lawrence and Berwyn stations would be closed. Customers would access the Red and Purple line trains using temporary platforms at Bryn Mawr and Argyle stations.
- **Stage B** - For approximately 18 to 24 months, the two western tracks would be reconstructed, while Red and Purple line trains share the two newly reconstructed tracks on the east. Lawrence, Argyle, and Berwyn stations would be closed. Customers would access the Red and Purple line trains using temporary platforms at Bryn Mawr (southbound only) and Foster/Winona (both directions).

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 \$1.33 billion in year-of-expenditure dollars.

Environmental Impacts and Measures to Avoid or Minimize Harm

Potential adverse environmental impacts, best management practices, and mitigation measures are detailed in **Chapters 3 and 4** 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 <i>Chapter 3</i>	No impacts.	<p>Construction</p> <ul style="list-style-type: none"> ■ Phased, temporary station closures would cause additional walk times to and from stations for passengers. Pedestrian detours would be required. ■ Bicycle parking at stations would be temporarily displaced during construction. <p>Permanent</p> <ul style="list-style-type: none"> ■ Permanent benefits on transit, pedestrians, and bicyclists. ■ No permanent impacts on traffic and parking. <p>Measures to Avoid or Minimize Harm</p> <ul style="list-style-type: none"> ■ Station entrances will be reconfigured to separate passengers from active construction zones. Temporary station entrances will be provided. ■ Train and bus service disruptions during construction will occur during weekends and off-peak periods to the extent possible. CTA will provide notifications for temporary service changes to neighboring property owners, residents, businesses, and transit passengers. ■ Bus routes affected by construction will be temporarily rerouted. ■ CTA will add service to parallel and connecting bus routes as necessary to accommodate additional riders choosing to take buses instead of the Red Line due to temporary station closures.
Displacements and Relocations of Existing Uses <i>Section 4.1</i>	No impacts.	<p>Construction</p> <ul style="list-style-type: none"> ■ Temporary displacement of four parking lots and air rights or construction easements for some buildings. <p>Permanent</p> <ul style="list-style-type: none"> ■ Two commercial displacements (two adjacent Toyota car dealerships) and several parking lots. No residential parcels. <p>Measures to Avoid or Minimize Harm</p> <ul style="list-style-type: none"> ■ Displaced owners and tenants will be compensated and relocated per the Uniform Act and FTA guidelines. ■ For temporary construction easements, CTA will work with the businesses and owners to establish reasonable compensation for the temporary use of property.

Resource Area	No Build Alternative	Build Alternative
<p>Land Use and Economic Development <i>Section 4.2</i></p>	<p>No impacts.</p>	<p>Construction</p> <ul style="list-style-type: none"> ■ No construction-related land use impacts. ■ Minimal impacts on economic development. <p>Permanent</p> <ul style="list-style-type: none"> ■ No permanent impacts on land use and economic development. ■ Portions of parcels remaining after construction could potentially be redeveloped with transit-related uses in cooperation with the CTA. This potential redevelopment would be independent of the project, and would be consistent with surrounding land uses and City zoning standards. <p>Measures to Avoid or Minimize Harm</p> <ul style="list-style-type: none"> ■ CTA will develop and implement a Construction Outreach and Coordination Plan to assist local businesses and residences affected by construction. ■ CTA will work with the City of Chicago Department of Planning and Development (DPD) to provide incentives to encourage transit-oriented redevelopment, consistent with local and regional development plans, as soon as construction activities allow.
<p>Neighborhoods, Communities, and Businesses <i>Section 4.3</i></p>	<p>No impacts.</p>	<p>Construction</p> <ul style="list-style-type: none"> ■ 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. <p>Permanent</p> <ul style="list-style-type: none"> ■ Permanent benefits to the surrounding neighborhoods, communities, and businesses. <p>Measures to Avoid or Minimize Harm</p> <ul style="list-style-type: none"> ■ CTA will develop and implement a Construction Outreach and Coordination Plan. ■ CTA will work with DPD to provide incentives to encourage transit-oriented redevelopment as soon as construction activities allow.
<p>Historic and Archaeological Resources <i>Section 4.4</i></p>	<p>Indirect adverse effect. Degradation of the track infrastructure would interfere with the track continuing to serve its historic function.</p>	<p>Permanent</p> <ul style="list-style-type: none"> ■ The project would result in adverse effects on four historic resources: the elevated track structure, the Uptown Square Historic District; the West Argyle Street Historic District, and the Bryn Mawr Avenue Historic District. <p>Measures to Avoid or Minimize Harm</p> <ul style="list-style-type: none"> ■ CTA, FTA and IHPA worked together to develop commitments that would integrate historic elements into the new stations that link to the historic districts. In addition, an interpretive display conveying the history and significance of the north Red and Purple lines is proposed. A Draft Memorandum of Agreement detailing these measures is provided in Appendix C-4.

Resource Area	No Build Alternative	Build Alternative
Visual and Aesthetic Conditions <i>Section 4.5</i>	Impacts related to the plating and/or shoring of the embankment or concrete structures.	<p>Construction</p> <ul style="list-style-type: none"> ■ Construction of the Build Alternative would result in temporary adverse impacts on the surrounding visual environment due to construction work zones. <p>Permanent</p> <ul style="list-style-type: none"> ■ The Build Alternative would improve the visual quality by replacing deteriorating infrastructure with a modern structure and enhancing station areas. <p>Measures to Avoid or Minimize Harm</p> <ul style="list-style-type: none"> ■ During construction, CTA will attempt to maintain as much existing vegetation as practical. BMPs will be employed and off-site construction areas are proposed to minimize visual and aesthetic impacts during construction. ■ 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 work with the City of Chicago and local community organizations to develop a Station Area Plan or other redevelopment plans and policies as an appendix or update to existing neighborhood plans and business district plans.
Noise <i>Section 4.6</i>	No impacts.	<p>CTA identified 68 noise-sensitive clusters within the project area.</p> <p>Construction</p> <ul style="list-style-type: none"> ■ Temporary impacts on noise-sensitive receivers within 50 feet of construction activities. <p>Permanent</p> <ul style="list-style-type: none"> ■ Moderate and severe noise impacts would occur on 20 receivers where buildings would be very near the track or near major sources of noise such as special trackwork like crossovers. <p>Measures to Avoid or Minimize Harm</p> <ul style="list-style-type: none"> ■ Construction noise will be reduced with alternate operational methods, scheduling, equipment choice, and acoustical treatments and implementation of BMPs. ■ Options for mitigating permanent noise impacts include installing devices to minimize noise from crossovers, rail dampers, residential sound insulation, and using ballast-and-tie track rather than direct-fixation track.

Resource Area	No Build Alternative	Build Alternative
Vibration <i>Section 4.7</i>	No impacts.	CTA identified 68 vibration-sensitive clusters within the project area. Construction <ul style="list-style-type: none"> Construction vibration levels may exceed the vibration risk of damage criteria at some receivers that are within 15 feet of the construction. Permanent <ul style="list-style-type: none"> Vibration impacts would occur at 12 vibration-sensitive receivers close to the project right-of-way, where the support column could be as close as 3 feet from the existing buildings. Measures to Avoid or Minimize Harm <ul style="list-style-type: none"> Project contractors will use less vibration-intensive construction equipment or techniques to the extent possible near vibration-sensitive buildings. Options for mitigating permanent vibration impacts include siting support columns away from sensitive receivers, installing rubber bearing pads, installing devices to minimize vibration from crossovers, and installing high-resilience direct-fixation fasteners.
Hazardous Materials <i>Section 4.8</i>	No impacts.	Construction <ul style="list-style-type: none"> There would be the potential to encounter hazardous materials during construction. BMPs would be followed to reduce risk. Permanent <p>The Build Alternative would result in removal of asbestos and lead-based paint associated with reconstructed stations and the cleanup and/or removal of contaminated material.</p>
Environmental Justice <i>Section 4.9</i>	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 <i>Section 4.10</i>	No impacts.	The Build Alternative takes into account and is being coordinated with other projects being conducted or planned 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 <i>Section 4.11</i>	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), as well as at the 46th Ward (4544 N. Broadway, Chicago IL 60640) and 48th Ward (5533 N. Broadway, Chicago, IL 60640) aldermanic offices. Hard copies of the EA are also available at the following libraries during the public review period:

- Bezazian Library, 1226 W. Ainslie Street, Chicago, IL 60640
- Uptown Library, 929 W. Buena Avenue, Chicago, IL 60613
- Edgewater Library, 6000 N. Broadway, Chicago, IL 60660
- 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 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 LawrenceToBrynMawr@transitchicago.com and U.S. mail to Chicago Transit Authority, Strategic Planning, 10th Floor, Attn: Lawrence to Bryn Mawr Modernization 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 the Lawrence to Bryn Mawr Modernization Project. The project would completely rebuild and modernize the Lawrence, Argyle, Berwyn, and Bryn Mawr Red Line stations and associated rail line tracks and structures. 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 Lawrence to Bryn Mawr Modernization 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 (USDOT) 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 effects of implementing the Lawrence to Bryn Mawr Modernization Project on the physical, human, and natural environments along the corridor and near stations. 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 Red Ahead Program, FTA and CTA have been analyzing proposed improvements to the line (see **Figure 1-1**). Among the improvements are those proposed by the Red and Purple Modernization (RPM) Program.

The RPM Program is a series of proposed improvements to the North Red Line (from just north of Belmont station to the northern terminus of the Red Line at Howard station) and the Purple Line (from just north of Belmont station to the Village of Wilmette). 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 at Linden station, passing through the Lakeview, Uptown, Edgewater, and Rogers Park community areas, the City of Evanston, and the Village of Wilmette.

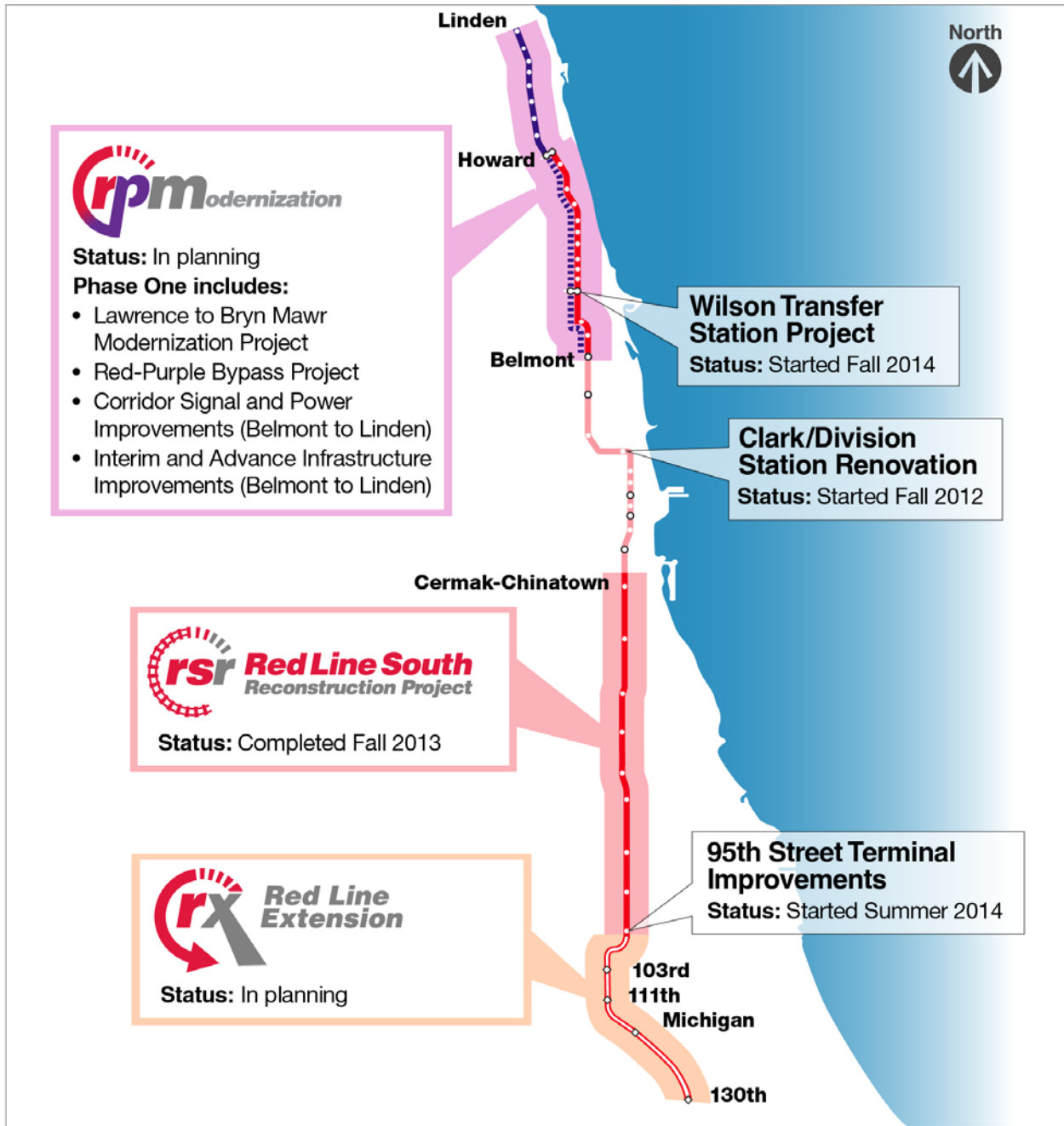


Figure 1-1: Red Ahead Program Overview

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 RPM is proposed to include two discrete projects within the 9.6-mile RPM corridor (see **Figure 1-2**):

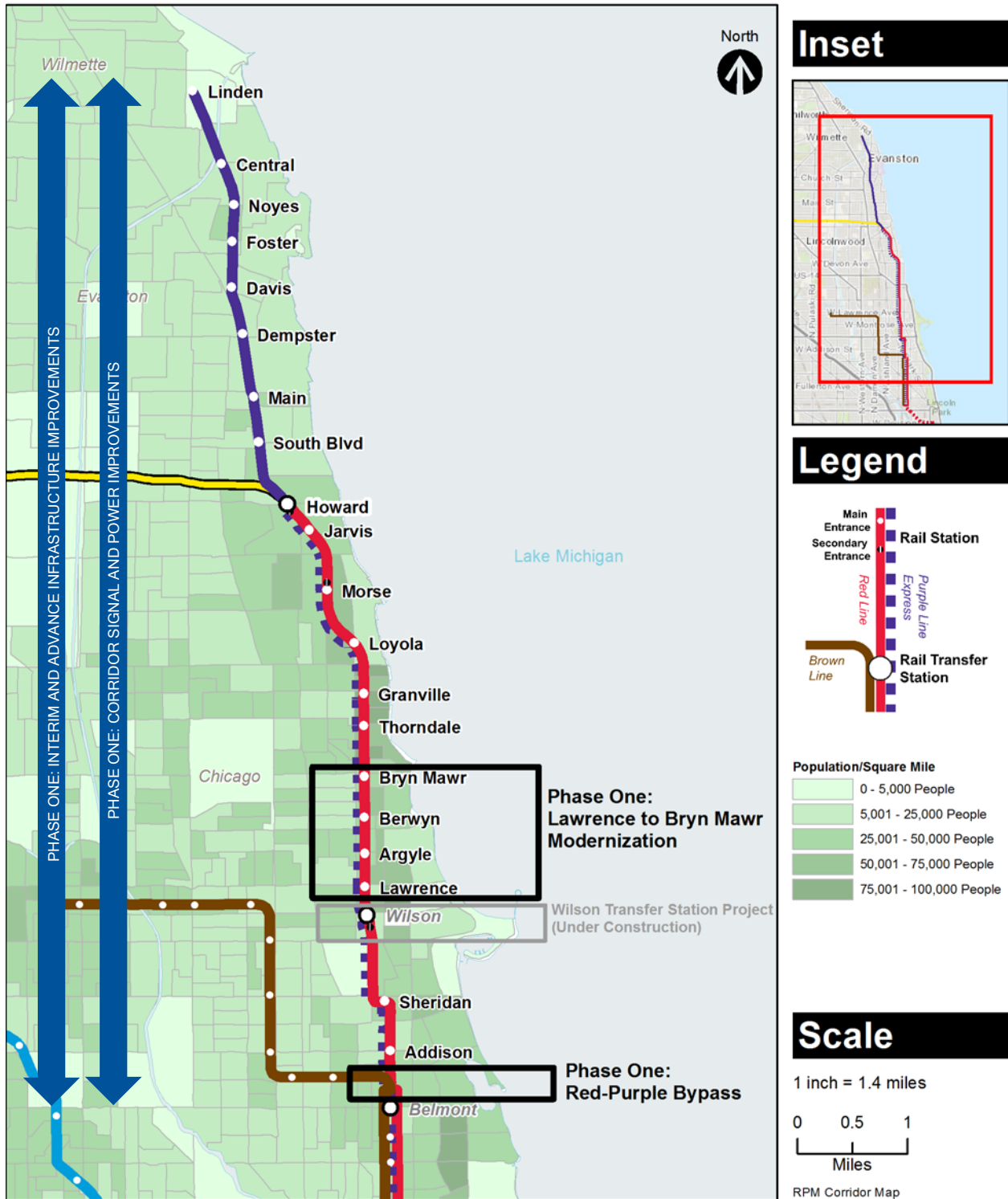
- **Lawrence to Bryn Mawr Modernization** - Modernization of four Red Line stations (Lawrence, Argyle, Berwyn, and Bryn Mawr) and aging CTA structures including tracks, embankment walls, viaducts, platforms, and stations from Leland Avenue on the south to near Ardmore Avenue on the north.
- **Red-Purple Bypass** - Construction of a bypass for the Brown Line at Clark Junction, just north of Belmont station, and 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.

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. Additionally, it will not restrict consideration of alternatives for future RPM improvements.¹ 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(f)). 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.



Source: U.S. Census Bureau 2012

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

1.1.2 Lawrence to Bryn Mawr Modernization Project

This EA addresses one major element of the first phase of the RPM Program, the Lawrence to Bryn Mawr Modernization Project. CTA proposes to reconstruct approximately 1.3 miles of the existing rail line track from Leland Avenue on the south to near Ardmore Avenue on the north in the Uptown and Edgewater Chicago community areas. Four stations, the Lawrence, Argyle, Berwyn, and Bryn Mawr stations, would be expanded, modernized, and made accessible according to the Americans with Disabilities Act (ADA). The Lawrence to Bryn Mawr Modernization Project would increase passenger capacity and comfort through construction of new rail infrastructure throughout the project limits. The improvements would also enhance station access along the corridor, expand platforms, and replace and modernize the structural system, which is more than 90 years old. **Figure 1-3** shows the project limits and the extent of the proposed improvements. While some basic rehabilitation of track and stations has been conducted in recent years, the lines and stations have never been fully modernized.

The remaining sections of this chapter underscore the purpose and need for the project—that is, the reasons this project is proposed and important. **Section 2.3** contains additional detailed information on the proposed project.

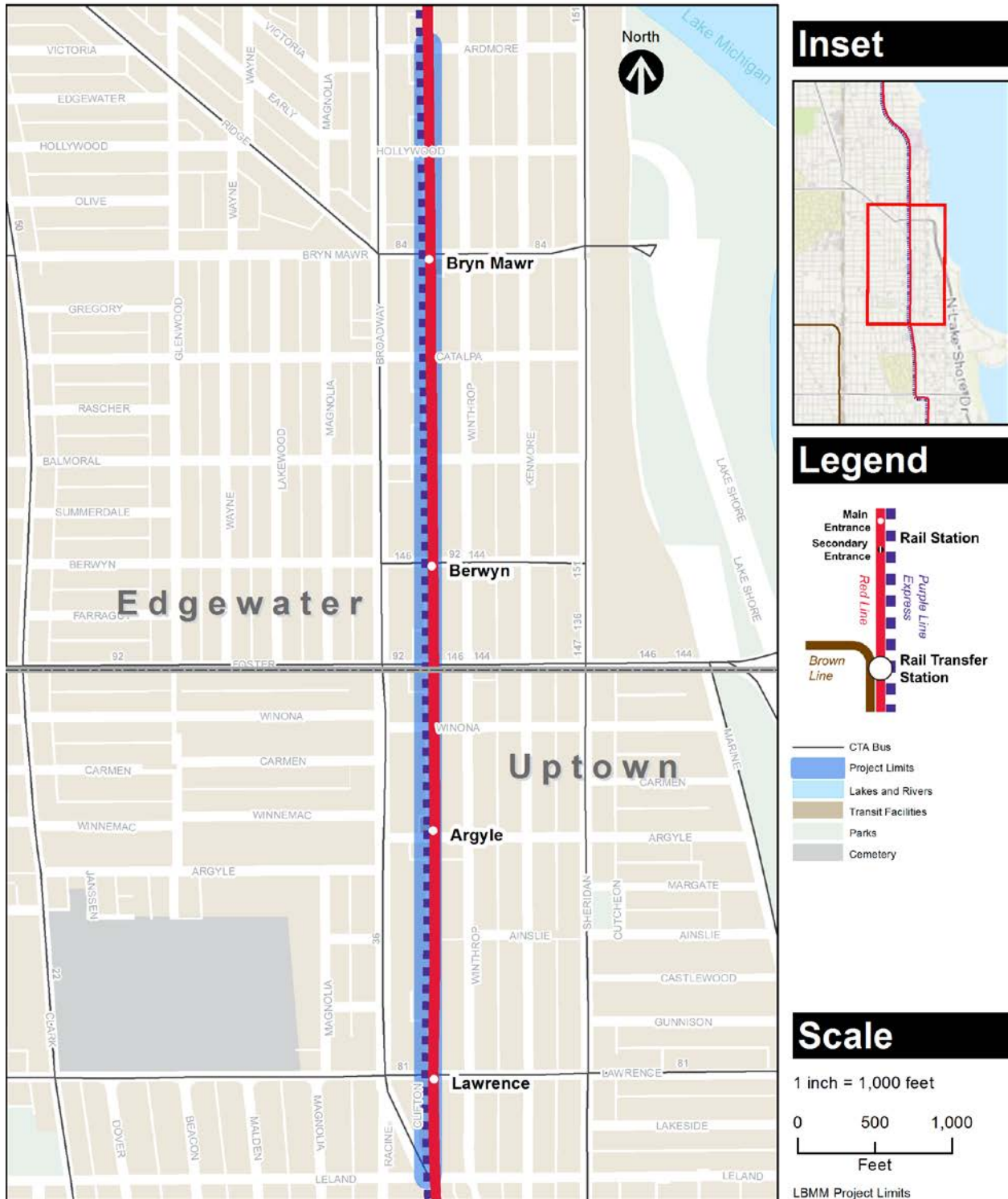


Figure 1-3: Lawrence to Bryn Mawr Modernization Project Limits

1.2 Needs to be Addressed

A number of problems help define the overall need for the Lawrence to Bryn Mawr Modernization Project. The following key factors define the project need:

- **A substantial number of transit passengers rely on the existing train line 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 20 percent of all CTA train trips and serve passengers in some of the densest neighborhoods of Chicago. Many of these passengers rely upon the 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 2014d, Cushman & Wakefield 2014). More than 110,000 people live in the Uptown and Edgewater community areas, where this project is proposed (U.S. Census Bureau 2012). More than 28,000 weekday train trips begin or end at the four stations proposed for reconstruction; almost 80,000 weekday train trips pass through this segment of railroad (CTA 2014b).
- **Peak ridership demand exceeds existing infrastructure capacity, both on the line and at stations.** The aging track structure within the project corridor affects line capacity, reliability, and emergency operation. The narrow platforms at stations in the project corridor do not accommodate the number of passengers loading and unloading or entering and exiting the platform, which contributes to long dwell times (the time a train stands at each station while passenger loading and unloading takes place).
- **Surrounding communities rely on rail service.** The project area is highly transit-reliant and is therefore affected considerably by increases and decreases in transit service and reliability. Approximately 46 percent of the population within ½ mile of the Lawrence to Bryn Mawr Modernization Project area does not own a car (U.S. Census Bureau 2012). In addition, many passengers choose public transportation over vehicular travel for trips within the RPM corridor; 58 percent of public transportation passengers in the RPM corridor have access to a vehicle yet still choose transit to get to work (U.S. Census Bureau 2012).
- **Passenger crowding is common on trains and platforms.** CTA has increased service on the Red and Purple lines to address crowding across the system by adding eight trains during morning peak periods and ten trains during evening peak periods since early 2012 (CTA 2014c). **Figure 1-4** shows a crowded North Red Line train during rush hour.



Figure 1-4: Photo Showing Passenger Crowding on North Red Line Train

■ **Existing infrastructure is substantially past its useful life.**

The rail line opened in phases from 1900 to 1912 as a freight rail system. Passenger rail stations in the project area are over 90 years old; the North Red and Purple line track infrastructure itself is as old or older than the stations and both stations and structural infrastructure are substantially past their useful lives. **Figures 1-5 and 1-6** show the deterioration of concrete structures in the project area. Infrastructure problems include the following:

- Tracks are deteriorating and embankment walls and structures are deficient. These conditions create slow zones and cause longer travel times as well as unreliable service for transit users.
- Many of the stations are antiquated, and are situated on embankment (14 to 17 feet in height) along narrow right-of-way (60 feet wide), supported by deteriorating embankment walls, making it difficult or impossible to expand platforms.
- Track ballast (crushed rock that supports rails), drainage systems within the embankment, and underlying soil along the embankment no longer drain properly. The lack of adequate drainage becomes most pronounced during winter months when the combined impact of drainage issues and winter effects (e.g., frost heaving) can lead to deficiencies in the track and stormwater infiltration into stationhouses, contributing to the difficulty in maintaining stations.
- The embankment walls have deteriorated in part because they were constructed of concrete that does not include entrained air, a construction technique used today to reduce the impact of freeze-thaw cycles.



Figure 1-5: Photo Showing Current Condition of Embankment Wall at Hollywood Avenue



Figure 1-6: Photo Showing Current Condition of Deteriorating Concrete Viaduct Requiring Shoring at Hollywood Avenue

- **Station improvements are needed to ensure ADA accessibility.** Improving ADA accessibility is critical to meeting passenger needs. Although CTA has been making strides in increasing ADA accessibility across the system, the project area includes four stations that do not currently provide ADA access. Even after the Wilson Transfer Station Project is complete (making Wilson station ADA accessible), a 2-mile gap would exist between accessible stations along the North Red Line. Within $\frac{1}{2}$ mile of the project corridor, approximately 12 percent of the population is elderly and approximately 10 percent is disabled (U.S. Census Bureau 2012). These groups are often also transit-dependent, and would realize benefits from enhanced ADA-accessible facilities in the project corridor.

Adding ADA access to the stations is not simple, because the existing narrow platforms in their current configuration prevent CTA from adding elevators. At other stations within the RPM corridor, like Granville (two stations north of the project limits), elevators were added to

narrow platforms; however, those improvements do not meet current National Fire Protection Association Standard 130 and cannot be built today.

- **Maintaining safe operating conditions becomes more difficult and costly as infrastructure continues to degrade.** Slow zones on the CTA system are instituted in areas where train speeds are restricted to maintain safe travel. In August 2014, more than 6.5 miles (19.4 percent) of RPM corridor track were slow zones, requiring trains to operate more slowly and increasing the travel time needed (CTA 2014a). 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. Steadily declining rail operating speeds contribute to reduced efficiency in corridor transit service even where high ridership exists. When trains cannot run according to schedule, passenger loads are distributed unevenly, and service suffers. The increases in degraded track and associated slow zones have impacts on other elements of the system, causing effects such as increased wear on rail vehicles.

Removing slow zones through repair work is common throughout the CTA system; however, slow zones develop more rapidly when the underlying infrastructure is past its useful life. Based on CTA slow zone data from 2008 to 2012, each year CTA has needed to repair and replace an average of 3.4 linear miles of track to mitigate slow zones in the RPM corridor, at an estimated annual cost of \$11.5 million (CTA 2012).

1.3 Project Purpose

The purpose of the Lawrence to Bryn Mawr Modernization Project is to provide continued high-speed transit service connecting Chicago's North Side and northern suburbs to the Loop and the rest of the Chicago metropolitan area and to expand capacity to meet growing ridership demand, while reducing train travel times and improving access to the system for people with disabilities. The capacity expansion would have the added benefit of bringing the aging rail infrastructure into a state of good repair, thereby improving efficiency and service reliability. Provision of modern amenities at all stations, expansion of passenger capacity, and speed and reliability enhancements would address safety and accessibility concerns and extend the useful life of the system.

1.4 Organization of the Document

NEPA documents such as this EA must provide sufficient technical detail 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. References are cited throughout this document. A letter appears after an in-text citation when this document references 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. **Appendix A** contains the full reference list.

<p>Chapter 1</p> <p>Purpose and Need</p>	<p>This chapter is the foundation of the document. It introduces the project, provides background, and explains why the project is proposed and important.</p>
<p>Chapter 2</p> <p>Alternatives Considered</p>	<p>This chapter reviews the planning process and the alternatives that were considered during project development, and it describes the alternatives under further consideration in this Environmental Assessment.</p>
<p>Chapter 3</p> <p>Transportation Impacts</p>	<p>This chapter reviews the potential for impacts on the transportation network, including construction and permanent impacts on transit service, traffic, parking, and bicycle and pedestrian accessibility.</p>
<p>Chapter 4</p> <p>Environmental Impacts</p>	<p>This chapter presents the potential for impacts on a variety of social, economic, and environmental resources that could be affected by the construction and implementation of the project and offers measures to avoid or minimize those impacts.</p>
<p>Chapter 5</p> <p>Public and Agency Coordination</p>	<p>This chapter discusses the processes for public involvement and agency coordination and addresses comments and suggestions that resulted from this process.</p>
<p>Chapter 6</p> <p>Section 4(f) Evaluation</p>	<p>This chapter focuses on meeting the federal requirements of Section 4(f) of the USDOT Act of 1966, which protects significant historic sites, publicly owned parks, recreation areas, wildlife refuges, and waterfowl refuges that could be used by a federally funded project.</p>

Figure 1-7: Environmental Assessment Document Organization

Chapter 2

Alternatives Considered

This chapter summarizes the decision-making process that led to alternatives considered 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 and evolved through a multiyear decision-making process that began in 2009 and included extensive public involvement.

2.1.1 RPM Vision Study

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 B-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 this analysis and outreach, CTA established the purpose and need for the project. CTA heard a number of public concerns that were raised frequently. These concerns shaped the goals and objectives for the project, including concerns about travel time, public safety, passenger amenities, intermodal connectivity, ADA access at stations, increased passenger capacity, and supportive community development.

This work led to CTA developing 20 alternative alignment and track configurations with various operating plans and service frequency scenarios. CTA then conducted a high-level feasibility analysis of these alternatives. Feasibility factors included consideration of constructability, ridership, time savings, environmental concerns, and level of capital investments required. CTA identified potentially feasible alternatives in greater detail, assuming differing levels of capital investment required, without officially eliminating other alternatives. Among the funding scenarios, CTA considered the following in greater detail:

- Worst-Case Scenario - Assumed a reduction in funding compared to historic levels
- Retain Scenario - Considered the implications of only maintaining current funding and maintenance levels in the corridor
- Improve Scenario - Involved using basic rehabilitation to bring the existing corridor into a state of good repair
- Modernization Scenario - Would completely reconstruct North Red and Purple line infrastructure in the corridor

Alternatives based on the Worst-Case Scenario were dropped from further consideration as unacceptable and unlikely. CTA carried forward the alternative based on the Retain Scenario for comparative purposes; this was essentially the No Build Alternative. Both the Improve Scenario and the Modernization Scenario informed multiple alternatives.

2.1.2 RPM Environmental Impact Statement Public Scoping

After the vision study, in January 2011 CTA initiated an EIS public and agency scoping process for the RPM corridor. CTA's scoping process presented six alternatives to the public for further consideration based on vision study findings:

- **No Build** - This alternative would provide minimum repairs required to keep the North Red and Purple lines functional and would not provide additional capacity to the system.
- **Basic Rehabilitation (without Transfer Stations)** - This alternative would include a strategic mix of repairs, rehabilitation, and replacement to bring the North Red and Purple lines into a minimal state of good repair. It would provide adequate service for the next 20 years. Most of the stations, viaducts, and other structural elements would not be brought up to modern standards and would only meet minimal ADA requirements.
- **Basic Rehabilitation (with Transfer Stations)** - This alternative would include all of the elements of the Basic Rehabilitation Alternative, but with modern transfer stations at Wilson and Loyola instead of standard rehabilitated stations.
- **Modernization 4-Track** - This alternative would include modern amenities at stations and would extend the useful life of the system for the next 60 to 80 years. This alternative would increase speed and reliability and would address safety and accessibility concerns, but would require significant right-of-way acquisitions. This alternative would include transfer stations at Loyola and Wilson and would consolidate the current 21 stations into 16 stations.
- **Modernization 3-Track** - This alternative would provide modern amenities at stations, extend the useful life of the system for the next 60 to 80 years, increase speed and reliability, and address safety and accessibility concerns. This alternative would remove one of the four tracks in the North Red Line corridor. This alternative would include the same transfer stations and consolidated stations as the Modernization 4-Track Alternative. This alternative would include transfer stations at Loyola and Wilson and would consolidate the current 21 stations into 16 stations.
- **Modernization 2-Track Underground** - This alternative would provide modern amenities at stations, extend the useful life of the system for the next 60 to 80 years, increase speed and reliability, and address safety and accessibility concerns. This alternative would operate underground in a new two-track alignment in place of the current four-track alignment in the North Red Line segment between Belmont and Loyola. A new stopping pattern would have fewer stations than the existing corridor.

2.1.3 Alternatives Refinements Based on Public Scoping

Throughout 2011, CTA revised the alternatives based on feedback received from the January 2011 scoping process. In early 2012, as part of a series of open house meetings, CTA presented revisions

to the alternatives for the public's consideration. CTA recommended eliminating three alternatives:

- **Basic Rehabilitation (without Transfer Stations)** - This alternative was eliminated based on project planning developments in the RPM corridor and new direction on how to best meet service needs. After the development of this alternative, CTA decided to reconstruct Wilson station as a transfer station as part of a separate project. Given this development, only one transfer station (at Loyola station) distinguished this alternative from the Basic Rehabilitation with Transfer Stations Alternative.
- **Modernization 2-Track Underground** - This alternative was eliminated due to operational challenges, other technical factors, and the comparative costs of improvements. This alternative's lack of express service garnered negative public comments during scoping. The reduction from four tracks to two tracks would reduce service flexibility. No service improvements would be realized until construction of the entire project was completed. The subway alignment would also have substantial construction cost risk and would be difficult to construct in phases as funding becomes available.
- **Modernization 3-Track** - This alternative was eliminated for operational and other technical reasons. Although a three-track alternative would include less land acquisition than the four-track alternative, it would reduce service flexibility and would not allow reverse-commute Purple Line express service. This drawback was cited in negative public comments during scoping. The three-track alternative would also be difficult to construct in phases and would not improve service until the entire project could be completed.

The remaining three alternatives were carried forward for further evaluation. The No Build Alternative was carried forward unchanged. CTA renamed the remaining two alternatives as follows:

- **Basic Rehabilitation (with Transfer Stations)** - renamed "**Basic Rehabilitation**" because the Basic Rehabilitation (without Transfer Stations) Alternative was eliminated for reasons noted above.
- **Modernization 4-Track** - renamed "**Modernization.**" In addition, CTA added a Brown Line flyover at Clark Junction for consideration as part of this alternative.

Based on public concerns about station consolidation, CTA identified an additional modernization alternative that would meet the benefits of modernization desired by the public but without station consolidation:

- **Modernization without Consolidation** - This alternative would include modern amenities at stations and would extend the useful life of the system for the next 60 to 80 years. This alternative would increase speed and reliability, but not to the same extent as the Modernization Alternative. This alternative would address safety and accessibility concerns, but would require substantial right-of-way acquisitions. This alternative would include a transfer station at Loyola, but would not consolidate any of the current 21 stations. In addition, CTA added a Brown Line flyover at Clark Junction for consideration as part of this alternative.

