IndyGo Red Line Rapid Transit Project – Phase 1

NEPA Documented Categorical Exclusion

September 2016

A. Detailed Project Description

Project Identification

The Indiana Public Transportation Corporation (IndyGo), as project sponsor to the Federal Transit Administration (FTA), is proposing to reintroduce transit in a historic transit corridor with the implementation of the Red Line Rapid Transit Project. The proposed project would establish a bus rapid transit (BRT) corridor in central Indianapolis, Indiana, focused on the Indianapolis Regional Center (downtown and vicinity) and extending north through Marion County to the Cities of Carmel and Westfield in Hamilton County and south through Marion County to the City of Greenwood in Johnson County, as shown in Figure 1. The Red Line would serve as the backbone to the planned regional transit network, Indy Connect. This project would provide a new, direct north-south transit link traveling through downtown Indianapolis. The complete Red Line Rapid Transit Project is proposed to be completed in three phases. Phase 1 would provide service from 66th Street (just north of Broad Ripple Village) in north Marion County to the Hanna Avenue in south Marion County, as shown in Figure 2. Phase 2 would extend service from 66th Street north to Westfield in Hamilton County. Phase 3 would extend service from the University of Indianapolis south to the City of Greenwood in Johnson County. Each phase of the proposed project connects logical termini and is of sufficient length to address environmental matters in a broad scope, has independent utility, and does not restrict consideration of alternatives for reasonably foreseeable transportation improvements, per 23 CFR Part 771.111(f). This Documented Categorical Exclusion (DCE) has been prepared to meet the requirements of the National Environmental Policy Act (NEPA) of 1969 and other applicable regulations for Phase 1 only.

Phase 1 of the Red Line Rapid Transit project is a 13.1-mile long initial operating segment with 28 stations, as listed in Table 1. In order to improve travel speeds and provide frequent, reliable service, 59% of the project is proposed to operate on dedicated transit lanes, either center- or curb-running exclusive transit lanes or dedicated business access and transit (BAT) lanes. Specifically, buses would utilize dedicated lanes on the northern portion of the Phase 1 Project Corridor, from Broad Ripple through downtown. Lane configurations were determined based on the existing street configuration and traffic volumes. The project would also include transit signal priority (TSP) at all 36 signalized intersections throughout the corridor and real time passenger information at stations. The project would require minor curb realignments near stations and at intersections, though lane widths would be maintained to accommodate traffic flow. The project would remove or limit 34 existing left turns but would include new U-turn locations to ensure drivers can still access all businesses and other destinations. The proposed project also requires limited expansion of the existing corridor right of way (ROW) along College Avenue and Meridian Street, as described in Section L.

The Red Line Project would provide BRT service 20 hours per day (5am to 1am), seven days per week, and 365 days per year. Fourteen hours would include 10-minute headway service; six hours would include 30-minute headway service. Initially, service would be provided on the Phase 1 corridor only, and then expanded as Phases 2 and 3 are completed. The project would use a fleet of 12 electric BRT vehicles. These buses would be charged at a new on-street charging station at the 66th Street station, and maintenance would occur at IndyGo's existing facility at 1501 W. Washington Street. The existing Route 39 bus line, currently operating between 38th Street & N. Mitthoefer Road and South Meridian Street & West Maryland Street, would operate existing buses but utilize the new dedicated lanes to provide service on the Red Line Project Corridor along Meridian Street between 38th Street and Maryland Street. This would make the headway in this portion of the Project Corridor five minutes. Buses used to provide service on Route 39 would be purchased separately and are not part of this project.

Table 1: Phase 1 Station Locations and Characteristics

Segment	Station Location	Type	Comments
College	66th	Curb	Single long (120') platform with charging equipment at route end
	Broad Ripple	Center	
	Kessler	Center	Mid-block station
	54th	Center	Mid-block station
	52nd	Center	Mid-block station
	46th	Center	
	42nd	Center	
38th	Park	Center	Dual one-sided platforms
Meridian	38th	Center	
	34th	Center	
	30th	Center	
	Fall Creek	Center	
	22nd	Center	
	18th	Center	
Capitol	18th	Center	
	14th	Center	
	St. Clair	Center	
	Vermont	Center	
	Market	Center	
Downtown	Downtown Transit Center	Transit Center	Transit center is a separate project
Virginia	Anthem	Curb	
	Merrill	Curb	
	Woodlawn	Curb	
Shelby	Pleasant Run	Curb	
	Raymond	Curb	
	Southern	Curb	
	Troy	Curb	
	Hanna	Curb	Single platform at route end

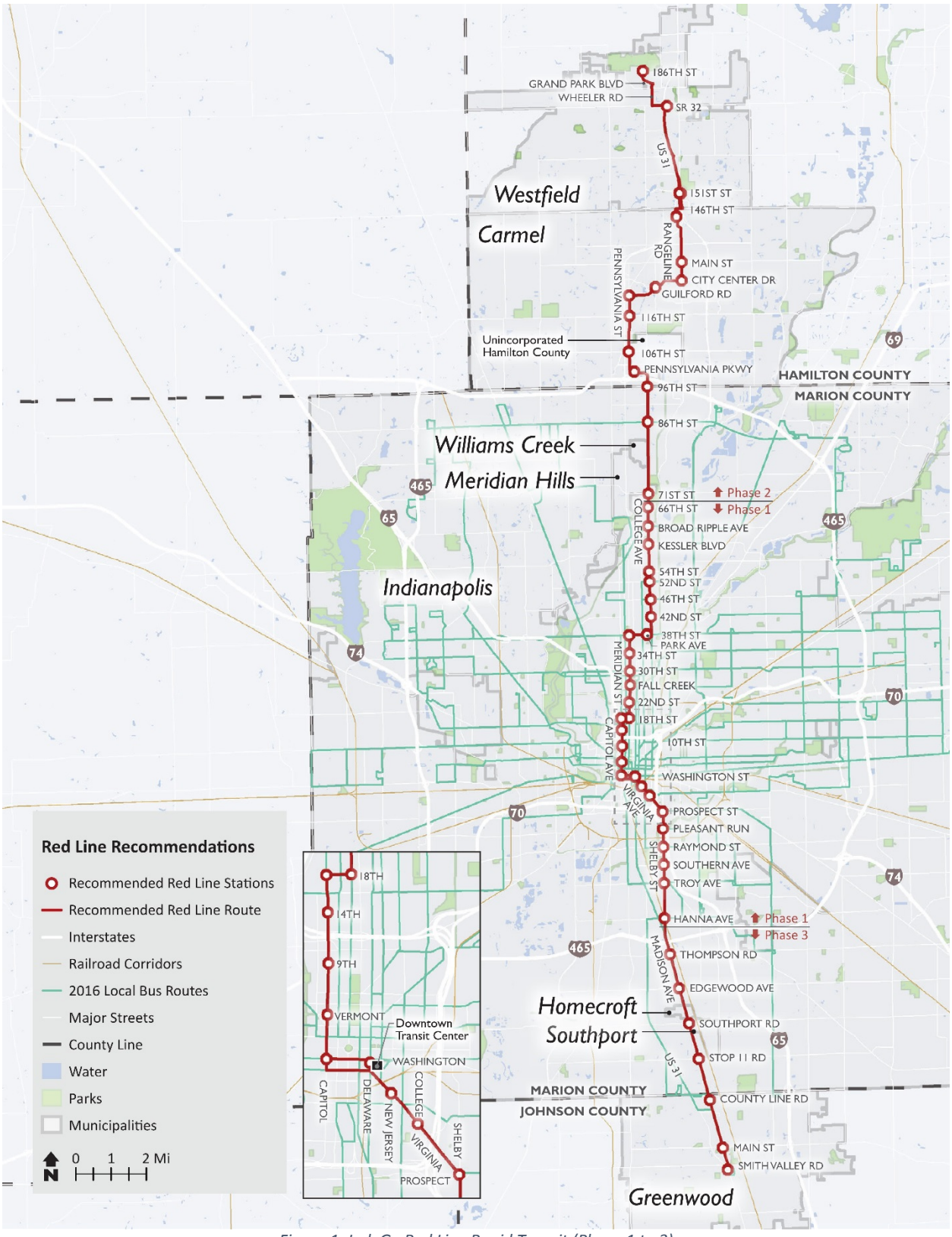

Figure 1: IndyGo Red Line Rapid Transit (Phase 1 to 3)

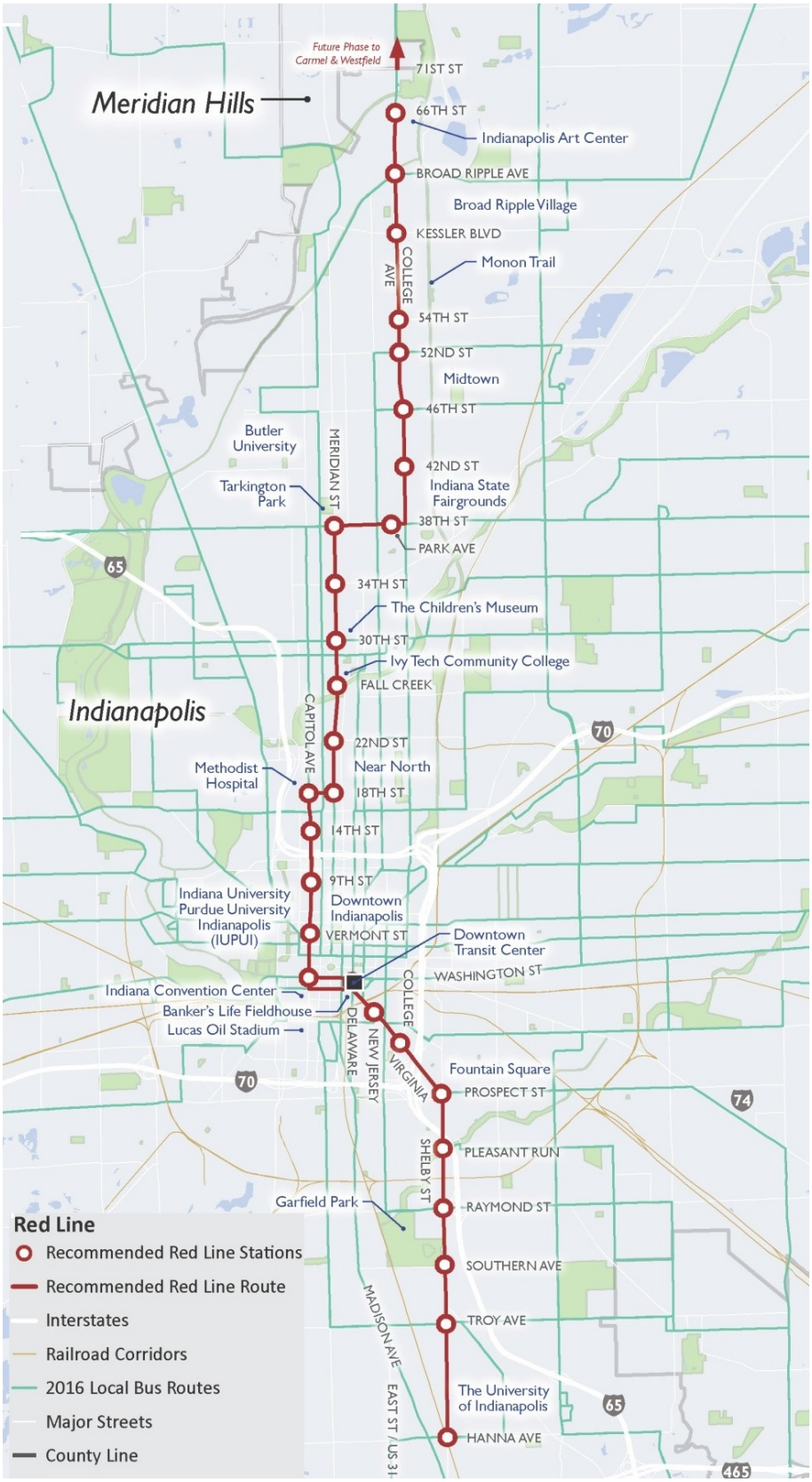

Figure 2: IndyGo Red Line Rapid Transit (Phase 1)

Purpose & Need

The Indianapolis Metropolitan Planning Organization (MPO), in cooperation with IndyGo, conducted an Alternatives Analysis in 2013.[1] The study identified the purpose and need for transit service in Central Indiana and resulted in the selection of the Red Line Rapid Transit Project as the best transit mode and alignment to meet the purpose and need.

The purpose of the Red Line Rapid Transit Project is to improve regional connectivity and mobility by providing high quality, high capacity, and cost effective premium transit service which provides a faster, more reliable, and comfortable passenger experience in comparison to current local bus service, which presently operates on all portions of the proposed corridor. Phase 1 of the proposed project would operate on a historic transit corridor in Indianapolis, amongst the densest combination of residential, commercial, universities, and hospitality/tourism venues and attractions in the region. Phase 1 of the Red Line Project would provide the initial operating phase to improve accessibility, increase reliability, and reduce transit travel times for residents and commuters in one of the busiest travel corridors in Central Indiana.

The need for this project is based on the following issues:

- Strong projected regional population growth along the corridor (17.9% population growth in the full Red Line Project Corridor by 2035 as compared to 2010 census); population growth across the state is projected to concentrate in urban areas such as the Indianapolis-Carmel metro area
- Lack of connections between major commercial, employment, government, and educational centers including the Indianapolis Regional Center (downtown at Ohio and Meridian Streets), sports and entertainment venues (south of Market Street), the State Capitol (downtown on Capitol Avenue), and several university and corporate campuses throughout the corridor
- Lack of competitive transit options despite strong north-south travel patterns throughout the study area, including during peak commuting periods and evening and weekend off-peak times
- High concentrations of transit-dependent households, including low-income households, public housing units, low-income rental assistance units (Section 8-eligible housing), and zero-car households.
- Slow bus speeds, frequent stops, and unreliable bus travel times

B. Location

The study area is located in Marion County in Central Indiana. As shown in Figure 2, Phase 1 of the Red Line Rapid Transit Project is a 13.1-mile long initial operating segment with 28 stations that would operate in Marion County from 66th Street (just north of Broad Ripple) through Downtown Indianapolis to the University of Indianapolis at Hanna Avenue. The project connects Downtown Indianapolis and its central business district with urban and suburban neighborhoods along the corridor as well as hospitals, cultural centers, parks, and government centers.

