Final Report

I-270 North Environmental Assessment
I-70 to the Chain of Rocks Bridge
Saint Louis County, Missouri

MoDOT Job Number: J6I3020

Prepared for

MoDOT – Missouri Department of Transportation
Saint Louis Area District
1590 Woodlake Drive
Chesterfield, MO 63017

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I-270 NORTH IMPROVEMENT PROJECT

Environmental Assessment

Saint Louis County, Missouri

MoDOT Job Number: J6I3020

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U.S. Department of Transportation – Federal Highway Administration and
Missouri Department of Transportation

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The Missouri Department of Transportation (MoDOT), in cooperation with the Federal Highway Administration (FHWA), is preparing a Location Study and National Environmental Policy Act (NEPA) investigation for a portion of Interstate 270 (I-270) in northern Saint Louis County, Missouri. This study will be referred to as the I-270 North Environmental Assessment (EA) study. The I-270 North EA study is a transportation study that will investigate and identify improvements to allow I-270 to fulfill its role as a major interstate artery within the area's transportation system. The study area starts at the I-70/I-270 interchange in Bridgeton and continues east along I-270 to the Mississippi River/Chain of Rocks Bridge.

The Federal Highway Administration signature gives approval to distribute this information for public and agency review and comment. Such approval does not commit to approve any future grant requests to fund the preferred alternative.

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Acronyms and Abbreviations

µg/m^3	microgram(s) per cubic meter
ACHP	Advisory Council on Historic Preservation
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
AEC	Atomic Energy Commission
AJR	Access Justification Report
APE	area of potential effects
ASTM	ASTM International
BMP	best management practice
CAG	Community Advisory Group
CCS	Context Sensitive Solutions
C-D	collector-distributor
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
CO	carbon monoxide
dB	decibel(s)
dBA	A-weighted decibel(s)
DOI	U.S. Department of the Interior
EA	environmental assessment
EB	eastbound
EJ	Environmental Justice
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPG	Engineering Policy Guide
EWG	East-West Gateway Council of Governments
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Agency
GHG	greenhouse gas
HIS	Hazelwood Interim Storage
I	Interstate
LOS	level(s) of service
LUST	leaking underground storage tank
LWCF	Land and Water Conservation Fund
kHz	kilohertz
MDC	Missouri Department of Conservation
MDNR	Missouri Department of Natural Resources
Metro Transit	Metropolitan Saint Louis Transit Agency
MO	Missouri Route
MOA	Memorandum of Agreement

MoDOT	Missouri Department of Transportation
MS4	municipal separate storm sewer system
MSAT	mobile source air toxic
NAC	Noise Abatement Criteria
NAAQS	National Ambient Air Quality Standards
NB	northbound
NCS	*Interstate 270 North Corridor Study*
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
PA	Programmatic Agreement
PIP	Public Involvement Plan
PM	particulate matter
$PM_{2.5}$	particulate matter less than 2.5 microns in aerodynamic diameter
PM_{10}	particulate matter less than 10 microns in aerodynamic diameter
ppb	part(s) per billion
ppm	part(s) per million
RCRA	Resource Conservation and Recovery Act
RTP 2040	2040 Regional Transportation Plan
SARA	Superfund Amendment and Reauthorization Act
SB	southbound
SEMA	State Emergency Management Agency
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	sulfur dioxide
TAC	Technical Advisory Committee
TDM	Travel Demand Management
TIP	Transportation Improvement Program
TMDL	total maximum daily load
TSM	Transportation System Management
USFWS	U.S. Fish and Wildlife Service
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USGS	U.S. Geological Survey
UST	underground storage tank
VHD	vehicle hours of delay
VHT	vehicle hours traveled
VMT	vehicle miles travelled
VOC	volatile organic compound
WB	westbound

Executive Summary

Proposed Action

The Interstate 270 (I-270) North Environmental Assessment (EA) is a transportation study to investigate and identify improvements to I-270, from the I-70/I-270 interchange in Bridgeton, Missouri, to the Mississippi River/Chain of Rocks Bridge, between Missouri and Illinois. **Figure S-1** depicts the vicinity of the study area for the I-270 North EA.