In addition, CTA informed the public of changing conditions in the corridor requiring modifications to the project alternatives, in that the Wilson station was removed from the project scope, as it was identified to be reconstructed before RPM improvements as a transfer station, consistent with previous alternatives considered for the RPM EIS.

Figure 2-1 shows the selection of alternatives considered in the EIS. Based on feedback received, only four-track alternatives remained for consideration in the EIS.

RPM EIS Alternatives	
Former Name	EIS Name
Basic Rehabilitation (without Transfer Stations)	→ <i>Eliminated through scoping process</i>
Basic Rehabilitation (with Transfer Stations)	→ Basic Rehabilitation
Modernization 4-Track	→ Modernization
Modernization 3-Track	→ <i>Eliminated through scoping process</i>
Modernization 2-Track Underground	→ <i>Eliminated through scoping process</i>
<i>NEW ALTERNATIVE</i>	→ Modernization without Consolidation
All EIS alternatives included four tracks from Belmont station to Howard station	

Figure 2-1: February 2012 Changes in Alternatives Considered

2.1.4 Research and Conceptual Design Process of 2013

In response to the public meetings in 2012, CTA undertook an in-depth research and conceptual design process to identify a refined Modernization Alternative that would provide key benefits to the RPM corridor while reducing property displacements and other environmental impacts (including noise, historic resource, community, and transportation impacts). In late 2013, CTA developed a series of strategies to reduce impacts while providing modernization benefits including extending the useful life of the system for the next 60 to 80 years. These strategies included using an “alley spanning” concept to expand the structure over the adjacent alley to the east to reduce right-of-way acquisitions, limiting the amount of station consolidation in the corridor to improve pedestrian access, and incorporating noise reduction elements into the design.

The Build Alternative for the Lawrence to Bryn Mawr Modernization Project, further described in **Section 2.3**, resulted directly from the alternatives development process and was refined through public input and additional conceptual design analysis. For example, the Build Alternative would reconstruct all four stations in the Lawrence to Bryn Mawr section, instead of consolidating Lawrence as was proposed in the Modernization Alternative. The Build Alternative would also use the alley spanning concept to reduce property acquisition, and would incorporate a closed-deck aerial structure with noise barriers to reduce noise impacts from the increased speed and service of trains.

2.1.5 Development of the RPM Phased Implementation Approach

As CTA was further considering strategies to reduce impacts while providing modernization benefits for the RPM corridor, CTA and FTA determined that implementing a smaller scope of work would be more reasonable and expedient for bringing improvements to the corridor. FTA and CTA developed a phased, tailored approach to implement improvements to the RPM corridor, allowing CTA to make the greatest number of improvements while minimizing impacts on the surrounding community. The projects proposed in this phased and tailored approach were defined through the evolution of alternatives that were studied in the EIS for the 9.6-mile RPM corridor. The projects assembled the best elements of the Modernization Alternatives, while incorporating the strategies defined during the in-depth research and conceptual design process of 2013.

Phase One of RPM is proposed to include four discrete projects within the 9.6-mile corridor, including the following:

- **Lawrence to Bryn Mawr Modernization** - 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.
- **Red-Purple Bypass** - Construction of a bypass for the Brown Line at Clark Junction, just north of Belmont station, and 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.

Separate EAs are being conducted for each of the above projects. Other components of RPM Phase One include the following:

- Corridor signal and power improvements would include installation, operation, evaluation, and replacement of wayside equipment and special trackwork. This work would take place within the CTA right-of-way or adjacent right-of-way along the 9.6-mile RPM corridor.
- Interim and advance infrastructure improvements would replace aging and deteriorating infrastructure on the track structure, track, and viaducts. This work would take place in the CTA right-of-way or adjacent right-of-way along the 9.6-mile RPM corridor.

Corridor signal and power improvements along the existing tracks and interim and advance infrastructure improvements to the existing tracks are not anticipated to result in any significant environmental impacts and FTA and CTA are documenting these actions as listed, categorically excluded actions.

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 Lawrence to Bryn Mawr Modernization Project. This alternative would maintain the status quo, and would not expand system capacity.

The No Build Alternative represents future conditions if the Lawrence to Bryn Mawr Modernization Project were not implemented. The No Build Alternative would include typical repairs to the Red and Purple lines within the corridor based on historic funding levels needed to keep the lines functional. Capital expenditures would be minor compared to the Build Alternative. Improvements would not be sufficient to respond to growing ridership demand, and would not be sufficient to meet the needs of aging infrastructure that is over 90 years old and past its useful life. Some expenditure would be made to keep the system operating; however, service quality and effective capacity would decline over time as new slow zones form across the system, 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 decrease due to the need to safely operate on deteriorating infrastructure. In addition, ADA access would not be provided at any of the four stations within the project area and the approximately 2-mile gap in ADA-accessible stations along this portion of the Red Line would continue to exist.

2.3 Build Alternative

The Build Alternative, shown in **Figure 2-2**, would consist of reconstructing approximately 1.3 miles of the existing Red and Purple lines from Leland Avenue on the south to near Ardmore Avenue on the north. The project area is in the Uptown and Edgewater community areas. This segment of railroad includes four stations: Lawrence, Argyle, Berwyn, and Bryn Mawr. The stations would be completely reconstructed and would be expanded, modernized, and made accessible in accordance with ADA standards. The project would provide a modern structure with a useful life for the next 60 to 80 years and support future growth and development in the corridor. The following describes the major physical elements of the Build Alternative, the anticipated construction and implementation schedule, and cost and funding considerations. Conceptual engineering plans are provided in **Appendix B-2**.

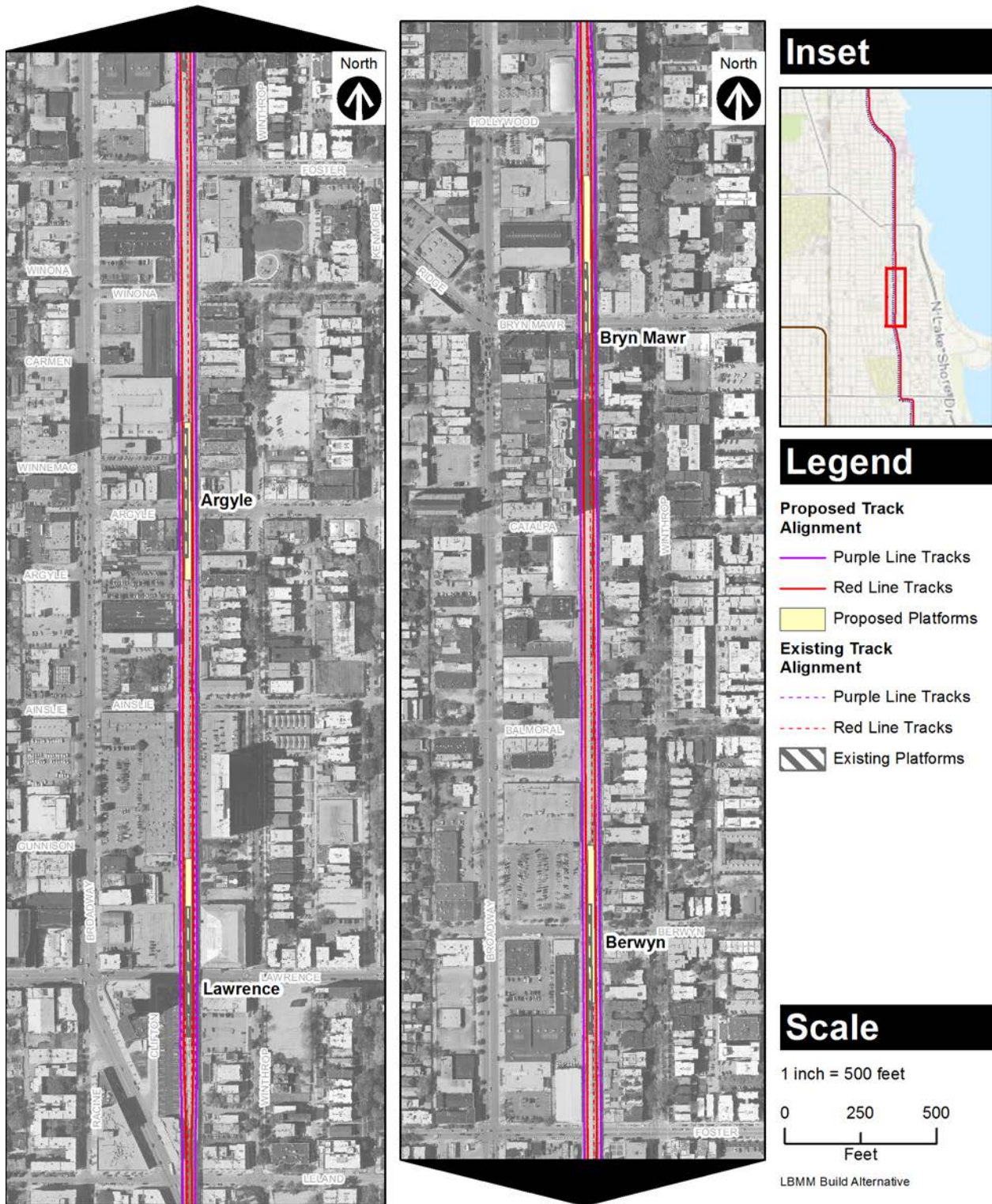


Figure 2-2: Lawrence to Bryn Mawr Modernization Build Alternative Map

2.3.1 Major Elements of the Build Alternative

Major elements of the Build Alternative include improvements to stations, tracks, viaducts, and the embankment walls that support the elevated track structure.

Stations

The Lawrence, Argyle, Berwyn, and Bryn Mawr stations would be completely reconstructed as part of the Build Alternative. Features such as elevators and wider stairways would increase capacity, provide ADA accessibility, and improve access from the ground floor of each station to the platform. New stairways would be wider for greater safety and capacity, meeting emergency entrance and exit requirements for the larger stations.

Platform widths of approximately 22 feet are proposed, nearly double the size of existing platforms, to provide increased safety and capacity, improve circulation on the platform, and improve passenger boarding and alighting (leaving a train). Platforms would be lengthened (to 520 feet compared to an existing length of 420 feet) to provide more waiting areas and improve circulation for passengers. These longer platforms could also accommodate ten-car trains in the future. Wider and longer platforms support increased capacity and decreased travel times. Wide platforms would also greatly reduce the existing interference of passengers boarding and alighting at narrow platforms, thereby reducing the time trains are stopped at each station and leading to an overall reduction in travel time. In addition, other amenities, such as enhanced passenger security features, longer canopies, more benches, and windscreens would be installed. Additional features to improve ADA accessibility include improved communications and tactile features. The addition of escalators will be determined during subsequent engineering and design based on more detailed information on available space and location of other station amenities.

Figures 2-3 and 2-4 present photos of existing stations along with conceptual renderings of the types of improvements proposed at the four stations. Specific improvement measures and aesthetics would be determined during the project engineering phase, after completion of the EA.



Figure 2-3: Photo of Existing Station Interior at Bryn Mawr Station and Conceptual Rendering of Proposed Station Interior Improvements



Figure 2-4: Photo of Existing Platform (12-foot Width) and Conceptual Rendering of Proposed Platform-Level Improvements (22-foot Width) at Bryn Mawr Station, Facing South

Tracks

The Build Alternative would reconstruct tracks from Leland Avenue to near Ardmore Avenue. Track reconstruction would involve the entire track system including rails, rail fixation, traction power, signals, and special trackwork, along with a new supporting aerial structure. Reconstruction would eliminate slow zones, and the modernized track and structures would be less susceptible to new slow zones. The special trackwork, including crossovers and a center storage track, would be located between the Argyle and Berwyn stations and would allow for flexible operations during maintenance and other incident management.

The existing structure consists of a ballast-and-tie track (the supporting surface for the rail is ballast or rock) on an embankment structure. The proposed structure evaluated in the EA assumes a closed-deck, concrete aerial structure with direct-fixation track and welded rail (welded at joints). With direct-fixation track, rails are mounted to specially designed concrete blocks fixed to the concrete deck. Noise barriers (3 to 5 feet in height) are proposed on both sides

of the track deck for the full length of the alignment to reduce noise transmission at and below track level.

Additional right-of-way would be required to space the tracks farther apart to accommodate the new, wider platforms. To minimize impacts on adjacent properties, the right-of-way widening would take place over adjacent alleys along the east side of the alignment, where possible. This “alley spanning concept” was selected to provide sufficient width for ADA accessibility on platforms while also minimizing impacts on adjacent properties. With alley spanning, existing alley access would remain, with sufficient vertical clearances and widths for passage of vehicles, including garbage trucks and moving vans. **Figure 2-5** depicts the alley spanning concept. At Lawrence Street, the Build Alternative includes a portion of the required track widening on the west side of the existing alignment to avoid impacts on the historic Aragon Ballroom.

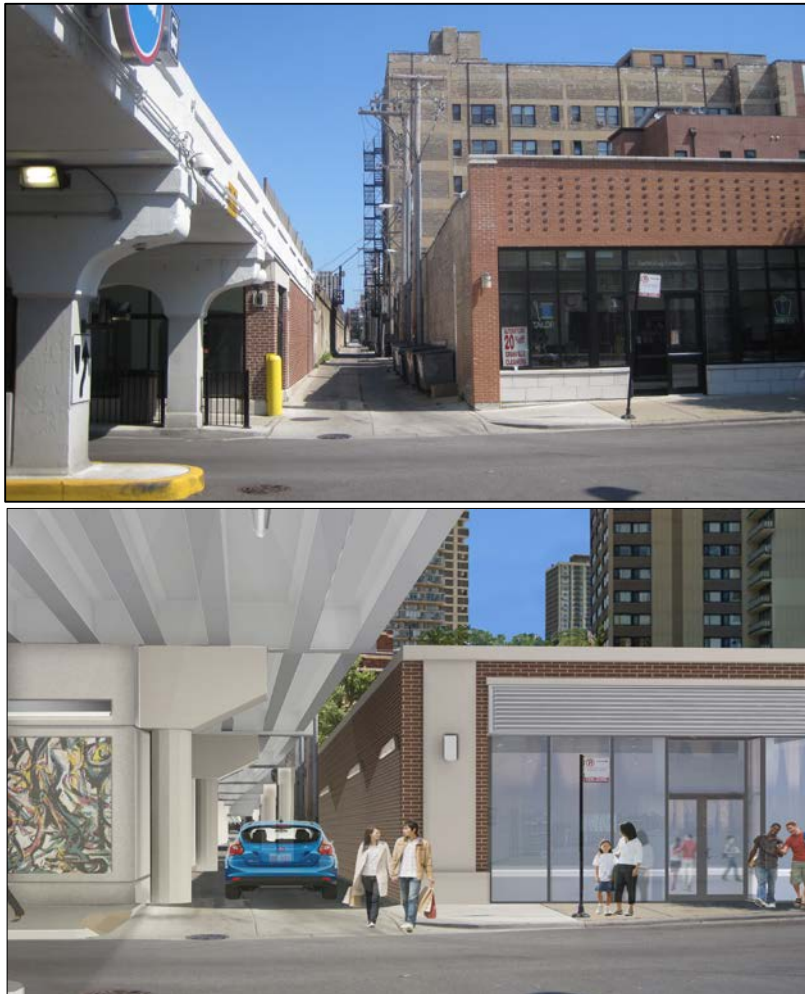


Figure 2-5: Alley Spanning Concept: Photo of Alley Adjacent to CTA Station and Conceptual Rendering of Alley Spanning Concept

Viaducts

Viaducts are the bridge structures supporting the trains above the streets. Currently, two types of viaducts are used in the project corridor. At Lawrence Avenue, steel beams support the rail lines.

Piers at Lawrence Avenue are at the edge of the sidewalk, and no piers are in the middle of the street. At all other cross streets within the project limits, thick concrete slabs support the rail lines. These slabs are supported by concrete piers in the center of the street and at the edge of the sidewalk (see **Figures 2-6 and 2-7**). As proposed, no piers would be located in the roadway within the project limits, improving sightlines and safety for pedestrians, drivers, and bicyclists.

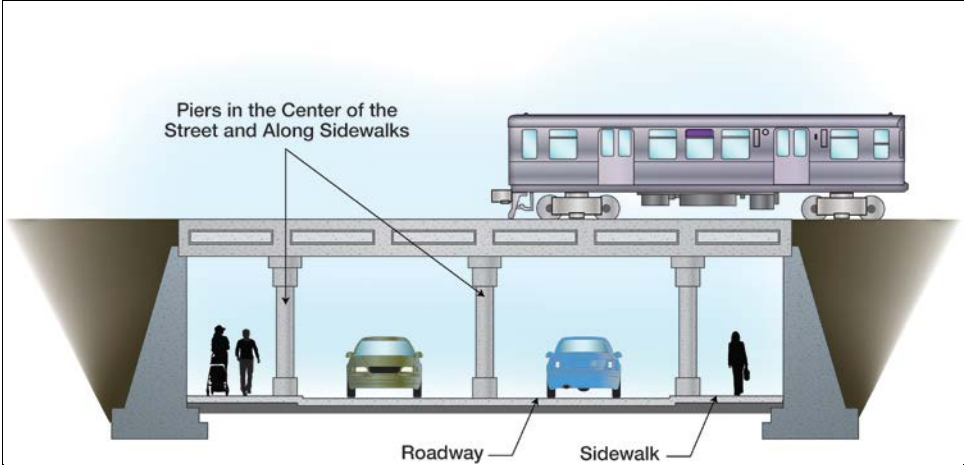


Figure 2-6: Schematic of Existing Viaduct



Figure 2-7: Photo Showing Existing Viaduct at Balmoral Avenue with Piers in the Roadway and Sidewalks

Illinois Department of Transportation (IDOT) local roads policy for new bridges requires vertical clearances of 14 feet 9 inches between the road surface and the bottom of the structure. Existing vertical clearances along roadways within the project corridor do not meet these standards, and would be increased for the Build Alternative to meet IDOT standards. The raised profile would be approximately 5 to 10 feet higher than the existing profile to meet these standards and to construct the modern support structure. **Figure 2-8** shows the existing Lawrence station and a conceptual rendering of the proposed Lawrence station viaduct with the new viaduct as well as a raised profile.



Figure 2-8: Photo Showing Existing Station and Viaduct and Conceptual Rendering of Proposed Viaduct and Station Improvements at Lawrence Station, Facing West from Lawrence and Winthrop Avenue

Embankment Walls

The current track support, referred to as “embankment,” was constructed in the 1920s using embankment walls with earth-fill. The embankment supports four tracks (northbound and southbound Red line tracks, and northbound and southbound Purple line express tracks), as shown in **Figure 2-9**.

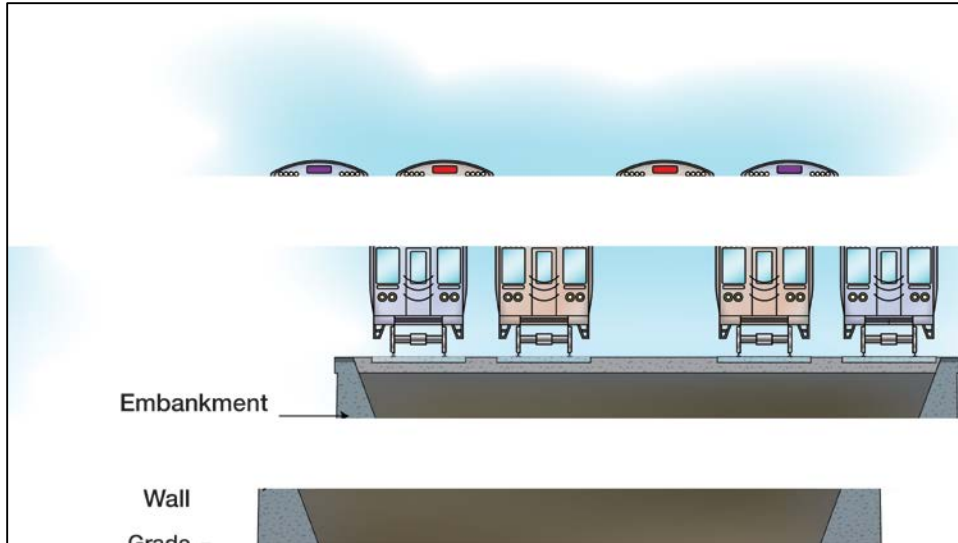


Figure 2-9: Schematic of Existing Embankment Wall Track Support

Raising the track profile 5 to 10 feet to meet IDOT vertical clearance requirements and to construct the modern support structure would require that the existing embankment track support system be replaced with a modern, aerial track support system. Several options were considered to meet the vertical clearance requirements, while leaving portions of the existing embankment in place:

- Increase the height of the existing embankment walls and earth-fill to support the tracks. The embankment walls and earth-fill cannot simply be raised to meet this requirement because the increased weight on the existing footings could cause settlement, which could affect adjacent buildings and underground utilities. This settlement would potentially have the greatest impact on adjacent unreinforced masonry/brick buildings.
- Construct new embankment walls to support the tracks. Constructing new embankment walls with fill would increase the number of property displacements and block alleys because of the width needed for the new track structure and platforms.
- Construct new aerial structure supported on concrete caisson foundations drilled through the existing earth-fill (see **Figure 2-10**).

An aerial support structure that can span the adjacent alley, as proposed, would minimize property displacements and would allow for vehicle movement and access to buildings and parking through adjacent alleys.

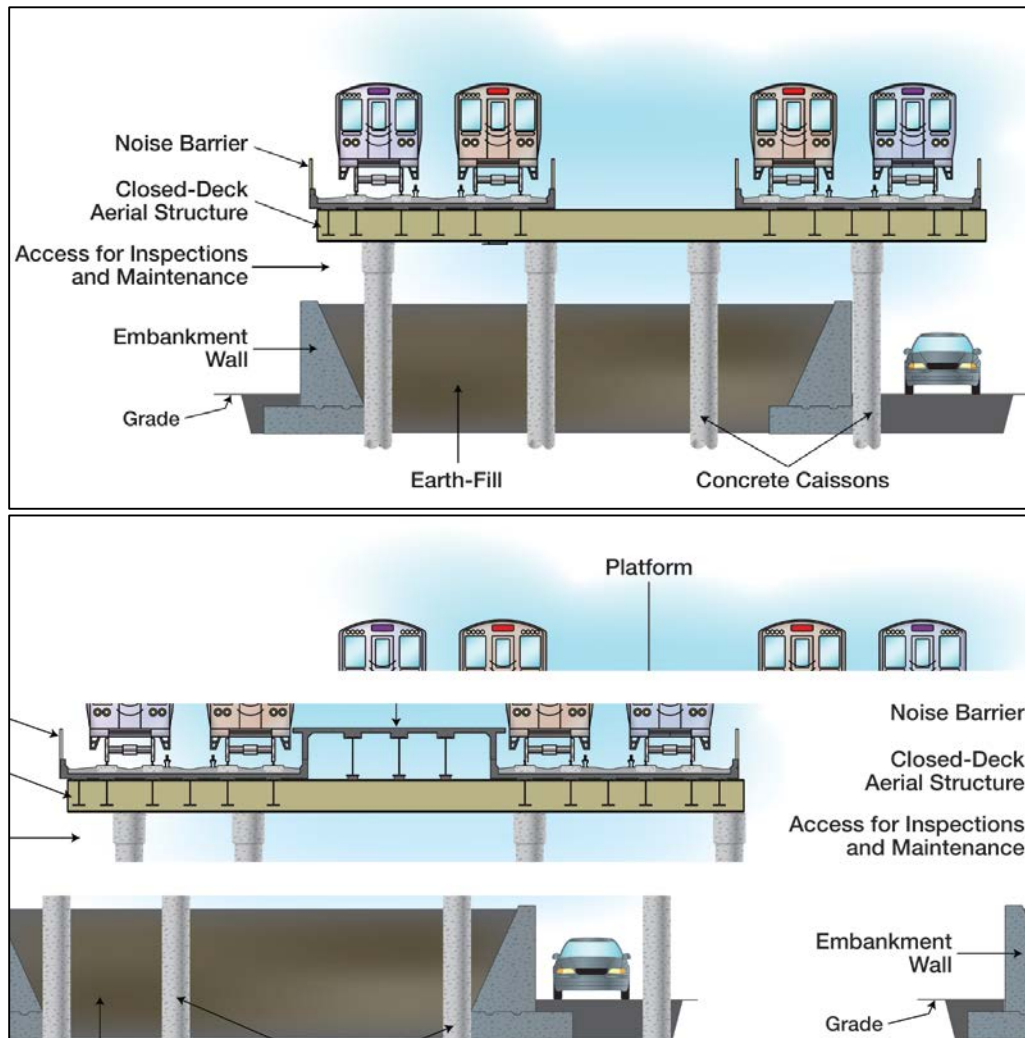


Figure 2-10: Schematic of Proposed Track Structure and Embankment between Stations (top) and at Stations (bottom)

Under the Build Alternative, the embankment would no longer act as the support for the tracks. Based on conceptual engineering, reconstruction of stations would require at least the removal of the existing embankment walls and earth-fill along the entire length of the new platforms to construct the new stationhouses and improve access from the ground floor of each station to the platform with elevators (for ADA accessibility) and wider stairways. As such, a minimum of approximately 40 percent of the embankment walls would need to be removed within the project limits for the reconstruction of stations.

CTA is analyzing whether portions of the embankment wall could be kept for visual or aesthetic purposes, or whether the embankment would need to be removed along the project corridor between stations and viaducts. Due to the complex engineering required for this analysis, this decision will be made as part of future design phases. The decision will consider more detailed engineering factors including structural integrity and longevity of improvements, cost, access to alleys, access to temporary platforms during construction, access to construction areas, accessibility for maintenance and ongoing/required CTA inspections, and public input. Where the

existing embankment wall could remain in place, the height of the embankment under the new aerial structure would be lowered (up to 7 feet) to allow access for required inspections and maintenance (see **Figure 2-10**). Where embankment walls could be kept, stabilization and repair of the existing walls would be required as part of construction activities.

The track structure and viaduct improvements would require air rights or easements to accommodate permanent right-of-way needs. Off-street construction sites necessary to support construction of the proposed Bryn Mawr station would require displacement of two buildings. **Appendix B-2** presents preliminary engineering concepts and assumptions concerning anticipated property displacements resulting from the Build Alternative.

2.3.2 Construction Staging and Implementation Schedule

Construction Sites

Construction would take place within existing CTA right-of-way and on properties to be acquired permanently and through temporary easements for this project. In addition to permanent right-of-way needs, CTA identified off-street construction sites that would be sufficient in size to support construction of the project, while minimizing community impacts and street closures. **Chapter 4** provides further discussion of property displacements, land use impacts, and economic development impacts of the Build Alternative.

Stages of Construction

Two stages of track construction are anticipated for this project (referred to as Stage A and Stage B). **Figure 2-11** shows a construction staging diagram. This staging plan is proposed to allow for the maximum level of improvements to be made while minimizing the duration of construction and the operational impacts on passengers.

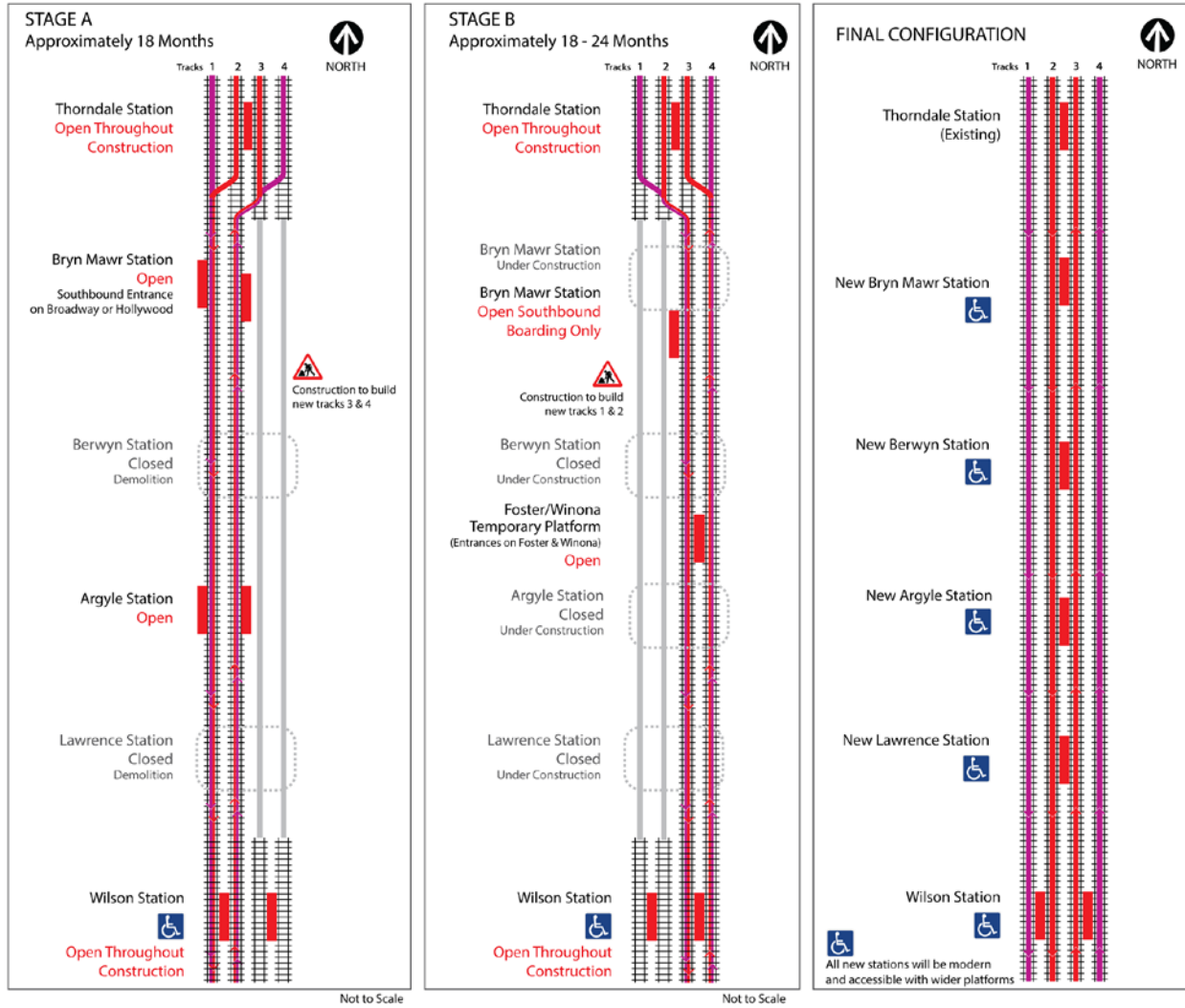


Figure 2-11: Conceptual Construction Staging Diagram

In the first stage of construction (Stage A), all rail traffic would run on the existing two western tracks (known as Tracks 1 and 2, with Track 1 being furthest west). Red and Purple line service would merge to a single northbound and single southbound track through the project limits. The merge and diverge locations would be at switches located north of Bryn Mawr station and south of Wilson station. Service patterns would need to be adjusted to reflect the constraint of only having two tracks operating through the project limits. While trains run on Tracks 1 and 2, the new eastern tracks (known as Tracks 3 and 4) would be constructed. After completion of the new Tracks 3 and 4, rail traffic would be switched to run on Tracks 3 and 4 during the second stage of construction. The second stage of construction (Stage B) would include construction of the new Tracks 1 and 2, new stationhouses, and new platforms. This staging plan allows for continued operation of north- and southbound trains throughout construction.

During construction, passengers would use a combination of existing and temporary platforms for boarding, as described in further detail below. Locations of temporary and new platforms are based on conceptual engineering to date and may be refined during subsequent engineering and design. The Lawrence and Berwyn stations would be closed during both stages of construction to facilitate the complex sequence of activities required for construction and to accomplish the work within the proposed construction timeframes.

During Stage A, passengers that typically use Lawrence station could use the Wilson or Argyle stations. Passengers that typically use Berwyn station could use Argyle or Bryn Mawr stations. Bus service along Broadway (approximately ½ block west of the project area) would also provide options for passengers. **Chapter 3** contains additional details about construction impacts on transit service and pedestrian walk times. The Argyle and Bryn Mawr stations would remain open during Stage A. Due to the configuration of the alley west of the tracks at Bryn Mawr Avenue, southbound-boarding passengers would need to access a temporary platform from Broadway or Hollywood Avenue instead of Bryn Mawr Avenue during Stage A.

During Stage B (which would include reconstruction of the stations), boarding and alighting locations with temporary platforms at each station would change as needed to separate passengers from active construction zones. One temporary platform would be located between Winona Street and Foster Avenue with entrances from both streets, serving the Argyle and Berwyn station passengers during Stage B. At this location, passengers could board both southbound and northbound trains. The second temporary platform would be south of Bryn Mawr Avenue with access from the south side of Bryn Mawr Avenue. This location would allow passengers to board southbound trains only. Northbound passengers wanting to exit at Bryn Mawr station during construction would need to alight at Thorndale station and then ride a train back south to Bryn Mawr station or, as alternatives, walk from an adjacent station or use parallel bus service on Broadway, which is available ½ block west of the Red Line tracks.

Construction Implementation Schedule

Contingent upon funding, construction of the Build Alternative is anticipated to begin as early as 2017 and construction would take 36 to 42 months. The duration of Stage A would be approximately 18 months. Stage B would follow immediately after Stage A and would last an additional 18 to 24 months, approximately. The timelines provided within this EA reflect the maximum construction duration for the evaluation of impacts. Preliminary engineering for this project is ongoing. After completion of preliminary engineering, the project is proposed as 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.

As with all CTA construction projects, public outreach would be conducted throughout construction to alert passengers to any operational and accessibility changes and inform them of upcoming work. **Section 4.3** presents additional information about neighborhood, community, and business impacts during construction and describes the efforts to minimize impacts. **Section 5.4** 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 Lawrence to Bryn Mawr Modernization Project were developed based on conceptual engineering considerations and will be further refined through

ongoing preliminary engineering. Anticipated capital costs for the Lawrence to Bryn Mawr Modernization Project are approximately \$1.33 billion in year-of-expenditure dollars.

CTA intends to seek Capital Investment Grant (CIG) Program funding from FTA for the Lawrence to Bryn Mawr Modernization Project. The CIG Program, more commonly known as the New Starts, Small Starts, and Core Capacity Improvements 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.³

FTA must evaluate and rate proposed projects seeking funding from the CIG Program 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 as well as 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. As projects proceed through the steps in the process, information concerning costs, benefits, and impacts is refined and the ratings are updated to reflect new information.

CTA proposes to use a mixture of federal, state, and local funds to pay for this project. Use of federal funds requires a local match (state and local funds) equal to 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 for the project 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**, Phase One of the RPM Program includes the Lawrence to Bryn Mawr Modernization Project and the Red-Purple Bypass Project as well as corridor signal and power improvements and interim and advance infrastructure improvements to the track and rail structures along the 9.6-mile RPM corridor.

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

³The FTA website is www.fta.dot.gov.

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 for construction 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 interim improvements to areas within the RPM corridor to ensure passenger safety and maintain a state of good repair for the entire 9.6-mile corridor.

Chapter 3

Transportation

This chapter describes the temporary construction and permanent impacts of the No Build and Build Alternatives on the transportation network. CTA analyzed the potential impacts on travel related to the duration of construction and sequencing of closures based on construction planning at the time of this analysis. The analysis takes into account potential impacts on the local transportation system including temporary construction and permanent impacts on transit facilities and service, pedestrians, bicyclists, traffic patterns, and parking or loading zones.