[1] http://indyconnect.org/wp-content/uploads/2016/02/Red-Line-AA-Final-Report.pdf

C. Metropolitan Planning & Air Quality Conformity

The Red Line Rapid Transit project is currently included in the Indianapolis Metropolitan Planning Area's 2035 Long-Range Transportation Plan and 2016-2019 Regional Transportation Improvement Program. The results of the Indianapolis Metropolitan Planning Organization's 2035 Long-Range Transportation Plan, Summer 2015 Amendment Air Quality Conformity Determination Report found the following:

The counties of Hamilton, Hendricks, Johnson, Marion, and Morgan counties are currently a Maintenance area for Particulate Matter of 2.5 microns or less in size ($PM_{2.5}$), based on the 1997 standard. Under the standards set forth in the Clean Air Act Amendments in 1990, the 9-county region of Hancock, Hamilton, Hendricks, Johnson, Morgan, Madison, Marion, Boone, and Shelby Counties is currently in attainment of the annual National Ambient Air Quality Standard (NAAQS) for the current eight-hour ozone standard. The attainment designation eliminates the requirement to make a conformity determination on ozone.

Between August 25, 2015 and August 31, 2015, the Indiana Department of Environmental Management (IDEM), US Environmental Protection Agency (USEPA), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) each confirmed that the proposed updates to the 2035 Transportation Plan, including the Red Line Rapid Transit project, conforms to all applicable requirements.

Metropolitan Planning and Air Quality Conformity supplemental documentation is included in Appendix A.

D. Land Use and Zoning

Land Use

Land use data from the City of Indianapolis was reviewed for the Project corridor. The City of Indianapolis completed its comprehensive plan in 2005 which included a land use element. Plan 2020, the City's latest comprehensive plan. The updated comprehensive plan will only include the Bicentennial Agenda/Plan, the Marion County Thoroughfare Plan and the Housing and Urban Development (HUD) Consolidated Plan. While other components of Plan 2020 including the Parks Plan, Comprehensive Economic Development (CED) Strategy, the Regional Center Plan are all still in development; the land use component has not yet started.

Although an updated land use plan is not available, updated neighborhood plans and other publicly available transit plans prepared by Indy Connect were analyzed as part of the proposed project. Details of these plans follow while detailed land use mapping either prepared for this project or included in one of the neighborhood plans is included in Appendix B.

The Meridan Kessler Neighborhood Plan includes the portion of Phase 1 along College Avenue between 38th Street and Kessler Boulevard.[2] This neighborhood plan depicts the land use along the Project Corridor as traditional neighborhood with spots of urban mixed use. Its worth noting the land use in the neighborhood plan closely follows the 2005 Comprehensive Plan. The land use description and map from the neighborhood plan is included in Appendix B.

The southern portion of the project is located within the Concord Neighborhood. The Concord Neighborhood Plan was the Concord Community Plan completed in 2000.[3] The land use section is included in Appendix B. No other land use plan has been completed within the past ten years.

Though a full update to the land use element is still forthcoming, Indy Connect completed the Transit Oriented Development (TOD) Strategic Plan in April 2015,[4] which evaluated several rapid transit corridor routes, of which the Red Line was one. The TOD Strategic Plan analyzed land use and economic development potential of transit investments in the Central Indiana region. It is the first document in a series of steps to assess the land use patterns to accommodate the proposed Red Line Rapid Transit project and other Transit Projects occurring within Indianapolis in the future.

Indy Connect completed The Central Indiana Transit Plan in 2016.[5] The transit plan aims to improve transit services in six counties, including Marion County. The plan will ensure that the local land use plans and ordinances maximize the opportunity for tax-generating developments in areas that are most likely to attract transit oriented development.

Review of the above information found the land use adjacent to the Project Corridor to be composed of a variety of low, medium and high-density uses. Figure 3 shows present land use along the corridor. Residential sections are spaced throughout. High density commercial uses are dominant in the central portion of the study area, downtown Indianapolis. The northern and southern sections of Red Line Project are dominated by medium density residential areas.

The primary changes within the project corridor would be inclusion of dedicated bus lanes along the corridor. Some parking locations along the Project would need to be removed to allow adequate space for the proposed stations. The loss of parking is addressed in more detail in Section E, Traffic Impacts. The Red Line Project is consistent with the existing land use along the Project Corridor. The proposed construction necessary for the Project would not alter or change the character of any of the current land uses, thus, no impacts are anticipated.

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[2] "Meridian Kessler Neighborhood Plan." *Comprehensive Plan for Indianapolis and Marion County*. Metropolitan Development Commission, June 2016. http://indy.gov/eGov/City/DMD/Documents/2016CPSR003-MeridianKessler-WebResDraft.pdf

[3] "Concord Community Plan: Building Homes, Community, and Hope." Concord Community Development Corporation, 17 May 2000. http://indiamond6.ulib.iupui.edu/cdm/ref/collection/NOS/id/234

[4] "Transit Oriented Development Strategic Plan." IndyConnect, Apr. 2015. https://issuu.com/indyconnect/docs/tod_strategic_plan_april_2015_01_pl

[5] "The Central Indiana Transit Plan." IndyConnect, 24 May 2015. http://indyconnect.s3.amazonaws.com/wp-content/uploads/2016/05/24134801/The-Central-Indiana-Transit-Plan_2016-05-24.pdf

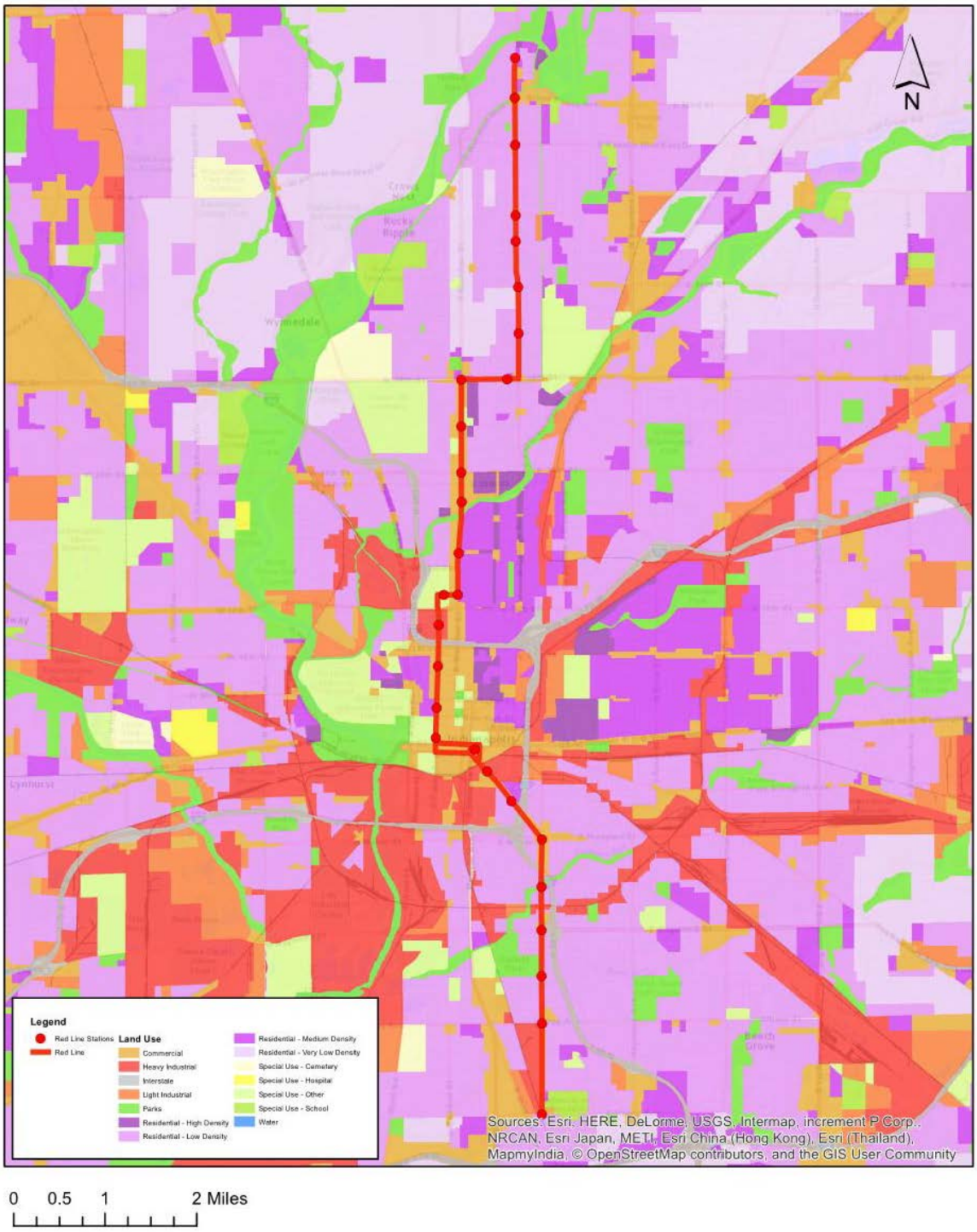

Figure 3: Red Line Project Corridor Land Use

Zoning

Zoning data from the City of Indianapolis was reviewed for the project corridor. Zoning districts, as shown in Figure 4, were updated as part of the Indy Rezone ordinance, which took effect in April 2016. The zoning districts within the project corridor are commercial, central businesses, neighborhood commercial district, dwelling district, hospital district, industrial urban district, university quarter districts, special uses and park districts. The special use zones include one religious use zone, and six school zones. Most of the zones within the proposed project area allow for high density residential and commercial development. The Project Corridor is consistent with the City's underlying zoning. The project alignment is proposed mainly within the existing public right-of-way, with the exception of one location on Meridian Street near its intersection with 38th Street where a small amount of additional right-of-way is required. This change would not require any changes to the existing zoning within the proposed project area. The Red Line Project is consistent with existing and proposed zoning; no impacts are anticipated.

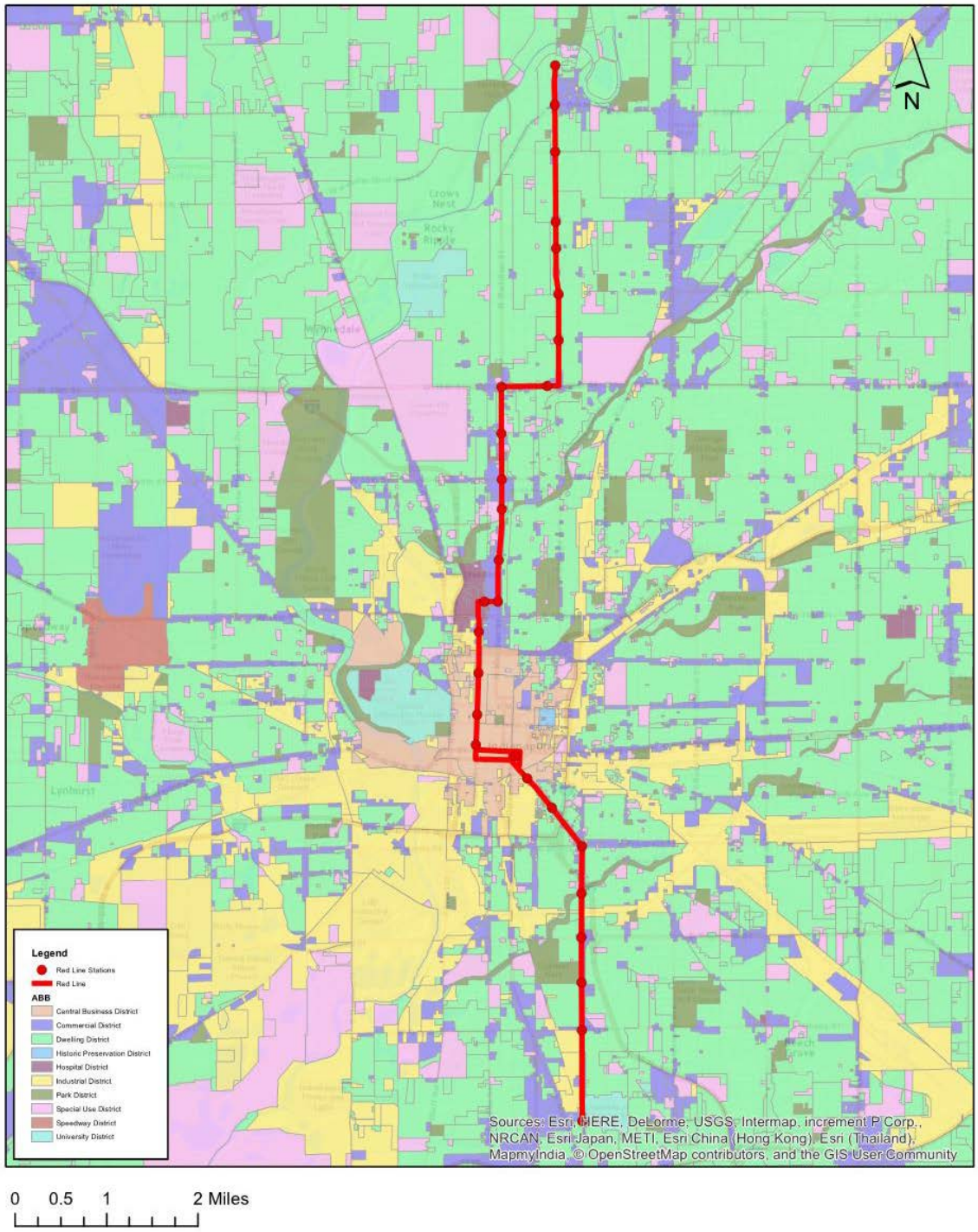

Figure 4: Marion County Zoning

E. Traffic Impacts

By reintroducing high capacity transit service to a historic transit corridor, the new service would enhance transportation options and increase overall mobility. In order to achieve higher operating speeds and increased reliability, the Red Line Rapid Transit Project would include the installation of

dedicated transit lanes along 59% of the corridor; either center- or curb-running exclusive transit lanes or dedicated BAT lanes. The project lane configurations were determined based on the existing street configuration and traffic volumes. The corridor's local bus service would continue to operate in the corridor. Like Red Line buses, local buses would also use the dedicated travel lanes where available, thereby removing them from the general travel lanes.

Exclusive transit lanes would be installed on the northern portion of the corridor, including the College Avenue, East 38th Street, and Meridian Street corridor segments; the College Avenue exclusive transit lane would be bidirectional. East 18th Street would include mixed flow traffic lanes and Capitol Avenue would include dedicated lanes (exclusive transit lane on northbound; BAT lane southbound). Maryland Street and Washington Street would also include dedicated lanes, each a mix of exclusive transit and BAT lanes. The southern end of the corridor, including Delaware Street, Virginia Avenue, and Shelby Street would not include any dedicated transit lanes and BRT service would operate in mixed flow traffic lanes.

In areas with center-running dedicated lanes, a concrete median would be installed that would limit left turns at 34 intersections, though new U-turn locations would be installed to ensure drivers can still access all businesses and other destinations. The project would require minor curb realignments near stations and at intersections, though appropriate lane widths would be maintained to accommodate traffic flow. The project would remove or limit some existing left turns but would include new U-turn locations to ensure drivers could still access all businesses and other destinations. The project would also include transit signal priority (TSP) at all 36 signalized intersections along the corridor and real time passenger information at all stations.