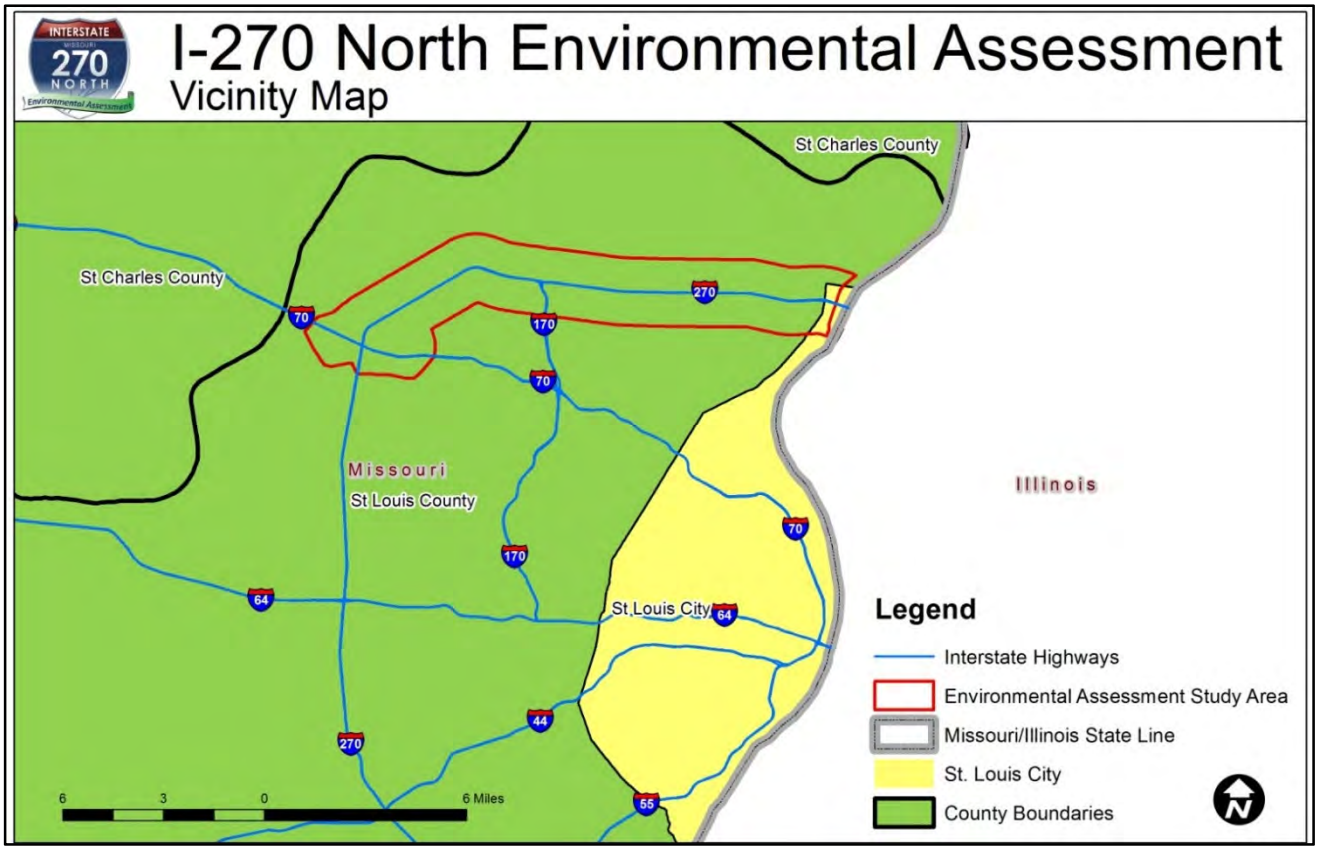

Figure S-1. Vicinity Map

The study's Preferred Alternative includes many elements, consistent with the performance measures as identified in **Table 3-5**. A complete listing of the reconfiguration of the corridor is available in **Section 3.3.7**. The major elements of the Preferred Alternative are summarized below.

In Area 1: I-70 to McDonnell Boulevard

- Add continuous auxiliary lanes between St. Charles Rock Road and MO 370, northbound (NB) and southbound (SB)
- Reconstruct the St. Charles Rock Road interchange as an improved interchange within the identified footprint
- Add SB auxiliary lane through the MO 370 interchange; maintain existing number of lanes NB
- Improve connections between northbound I-270, MO 370 and Missouri Bottom Road
- Reconstruct the McDonnell Boulevard interchange as an improved interchange within the identified footprint

In Area 2: McDonnell Boulevard to Hanley/Graham Road

- Add continuous auxiliary lanes between McDonnell Boulevard and Lindbergh Boulevard
- Reconstruct the Lindbergh Boulevard interchange as an improved interchange within the identified footprint
- Separate I-270 and Lindbergh Boulevard interchange traffic from Taylor/Lynn Haven
- Add basic lane EB and WB on I-270; east of Lindbergh Boulevard to Route 367
- Add auxiliary lane on eastbound I-270 from Lindbergh Boulevard to I-170
- Maintain/improve two-way Dunn Road and Pershall Road, mainly in existing location

Preferred Alternative

Reasonable Alternative 1, with variation 1a, between West Florissant Avenue and New Halls Ferry Road is the Preferred Alternative.

The Preferred Alternative conforms to Missouri Department of Transportation's (MoDOT's) Engineering Policy Guide (EPG), satisfies the study's Purpose and Need, and fulfills the study's desired operational characteristics/performance measures. It also minimizes impacts to the human and natural environment.

In Area 3: Hanley/Graham Road to Old Halls Ferry Road

- Add basic lane EB and WB on I-270
- Reconstruct Dunn Road and Pershall Road within the identified footprint, improving mobility and maintaining access. This includes conversion to a one way outer road system with turn-around connections where needed.
- Reconstruct the interchanges between Hanley and New Halls Ferry as improved interchanges within the identified footprint
- Construct as many as overpass turnarounds connecting Dunn Road and Pershall Road as necessary to achieve established level of service (LOS), mainline weaves, Vehicle Hours of Delay, and Average Speed performance measures identified in **Table 3-5**.
- Add auxiliary lane(s) EB and WB on I-270 between interchanges

In Area 4: Old Halls Ferry Road to Chain of Rocks Bridge

- Maintain/improve Dunn Road and Pershall Road, mainly in their existing locations and configurations
- Add basic lane EB and WB I-270 from Old Halls Ferry to MO 367
- Reconstruct the MO 367 interchange as an improved interchange within the identified footprint
- Add auxiliary lane EB and WB I-270 from MO 367 to Bellefontaine Road
- Reconstruct the Bellefontaine Road interchange as an improved interchange within the identified footprint
- Relocate Dunn Road to the north at Bellefontaine Road
- Maintain number of existing basic lanes from Bellefontaine Road to the Lilac Avenue interchange
- Reconstruct the Lilac Avenue interchange as an improved interchange within the identified footprint
- Add basic lane EB and WB on I-270 from the Lilac Avenue interchange to Chain of Rocks Bridge
- Reconstruct the Riverview Drive interchange as an improved interchange within the identified footprint

All study exhibits are contained in **Appendix A**[1].

The Preferred Alternative as presented in this I-270 North EA is composed of alternative configurations that meet a set of minimum performance measures agreed upon prior to the development of study alternatives. The performance measures are broken out into corridor-wide measures, as well as location-specific operational measures that are met by the Preferred Alternative, and would be required of any alternate configuration proposals. The Preferred Alternative is depicted on **Figure S-2**. MoDOT intends to take full advantage of savings that may be realized through alternative project delivery options.

Purpose and Need

The term "Purpose and Need" refers to the transportation-related problems that a study is intended to address. The generation and evaluation of alternatives are conducted to develop the most appropriate solution to the identified problems. Ultimately, the identification of a Preferred Alternative will be based, in part, on how well it satisfies the study's Purpose and Need.

In its very broadest sense, the purpose and need of the I-270 North EA can be defined as follows:

The need to address the aging infrastructure along I-270
The need to improve mobility and operations within the I-270 corridor
The need to achieve accessibility consistent with the designated uses of I-270
The need to improve safety within the I-270 corridor

The specific transportation problems that affect the I-270 North EA study area are detailed in the summary of the Purpose and Need Statement in **Section 2**.

Reasonable Alternatives Considered

Based on evaluation and coordination, a series of Reasonable Alternatives were developed. These configurations conform to the study's design standards, satisfy the study's Purpose and Need, and fulfill the study's desired operational characteristics and performance measures. These configurations represent changes to the I-270 corridor that will result in acceptable future conditions. The selection of a Preferred Alternative was based on the differential impacts, costs, and operations that they represent.

The Reasonable Alternatives are shown in **Appendices A and C**. The configurations are numbered and organized into four map areas. The configurations are interchangeable. The Reasonable Alternatives are described as follows:

Reasonable Alternative #1

Map Area #1: I-70 to McDonnell Boulevard
The existing numbers of I-270 lanes is maintained, with auxiliary lanes added to accommodate the operation of I-270. At St. Charles Rock Road, a diverging diamond interchange will replace the diamond interchange. At McDonnell Boulevard, a diverging diamond interchange will replace the existing diamond interchange.