Within the context of 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. As needed, additional mitigation measures are provided to minimize impacts and result in a level less than significant under NEPA.

3.1 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 near the project corridor. These resources included the Chicago Metropolitan Agency for Planning (CMAP) *GO TO 2040 Comprehensive Regional Plan*, City of Chicago transportation and community plans, and IDOT studies.

CTA identified impacts on the transportation system based on the project definition and whether implementation of the project would cause changes to existing transportation conditions within the project limits. In the event of an adverse change, CTA identified mitigation measures to minimize impacts and to reduce them to a level less than significant under NEPA.

3.2 Existing Conditions

The Lawrence to Bryn Mawr Modernization Project would occur in an established urban area with a complete transportation network of transit routes, sidewalks and pedestrian crossings, bicycle facilities, and regional and local roadways.

3.2.1 Transit

The North Red and Purple lines run on elevated tracks above the street network. The Purple Line Express runs through the project area during weekday peak periods but does not stop. The Red Line operates 24 hours a day through the project corridor and stations in the project area include Lawrence, Argyle, Berwyn, and Bryn Mawr. The four stations span approximately 1.3 miles of track with the spacing between stations ranging from just over $\frac{1}{4}$ to $\frac{1}{3}$ mile. Five CTA bus routes (shown in **Figure 1-3**) currently provide connections to the project at stations: #81 Lawrence (Lawrence station), #92 Foster and #146 Inner Drive/Michigan Express (Berwyn station), #84 Peterson (Bryn Mawr station), and #36 Broadway (serves all four stations, approximately $\frac{1}{2}$ block west of the Red Line tracks). Additional bus service, both local and express service to downtown Chicago, runs $\frac{1}{2}$ blocks east along Sheridan Road. These routes include #136 Sheridan/LaSalle Express, #147 Outer Drive Express, and #151 Sheridan.

3.2.2 Pedestrians

Pedestrian sidewalks of varying widths connect station areas to destinations predominantly along the existing street network. The condition of sidewalks varies throughout the project area; however, the City of Chicago implemented a sidewalk ramp program in 2006 to make all sidewalks compliant with ADA standards. Entrances to the Lawrence, Argyle, Berwyn, and Bryn Mawr stations are on the north and/or south sides of the streets. **Figure 3-1** shows the existing walk times in minutes for pedestrians accessing the stations as well as the stations directly north or south of the project area. As shown on **Figure 3-1**, based on a 3 mile per hour walking speed and existing street network, passengers within about ½ mile of the alignment can walk to a station in less than 15 minutes.

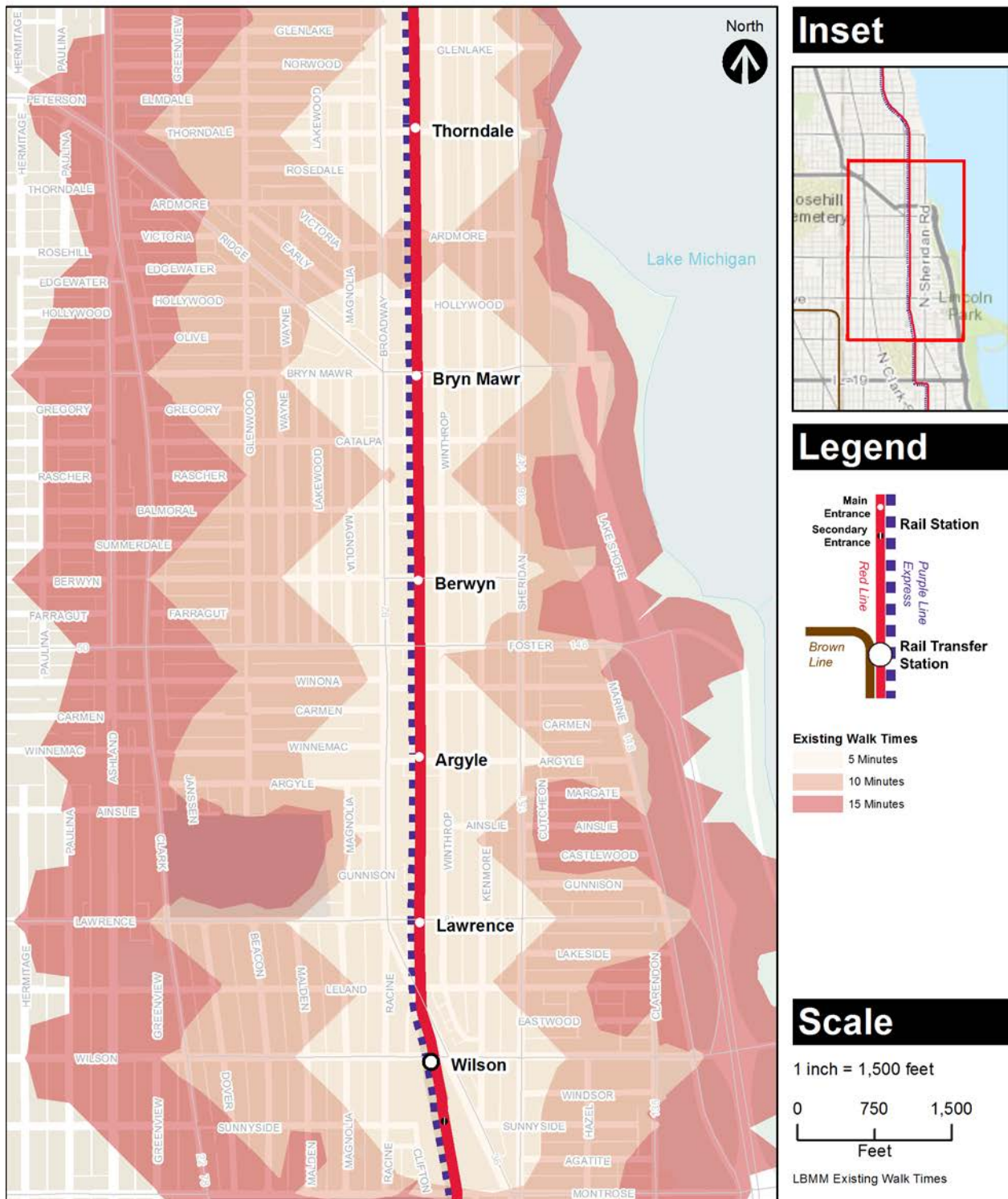


Figure 3-1: Existing Walk Times for Pedestrians Within the Project Area

3.2.3 Bicyclists

The City of Chicago is known as a bicycle-friendly community (City of Chicago 2012a). As of 2014, Chicago has over 200 miles of on-street bikeways and more than 13,000 racks for bicycle parking

(City of Chicago 2014a). The City of Chicago Department of Transportation (CDOT) *Streets for Cycling Plan 2020* guides the development of a citywide network of over 645 miles of innovative bikeways such as barrier- and buffer-protected bicycle lanes and neighborhood greenways (City of Chicago 2012a). In addition, Chicago has a large and growing bicycle-sharing network called Divvy. Within the project area, Divvy bicycle sharing stations exist near the Lawrence, Argyle, and Berwyn stations (Divvy 2014). All four station areas in the project corridor have outdoor bicycle racks and are connected to bicycle facilities on the existing street network. Bryn Mawr station also has indoor bicycle parking available.

3.2.4 Traffic

The existing street network in the project area is a grid of east-west and north-south streets, with the exception of Broadway, which runs at a diagonal south of Lawrence Avenue. Leland Avenue defines the project limits on the south and the northern border is near Ardmore Avenue. The elevated transit structure is carried over the street network by viaducts located midblock between street intersections. Most of the east-west streets within the project limits have piers in the middle of the street, limiting sightlines and safety for pedestrians, drivers, and bicyclists. The two roadways that do not have piers in the middle of the street are Leland and Lawrence Avenues.

3.2.5 Parking

On-street parking is provided along the street network for businesses and residents. Residential permit parking is used on some streets to prevent transit passengers from parking on the residential streets. An off-street parking facility adjacent to Lawrence station offers daily and monthly parking for transit passengers.

3.3 Environmental Impacts

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

3.3.1 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.

GO TO 2040 calls for investment in the existing transit infrastructure in the region, and the No Build Alternative would not achieve this. *GO TO 2040* includes implementation of the RPM Program in its list of fiscally constrained projects; therefore, the No Build Alternative would be inconsistent with the transportation plan for the region. The No Build Alternative would not modernize the rail system in the project corridor.

3.3.2 Build Alternative

Construction Impacts

Transit Impacts

The Build Alternative would be constructed using two construction stages (see **Section 2.3.2**). During both stages of construction, only two of the four existing tracks would carry trains while construction takes place on the other two tracks (see **Figure 2-11**). This constraint would require changes in service patterns to accommodate passengers. Red Line trains would normally continue

to operate 24 hours per day and trains would operate at frequencies similar to current ones. There would be temporary adverse impacts on transit passengers beginning or ending their trip in the project area during construction due to closed stations and additional walk times to and from stations. Further detail is provided below regarding temporary impacts on pedestrians accessing stations.

Construction-related train and bus service disruptions would occur during weekends and off-peak periods to the extent possible. CTA would provide notifications for temporary train service changes to neighboring property owners, residents, businesses and train passengers. When viaducts would be temporarily closed due to construction activities, affected bus routes would be temporarily rerouted. CTA would follow customary procedures for temporary bus service changes. To maintain passenger safety during construction, existing station entrances would be reconfigured to separate passengers from active construction zones and temporary station entrances would be provided.

CTA would add service to parallel and connecting bus routes as necessary to accommodate additional riders who take buses instead of the Red Line due to temporary station closures, construction-related service disruptions, or longer travel times. Implementation of temporary stations and increased bus frequency within the corridor (discussed below) would mitigate construction-related impacts on passengers.

As discussed in **Section 2.3.2**, construction is proposed in two stages (Stage A and Stage B) to allow for the maximum level of improvements while minimizing operational impacts on passengers. The anticipated impacts for each stage of construction are summarized below.

The anticipated impacts during Stage A of construction are as follows:

- Lawrence Station - Lawrence station would be closed during Stage A. Passengers would be able to access Wilson station to the south or Argyle station to the north by walking or riding the #36 Broadway bus ½ block west of the Red Line tracks.
- #81 Lawrence Bus - Because Lawrence station would be closed during Stage A, the #81 Lawrence bus would be rerouted to serve Wilson station.
- Argyle Station - Argyle station would remain open during Stage A.
- Berwyn Station - Berwyn station would be closed during Stage A. Passengers would access transit at Argyle or Bryn Mawr station. Passengers could also ride the #36 Broadway bus, ½ block west of the Red Line tracks.
- #92 Foster Bus - The #92 Foster bus would be rerouted from Berwyn station to serve Argyle station.
- #146 Inner Drive/Michigan Express Bus - There would be no routing changes required to the #146 Inner Drive/Michigan Express bus during Stage A.
- Bryn Mawr Station - Bryn Mawr station would remain open during Stage A.

- #84 Peterson Bus - There would be no routing changes required to the #84 Peterson bus during Stage A.

The anticipated impacts during Stage B of construction are as follows:

- Lawrence Station - Lawrence station would be closed during Stage B. Passengers would access transit at Wilson station or the Foster/Winona temporary platform from temporary entrances on Winona Street and Foster Avenue. Passengers could also ride the #36 Broadway bus, ½ block west of the Red Line tracks.
- #81 Lawrence Bus - Because Lawrence station would be closed during Stage B, the #81 Lawrence bus would be rerouted to serve Wilson station.
- Argyle Station - Argyle station would be closed during Stage B. Passengers would access transit at the Foster/Winona temporary platform from temporary entrances on Winona Street and Foster Avenue. Passengers could also ride the #36 Broadway bus, ½ block west of the Red Line tracks.
- Berwyn Station - Berwyn station would be closed during Stage B. Passengers would access transit at the Foster/Winona temporary platform from temporary entrances on Winona Street and Foster Avenue. Passengers could also ride the #36 Broadway bus, ½ block west of the Red Line tracks.
- #92 Foster Bus - The #92 Foster bus would be rerouted to serve the Foster Avenue entrance of the Foster/Winona temporary platform.
- #146 Inner Drive/Michigan Express Bus - There would be no routing changes required to the #146 Inner Drive/Michigan Express bus during Stage B.
- Bryn Mawr Station - A temporary platform would serve southbound passengers only during Stage B. Northbound passengers wanting to exit at Bryn Mawr station during construction would need to alight at Thorndale station and then ride the train south to Bryn Mawr station or alternatively, walk from an adjacent station or use bus service from any of the stations adjacent to Broadway.

Passengers traveling through the project area during construction (not starting or ending their trip at one of the project area stations) would experience slightly longer travel times and intermittent service disruptions to accommodate construction; however, trains would continue to pass through the project area to accommodate passenger demand.

Pedestrian Impacts

During construction, sidewalks near the stations may be closed, requiring pedestrian detours. Pedestrian travel times to station entrances would be affected for some passengers during station closures as part of construction. Impacts on pedestrians are described below for each stage of construction.

- **Stage A** - During the first stage of construction, some pedestrians would experience an increased walking time to open stations. **Figure 3-2** shows the change in walking time compared to existing conditions for southbound passengers during Stage A, during which

Lawrence and Berwyn stations would be closed; the Argyle and Bryn Mawr stations would be open with temporary access locations (Bryn Mawr station would be accessible from Broadway or Hollywood Avenue). The average walking speed of 3 miles per hour was used for this analysis. Walk time to an adjacent station entrance for passengers who live near Lawrence station would increase by a maximum of 5 minutes. Walk time to an adjacent station entrance for passengers who live near Berwyn station would increase by a maximum of 9 minutes. Some passengers may experience shorter walking times due to the locations of stations and temporary platforms relative to the passengers' point of origin.

- **Stage B - Figure 3-3** shows changes in walk time for southbound passengers during Stage B. Walk time to an adjacent station entrance for passengers who live near Lawrence station would increase by a maximum of 6 minutes. Walk time to an adjacent station entrance for passengers who live near Berwyn station would increase by a maximum of 4 minutes. Some passengers may experience shorter walking times due to the locations of stations and temporary platforms relative to the passengers' point of origin. Northbound passengers wanting to exit at Bryn Mawr station during construction would need to alight at Thorndale station and then ride the train back south to Bryn Mawr station or, as alternatives, walk from an adjacent station or use parallel bus service from any of the stations adjacent to Broadway.

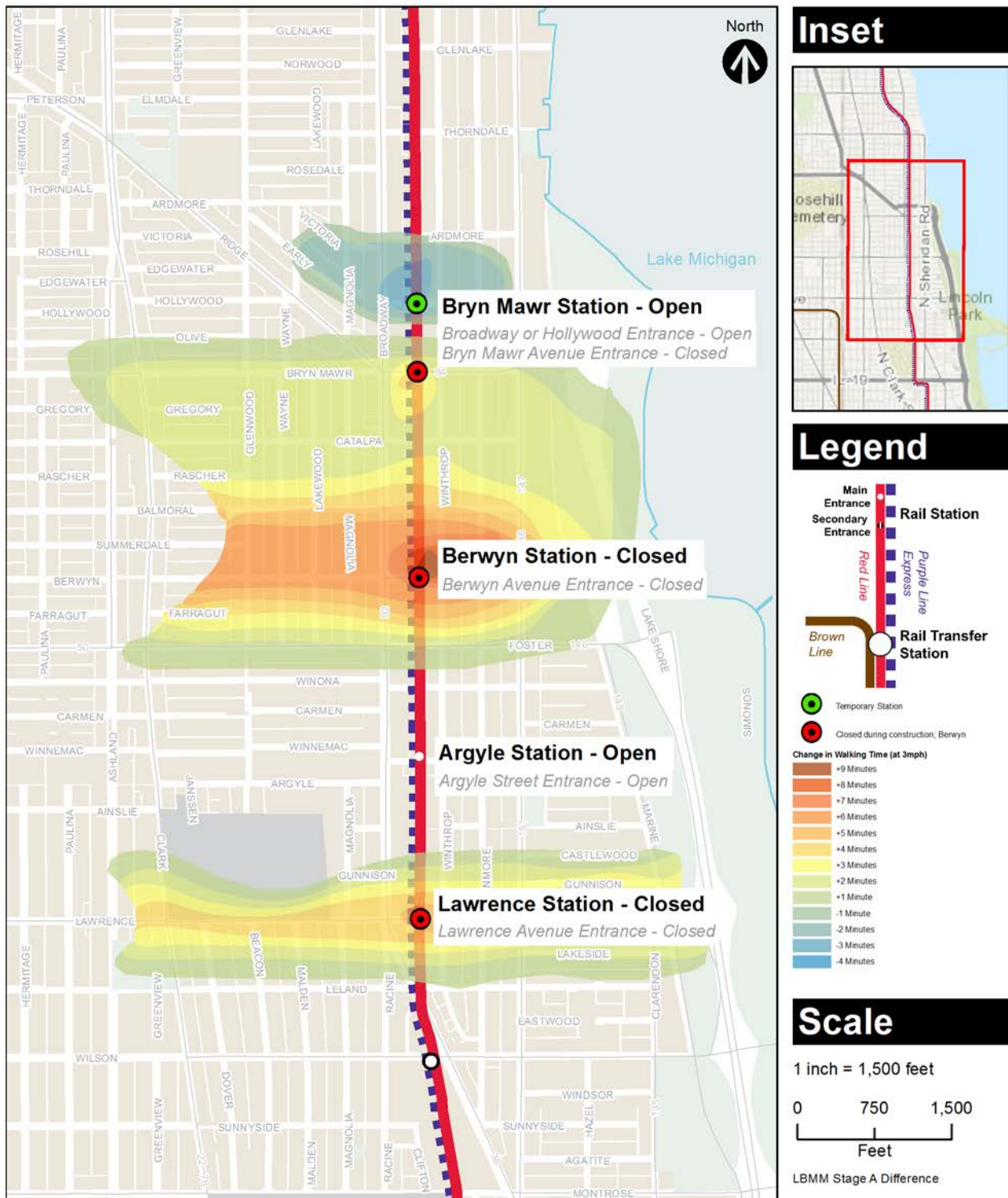


Figure 3-2: Difference in Walking Time for Southbound Passengers During Construction Stage A Compared to Current Walk Time

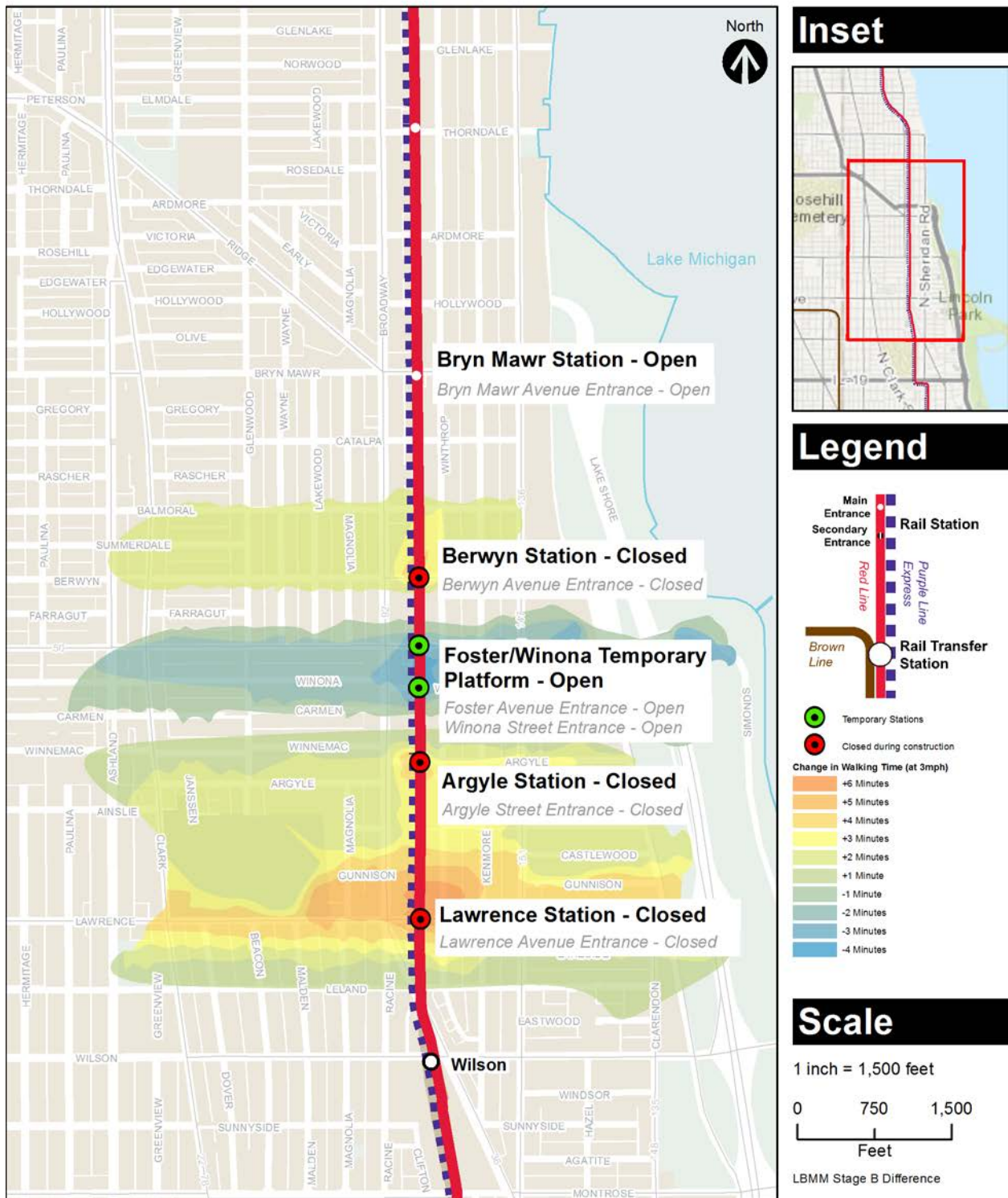


Figure 3-3: Difference in Walking Time for Southbound Passengers During Construction Stage B Compared to Current Walk Time

Residents who live near stations that would be temporarily closed may choose to switch to an alternative mode of transit by using the #36 Broadway, #135 Clarendon/LaSalle Express, #136 Sheridan/LaSalle Express, #146 Inner Drive/Michigan Express, #147 Outer Drive Express, #148 Clarendon/Michigan Express, or #151 Sheridan bus routes, which cross Lawrence Avenue in the project area. CTA would add service to these bus routes as necessary to accommodate additional passengers. Metra is constructing the Peterson Ridge station (expected to open in early 2017, before construction of this project), approximately $\frac{3}{4}$ mile west of Thorndale station; this new Metra station would provide another transit option during construction.

Bicyclist Impacts

Bicycle parking at stations would be temporarily displaced during construction. The availability for bicycle parking near stations would be limited due to construction activities.

Traffic Impacts

Construction activities, including demolition of the existing viaducts, construction of new foundations, and placement of new beams, would cause temporary traffic impacts. Temporary detours or lane restrictions may be required. During the construction of structures in and over alleys, temporary alley closures would be required for installing new foundations, erecting superstructure over the alley, and relocating utilities.

Parking Impacts

The Build Alternative would temporarily affect on- and off-street parking to accommodate construction and delivery of construction materials. On-street parking may also be temporarily affected by measures taken to maintain traffic during viaduct and station reconstruction.

Permanent Impacts

Transit Impacts

The Build Alternative would result in permanent transit benefits. CTA would improve transit service along the project corridor by increasing passenger capacity through construction of new transit infrastructure. The project would enhance station access along the corridor and replace the existing aging rail infrastructure, as described in **Section 2.3**. Improvements to the rail infrastructure would increase service reliability and efficiency and extend the useful life of the system. The project would result in shorter and more reliable travel times in both directions for passengers riding the Purple and Red lines. Stations would be accessible by passengers with disabilities.

The Build Alternative would include a new station entrance on Broadway or Hollywood Avenue for Bryn Mawr station, which would improve circulation and provide passengers an additional station entrance.

Pedestrian Impacts

The Build Alternative would result in permanent pedestrian benefits due to improved access to station areas and the additional Bryn Mawr station entrance at Broadway or Hollywood Avenue.

Bicyclist Impacts

The project would result in no permanent impacts on bicycle facilities. All four stations would include bicycle parking racks after construction.

Traffic Impacts

Due to the location of the project in the existing right-of-way and the nature of the project (an improvement to an operational rail line), changes in vehicle miles traveled or traffic circulation are not anticipated. The existing transit system and the proposed improvements would be elevated above the street network. Minor roadway geometric changes such as curb bump-outs and mid-block crossing at the station entrances are proposed. The alignment of the roadways within the project area would not be modified. No permanent traffic impacts are anticipated. Some benefits would be provided because new viaducts would not have piers in the center of the roadway, improving sightlines and safety for drivers.

Parking Impacts

The Build Alternative would not result in permanent adverse impacts related to parking, loading zones, or access to building entrances. The permanent footprint of the project would not reduce the amount or general location of on-street parking, permit-regulated parking on residential streets, loading zones, or parking for car sharing. Commercial parking spaces at Bridgeview Bank (4723 N. Clifton Avenue) may be affected by piers supporting the new track structure. Every effort would be made in design to adjust column and pier placements to minimize and limit the impacts on parking. Additional off-street parking would be created in locations where the existing embankment is removed, primarily adjacent to the reconstructed stations.

3.4 Measures to Avoid or Minimize Harm

The Build Alternative would result in permanent transit benefits and would not result in permanent adverse impacts related to traffic, public parking, pedestrians, or bicyclists; no mitigation is proposed. Measures to minimize or mitigate transportation impacts during construction are provided below.

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

- #36 Broadway Bus - CTA will increase the frequency of the #36 Broadway bus as necessary during Stages A and B to accommodate passengers. The increased bus service frequency would not affect traffic flow along Broadway because it is expected to result in no more than a few extra buses each hour.
- #81 Lawrence Bus - CTA will reroute the #81 Lawrence bus, which currently serves Lawrence station, to serve Wilson station during Stages A and B.
- #92 Foster Bus - During Stage A, CTA will reroute the #92 Foster bus, which currently serves Berwyn station, to serve an adjacent open station, either Argyle or Bryn Mawr station. During Stage B, CTA will reroute the #92 Foster bus to serve the Foster/Winona temporary platform at the Foster Avenue temporary entrance.
- CTA will schedule construction-related service disruptions to occur during weekends and/or off-peak periods to the extent possible.

- CTA will provide notifications of any service changes to transit passengers as well as neighboring property owners, residents, and businesses.

To minimize impacts on bicyclists, the following measures will be implemented:

- CTA will provide additional, temporary bicycle racks at stations that remain open during construction activities to accommodate diverted bicycle traffic.

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

- CTA will develop a detailed Maintenance of Traffic (MOT) Plan during subsequent engineering and design in coordination with IDOT, CDOT, and the City of Chicago Office of Emergency Management and Communications. The MOT Plan will ensure that emergency vehicle access is not hindered during construction. The MOT Plan will define how temporary closures or longer-term lane closures will be addressed. The MOT Plan will include specific measures to reduce impacts (developed during subsequent engineering and design) to determine peak and off-peak traffic period lane closures, traffic control, traffic rerouting measures, and scheduling of construction activities during off-peak traffic periods.
- Project contractors will adhere to federal, state, and local guidelines and will acquire permits from the appropriate transportation and planning agencies for roadway disruptions, blockages, and closures.
- CTA, the City of Chicago, and/or the project contractor will provide notifications of roadway and sidewalk disruptions, blockages, or closures to neighboring property owners, residents, and businesses using signs along streets, in nearby CTA stations, and in applicable CTA trains and buses. Descriptions of alternate routes will be provided.
- Construction over or adjacent to alleys may temporarily affect access to the alleys; coordination with deliveries or garbage collection using the alleys will be conducted at the time of construction.
- Access to businesses and parking for deliveries to businesses will be maintained throughout construction through the use of both permanent and temporary loading zones.
- The contractor will limit roadway detours and blockages during special events in the surrounding neighborhoods.
- Construction workers will be required to park at off-street parking locations to limit impacts on existing on-street parking.

Chapter 4

Environmental Resources, Impacts, and Mitigation Measures

This chapter describes existing conditions and the consequences 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: displacements and relocations, land use and economic development; neighborhoods, communities, and businesses; 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 lengthy analysis; for those cases, technical memoranda were developed and are included in **Appendix C**. This chapter summarizes the findings of those more detailed technical analyses.

Each discussion below 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.

4.1 Displacements and Relocations of Existing Uses

Displacements and relocations may occur when land and/or structures are needed to accommodate construction or the permanent footprint of a project. Many of the Build Alternative improvements are proposed to occur within the existing CTA right-of-way. This section describes the right-of-way expansion needed for the project, including acquisition of air rights and easements for track realignments and temporary or permanent acquisition for off-street construction sites.

4.1.1 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 people displaced

from their homes or businesses by establishing uniform and equitable land acquisition policies to address impacts.

4.1.2 Existing Conditions

The project corridor is in a mature, dense, urban area. Private development has been built through the years immediately adjacent to the elevated rail line, which limits the area available for construction activities. The majority of land uses adjacent to the project area are multifamily residential and urban mixed-use, with commercial nodes near station locations. A continuous alley lies immediately east of the existing elevated rail line. This alley provides access to parking areas and garbage collection for properties fronting Winthrop Avenue, the street one block west of the rail line. To the west of the elevated rail line is an intermittent alley. At some locations in the corridor, buildings have been built immediately next to the elevated rail line retaining walls.

The current CTA right-of-way through the project area is 60 feet wide. This right-of-way generally includes two southbound tracks on the west, a platform (approximately 12 feet wide) in the middle, and two northbound tracks on the east. To accommodate wider platforms, the right-of-way must be expanded beyond the current 60 feet. To minimize property impacts, CTA proposes to expand the right-of-way over the adjacent alley on the east side of the tracks where possible. Air rights over several parcels would also be required. In addition to air rights needed to accommodate wider platforms and track realignments, construction sites—adjacent to the project corridor and sufficient in size to support the project structures—would be needed.

4.1.3 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 modernize the rail system in the project corridor and would not displace any properties; therefore, no temporary construction or permanent displacement or relocation impacts would occur.

Build Alternative

The Build Alternative would directly affect seven properties either temporarily for construction, for permanent right-of-way acquisition, or both. **Figure 4-1** shows the affected properties as well as refinements from preliminary engineering. **Table 4-1** provides additional information on these anticipated property impacts. Additional information on each parcel, including tax property index numbers, is provided in **Appendix C-1**.

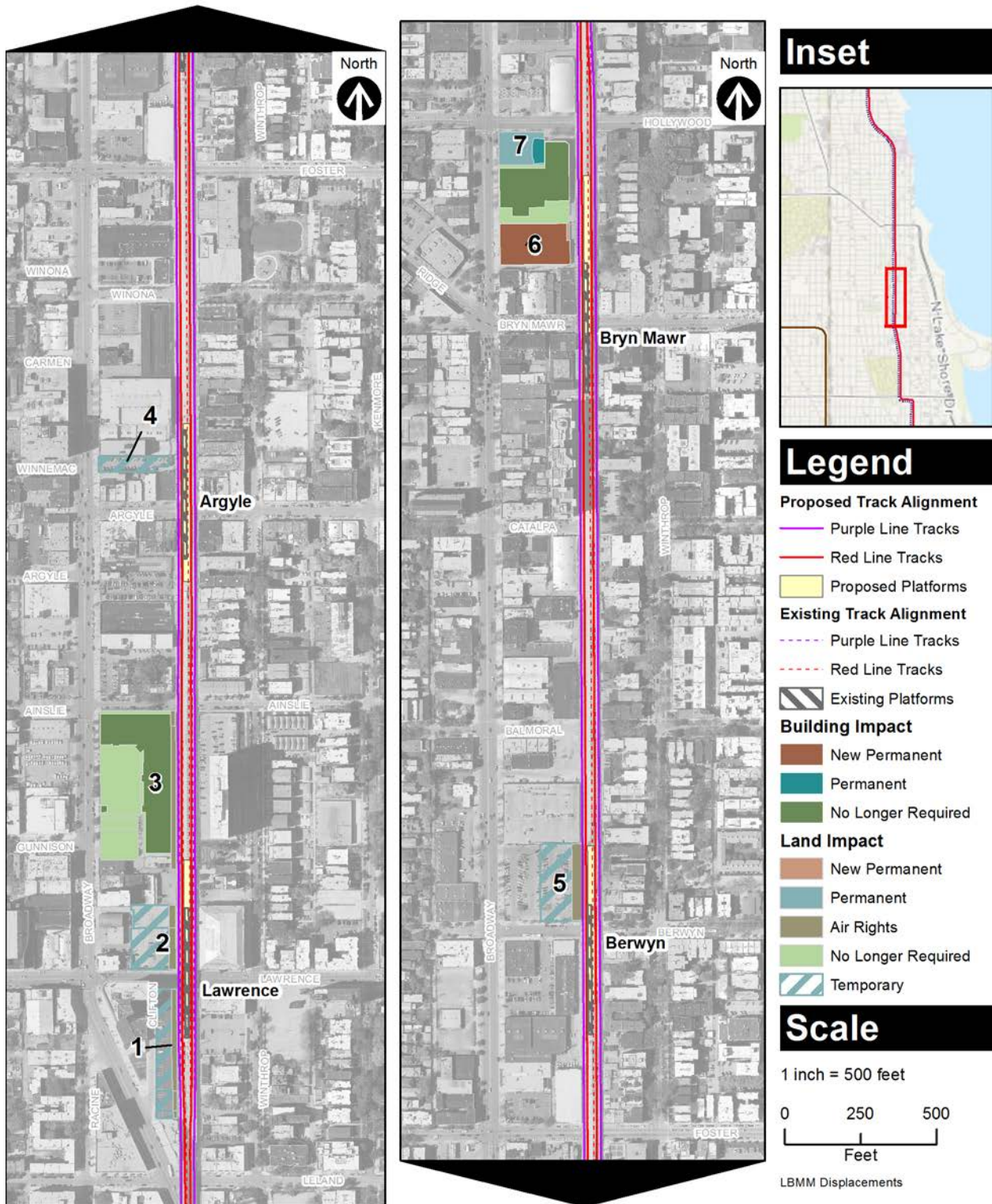


Figure 4-1: Overview of Potentially Displaced Properties

Table 4-1: Property Displacements

Map ID	Address	Current Use	Type of Acquisition
1	4723 N. Clifton Avenue/ 1123 W. Lawrence Avenue	Private Surface Parking	Temporary Construction Easement Permanent Air Rights
2	1130 W. Lawrence Avenue/ 4819 N. Broadway	City of Chicago Surface Parking	Temporary Construction Easement Permanent Air Rights
3	4837-4887 N. Broadway	Commercial Strip Mall	Permanent Air Rights
4	5033 N. Broadway	Private Surface Parking	Temporary Construction Easement
5	5343 N. Broadway	Grocery Store Surface Parking Only	Temporary Construction Easement
6	5625 N. Broadway	New Car Dealership (same business as #7)	Full Land Acquisition and Demolition of Primary Building
7	5657 N. Broadway	Used Car Dealership (same business as #6)	Full Land Acquisition and Demolition of Primary Building

Note: In addition to property displacements noted in this table, vacant CTA-owned retail buildings underneath and adjacent to the elevated track structure at Argyle, Berwyn, and Bryn Mawr stations would be demolished to reconstruct modern, enhanced stations. These include CTA-owned properties at 1117-1119 and 1116-1124 W. Argyle Street, 1121 W. Berwyn Avenue, and 1111-1123 and 1116-1122 W. Bryn Mawr Avenue.

The parcels in **Table 4-1** include one commercial use (car dealership) and several parking lots. No residential parcels are proposed for either temporary or permanent acquisition as part of the Build Alternative. The affected business would be relocated as required by the Uniform Act. In addition to these property displacements, the CTA-owned stationhouse and currently vacant retail facilities underneath the track structure at Argyle, Berwyn, and Bryn Mawr stations would be demolished to build modern, expanded stations with auxiliary entrances or exits.