The introduction of a concrete median along segments of the historic transit corridor would introduce access management principles to the corridor. Access management is a set of techniques that organize roadway access points designed to increase roadway capacity, manage congestion, and reduce crashes. The geometric access management changes along with updated signal timing plans would be used to provide the BRT service with dedicated travel lanes, resulting in decreased travel times, improved reliability, and increased ridership. Federal Highway Administration[6] and Transportation Research Board[7] analysis has shown that access management techniques can provide net benefits to businesses affected by their implementation and do not decrease profitability or property values. Managing access can improve overall traffic operations and provide a better shopping experience for customers. The implementation of a median would provide for safer approaches to many businesses.

The traffic analysis included both planning- and operations-level analysis to measure the changes in traffic conditions associated with the project. The Indianapolis Department of Public Works (DPW) was consulting on the approach and results of both types of analysis. The primary planning-level analysis focused on signalized intersections using the Synchro traffic simulation software to verify that general traffic conditions would be acceptable based on changes in geometric and traffic signal

[6] "Access Management." FHWA Office of Operations. US Department of Transportation, 20 Oct. 2015. Web. 04 Apr. 2016.
[7] Rose, David C., Jerry Gluck, Kristine Williams, and Jeff Kramer. A Guidebook for Including Access Management in Transportation Planning. Rep. no. 548. Washington: Transportation Research Board, 2005. Web. 4 Apr. 2016.

timing conditions. The secondary operations-level analysis was segment-based, performed along select sections of the corridor using the microscopic simulation tool VISSIM to quantify the changes in traffic conditions at both signalized and unsignalized intersections. The segment-based analysis allowed for the detailed use of TSP to provide a more comprehensive traffic and BRT operations-level analysis. TSP would be utilized to provide BRT vehicles with priority at traffic signals in order to maintain headeways and improve reliability; different TSP plans were simulated in the VISSIM models to development scenarios that ensure satisfactory bus and general traffic operations.

Level of service (LOS) is the generally accepted measure used to describe the quality of traffic service. Peak-hour LOS thresholds at signalized intersections were designated based on established DPW standards. LOS A, B, C, or D was considered acceptable, while heavily used or physically constrained intersections operating at LOS E or F could also have been considered acceptable, as identified by DPW on a case-by-case basis. Intersections that currently and would continue to operate at LOS E or F were also considered acceptable. Due to the fundamental differences in the analysis techniques, the LOS for some of the study intersection results slightly varied between the Synchro and VISSIM analysis. Regardless of the analysis technique, the traffic impact threshold approach, previously described, was consistently applied to identify changes in traffic levels at all intersections.

The VISSIM analysis identified one intersection with existing deficiencies and two intersections would operate at LOS E with the project, which are described below. 39 other intersections would operate at LOS D or better with the project and thus, would have no adverse impact.

- College Avenue & Kessler Boulevard – This intersection would continue to achieve LOS E in the PM peak even when testing roadway geometry changes along College Avenue and intersection signal timing options. Achieving LOS D or better would likely require adding east-west through capacity or prohibiting left turning movements at this intersection. Both of these intersection modifications were impractical given narrow sidewalks, limited right of way, and the historical nature of and presence of commercial buildings along Kessler Boulevard.
- Meridian Street & 34th Street – LOS E traffic operations with the project result from spillback queuing at downstream intersections, specifically southbound right turning vehicles at Meridian Street & 30th Street, heading west towards the I-65 interchange. However, observed delays are less than one second above the threshold for LOS D. The project would include signage for vehicles heading to I-65 to redirect traffic and alleviate the southbound right turning vehicles at the downstream intersections. It is anticipated that this refinement would provide a means for the intersection to operate at LOS D.
- Virginia Avenue & South Street & East Street – The intersection had existing deficiencies and operated at LOS E under Existing Conditions in both AM and PM peak hours. This signalized intersection has known traffic issues, acknowledged by DPW, and would continue to operate at the same LOS following the introduction the Red Line Project. Based on DPW traffic impact thresholds, the project would not result in a traffic impact at this location.

DPW recognized the limitations of the project to provide LOS D with the project at these locations and, after consultation, elected to make an exception at these locations and consider LOS E acceptable. Additionally, any vehicle travel pattern changes associated with the recommended

signage (ex. one or two vehicles turn at Meridian Street & 32nd Street instead of Meridian Street & 32nd Street) would likely decrease the delay at the intersection of Meridian Street & 34th Street and result in LOS D operations in the AM peak hour. Based on the results of the signalized intersection analysis conducted with Synchro (August 2015 concept designs) and the microsimulation analysis conducted with VISSIM (December 2015 concept designs), the build conditions would not result in any traffic impacts outside the allowable levels. A more detailed analysis of traffic operations can be found in Appendix C.

Parking

In order to accommodate dedicated bus lanes within the existing right-of-way, the design of the Red Line Project requires the removal of 670 on-street parking spaces along the corridor to stay within the current right-of-way and maintain adequate pedestrian accommodations. Preliminary design solutions for intersections, including the provision of left turns at certain locations to provide sufficient residential and business access, would be determined through conceptual engineering and into final design in coordination with agency partners and the public involvement process.

The project is estimated to require the removal of 670 existing spaces along Capitol Avenue, Meridian Street, College Avenue, Virginia Avenue, and Shelby Street. However, proposed as part of the Red Line Project is the provision of 69 angled/diagonal parking along several segments of Capitol Avenue between Maryland Street and 18th Street as well as an additional 16 spaces on Meridian Street between 18th Street and 38th Street. As such, the net number of impacted spaces would be reduced to 585 spaces. In addition to this estimate, but not included in the total, it is recommended that additional 18-20 spaces be introduced along Capitol Avenue between 11th and 12th Street under the I-65 Bridge. The area is currently signed as “No Parking,” potentially for safety concerns underneath an interstate bridge. This should be evaluated in discussion with the City of Indianapolis for further consideration and reducing the overall parking impact. Parking space impact estimates were developed based on the conceptual roadway alignment and station layout design of the proposed Red Line Project.

As shown in Table 2, there are approximately 2,756 parking spaces along the corridor. The majority (79.5%) of these spaces are located at unmetered parking spaces. In many of these locations along the corridor, parking spaces are not individually marked. The proposed Red Line project would remove approximately 21.2% (inclusive of regained/added spaces) of total on-street parking along the corridor.

An inventory of the existing on-street parking along the Red Line Project Corridor was taken to determine the impact of displaced parking spaces due to the new BRT infrastructure. The survey collected parking occupancy rates on the weekdays of June 16-17, 2015 along each roadway segment that was included in the parking inventory. Table 2 summarizes inventory, occupancy, and removal of parking spaces on each roadway. An analysis of both parking supply and demand revealed that at all locations, the number of parking spaces being removed is substantially less than the demand for parking in the area currently, with no more than 41% of unmetered spaces occupied at any given time. Occupancy of metered spaces was calculated using a separate methodology, and did not exceed 39%. Therefore there are no parking impacts on surrounding community and business uses. A more detailed analysis of parking can be found in Appendix C.

Table 2: Summary of Parking Inventory, Occupancy, and Removal

Street	From	To	Metered Spaces	Unmetered Spaces	Total Spaces (Metered + Unmetered)	Occupied Unmetered Spaces[1]	Percent Occupied	Spaces Removed	Spaces Regained / Added	Net Spaces Removed[2]
Washington Street	Delaware St	Capitol Ave	34	12	46	N/A	N/A	0	0	0
Maryland Street	Delaware St	Capitol Ave	69	4	73	N/A	N/A	0	0	0
Capitol Ave	Maryland St	18th St	205	103	308	42	41%	196	69	127
Illinois St	Maryland St	18th St	232	105	337	N/A	N/A	0	0	0
Meridian St	18th St	38th St	0	430	430	57	13%	220	16	204
College Ave	38th St	Broad Ripple Ave/ 64th St	26	924	950	350	38%	228	0	228
Virginia Ave	Prospect St	New Jersey St	0	203	203	N/A	N/A	16	0	16
Shelby St	Hanna Ave	Pleasant Run Pkwy	0	409	409	N/A	N/A	10	0	10
Total[4]			**566**	**2,190**	**2,756**	**449**		**670**	**85**	**585**

Notes:

1) Measured during weekday evening retail peak hour

2) Accounts for # of spaces added/regained with angled parking and/or moving Bike Lane to Illinois Street

3) Occupancy Data not captured since the anticipated impacts on existing parking spaces is very little to none

4) Total includes Blue Indy spaces that are unimpacted

F. CO Hot Spots

Marion County is in attainment for CO pollutants, and the proposed project is consistent with all air quality conformity requirements. The traffic analysis in Section E describes that there are no serious traffic impacts predicted at any affected intersections. No carbon monoxide (CO) hot spots would be created as a result of the project. Additionally, the Red Line Rapid Transit project proposes to use electric buses, meaning that the vehicles would not emit any additional carbon monoxide (CO) during operation.

G. $PM_{2.5}$ & PM_{10} Hot Spots

The proposed project is consistent with all air quality conformity, and no particulate matter ($PM_{2.5}$ or PM_{10}) hot spots would be created as a result of the project. The greater Indianapolis area is currently designated as a maintenance area for $PM_{2.5}$ standards and has approved motor vehicle emission budgets for fine particulate matter precursors of direct $PM_{2.5}$. The project has been adopted into the region's 2035 LRTP and 2016-2019 TIP, and any impacts on regional emissions from this project have therefore already been taken into account. While it is located in a maintenance area, the project does not meet any criteria for "projects of air quality concern" as defined in 40 CFR Part 93.123(b)(1) for which a detailed hot-spot analysis is required. The project would not cause any significant changes to traffic and proposes to use electric buses, meaning that the vehicles would not emit any particulate matter during operation.

H. Historic Resources

Public transit has a long history in Indianapolis, dating back as early as 1864 with upgrades to electric streetcar by 1890. In less than a decade, the city had over 340 electric streetcars utilizing more than 100 miles of track. Sections of the proposed Red Line Project Corridor hosted such electric streetcars. Eventually, electric street cars were replaced by bus service. Indianapolis's changes and improvements in mass transit had a direct impact on the development and expansion of the city. The capability of the electric street car allowed residential areas to move further from manufacturing areas as foot traffic was no longer the main mode of travel. As a result, downtown became more associated with manufacturing and entertainment, and residential areas expanded beyond the city center.

The National Environmental Policy Act of 1969's regulations (NEPA), under 40 CFR Part 1500-1508, requires that all projects receiving federal funding take into account effects on historic and cultural resources, and identify all adverse and beneficial effects of a project on these resources. Cultural and historic resources are protected by various federal authorities; most notably Section 106 of the National Historic Preservation Act (NHPA) which requires federal agencies to consider impacts on historic resources from their actions and to balance preservation needs with the need for the action. The Section 106 process "seeks to accommodate historic preservation concerns with the needs of federal undertakings through consultation…" (36 CFR Part 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 (36 CFR Part 800.1.a). Section 106 consultation was conducted for this project with the State Historic

Preservation Officer (SHPO) of the Indiana Department of Natural Resources (DNR) and other consulting parties.

In addition to the Section 106 requirements, Section 4(f) of the Department of Transportation Act of 1966 protects publicly or privately owned historic sites listed or eligible for listing on the National Register of Historic Places (NRHP). Where projects involve the use, including temporary or constructive use, of land from a historic site or district, additional consultation with the SHPO is required to determine whether a programmatic and/or individual Section 4(f) Evaluation is required. The complete Cultural Historic Survey is included as Appendix D.

For the assessment of historic and archaeological resources, the Federal Transit Administration (FTA) determined an Area of Potential Effect (APE) for cultural/historic resources along the Red Line Project Corridor, which the SHPO concurred with. A detailed map depicting the architectural and archaeological APE is included in Appendix D. The APE takes into account the location of proposed BRT stations that could impact historic resources.

The APE for above-ground resources was confined to the limits of the existing road right-of-way in the areas between the stations because project activities would be minimal in these areas, including milling of pavement, re-paving, re-striping, median improvements, and spot landscaping improvements. These activities would be limited to areas within the existing road right-of-way and would not result in any potential adverse proximity effects to the location, design, setting, materials, workmanship, feeling, or association of nearby historic resources. Although the Red Line Project's introduction of medians and other roadway infrastructure updates along some segments of the corridor restrict left-turn movements, these access management treatments are not expected to cause impacts based on analysis conducted by the Federal Highway Administration[8] and Transportation Research Board.[9] For areas surrounding the station locations, the APE boundary was expanded to include adjoining parcels that would have a clear and direct view of the new stations. As buildings block the visibility and/or vacant lots or surface parking lots exist, the APE boundary was reduced or expanded at the station locations

Architectural historians for CDM Smith drove all roads within the APE, examined all properties within the APE and photographed and took notes on all resources that were at least 45 years old. Individual properties were examined and those considered to at least warrant a contributing rating were evaluated for architectural and contextual integrity and historical significance, based on criteria set forth in NPS 1997, CFR 36 Part 60. Above ground resources within the APE were identified and evaluated for listing in the National Register.

A review of the National Register database indicated that there are eleven properties currently listed in the National Register: CDMS 133, 138 (Reuben Wells Locomotive), 139 (Broad Ripple Carousel), 145 (Louis Levey Mansion NR-0108), 146 (Charles W. Fairbanks House NR-1465), 148

[8] "Access Management." FHWA Office of Operations. US Department of Transportation, 20 Oct. 2015. Web. 04 Apr. 2016.

[9] Rose, David C., Jerry Gluck, Kristine Williams, and Jeff Kramer. A Guidebook for Including Access Management in Transportation Planning. Rep. no. 548. Washington: Transportation Research Board, 2005. Web. 4 Apr. 2016.

(Marott Hotel), 153 (Coulter Flats NR-0970), 172 (HCS Motor Car Company), 189 (Gibson Company Building), 191 (Indiana State Capitol NR-0065), and 199 (Indiana Repertory Theatre NR-0173).

There are also ten National Register Historic Districts that fall within the APE. They are: Indianapolis Parks and Boulevard System, Shortridge-Meridian Street Apartments, Fountain Square, Fletcher Place, St. Joan of Arc, Watson Park, Oliver Johnson's Woods, Forrest Hills, North Broadway and Washington-Street-Monument Circle.

Twenty-five newly recorded resources were recommended as individually eligible for listing on the National Register of Historic Places. The recommended eligible properties include nine apartment buildings, nine commercial buildings, two bridges, a movie theatre, a church, a masonic temple, and a fire station.

One previously recorded archaeological site was identified along the Red Line Rapid Transit corridor, site MA-0985, which includes the Indiana State House, the state capitol building of Indiana. No preconstruction archaeological field investigations are expected due to the limited nature of the project and its location within the existing right of way. While this project does not include any invasive investigations, an Archeological Monitoring Program would be conducted during construction, demolition, and earthmoving activities. If any historic or prehistoric archeological artifacts or human remains are uncovered any construction, demolition, or earthmoving activities, state law (Indiana Code 14-21-1-27 and 29) requires that the discovery must be reported to the Indiana Department of Natural Resources (IDNR) within two business days.