Map Area #2: McDonnell Boulevard to Hanley/Graham Road

[1] Exhibit 1 depicts natural resources (including floodplains and National Wetland Inventory).
Exhibit 2 depicts human resources (including Endangered Species Act screening sites and noise study areas).
Exhibit 3 depicts community resources (including land uses and important community landmarks).
Exhibit 4 depicts the footprint and impacts associated with Reasonable Alternative 1/1a (Preferred Alternative).
Exhibit 5 depicts the footprint and impacts associated with Reasonable Alternative 2/2a.
Exhibit 6 depicts the detailed lane work and transportation improvements associated with the Preferred Alternative.

The only alternative at the existing cloverleaf Lindbergh Boulevard interchange is a partial cloverleaf configuration. It will add an additional lane on I-270, east of Lindbergh Boulevard. It will remove the WB-to-SB loop ramp at Lindbergh Boulevard with a direct connection to the north. Dunn Road will be extended through (under) the interchange. An auxiliary lane will be added (EB) between Lindbergh Boulevard and I-170.

Map Area #3: Hanley/Graham Road to Old Halls Ferry Road

The focus of Reasonable Alternative 1 is converting the outer road system (Dunn Road and Pershall Road) from a two-way system to a one-way system. There are two different variations under consideration (1 and 1a). An additional through lane on I-270 in each direction will be constructed. The interchange ramps within this area will be consolidated into a split diamond configuration. Variation 1 will extend the split diamond configuration from West Florissant Avenue to Old Halls Ferry Road. Variation 1a will limit the split diamond to between West Florissant Avenue to New Halls Ferry Road. To minimize out-of-direction travel on the one-way system, two EB-to-WB U-turn lanes will be added at New Florissant Road and West Florissant Avenue. An additional U-turn lane for both EB to WB and WB to EB located between Elizabeth Avenue and West Florissant Avenue (nearest Knollway Drive) has two options. Auxiliary lanes will be added as needed.

Map Area #4: East of Old Halls Ferry Road to Chain of Rocks Bridge

The only alternative at the existing cloverleaf MO 367 interchange is a partial cloverleaf configuration. It will eliminate two loop ramps, using a fly-over ramp for the EB-to- NB movement and diamond exit ramp from WB I-270 to NB and SB MO 367. At the Bellefontaine Road interchange, the existing diamond interchange will be reconfigured. The slip ramps will be removed and Dunn Road relocated. At the Lilac Avenue interchange, the existing diamond configuration will be modified. Most noticeably, the ramps will be moved closer to I-270. At the Riverview Road interchange, the existing diamond configuration will be modified.

Reasonable Alternative #2

Map Area #1: I-70 to McDonnell Boulevard

The existing numbers of I-270 lanes is maintained with auxiliary lanes added to accommodate the operation of I-270. At St. Charles Rock Road, the existing diamond interchange will be reconstructed with added lanes. At McDonnell Boulevard, a partial cloverleaf interchange will replace the existing diamond interchange. New one-way connector roads will be constructed between Missouri Bottom and McDonnell Boulevard.

Map Area #2: McDonnell Boulevard to Hanley/Graham Road

The only alternative at the existing cloverleaf Lindbergh Boulevard interchange is a partial cloverleaf configuration. It will add an additional lane on I-270, east of Lindbergh Boulevard. It will remove the WB-to-SB loop ramp at Lindbergh Boulevard with a direct connection to the north. Dunn Road will be extended through (under) the interchange. An auxiliary lane will be added (EB) between Lindbergh Boulevard and I-170.

Map Area #3: Hanley/Graham Road to Old Halls Ferry Road

The focus of Reasonable Alternative 2 is retaining the existing two-way Dunn and Pershall Roads. An additional through lane in each direction on I-270 will be constructed. The interchange ramps will also be consolidated into split diamond configurations. Variation 2a will extend the split diamond configuration from West Florissant Avenue to Old Halls Ferry Road. Variation 2 will limit the split diamond to between West Florissant Avenue to New Halls Ferry Road (the opposite of Reasonable Alternative 1). The two-way configuration of Dunn and Pershall Roads will be retained, although some sections of both roads would be relocated. An overpass at Lafayette Street will be added. The New Florissant Road and Washington Street/Elizabeth Avenue interchange and the West Florissant Avenue

and the Halls Ferry interchange essentially operate as two diamond interchanges. Auxiliary lanes will be added as needed.

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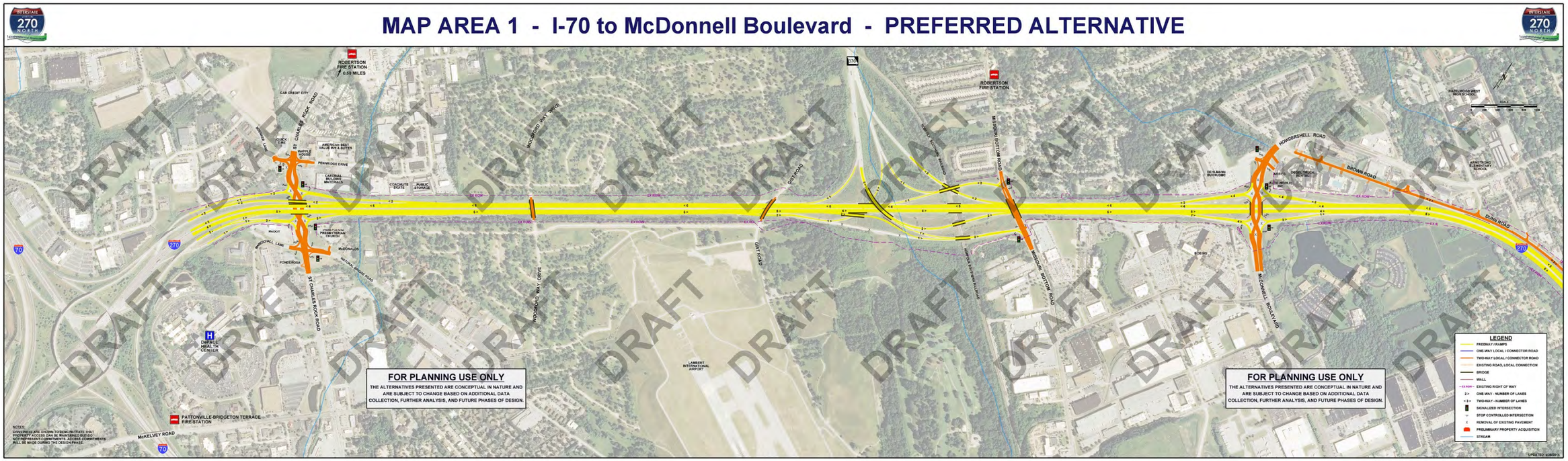