In public meetings during development of the Build Alternative, citizens and businesses expressed concerns about construction and permanent property impacts resulting from the project. With regard to construction sites, citizens and businesses were most concerned with impacts from street closures (due to equipment storage and construction employee parking) during construction. Suggestions included using off-street sites for construction equipment and material storage and ensuring construction employees did not use on-street parking that is critical for commercial businesses. Citizens also 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. Through this technical analysis, CTA determined an “alley spanning” concept (further described in **Section 2.3.1**) would allow CTA to construct wider platforms and modernize the tracks and structures, while minimizing the number of permanent displacements required. The “alley spanning” concept would expand the structure over the adjacent alley to the east. The alternative to the “alley spanning” concept would have been to expand the structure to the west, which would have required the displacement of adjacent buildings. The expanded structure over the alley would maintain sufficient horizontal and vertical clearance to allow for continued access (such as access to parking) and function (such as garbage collection).

During conceptual design, CTA also identified potential construction sites that would provide adequate storage for construction equipment, materials, and construction activities, while limiting the need for street closures. Where possible, CTA identified parking lots adjacent to the corridor to meet temporary construction needs.

In April 2014, CTA and FTA announced the Lawrence to Bryn Mawr Modernization Project to the public and held a series of public and community-specific meetings to discuss anticipated displacements. Since that time, CTA further refined the alignment in order to decrease impacts. Changes since April 2014 include:

- Between the Lawrence and Argyle stations, a commercial strip mall (4851–4887 N. Broadway), known locally as “My A” or 美亞, and associated parking lot (4839–4849 N. Broadway) had been identified for permanent acquisition and demolition to accommodate a modernized Lawrence station. At Lawrence station, the potential for expanding the right-of-way by spanning over the east alley is limited due to loading activities in the alley for the adjacent Aragon Ballroom. Based on preliminary engineering, however, CTA determined that the strip mall would not need to be fully acquired or demolished. The preliminary engineering determined that an expansion partially over the east alley would be possible without affecting the Aragon Ballroom loading zone and that a 22-foot station platform would be sufficient to meet ADA standards and capacity needs. Air rights over the rear edge of the commercial strip mall property would still be necessary to construct the project.
- Because portions of the commercial strip mall site would no longer be available for construction, the entire city-owned parking lot at 1130 W. Lawrence is proposed for temporary construction use instead.
- Further research of property ownership, combined with outreach to owners, indicated that acquisition of multiple Toyota dealership properties near the Bryn Mawr station (previously identified as 5657 N. Broadway and the nearby newly identified 5625 N. Broadway) would meet project construction needs.
- Because the Toyota dealership properties would provide adequate construction space, the Public Storage lot and building (5637–5643 N. Broadway) near Hollywood Avenue would no longer be needed for construction.

Construction Impacts

All properties referenced in **Table 4-1** would be used during construction. Temporary displacements are further described in this section. During construction, temporary easements would be needed at four surface parking lots along the corridor to accommodate construction activities and for equipment and materials storage: two would be adjacent to Lawrence station, one would be adjacent to Argyle station, and one would be on an existing Jewel Osco grocery store parking lot (near Berwyn station). Only a portion of the Jewel Osco parking lot (less than one third) would be needed for temporary construction access; the construction easement would not affect business operations and CTA would work with the business to establish reasonable compensation for the temporary use of property.

Table 4-2 provides additional details about the temporary construction easements, including total lot area and area required during construction.

Table 4-2: Displacements for Construction

Map ID	Address/Current Use	Nearest Station	Total Lot Area (square feet)	Area Required During Construction
1	4723 N. Clifton Avenue/ 1123 W. Lawrence Avenue Private Surface Parking	Lawrence	4,360	Approximately 48 Parking Spaces
2	1130 W. Lawrence Avenue/ 4819 N. Broadway City of Chicago Surface Parking	Lawrence	27,496	Alley and Approximately 80 Parking Spaces (full parking lot)
5	5033 N. Broadway Private Surface Parking	Argyle	10,794	Approximately 33 Parking Spaces
6	5343 N. Broadway Grocery Store Surface Parking Only	Berwyn	69,302	Approximately 65 Parking Spaces (1/3 of total parking lot area)

Permitting would be obtained for temporary construction easements through the City of Chicago Department of Buildings where necessary. Assistance related to temporary relocations would be determined on a case-by-case basis taking into account the provisions of the Uniform Act and subject to negotiation with the tenant or owner.

Permanent Impacts

As indicated in **Table 4-1**, implementation of the Build Alternative would result in acquiring permanent air rights over two existing surface parking lots (Map ID #: 1 and 2) due to track realignment and station expansion, which would not alter the function or use of the parking lots. Piers supporting the new track structure may affect one or two parking spaces.

The wider right-of-way necessary for the Lawrence station and track modernization would require a strip of air rights over the existing pedestrian alley behind (to the east of) the commercial strip mall (4851–4887 N. Broadway), known locally as the “My A” or 美亞. The new structure over the existing pedestrian alley would not affect access or use of the building.

At three stations within the corridor (Argyle, Berwyn, and Bryn Mawr), CTA-owned retail buildings underneath the track structure would be demolished to allow for reconstruction of the track structure and stations. There is no CTA-owned retail building underneath Lawrence station. CTA leases these types of retail facilities on 30-day (short-term) or long-term lease terms (varied durations). Currently, all of the retail spaces at these stationhouses are vacant and no relocation of businesses would be required. CTA does not currently have plans to lease the commercial spaces between now and the proposed construction; any leases issued would be on a 30-day (short-term) basis with provisions concerning lease termination before construction dates clearly documented. No relocations would be necessary.

There are two commercial properties for which land acquisition and building demolition would be required, both occupied by the same business on noncontiguous parcels. These properties are north of Bryn Mawr station on Broadway near Hollywood Avenue. These properties would be acquired for permanent right-of-way needs and construction. Portions of these properties remaining after construction could be redeveloped with transit-related uses in cooperation with CTA independently of this project.

4.1.4 Measures to Avoid or Minimize Harm

To address the impacts for all private property acquisitions, the following requirements (in compliance with the Uniform Act) 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 to result in a level that is less than significant under NEPA 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 businesses. **Section 5.1.3** provides additional information on property displacement outreach.
- CTA, in coordination with the City of Chicago and the local aldermen's offices, 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 by the City of Chicago, aldermen's offices, and through CTA and aldermen's outreach to local chambers of commerce.

4.2 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 corridor. This section takes into account proposed property displacements and relocations (described in **Section 4.1**).

4.2.1 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 areas within ¼ mile of the project alignment to determine compatibility with the proposed project. This ¼-mile buffer was used to represent a reasonable walking distance for an existing transit route with existing stations in a dense, urban environment. The project could directly or indirectly affect land uses and economic development plans within this ¼-mile buffer. The City of Chicago also recently increased incentives for development near transit stations through its

transit-oriented development ordinance, which was reviewed for consistency with the Build Alternative.

For this EA, a land use change may result in an impact if it would be incompatible with surrounding land uses or would encourage land use and development inconsistent with local plans, goals, and objectives.

An economic 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 analyzed 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 corridor to determine consistency of the project with the goals and policies presented in the local and regional land use plans of the City of Chicago and CMAP, including the following:

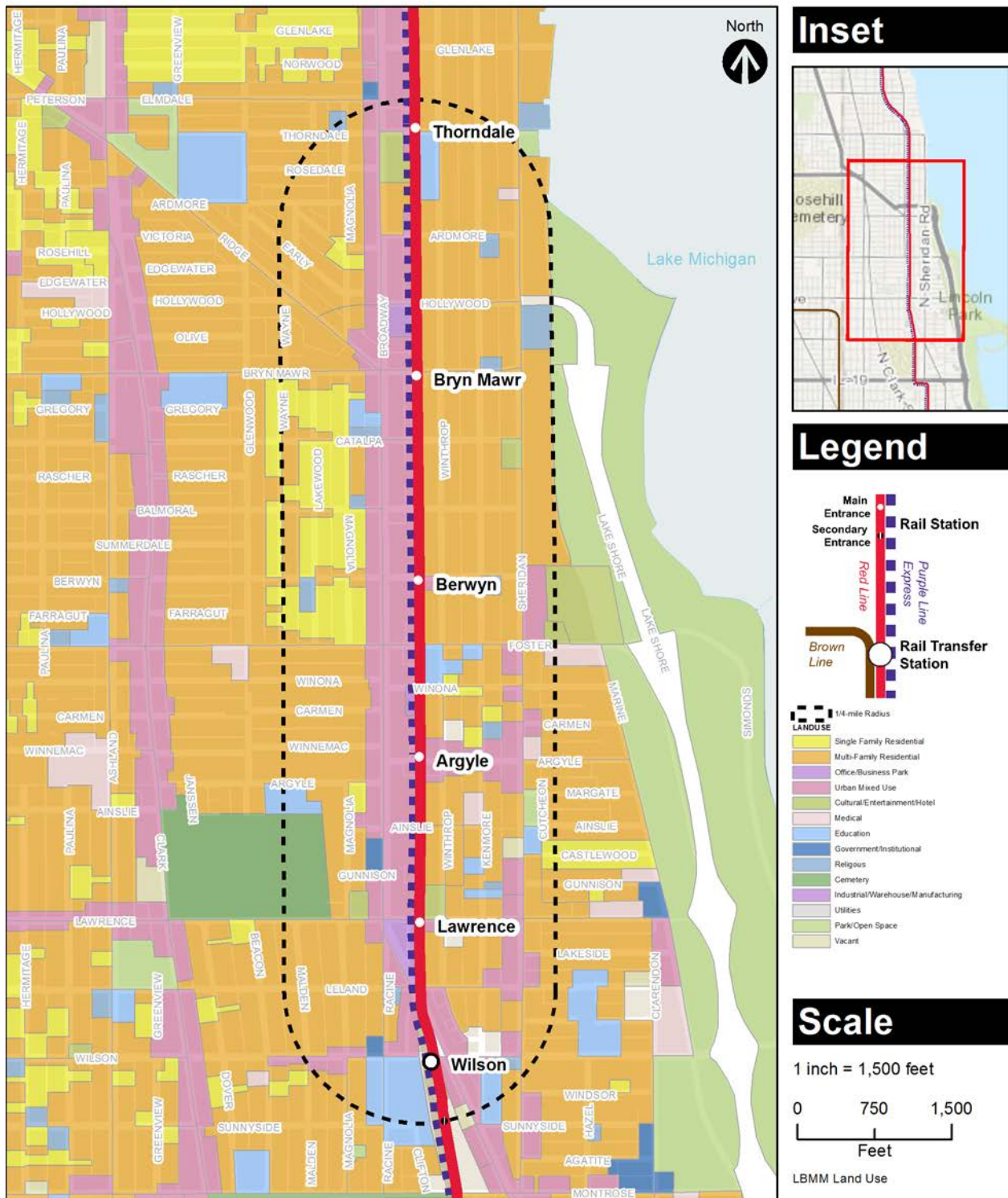
- CMAP *GO TO 2040* (2010)
- Cook County Long Range Transportation Plan, *Connecting Cook County* (in development)
- Cook County *Comprehensive Economic Development Strategy Report* (2009)
- CTA and City of Chicago *Transit-Friendly Development Guide* (2009)
- CTA and City of Chicago *Transit-Friendly Development Guide: Plans for Four Station Areas (Draft)* (2010)
- 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)
- City of Chicago *Uptown Action Plan* (in development)
- City of Chicago *North Broadway Plan* (in development)

A qualitative evaluation covered the potential benefits associated with transit-oriented development, livability, access to jobs, and local economic activity. **Appendix C-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 be no indirect impacts from the Build Alternative on planned development.

4.2.2 Existing Conditions

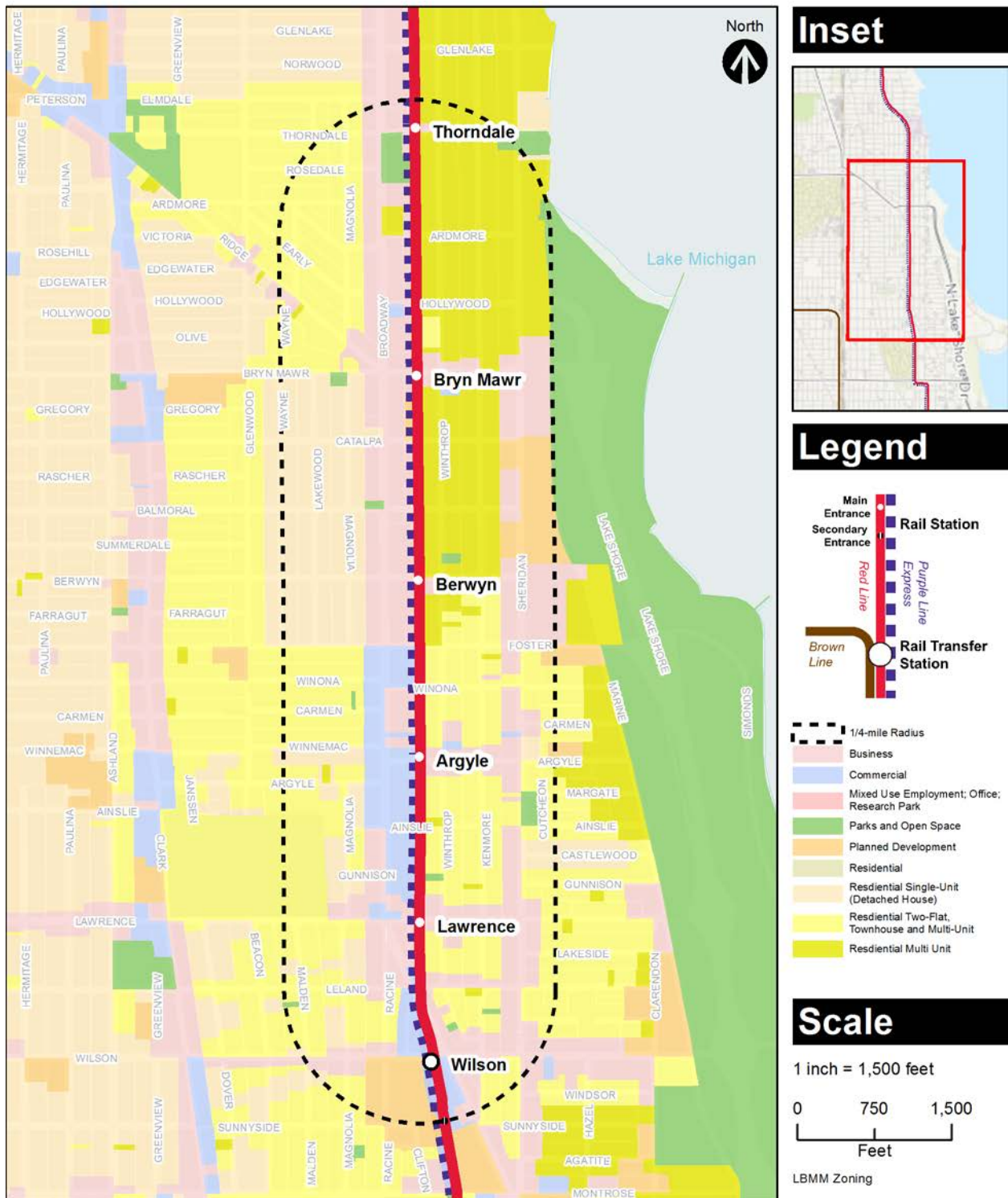
The land use and zoning surrounding the North Red and Purple lines is transit-supportive. The rail corridor has been in place for over 90 years. Accordingly, local zoning has adapted and development has taken advantage of the benefits of transit. The majority of land uses adjacent to

the project area are multifamily residential and urban mixed-use. The areas around stations are most commonly zoned as commercial nodes surrounded by mixed-use and medium- to low-density residential zones (City of Chicago 2012b). **Figures 4-2 and 4-3** show current land use and zoning designations for parcels within $\frac{1}{4}$ mile of the project alignment.



Source: CMAP 2005

Figure 4-2: Current Land Uses in the Project Area



Source: City of Chicago 2012b

Figure 4-3: Current Zoning in the Project Area

4.2.3 Environmental Impacts

The following sections summarize the potential land use and economic 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 and economic impacts. There would also be no economic development benefits.

Build Alternative

Construction Impacts

Construction associated with the Build Alternative would not introduce new land uses that are inconsistent with existing ones. Construction along the right-of-way would result in seven partial or full displacements and easements. Properties used for construction would temporarily shift from their current use (one commercial property on two parcels and remaining properties identified as surface parking lots) to be used for construction activities.

Construction of the Build Alternative would have a minimal impact on economic development in the project area because only one business (car dealership) would be permanently displaced. **Sections 4.2.4 and 4.3.4** contain mitigation measures to assist businesses affected by construction activities.

Construction activities would occur along the corridor, 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 in nature pending redevelopment of two parcels remaining after construction. This impact would be minor given the small number of parcels proposed for acquisition.

Permanent Impacts

The Build Alternative would not result in permanent impacts on land use and economic development.

Portions of parcels remaining after construction could potentially be redeveloped with transit-related uses in cooperation with the CTA. This potential redevelopment would be independent of the project, but would be consistent with surrounding land uses, zoning, and local plans, goals, and objectives.

4.2.4 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:

- CTA will develop and implement a Construction Outreach and Coordination Plan. The plan will include a Business Outreach Program to assist local businesses and residents affected by

construction. The plan will be tailored to business and community needs, and will include a series of initiatives to minimize construction disruption to businesses and the surrounding community. Examples of these initiatives include a community calendar to inform the construction schedule and avoid affecting special events or festivals, advertising campaigns, provisions for additional parking during construction, signage, and other economic incentives or tax relief measures for businesses adversely affected by construction.

- CTA will work with the City of Chicago Department of Planning and Development (DPD) to provide incentives to encourage transit-oriented redevelopment, consistent with local and regional 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, or expedited permitting. This measure could spur transit-oriented redevelopment and other land uses that support local and regional development plans after the project is complete by easing the path to construction for developers on parcels required for construction.

4.3 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 near the project corridor, such as schools, parks, and community centers.

4.3.1 Regulatory Framework/Methods

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 further delineated for areas within ¼ mile of the project corridor, which represents a typical walking distance from transit stations. The analysis also identified any key community resources within ¼ mile of the corridor. 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 have ripple effects on the surrounding neighborhood. Mitigation measures are proposed to offset identified impacts, with an emphasis on community and transit-supportive solutions to address temporary construction impacts. **Appendix C-3** provides detailed information on community profiles and demographics, as well as maps and information about community resources.

4.3.2 Existing Conditions

The project corridor lies within two community areas: Uptown and Edgewater. These community areas contain dense, urban development with a diverse population. **Table 4-3** shows demographics for the Uptown and Edgewater community areas, and **Table 4-4** summarizes demographic factors within ¼ mile of the project limits.

Table 4-3: Community Area Population Profile

Category	Community Area Profile - Uptown	Community Area Profile - Edgewater	Community Area Total	Chicago (Citywide)
Population	54,995	55,333	110,328	2,698,831
Households	29,441	29,110	58,551	1,033,022
Employment	13,505	10,512	24,017	1,252,656
% Minority	48	47	47	67.2
% Elderly	10	12	11	10.3
% Renters	68	61	64	52.2
% Owners	32	39	36	47.8
Median Home Value	\$288,800	\$248,971	\$268,885	\$269,200
Average Household Size (# persons)	1.87	1.90	1.88	2.56
Average Gross Rent per Month	\$806	\$874	\$840	\$885

Source: U.S. Census Bureau 2012

Table 4-4: Project Area Profile

Demographic Factor	Project Area (within ¼ mile)	Density (number per acre)
2012 Population	32,332	56.9
2012 Households	17,653	31.0
2011 Jobs	9,511	16.7
2012 No Vehicles Available (Households)	8,605 (49% of project area total)	15.1
Average Commute Time	36.0 minutes (based on zip code)	--

Source: U.S. Census Bureau 2012

Uptown Community Area

Uptown has two CTA rail stations within the project area: Lawrence (established in 1923), and Argyle (established in 1908); see **Figures 4-4 and 4-5**. Broadway is the major north-south arterial through the project area, and it serves as the primary commercial corridor for the adjacent community areas with local business and commercial activities located directly adjacent to stations. Lawrence Avenue, a minor east-west arterial, also is an entertainment and commercial district contiguous to Broadway. Argyle Street is a primary commercial district for local Asian populations, with Broadway serving as a contiguous, secondary commercial corridor. The remaining streets within the project area are primarily residential and contain a diverse mix of housing.



Figure 4-4: Lawrence Station Opening, February 1923



Figure 4-5: Argyle Station in the 1940s

Community facilities, such as schools, parks, and community centers are primarily located on major north-south arterial roadways beyond the proposed construction areas; Hickory Playlot Park and William C. Goudy Technology Magnet Cluster Elementary School are near the project alignment (see **Appendix C-3** for map).

The following summarizes the community character within ¼ mile of each station area:

- Lawrence - The station area is an entertainment destination due to a number of bars and theatres. The Riviera Theatre and Aragon Ballroom host live music, while the Uptown Theatre is under study for renovation. The area includes primarily multifamily residential uses.
- Argyle - The station area is a restaurant destination and sometimes referred to as “Little Vietnam,” due to the numerous Vietnamese restaurants along Argyle Street and Broadway. The area also includes mixed-use commercial, as well as single-family and multifamily residential uses.

Edgewater Community Area

Edgewater also has two CTA rail stations: Berwyn (established in 1916–17), and Bryn Mawr (established in 1908). Again, Broadway is the major north-south arterial through Edgewater, and serves as the primary commercial corridor for the adjacent community areas. The remaining streets within Edgewater are residential and contain a diverse mix of multifamily housing. Community facilities are primarily located on major north-south arterial roadways beyond the proposed construction areas; George B. Swift Elementary School is near the project alignment (see **Appendix C-3** for map).

The following summarizes the community character within ¼ mile of each station area:

- Berwyn - The station area includes mixed-use commercial and single-use, single-story buildings along Berwyn Avenue and Broadway, including a Jewel-Osco supermarket. The area includes some single-family homes, but mostly multifamily residential uses.
- Bryn Mawr - The station area includes a mixed-use business district along Bryn Mawr Avenue—a gateway to lakefront parks and beaches. Commercial uses also occur on Broadway. The area includes some single-family homes, but mostly multifamily residential uses.

More detailed demographic and ridership information for the area within ¼ mile of the project alignment and at each of the stations proposed for improvement was gathered to further describe the project area neighborhood and community character (**Table 4-4** provides a summary). Much of the population living within ¼ mile of each station area relies on transit and is uniquely situated to benefit from transit system improvements. There are 32,332 people living within ¼ mile of the project corridor and approximately 49 percent of households within ¼ mile of the corridor do not own a car and rely on public transportation for daily travel needs (U.S. Census Bureau 2012).

4.3.3 Environmental Impacts

The following sections summarize the potential neighborhood, community, and business 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 associated with the No Build Alternative.

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 for the Build Alternative would last approximately 36 to 42 months; however, the duration of construction at any one location along the corridor would be shorter than this total duration. This timing does not include advance work on the track structure and utility relocations. 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. Parcels used for construction may affect the community street life and cohesion. Temporary detours, alley closures and station closures would reduce mobility throughout the project area.

CTA identified off-street parcels adjacent to the project corridor for storage of construction materials and equipment to minimize the need for street closures during construction. All of the property acquisitions would be permanent due to the duration of construction, the cost and impact of demolishing the existing buildings, and the provision for transit-oriented uses on the property remaining after construction. Mitigation measures, as discussed in **Section 4.3.4**, are provided to reduce construction impacts to a level that is less than significant under NEPA.

Permanent Impacts

The Build Alternative would result in permanent benefits to the surrounding neighborhoods, communities, and businesses. Modernization of the stations and track structure would provide additional access to stations, would enhance sightlines to the surrounding neighborhoods, and would improve safety for pedestrians, drivers, and bicyclists. The track structure and stations, an integral part of the community, would be reconstructed and would enhance the community character and cohesion. As discussed in **Sections 4.6 and 4.7**, some community facilities would be subject to moderate noise and vibration impacts; mitigation measures would minimize impacts to levels below FTA noise and vibration thresholds.

The Build Alternative would improve mobility. Stations would be wider and longer with auxiliary entrances or exits that would better connect the community to the station. Passengers would be able to access destinations and jobs in the corridor more quickly, which would support future station area business development. The Build Alternative would also provide faster, more reliable transit access to jobs both in and outside the project area, which would be a long-term benefit to local businesses. Access to nearby community resources would be enhanced as a result of the proposed improvements to mobility and viewsheds (i.e., areas visible to the human eye from a fixed vantage point).

4.3.4 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.

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

- CTA will develop and implement a Construction Outreach and Coordination Plan. The plan will include a Business Outreach Program to assist local businesses and residents affected by construction. The plan will be tailored to business and community needs, and will consist of a number of strategies to minimize construction disruption to businesses and the surrounding community. These strategies could include, but are not limited to the following:
 - A community calendar to inform the construction schedule so that impacts on special events or festivals may be avoided
 - Advertising campaigns to promote local business patronage during construction
 - Additional parking during construction to maintain access to businesses
 - Signs, for example, “We Are Open” and other signs explaining changes in access for business patrons
 - Other economic incentives or tax relief measures for businesses adversely affected by 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 the City of Chicago and local community organizations to develop a Station Area Plan or other redevelopment plans and policies as an appendix or update to existing neighborhood plans and business district plans. Plans will indicate appropriate locations for new commercial, residential, or mixed-use developments at the displaced property.
- CTA will maintain access, or provide alternate access to businesses, residences, community facilities, and parks affected by temporary access changes during construction.
- CTA will provide detours and alternate transit service options around closed stations during construction as described in **Chapter 3**, with enhanced service modifications during special community events and festivals.

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

- CTA will work with DPD, aldermen’s offices, and developers to encourage the redevelopment of vacant areas in a timely manner after construction is complete.

With implementation of these measures, impacts would be minimized, and would be at a level less than significant under NEPA.

4.4 Historic and Archaeological Resources

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. Additional analysis under Section 4(f) of the USDOT Act of 1966 is described in **Chapter 6** of this EA.

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 C-4** contains additional detailed information on this analysis. **Section 5.2.2** summarizes Section 106 coordination efforts to date.

4.4.1 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 actions. 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 Section 106 assessment of historic and archaeological resources, FTA and 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. The SHPO reviewed the proposed APE and provided concurrence on July 9, 2014.
2. **Identify Historic and Archaeological Resources** - After an extensive records check, the area within the APE footprint was field-surveyed by an architectural historian to identify any archaeological resources and historic resources that meet National Register of Historic Places (NRHP) criteria. 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, as well as local landmarks and Chicago Historic Resources Survey (CHRS) “Red” and “Orange”-rated⁴ 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.

3. **Assess Effects on Historic and Archaeological Resources** - 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 might 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 for this project. The Draft MOA is included in **Appendix C-4**. The signed MOA will be included in the final NEPA decision document.

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 Illinois Historic Preservation Agency (IHPA), which acts as the SHPO for Illinois; the City of Chicago Historic Preservation Division; Preservation Chicago; Landmarks Illinois; the Edgewater Historical Society and Museum; the Uptown Chicago Commission; Friends of the Parks; and the Uptown Historical Society. 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 4, 2014. A meeting was held on August 21, 2014 to review the eligibility and preliminary effects findings and a 30-day comment period was initiated to solicit input into the determinations. **Appendix C-4** provides full details on the Section 106 assessment and consultation process carried out for the project. **Appendix C-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.

After SHPO’s concurrence with the eligibility and effects determinations for the project, on January 20, 2015, FTA and CTA notified the Advisory Council on Historic Preservation (ACHP) 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 C-4**.

⁴ 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.

Based on the eligibility and effects findings and SHPO's concurrence with those findings, FTA, CTA, and IHPA together developed a Draft Memorandum of Agreement (MOA) to resolve the adverse effects on historic resources. The Draft MOA is included in **Appendix C-4**. FTA and CTA held a meeting with consulting parties on March 24, 2015 to obtain additional comments on proposed measures in the Draft MOA to avoid or minimize harm to historic resources. The final, signed MOA will incorporate consulting party input and contain stipulations to be carried out in consultation with all signatories of the document. The MOA will be signed before FTA's final NEPA decision on this project and a copy of the final, signed MOA will be included in the NEPA final decision document.

4.4.2 Existing Conditions

Figure 4-6 is a map of the APE and NRHP-eligible resources and historic districts. Within the limits of the APE for the project, 261 individual resources were surveyed. A total of 17 resources were determined to meet eligibility criteria for inclusion in the NRHP: 13 individually eligible resources and 4 historic districts. Of the individually eligible structures, 1 is listed on the NRHP (Uptown Broadway Building) and 12 have been recommended as eligible according to the criteria established for listing on the NRHP. **Tables 4-5 and 4-6** list the individually eligible properties and districts within the APE. **Appendix C-4** provides the historic background of the project area, a full description of the analyzed properties and districts, and a discussion of historic properties and districts that are locally designated.

In addition to NRHP-listed and eligible resources, 2 local landmarks and 12 CHRS Red and Orange properties exist within the APE. No local landmarks or CHRS Red or Orange-rated properties would be demolished by the project; for that reason, they are not included in **Figure 4-6** or discussed further in this section. **Appendix C-4** describes the CHRS Red and Orange properties further.

According to an IHPA records review of the Historic Architectural and Archaeology Resources Geographic Information System, no known archaeological sites exist within approximately 2 miles of the APE.

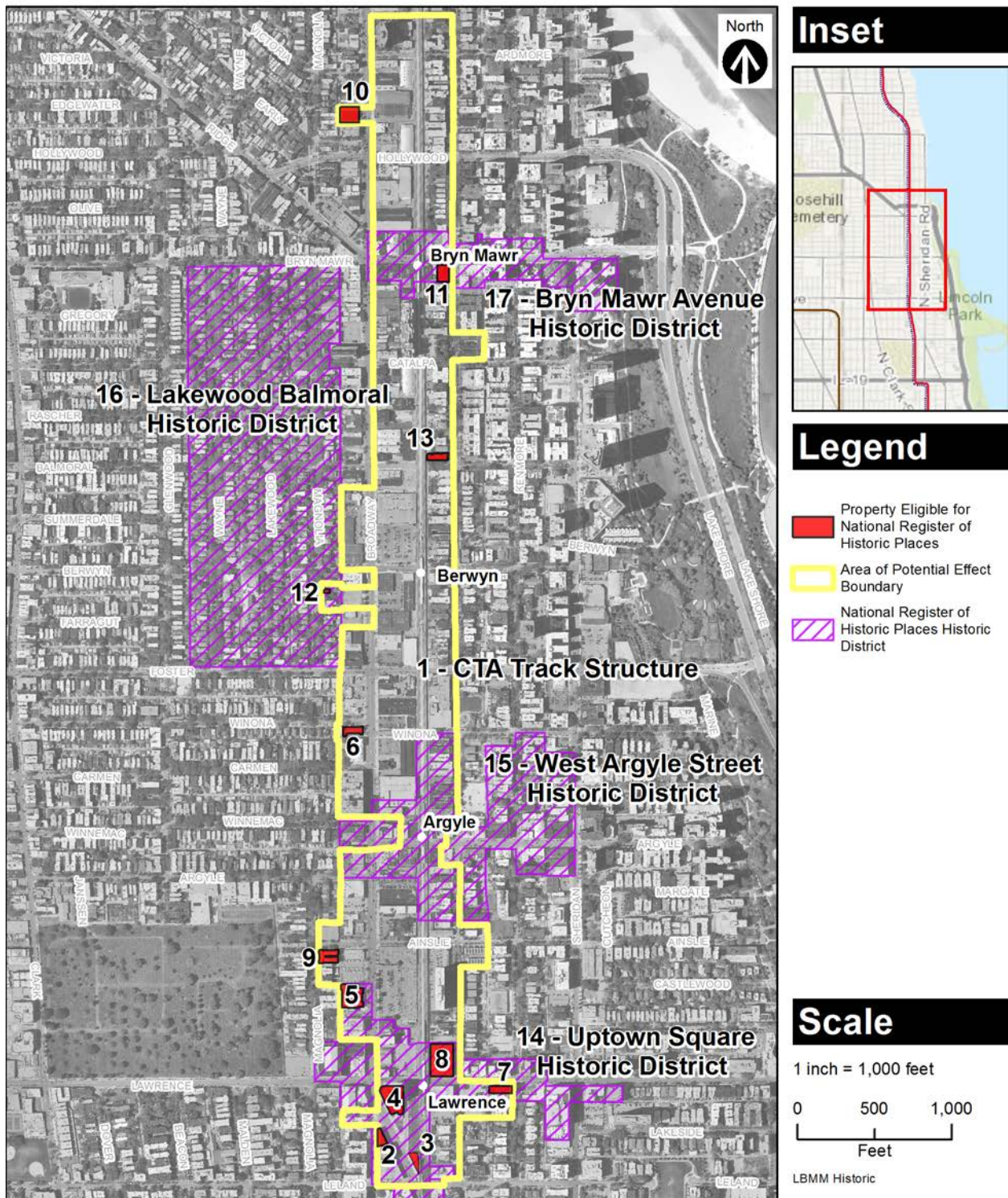


Figure 4-6: Historic Area of Potential Effects Boundary and NRHP-Eligible Resources

Table 4-5: Individually Eligible Properties in the Area of Potential Effects

Map ID	Address	Period of Significance	Description	NRHP Eligibility Criteria	Contributing to Historic District
1	Wilson Station to Howard Station (CTA Track Structure)	1920	Elevated Track (CTA)	Criterion A	Multiple
Uptown					
2	4728-4744 N. Broadway	1914	Classic Revival Commercial Building	Criterion C	Uptown Square
3	4703-4715 N. Broadway ¹	1927	Uptown Broadway Building	Criterion C	N/A
4	4753 N. Broadway ¹	1924-1928	Sheridan Trust & Savings Bank	Criterion C	Uptown Square
5	4850 N. Broadway	1939	Art Moderne-Style Post Office	Criterion C	Uptown Square
6	5120 N. Broadway	1904	Schlitz Brewery-Tied House	Criterion C	N/A
7	1039-1053 W. Lawrence Avenue	1929	Venetian Gothic Apartment	Criterion C	Uptown Square
8	1100-1108 W. Lawrence Avenue	1926	Aragon Ballroom	Criterion C	Uptown Square
9	4875 N. Magnolia Avenue	1927	Gothic Revival Apartment	Criterion C	N/A
Edgewater					
10	5718 N. Broadway	1922	Art Moderne Commercial	Criterion C	N/A
11	1101-1107 W. Bryn Mawr Avenue	1927	Venetian Gothic Mixed-use	Criteria A and C	Bryn Mawr Avenue
12	5247 N. Magnolia Avenue	1898	Classical Revival Residence	Criterion C	Lakewood Balmoral
13	5400-5402 N. Winthrop Avenue	1925	Spanish Revival Apartment	Criterion C	N/A

NRHP = National Register of Historic Places; N/A = Not Applicable

¹ This property is also documented in the *Wilson Transfer Station Project EA and Section 4(f) Evaluation*, which contains analysis of the Section 106 effects for that project, which has separate, independent utility and would be completed before the Lawrence to Bryn Mawr Modernization Project.