One previously recorded archaeological site was identified along the Red Line Rapid Transit corridor, site MA-0985, which includes the Indiana State House, the state capitol building of Indiana. No preconstruction archaeological field investigations are expected due to the limited nature of the project and its location within the existing right of way. While this project does not include any invasive investigations, an Archeological Monitoring Program would be conducted during construction, demolition, and earthmoving activities. If any historic or prehistoric archeological artifacts or human remains are uncovered any construction, demolition, or earthmoving activities, state law (Indiana Code 14-21-1-27 and 29) requires that the discovery must be reported to the Indiana Department of Natural Resources (IDNR) within two business days.

On July 25, 2016, FTA invited the SHPO and interested consulting parties to participate in the Section 106 Consultation Process. The findings of this cultural resources technical analysis were presented to interested parties on September 7, 2016 and were invited to share their comments on this project. The full list of invited consulting parties is shown in Table 3. Letters of response to SHPO and these organizations are also provided in Appendix D.

Table 3: Consulting Parties

Consulting Parties	
Indiana Department of Natural Resources (Indiana SHPO), Division of Historic Preservation and Archaeology	Perry Township-Southport Historical Society
Indiana Landmarks	Absentee Shawnee Tribe of Oklahoma
Indiana Historical Bureau	Cherokee Nation
Indianapolis Metropolitan Planning Organization	Chickasaw Nation
Marion County Historian	Eastern Band of Cherokee Indians
Marion County Historical Society	Eastern Shawnee Tribe of Oklahoma
Advisory Council on Historic Preservation	Miami Tribe of Oklahoma
City of Indianapolis, Indiana	Peoria Indian Tribe of Oklahoma
Town of Meridian Hills, Indiana	The Shawnee Tribe
Downtown Indy	United Keetoowah Band of Cherokee Indians
Indianapolis Historic Preservation Commission	

On April 25, 2016, the SHPO provided provisional concurrence on the Phase 1 APE, under the conditions that FTA (1) continue the Section 106 consultation process, (2) continue to monitor properties that are potentially eligible for inclusion on the National Register of Historic Places, and (3) keep the SHPO informed of the location of ground disturbing activities as they become known. Stations would be designed to fit the historic context of historic areas, with modern, glass enclosures.

On June 1, 2016 IndyGo provided consulting parties a tour of Red Line Project Corridor. The tour made several stops along the corridor and IndyGo highlighted the operational characteristics of the BRT within the various segments of the alignment. There was ongoing dialog where questions we asked and clarification sought. Representatives from IndyGo, FTA, City of Indianapolis, Indianapolis Department of Natural Resources/Historic Preservation & Archaeology (DHPA SHPO), Indianapolis Department of Public Works and Downtown Indy, Inc. participated in the tour.

Based on the preliminary assessment, no adverse effects to historic resources are anticipated from the implementation of the Phase 1 Red Line Project. These resources within the APE include ten previously recorded historic districts, eleven properties which were previously listed in the National Register of Historic Places (NRHP), and twenty-five properties that were recommended as individually eligible for listing in the NRHP, including two which were recommended as individually eligible and contributing to the Indianapolis Parks and Boulevard System historic district.

There would be no direct affects to any of the listed or recommended eligible resources by the proposed project. Noise and vibration analyses determined that neither would constitute any adverse effects upon historic resources.

The project team also evaluated the potential for visual impacts that could result in indirect impacts on historical resources. The potential for visual impacts on historic structures is limited since the

project is an existing transportation corridor and the proposed action is not expected to disturb or alter any of the characteristics that qualify the identified buildings as being historic. Seventeen station locations are proposed within the APE and near individual historic properties or within the parcels of contributing properties within historic districts. Potential project impacts are limited to changes to historic properties' visual settings, which would be minimal and not rise to the level of adverse. BRT stations would be located in a manner to avoid visual impacts on historic properties. Although some of the proposed stations are located within the view sheds of historic properties identified, no station structures would be located where they would obstruct or obscure any historically significant views to or from any historic properties. Therefore, no adverse visual effects are anticipated to historic properties.

I. Visual Quality

As illustrated in the visualizations included in Table 4, the proposed project is proposed to include pavement markings, bus shelters, and signage. The most visible aspect of the project would include the stations and the dedicated bus lanes. It is a project goal to blend these aspects in within the context of the local community to minimize impacts on views of the prominent features along the corridor. Some of the more notable feature along Phase 1 deserving of viewshed preservation are areas around Broad Ripple, the Children's Museum, the White River, Fall Creek, the Indiana State Capitol building, Washington Street corridor, Fountain Square, Garfield Park and the University of Indianapolis.

Table 4: BRT Station Visualizations at Select Locations

Description	Conceptual Rendering
Viewshed looking west along 42nd Street across College Avenue	
Looking northwest along Meridian Street	
Viewshed looking north along Meridian Street across 30th Street	
Viewshed looking northeast across Meridian Street from 30th Street	

To best fit the stations into the context of the environment, multiple options were considered and designed with input from the public in the form of a contest. The entrants were all assigned a random 5 digit number in order to maintain anonymity, and given station and budgetary specifications, as well as design guidelines, in order to guide their design process. 31 submissions were received and went through a pre-review process. The Indianapolis Historic Preservation

Commission (IHPC) considered compatibility with historical districts, contracted architects and engineers considered structural and financial feasibility, and IndyGo's Director of Special Transit Projects considered operational feasibility. Seven submissions were disqualified prior to consideration by the jury due to structural, budgetary, or operational infeasibility. The 24 remaining submissions were rated by a public vote which took place both in person and online in order to help to ensure that the preferred design fit into the context of the community. A diverse eight person jury was convened on convened on August 2, 2016 to consider 9 designs, which comprised of the 6 highest average scores from the jury and the top 5 selections from the public vote, and led to design #54679 being selected as the overall winner of the competition. The winning design was shared with the Indiana Department of Natural Resources' Division of Historic Preservation & Archaeology for concurrence before implementation. Renderings of the design are shown in Figure 5.

Figure 5: Example Concept Rendering of Station

Several bus stations throughout downtown would be a center bus stations that would include benches and landscaping. Landscaping would be added to curbs and bus stations to fit with the context of the environment. A new skywalk to the Children's Museum would be added from the bus station on Meridian Street just north of 30th Street. The skywalk would be designed to fit in with the local environment and the new bus station. Figure 6 shows three options of what the skywalk could look like. The Children's Museum, in addition to the Section 106 Consulting Parties, would be coordinated with during the final design of the skywalk in an effort to determine which option best fits the context of the area, needs of the Children's Museum and the project cost.

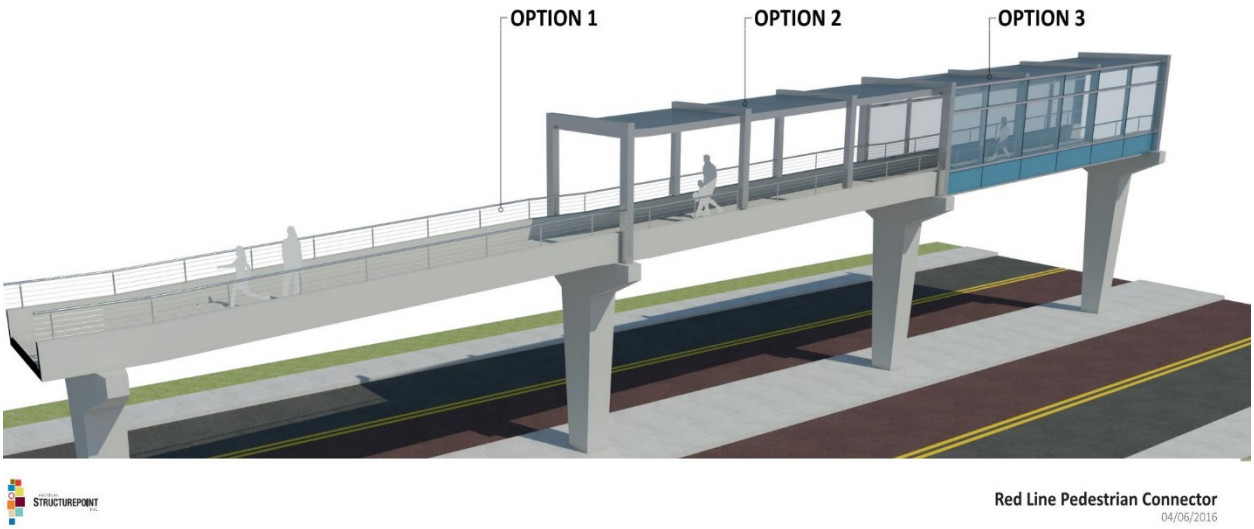

Figure 6: Examples of Possible Skywalk Options to the Indianapolis Children's Museum

The proposed project would not significantly alter open spaces or the buildings that line the street. The proposed project would also not significantly alter the width of the built roads, but reconfigure the operation to provide for a bus lane at certain locations. Therefore, the proposed project would provide improved amenities along existing City infrastructure with historic transit uses.

J. Noise

The *FTA Transit Noise and Vibration Impact Assessment Manual* provides methodologies for evaluating noise impacts of transit projects based on the type and scale of the project, the stage of project development, and the environmental setting. Based on the characteristics of this project, the screening procedure was determined to be the most appropriate methodology for analyzing the potential for noise impacts. This procedure is used to identify noise-sensitive land uses in the vicinity of a project and whether there is likely to be a perceivable noise impact. The screening procedure takes into account noise impact criteria, the type of project, and noise-sensitive land uses. The screening procedure provides an impact distance, which is defined as the distance large enough to include all locations potentially impacted by noise from this project. This distance is measured from the center of the noise-generating activity – in this case, the centerline of the project corridor.

The *FTA Transit Noise and Vibration Impact Assessment Manual* includes a spreadsheet tool to calculate the increase in project noise exposure and the total project noise exposure, based on the category of surrounding land uses, the existing noise level, and the operational characteristics of the proposed transit service. The detailed spreadsheet results from this analysis are provided in Appendix E. A worst case scenario was assumed for each of the inputs into the tool to fully identify the potential for noise impacts, as follows:

- **Land Use Assumptions:** The three land use categories used to conduct a noise impact assessment, from lowest to highest impact threshold, include outdoor quiet, residential,

and institutional. An outdoor quiet land use category was assumed for the entire corridor to provide a worst case scenario for noise impacts on surrounding land uses.

- **Existing Noise Levels:** In areas away from major roadways, noise from local streets or in neighborhoods is generally the main source of existing noise. The manual provides a formula to calculate existing noise levels (in decibels) based on population density. To estimate a worst case scenario, the intersection with the lowest population density along the corridor (at College Avenue & 66th Street) was used to calculate the existing noise levels. Using this worst case (i.e., lowest existing noise level along the corridor) resulted in an existing noise estimate of 55 dBA.

- **Noise Impacts of the Project:** The expected operating characteristics of the Red Line were also input into the tool to estimate noise impacts anticipated to result from the project. These characteristics assume electric buses that pass by once every 10 minutes in each direction (12 times total per hour). To calculate a worst case scenario, an operating speed of 35 miles per hours was used, though average buses speeds would be closer to 18 miles per hour.

The noise impacts were measured at a distance of 50 feet from center of the proposed alignment, the lowest standard reference measurement distance. The tool shows that even in this worst-case scenario for projecting noise impacts, the project would have no impacts from noise. Electric buses are proposed to operate along a corridor with substantial existing general traffic noise as the predominant source of noise; the added effect of the project on noise in the corridor would be negligible.

The proposed project also includes nine stations or other areas that would require a minor shift of the travel lane, such that vehicles would operate closer to adjacent buildings. A full list of these areas is shown in Appendix E. Noise sensitive receptors at these locations and adjacent sites were determined through recent land use data and current zoning data within 500 feet of the proposed project site. Noise-sensitive receptors within 500 feet of these locations are predominately residential land uses, with one additional linear park at the proposed Broad Ripple Station. Due to the corridor's existing urban context, the presence of existing local bus service and general traffic, and the minimal noise created by electric buses, the results of the noise evaluation show no adverse impact at all locations along the Red Line Project Corridor.

K. Vibration

The project proposes to operate thirty new rubber-tired electric buses on existing roadways in an existing urban corridor. The proposed route alignment for this new service would operate on smooth asphalt streets, on a mix of dedicated travel lanes and shared lanes with general traffic. Ground-borne vibration impacts are not anticipated from the operation of rubber-tired buses as proposed and any potential vibration effect is not likely to be perceptible at sensitive receptor locations adjacent to the proposed transit route. Therefore, no vibration impacts as a result of the project are expected to occur.

L. Acquisitions & Relocations Required

The Project does not result in the displacement of businesses or residences along the project corridor, and is expected to be constructed mostly within existing right-of-way. However, there would be a need to acquire a minor amount of strip and corner cut right-of-way for the completion of the project. The areas affected by right-of-way acquisition are along College Avenue between Broad Ripple Avenue and 42nd Street, Meridian Street at the 38th Street intersection, 18th Street between Illinois Street and Capitol Avenue, and Shelby Street between Raymond Street and Troy Avenue. In all, a total of 0.241 acre of right-of-way, permanent and temporary, would be required from 28 parcels. Of the total 0.241 acre, approximately 0.074 acre is permanent right-of-way required specifically from commercial land uses (four parcels). The remaining 0.167 acre is temporary right-of-way that would be acquired from 27 parcels comprised of a variety of land use types including, residential, commercial and public / non-profit (i.e., church). The temporary right-of-way is needed for equipment access for station construction, yard grading and drive construction.

Although 27 parcels would be affected temporarily by loss of usable land, the temporary right-of-way acquired for the Project would be restored to its pre-construction condition and revert to the original owners upon completion of the Project. The permanent loss of land by the four commercial properties is considered to be minor (less than 0.1 acre cumulatively) and does not impair the accessibility or functionality of the businesses. Therefore, the proposed acquisitions do not constitute an adverse effect. Table 5 summarizes the amount and type of right-of-way required for the project based on land uses. Detailed maps showing the location of the right-of-way acquisitions are included in Appendix F.

Table 5: Summary of Right-of-Way Acquisition by Land Use Type

Land Use	Permanent Right-of-Way	Temporary Right-of-Way
Residential	0.000	0.009
Commercial	0.074	0.156
Agricultural	0.000	0.000
Forest	0.000	0.000
Wetlands	0.000	0.000
Other: Public / Non-Profit (Church)	0.000	0.002
Total	**0.074**	**0.167**

M. Hazardous Materials

This analysis includes identification of potential sources of hazardous materials impacts, both within and adjacent to the IndyGo Red Line Project Corridor. Sites that currently or have historically handled, stored, transported, released, or disposed of hazardous or regulated waste are potential sources of hazardous material contamination.