Figure S-2. I-270 North Environmental Assessment Preferred Alternative

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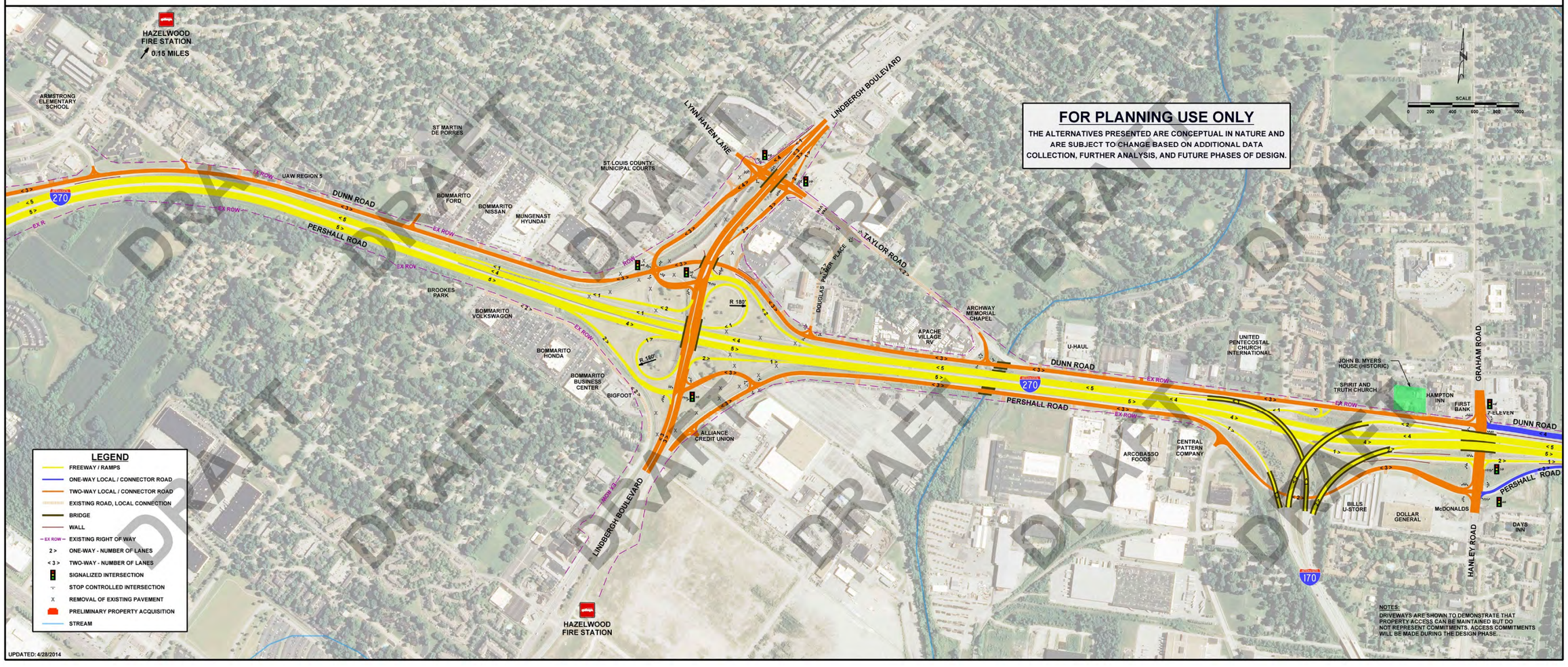
MAP AREA 2 - PREFERRRED ALTERNATIVE
East of McDonnell Boulevard to Hanley Road / Graham Road



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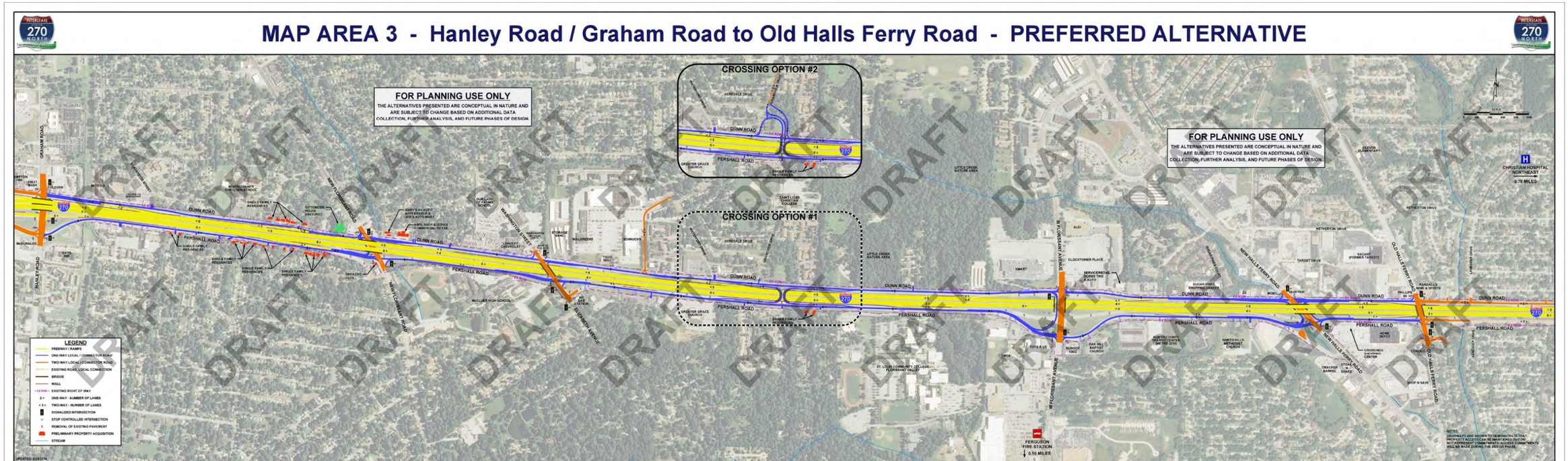

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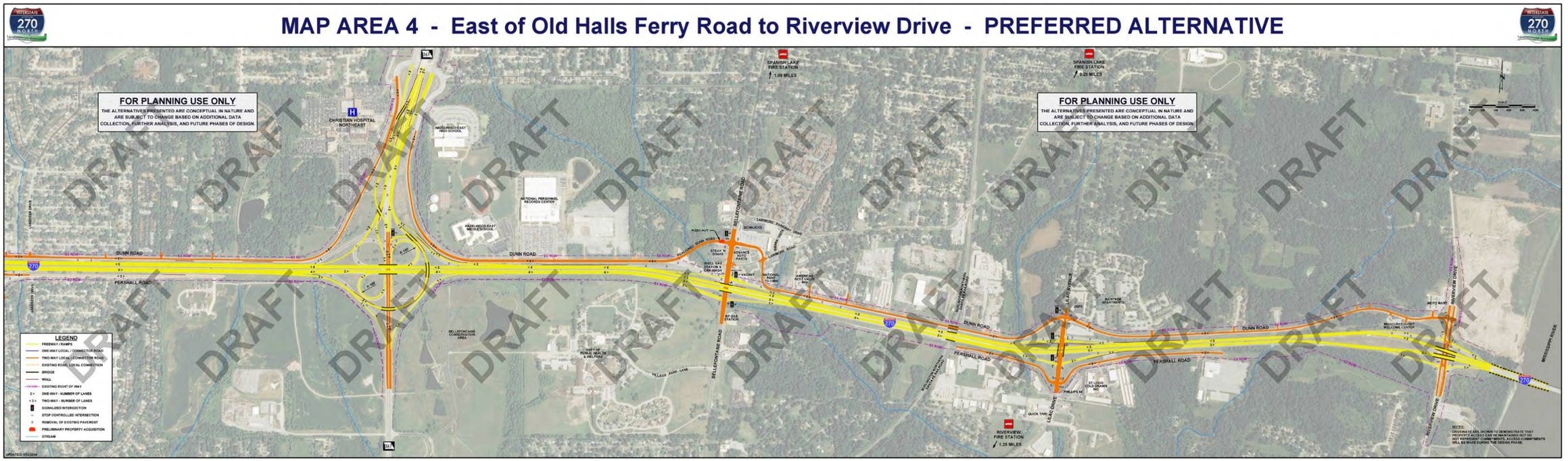