Table 4-6: Existing Historic Districts in the Project Area

Map ID	Historic District Name	Period of Significance	Community Area	NRHP Eligibility Criteria
14	Uptown Square HD	1900-1974	Uptown	Criteria A and C
15	West Argyle Street HD	1898-1938	Uptown	Criteria A and C
16	Lakewood Balmoral HD	1890-1929	Edgewater	Criterion A
17	Bryn Mawr Avenue HD	1875-1949	Edgewater	Criterion C

HD = Historic District; NRHP = National Register of Historic Places

4.4.3 Environmental Effects (including 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 property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property'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 districts and properties that are eligible for NRHP listing. Effects are not separated into temporary 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, however, allow the track infrastructure to continue to degrade despite interim maintenance repairs. Ultimately, the degradation would interfere with the North Red and Purple line infrastructure continuing to serve its historic function as a crucial passenger rail transportation facility. It is due to this function that the facility was identified as eligible for listing on the NRHP. The No Build Alternative would interfere with this function and thus would result in an indirect adverse effect on the elevated track structure.

Build Alternative

Table 4-7 summarizes the effects determinations for all NRHP-eligible resources described in Section 4.4.2.

Table 4-7: Section 106 Effects Determinations

Community Area	Resource	Effect
--	CTA Elevated Steel Track Structure	Adverse Effect
Uptown	4728-4744 N. Broadway	No Adverse Effect
Uptown	Uptown Square Historic District	Adverse Effect
Uptown	4703-4715 N. Broadway	No Adverse Effect
Uptown	4753 N. Broadway	No Adverse Effect
Uptown	1039-1053 W. Lawrence Avenue	No Adverse Effect
Uptown	1100-1108 W. Lawrence Avenue	No Adverse Effect
Uptown	4850 N. Broadway	No Effect
Uptown	4875 N. Magnolia Avenue	No Adverse Effect
Uptown	West Argyle Street Historic District	Adverse Effect
Uptown	5120 N. Broadway	No Effect
Edgewater	Lakewood Balmoral Historic District	No Effect
Edgewater	5247 N. Magnolia Avenue	No Effect
Edgewater	5400-5402 N. Winthrop Avenue	No Adverse Effect
Edgewater	Bryn Mawr Avenue Historic District	Adverse Effect
Edgewater	1101-1107 W. Bryn Mawr Avenue	No Adverse Effect
Edgewater	5718 N. Broadway	No Effect

The Build Alternative would include modernization efforts at four stations and reconstruction of the track structure as a modern aerial structure. The project would result in adverse effects on four historic resources:

- **Elevated Track Structure** - This resource is identified as individually eligible under Criterion A for its contribution to the development of Chicago's North Side and Evanston. Under the Build Alternative, the elevated track would be reconstructed as a modern aerial structure, compromising its historic integrity.
- **Uptown Square Historic District** - The existing elevated track structure is a contributing resource to the Uptown Square Historic District. The district itself is NRHP-listed under Criteria A and C for its association with the broader historic patterns of entertainment and recreation, commerce, and transportation in the Uptown area and its various examples of architecture with distinctive characteristics attributed to the Spanish Baroque Revival, Classical Revival, and Commercial Styles. Because the elevated track structure is a contributing resource to the district, there would also be an adverse effect on the Uptown Square Historic District.
- **West Argyle Street Historic District** - The district is listed on the NRHP under Criterion A for its contribution to community planning and development, and architecture, and under Criterion C for its distinctive buildings and artistry dating between 1898 and 1938. Under the Build Alternative, the vacant CTA-owned retail building beneath the track structure on the south side of Argyle Street (1117-1119 W. Argyle Street) would be demolished. Because this structure is identified as contributing within the West Argyle Street Historic District, its demolition would compromise the historic integrity of the encompassing district.

Also within the West Argyle Street Historic District, CTA's Argyle station is a resource contributing to the district. Argyle station would be reconstructed under the Build Alternative. Because the station has been substantially altered over time, IHPA has agreed to a finding of No Adverse Effect as long as the station design is consistent with the Secretary of the Interior's *Guidelines for the Treatment of Historic Properties* and other applicable guidelines. Concurrence from IHPA was provided for the determination of No Adverse Effect in September 2014.

- **Bryn Mawr Avenue Historic District** - The district is listed on the NRHP under Criterion C for its distinctive architectural features. Under the Build Alternative, the vacant CTA-owned retail building beneath the track structure on the north side of Bryn Mawr Avenue (1116 W. Bryn Mawr Avenue) would be demolished. Because this structure is identified as a contributing resource within the Bryn Mawr Avenue Historic District, this would compromise the historic integrity of the encompassing district.

4.4.4 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 an MOA to resolve the adverse effects on historic resources. The stipulations of the Draft MOA are summarized below and the full Draft MOA is included in **Appendix C-4**. The final, signed MOA will incorporate consulting party input and contain stipulations to be

carried out in consultation with all signatories of the document. The MOA will be signed before FTA's final NEPA decision on this project and a copy of the final, signed MOA will be included in the NEPA final decision document.

- **Elevated Track Structure** - 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 route. To mitigate effects, CTA will solicit visual preferences regarding the elevated track structure from consulting parties. The feedback received will be incorporated as appropriate into the reference materials provided to firms bidding on the project. As part of the project contractor selection process, CTA will also incorporate a selection criterion that provides additional points for proposals that consider the aesthetic qualities of the historic elevated track structure in their designs. Finally, as a coordinated effort between the Wilson Transfer Station Project and the Lawrence to Bryn Mawr Modernization Project, CTA will develop an interpretive exhibit for installation at Wilson station discussing the history and context of the elevated North Red Line.

Before any demolition of the existing track structure (including the embankment) within the project limits, CTA will prepare Historic American Engineering Record documentation for the existing track structure.

- **Uptown Square Historic District** - Because the elevated track structure is a resource contributing to the district, there would also be an adverse effect on the Uptown Square Historic District. CTA, in coordination with IHPA, will prepare an updated NRHP nomination form for the district as a commitment of the project. At the direction of IHPA, the updated nomination form for the Uptown Square Historic District will indicate that the track structure will continue to be a resource contributing to the historic district after implementation of the project. In addition, based on suggestions from consulting parties, CTA will prepare a Historic Preservation Plan (HPP) for the district.
- **West Argyle Street Historic District** - CTA-owned retail underneath the station, as well as the Argyle station itself, are resources contributing to this historic district. Under the Build Alternative, the CTA-owned retail would be demolished and the station would be rebuilt. As with the Uptown Square Historic District, CTA will prepare an updated NRHP nomination form for the district, removing these contributing resources from the form and will prepare an HPP for the district. In addition, to further minimize and mitigate effects on the Argyle station, CTA will develop design plans for Argyle station that are consistent with the design of the Prairie-style Argyle station originally constructed in 1921, and that integrate into the setting of the encompassing historic district. Before construction, CTA will also examine the feasibility and cost implications of preserving existing Argyle station materials and reincorporating them into the station design.
- **Bryn Mawr Avenue Historic District** - CTA-owned retail underneath the station is a resource contributing to this historic district. Under the Build Alternative, the CTA-owned retail will be demolished as part of the station reconstruction. As with the Uptown Square

Historic District, CTA will prepare an updated NRHP nomination form for the district, removing these contributing resources from the form and will prepare an HPP for the district. In addition, while the Bryn Mawr station is not a resource contributing to the district, CTA will develop design plans for Bryn Mawr station that are consistent with the design of the Prairie-style Bryn Mawr station originally constructed in 1921, and that integrate into the setting of the encompassing historic district.

In addition to these measures to minimize or mitigate permanent impacts from the project, CTA is also committed to a number of provisions as part of construction of the project. The following provisions will apply during construction:

- To minimize the potential for construction impacts, CTA will comply with all relevant FTA standards and guidelines regarding noise and vibration impacts and will implement BMPs for construction to minimize other environmental impacts.
- CTA will conduct a conditions assessment for any NRHP-listed, eligible, or contributing structures within 15 feet of project construction activities. If warranted based on structure type and condition, CTA will prepare a protection and stabilization plan before construction.
- To offset potential community impacts, CTA will develop and implement a Construction Outreach and Coordination Plan. The plan will include a Business Outreach Program to assist local businesses and residents affected by construction. The plan will be tailored to business and community needs, and will include a series of initiatives to minimize construction disruptions.

4.5 Visual and Aesthetic Conditions

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

4.5.1 Regulatory Framework/Methods

For the purposes of this analysis, CTA assessed visual and aesthetic impacts by first analyzing existing visual resources surrounding the track structure and stations, including any sensitive views, and assessing existing visual quality of the surrounding environment. Sensitive views were determined from research and field observations as well as public comments received as part of CTA's early planning and spring 2014 outreach efforts (see **Chapter 5**). 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 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 that 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 the 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

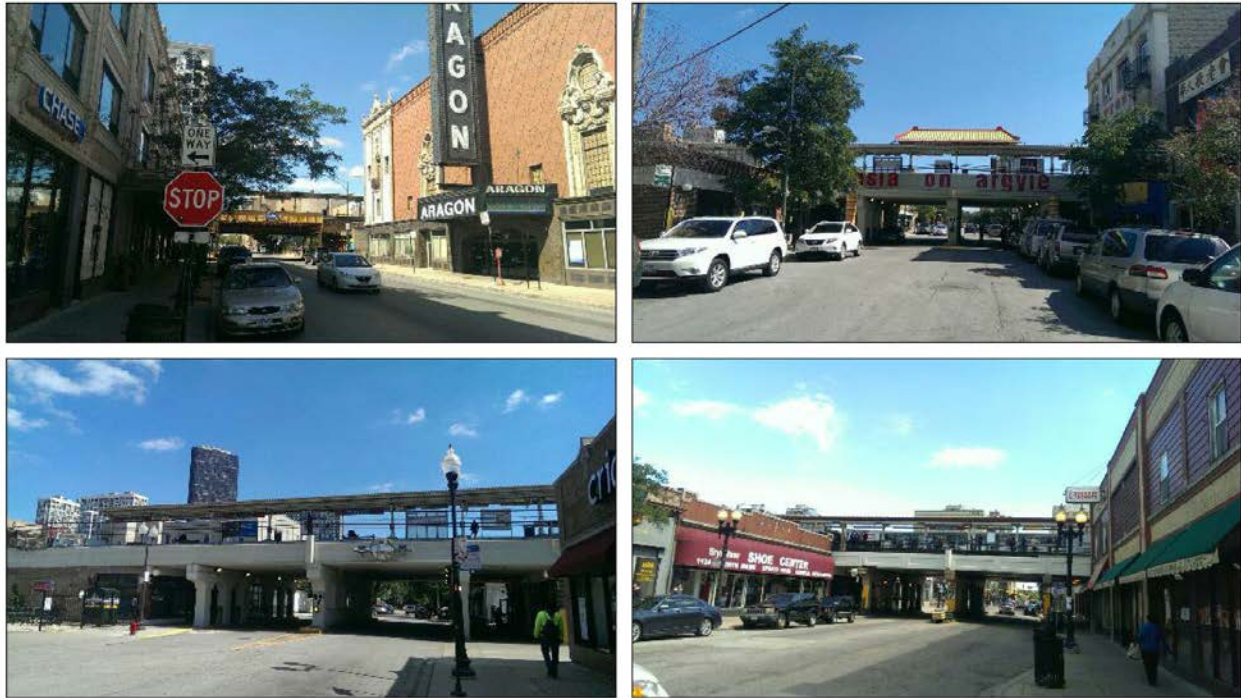
consideration of any potential changes to the visual environment that could create new shade or shadow effects.

4.5.2 Existing Conditions

The project corridor is a mix of residential and commercial land uses, primarily comprising two- to four-story buildings directly adjacent to the alignment. The areas around stations are zoned as commercial nodes (i.e., focal points of commercial activity) surrounded by mixed-use and medium- to low-density residential zones. Nearly a century and a half of development and redevelopment has led to a diversity of scale, architectural styles, and neighborhood character. Project area stations are shown in **Figure 4-7** and described briefly below:

- The Lawrence station area is an integrated part of the Uptown Entertainment District. Directly adjacent to the station is the Aragon Ballroom, considered a historic and active entertainment venue. The Aragon Ballroom features a large vertical sign marking its location immediately outside the transit station. The station is on Lawrence Avenue, a two-lane road with one lane in each direction, with a bicycle lane, parallel on-street parking, and sidewalks on either side of the general traffic lanes. Residential buildings of eight stories and more are in the immediate vicinity of the station. An alley running the length of the corridor is adjacent to each side of the rail line.
- The Argyle station area is a restaurant destination and is sometimes referred to as “Little Vietnam” due to the numerous Vietnamese restaurants and other businesses along Argyle Street and Broadway, many of which are observable from Argyle station. The area also includes mixed-use commercial, as well as single- and multifamily residential uses. Argyle station serves as a gateway to “Little Vietnam” and the West Argyle Street Historic District. The station itself features a distinctly East Asian-style gabled roof. The station is on Argyle Street, which features a single, general-purpose travel lane in each direction, bicycle lane, parallel on-street parking, and sidewalks on both sides. Concrete piers in the center of the roadway require the discontinuation of bicycle lanes and parking directly underneath the station. A continuous alley runs along the east side of the track structure.
- The Berwyn station area includes mixed-use commercial and single-use, single-story buildings along Berwyn Avenue and Broadway, including a Jewel-Osco supermarket on the west side of the track structure. East of the track structure is a primarily lower-density multifamily residential area. The area surrounding the station on the west side is mostly commercial and is more auto-centric than other station areas within the project corridor. The station is on Berwyn Avenue, which features a single, general-purpose travel lane in each direction and parallel, on-street parking in each direction. Most sidewalks are tree-lined. A continuous alley, providing access to the rear of single- and multifamily properties, runs along the tracks except on the northwest side of the station.
- The Bryn Mawr station area has a distinct and integrated historic architectural quality and includes a mixed-use business district along Bryn Mawr Avenue—a gateway to lakefront parks and beaches. Commercial uses are also present on Broadway. Seven- to eight-story multifamily residential buildings are located within a few blocks of the station and are observable from the station platform. Bryn Mawr Avenue features a single, general-purpose travel lane in each direction, parallel on-street parking, and sidewalks on both sides. A

continuous alley, providing access to the rear of single- and multifamily properties, runs on the east side of the tracks north of the station.



Top left: Lawrence Station | Top right: Argyle Station
Bottom left: Berwyn Station | Bottom right: Bryn Mawr Station

Figure 4-7: Photos of Lawrence, Argyle, Berwyn, and Bryn Mawr Stations

While the neighborhoods around the stations are distinct in terms of surrounding architectural features and activity purposes (as discussed in further detail in **Section 4.3**), the visual character and condition of the rail infrastructure within the four station areas are similar, showing signs of substantial deterioration of visual and aesthetic quality such that in many cases the infrastructure itself detracts from the strong community character of surrounding residential and commercial uses. Important visual features of the infrastructure include concrete piers in the center of streets underneath the elevated track structure and between the sidewalk and the roadway; this positioning creates a visual barrier between one side of the street and the other. The concrete piers and the embankment upon which the stations rest have been repaired continually due to age and deterioration.

The elevated tracks and trains are already a major part of the visual landscape throughout the project area. The existing viaducts, elevated structures, embankment, and stations show substantial signs of age and wear, as shown in **Figure 4-8**. The photo on the left in **Figure 4-8** also shows part of the mainly continuous alley on the east of the tracks. Conditions on the intermittent alley on the west side are similar to those shown in **Figure 4-8**. **Figure 4-9** shows the aging embankment's deteriorating physical structure, which is often at visual odds with recent efforts undertaken by CTA to provide interim station and track improvements necessary to maintain a state of good repair.



Figure 4-8: Photos of Deteriorating Structures; Balmoral Avenue Viaduct and Embankment Wall Facing Northwest (left); Winona Street Viaduct Facing West (right)



Figure 4-9: Photos of Deteriorating Embankment Walls and Viaduct Adjacent to Newer (2012) Structures at Argyle (left) and Berwyn (middle and right) Stations

4.5.3 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 not improve the existing visual and aesthetic conditions. The low visual quality of the existing system would remain and would continue to degrade with time. Construction under the No Build Alternative would be limited to routine maintenance and minor repairs. Routine maintenance and repairs necessary to keep structures in a state of good repair would continue to degrade the visual quality of the track structure because options for maintaining the old structures are limited. Temporary or more permanent visual impacts could, for example, include additional plating and/or shoring of the embankment or concrete structures (see example in **Figure 4-10**).



Figure 4-10: Embankment Wall on East Side of Track near Balmoral Avenue (left) and Embankment Wall on East Side of Track near Winona Street (right) with Shoring/Plating Repairs for Structural Support

Build Alternative

The major visual/aesthetic changes proposed as part of the Build Alternative include the following:

- Enhanced Stations - Stationhouses would be completely rebuilt with auxiliary entrances or exits on both sides of the street, enhanced internal station circulation and ADA accessibility, and wider platforms.
- Piers in the Roadways - The piers currently in the center of the street would be removed.
- Increased Height of the Track Structure - The height of the existing track structure would be raised 5 to 10 feet to meet IDOT vertical clearance requirements and construct the support structure.
- Noise Barriers - The proposed modern structure would have a closed-deck aerial structure and noise barriers (3 to 5 feet high) on both sides of the track deck, limiting the view of the track.
- Alley Spanning - To accommodate wider platforms, additional right-of-way would be needed to allow the track layout to spread out from its current configuration. To minimize impacts on adjacent properties, track widening would take place over adjacent alleys along the east side of the alignment, where possible.

- **Removal of Some Portion of the Embankment Walls** - At the reconstructed stations, the existing embankment walls and earth-fill would be removed along the entire length of the new platforms to construct the new stationhouses, elevators, and stairways. Remaining portions of the embankment wall could be kept or removed along the project corridor between stations and viaducts; this will be determined during subsequent engineering and design. Where the existing embankment wall could remain in place, the height of the embankment under the new aerial structure would be lowered (up to 7 feet) to allow access for required inspections and maintenance. Where embankment walls could be kept, stabilization and repair of the existing walls would be required as part of construction activities.

Construction Impacts

Construction of the Build Alternative would result in temporary adverse impacts on the surrounding visual environment due to construction work zones. Off-street construction sites that would minimize visual impacts (as well as neighborhood, community, and business impacts) during construction have been identified as part of the Build Alternative. While construction activities would temporarily disrupt the visual environment surrounding the project area, implementation of the Build Alternative would remove the need for continual disruption to the visual environment in the project area during maintenance of the aging and deteriorating existing structure. In addition, overall visual impacts would be perceived as relatively limited and localized because passengers and visitors typically only interact with two stations along the route, for entering and exiting. Residents, business owners, and recreational groups typically view only one station in their local community.

Permanent Impacts

The Build Alternative would introduce visual changes and new visual elements to areas within view of the track structure and stations; overall the proposed improvements would enhance the current visual quality of the surrounding environment. The Build Alternative would improve the visual quality by replacing deteriorating infrastructure with a modern structure and enhancing station areas near community commercial nodes. The stationhouses would be larger and the new platforms would be wider, allowing for better sightlines. **Figure 4-11** shows existing conditions and a conceptual rendering of the proposed improvements at the Bryn Mawr station platform. New station materials, colors, and detailing would be implemented to be aesthetically pleasing and complementary with surroundings. The final design of the stations is anticipated to be sensitive to the context of the surrounding community.



Figure 4-11: Photo of Existing Platform (12-foot Width) and Conceptual Rendering of Proposed Improvements (22-foot Width) at Bryn Mawr Station (Facing South)

As part of the Build Alternative, viaducts would be reconstructed, removing the piers that currently stand in the middle of the roadway. Bump-outs or curb extensions are proposed at station locations and would allow for some widening of sidewalks at stations. The changes would improve sightlines for pedestrians, drivers, and bicyclists, and improve access to surrounding businesses. **Figure 4-12** shows existing conditions at Bryn Mawr station (note the piers beneath the viaduct) and a conceptual rendering of the reconstructed Bryn Mawr viaduct and station entrance.

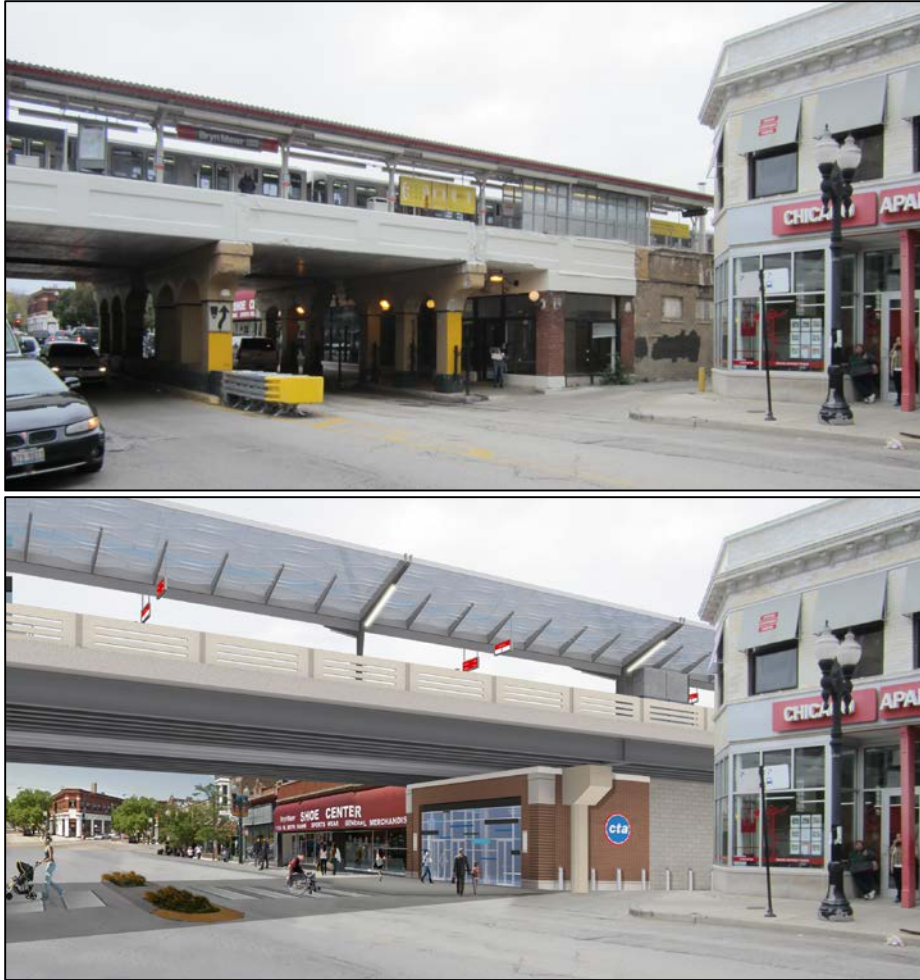


Figure 4-12: Bryn Mawr Viaduct and Station Entrance: Photo and Conceptual Rendering of Proposed Improvements (Facing Northwest)

The new track structure would be slightly higher (approximately 5 to 10 feet higher) than the existing structure and would contain noise barriers 3 to 5 feet high; given this relatively minor change in this existing transportation corridor, adverse visual impacts are not anticipated. While the additional height of the structure might be perceivable once built, the resulting visual effect would be congruent with the inherent, established character of the environment. Comparable track heights are found in a number of neighborhood locations along the Brown Line, for example, at the Paulina Brown Line station. In addition, the project would provide beneficial improvements to the visual environment through the replacement of deteriorating infrastructure with modern structures.

To minimize acquisition of existing buildings and reduce construction impacts, the new track structure would span over adjacent alleys. **Figure 4-13** shows an existing alley adjacent to the CTA tracks, as well as a conceptual rendering of the alley spanning concept at that location.



Figure 4-13: Alley Spanning Concept: Photo of Alley Adjacent to CTA Station and Conceptual Rendering of Alley Spanning Concept

During subsequent engineering and design CTA will determine what portion of the existing embankment would be kept. At station areas, the embankment must be removed to construct the new stationhouses and improve access from the ground floor of each station to the platform with elevators and wider stairways. Between stations the embankment could be kept or removed. If the existing embankment between stations were kept, very little change in visual character would occur because the dominant visual object—the embankment walls—would remain between stations. If kept, the embankment would be at a lower height than it is currently, to provide adequate room for inspections and maintenance. At stations, the new stationhouses and viaducts would enhance the existing visual character and cohesiveness of the surrounding community, while maintaining a similar concrete and brick closed area.

Station designs would be consistent with the historic and architectural context of the surrounding communities. If the existing embankment between stations would be removed and replaced, open

area would be created below the structure. Visual barriers could be included as part of the design to lessen visual impacts on the surrounding historic districts.

4.5.4 Measures to Avoid or Minimize Harm

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

- During construction, CTA will attempt to maintain as much existing vegetation as practical.
- 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 minimize temporary visual impacts from construction sites.
- CTA will work with the community to further minimize potential visual and aesthetic impacts during construction. These details will be noted in the Construction Outreach and Coordination Plan.
- CTA will use off-street construction sites for pertinent machinery and materials storage as much as possible to minimize visual disruption to the surrounding neighborhoods and businesses.

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

Detailed station and elevated track designs are not yet available and preliminary engineering for this project is ongoing. After completion of preliminary engineering, the project is proposed as 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. CTA is committed to the following measures to mitigate permanent visual effects from the Build Alternative:

- Because the elevated structure is an NRHP eligible historic resource (as further described in **Section 4.4**), CTA will solicit visual preferences regarding the elevated track structure from consulting parties. The feedback received will be incorporated as appropriate into the reference materials provided to firms bidding on the project.
- As part of the project contractor selection process, CTA will also incorporate a selection criterion that provides additional points for proposals that consider the aesthetic qualities of the historic elevated track structure in their designs.
- At Argyle and Bryn Mawr stations, CTA will develop design plans that are consistent with the design of the Prairie-style Bryn Mawr station originally constructed in 1921, and that integrate into the setting of the encompassing historic district.
- CTA will work with the City of Chicago and local community organizations to develop a Station Area Plan or other redevelopment plans and policies as an appendix or update to existing neighborhood plans and business district plans so that station designs are sensitive to the context of the surrounding community.

4.6 Noise

This section describes the predicted noise impacts of the Lawrence to Bryn Mawr Modernization 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 environmental 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-decibel increase in noise level is generally perceived as a doubling of loudness, while a 3-decibel increase in noise is just barely perceptible to the human ear. **Appendix C-5** contains additional details about noise impacts.

4.6.1 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 Lawrence to Bryn Mawr Modernization Project would upgrade an existing rail corridor that currently generates relatively high levels of noise. Because existing noise levels from CTA operations are quite high, noise impacts may be caused by relatively small increases in noise exposure.

In conducting the analysis, CTA first identified noise-sensitive receivers in the project corridor. 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 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 landuses 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 C-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 corridor 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 along the existing elevated structure where the structure type was determined to be similar to the proposed replacement structures. These 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 system.

The fourth step in the noise assessment was to predict future noise levels and identify predicted noise impacts. CTA used the models 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 is 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 where moderate impacts are predicted and implemented when there would be severe impacts unless there are very compelling reasons why mitigation would not be feasible.⁵ CTA's 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 details on construction noise impact thresholds may be found in **Appendix C-5**.

4.6.2 Existing Conditions

There are 68 clusters of noise-sensitive receivers within 350 feet of the alignment including residences, schools, the Aragon Ballroom, and the Riviera Theatre. All noise-sensitive receiver clusters are shown on a map in Figure 4-1 of **Appendix C-5**. The dominant noise source in the project area is train noise from the existing Red and Purple lines, which run on ballast-and-tie track (the supporting surface for the rail is ballast, or rock) on an embankment structure. Red Line trains operate 24 hours a day and Purple Line trains operate during weekday peak periods, between approximately 5:30 and 11:15 AM and between 2:30 and 8:00 PM. The FTA thresholds for noise impacts are on sliding scales that are functions of the existing noise exposure rather than a set value of impact; therefore, accurately determining the existing noise exposure is an important step in the noise impact assessment.

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

⁵ 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).

were conducted at eight representative noise-sensitive receivers throughout the project area. Short-term measurements were conducted at an additional nine 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 existing stations and between existing stations. Sites also included noise-sensitive receivers with intervening buildings that may shield existing train noise. The long- and short-term noise measurements confirmed that train noise is the dominant noise source in the project area, even where there are intervening buildings. Figure 4-1 of **Appendix C-5** includes a map showing the long- and short-term noise measurement sites.

The measured average train noise level was determined based on long-term measurements and varied by about 6 dB at the measurement sites closest to the alignment. The variation in train noise levels is likely caused by differences in track condition. A site might, for example, be near track with wide-gap rail joints or misaligned track, which are conditions that may result in more noise. The more detailed data collected during the short-term measurements was used to further determine the source of the variation in noise levels and to develop a model to estimate the existing noise levels at the remaining noise-sensitive receivers where long-term noise measurements were not conducted.

The existing noise levels at all noise-sensitive receivers in the project area were estimated using the developed model for identifying impacts. The model assumed existing train noise levels consistent with measurement results from the lowest noise sites. This assumption is conservative because noise-sensitive receivers with lower existing noise levels have a lower allowable *future* noise level, which helps to ensure potential impacts are not overlooked. In addition, the assumption allows a more uniform comparison between existing and future noise levels because the existing and future noise levels are estimated using the same basic model, which captures the change in noise levels due to the change in track structure without penalizing some noise-sensitive receivers for temporary, localized track conditions.

Using the developed model, the estimated existing noise level was within 1 dB of the measured noise level at two of the five closest measurement sites. The estimated existing noise level was 5 dB lower than the measured noise level at the site with the highest measured noise levels. The estimated existing noise levels range from 57.9 dBA at the farthest noise-sensitive receivers to 69.8 dBA at the closest noise-sensitive receivers.

Appendix C-5 contains detailed results of the existing noise measurements and additional detail regarding the applied model.

4.6.3 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 exceed the FTA impact thresholds and no noise impact is predicted. Existing high levels of noise in the project area would not be addressed under 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 closed-deck, concrete aerial structure with noise barriers along the edges of the structure and welded rail. The new aerial structure would be closer to properties to the east than it is under existing conditions because the track structure would span the alley. Portions of the embankment wall at station areas would be removed to provide for new stationhouses and sufficient vertical clearance to the platforms. A fifth middle track is proposed for the segment between Argyle and Berwyn stations; this track would require special trackwork.

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. Pile-driving is not proposed.

The predicted construction noise levels exceed the FTA daytime impact thresholds for noise-sensitive receivers within 50 feet of the construction activities and would result in adverse impacts on noise-sensitive receivers. There are three primary types of construction activities with a potential for impact at locations within 50 feet:

- Demolition, site preparation, and utilities (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)

Permanent Impacts

There were 68 clusters of noise-sensitive receivers identified within 350 feet of the alignment, of which 18 are predicted to have a moderate permanent noise impact and 2 are predicted to have a severe permanent noise impact before mitigation, as presented in **Table 4-8** and on **Figure 4-14**. **Appendix C-5** contains full prediction results for all 68 noise-sensitive receiver clusters.

Table 4-8: Existing and Predicted Noise Levels and Moderate and Severe Impacts at Noise-Sensitive Receiver Clusters

Noise-Sensitive Receiver Cluster ID	Noise-Sensitive Receiver Description	Existing Noise Level (L _{dn} in dBA)	Predicted Noise Level under Build Alternative (L _{dn} in dBA)	Change in Noise Level (dB)	FTA Allowable Noise Increase ¹ - Moderate Impact (dB)	FTA Allowable Noise Increase ¹ - Severe Impact (dB)	Level of Impact (before mitigation)
NB-12	MFR	70.3	71.8	1.5	1.0	2.7	Moderate
NB-18	MFR	63.1	65.5	2.4	1.6	4.1	Moderate
NB-19	MFR	68.4	72.9	4.6	1.1	3.0	Severe
NB-21	MFR	58.4	63.6	5.2	2.3	5.6	Moderate
NB-22	School ²	66.7 ³	73.2 ³	6.5	3.1	6.6	Moderate
NB-23	SFR	58.1	63.4	5.3	2.4	5.7	Moderate
NB-25	MFR	58.9	64.2	5.3	2.2	5.4	Moderate
NB-39b	MFR	66.0	68.0	2.0	1.3	3.4	Moderate
NB-39c	MFR	65.7	67.6	1.9	1.3	3.5	Moderate
NB-39d	MFR	65.8	67.6	1.9	1.3	3.5	Moderate
NB-40	MFR	70.4	71.9	1.5	1.0	2.7	Moderate
SB-6	MFR	66.8	68.9	2.2	1.3	3.3	Moderate
SB-12	MFR	64.8	66.9	2.1	1.4	3.7	Moderate
SB-13	MFR	72.6	73.7	1.1	0.7	2.4	Moderate
SB-16	MFR	67.5	69.2	1.7	1.2	3.2	Moderate
SB-18	MFR	64.6	66.4	1.9	1.4	3.7	Moderate
SB-34	MFR	61.1	63.0	1.9	1.9	4.7	Moderate
SB-35	MFR	73.6	76.2	2.6	0.6	2.3	Severe
SB-39	MFR	67.1	69.2	2.1	1.2	3.2	Moderate
SB-45b	MFR	67.2	69.7	2.5	1.2	3.2	Moderate

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

¹ Source: FTA 2006

² NB-22 is William C. Goudy Technology Magnet Cluster Elementary School.

³ Existing and predicted noise levels for Category 3 land uses (schools, churches, and theaters) are the L_{eq} (equivalent continuous sound level) over the peak hour.

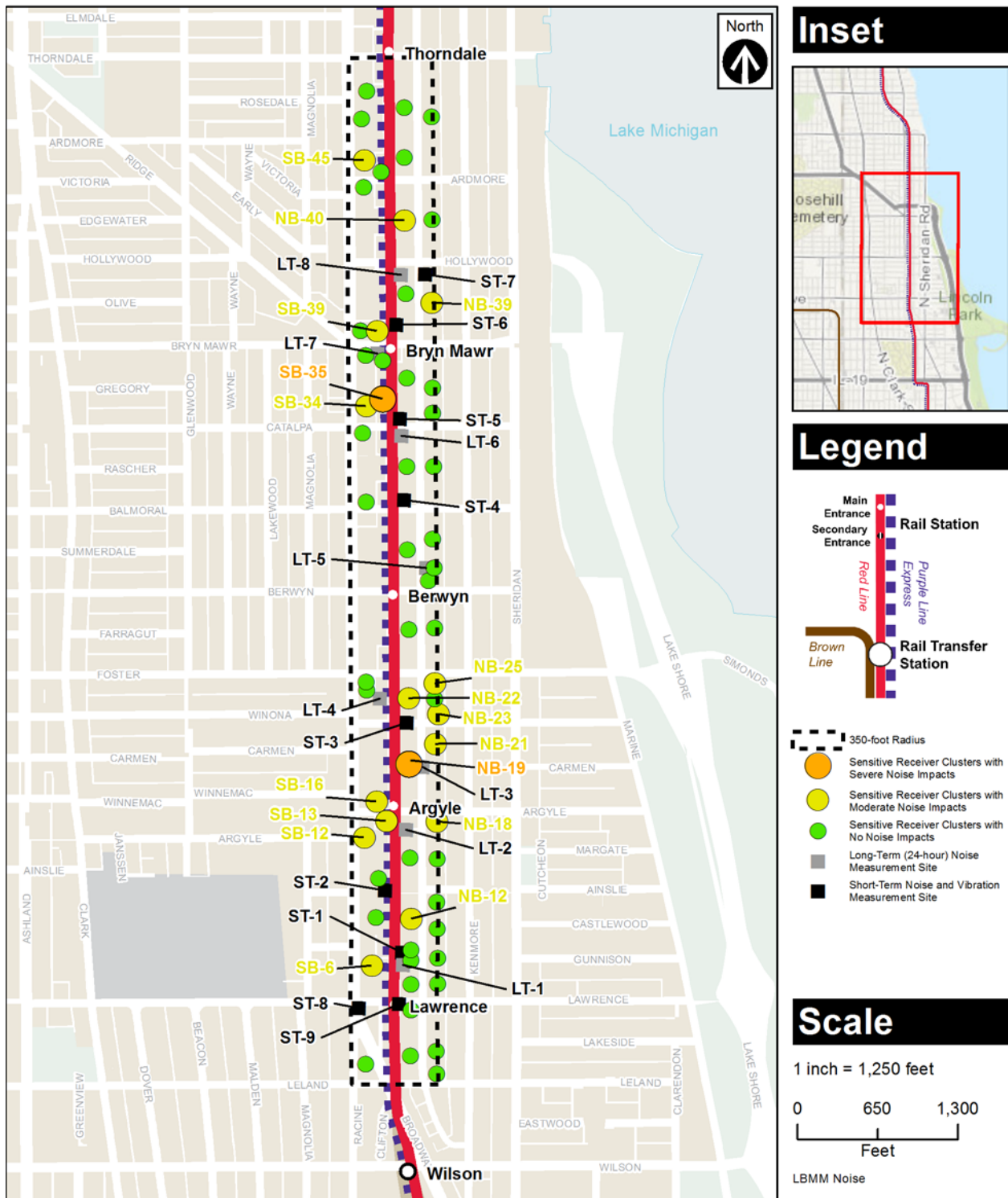


Figure 4-14: Locations of Noise-Sensitive Receiver Clusters with Noise Impacts Before Mitigation

Many of the impacts would be at noise-sensitive receivers near Winona Street and Foster Avenue, because crossovers, which can increase noise levels by 6 decibels, would be installed at that location. Severe and moderate impacts are also predicted for many of the noise-sensitive receivers that are closest to the tracks. Because existing noise levels are high at the noise-sensitive receivers, the allowable noise increases (using the FTA noise impact criteria) are very small. The change in noise levels from the future increased train frequency and the change in track structure from the existing ballast-and-tie to the proposed direct-fixation would exceed the threshold at many of the receivers with the highest levels of existing noise. Mitigation measures proposed for these locations would reduce noise levels to below FTA impact thresholds.