There are no specific NEPA thresholds for determining potential adverse impacts related to hazardous materials; however, FTA's process for implementing NEPA requires an evaluation of

potential impacts related to hazardous materials. For the purpose of this impacts analysis, a hazardous material is any media such as soil, groundwater or building materials that contain detectable concentrations of any state or federally regulated contaminant. An impact would be considered adverse if it would have the potential for the following:

- Harm to human health or the environment through the routine transport, use, or disposal of hazardous materials
- Harm to human health or the environment through the accidental release of hazardous materials into the environment.

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. The full list of federal, state, local, tribal, and other databases that were consulted for this analysis are listed in Appendix G.

Nine sites of the greatest concern adjacent to the proposed project are summarized in Appendix G, neither of which are Superfund sites. Six of these sites are located more than 500 feet from proposed station locations. There are three sites within 500 feet of proposed station locations: CVS Pharmacy #2311 (2215 South Shelby Street) near the proposed Troy Station, CVS Pharmacy #6569 (6290-6292 North College Avenue) near the proposed 66th/Art Center Station, and the Lilly Corporate Center Building (25-46 Delaware Street) near the Downtown/Transit Center Station. The complete list of sites containing potentially hazardous material in within a mile of the Project Corridor is included in Appendix G.

There are no known contamination plumes in the project study area. While the potential for contamination exists at any location that has underground storage tanks (USTs) for hazardous materials, the sites identified as having USTs are regularly monitored to ensure they are not leaking and do not threaten human health and welfare.

In addition to these sites, the urban setting of the project area creates the potential for the presence of typical urban fill throughout the entire project corridor. Typical urban fill materials contain elevated concentrations of polynuclear aromatic hydrocarbons and metals due to nearby roadways, railways, and industrial and commercial land uses and activities. In addition, urban fill may include contaminated building demolition debris. This type of contamination is not necessarily associated with a release from a specific site or source. Contaminated urban fill may be encountered during excavation.

The majority of the project footprint is limited to within the existing right-of-way, however a small property acquisition would be required in order to expand existing right-of-way at Meridian Street near the intersection of 38th Street. Soil and/or groundwater could be contaminated with hazardous materials due to the urban setting of the project and/or adjacent or nearby regulated hazardous material sites identified in the database search. Based on this assessment, a number of measures are proposed as part of this project to ensure no impacts result from implementation of the proposed improvements. These measures primarily relate to construction and pre-construction

activities as described below. With these project measures incorporated, no impacts on hazardous materials sites would be expected, and no mitigation would be required.

Construction of the proposed project would include subsurface ground disturbance activities, which could result in contaminated soil and/or groundwater being encountered. However, the majority of excavation would be associated with construction of the BRT stations, such as for the slab-on-grade platforms and shelters, and excavation would be limited to the top three to five feet below ground surface.

In the limited areas of right-of-way acquisition, Phase I Environmental Site Assessments (ESAs) are scheduled to be conducted in Summer/Fall 2016, before acquisition of any new properties. Based on the Phase I findings, a Phase II ESA could also be recommended prior to acquiring the property. Should a Phase II ESA be required, site testing and additional analysis would be conducted to identify whether there is no reasonable risk of contamination at the site, or to confirm and detail the risk of contamination at the site. If a site is contaminated and remediation is needed, the Phase II ESA would provide recommendations for remediation. Once remediation of the site has occurred, there would be no impacts.

Project construction, which would be in a previously disturbed area and in close proximity to the existing roadway, is not expected to have impacts associated with hazardous materials. All proposed construction debris would be properly disposed of in construction/demolition landfills. If encountered, lead-based paint and asbestos containing materials would be disposed of in accordance with all federal, state, and local regulations.

N. Social Impacts & Community Disruption

The project proposes the addition of new transit service between Broad Ripple and the University of Indianapolis. As noted in the Section D of this document, the Red Line Project Corridor, in particular the sections further from downtown, are dominated by medium density residential uses. However, even in the central portions of the Red Line Project Corridor (downtown Indianapolis) there are residential uses mixed in with the high density commercial development. Several neighborhoods are located along the Red Line Project Corridor including Broad Ripple, Meridian Kessler, Indiana Avenue and Indiana University Purdue University Indianapolis (IUPUI), North Meridian, Wholesale District, Market East, Fletcher Place / Holy Rosary-Danish Church, Fountain Square, Garfield Park, and Concord. In addition, there are many community resources along the Red Line Project Corridor (e.g., parks, schools, government centers, and religious institutions), as shown in Table 6.

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Table 6: Community Resources

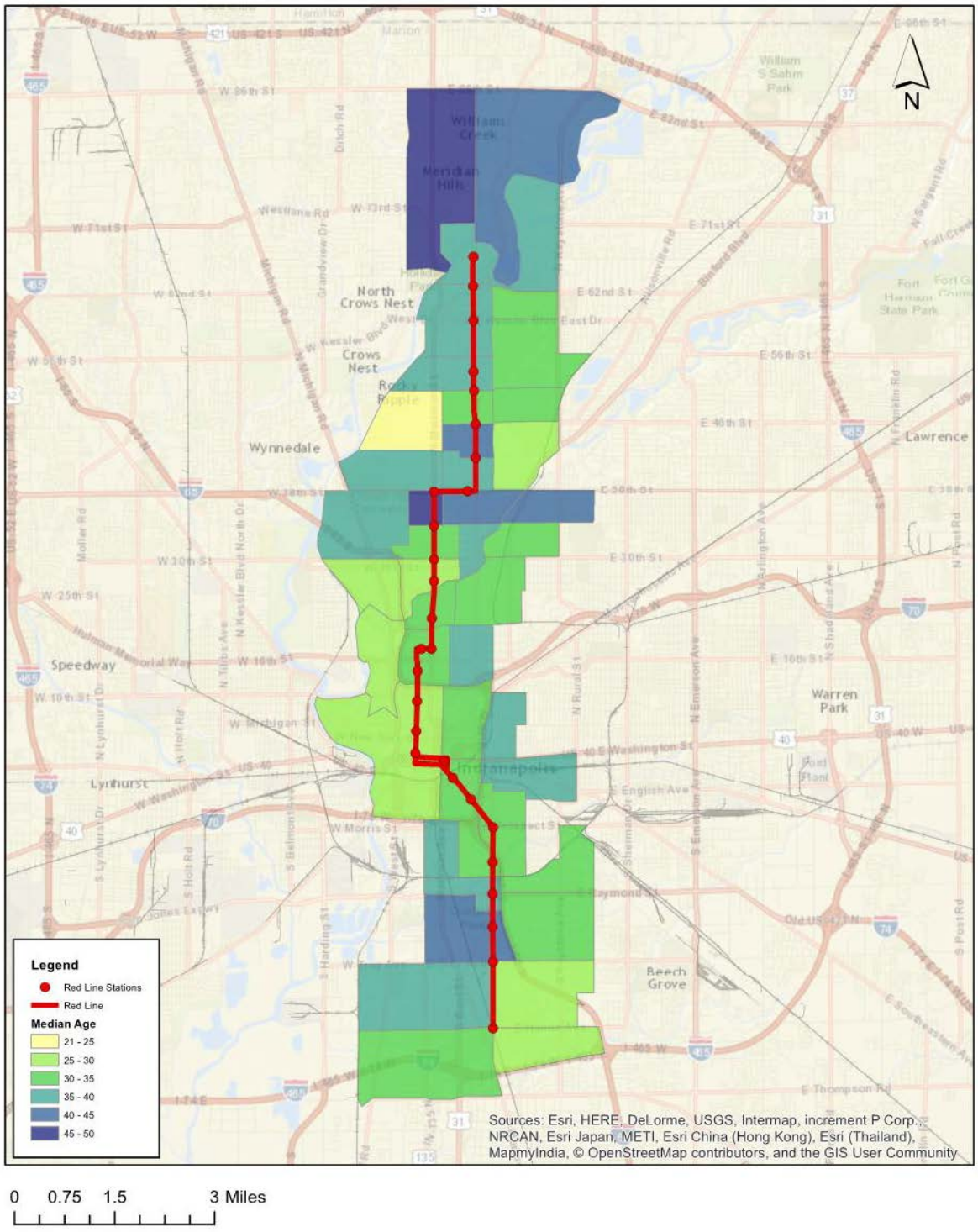
Community Resources	Type
Convention Center Plaza	Convention Center
Robinson Community AME Church	Church
New Paradigm Christian Church	Church
Church of Christ Scientist	Church
Unification Church	Church
North United Methodist Church	Church
Trinity Episcopal Church	Church
St. John the Evangelist Catholic Church	Church
Christian Church (Disciples of Christ)	Church
St. Patrick Church	Church
St. Mark AME Zion Church	Church
Garfield Park Baptist Church	Church
Bethany Wesleyan Church	Church
Church of Christ Garfield Heights	Church
Good Shepherd Catholic Church	Church
Indiana State Capitol	Government
Methodist Hospital	Hospital
Indianapolis Public Library Services Center	Library
The Indianapolis Children's Museum	Museum
Shortridge Middle School	School
Ivy Tech Community College	School
Sense Charter School	School
Fountain Square Academy	School
University of Indianapolis	School

Data from the US Census Bureau was analyzed to determine the demographic profile within the Red Line Project Corridor. The median age of most tracts adjacent to the project corridor is 30-35 years, as shown in Figure 7. The ratio of males to 100 females is mainly 82-93.4. Overall, there are slightly more females surrounding the project corridor than males.

According to US Census Bureau data, most residents near the project corridor commute by car; a low percentage, less than 5%, commute by public transportation, as shown in Figure 8. The anticipated increase in utilization of IndyGo's public transportation system associated with Red Line Project would result in added benefits to the central region of Indianapolis such as better accessibility to jobs, improved air quality through the reduction in commuter traffic, reduced travel times and congestion, and greater potential for economic opportunities along the corridor. In addition, the proposed amenities to be included near stations (i.e., landscaping, benches, and lighting) would enhance community aesthetics. The upgrades to existing sidewalks, curb ramps, and crosswalks near stations also takes the necessary steps to provide the community with pedestrian facilities that are compliant with the Americans with Disabilities Act (ADA); many of these facilities are not currently ADA compliant.

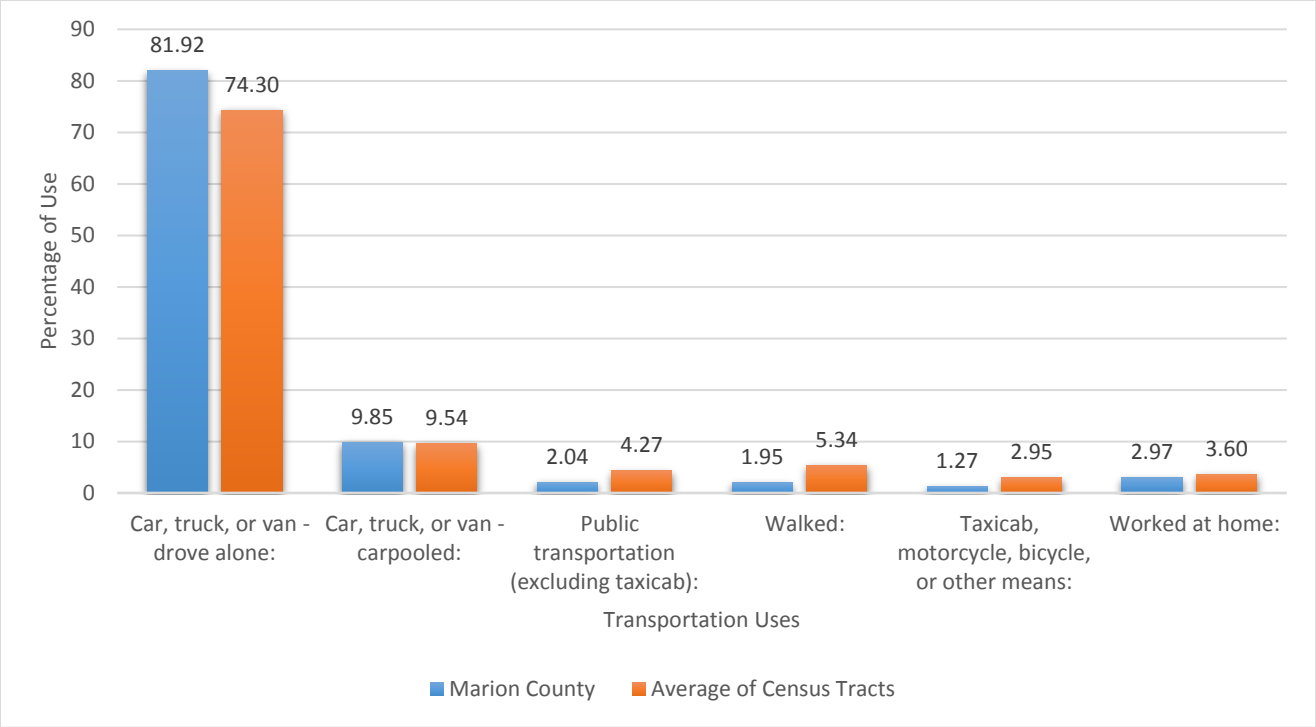
No residences or community resources would be displaced as a result of the Red Line Project. Permanent socioeconomic effects resulting from the Project includes the loss of property tax base due to right-of-way acquisition. However, this impact is somewhat diminished by the actual minimal amounts (less than 0.05 acre) of total permanent right-of-way that would be acquired, which is entirely from properties identified as commercial uses. Another permanent impact resulting from the Red Line Project is the loss of metered and non-metered parking in numerous locations along the corridor. These loss of parking spaces is intended to be offset either through compensatory measures or efforts to establish new parking spaces nearby the area of loss, thus minimizing the severity of impact. Temporary negative socioeconomic impacts the project would have on the community include inconveniences commonly associated with construction such as noise, fugitive dust, increased travel delay, and utility disruptions. These impacts are temporary and would cease upon completion of the project. Access to businesses and residences would be provided throughout construction.

The project would not adversely affect community cohesion as it does not change access or travel patterns. The neighborhoods identified above would not be segmented by the Red Line Project, as the new service is an expansion along the existing transportation infrastructure. Opportunities provided by the Red Line Project include the enhancement of bus frequency through the affected area in addition to the number of stations providing easier access within the community. To that end, the project would contribute to the enhancement of the surrounding communities by adding more convenient and more accessible public transportation and lowering air emissions. Therefore, the Red Line Project is not expected to have adverse impacts on the social or community environment.