Figure S-2. I-270 North Environmental Assessment Preferred Alternative

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Map Area #4: East of Old Halls Ferry Road to Chain of Rocks Bridge

The only alternative at the existing cloverleaf MO 367 interchange is a partial cloverleaf configuration. It will eliminate two loop ramps, using a fly-over ramp for the EB-to-NB movement and diamond exit ramp from WB I-270 to NB and SB MO 367. At the Bellefontaine Road interchange, the existing diamond interchange will be converted into a partial cloverleaf interchange. At the Lilac Avenue interchange, the existing diamond interchange will be converted into a partial cloverleaf interchange. At the Riverview Road interchange, the existing diamond configuration will be converted into a partial cloverleaf interchange.

Performance Measures

The development and evaluation of alternatives depicted in this I-270 North EA are based on their ability to satisfy the operational characteristics and performance measures that underlie the study's Purpose and Need. The impacts of the alternatives are based on the configurations that emerged by using the engineering standards/design criteria established in the MoDOT EPG.

Because of the corridor size and complexity, MoDOT intends to investigate all available project delivery options, including design-build and/or phased delivery. Alternative project delivery options are intended to identify cost and time saving technologies. MoDOT intends to take full advantage of these savings while remaining consistent with the study's established operational characteristics, performance measures, and Purpose and Need.

Summary of Impacts

The process that led to the identification of the Preferred Alternative included evaluating impacts. The impact analysis was multi-faceted, encompassing numerous elements, such as right-of-way requirements, environmental impacts, socio-economic consequences, disruptions to important cultural resources, community impacts, building relocations, safety, and other engineering considerations along with an examination of the compatibility with local transportation priorities.

Impacts associated with the Preferred Alternative include the acquisition of land and structures, stream and floodplain crossings, alterations to the bike/pedestrian environment, noise impacts, and work in proximity to several neighborhoods. **Tables 3-2** through **3-4,** in **Section 3**, present a summary of the impacts associated with the Reasonable Alternatives. In general, the impacts associated with the Reasonable Alternatives are very similar. **Table S-1** presents an impact summary for the Preferred Alternative.

Based on the evaluation of impacts, a Preferred Alternative emerged. The Preferred Alternative conforms to the criteria contained within the MoDOT EPG, the study's Purpose and Need, and the study's desired operational characteristics/performance measures. It also minimizes impacts to the human and natural environment. **Section 4** presents data regarding the natural and human resources associated with the study area and present study-related impacts for the Reasonable Alternatives and the Preferred Alternative.

Environmental Commitments

If approved, during the design and implementation of the Preferred Alternative, MoDOT is committed to obtaining necessary permits and performing other actions that would minimize and mitigate the impacts of the study on the environment.

Those commitments are listed in **Section 5**.

Public Involvement/Agency Coordination

The public involvement techniques used for this study included newsletters, a website, news media releases, formal and informal meetings, and other general coordination. The agency coordination process included multiple collaboration points where study updates were provided and input requested. **Section 6** discusses the public involvement and agency coordination activities that have been conducted. Public involvement efforts will continue throughout the duration of the study.

Project Coordination in 2016

In early 2015, the I-270 North EA was suspended as part of a funding shortfall. The study was restarted in mid-2016. Overall, the basic nature of the study is unchanged from the suspension including alternatives, construction methods, and techniques. Some techniques, such as cost estimating and crash evaluations, have evolved. As necessary, those have been updated. New information, such as the updated long-range transportation plan (Connected2045), were also incorporated into the analysis. As necessary, impact analyses were also updated based on new or revised regulations. Public involvement and stakeholder coordination was restarted and is documented here.

Table S-1. Environmental Impact Summary for the Preferred Alternative
I-270 North Environmental Assessment

DESCRIPTION	PRELIMINARY STRUCTURE ACQUISITION ESTIMATES	PRELIMINARY PROPERTY ACQUISITION ESTIMATES	PARKS AND RECREATION IMPACTS	ENVIRONMENTAL JUSTICE IMPACTS	WATERWAY IMPACTS	BIKE/PED IMPACTS	KEY TRAFFIC PATTERN IMPACTS
SAINT CHARLES ROCK ROAD							
Improved Interchange (Alternative 1)	None	Less than 1 acre	No property acquisition from Carrollton Disc Park; operational impacts are not expected	Diverging diamond interchanges can limit some transit bus and emergency medical services operations.	Nearly identical Cowmire Creek Crossings	Depending on design, diverging diamond interchanges can require pedestrians to cross free-flowing traffic	• Synchronized signals reduce delay • Reduced number of conflict points
MCDONNELL BOULEVARD							
Improved Interchange (Alternative 1)	None	Less than 1 acre	None	Diverging diamond interchanges can limit some transit bus and emergency medical services operations.	None	Depending on design, diverging diamond interchanges can require pedestrians to cross free-flowing traffic	• Synchronized signals reduce delay • Reduced number of conflict points
LINDBERGH BOULEVARD							
Improved Interchange (Alternative 1)	None	± 4 acres	No property acquisition from Brookes Park, but trees within right-of-way may be removed	Improved interchange will benefit local users.	None	Direct Dunn Road connection through Lindbergh Boulevard interchange should improve bike/pedestrian operations	• Improved connection between WB 270 and NB Lindbergh Boulevard • Improved connection for SB Lindbergh Boulevard and WB I-270 • Eliminating loop ramp reduces conflicts • Continuous Dunn Road under Lindbergh Boulevard
HANLEY ROAD/GRAHAM ROAD							
Improved Interchange with One-Way Dunn/Pershall Roads (Alternative 1)	Two single-family residences at Pershall Road and Brackleigh Lane	Less than 2 acres	No expected impacts to the Myers House	Metropolitan Saint Louis Transit Agency (Metro Transit) estimates that one-way outer roads will increase their operating expenses.	None	One-way outer roads tend to benefit pedestrians (because of fewer conflict points). One-way outer roads tend to result in out-of-direction travel by bicyclists, thus creating more conflicts with automobiles	• Dunn and Pershall Roads operate as one-way outer roads • Access to/from I-270 via slip ramps
NEW FLORISSANT ROAD TO WASHINGTON STREET/ELIZABETH AVENUE							
Improved Interchange with One-Way Dunn/Pershall Roads (Alternative 1)	• Twenty-one single-family residences: six at Santa Cruz Drive, and fifteen between DuBourg Lane and Jean Drive • Plaza Duchesne: Kwik Mart and five others and Gary's A+ Auto/ Joe's Auto Mart • Creative Cuts: Pershall/Jean	± 13 acres	None	One-way operation at New Florissant Road and Washington Street is primarily within the existing corridor. Important exceptions include the creation of a connection between Dunn Road and Waterford, behind the Grandview Plaza Shopping Center and the possible mid-block crossover at Grandview Drive.	Limited culvert extensions for Fountain Creek	One-way outer roads tend to benefit pedestrians (because of fewer conflict points). One-way outer roads tend to result in out-of-direction travel by bicyclists creating more conflicts with automobiles	• Dunn and Pershall Roads operate as one-way outer roads • Access to/from I-270 via slip ramps