4.6.4 Measures to Avoid or Minimize Harm

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

- CTA will provide adequate advance notification to the public of construction operations and schedules.
- Whenever possible, CTA will conduct construction activities during the daytime and during weekdays.
- Where practical, CTA will erect temporary noise barriers between noisy activities and noise-sensitive receivers. Where possible, CTA will use movable noise barriers at sources of construction noise.
- CTA will demonstrate in the Construction Management Plan the use of best available control technologies to limit excessive noise when working near residences.
- The Construction Management Plan will detail and discuss 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, aboveground jackhammering will be prohibited. In addition, project contractors will use spotters and smart backup alarms during nighttime work to automatically adjust (lower) the alarm level or tone based on the background noise level.

FTA's policy on project noise impacts is that mitigation measures should be considered when moderate impacts are predicted. For severe impacts, noise mitigation will be implemented unless there are compelling reasons why mitigation measures are not feasible.

CTA proposes a closed-deck, concrete aerial structure, noise barriers along the edges of the structure, and welded rail as part of the project. 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 decibels, and was predicted using noise measurement data from a structure similar to the noise barrier proposed for the project. Lower noise levels associated with these features are taken into account in the predicted noise levels, and are therefore not considered as potential mitigation measures. Increasing the height of the noise barriers on the structure is 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 reducing 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 measures 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 to below moderate or severe thresholds at noise-sensitive receivers:

- Monoblock or other low-impact frogs could be installed to minimize noise from crossovers. A "frog" refers to the crossing point of two rails. There are several alternatives for low-impact frogs, including monoblock frogs. 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 to reduce 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 to 3 dB.
- Residential sound insulation could be installed for upper-story receivers or receivers without outdoor land uses. Assessment of the existing sound insulation at noise-sensitive receivers would determine the noise reduction necessary to eliminate impact, and may show that additional sound insulation is not warranted.
- Ballast-and-tie track could be used rather than direct-fixation track. Ballast is an absorptive material, so it reflects less noise than a concrete deck and would result in lower noise levels. While direct-fixation track was identified for the Build Alternative for many engineering and maintenance reasons, this mitigation measure could be employed if other mitigation measures listed above are not used to reduce noise levels. Installing ballast-and-tie track in place of direct-fixation track would reduce predicted noise by 3 dB.

To determine the effectiveness of potential noise impact mitigation measures, predicted noise levels were calculated assuming low-impact frogs and ballast-and-tie track. Refer to **Appendix C-5** for information on these calculations. Using one or both of these options, predicted noise levels

could be reduced to below the severe or moderate impact threshold at all noise-sensitive receivers. If it were determined during subsequent engineering and design that it would not be feasible or reasonable to use low-impact frogs or to construct an aerial structure with ballast-and-tie track, CTA would consider alternative mitigation measures, such as rail dampers or residential sound insulation. Alternative mitigation options would also reduce predicted noise levels to below the FTA impact thresholds.

4.7 Vibration

This section describes the predicted vibration impacts of the Lawrence to Bryn Mawr Modernization 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 C-5** contains additional details about vibration impacts.

4.7.1 Regulatory Framework/Methods

CTA prepared the vibration analysis 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.

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

The identified sensitive receivers for vibration analysis were the same as for noise and the sensitive receivers were grouped into the same clusters. A map in **Appendix C-5** shows the locations of the vibration-sensitive receiver clusters.

The second step in the vibration assessment involved establishing existing vibration conditions in the project area by taking measurements at representative vibration-sensitive receivers.

The third step in the vibration assessment was to develop a vibration prediction model and predict future vibration levels at the vibration-sensitive receivers. For predicted vibration, CTA assumed that under the Build Alternative a new closed-deck, concrete aerial structure would replace the existing embankment structure. CTA also assumed that the support columns of the new structure might be placed as close as 3 feet from sensitive receivers.

CTA collected detailed vibration measurements at locations outside of the project area along the existing CTA elevated structure where the structure type was determined to be similar to the proposed replacement structure. **Appendix C-5** includes a map of these measurement sites that are outside of the project area. These measurements were used as references for modeling purposes to predict future vibration levels at identified vibration-sensitive receivers.

The final step in the vibration assessment was to recommend mitigation measures. CTA identified feasible mitigation measures where predicted levels exceeded 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 maximum vibration level generated from a single train event in an occupied indoor space. For predicted vibration impacts, mitigation measures were 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 would be 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 inch per second.

4.7.2 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 for train events were measured over a period of 1 hour at the same nine locations as the short-term noise measurements in the project area. **Appendix C-5** shows the long- and short-term noise and vibration measurement sites.

The vibration measurements indicated that track and wheel conditions are important factors in determining existing vibration levels. The existing vibration levels exceed the FTA impact threshold of 72 VdB for all Category 2 land uses (residential and other similar nighttime vibration-sensitive locations) that are within 30 feet of the existing tracks. **Appendix C-5** presents the existing vibration levels.

4.7.3 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.

Build Alternative

Construction Vibration Impacts

High-vibration activities during construction would include demolition of buildings, construction of aerial structures, pavement breaking, and ground compaction. Predicted vibration 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 inch 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 C-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 a change in the track structure and the relocation of the structure closer to some sensitive receivers. Of the 68 vibration-sensitive receiver clusters identified within 350 feet of the alignment, 12 clusters are predicted to have vibration impacts that meet or exceed the FTA impact threshold before mitigation, as presented in **Table 4-9** and on **Figure 4-15**. Almost all of the impacts would occur at vibration-sensitive receivers close to the project right-of-way, where the support column could be as close as 3 feet from the existing building. The highest vibration levels are predicted at vibration-sensitive receivers close to a crossover. Crossovers can increase vibration levels by as much as 10 VdB. Mitigation measures are proposed to reduce vibration impacts below FTA-established thresholds.

Table 4-9: Existing and Predicted Vibration Levels and Impacts at Vibration-Sensitive Receiver Clusters

Sensitive Receiver Clusters ID	Sensitive Receiver Description	Distance to Nearest Column (feet)	Existing L _v (Band Max.) ¹ (VdB)	Predicted L _v under Build Alternative (Band Max.) ¹ (VdB)	FTA Impact Threshold ² (VdB)	FTA Threshold Exceedance (VdB)
NB-5	MFR	3	75	78	78	< 1
NB-7	Theater ³	12	74	77	77	< 1
NB-16	MFR	3	74	82	77	5
NB-19	MFR	3	74	92	77	15
NB-22	School ³	3	74	92	78	14
NB-26	MFR	3	84	92	87	5
NB-32	MFR	3	74	82	77	5
NB-35	MFR	3	74	82	77	5
NB-38	MFR	23	68	75	72	3
NB-40	MFR	3	74	82	77	5
NB-42	MFR	3	74	82	77	5
NB-44	School ³	3	74	82	78	4

L_v = vibration velocity level; VdB = vibration decibels; FTA = Federal Transit Administration; MFR = multifamily residence

¹The band maximum is the vibration level from the maximum 1/3-octave band of the L_{max} (maximum noise level) spectra

² Source: FTA 2006

³ NB-07 is the Aragon Ballroom; NB-22 is William C. Goudy Technology Magnet Cluster Elementary School; NB-44 is Swift Elementary School

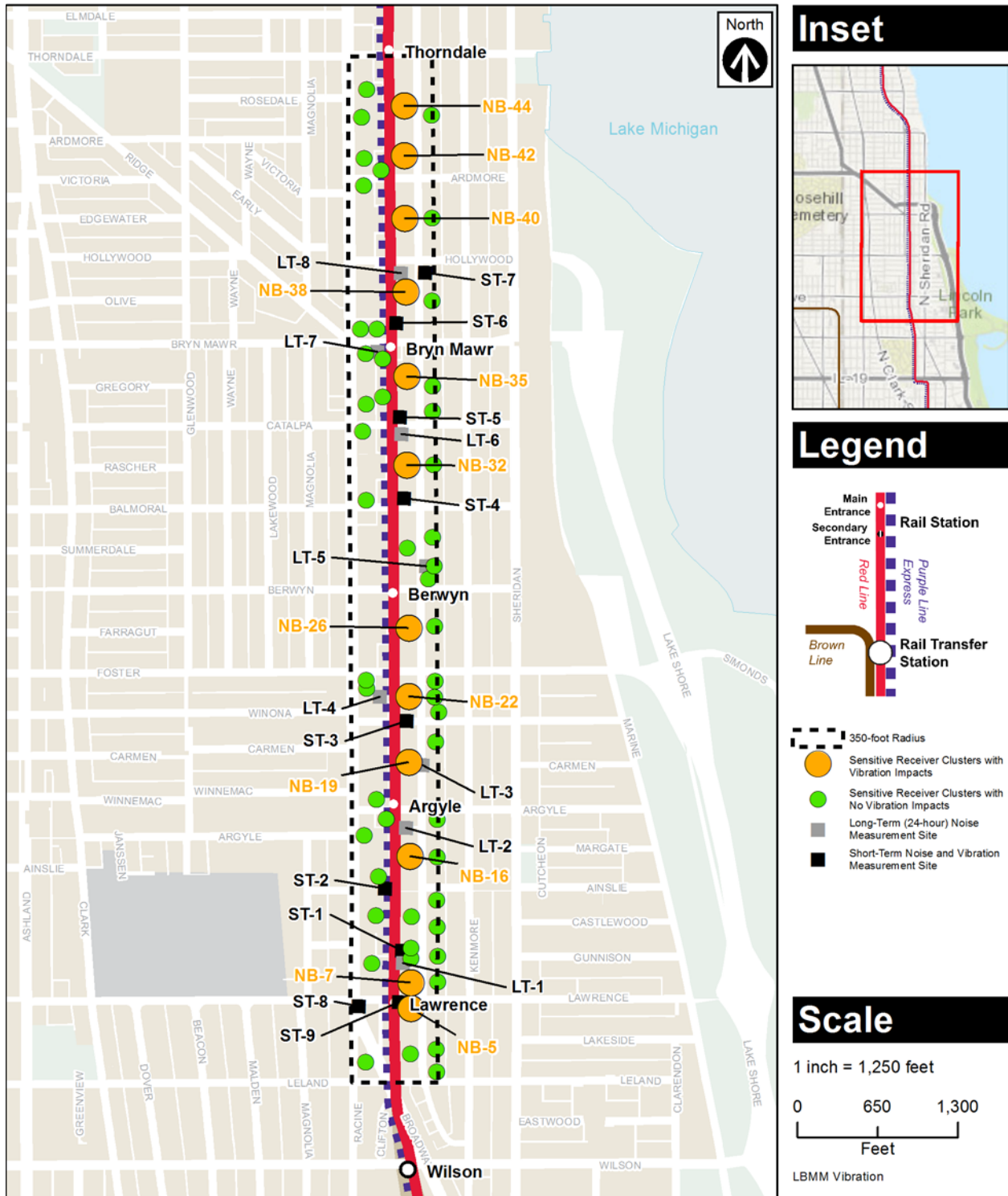


Figure 4-15: Locations of Vibration-Sensitive Receivers with Vibration Impacts Before Mitigation

4.7.4 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:

- CTA will develop a vibration-monitoring plan during final design to ensure appropriate measures will be taken to avoid any damage to buildings during construction.
- Before beginning construction, CTA will identify any buildings where the predicted construction vibration level exceeds the damage risk criteria. 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.
- Project contractors will use less vibration-intensive construction equipment or techniques 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. 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. Mitigation measures are proposed and planned for all clusters of sensitive receivers where impact is predicted.

The most severe vibration impacts would be at vibration-sensitive receivers near special trackwork. Most of the predicted vibration impacts would be at vibration-sensitive receivers where support columns may be placed within 3 feet of an existing building. Several mitigation measures are possible and would be determined during subsequent engineering and design. The measures listed below are in order of applicability and likelihood to be implemented.

- Support columns could be located away from sensitive receivers. The column locations have not been finalized, so this analysis assumes worst-case location of the columns—within 3 feet of existing buildings. Vibration levels could be reduced to below the impact thresholds if the columns were placed a sufficient distance away from vibration-sensitive receivers. The necessary distance away from vibration-sensitive receivers is 9 to 13 feet.
- Rubber bearing pads could be installed on the top of the columns to reduce the vibration transmitted through the columns into the ground. The specific details of this approach and predicted vibration reduction would be investigated during preliminary engineering.
- Low-impact frogs, such as monoblock frogs, could be installed to minimize vibration impacts from 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 frogs would reduce predicted vibration levels by 5 VdB.
- High-resilience (soft) direct-fixation fasteners could be installed to reduce the vibration transmitted through the rail into the structure. High-resilience fasteners typically reduce vibration levels by 5 to 10 decibels at frequencies above 30 Hz.

CTA calculated predicted vibration levels assuming low-impact frogs and relocation of columns. Refer to **Appendix C-5** for information on the calculations. Using one or both of these options, vibration levels could be reduced to below the FTA threshold. Because vibration is a function of distance from the source to the receiver, columns would need to be relocated an average of 9 to 13 feet further away from the receiver to reduce impacts below the FTA threshold. **Appendix C-5** details the specific distance required between each receiver and the closest column to reduce predicted vibration levels to below the FTA impact threshold at all sensitive receivers.

If it were not feasible to relocate the columns farther than the specified distances, some sort of vibration isolation would be incorporated into the structure or track design near locations where impacts are predicted. Examples of vibration isolation methods include the use of rubber bearing pads on the columns or high-resilience fasteners. Specifications for the rubber bearing pads or high-resilience fasteners would be developed during subsequent engineering and design to achieve the vibration reduction necessary to result in levels below the FTA impact thresholds.

4.8 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, 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 to avoid or minimize the potential for hazardous material impacts from the project.

4.8.1 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 following: the Resource Conservation and Recovery Act; 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, historical Sanborn® fire insurance maps, topographic and aerial maps, and other sources were reviewed for the analysis (EDR 2012a, Historical Information Gatherers, Inc. 2012a, 2012b, and 2012c).

Specific sites within ¼ mile of the project alignment, 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 though 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 property 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.

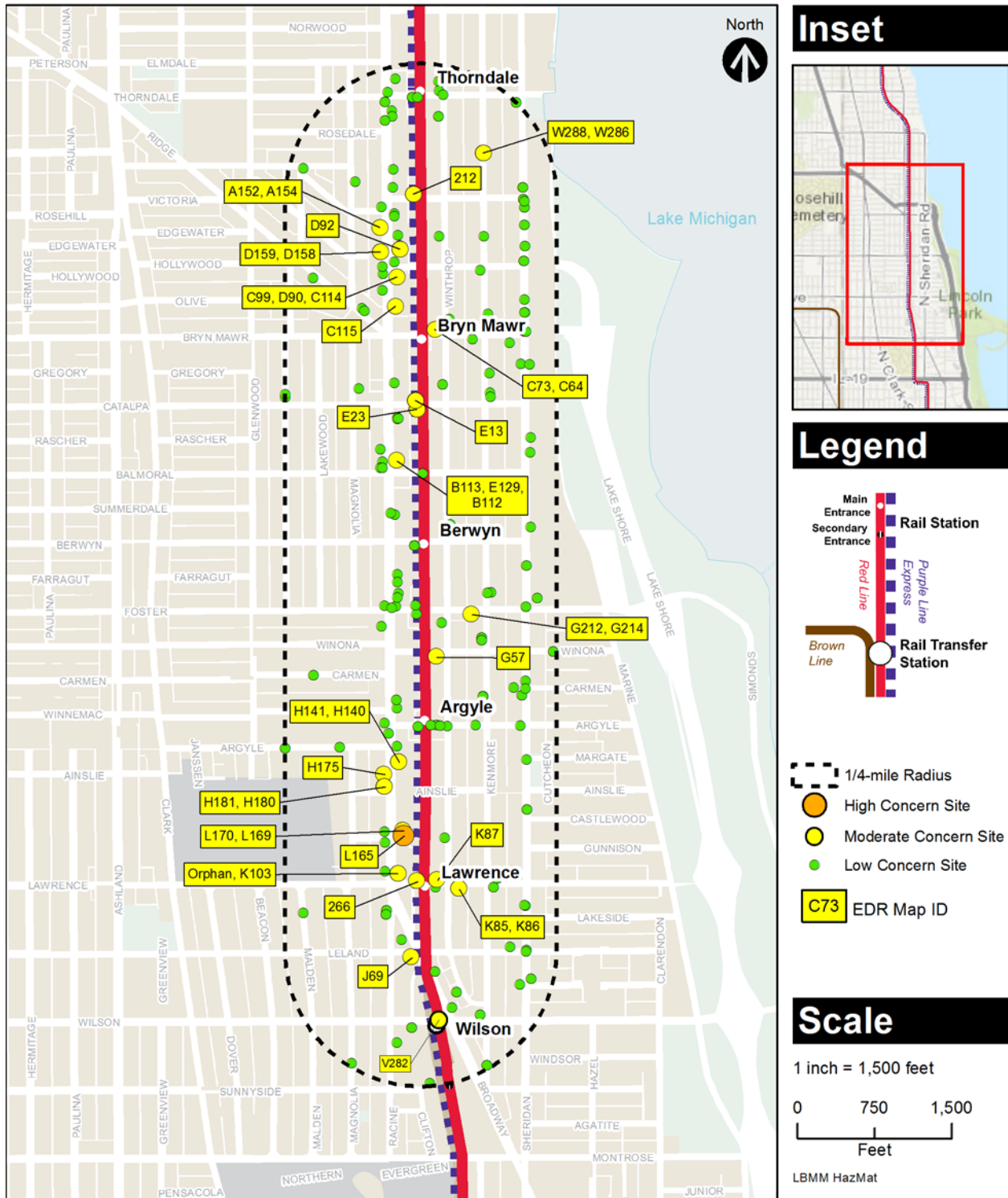
4.8.2 Existing Conditions

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). An updated search within the Lawrence to Bryn Mawr Modernization Project limits was done on July 7, 2014 (EDR 2014). Using the impact analysis criteria described above, CTA reviewed the sites identified by EDR and classified them 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 2 High Concern and 23 Moderate Concern sites (see **Figure 4-16**). All sites not identified as High or Moderate Concern sites were classified as Low Concern sites. **Appendix C-6** includes the full listing of High, Moderate, and Low Concern sites and additional supporting documentation.

One site classified as a High Concern is adjacent to the project. EDR identifies the site as the Emerald Development Co. and Parking Lot (4843 N. Broadway; EDR Map ID: L165). This site is registered as a leaking underground storage tank (UST) site with one heating oil UST and two gasoline USTs. The EDR report indicates that representatives for this site elected not to proceed with the cleanup program and have not received a No Further Remediation letter from the Illinois Environmental Protection Agency. This site is classified as High Concern because the extent of contamination from this site is not known and the status of remediation activities are not known, and because of the site's proximity to the project.

The North Red and Purple lines themselves, including the rail structures, embankment material, and stations, are also classified as a High Concern. Given the urban setting of the Lawrence to Bryn Mawr Modernization Project, the potential exists for the presence of typical urban fill throughout the 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.



Source: EDR 2012b, EDR 2014

Figure 4-16: Identified Hazardous Materials Sites of Concern

4.8.3 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 from hazardous materials would occur under the No Build Alternative. Construction activities associated with the No Build Alternative, such as routine maintenance, have the potential to 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 and Purple 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 and existing procedures are already in place to address the proper storage and handling of hazardous materials during operations.

Build Alternative

Construction Impacts

Under the Build Alternative, construction impacts relate primarily to the potential to encounter soil and/or groundwater containing hazardous materials. Station reconstruction, viaduct replacement, structure construction, and embankment removal would require subsurface excavation throughout the majority of the project corridor. 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. High and Moderate Concern sites are the greatest potential sources of hazardous material impacts from regulated contaminants. One High Concern site (EDR Map ID: L165) is adjacent to the construction area. In addition, the North Red and Purple lines themselves are a High Concern; therefore any excavation within the CTA right-of-way has the potential for hazardous materials impacts. Excavated material from the High Concern sites would be handled and disposed of according to the laws and regulations of the State of Illinois.

CTA plans to acquire certain parcels for off-street construction sites. One of these parcels contains a Moderate Concern site. The parcel on the south side of Hollywood Avenue includes a Moderate Concern site (EDR Map ID: C99, D90, C114). Although planned 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 reconstruction and/or demolition of existing structures and stations that were constructed before 1978–1979. The structures and stations potentially contain 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.

The project could also result in beneficial impacts through the cleanup and/or removal of contaminated material (soil, groundwater, and/or asbestos and lead-based paint particles) during construction. Without this project, cleanup and/or removal would occur either at a later date or not at all.

Permanent Impacts

As discussed for the No Build Alternative, transit operation has the potential to result in the release of hazardous materials and/or petroleum products into the environment from accidental spills. The Build Alternative would result in removal of asbestos and lead-based paint associated with reconstructed stations. Existing procedures are already in place to address the proper storage and handling of hazardous materials during operations. There would be no permanent impacts related to hazardous materials associated with the project.

4.8.4 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 standard BMPs, at a minimum, will be implemented to avoid and minimize the potential for impacts before and during construction:

- CTA will conduct Phase I Environmental Site Assessments (ESAs) for any property to be purchased as part of the Build Alternative in order to identify recognized environmental conditions and assess and limit environmental liability. Based on the Phase I ESA findings, a Phase II ESA could also be required before purchasing a property.
- CTA will conduct focused site assessments for areas where earthmoving activities would 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.
- CTA will conduct asbestos, lead-based paint, and hazardous material surveys of buildings or structures before reconstruction or demolition, 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 construction contractors and read and signed by all workers 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 CTA's existing system-wide hazardous material usage, storage, and disposal plans and procedures, further minimizing the potential for hazardous material impacts.

4.9 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 additional information on EJ analysis and outreach conducted for this project. **Appendix C-7** contains additional details.

4.9.1 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 Lawrence to Bryn Mawr Modernization Project were designed to accomplish the following:

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, 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, the Illinois Environmental Justice Act, and FTA Circulars 4703.1 and 4702.1B. **Appendix C-7** presents further 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 in an existing urban transportation corridor.
- 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 proposed alignment. 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 stations, which is generally considered to be a walkable distance. **Section 4.10** 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 a series of organizations representing the interests of potential EJ communities through a process of mapping project impacts, reviewing census data on potential EJ groups, and leveraging existing CTA community relationships. CTA met with many of these organizations to verify locations of EJ communities and to better understand their concerns. As part of spring 2014 outreach efforts, CTA provided these communities additional information on the RPM Phase One improvements. **Section 4.9.4** contains additional details on this outreach.

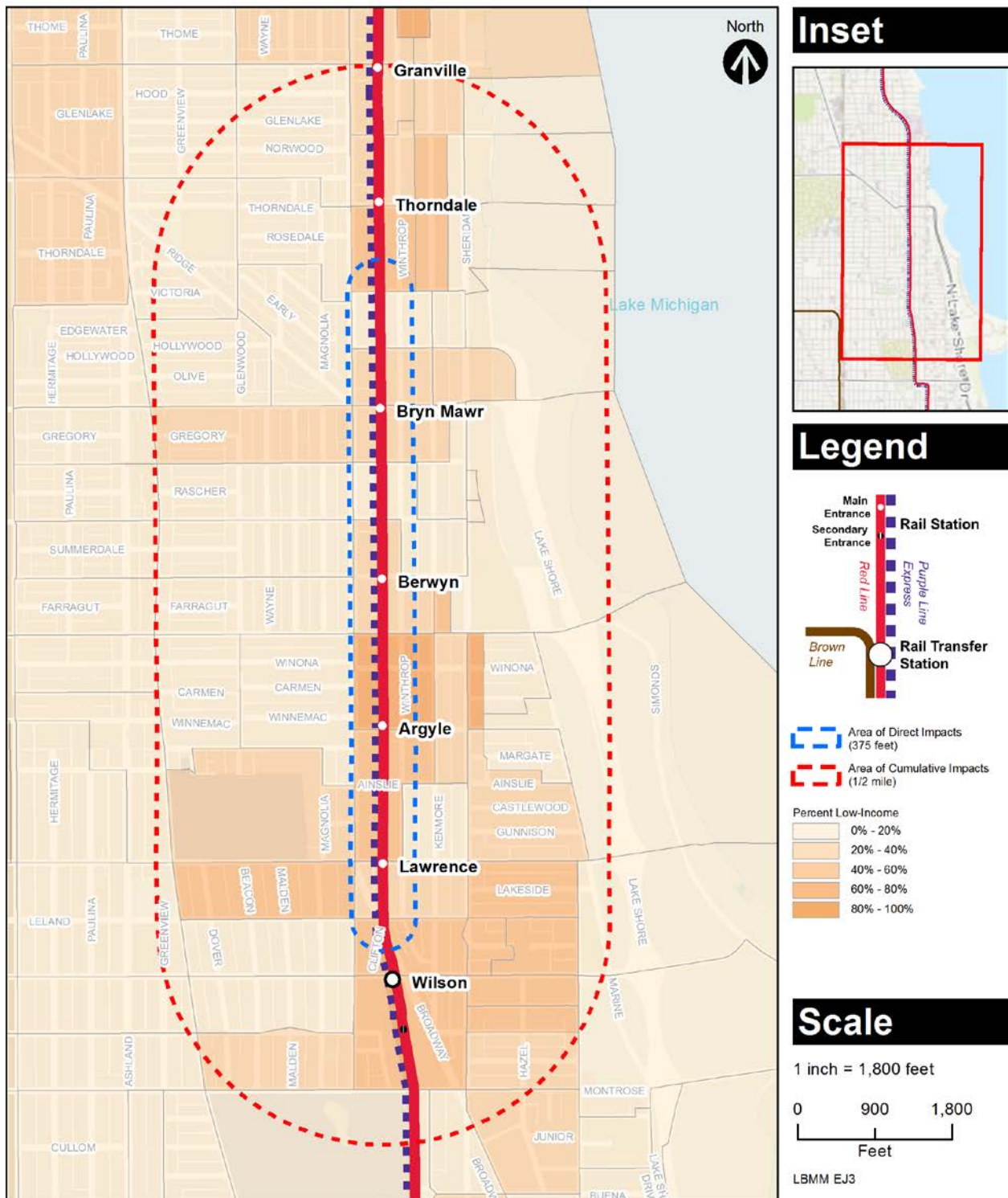
CTA also analyzed year 2012 American Community Survey data for all census blocks within ½ mile of the proposed Build Alternative alignment to further verify the presence of low-income and minority populations. Low-income populations were identified by comparing income levels and Department of Health and Human Services (DHHS) poverty thresholds. Low-income populations were identified where the percentage of households with median income below the DHHS poverty guidelines exceeds the citywide percentage (22.1 percent). The combination of non-white races and Hispanic/Latino populations was used to determine and describe the minority population in the corridor.

In addition to information about low-income and minority 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. **Appendix C-7** contains additional details regarding elderly and disabled populations.

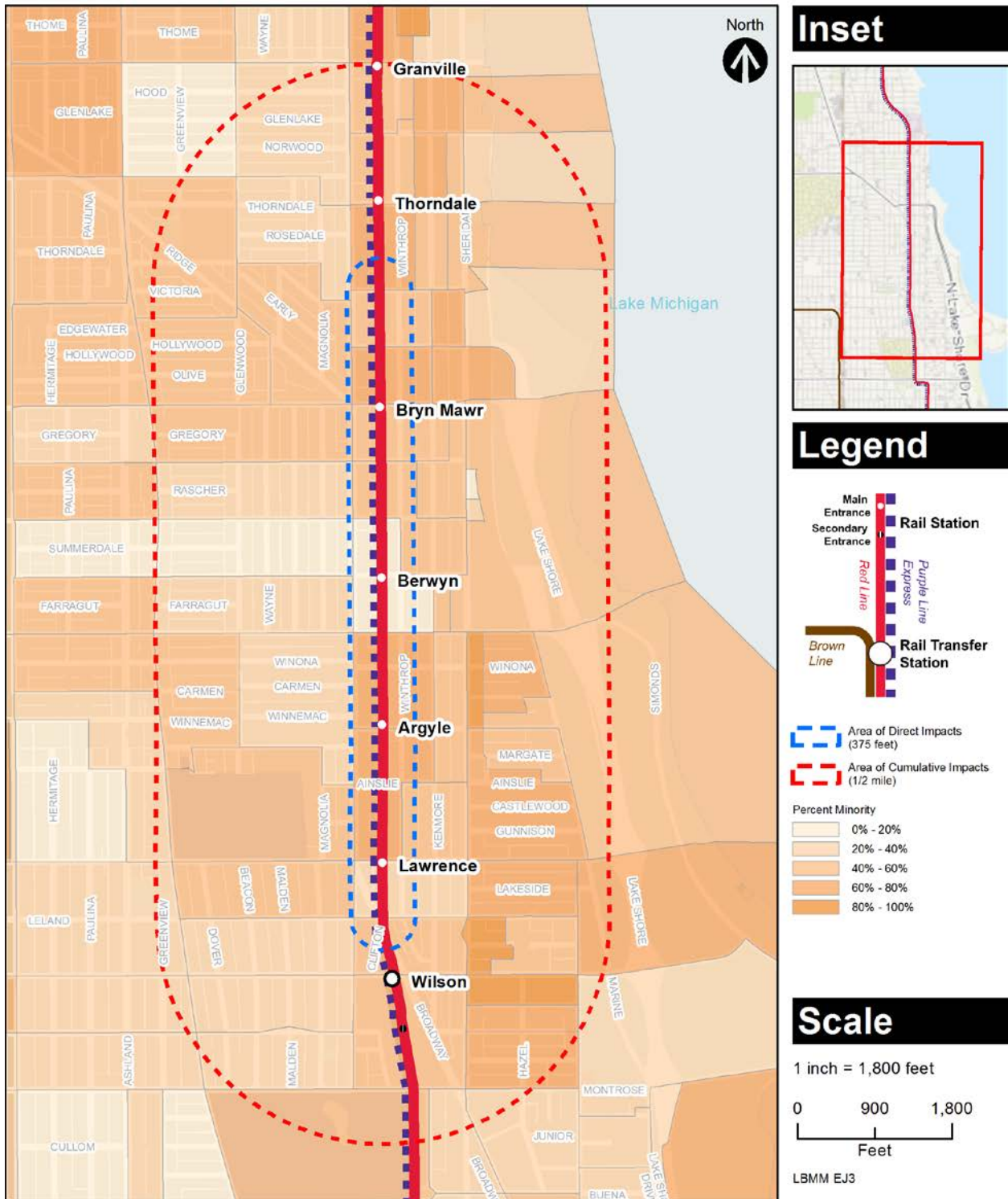
4.9.2 Existing Conditions

Figures 4-17 and 4-18 show, by census block group, low-income and minority populations within the corridor. The maps show that most areas within ½ mile of the alignment include low-income or minority populations. **Appendix C-7** contains additional mapping and detailed tables.



Source: U.S. Census Bureau 2012

Figure 4-17: Low-Income Populations



Source: U.S. Census Bureau 2012

Figure 4-18: Minority Populations

Based on the DHHS poverty guidelines, 25.1 percent of the population within ½ mile of the project corridor lives in a household with an income below the poverty level, which is higher than the citywide percentage of 22.1 percent (U.S. Census Bureau 2012).

The population living within ½ mile of the project corridor is racially and ethnically diverse. The most prevalent race is white (47.7 percent). Hispanic or Latino populations can be of any race including white and they make up 13.4 percent of the total population. Of the 68,418 people who live within ½ mile of the corridor, minority persons, who include all non-white races and white Hispanics/Latinos, make up 52.3 percent.

In addition, approximately 12 percent of those living within ½ mile of the project corridor are elderly, which is slightly higher than the citywide elderly proportion of 10 percent. Disabled populations within ½ mile of the corridor constitute 10 percent of the corridor population, relatively consistent with the 11 percent found at the citywide level (U.S. Census Bureau 2012). **Appendix C-7** contains additional details regarding elderly and disabled populations.

4.9.3 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; however, the No Build Alternative would also lack the benefits of the proposed project, including enhanced mobility, economic development, and livability. Travel times would not improve, thereby limiting the mobility of passengers, many of whom are low-income and transit-dependent.

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 in nature and would be experienced by EJ and non-EJ communities alike. Construction impacts would include impacts on parcels from construction (temporary impacts) and displacements that would be necessary to accommodate off-street construction sites. See **Section 4.1.4** for additional details on mitigation measures for displaced properties. Impacts would be temporary in nature, and the identification of off-street construction sites would limit street closures and other neighborhood, community, and business impacts.

During construction, temporary station closures would be required and passengers would need to access adjacent stations. Station closures would be similar throughout the corridor, and would not have a disproportionately high and adverse effect on EJ populations. Pedestrian travel times to station entrances would be affected for some passengers. CTA plans to increase service of the #36 bus route during construction to minimize impacts for pedestrians attempting to board at stations that are closed during construction. In addition, CTA is committed to coordinating with Pace ADA Paratransit Service to provide sufficient alternative paratransit services during construction.

The construction of the Build Alternative would produce temporary noise and vibration associated with construction activities, but would not result in severe impacts after mitigation. See **Sections 4.6.4 and 4.7.4** for mitigation measures for noise and vibration impacts, respectively. Some minor air quality impacts as a result of fugitive dust and/or construction vehicle emissions may also be experienced. The impacts would temporarily affect all people that live, recreate, or do business adjacent to the construction activities. Construction BMPs and construction scheduling would be used to minimize these adverse impacts. As a result, construction of the Build Alternative would not result in disproportionately high and adverse effects on low-income or minority populations.

Permanent Impacts

The Build Alternative would reconstruct four project area stations and elevated track structure that has deteriorated. The project would be consistent with and support existing land uses and zoning allowances and would result in minimal permanent commercial displacements (two buildings). Property owners would be provided just compensation for any permanent displacements and relocation assistance would be provided for tenants in accordance with the Uniform Act (42 USC § 4601, et seq.). **Section 4.1.4** provides additional details on mitigation measures for property displacements resulting from implementation of the Build Alternative. The Build Alternative would improve the visual environment by replacing deteriorating track structure and enhancing the internal and external stations within the project corridor. **Section 4.5.4** details mitigation measures that would minimize visual impacts during construction, resulting in a level less than significant under NEPA.