Source: US Census Bureau, 2014

Figure 7: Median Age (years) by Census Tract



Source: US Census Bureau, 2014

Figure 8: Percentage of Transportation Uses to Work

O. Environmental Justice

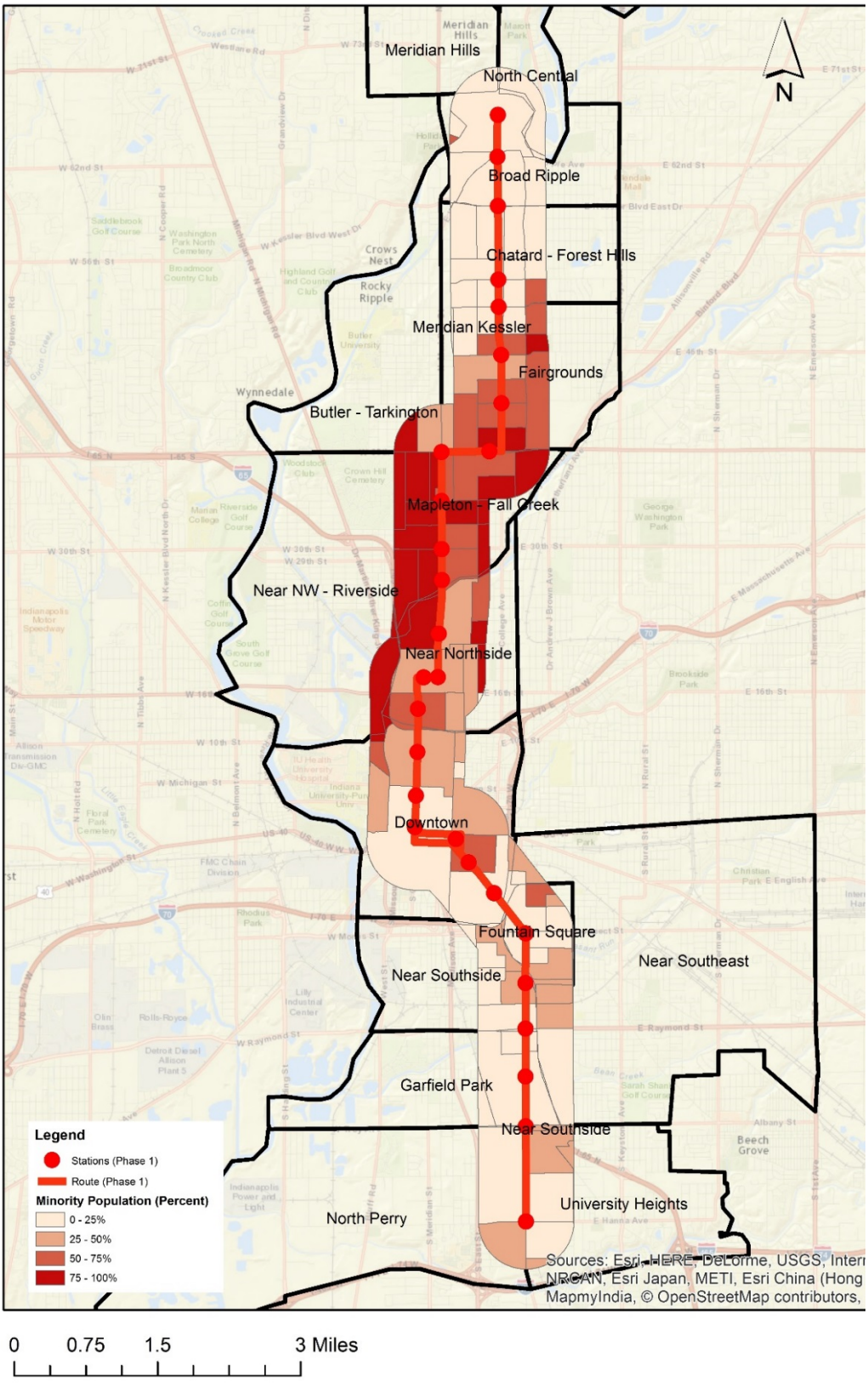
According to the US Environmental Protection Agency, Environmental Justice (EJ) is the "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." EJ analysis was performed in accordance with related federal and state laws and guidance including Title VI of the 1964 Civil Rights Act, Executive Order (EO) 12898, EO 13166, and FTA Circulars 4703.1 and 4702.1B. This section provides information on EJ analysis conducted for this project.

FTA Circulars 4703.1 Environmental Justice Policy Guidance for Federal Transit Administration and 4702.1B Title VI Requirements and Guidelines for Federal Transit Administration Recipients provide methods to fulfill the key goals of federal environmental justice policies:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

To establish the presence of low-income and minority populations, US Census data was analyzed for all census tracts within a half mile of the proposed alignment along the corridor.

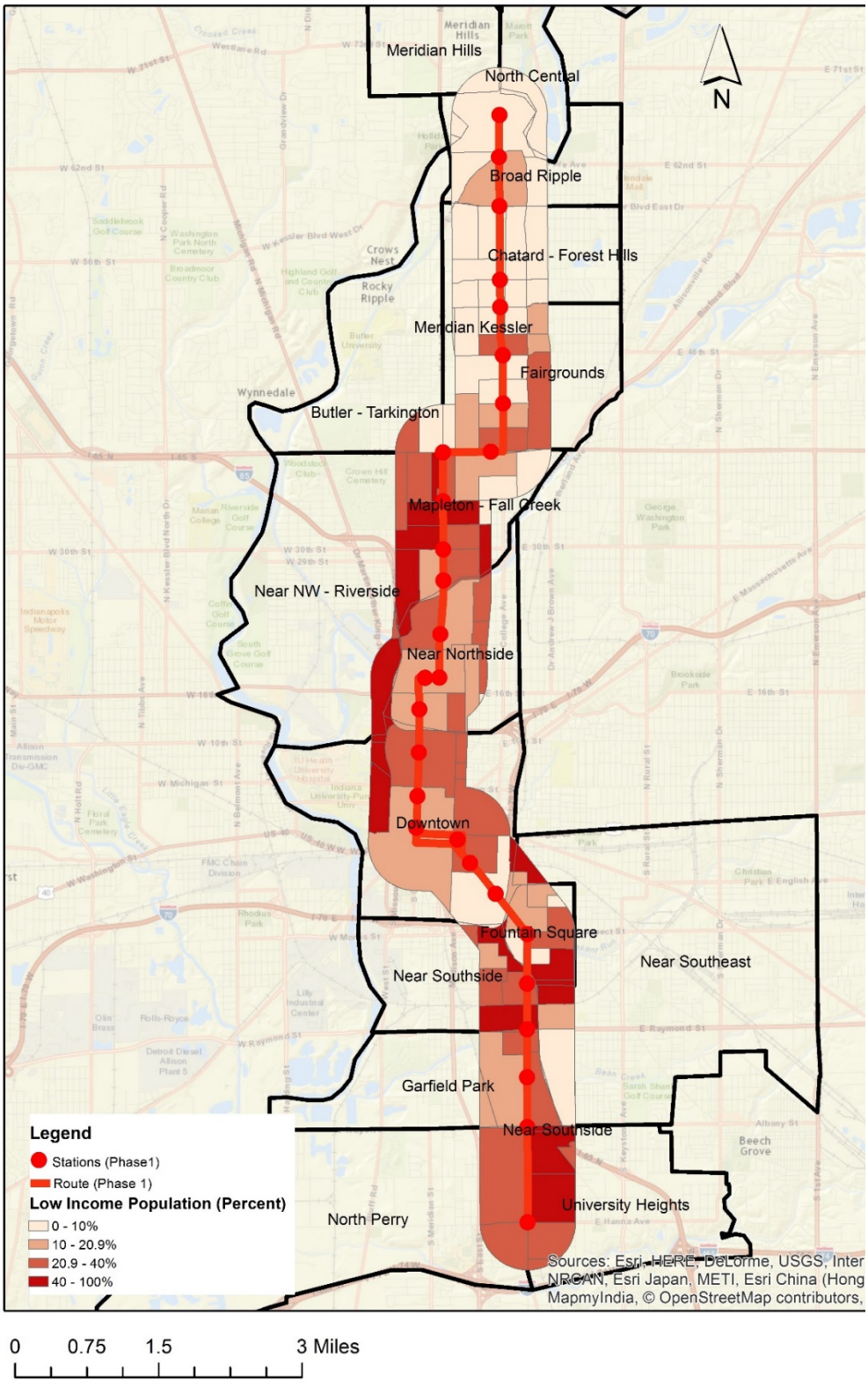
Minority populations were determined by using the combination of all persons identifying as non-white and/or Hispanic/Latino populations. Figure 9 provides a map of the minority populations of neighborhoods along the Red Line Project Corridor. The neighborhood boundaries defined by the City of Indianapolis typically coincide with geographic features that are more meaningful to residents than census tract boundaries, such as boulevards, freight corridors, highways, and other major divisions between neighborhoods. To avoid artificially diluting or inflating the presence of minority and low-income populations, all census tracts along the corridor within each affected neighborhood were analyzed to determine whether the neighborhood as a whole contains a predominantly minority or low-income population. The map shows high concentrations of minority populations were found in the Near NW-Riverside, Mapleton-Fall Creek, Butler-Tarkington, and Fairgrounds neighborhoods.



Source: US Census Bureau, 2010

Figure 9: Minority Population

As shown in Figure 10, low-income populations were identified by comparing income levels and Department of Health and Human Services (DHHS) poverty thresholds. Similar to the process for identifying neighborhoods with high concentrations of minority populations, low-income populations were identified by neighborhoods where the percentage of households with median income below the DHHS poverty guidelines exceeds the citywide percentage. As such, neighborhoods where the percentage of low-income families in the census tracts along the Red Line Project Corridor is greater than the city-wide percentage of 20.9% were classified as communities with concentrations of low-income populations.



Source: US Census Bureau, 2010

Figure 10: Low Income Population

All neighborhoods containing predominantly minority populations and/or concentrations of low-income populations were classified as environmental justice communities. These findings were then analyzed to determine whether impacts would occur disproportionately in neighborhoods with environmental justice populations. The Red Line Rapid Transit Project would not have a high or disproportionate impacts on EJ communities. No direct impacts or indirect/cumulative impacts are anticipated. The project would result in transportation benefits to all populations within the project corridor, including environmental justice populations. Benefits would include faster, more frequent bus service, improved bus stations, sidewalk enhancements, and associated quality of life improvements. These physical enhancements would also contribute to potential economic development and livability improvements. BRT facilities would be designed to fit within the existing urban context of the surrounding neighborhoods, thereby preserving the character of existing EJ neighborhoods. IndyGo's current fare policy and structure would remain at the current levels through the implementation of the Red Line Rapid Transit Project; no price increases, which could potentially impact EJ communities are planned.

Community Outreach

Though not specifically required for a DCE, recent community outreach efforts have included a focus on an overall greater outreach to minority communities. Throughout the planning process, IndyGo has and would continue to prepare and distribute public information materials to update the public, including minority and low income communities, on the project. The Red Line public outreach and involvement process has followed several parallel paths including: public involvement, public presentations with informational boards, key stakeholder meetings, champion meetings, focus groups, advertising buys, social media, a newsletter, a website, coordination with partner organizations, email, and phone. The marketing and communications team individually responded to each inquiry made regarding the project. Recent community outreach efforts have included a focus on an overall greater outreach to minority communities. Stakeholder meetings were held with community groups that focus on advocating for minorities and other disadvantaged groups including the African American Coalition, Indiana Black Expo, and the Urban League. A number of public meetings were held in Title VI areas to encourage broader input from a diverse set of communities in shaping the project.

In support of these efforts, a variety of materials have been developed that provide an overview of the project and the opportunities for public input. Surveys and materials displayed and discussed at outreach and events through 2016, are available to those who could not attend on the website www.IndyGo.net/RedLine. Information was also passed along to the Mayors Neighborhood Liaison for posting and communicated to neighborhood leaders and stakeholders, as well as follow up emails to those who attend stakeholder meetings.

P. Use of Public Parkland & Recreations Areas

In accordance with Section 4(f) of the Department of Transportation Act of 1966, which requires the consideration of park and recreational lands and wildlife and waterfowl refuges in development of transportation projects, the project study area was examined to determine the location of such lands along the proposed Red Line Project Corridor. The proposed alignment lies within a one quarter mile walking-shed of 25 existing parks and greenways, plus the Indianapolis Cultural Trail, as shown in Table 7 and Figure 11. No parklands, wildlife refuges, or recreational areas would be taken or adversely impacted as a result of this project. More detailed descriptions of these parks and trails can be found in Appendix H.

Table 7: Parks and Trails within ¼ Mile of Proposed Alignment

Park Name	Managing Entity	Total Area (ac)	Area Within ¼ Mile of Project (ac)	Use
Al E. Polin Park	Indy Parks	1.56	1.56	Active Park
American Legion Mall	Indiana War Memorial Commission	8.53	5.14	Memorial
Barton Park	Indy Parks	6.07	0.09	Active Park
Broadway & 61st Park	Indy Parks	2.71	2.71	Active Park
Canal Walk	Indianapolis Dept. of Metropolitan Development	15.94	12.07	Trail
Cultural Trail	ICT, Inc.	N/A	N/A	Urban Trail
Edna Balz Lacy Park	Indy Parks	2.14	2.14	Active Park
Fall Creek Greenway	Indy Parks	179.00	15.93	Trail
Fountain Square Fountain	Indy Parks	0.02	0.02	Passive Pocket Park
Garfield Park	Indy Parks	122.83	36.56	Active Park
George E. Kessler Park	Indy Parks	1.16	1.15	Passive Park
Hot Shot Tot Lot	Indy Parks	0.14	0.14	Active Pocket Park
Indiana War Memorial	Indiana War Memorial Commission	4.64	2.82	Memorial Museum
Iwc Canal Towpath Greenway	Indianapolis Water Company	19.79	1.40	Trail
Marott Park Woods Nature Preserve	Indy Parks	78.46	1.01	Nature Preserve
McCord Park	Indy Parks	0.66	0.52	Passive Pocket Park
Monon Greenway	Indianapolis Dept. of Metropolitan Development	55.85	3.19	Trail

Park Name	Managing Entity	Total Area (ac)	Area Within ¼ Mile of Project (ac)	Use
Monument Circle	Indiana War Memorial Commission	2.22	2.22	Memorial
Peace Park	Indy Parks	0.08	0.08	Passive Pocket Park
Pleasant Run Greenway	Indy Parks	30.42	5.38	Trail
Presidential Place	Indy Parks	0.55	0.55	Passive Pocket Park
Ringgold Park	Indy Parks	0.21	0.21	Active Pocket Park
Tarkington Park	Indy Parks	10.31	9.89	Active Park
University Park	Indiana War Memorial Commission	5.33	3.20	Memorial
Veteran's Memorial Plaza	Indiana War Memorial Commission	4.60	2.77	Memorial
Watson Road Bird Preserve	Indy Parks	4.00	3.37	Wildlife Sanctuary

The proposed Red Line Project Corridor would cross the Cultural Trail, Canal Towpath, and Monon Greenways in multiple locations. At each site trail users cross the street at a crosswalk and continue on the trail on the opposite side. The proposed project would generally be constructed entirely within current right of way on existing roadways and would have no effect on these trail crossings. The lone exception is where the Cultural Trail crosses Capitol Avenue at Walnut Street. An existing bumpout would be removed and replaced with a center median with a pedestrian and bicycle cutout, which would reduce the distance a pedestrian or cyclist must travel across motor vehicle traffic lanes. The intersection is signalized, allowing for safe crossing movements by trail users, and the proposed project would have no adverse impacts on the trail.