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DESCRIPTION	PRELIMINARY STRUCTURE ACQUISITION ESTIMATES	PRELIMINARY PROPERTY ACQUISITION ESTIMATES	PARKS AND RECREATION IMPACTS	ENVIRONMENTAL JUSTICE IMPACTS	WATERWAY IMPACTS	BIKE/PED IMPACTS	KEY TRAFFIC PATTERN IMPACTS
WEST FLORISSANT AVENUE TO OLD HALLS FERRY ROAD							
Improved Interchange from West Florissant Avenue to New Halls Ferry Road with One-Way Dunn/Pershall (Alternative 1a)	None	± 6 acres	Little Creek Nature Area: Acquisition limited to narrow linear strip along Dunn Road. Driveway will be improved as necessary	Metro Transit estimates that one-way outer roads will increase their operating expenses. Additional turnarounds provided from WB Dunn Road to EB Pershall Road between Washington Street /Elizabeth Avenue and West Florissant Avenue and from EB Pershall Road to WB Dunn Road at New Halls Ferry Road.	All alternatives have limited culvert extensions of existing culverts within Maline Creek tributaries at New Halls Ferry Road and Old Halls Ferry Road. These alternatives have no other impacts	One-way outer roads tend to benefit pedestrians (because of fewer conflict points). One-way outer roads tend to result in out-of-direction travel by bicyclists, thus creating more conflicts with automobiles	• Dunn and Pershall Roads operate as one-way outer roads • Access to/from I-270 via slip ramps • No direct ramps from WB I-270 to Old Halls Ferry Road
MO 367							
Improved Interchange (Alternative 1)	None	± 1 acres	No direct impacts to Bellefontaine Conservation Area	-	Limited culvert extensions of existing culverts for Maline Creek tributaries	-	• Provides free flow movement from EB I-270 to MO 367 • Ramps on SB MO 367 to transition from freeway to arterial • Removes two loop ramps, thus improving safety and operations
BELLEFONTAINE ROAD							
Improved Interchange (Alternative 1)	Pizza Hut restaurant	± 8 acres	None	-	New crossing of Watkins Creek for relocated Dunn Road and replacement of existing culverts elsewhere	-	• Removes slip ramps • Relocates Dunn Road
LILAC AVENUE							
Improved Interchange (Alternative 1)	None	None	None	-	None	-	• Moves WB I-270 ramps closer to the freeway to avoid relocating Dunn Road
RIVERVIEW DRIVE							
Improved Interchange with Two-Way Dunn Road (Alternative 1)	None	None	No impact to Dundee Park or Watkins Estate	-	Limited culvert extensions of existing culverts within Watkins Creek	-	• Will require extension of ramps to the east when the bridge is replaced

SECTION 1

Introduction and Study Overview

1.1 Study Overview

The Missouri Department of Transportation (MoDOT), in cooperation with the Federal Highway Administration (FHWA), is preparing a Location Study and National Environmental Policy Act (NEPA) investigation for a portion of Interstate 270 (I-270) in northern Saint Louis County, Missouri. This study will be referred to as the I-270 North Environmental Assessment (EA). The I-270 North EA is a transportation study that will investigate and identify improvements to allow I-270 to fulfill its role as a major interstate artery within the area's transportation system. The study area starts at the I-70/I-270 interchange in Bridgeton and continues east along I-270 to the Mississippi River/Chain of Rocks Bridge. **Figure 1-1** depicts the vicinity of the study area for the I-270 North EA.