The project would increase speed and reliability of the system, and impacts on air quality would be minor. Safety at stations would be improved by providing full ADA accessibility and wider platforms. Safety throughout the corridor would be improved by replacing aging, deteriorated track infrastructure. The noise and vibration analyses conducted for this EA have identified the potential for noise and vibration impacts during operation; however, as described in **Sections 4.6 and 4.7**, CTA is committed to implementing control measures during operation that would mitigate potential impacts to levels below the FTA noise and vibration criteria. The project would offer all populations—including low-income and minority populations—improved access to and within stations, accessibility for passengers with disabilities, modern passenger amenities, enhanced neighborhood presence, and safer and more reliable service.

Based on the analysis contained in this EA and the mitigation commitments made by CTA, the Build Alternative would not result in substantial environmental impacts. As a result, the Build Alternative would also not result in disproportionately high and adverse effects on low-income, minority, aging, or disabled populations. In addition, the project would provide positive benefits to EJ populations surrounding the corridor, as well as the population as a whole.

4.9.4 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 improvements and most importantly, to provide opportunities for EJ populations to have meaningful participation in the review of the project and its benefits and impacts. To provide these opportunities, CTA coordinated with community leaders, made targeted distributions of project information, and developed project materials in the languages of those that are linguistically isolated. Within the Lawrence to Bryn Mawr Modernization Project area, community groups who were identified and contacted as part of the EJ and community group outreach included the following:

- Access Living of Metropolitan Chicago (serves people with disabilities)
- Salvation Army (serves low-income and transit-dependent people)
- South-East Asia Center (serves people from China, Vietnam, Laos, Cambodia, and the Philippines, as well as South Asia, West Asia, and immigrants from Eastern Europe, the Caribbean, Africa, and Latin America)
- North Shore Spanish Baptist Church (serves the Spanish-speaking community)
- Asian Human Services (serves the Southeast Asian community)
- Vietnamese Association of Illinois (serves the Vietnamese community)
- Chinese Mutual Aid Society (serves the Chinese community)

CTA contacted each of the groups by telephone and provided an opportunity for a presentation on the proposed project. All community groups received a follow-up letter 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 C-7** contains formal follow-up correspondence to all community groups.

At the request of interested community groups, CTA conducted meetings to share information about the project and allow community members to ask questions and voice concerns. Meeting formats were tailored to the community group needs and requests. At the request of Asian Human Services, a more informal short briefing with a question-and-answer (Q&A) session was conducted in April 2014. In addition, the South-East Asia Center Golden Diners Club, which serves a community of elderly people of Chinese and Vietnamese descent near Argyle station, requested a presentation and Q&A session as part of their standing community group luncheons. Meeting materials were provided in Mandarin, Cantonese, and Vietnamese, and interpreters in each of these languages were in attendance to translate presentation information and assist with the Q&A session that followed. **Appendix D-1** contains the meeting notes and other supporting information for the outreach efforts.

In addition, CTA has promoted full and fair participation from all members of the public during the decision-making process for the Lawrence to Bryn Mawr Modernization Project. CTA's efforts included specialized outreach to people who, as a result of national origin, have limited English proficiency. The Uptown and Edgewater community areas contain some of the most linguistically diverse populations within Chicago, making it challenging to identify a predominant linguistically isolated population. CTA evaluated the need for additional outreach by using 2006–2010 Census

data and analyzing whether populations throughout the project corridor were linguistically isolated because of challenges with reading, writing, and/or speaking English.

Based on CTA’s analysis, Spanish language interpreters were made available at all public meetings. Interpreters for other languages were also made available upon request at all public open houses, community meetings, and the public hearing for the project. Public notice of the availability of translation services was also made 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. **Table 4-10** highlights the languages spoken by non-English speakers that are the most linguistically isolated by location.

Table 4-10: Linguistic Isolation by Station and Community Area

Community	Station	Most Linguistically Isolated
Uptown	Wilson	Spanish and Russian
	Lawrence	Vietnamese and Russian
	Argyle	Vietnamese, Chinese, and Korean
Edgewater	Berwyn	Serbo-Croatian, Russian, and Spanish
	Bryn Mawr	Serbo-Croatian, Russian, and Spanish
	Thorndale	Serbo-Croatian, Russian, and Spanish

Source: U.S. Census Bureau 2010

4.10 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.

4.10.1 Regulatory Framework/Methods

Indirect impacts, also known as secondary impacts, are defined under 40 CFR § 1508.8. As defined, indirect 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 aggregate result of the incremental direct and indirect effects of a project or plan, the effects of past and present actions, and impacts of reasonably foreseeable future actions by others on resources of concern.

CTA used the following guidance documents in determining the potential for indirect and cumulative 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 followed 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 4.1**). For the analysis, findings from the environmental resource analyses described 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 such as community facilities, historic resources, and other vulnerable or unique resources. A qualitative assessment of the potential for and impacts of induced growth that could result from this project were then determined. Factors in this assessment relate to changes in growth and development expected as a result of the increases in transit accessibility resulting from this 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, CTA followed the 11-step method identified in Council on Environmental Quality guidance 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 effects. CTA reviewed applicable current and future regional and local plans. In addition, the cumulative impacts assessment included an evaluation of the proposed off-street construction sites for 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 Lawrence to Bryn Mawr Modernization Project is anticipated to occur 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.

4.10.2 Indirect Impacts

The area around the Lawrence to Bryn Mawr Modernization Project location is highly urbanized and developed, with mature neighborhoods. The project would support existing and planned land uses around the stations and would help improve the environment and visual experience of CTA passengers and patrons of commercial uses adjacent to the corridor. Redevelopment of the surrounding community areas could be spurred by the improved accessibility and station enhancements. Properties remaining after construction would become available for transit-oriented redevelopment consistent with land use and development plans in the surrounding communities. CTA is continuing to work with DPD on joint development opportunities and to coordinate land use and development plans with this project.

4.10.3 Cumulative Impacts

Past, present, and reasonably foreseeable future actions within the project area were considered in this analysis and included the following:

- CDOT Broadway/Lawrence Avenue Streetscape Project (currently in the Transportation Improvement Program)
- CDOT Argyle Street Streetscape Project (in the later stages of implementation)
- CDOT North Lake Shore Drive Project (currently in planning and expected to be initiated after implementation of the Build Alternative)
- City of Chicago North Broadway Plan (currently in planning)
- Metra Peterson Ridge Station Plan (expected to open in early 2017, before implementation of this project)

Improvements to the rail transit and viaducts within the project area would have a beneficial cumulative impact with improved mobility, accessibility, connectivity, and safety for different modes of travel in conjunction with the planned roadway improvement projects. If the Lawrence to Bryn Mawr Modernization Project and the roadway improvement projects were in construction simultaneously, activities would be coordinated with CDOT or IDOT to minimize the potential for negative cumulative impacts during construction and provide adequate detour routes.

The permanent cumulative impacts of these projects would be largely beneficial to the surrounding communities because they would improve access to jobs, places of interest, and residences. CTA anticipates the incremental impact from reasonably foreseeable future actions to be more efficient mobility and access to jobs, retail, and places of interest within the project corridor for Chicago residents and visitors. CTA expects that over a period of time retail establishments and places of interest would benefit from the more efficient access to their locations.

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

Future phases of the RPM Program would include rail transit system work that would decrease travel times and increase capacity along the North Red and Purple lines. The future RPM Program activities, combined with other ongoing transit improvements on the Red Line, such as the Red Line Extension Project and Wilson Transfer Station Project, 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.

4.11 Resources with Limited or No Impacts

A number of other environmental resources typically examined under NEPA were determined by FTA and CTA to have limited to no impact from the proposed project. The following sections summarize this analysis. **Appendix C-8** includes additional supporting documentation regarding each of these resources.

4.11.1 Air Quality

The Build Alternative could result in some temporary adverse impacts on air quality during construction; these impacts would not be substantial and would be minimized through implementation of appropriate construction BMPs. The Build Alternative would result in an overall permanent beneficial impact on air quality by improving speed and reliability of the transit system, making transit a competitive and attractive option for new passengers who currently make trips in automobiles.

4.11.2 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 corridor (Federal Emergency Management Agency 2008, USEPA 2014). There are no aspects of this project that would increase the 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.

4.11.3 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 (Illinois Department of Natural Resources 2014, U.S. Fish and Wildlife Service 2014).

4.11.4 Geology and Soils

The Build Alternative would not result in adverse impacts on geologic or soil resources. The project would, in accordance with federal disposal guidelines, remove urban fill that is potentially contaminated with hazardous materials. Removing the materials, disposing of it properly, and as needed, filling with tested materials, could be beneficial to human health and the environment.

4.11.5 Energy

Construction of the Build Alternative would not have an impact on energy consumption in Cook County or the Chicago metropolitan area. No changes to energy use are anticipated due to train operations. The one-time irreversible commitment of energy resources for construction would amount to less than 1 percent of the total annual energy consumption for Cook County. The reconstructed stations would require additional energy to operate due to lighting at larger platforms and use of elevators for accessibility. The additional energy use would be less than a 4 percent change compared to the current energy use for stations along the Red Line between

Belmont and Howard stations. The additional energy use at the four reconstructed stations would amount to less than 0.1 percent of total annual energy consumption for Cook County.

4.11.6 Safety and Security

No negative impacts on safety and security are anticipated from the Build Alternative. The Lawrence to Bryn Mawr Modernization Project is being designed and would be operated consistent with federal, state, and local safety and security policies and guidance. The proposed improvements would improve both safety and security for CTA passengers and employees by providing upgraded facilities and amenities such as increased lighting, security cameras, wider platforms, and improved access. The proposed design would allow for reduced safety and security incident frequency at stations due to the wider platforms and elevators, as well as reduced evacuation times at stations because of the additional emergency egress points and stairs. The project design involves replacing viaducts, which would improve sightlines along the sidewalks and street adjacent to stations, improving safety and security conditions for pedestrians, drivers, and bicyclists. In addition, the project would fully replace aging track and viaducts, thereby reducing the risk of major incidents—including collisions and derailments—and improving safety and security under viaducts.

As part of the subsequent engineering and design for the project, CTA will determine the feasibility and practical considerations for keeping portions of the existing embankment walls between stations along the project corridor. Should the embankment walls be removed, there would be an increase in the amount of open space under the structure between station areas. Lighting would minimize dark spaces and fencing could be used where safety risks are identified. Security cameras will be installed for surveillance of public areas, including auxiliary and emergency-only exits. Lighting will also be provided at these auxiliary and emergency-only exits. All exits will have an alarm, which will be monitored remotely, thereby enabling an appropriate response.

Chapter 5

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 community input received as well as additional analysis, in late 2013 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.

5.1 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 locations were 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 D-1** contains a summary of the outreach conducted in spring 2014 including public comments received.

In general, the public expressed positive support for RPM Phase One. The public was supportive of the modernization of stations with ADA accessibility and the improvements to operations and reliability that would result from the project. Concerns expressed by the public concentrated on construction impacts on the surrounding community. More specific questions from the public were received regarding design features of the Build Alternative as well as concerns about resulting noise and vibration impacts.

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 transit 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 on the project status and open house meeting. CTA provided flyers with information about the RPM Phase One open house meeting to aldermen and other elected officials for distribution to community members.

5.1.1 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 D-1** lists federal, state, and local elected officials who were contacted and offered an opportunity for a briefing.

5.1.2 Community Group Meetings

In addition to the public open house meeting, CTA conducted outreach to a variety of local community groups within the project corridor and coordinated with the local aldermen to provide eight community-focused meetings throughout April and June 2014.

Appendix D-1 contains a full list of community group meetings and meeting summaries. 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 Q&A sessions, to informal overviews of the project, active listening sessions, and tours. In addition, at the request of the alderman, CTA also delivered a presentation to local business owners on May 9, 2014. On June 3, 2014 CTA held a smaller open house meeting that mirrored the format and materials provided at the public open house, with brief opening remarks from the 48th Ward alderman followed by a 30-minute Q&A session with CTA representatives.

Project Area Community Groups and Environmental Justice Communities
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- | |
|--|
| <ul style="list-style-type: none"> ■ Access Living of Metropolitan Chicago ■ Salvation Army ■ South-East Asian Center ■ Edgewater Chamber of Commerce ■ North Shore Spanish Baptist Church ■ Asian Human Services ■ Vietnamese Association of Illinois ■ Chinese Mutual Aid Society ■ Uptown United ■ Uptown Chicago Commission ■ Edgewater Development Corporation ■ Edgewater Environmental Sustainability Project |
|--|

5.1.3 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 Lawrence to Bryn Mawr Modernization 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. 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. **Appendix D-2** includes additional details about property displacement outreach.

5.1.4 Spring 2014 Open House

CTA held a public open house meeting on May 21, 2014. The meeting was hosted in an ADA-compliant location close to the project site and accessible by public transportation. Spanish translators, sign language interpreters, and a court reporter were available during the meeting. Speakers explained the information presented on exhibit boards and answered project-related questions. Attendees with specific questions about potential property displacements could discuss the issues with Uniform Act public outreach specialists. Attendees also had an opportunity to view a video about the Phase One projects during the meeting. The open house provided attendees with an early opportunity to review the proposed project and provide input on project designs, costs, and environmental considerations. Attendees could comment in writing during the open house or submit their comments after the open house via e-mail or U.S. mail.

A total of 94 community members attended the May 21, 2014 open house meeting. A total of 19 community members submitted written comments at that meeting and 3 community members submitted verbal comments to the court reporter. An additional 7 comment cards were received as part of the community meeting held on June 3, 2014. One mailed comment card and 73 e-mails were received between April 17, 2014 (project announcement date) and June 4, 2014 (two weeks after the open house meeting).

Appendix D-1 contains complete documentation of the spring 2014 outreach.

5.2 Agency Coordination

Agency outreach for the Lawrence to Bryn Mawr Modernization 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.

5.2.1 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 letters, project informational materials, and flyers regarding the spring 2014 open house meeting to federal agencies and tribes. 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 comments. Responses to these letters provided an opportunity for FTA and CTA to confirm agency coordination and interest in the proposed project. Below is a list of agencies contacted. **Appendix D-3** contains copies of correspondence.

Federal Agencies	State Agencies	Local Agencies
<ul style="list-style-type: none"> ■ 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 	<ul style="list-style-type: none"> ■ Illinois Commerce Commission ■ Illinois Department of Natural Resources ■ Illinois Department of Transportation ■ Illinois Housing Development Authority ■ Illinois Terrorism Taskforce 	<ul style="list-style-type: none"> ■ City of Chicago Department of Fleet and Facility Management ■ City of Chicago Department of Planning and Development ■ City of Chicago Department of Transportation ■ City of Evanston ■ Chicago Park District ■ City of Chicago Department of Business Affairs and Consumer Protection ■ City of Chicago Department of Public Health ■ City of Chicago Office of the Mayor ■ Metra Rail ■ Metropolitan Water Reclamation District of Greater Chicago ■ Pace Suburban Bus Service ■ Regional Transportation Authority

In addition to the letters, CTA conducted a series of agency and elected official briefings as part of the spring 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 also 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 D-3** contains a full list of the meetings and attendees.

5.2.2 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 4.4**). The purpose of consultation is 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 local potential resources. The consulting parties included the IHPA, the City of Chicago Historic Preservation Division, Preservation Chicago, Landmarks Illinois, the Edgewater Historical Society, the Uptown Chicago Commission, Friends of the Parks, and the Uptown Historical Society. Consultation meetings were held on August 21, 2014 and March 24, 2015, as described in **Section 4.4**. FTA and CTA provided multiple opportunities throughout the development of this EA for additional 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 C-4** contains copies of correspondence and Section 106 consultation materials as well as the Draft MOA.

5.2.3 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 its participation in the Section 106 process for the RPM corridor; 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; copies of the letters are included in **Appendix C-4**. No responses were received. Throughout the Section 106 consultation, the Miami Tribe of Oklahoma was provided with materials and notice of all meetings.

5.3 Environmental Assessment Distribution and Public Comment Period

FTA has issued a Notice of Availability for this EA to provide the public an opportunity to review and comment on the EA. The formal public comment period is from April 29 to May 29, 2015. All comments received during the 30-day public comment period, along with responses thereto, 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 the CTA website (transitchicago.com/rpmproject), and hard copies of the EA are available at the following locations during the public review period:

- CTA headquarters, 567 W. Lake Street, 2nd Floor, Chicago, IL 60661
- 46th Ward Alderman's Office, 4544 N. Broadway, Chicago, IL 60640
- 48th Ward Alderman's Office, 5533 N. Broadway, Chicago, IL 60640
- Bezazian Library, 1226 W. Ainslie Street, Chicago, IL 60640
- Uptown Library, 929 W. Buena Avenue, Chicago, IL 60613
- Edgewater Library, 6000 N. Broadway, Chicago, IL 60660
- Harold Washington Library Center, 400 S. State Street, Chicago, IL 60605

A public hearing is scheduled for May 14, 2015 from 6:30 to 8:00 PM at the Broadway Armory (5917 N. Broadway, Chicago, IL 60660) to solicit comments from the community about findings presented in the EA. The public hearing was advertised through display ads in local and regional newspapers, an e-Blast, postcard mailing, and through CTA press releases, flyers, and transit alert cards placed on CTA rail cars and buses within the project corridor. Additional details concerning the public hearing were also posted on CTA's website. The public hearing location within the project corridor is ADA-compliant, and accessible by public transit.

Comments received during the public hearing and public comment period will be submitted to FTA and will be entered into public record. A summary of the public hearing will be included in the final NEPA decision document. Written comments will also be accepted at any time during the public comment period via e-mail to: LawrenceToBrynMawr@transitchicago.com and U.S. mail to: Chicago Transit Authority, Strategic Planning, 10th Floor, Attn: Lawrence to Bryn Mawr Modernization Project, 567 W. Lake Street, Chicago, IL 60661.

5.4 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 aldermen's offices as further project details are known. CTA Government and Community Relations staff will continue to work with the aldermen's offices and community groups to develop marketing plans during construction. 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 and Task Force** - CTA will lead meetings with local residents and business owners regarding the project and anticipated construction impacts.
- **Construction Outreach and Coordination Plan** - CTA will develop a plan that includes a Small Business Outreach Program to assist local businesses and residents affected by construction. The plan will be tailored to business and community needs, and will include a series of initiatives to minimize construction disruption to businesses and the surrounding community. CTA plans to work with the community, businesses, and elected officials to develop this plan.
- **Dedicated Webpage** - A dedicated webpage will be updated and maintained by CTA to provide passengers with information regarding work planned, scheduling, progress of the overall program, and other pertinent construction details.
- **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 business. In addition, the same information will be provided to the aldermen's offices and flyers will be posted in the area and on the RPM Program website.

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

Chapter 6

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.

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 this guidance.

Based on the evaluation contained within 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 (detailed in **Section 4.4** and **5.2.2**), however, FTA, CTA, and IHPA identified NRHP-eligible resources within the project area that are afforded protection under Section 4(f), and are the subject of this analysis and chapter.

6.1 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.

6.2 Regulatory Framework

Section 4(f) protects specific resources of national, 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 a very specific meaning. There are three potential types of uses of Section 4(f) resources:

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 the 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 is temporary (i.e., less than the time needed for construction of the project), and there is no change in ownership of land.

- The scope of work is minor (i.e., both the nature and magnitude of the changes to Section 4(f) resource are minimal).
 - There are no anticipated permanent adverse physical impacts, nor is there interference with the protected activities, features, or attributes of the resource, on either a temporary or permanent basis.
 - The land being used is 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 resource 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 impacts are *de minimis* or undertake an individual Section 4(f) evaluation. 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 four adverse effects findings. IHPA correspondence is included in **Appendix C-4**.

Based on the Section 106 effects findings and in accordance with 23 CFR § 774, FTA may not approve a project requiring the use of a Section 4(f) resource until an individual Section 4(f) evaluation is completed. For FTA to approve the Section 4(f) evaluation, two findings must be made:

- There is no feasible and prudent alternative to the use of land from the resource (23 CFR § 774.17).
- The action includes all possible planning to minimize harm to the resource resulting from such use (23 CFR § 774.17).

6.3 Organization of this Chapter

The sections within this Section 4(f) evaluation consider potential impacts 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 6.4** - Identification of Section 4(f) Resources

- **Section 6.5** - Assessment of Use of Section 4(f) Resources
- **Section 6.6** - Avoidance Analysis
- **Section 6.7** - Least Overall Harm Analysis
- **Section 6.8** - All Possible Planning to Minimize Harm

The concluding sections of this chapter provide details on the consultation and coordination process undertaken (**Section 6.9**) and summarize the finding of this Section 4(f) evaluation (**Section 6.10**).

6.4 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 Lawrence to Bryn Mawr Modernization Project (held on August 21, 2014). This consultation is further described in **Section 4.4**.

Through the Section 106 process, FTA and CTA identified 17 resources that meet eligibility criteria for inclusion in the NRHP and that lie within the designated area of potential effects (APE) for the project: 13 individually eligible resources and 4 historic districts. **Table 6-1** describes these resources, which are shown on **Figure 6-1**. **Section 4.4** contains additional details on the APE and eligibility criteria.

Table 6-1: Resources Eligible for or Listed on the National Register of Historic Places in the Area of Potential Effects

Map ID	Address	Period of Significance	Description	NRHP Eligibility Criteria	Contributing to Historic District
1	Wilson Station to Howard Station (CTA Track Structure) ¹	1920	Elevated Track (CTA)	Criterion A	Multiple
Uptown					
2	4728-4744 N. Broadway	1914	Classic Revival Commercial Building	Criterion C	Uptown Square
3	4703-4715 N. Broadway ¹	1927	Uptown Broadway Building	Criterion C	N/A
4	4753 N. Broadway	1924-1928	Sheridan Trust & Savings Bank	Criterion C	Uptown Square
5	4850 N. Broadway	1939	Art Moderne-Style Post Office	Criterion C	Uptown Square
6	5120 N. Broadway	1904	Schlitz Brewery-Tied House	Criterion C	N/A
7	1039-1053 W. Lawrence Avenue	1929	Venetian Gothic Apartment	Criterion C	Uptown Square
8	1100-1108 W. Lawrence Avenue	1926	Aragon Ballroom	Criterion C	Uptown Square
9	4875 N. Magnolia Avenue	1927	Gothic Revival Apartment	Criterion C	N/A
Edgewater					
10	5718 N. Broadway	1922	Art Moderne Commercial	Criterion C	N/A
11	1101-1107 W. Bryn Mawr Avenue	1927	Venetian Gothic Mixed-use	Criteria A and C	Bryn Mawr Avenue
12	5247 N. Magnolia Avenue	1898	Classical Revival Residence	Criterion C	Lakewood Balmoral
13	5400-5402 N. Winthrop Avenue	1925	Spanish Revival Apartment	Criterion C	N/A
Historic Districts					
14	Uptown Square HD ¹	1900-1974	Uptown Square HD	Criteria A and C	N/A
15	West Argyle Street HD	1898-1938	West Argyle Street HD	Criteria A and C	N/A
16	Lakewood Balmoral HD	1890-1929	Lakewood Balmoral HD	Criterion A	N/A
17	Bryn Mawr Avenue HD	1875-1949	Bryn Mawr Avenue HD	Criterion C	N/A

NRHP = National Register of Historic Places; HD = Historic District; N/A = Not Applicable

¹These resources are also documented in the *Wilson Transfer Station Project EA and Section 4(f) Evaluation*, which contains analysis of the Section 106 effects for that project, which has separate, independent utility and would be completed before the Lawrence to Bryn Mawr Modernization Project.

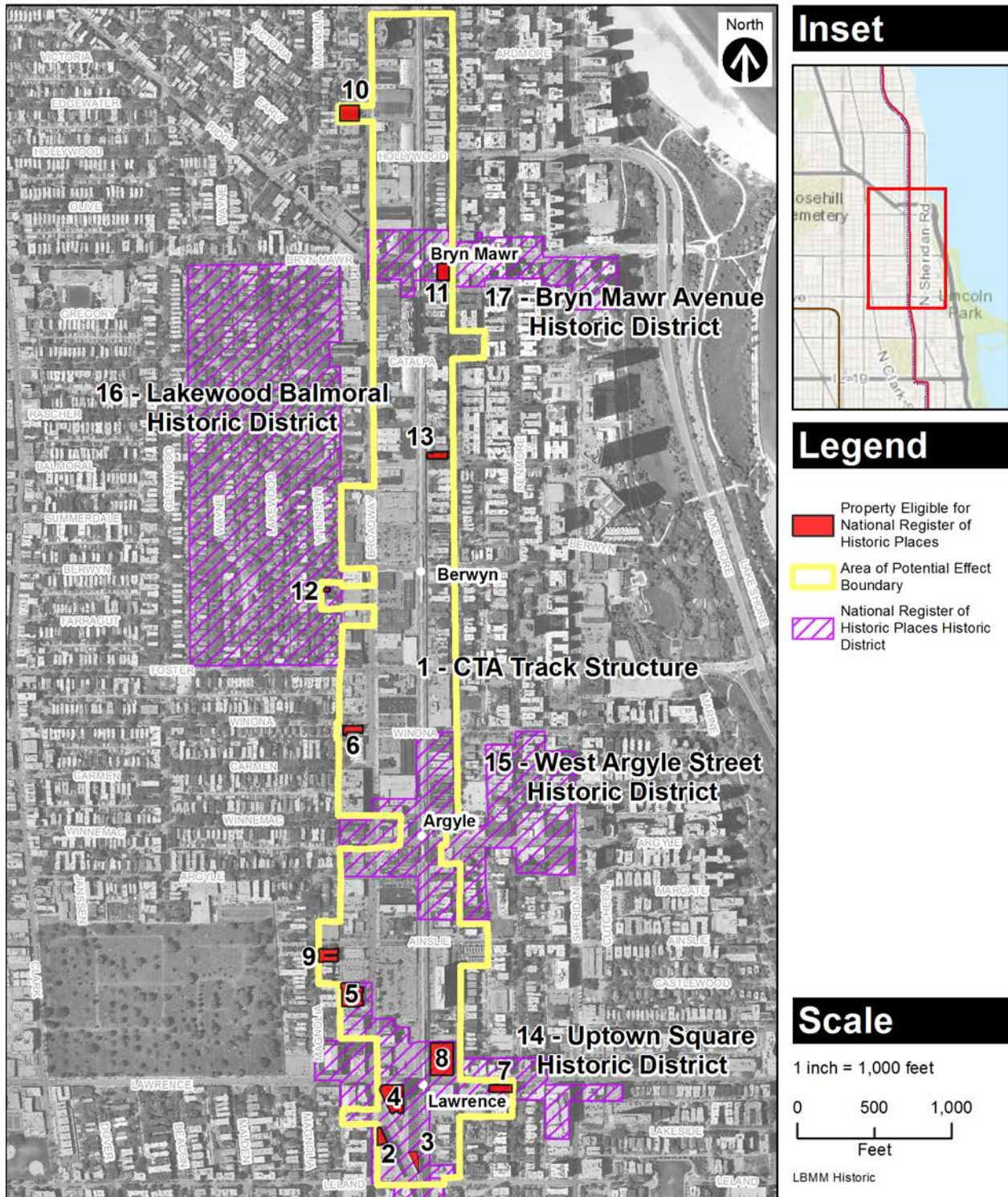


Figure 6-1: Area of Potential Effects Boundary and NRHP-Eligible Resources

6.4.1 Resources Not Further Evaluated for Section 4(f)

Section 4(f) applies when there is a “use” of NRHP-eligible resources. Under the Section 106 process, FTA and CTA determined that five of the NRHP-eligible historic resources (Map ID #: 5, 6, 10, 12, and 16) would result in a “no effect” finding under Section 106 because their location falls well outside of the proposed project right-of-way and construction footprint. 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.

The Section 106 process also determined that the Build Alternative would have No Adverse Effect on eight other NRHP-eligible resources (Map ID #: 2, 3, 4, 7, 8, 9, 11, and 13). These resources, while near the project area, are also outside of the proposed project right-of-way and construction footprint. 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 and districts, 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, because the threshold for an “adverse effect” under Section 106 is lower than that of a “constructive use” as defined under Section 4(f), 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 discussed further in this chapter.

6.4.2 Resources Subject to Individual Section 4(f) Evaluation

Four NRHP-eligible resources are subject to further individual Section 4(f) evaluation. These resources are described in greater detail below. **Section 6.5** contains additional discussion of these resources, including photos of each resource under further evaluation and how they would be used by the project.

Resource 1: CTA Elevated Track Structure

The CTA elevated track structure was constructed in the 1920s. From north of Wilson station to Howard station, the aging track structure contains four tracks, supported by an earthen embankment with concrete walls. This segment has undergone numerous minor rehabilitation and viaduct repair projects over the past decades.

The portion of the Red and Purple line elevated track structure within the Lawrence to Bryn Mawr Modernization Project APE is identified as individually eligible under Criterion A for its contribution to the development of Chicago’s North Side and Evanston.

Resource 2: Uptown Square Historic District

In addition to being listed as individually eligible on the NRHP, the Red and Purple line elevated track structure is currently identified as a contributing resource within the NRHP-listed Uptown Square Historic District.

The Uptown Square Historic District is bounded by Lawrence Avenue on the north, Leland Avenue on the south, Sheridan Road on the east, and Broadway on the west. Uptown Square is significant as a cohesive, early 20th century commercial and entertainment district. Its 44

contributing buildings were erected from 1900 through 1950 and feature brick, limestone, and terra cotta. They include low-rise apartment buildings with storefronts, grand Spanish Baroque entertainment venues, Classical Revival terra cotta-clad office buildings, an Art Deco post office, and Art Deco and Venetian Gothic apartment hotels. The district is listed on the NRHP under Criterion A for its association with the broader historic patterns of entertainment and recreation, commerce, and transportation in Uptown. The district is also significant under Criterion C for its various examples of architecture with distinctive characteristics attributed to the Spanish Baroque Revival, Classical Revival, and Commercial Styles.

Resource 3: West Argyle Street Historic District

Two contributing resources within the West Argyle Street Historic District lie within the project footprint: the Argyle stationhouse (1116–1120 W. Argyle Street) and the vacant CTA-owned retail building beneath the track structure on the south side of Argyle Street (1117–1119 W. Argyle Street). The West Argyle Street Historic District is adjacent to the elevated track structure, with contributing buildings both east and west of Argyle station.

The West Argyle Street Historic District is roughly bounded by Sheridan Road on the east, Broadway on the west, Winona Street on the north, and Ainslie Street on the south. The commercial and residential district has 64 contributing buildings that were erected from 1898 through 1938 around Argyle station. Its building stock includes single-family homes, small apartment buildings, apartment hotels, and commercial buildings, the vast majority of which are one to three stories in height. Together, they reflect the district's evolution from suburban enclave to a dense and diverse urban neighborhood. Many of the buildings feature elements from a variety of historical revival styles, including Queen Anne, Classical Revival, Spanish Eclectic, Tudor Revival, and Gothic Revival. The district is listed on the NRHP under Criterion A for its contribution to community planning and development, and architecture, and under Criterion C for its distinctive buildings and artistry dating between 1898 and 1938.

Resource 4: Bryn Mawr Avenue Historic District

One contributing resource within the Bryn Mawr Avenue Historic District lies within the project footprint: the vacant CTA-owned retail building beneath the track structure on the north side of Bryn Mawr Avenue (1116 W. Bryn Mawr Avenue). The Bryn Mawr Avenue Historic District is adjacent to the elevated track structure, with contributing buildings both east and west of Bryn Mawr station.

The Bryn Mawr Avenue Historic District is on Bryn Mawr Avenue between Sheridan Road and Broadway. It includes 17 contributing buildings around Bryn Mawr station. These buildings were constructed from 1897 through 1935. A mix of building types, styles, and scales populate the diverse streetscape. Structures exhibit the use of high quality craftsmanship and represent a variety of turn-of-the-century revival styles: Tudor, French Romanesque, Late Gothic, and Italian Renaissance. There are also fine examples of Art Deco, Moderne, and various 20th century vernacular commercial styles. These buildings exemplify the innovative efforts of architects to integrate domestic and commercial space on the same street and in the same buildings, creating a dense pedestrian retail corridor. The Bryn Mawr Avenue Historic District is listed on the NRHP under Criterion C for its distinctive architectural features.

6.5 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 6.6.

6.5.1 CTA Elevated Track Structure

The Build Alternative would require reconstruction of the Red and Purple line elevated track structure, an individually eligible NRHP resource. **Figure 6-2** is a photo of the track structure within the project area. Approximately 1.3 miles of the elevated track structure, including embankment walls and support columns from approximately Leland Avenue on the south to near Ardmore Avenue, would be demolished and rebuilt as part of the project. Although the rail line is in poor repair, the track structure preserves the characteristic details and function that contribute to its historic significance under Criterion A.

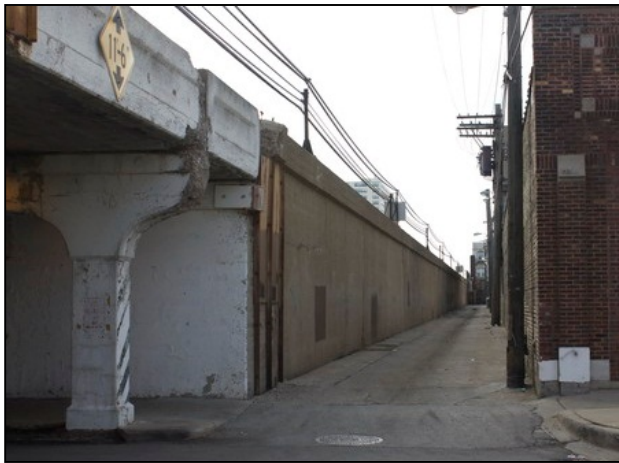


Figure 6-2: Photo of the CTA Elevated Track Structure

Although the resource is not eligible due to its architecture, reconstructing the track structure would substantially alter aspects of integrity: materials, workmanship, and design. 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.

6.5.2 Uptown Square Historic District

Regarding the Uptown Square Historic District, all contributing buildings would fall outside the permanent right-of-way and construction footprints of the project. One contributing resource (i.e., the elevated track structure) would be adversely affected by the project; therefore, the district as a whole would be subject to an adverse effect.

The elevated line constitutes a major visual element of the district and illustrates the relationship of the development of the Uptown community area to the elevated transportation system during

the period of significance. This resource is a contributing resource to the district and the segment proposed for demolition makes up a large part of the line through the district.

Section 4(f) Use Determination - Because the elevated track structure is a contributing resource to the Uptown Square Historic District, demolition of the elevated track structure would result in a **permanent incorporation** of a resource contributing to the historic district.

6.5.3 West Argyle Street Historic District

In the West Argyle Street Historic District, two resources contributing to the district lie within the project footprint: the Argyle station itself (1116–1120 W. Argyle Street) and the vacant CTA-owned retail building beneath the track structure on the south side of Argyle Street (1117–1119 W. Argyle Street). **Figure 6-3** shows photos of the stationhouse façade circa 1985 (left), which remained largely intact to its original construction, and in 2012 (right) following its most recent renovation. **Figure 6-4** shows the contributing commercial building. The project would construct a new, modern Argyle station, requiring demolition of the stationhouse on the north side of Argyle Street and the vacant CTA-owned retail building on the south side of Argyle Street. All other contributing buildings fall outside the permanent right-of-way and construction footprints of the project and are therefore not further considered in this Section 4(f) analysis (see **Section 6.4.1** for further details).



Figure 6-3: Views of Argyle Station Circa 1985 and 2012



Figure 6-4: Photo of CTA-Owned Retail Building at Argyle Station

Section 4(f) Use Determination - Because the Argyle station and vacant CTA-owned retail building are contributing resources to the West Argyle Street Historic District, reconstruction of the station and demolition of the retail building would result in a **permanent incorporation** of resources contributing to the historic district.