The transit service provided by the proposed project would help enhance access to all parklands located within the one quarter mile walking-shed of the proposed alignment, all of which are labeled in Figure 11. Transit access would be particularly enhanced for those parks and trails that are directly adjacent to a proposed station, including the IWC Canal Towpath, Monon Greenway, Cultural Trail, Pleasant Run Greenway, and Garfield Park.

Figure 11: Public Parkland & Recreations Areas

Q. Impacts on Wetlands

Executive Order 11990 of May 24, 1977, *Protection of Wetlands*, requires that an analysis of impacts on wetlands be performed for any mass transportation project that may affect a wetlands area. In addition, per Section 404 of the Clean Water Act, infrastructure development projects must document minimal impacts on wetlands resulting from dredged or fill material. The US Fish and Wildlife Service (USFWS) and National Wetlands Inventory (NWI) wetlands maps were consulted to assess the impact of the project on any wetlands that may occur near the project site. The project corridor is located in an urbanized area and would be constructed primarily within the existing ROW, and there are no anticipated impacts on wetlands associated with the project.

A small island in Fall Creek is the only designated wetland within ¼ mile of the proposed alignment. The island, which contains a designated forested wetland, is located about 45 feet from the bridge containing the proposed alignment. The project would be constructed within the current ROW on an existing bridge, there would be no modifications to the bridge, and the impermeable surface area in the vicinity of the wetlands would not increase. As such, the project and its construction activities would have no impacts on this wetland. The proposed alignment would cross two waterways: Fall Creek near 27th Street station and Central Canal near Broad Ripple station. The project would be constructed within the current ROW on existing bridges and would have no impacts on the waterways. Three freshwater ponds are located within ¼ mile of the proposed alignment, but the proposed alignment would not affect these wetlands as the project would be constructed entirely within the existing roadway in these areas. Construction best management practices, as described in Section V, would be used in all cases to ensure no impacts on nearby wetlands. A map of wetlands in the area are shown in Figure 12.

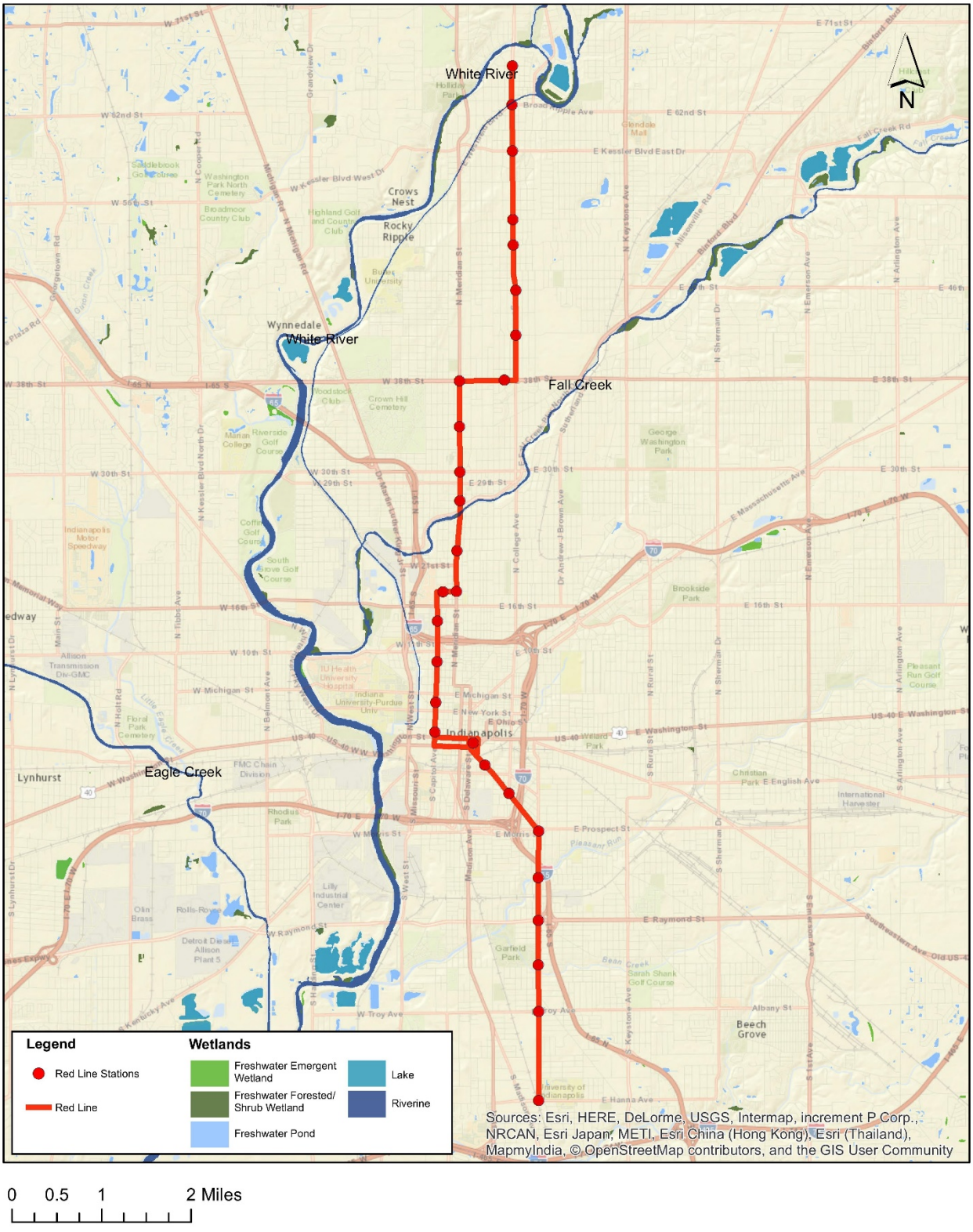


Figure 12: Wetlands

R. Floodplain Impacts

The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate map was consulted to assess the impact of the project on floodplains near the project site. The proposed alignment lies within the 100-year floodplain in two locations, as shown in Figure 13.

In northern Marion County, the East 66th Street and Broad Ripple Avenue stations and approximately 3,000 feet of proposed alignment on College Avenue lie within the 100-year floodplain surrounding the White River. This area is controlled by the Warfleigh Levee to the west, north, and east. The majority of this section of the corridor would be constructed within the existing right-of-way, though there would be a slight expansion (less than 1/10 of an acre) of impermeable surface area on the approach to the East 66th Street Station in order to accommodate the bus turnaround area. This increase would not have a significant impact on the floodplain. Roadway construction would be minimal and would not impact base flood elevations.

In downtown Indianapolis, roughly 1,600 feet of alignment between East Pearl Street and East Louisiana Street lies within the 100-year floodplain. No proposed stations lie within the floodplain, and these sections would be constructed entirely within current ROW on existing roadways and would have no impacts on floodplain areas. The proposed alignment crosses Fall Creek, Pleasant Run and Bean Creek floodways via bridge. The project would be constructed mostly within the existing right-of-way with no anticipated modifications to the existing bridges and would have no adverse impacts on floodways.

No significant impacts on floodplains are anticipated. The proposed alignment is located almost entirely within current right of way on existing roadways and would not affect surface contours. The addition of impervious surfaces due to new construction would be minimal and would not impact base flood elevations.

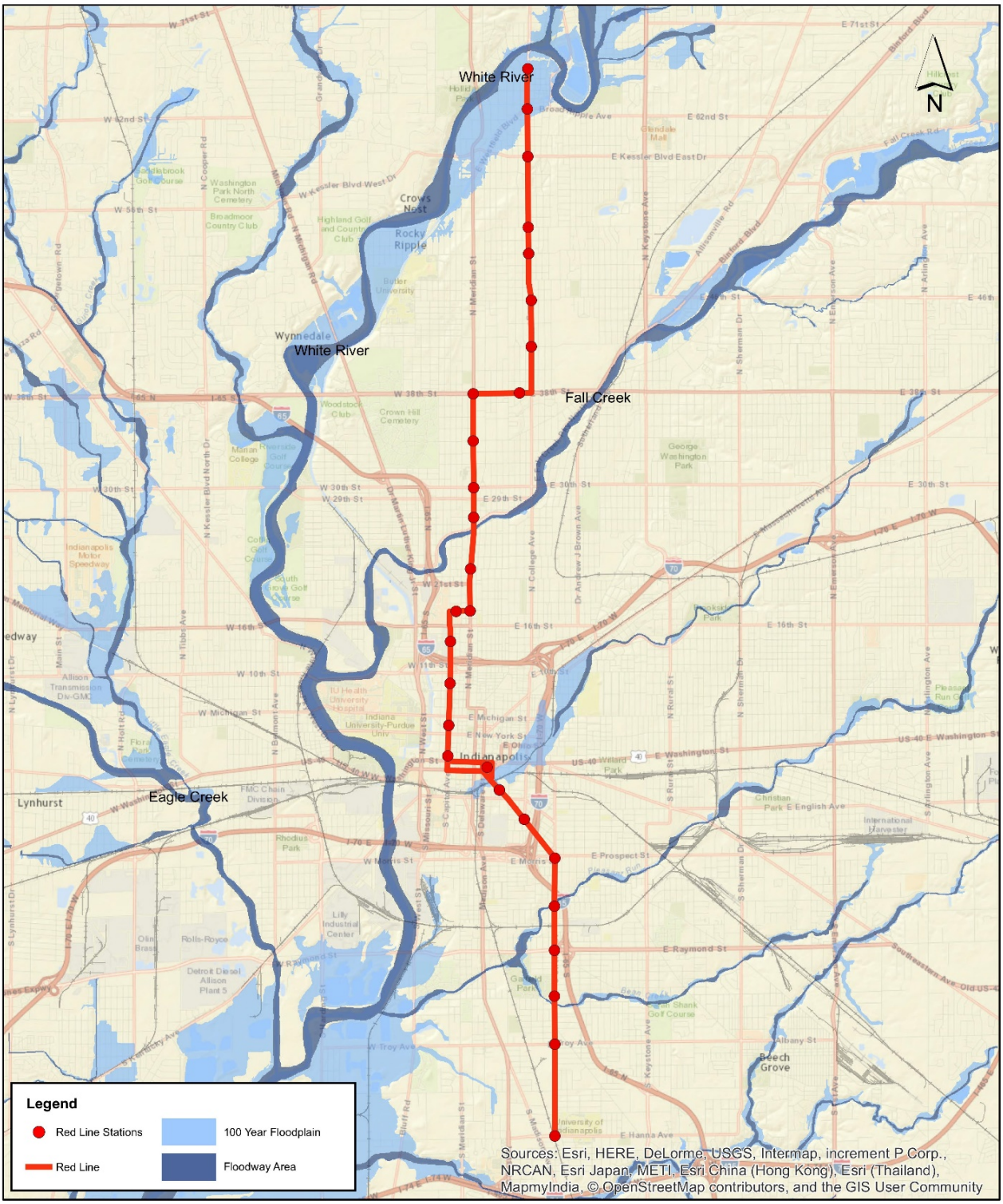


Figure 13: Floodplains

S. Water Quality, Navigable Waterways, & Coastal Zones

Waterways are regulated under the Clean Water Act of 1977, as amended (33 USC 1251). In addition, navigable waterways are regulated by Section 10 of the Rivers and Harbors Act of 1899, as amended (33 USC 403). The Outstanding Rivers List for Indiana was reviewed to determine possible presence of protected waterways in the project area. No listed waterways were identified within or adjacent to the project area. Additionally, the 2011 aerial photography, United States Geological Survey (USGS) topographic mapping, Marion County Soil Survey, and the National Wetland Inventory (NWI) map were reviewed to determine whether any perennial or intermittent streams occurred in the project area. Figure 14 shows waterways in the vicinity of the project.

The Red Line Project crosses six waterways: the Indianapolis Water Company (IWC) Canal, Fall Creek, Pogues Run, Pleasant Run, Bean Creek, and Highland Creek. No endangered or threatened species have been noted in these streams according to the USFWS. Additionally, no work below the ordinary high water mark is expected to occur at these stream crossings; therefore, it is anticipated that there would be no direct impacts on these streams.

The 2014 IDEM Section 303(d) list of Impaired Waters [10]was reviewed for the Study Area. Table 8 identifies those waterways within Phase 1 designated as impaired, as well as the causes of impairment and the impairment category of the streams. The incorporation of best management practices (BMPs) would be used to ensure the project does not contribute to the degradation of the impaired waterways or hinder any established recovery plans.

[10] http://www.in.gov/idem/nps/2647.htm

Table 8: Cause of Impairment of Streams

Waterway	Facility Carried	Cause of Impairment	Impaired Category
IWC Canal	College Avenue	E. Coli	5A
		Nutrients	
Fall Creek	Meridian	PCBS (Fish Tissue)	5B
Pogues Run	Virginia	E. Coli	5A
		Impaired Biotic Communities	
Pleasant Run	Shelby	Impaired Biotic Communities	5A
Bean Creek	Shelby	E. Coli	5A
		Impaired Biotic Communities	
Highland Creek	Shelby	PCBS (Fish Tissue)	5B
White River	College Avenue	Nutrients	5A 5B
		PCBS (Fish Tissue)	
		Impaired Biotic Communities	

None of the streams within the project corridor are designated as a Traditional Navigable Waterway (TNW). The White River West Fork, located approximately 0.2 miles north of the project corridor, is a TNW up to 66.2 miles above the mouth according to the US Army Corps of Engineers (USACE). This TNW designation extends from the junction with the Wabash River to where the river splits into the East Fork and the West Fork. The Red Line Project would not impact this TNW.

Generally, the water quality within urban settings is impaired by runoff from transportation uses. During construction, erosion and/or pollutant spills could decrease the quality of the storm water runoff from the construction sites and, in turn, the water quality in the receiving streams. As the Project would disturb more than one acre of land, Rule 5 approval from the local Soil and Water Conservation District and IDEM is required. The Rule 5 approval process would ensure BMPs are utilized in the Project's erosion control plan. A component of the Rule 5 application is the preparation of a Storm Water Pollution Prevention Plan (SWPPP), which would define specific measures to be implemented during construction that minimize impacts storm water would have on receiving waterways. IndyGo, or their Agent, would prepare the Rule 5 and SWPPP prior to construction.

A National Pollutant Discharge Elimination System (NPDES) permit may also be required for the Project as the drainage outfalls from the stations may be considered a point source discharge of pollutants. The NPDES permits would include effluent limits, as well as monitoring and reporting requirements to ensure water quality is not degraded to a point that adversely affects public health.