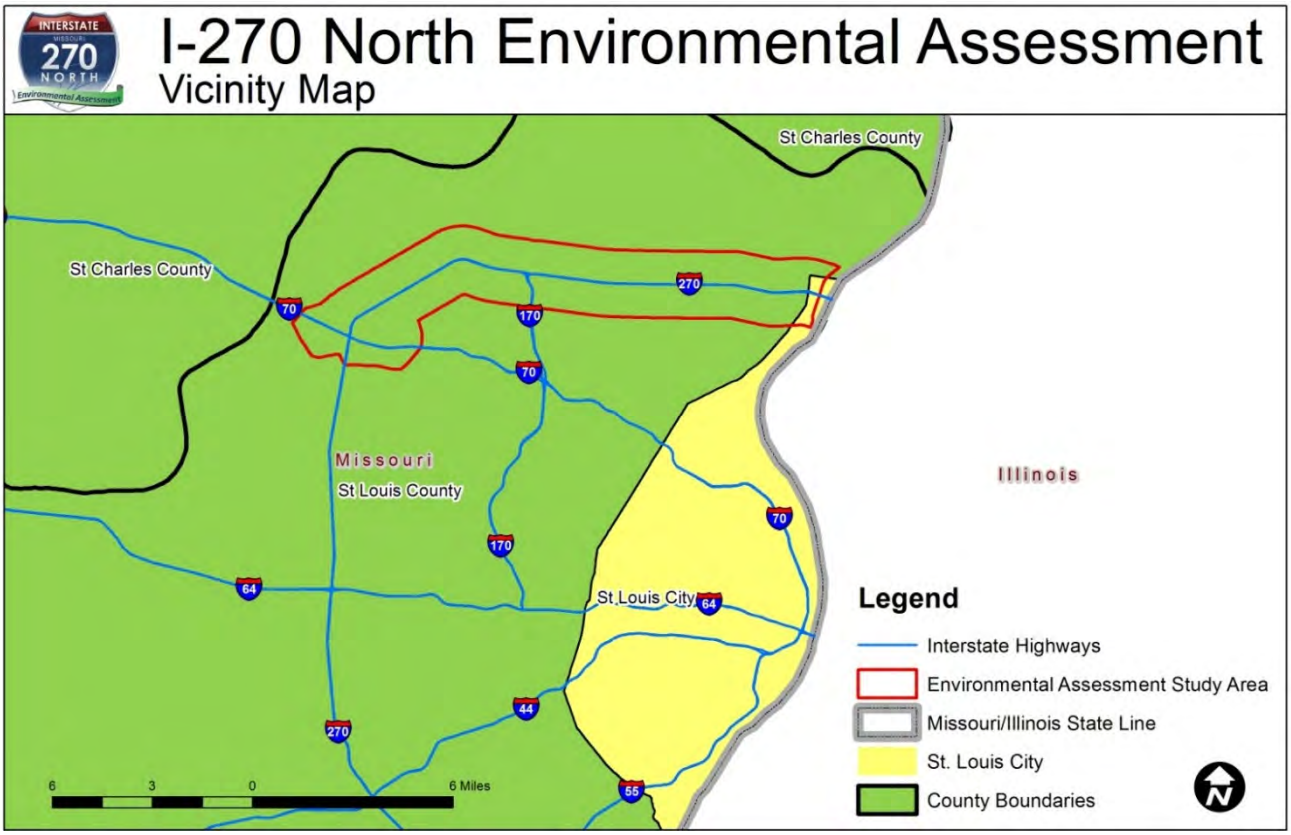


Figure 1-1. I-270 Vicinity Map

1.2 Study Background

The I-270 North EA is the result of previous investigations. In 2005, the Board of Directors of the region's Metropolitan Planning Organization, the East-West Gateway Council of Governments (EWG), adopted *Legacy 2030*, the long-range transportation plan for the Missouri-Illinois (Metropolitan Saint Louis) region. The plan recommended a planning study of the I-270 corridor in north Saint Louis County. *Legacy 2030* recognized increasing traffic volumes and crashes, aging and outdated infrastructure, increasing need for public transportation service, and the growing and important role that I-270 plays in the movement of goods and commuters.

In October 2012, MoDOT, in cooperation with EWG, completed a planning study of I-270 in North Saint Louis County. Known as the *I-270 North Corridor Study* (NCS), this work examined the problems of the I-270 corridor and identified possible strategies to address those problems. The NCS identified a forecasted increase in traffic of approximately 20 to 25 percent by the year 2040. The NCS concluded that both near- and long-term improvements were worthy of further analysis and consideration. The near-term concepts included the addition of an auxiliary lane on eastbound (EB) I-270 between U.S. Route 67/Lindbergh Boulevard (Lindbergh) and I-170, restriping westbound (WB) I-270 at Lindbergh to improve lane configuration, and modifications along McDonnell. The long-term concepts included widening I-270, a reconfigured two-way outer road system, a new one-way outer road system, and interchange reconfigurations at the Lindbergh and Missouri Route (MO) 367 interchanges. These concepts were intended to be carried forward for a more detailed environmental evaluation under the NEPA process. The NCS study serves as the foundation for the I-270 North EA.

The updated long-range transportation plan, *Connected2045,* was approved on June 24, 2015, by the EWG Board of Directors. All elements of the Preferred Alternative are included in the long-range plan and are included in the region's air quality conformity analysis.

The projects are intended to be developed in phases as summarized in **Table 1-1**.

Table 1-1. I-270 Projects in the Long Range Plan

Project #	Location	Year of Expenditure Costs*	Period
2045019	I-170 To Lindbergh Boulevard (from east of McDonnell Blvd. to west of Hanley/Graham Rd.)	$93,000,000	2016-2025
2045018	Old Hall Ferry Road to Hanley/Graham Road (from east of Old Halls Ferry Rd. to west of Hanley/Graham Rd.)	$289,000,000	2016-2025
2045022	MO 367 Interchange (from east of Old Halls Ferry Rd. to east of Bellefontaine Rd.)	$107,000,000	2026-2035
2045020	Riverview Road to Lilac Avenue (from east of Bellefontaine Rd. to east of Riverview Dr.)	$163,000,000	2026-2035
2045021	McDonnell Boulevard to MO 370 (from east of McDonnell Blvd. to west of MO 370)	$86,000,000	2026-2035
2045023	Dorsett Road to MO 370 (from west of MO 370 to east of Dorsett Rd.)	$211,000,000	2036-2045

* Assumes 3% inflation per year

The first phase will be implemented as MoDOT Project J6I3020B that is included in the 2017 – 2021 Statewide Transportation Improvement Program and in East-West Gateway's 2017-2020 Transportation Improvement Program. As part of the improvements identified in this study, Project J6I3020B will include elements consistent with the Preferred Alternative and will have independent utility (e.g. is a single and complete project that could be constructed absent the construction of other projects in the project area).

In early 2015, the I-270 North EA was suspended as part of a funding shortfall. Restarted in mid-2016. Overall, the study's findings are unchanged from the time of its suspension, including alternatives, construction methods, and techniques. Some techniques, such as cost estimating and crash evaluations, have evolved. As necessary, those have been updated. New information, such as the updated long-range transportation plan (*Connected2045)*, were also incorporated into the analysis. As necessary, impact analyses were also updated based on new or revised regulations. Public involvement and stakeholder coordination was restarted and documented. **Figure 1-2** depicts project implementation phasing based on

the region's long-range transportation plan priority and fiscal capacity. Fiscal capacity refers to the region's projected estimate of funding likely to be available over the next 30 years or so.