6.5.4 Bryn Mawr Avenue Historic District

The vacant CTA-owned retail building beneath the track structure on the north side of Bryn Mawr Avenue (1116 W. Bryn Mawr Avenue) is identified as a contributing feature within the Bryn Mawr Avenue Historic District and would be demolished as a result of this project. The commercial building is shown in **Figure 6-5**. All other contributing buildings fall outside the permanent right-of-way and construction footprints of the project and are therefore not further considered in this Section 4(f) analysis (see **Section 6.4.1** for further details).



Figure 6-5: Photos of CTA-Owned Retail Building at Bryn Mawr Station

Section 4(f) Use Determination - Because the vacant CTA-owned retail building is a contributing resource to the Bryn Mawr Avenue Historic District, demolition of the retail building would result in a **permanent incorporation** of a resource contributing to the historic district.

6.6 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) resource. Feasible and prudent avoidance alternatives are those that avoid using any Section 4(f) resource and do not cause other problems of a magnitude that substantially outweigh the importance of protecting the Section 4(f) resource. Alternatives evaluated to avoid use of identified historic resources afforded protection under Section 4(f) above include the No Build Alternative, as well as considering 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 involve construction or 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 a use.

Definitions of feasible and prudent alternatives under 23 CFR § 774.17 note that an alternative that would use any Section 4(f) resource is not an avoidance alternative for further prudence evaluation. **Section 6.6.1** contains details about alternatives considered but determined not to be avoidance alternatives. Based on this analysis, the No Build Alternative and a Basic Rehabilitation Alternative were determined to be the only avoidance alternatives. The No Build Alternative and Basic Rehabilitation Alternative are further evaluated for prudence in **Section 6.6.2**.

6.6.1 Alternatives Determined as Non-Avoidance

The Section 4(f) regulations and policy guidance require evaluation of a reasonable range of alternatives to avoid using Section 4(f) resources. This evaluation considers those alternatives developed or identified as part of public involvement efforts conducted through development of the Build Alternative. A number of the alternatives considered would not completely avoid the use of Section 4(f) resources. As required by Section 4(f), the sections below provide sufficient documentation to explain why these alternatives were not further considered as avoidance alternatives. While not subject to evaluation of prudence factors under Section 4(f) for avoidance alternatives, these alternatives were further considered in the Section 4(f) Least Overall Harm Analysis (**Section 6.7**).

Alternatives Considered for All Identified Section 4(f) Resources

Three alternatives were considered based on early planning work done for the RPM Program and FHWA's *Section 4(f) Policy Paper* guidance on considerations for identifying potential avoidance alternatives. Each was eliminated from further prudence evaluation, as they would not avoid the use of one or more Section 4(f) protected resources. Additional reasoning for elimination of these alternatives is provided in **Section 6.7** (Least Overall Harm Analysis).

- **Underground Tunnel Alternative** - This alternative would excavate and construct a new, underground rail tunnel along either the existing alignment or along Broadway. No train service or limited train service would operate on the existing elevated track structure. If the existing elevated track structure were completely replaced, the alternative would irreversibly alter the historic function of the elevated track structure and its eligibility under Criterion A for its contribution to the development of Chicago's North Side. If only a portion of the elevated track remained in operation, maintenance would still be required for the abandoned elevated track structure to preserve the resource in place, and would still constitute a Section 4(f) use of a resource contributing to the Uptown Square Historic District. According to Section 4(f) guidance, if an alternative would use any Section 4(f) resource, it is not an avoidance alternative; therefore, this alternative is not further considered for prudence factors.

- **3-Track Modernization Alternative** - This alternative would reconstruct only three of the four tracks along the project corridor to accommodate the additional right-of-way required for the wider station platforms to create ADA-accessible stations. Like the Build Alternative, this alternative would modernize the track structure, constituting a Section 4(f) use of the elevated track structure and a use within the Uptown Square Historic District because the elevated track structure is a contributing resource. The platforms and stations would be expanded, requiring the use of the identified Section 4(f) resources (i.e., the CTA-owned retail buildings) contributing to the West Argyle Street and Bryn Mawr Avenue Historic Districts. According to Section 4(f) guidance, if an alternative would use any Section 4(f) resource, it is not an avoidance alternative; therefore, this alternative is not further considered for prudence factors.

- **Alignment Shift Alternative** - This alternative would realign the elevated track structure along a parallel alignment such as Broadway. A new elevated structure carrying four tracks and stations over Broadway would be constructed. The existing elevated track structure would be abandoned. Maintenance would be required for the abandoned elevated track structure to preserve the resource in place. This alternative would irreversibly alter the historic function of the elevated track structure and its eligibility under Criterion A for its contribution to the development of Chicago's North Side. Maintenance would be required for the abandoned elevated track structure to preserve the resource in place, and would still constitute a use of a resource contributing to the Uptown Square Historic District. According to Section 4(f) guidance, if an alternative would use any Section 4(f) resource, it is not an avoidance alternative; therefore, this alternative is not further considered for prudence factors.

Additional Alternatives Considered for Elevated Track Structure and Uptown Square Historic District

To provide sufficient vertical clearance (to meet IDOT requirements and construct the modern track structure), the profile of the tracks must be raised. In addition, a wider right-of-way is required to accommodate platforms wide enough to provide modern ADA-accessible stations, which is one of the purposes of this project. Raising the profile of the tracks for IDOT clearances and widening the right-of-way would require a change in the structural support system. In addition, reconstruction of stations would require removal of the existing embankment walls and earth-fill along the entire length of the new platforms to construct the new stationhouses and provide sufficient access from the ground floor of each station to the platform with elevators (for ADA accessibility) and wider stairways. At a minimum, approximately 40 percent of the embankment walls would be removed within the project limits for the reconstruction and enhancement of stations.

CTA considered two design alterations to keep some portion of the embankment along the elevated track structure and minimize the effect of reconstructing a modern aerial track structure:

- Increase the height of the existing embankment walls and earth-fill.

- Construct new embankment walls.

Both of these options would still require use of a Section 4(f) resource (i.e., the elevated track structure), and are therefore not considered for further prudence factors.

Additional Alternatives Considered for West Argyle Street and Bryn Mawr Avenue Historic Districts

The contributing resources in the West Argyle Street and Bryn Mawr Avenue Historic Districts, which make Section 4(f) evaluation necessary, are the Argyle stationhouse and CTA-owned vacant commercial buildings underneath the Argyle and Bryn Mawr station platforms, respectively. These resources would be demolished under the Build Alternative. These spaces are integrated with the stationhouses and elevated track structure, which would be modernized and expanded under the Build Alternative.

No additional avoidance alternatives that would meet the purpose and need for the project were identified, beyond those identified above for retaining these resources (Underground Tunnel, 3-Track Modernization, and the Alignment Shift Alternatives).

6.6.2 Avoidance Alternative Feasibility and Prudence Standards

Based on the identification of potential avoidance alternatives described above, only two alternatives were identified that could avoid use of Section 4(f) resources: the No Build Alternative and the Basic Rehabilitation Alternative. These avoidance alternatives are 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 following sections provide an evaluation of the avoidance alternatives for these feasible and prudent factors. Based on the evaluation below, there are no feasible and prudent alternatives to the Build Alternative.

Avoidance Alternative #1: No Build Alternative

The No Build Alternative would avoid the use of any Section 4(f) resource by making no constructive alterations to the existing infrastructure; however, it is not a prudent avoidance alternative, as described by Section 4(f) resource below.

CTA Elevated Track Structure

The No Build Alternative would avoid the use of the CTA elevated track structure by making no constructive alterations to the existing infrastructure. The No Build Alternative is not a prudent avoidance alternative under Factors 1, 2, 3, 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 project's purpose and need. The existing infrastructure is past its useful life. The narrow platforms limit capacity and the stations currently are not ADA accessible. The No Build Alternative would not replace the existing infrastructure and would not serve current and future ridership demand by improving service that would accommodate growth in ridership. The No Build Alternative would not address the limited width and capacity of the station platforms, which affect the safety, security, and comfort of passengers. This alternative would not improve efficiency and safety of transit operations and maintenance.
- **Factor 2** - *It would result in unacceptable safety or operational problems.* The No Build Alternative would not address the infrastructure's severely deteriorated state, which is expected to otherwise result in safety and operational problems. The No Build Alternative would not replace viaducts and would not provide safety improvements to the pedestrian, driver, and bicyclist environment. Vertical clearances over existing streets would not be improved to bring them up to modern IDOT standards. The No Build Alternative would not allow for capacity expansion, and current operational problems in the corridor would persist and worsen over time.
- **Factor 3** - *After reasonable mitigation, it would still cause severe environmental impacts.* The No Build Alternative would not allow CTA to provide capacity expansion of the line and at stations. Over time, the inability to make these capacity improvements would be expected to result in increased traffic congestion, leading to potentially severe social and economic impacts. Increased congestion, along with a limited ability to add capacity to roadways in dense urban communities, would be expected to result in severe disruption to established communities in the corridor. Further, limiting public transportation options would be expected to result in potentially severe, disproportionate impacts on low-income and minority populations who rely upon public transportation to meet their travel needs and may not have alternative transportation options.
- **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. 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 to repair a structure that is substantially past its useful life.

Uptown Square Historic District

The No Build Alternative would avoid the use of the CTA elevated track structure by making no constructive alterations to the existing infrastructure. The No Build Alternative would not use this contributing resource to the Uptown Square Historic District. This alternative is not a prudent avoidance alternative under Factors 1, 2, 3, and 4, as described above for the CTA elevated track structure.

West Argyle Street Historic District

The No Build Alternative would avoid the use of the vacant CTA-owned retail building, a resource contributing to the district, as it would not involve constructive alterations to the existing infrastructure or stations. This alternative is not a prudent avoidance alternative under Factors 1, 2, 3, and 4, as noted above for the CTA elevated track structure.

Bryn Mawr Avenue Historic District

The No Build Alternative would avoid the use of the vacant CTA-owned retail building, a resource contributing to the district, as it would not involve constructive alterations to the existing infrastructure or stations. This alternative is not a prudent avoidance alternative under Factors 1, 2, 3, and 4, as noted above for the CTA elevated track structure.

Avoidance Alternative # 2: Basic Rehabilitation Avoidance Alternative

The Basic Rehabilitation Avoidance Alternative would avoid the use of any Section 4(f) resource by making minimal alterations to the existing infrastructure. Work would largely be contained within the physical constraints of the existing system and would include a mix of repairs, rehabilitation, and replacement to maintain the tracks and platforms for an additional 20 to 30 years. Viaducts would be repaired or replaced, depending on their condition. Vertical clearance over existing streets would not be improved to bring viaducts up to modern IDOT standards. Embankment walls would receive major repairs. The station platform widths would be slightly widened to approximately 14 feet. Stations would be modified to provide elevator access to the platform, but because of the narrow platform width, all ADA requirements would not be met.

CTA Elevated Track Structure

Rehabilitation would largely preserve aspects of architectural integrity, most importantly keeping materials and the structural design of the structure. The Basic Rehabilitation Avoidance Alternative is not prudent under Factors 1, 2 and 3.

- **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 Basic Rehabilitation Avoidance Alternative would not fully meet the project's purpose and need such that it would not be reasonable to proceed with the project. While minor widening of platforms and installation of elevators were proposed in the Basic Rehabilitation Avoidance Alternative, ADA requirements would not be met. The Basic Rehabilitation Avoidance Alternative would not allow for reduction in crowding during peak periods. The alternative would not replace the existing infrastructure, which is past its useful life. While this alternative would involve more substantive maintenance and repair than the No Build Alternative, the improvements would extend the useful life of the infrastructure by 20 to 30 years, compared to the 60- to 80-year

improvement proposed by the Build Alternative. This alternative would not serve current and future ridership demand.

- **Factor 2** - *It would result in unacceptable safety or operational problems.* The Basic Rehabilitation Avoidance Alternative would not widen the existing spacing between tracks, and would not provide greater horizontal and vertical circulation at the stations. Platforms would not be widened as proposed, keeping narrow platforms that would not meet full ADA standards and would not improve safety. Stairways would not be widened to meet modern entrance and exit requirements and would not address capacity issues as ridership continues to grow.

The alternative would not fully address the infrastructure's severely deteriorated state, which could result in safety and operational problems. Slow zones, which are instituted by CTA in areas where train speeds must be restricted to maintain safe travel, often are a result of the condition of infrastructure. While slow zones might temporarily improve under the Basic Rehabilitation Avoidance Alternative, not fully modernizing the track structure would limit the ability to minimize slow zones in the longer term along the corridor. Slower train speeds through the slow zones 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. Steadily declining rail operating speeds contribute to reduced efficiency in corridor transit service even where high ridership exists. When trains cannot run according to schedule, passenger loads are distributed unevenly, and service suffers.

Finally, the track profile would not be raised under this alternative, and would not meet modern IDOT vertical clearance standards. Because the viaducts would be repaired, not replaced with modern structures, piers in the middle of the street would also remain, and the pedestrian, driver, and bicyclist environment would not be improved.

- **Factor 3** - *After reasonable mitigation, it would still cause severe environmental impacts.* The Basic Rehabilitation Alternative would not allow CTA to provide capacity expansion of the line, and capacity at stations would be similar to capacity under existing conditions. Over time, the inability to make these capacity improvements would be expected to result in increased traffic congestion, leading to potentially severe social and economic impacts. Increased congestion, along with a limited ability to add capacity to roadways in dense urban communities, would be expected to result in severe disruption to established communities in the corridor. Further, limiting public transportation options would be expected to result in potentially severe, disproportionate impacts on low-income and minority populations who rely upon public transportation to meet their travel needs and may not have alternative transportation options.

Uptown Square Historic District

The Basic Rehabilitation Avoidance Alternative would avoid the use of the CTA elevated track structure by making no constructive alterations to the existing infrastructure. The Basic Rehabilitation Alternative would not use a resource contributing to the Uptown Square Historic District. This alternative is not a prudent avoidance alternative under Factors 1, 2, and 3, as described above for the CTA elevated track structure.

West Argyle Street Historic District

The Basic Rehabilitation Avoidance Alternative would avoid the use of the vacant CTA-owned retail building, a resource contributing to the district, as it would not involve constructive alterations to the existing infrastructure or stations. This alternative is not a prudent avoidance alternative under Factors 1, 2, and 3, as noted above for the CTA elevated track structure.

Bryn Mawr Avenue Historic District

The Basic Rehabilitation Avoidance Alternative would avoid the use of the vacant CTA-owned retail building, a resource contributing to the district, as it would not involve constructive alterations to the existing infrastructure or stations. This alternative is not a prudent avoidance alternative under Factors 1, 2, and 3, as noted above for the CTA elevated track structure.

6.7 Least Overall Harm Analysis

CTA conducted a detailed analysis to identify a range of alternatives documented in this evaluation. As described in **Section 6.6**, there are no feasible and prudent avoidance alternatives that would avoid the use of Section 4(f) resources. All the potential alternatives that were considered during planning and development of the Build Alternative and this Section 4(f) evaluation would use protected resources, as defined in 23 CFR § 774.17; therefore, FTA is required to select the alternative (which uses a Section 4(f) resource) that causes the least overall harm in light of the statute's preservation purpose.

6.7.1 Alternatives Evaluated

The alternatives identified in **Section 6.6.1** are further considered along with the Build Alternative for this least overall harm analysis:

■ Alternative A - Build Alternative

The Build Alternative would reconstruct approximately 1.3 miles of the existing rail line track from Leland Avenue on the south to near Ardmore Avenue on the north, replacing and modernizing the structural system, which is more than 90 years old. All stations within the project limits would be expanded, modernized, and made ADA accessible.

■ Alternative B - Underground Tunnel Alternative

This alternative would excavate and construct a new, underground rail tunnel along either the existing alignment or along Broadway. The existing elevated track structure would be abandoned and no train service would operate on the existing elevated track structure. This alternative would require substantially longer track infrastructure to make transitions from grade to subsurface. The transitions, along with cost considerations, would likely require a reduction in the number of stations in the corridor. 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 for the tunneling machine would require creating trenches approximately 700 by 140 feet in area. The extensive area required for construction of an underground tunnel would affect existing traffic circulation and could require street realignments or closures during construction.

■ Alternative C - 3-Track Modernization Alternative

This alternative would reconstruct only three of the four tracks along the project corridor to accommodate the additional right-of-way required for the wider station platforms to create ADA-accessible stations. It would not require the alley spanning proposed as part of the Build Alternative, but would result in operation of a three-track system rather than the existing four-track operational system that is also proposed under the Build Alternative.

- **Alternative D - Alignment Shift Alternative**

This alternative would realign the elevated track structure along a parallel alignment such as Broadway. A new elevated structure carrying four tracks and stations over Broadway would be constructed. The new structure would be 56 to 76 feet wide to accommodate modern track standards and stations, covering most of the current 100-foot public right-of-way. New columns along Broadway would be needed to support the new structure, potentially requiring a reduction in travel lanes. The existing elevated track structure would be abandoned and no train service would operate on the existing elevated track structure. Compared to the Build Alternative, a greater project footprint would be required to reconnect the parallel structure to the existing elevated track structure outside of the project limits.

- **Alternative E - Increase the Height of Existing Embankment Walls and Earth-Fill**

This alternative to constructing a modern aerial structure would raise the existing embankment wall and earth-fill to meet modern IDOT vertical clearance standards. Alley spanning would still be required to accommodate the wider platforms and ADA access. The weight of the additional embankment walls and earth-fill could cause settlement within the clay strata underlying the existing footings and surrounding commercial and residential buildings. Adjacent unreinforced masonry/brick buildings would be potentially affected by settlement. As such, this alternative would require additional support for the embankment within the existing alleys and result in expansion of the right-of-way. This expansion of right-of-way would either block or eliminate alley access.

- **Alternative F - Construct New Embankment Walls (to support new track)**

This alternative would construct new embankment walls with earth-fill to support the modern track structure and is further considered in this analysis as a design alternative to meet modern, IDOT vertical clearance standards and maintain the embankment as the structural support system. Other elements of this alternative, including modernizing the tracks and expanding stations and making them ADA accessible, would be similar to those of the Build Alternative. Expansion of the right-of-way to the east of the existing track structure would be required for expanding stations and would either block or eliminate alley access.

6.7.2 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.

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

Alternative A (the Build Alternative) would include reconstruction of the Red and Purple line elevated track structure from an embankment support to a modern aerial structure. This resource is individually eligible and is a resource contributing to the Uptown Square Historic District. The improvements to the elevated track would not change the reason it is listed—its transportation function. Modernizing the track system and support would provide an improvement that would last 60 to 80 years, allowing for continued transportation functionality. While a Section 106 Adverse Effect determination was made for the track structure and the Uptown Square Historic District, IHPA noted in its letter dated September 5, 2014 that after construction the modern aerial structure would still contribute to the Uptown Square Historic District for its continued role in the history and development of Chicago.

Expanding and modernizing the Argyle station under this alternative would require demolition of both the stationhouse and CTA-owned retail building across the street, which both contribute to the West Argyle Street Historic District. IHPA, in its correspondence dated September 5, 2014, agreed that there would be no adverse effect on the Argyle station if it were constructed consistent with Secretary of the Interior's *Guidelines for the Treatment of Historic Properties* and other applicable guidelines. Expanding and modernizing the Bryn Mawr station would also require demolition of a CTA-owned retail building (across the street on Bryn Mawr Avenue) that contributes to the Bryn Mawr Avenue Historic District. While the demolition of the CTA-owned retail buildings would remove contributing resources from these districts, the new and expanded stations would be built consistent with the historic character of the district.

Both Alternative B (Underground Tunnel) and Alternative D (Alignment Shift) would irreversibly alter the historic function of the elevated track structure, which would be either completely or partially abandoned, and would affect its eligibility under Criterion A for its contribution to the development of Chicago's North Side. Maintenance would be required for any portion of the abandoned elevated track structure to preserve the resource in place. Abandoning all or some portion of the elevated track structure as part of these alternatives would result in greater impacts than with the Build Alternative on Uptown Square, West Argyle Street, and Bryn Mawr Avenue

Historic Districts. This structure is a prominent visual feature in these districts and it would no longer provide the same service as today. Additional effects on Section 4(f) resources in these districts would result from these alternatives given the larger project footprints required. The ability to mitigate these effects would be more limited than for the Build Alternative because additional direct effects on contributing Section 4(f) resources in these districts would occur.

Alternative C (3-Track Modernization) would result in adverse effects similar to those of the Build Alternative. The elevated track would still be modernized and the track would still need to be raised to meet modern IDOT vertical clearance standards. Using only three of the four tracks in the existing system would accommodate wider platforms and ADA accessibility without using alley spanning for right-of-way needs; however, the result would be to limit future growth and flexibility of the existing four-track system by taking one line out of operation. This alternative would not provide the capacity expansion of the Build Alternative, and an adverse effect on the Uptown Square Historic district would still occur. CTA-owned retail underneath the track structure in the West Argyle Street and Bryn Mawr Avenue Historic Districts would still be demolished, like with the Build Alternative, to accommodate the new ADA-accessible stations. Mitigation measures would be similar to those of the Build Alternative.

Alternative E (Raising the Height of the Embankment Walls) and Alternative F (Construction of New Embankment Walls) would have a larger footprint than the Build Alternative, requiring expansion of the right-of-way. As a result, this alternative would require more property displacements than the Build Alternative because of the width needed for the new track structure and platforms. New or heightened embankment walls would also require removal of the existing alleys everywhere where right-of-way expansion is needed. With expansion of the right-of-way into the alley, there would be no alley access for buildings along the west side of Winthrop Avenue and therefore no place for garbage pickup, utility connections, and some secondary fire exits. This could render properties along Winthrop Avenue uninhabitable; these properties include non-historic as well as individually eligible and contributing buildings. To provide suitable access and retain inhabitability of these properties, partial or full demolition of some properties would be needed to relocate the existing alley further east. Alternatives D and E would require more extensive mitigation measures than the Build Alternative would, and the ability to mitigate adverse effects on the historic districts would be more limited than with 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

Under Alternative A, the remaining harm to the elevated track structure—which is individually eligible for its historic transportation function—would be minimized. The new track structure improvements would constitute a 60- to 80-year improvement to the transportation facility and improve the functionality of the transportation system. The new stations at Lawrence, Argyle, and Bryn Mawr would all lay within historic districts analyzed in this Section 4(f) evaluation and would be reconstructed in a context-sensitive manner. While contributing buildings underneath the track structure would be removed, expansion of stations would have a positive benefit to these historic districts, providing enhanced access for visitors.

The permanent severity of impact on the CTA elevated track structure from Alternatives B and D would be greater than the impact from the Build Alternative. These alternatives would both

irreversibly alter the historic function of the elevated track structure and its eligibility under Criterion A for its contribution to the development of Chicago's North Side. Maintenance would be required for the abandoned elevated track structure to preserve the resource in place. This maintenance of the track structure would not avoid an adverse effect on the Uptown Square Historic District, because one of the reasons the elevated track structure is a contributing resource is its transportation use, which would no longer occur. Alternatives B and C would retain the locations where the Argyle station and CTA-owned retail buildings had been, but these buildings would no longer serve their historic function or be underneath a vital transportation facility. Viaducts would not be reconstructed as part of these alternatives, and structures above and surrounding these buildings would continue to age and degrade despite routine repairs for safety. Without reconstruction and modernization, the CTA-owned buildings would further diminish the character of the districts.

Alternative C would have remaining harm after mitigation similar to that of Alternative A in most cases. The remaining harm to the track structure would be somewhat greater than with Alternative A because it would permanently remove one track from service to accommodate wider, ADA-accessible platforms. Modernization of the elevated track structure constitutes a 60- to 80-year improvement to address the functionality of the transportation system, like the Build Alternative. At the same time, unlike the Build Alternative, this alternative would remove one rail line from service, and thereby impair its role in the transportation network.

Alternative E and F would result in impacts on the CTA elevated track structure similar to those of Alternative A. Remaining harm of impacts due to construction of new embankment walls would, however, more substantially affect the surrounding historic districts due to the larger project footprint and need for using additional right-of-way from alleys and adjacent Section 4(f) resources.

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

Each of the three Section 4(f) resources identified in this evaluation would be affected by the alternatives. In addition, all other alternatives to the Build Alternative would cause even greater effects on these Section 4(f) resources compared to Alternative A because they would all require a larger project footprint.

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. While IHPA has concurred with the Section 106 adverse effect findings for the elevated track structure, IHPA has also 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. The Build Alternative would enhance capacity and ensure continued vitality of this resource for the next 60 to 80 years. Given that the existing infrastructure is substantially past its useful life, the other alternatives would compromise the continuing vitality of this resource.

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

Alternatives A, B, D, E, and F would meet the purpose and need of the project. Alternative C would remove one track from service to accommodate platform widening and ADA accessibility. Under Alternative C, the Red and Purple lines would need to share a track in one direction, which would limit Purple Line express service to only one direction during peak hours. This situation would limit the operational capacity in the corridor. Because a major intent of the project is to expand capacity, this alternative would not meet the purpose and need for the project.

Alternative A would provide a phased, tailored approach to modernizing the Red and Purple lines that would provide the greatest amount of infrastructure and passenger capacity improvements while also minimizing impacts and disruption to passengers. The Build Alternative would provide the greatest flexibility in meeting the purpose and need for the project while limiting impacts on passengers along the Red and Purple lines and the surrounding community.

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

Alternative A was identified and developed through the planning process to address public concerns, most specifically about property impacts. Alley spanning, as proposed under Alternative A, would limit property acquisitions, retain existing alleys, and respect the built, urban environment and neighborhoods through which the elevated track operates.

Alternative C would provide capacity expansion at stations, but would reduce operational flexibility compared to existing conditions or the Build Alternative. As described above for Factor 5, only three of the existing four tracks would continue to operate, which would cause operational problems. The Red and Purple lines would need to share a track in one direction, a situation that would limit Purple Line Express service to only one direction during peak hours. This alternative would also limit future growth and flexibility of the existing four-track system. Over time, the inability to expand operational capacity would be expected to result in increased congestion and additional adverse impacts on surrounding communities.

Alternatives B, D, E, and F would all result in greater impacts than the Build Alternative, and not just on Section 4(f) resources, due to the more expansive project limits.

Placing facilities underground as part of Alternative B would not eliminate impacts on the surrounding community, because construction sites would be larger than for the Build Alternative, and permanent ventilation and emergency exit facilities would be required. This alternative would require substantially larger project limits that would result in impacts on more residences, businesses, and other environmentally protected resources outside the Build Alternative project limits. Permanent street realignments or closures would likely be required at the incline locations where the trains would transition from the elevated structure to the underground tunnel. Temporary street closures and detours would be required where station construction would occur.

Alternative D would expand the project limits, would require more property displacements, and would have greater impacts on the surrounding neighborhood and communities than those identified as part of the Build Alternative. The elevated structure would be located above an active retail street, resulting in visual and noise impacts for buildings, including individually eligible and

contributing resources. These buildings' front doors and windows would be less than 15 feet from the new structure. In addition, to support this wide structure, columns would need to be added within the Broadway right-of-way, potentially removing travel lanes and having impacts on sight-lines and safety for pedestrians, bicyclists, and motorists.

Alternatives E and F would require further expansion of the permanent right-of-way (larger than for the Build Alternative) that would result in more property displacements. The new footprint would block alleys because of the width needed for the new track structure and platforms. New or heightened embankment walls would also require removing alleys everywhere where right-of-way is required. With expansion of the right-of-way into the alley, there would be no alley access for buildings on the west side of Winthrop Avenue and therefore no place for garbage pickup, utility connections, and some secondary fire exits. This could render properties along Winthrop Avenue uninhabitable; these properties include non-historic as well as individually eligible and contributing buildings. To provide suitable access and retain inhabitability of these properties, partial or full demolition of some properties would be needed to relocate the existing alley further east. In addition, increasing the height of the embankment walls and earth-fill may result in settlement within the clay strata underlying the existing footings and surrounding commercial and residential buildings. Adjacent unreinforced masonry/brick buildings would be potentially affected by settlement.

Finally, compared to Alternative A, all other alternatives would require substantially longer construction durations, more expansive project limits, and/or larger project footprints. These alternatives would result in greater impacts on passengers and the surrounding community due to greater construction times and expanded project limits. One of the reasons this project was moved forward as part of the RPM Phase One improvements is that it would allow CTA and FTA to minimize impacts on the surrounding community and passengers who rely upon public transportation service in this dense, urban environment.

Factor 7 - Substantial differences in costs among the alternatives

Costs for constructing Alternative A are estimated at \$1.33 billion. Alternatives B and D would cost substantially more than the other alternatives considered due to the larger project limits, the costs to completely alter the existing infrastructure design, and the additional property displacements. Costs for these alternatives would also be greater due to the need to maintain the abandoned elevated track structure. The cost for Alternative C would be substantially greater than for Alternative A because the project limits would need to be expanded. Alternative C's three-track alignment would require using a middle track as the express track, rather than using the outside two tracks, a change from the current configuration. For this alternative to provide improved transit service, the transition would need to be done at existing junctions, like Clark Junction near the Belmont station and Howard Junction near Howard station. This constraint of Alternative C would result in a much longer segment of independent utility (a segment that is usable even if no additional improvements are made) than would be the case for Alternative A. The cost for Alternatives E and F would be substantially greater than the cost of Alternative A because of the additional property displacements and impacts on adjacent buildings, parking, garbage access and utilities due to removing or relocating the existing alleys.

6.7.3 Least Overall Harm Determination

Table 6-2 summarizes the results of the least overall harm analysis.

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, Alternative A (the Build Alternative) evolved through the planning process. This alternative would require less property than the other alternatives, would have fewer and smaller physical effects on Section 4(f) resources, and would have fewer and smaller environmental impacts on other resources not protected by Section 4(f). The Build Alternative represents the alternative of least overall harm.

Table 6-2: Least Overall Harm Comparisons to the Build Alternative

Least Overall Harm Factor	Alternative B: Underground Tunnel	Alternative C: 3-Track Modernization	Alternative D: Alignment Shift	Alternative E: Increase Height of Existing Embankment Walls	Alternative F: Construct New Embankment Walls
1. Ability to mitigate adverse impacts on each Section 4(f) resource	Less ability than Build Alternative	Ability similar to Build Alternative	Less ability than Build Alternative	Less ability than Build Alternative	Less ability than Build Alternative
2. Relative severity of remaining harm	Greater than Build Alternative	Greater than Build Alternative	Similar to Build Alternative	Greater than Build Alternative	Greater than Build Alternative
3. Relative significance of each Section 4(f) resource	Greater impacts than Build Alternative	Greater impacts than Build Alternative	Greater impacts than Build Alternative	Greater impacts than Build Alternative	Greater impacts than Build Alternative
4. Views of the officials with jurisdiction	See Note Below	See Note Below	See Note Below	See Note Below	See Note Below
5. Degree to which each alternative meets purpose and need	Meets purpose and need	Does not meet purpose and need	Meets purpose and need	Meets purpose and need	Meets purpose and need
6. Magnitude of adverse impacts not protected by Section 4(f)	Greater than Build Alternative	Greater than Build Alternative	Greater than Build Alternative	Greater than Build Alternative	Greater than Build Alternative
7. Substantial differences in costs	Greater than Build Alternative	Greater than Build Alternative	Greater than Build Alternative	Greater than Build Alternative	Greater than Build Alternative

Note: 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. Given that the existing infrastructure is substantially past its useful life, the other alternatives would compromise the continuing vitality of this resource. Compared to the Build Alternative, all other alternatives would result in greater effects on historic resources.

6.8 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 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

Following the Section 106 consultation with IHPA and consulting parties on effects, 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 as part of the Section 106 Memorandum of Agreement (MOA) to minimize and mitigate effects on Section 4(f) resources. A consultation meeting with IHPA and consulting parties was held on March 24, 2015 to solicit feedback on these provisions. The Draft MOA is included in **Appendix C-4**. The final signed MOA will be included in the NEPA final decision document.

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

- Before construction, CTA will solicit visual preferences regarding the elevated track structure from consulting parties. The feedback received will be incorporated as appropriate into 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.
- As a coordinated effort between the Wilson Transfer Station Project and the Lawrence to Bryn Mawr Modernization Project, CTA will develop an interpretive exhibit for installation at Wilson station discussing the history and context of the elevated North Red Line.
- Before any demolition of the existing track structure (including the embankment) within the project limits, CTA will prepare Historic American Engineering Record documentation for the existing track structure.

Uptown Square Historic District, West Argyle Street Historic District, and Bryn Mawr Avenue Historic District - The following measures are proposed for each of these historic districts to mitigate effects on the districts:

- CTA, in coordination with IHPA, will prepare an updated NRHP nomination form for each of these historic districts. At the direction of IHPA, the updated nomination form for the Uptown Square Historic District will indicate that the track structure will continue to be a contributing resource to the historic district after implementation of the project. The updated nomination forms for the West Argyle Street and Bryn Mawr Avenue Historic Districts will

remove the CTA retail buildings from contributing resources to each district because they would be demolished by the project. For the West Argyle Street Historic District, the nomination form will remove the station as a contributing resource. Additional provisions for the station are provided below.

- CTA will prepare a Historic Preservation Plan for each of these historic districts. Consulting parties noted this as a positive benefit for the surrounding communities.

West Argyle Street Historic District - The following provisions relate specifically to the Argyle station.

- Before construction, CTA will develop design plans for Argyle station that are consistent with the design of the Prairie-style Argyle station originally constructed in 1921, and that integrate into the setting of the encompassing historic district.
- Before construction, CTA will examine the feasibility and cost implications of preserving existing Argyle station materials and reincorporating these features into the station design.

Bryn Mawr Avenue Historic District - Based on feedback from consulting parties, the following provision will be made for the Bryn Mawr station. While this station is not a resource contributing to the district, consulting parties expressed a desire for historic design patterns to be incorporated into the new station design. The following provision will apply to Bryn Mawr station:

- Before construction, CTA will develop design plans for Bryn Mawr station that are consistent with the design of the Prairie-style Bryn Mawr station originally constructed in 1921, and that integrate into the setting of the encompassing historic district.

In addition to these measures to minimize or mitigate permanent impacts from the project, CTA is also committed to a number of provisions as part of construction of the project. The following provisions will apply during construction:

- To minimize the potential for construction impacts, CTA will comply with all relevant FTA standards and guidelines regarding noise and vibration impacts and will implement BMPs for construction to minimize other environmental impacts.
- CTA will conduct a conditions assessment for any NRHP-listed, eligible, or contributing structures within 15 feet of project construction activities. If warranted based on structure type and condition, CTA will prepare a protection and stabilization plan before construction.
- As a commitment from the NEPA process to offset potential community impacts, CTA will develop and implement a Construction Outreach and Coordination Plan. The plan will include a Business Outreach Program to assist local businesses and residents affected by construction. The plan will be tailored to business and community needs, and will include a series of initiatives to minimize construction disruptions.

6.9 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. This coordination and consultation has continued throughout the development of the EA.

IHPA and consulting party involvement has been extensive, including plan reviews, 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. A Draft MOA was developed to avoid, minimize and mitigate effects on historic resources and shared with consulting parties for input. Effects determinations were also shared with the Advisory Council on Historic Preservation (ACHP), and this agency agreed to join the consultation process on March 25, 2015. This coordination will culminate in a final, signed MOA for the Section 106 process, a public hearing on the EA, and a final decision document for this NEPA analysis. The Draft MOA and full correspondence from the Section 106 process is included in **Appendix C-4** and was shared with consulting parties for input. The final signed MOA will be included in the NEPA final decision document.

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

6.10 Section 4(f) Determination Conclusions

Based on the analysis above, FTA finds that there is no feasible and prudent avoidance alternative (23 CFR § 774.17) to the use of the elevated track structure or land from the any of the historic districts afforded protection under Section 4(f) as contributing resources. As described in **Section 6.7**, 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 6.8**.