The US Fish and Wildlife Service (USFWS) early coordination response, dated May 3, 2016, stated that in order to protect water quality in areas where additional drainage outlets are proposed, pollutant-trapping technology should be used, such as storm drain inserts, to reduce the runoff of urban pollutants directly to the stream system. These recommendations would be implemented to reduce contamination of water resources. Appendix I includes coordination correspondence with USFWS.

In correspondence dated June 2, 2016, the IDNR recommended consideration of sustainable storm water management. Such approaches include the use of storage techniques (retention basins, constructed wetlands, raingardens, etc.), recharging groundwater using infiltration techniques (infiltration basins or trenches, pervious pavement, etc.), and reusing runoff for irrigation elsewhere in the basin. These recommendations would be considered in the advancement drainage design for the project. However, it should be noted that should a Construction in a Floodway Permit be required from the IDNR, these recommendations may become conditions to the permit.

The Red Line Project's impacts on water quality is expected to be limited to runoff that is collected by storm sewers and discharged into receiving waterways. The implementation of the SWPPP would minimize these impacts during construction, while the NPDES permit would provide long-term measures to controlling pollution discharged into the affected waterways. Therefore, the Red Line Project would not result in adverse impacts on the water quality along the corridor.

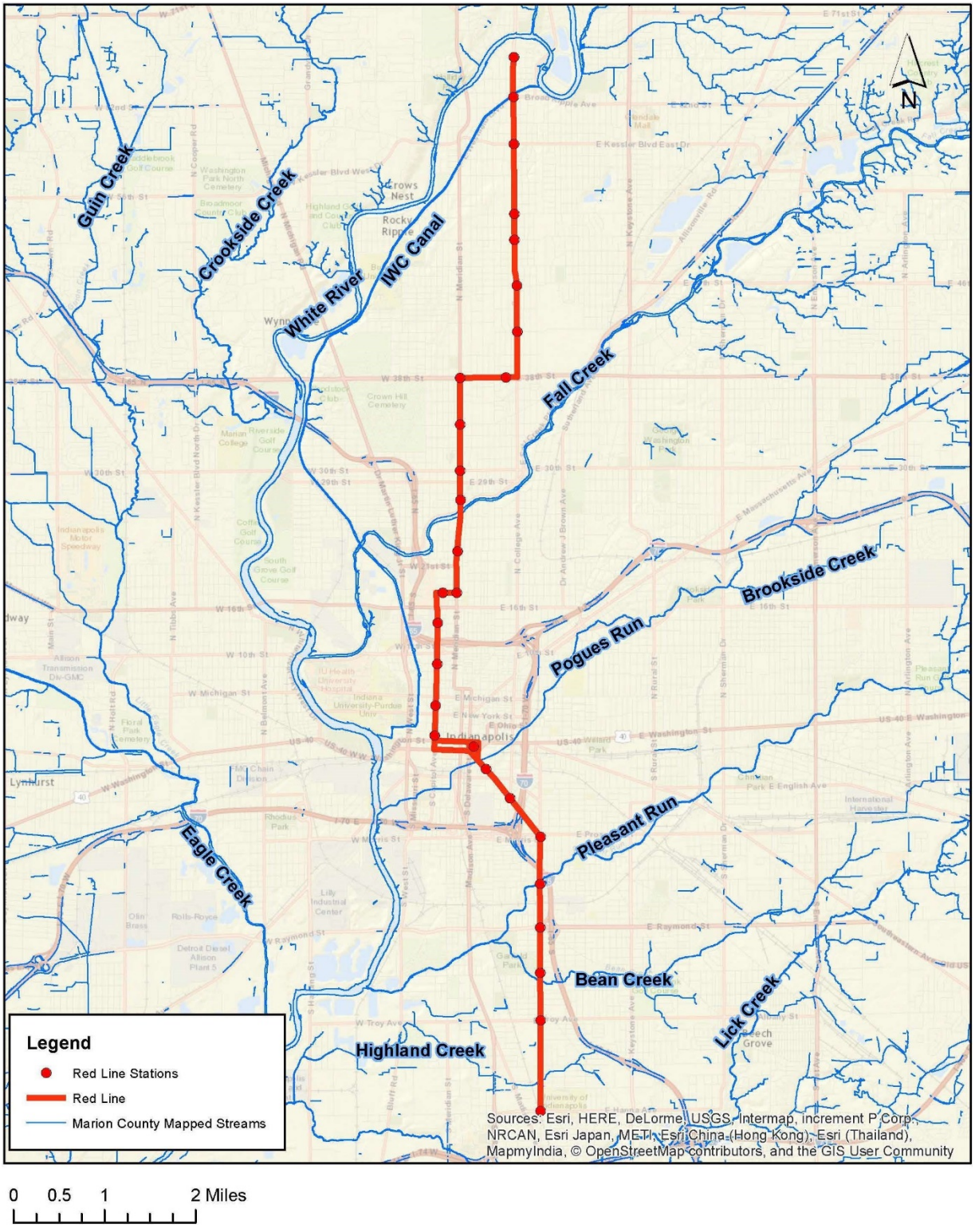


Figure 14: Floodplains

The Indiana Department of Environmental Management's (IDEM) Wellhead Proximity Locator website (http://www.in.gov/idem/cleanwater/pages/wellhead) was accessed on February 2, 2016. The required project location data was provided and it was determined that the project is located

within at least one Wellhead Protection Area (WHPA). Due to security concerns related to WHPAs, detailed location information about the WHPA is not available. Any potential for impacts related to the WHPAs would be associated with areas where construction would occur at station locations or areas of pavement widening. These impacts would not only be temporary, but likely addressed through the sediment and erosion control plan approved through the Rule 5 permitting process. Coordination would occur with the managing entities of the WHPA during the design phase to determine the impacts that may occur as well as any special conditions that need to be included in the plan development.

The Indiana Department of Natural Resources (IDNR) Water Wells Enhanced Web Viewer (http://dnrmaps.dnr.in.gov/apps/dnrwaterwells_enh) was accessed on February 2, 2016. Approximately five bedrock water wells, seven unconsolidated water wells, and nine unknown water wells are along the Project Corridor. It should be noted that these wells are located beyond the right-of-way limits and are not located next to or within the proposed construction limits. Due to the scope of the proposed project, it is anticipated that no impacts on the water wells would occur.

Because the project is located in Marion County, the project is not located within the St. Joseph Sole Source Aquifer System, which is the only legally designated sole source aquifer in the state. The St. Joseph Sole Source Aquifer System is located within St. Joseph, Elkhart, Lagrange, Koscuisko, and Noble Counties in the northern portion of Indiana. Due to the geographic distance between the project and the St. Joseph Sole Source Aquifer, no impacts are anticipated.

T. Impacts on Ecologically-Sensitive Areas and Endangered Species

Protection of federally threatened and endangered species is governed by the Endangered Species Act of 1973 as amended. The consultation that occurs between the sponsoring federal agency and the US Fish and Wildlife Service (USFWS) to determine a project's likeliness to jeopardize a threatened or endangered species is done so under Section 7 of the Act. The USFWS endangered species list (http://www.fws.gov/midwest/endangered/lists/indiana-cty.html) was referenced on December 18, 2015. The species that potentially occur in Marion County include two bat species. The IDNR Natural Heritage database indicates that there are a number of other federally listed species potentially occurring in Marion County, but the USFWS records indicate that these species do not occur within the County any longer. The USFWS list is used for federally listed species and the IDNR Natural Heritage database is used for state and federally listed species.

The USFWS endangered species that may occur in Marion County include the endangered Indiana bat (*Myotis sodalis*) and the threatened northern long-eared bat (*Myotis septrenionalis*). Both species hibernate in caves and mines during the winter months. Summer roosting and foraging habitat for both bats occurs along wooded stream corridors and in bottomland and upland forests and woods. Maternity colonies are typically found in fallen trees with hollow cavities or trees with loose or sloughing bark. Within the limits of the Red Line Project, the only notable areas of riparian habitat are along the White River where it crosses College Avenue just north of the northern terminus; Fall Creek where it crosses Meridian Street just south of Fall Creek Parkway; Pleasant Run at its Shelby Street crossing north of Pleasant Run Parkway; and Bean Creek where it crosses Shelby

Street south of Southern Avenue. Most of these riparian areas are narrow and surrounded by dense urban development and would likely provide limited potential habitat. If either of these species are located adjacent to the Project Corridor, the species would be accustomed to typical activity along the streets of Indianapolis, including periodic roadwork and bus traffic. No tree removal is anticipated in these riparian areas, therefore no impacts are anticipated to the USFWS federally listed species.

The project would not conduct any work below the ordinary high-water marks of any of the waters within the project area. Although the alignment does cross several streams, these streams have been altered by the urban environment and no listed species are known to exist within the waters located within the proposed project area. Therefore, there would be no effect on any aquatic species.

As the project crosses multiple streams, an early coordination letter was prepared and sent to the USFWS on May 2, 2016. The USFWS early coordination response, dated May 3, 2016, stated that the USFWS have no objections to the project as currently proposed. This precludes the need for further consultation on this project as required under Section 7 of the Endangered Species Act of 1973, as amended. However, should new information arise pertaining to project plans or a revised species list be published, it would be necessary for the Federal agency to reinitiate consultation. Appendix I includes coordination correspondence with USFWS.

An early coordination letter was also sent to the IDNR on May 2, 2016. In correspondence dated June 2, 2016, the IDNR indicated that the Natural Heritage Database identified the Rose Turtlehead (Chelone obliqua var. speciose), a plant on the state watch list, as being documented within a half mile of the project area. However, the IDNR, Division of Nature Preserves does not anticipate any impacts on this species. Their correspondence further indicates documentation of the three faunal species within a half mile of the project area, the state endangered Kirtland's Snake (*Clonophis kirtlandii*), the state special concern Peregrine Falcon (*Falco peregrinus*), and the American Badger (*Taxidea taxus*). According to IDNR records, a Peregrine Falcon nest is located 0.8 mile from the project area and is a suitable distance to provide buffer against any disturbance. Indiana is at the eastern edge of the American Badger's natural range, which continues to expand as a result of land use changes from forest to farmland and open pastureland. The IDNR has determined impacts on the Peregrine Falcon and the American Badger are unlikely as a result of this project. With respect to Kirtland's Snake, the IDNR indicates it inhabits urban landscapes and are regularly found in the Indianapolis metropolitan area. The species is known for using crawfish burrows during both the active (April 15 – November 1) and inactive (November 1 – April 15) phase as hibernaculum and for refuge, while using manmade trash and debris only during the active phase for refuge and cover. In order to avoid impacts on Kirtland's Snake, the IDNR recommends:

a) For work occurring during the active season, all trash and debris should be removed from the worksite one week prior to construction. A trenched-in drift fence should be placed around the construction site and remain in place until work is completed. Any snakes found within the construction area, regardless of species, should be removed, unharmed, and immediately relocated to suitable habitat outside the drift fence and away from roads.

b) If work is planned to occur during the inactive season and crawfish burrows are present within the construction limits, then no work should occur until the active season begins and the above guidelines are followed.
c) If work is planned to occur during the inactive season and no crawfish burrows are present or have been known to occur at the site, then no impacts are foreseen as a result of the project.

Crawfish burrows are typically present in areas near waterways or drainage depressions. With the exception of the seven crossed waterways identified in Section S above, the majority of this project occurs within an environment where drainage is facilitated by a storm sewer system. Therefore, the majority of the stations to be constructed are unlikely to encounter any crawfish burrows. However, the incorporation of IDNR Condition (a) would assist in keeping transient snakes from entering the construction area. It should be ensured that stations where added drainage structures to adjacent waterways are required are constructed between April 15 and November 1, the active season of Kirtland's Snake, due to likely potential to encounter crawfish burrows. Appendix I includes coordination correspondence with IDNR.

With the incorporation of IDNRs comments as commitments, the Red Line Project would not adversely affect any state or federally threatened or endangered species, or ecologically sensitive areas.

U. Impacts on Safety & Security

No impacts on safety or security are anticipated to result from the project. The Red Line Rapid Transit project has the potential to enhance the safety and security of the corridor for all roadway users. The project would include pedestrian improvements around all stations, including restriped crosswalks and enhanced accessibility through sidewalks and ramps. New crosswalks, pedestrian signals, and transit signals for holding buses would be installed at stations, where appropriate, to enhance safety for pedestrians, motorists and other users of the roadway.

The addition of new stations and safer pedestrian crossings could contribute to a safer environment by providing security measures such as more lighting and new security cameras at proposed station areas. In addition, a new skywalk would be installed to connect the 30th Street Station with the Children's Museum, allowing museum-goers to walk from the transit station without crossing vehicular travel lanes.

Where the project would involve a bus-only travel lane, safety would potentially be enhanced for all roadway users due to the traffic-calming effects of segregating uses and reducing the number of vehicular lanes.

V. Impacts Caused by Construction

Construction would primarily consist of earth removal and hauling, grading, repaving and restriping of lanes, median and landscaping improvements, sidewalk improvements, streetscaping and

installation of curb extensions for enhanced pedestrian space at BRT station intersections, and placement of shelters and other BRT station features.

Construction would predominantly take place during daylight hours, and would take into account peak travel hours so as to minimize delays wherever possible. Some nighttime work may be required where specific work activities would disrupt traffic or create safety concerns.

Traffic delays would likely occur during construction, but would be temporary in nature. Detours with alternative routing and appropriate signage would be provided to maintain access for motorists, transit riders, and pedestrians. Some closures to streets and intersections as well as removal of on-street parking would occur; however, these closures would be limited in duration. Detailed maintenance of traffic plans would be developed during final design in coordination with Department of Public Works (DPW) to ensure safety during construction and emergency vehicle access is not impeded.

General construction noise impacts for passersby and individuals living or working near the project can be expected. In some areas, construction noise impacts can be expected to be greater due to the close proximity of existing housing. However, considering the relatively short-term nature of construction noise at any one location and daytime scheduling of construction activities along the project corridor, these impacts are not expected to be substantial.

No major impacts would occur to water resources during construction. Best management practices and the appropriate erosion and sediment control measures would be employed during construction to offset any potential surface run-off or soil erosion.

Prior to construction, procedures for identifying, characterizing, managing, handling, storing, and disposing of contaminated soil and groundwater encountered during construction activities would be developed by the construction contractor as part of the project construction plan. These procedures would cover the entire project area, as it is assumed that all material has at least some level of contamination associated with it. Contaminated material encountered during construction would be disposed of at a facility permitted to accept such material.

No relocation of utilities under the Project Corridor would be needed. Utility relocation at station areas would consist of valves, fire hydrants, electric poles, utility boxes, and vaults. Where utility access is required underneath station areas, utility relocations may be required; however, this work would be short-term in duration and could be completed in tandem with other roadway restriping and paving work to minimize impacts on traffic flow during this time.

Appendices