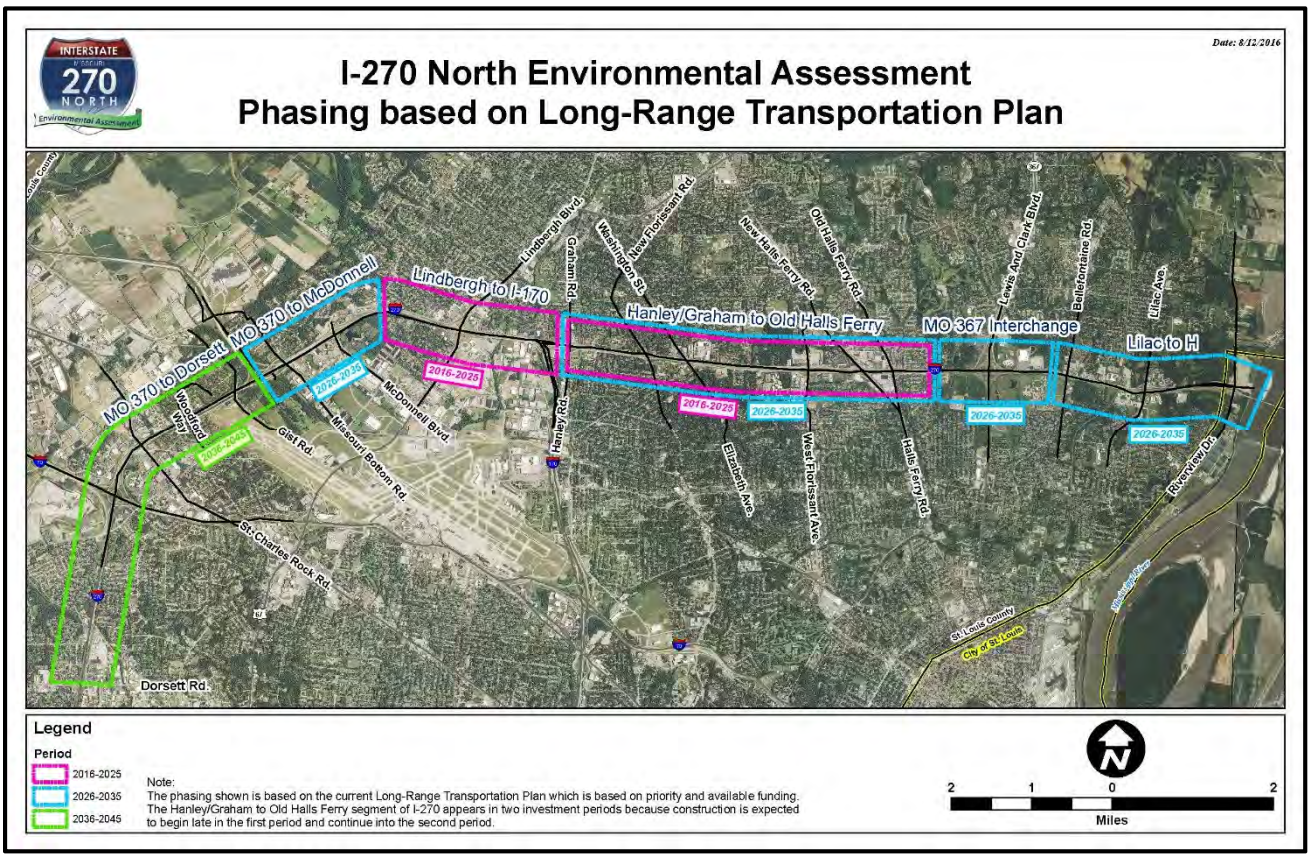


Figure 1-2. I-270 North Environmental Assessment Phasing Map

1.3 Study Area Description

The study area for the I-270 North EA includes the entire portion of I-270 between the I-70/I-270 interchange and the Chain of Rocks Bridge—a total distance of roughly 16 miles. For initial data collection purposes, the study width is roughly 1 mile beyond the interstate roadway elements limits. **Figure 1-2** depicts the expanded study area. As part of the study, a utility resources review was conducted for those areas most likely to be affected by an improved I-270. The study area for the utility resources review is also shown on **Figure 1-3**.

The study area for the I-270 North EA is within the northern portion of Saint Louis County. Known as North County, it encompasses numerous municipalities and unincorporated areas and the northern city limits of Saint Louis. Specifically, the study area encompasses portions of the following municipalities:

- Bellefontaine Neighbors
- Dellwood
- City of Saint Louis
- Berkeley
- Glasgow Village
- Unincorporated Saint Louis County
- Champ
- Ferguson
- Spanish Lake
- Black Jack
- Florissant
- Castle Point
- Bridgeton
- Hazelwood
- Calverton Park
- Maryland Heights

According to tax map data, almost half of the land surrounding this portion of I-270 is residential, almost entirely single-family homes. Occupancy rates are high. Roughly two-thirds of the homes are owner-occupied. About half of the residents are minorities. The balance of the land surrounding this portion of

I-270 is equally distributed amongst industrial, commercial, institutional, agricultural/vacant, and transportation uses.

The residential neighborhoods vary widely throughout North County. From historic century homes to condominiums, many different housing options are available. The new housing market is also expanding into the available vacant lands. The socioeconomic status and demographic profiles of the study area is also quite varied. Of particular concern are the potential Environmental Justice (EJ) populations that may be affected. The NCS identified areas with high poverty rates and high percentage of elderly, persons with disabilities, and a sizable minority population, as well as a high percentage of zero-vehicle households. At the same time, North County is home to many of Saint Louis' largest corporations and employers, including Lambert Saint Louis International Airport, which employs more than 11,000 people. Other major regional employers include Boeing, Emerson, World Wide Technology, GKN, and Mallinckrodt Pharmaceuticals.

Healthcare is a leading-edge industry in the study area. North County has two award-winning hospitals. The Christian Hospital Northeast is a 485-bed facility offering the full range of healthcare services and an array of medical and surgical specialties and employs more than 2,500 people. It is located in the northwestern quadrant of the I-270/MO 367 interchange. The SSM DePaul Health Center (northeast quadrant of the I-270/I-70 interchange) is a 450-bed, full-service acute care hospital.

Relative to transportation, North County is centrally located. It is minutes from major employment centers in downtown Saint Louis, Saint Charles County, West Saint Louis County, and downtown Clayton. Earth City Business Park is located in North County. North County is also served by air, water, and rail. North County is home to Lambert International Airport. The MetroLink light rail service provides rapid access from North County to downtown Saint Louis and to western Illinois. The Bi-State bus system also serves North County, with many routes connecting to MetroLink stations. The ability to access public transportation is essential to those living along the corridor. In 2015, Metropolitan Saint Louis Transit Agency (Metro Transit) opened a new Transit Center and bus garage in North County (Pershall Road between West Florissant Avenue and New Halls Ferry Road). The Missouri and Mississippi rivers border North County, offering the option of barge transportation to area commerce. Norfolk Southern, Union Pacific, and Terminal Railroad Association of St. Louis railroads also serve the region.

North County is home to eight accredited public school districts. Major public schools adjacent to I-270 include the following: McCluer High School (between New Florissant Road and Washington/Elizabeth Road), Hazelwood East Middle School and High School (northeast quadrant of the I-270/MO 367 interchange) and Garrett Elementary School (between Missouri Bottom Road and McDonnell Boulevard). The Florissant-Ferguson School District operates an outdoor education facility, known as the Little Creek Nature Center (between Washington/Elizabeth Road and West Florissant Avenue). Private schools adjacent to I-270 include the North County Christian School (Between Graham/Hanley Road and New Florissant Road). North County also has excellent colleges, universities, and technical schools. One of the four campuses of the Saint Louis Community College system, Saint Louis Community College at Florissant Valley, offers a wide range of educational opportunities. The campus is located at 3400 Pershall Road. Saint Louis Christian College is a private 4-year undergraduate Bible college located at 1360 Grandview Drive in Florissant.

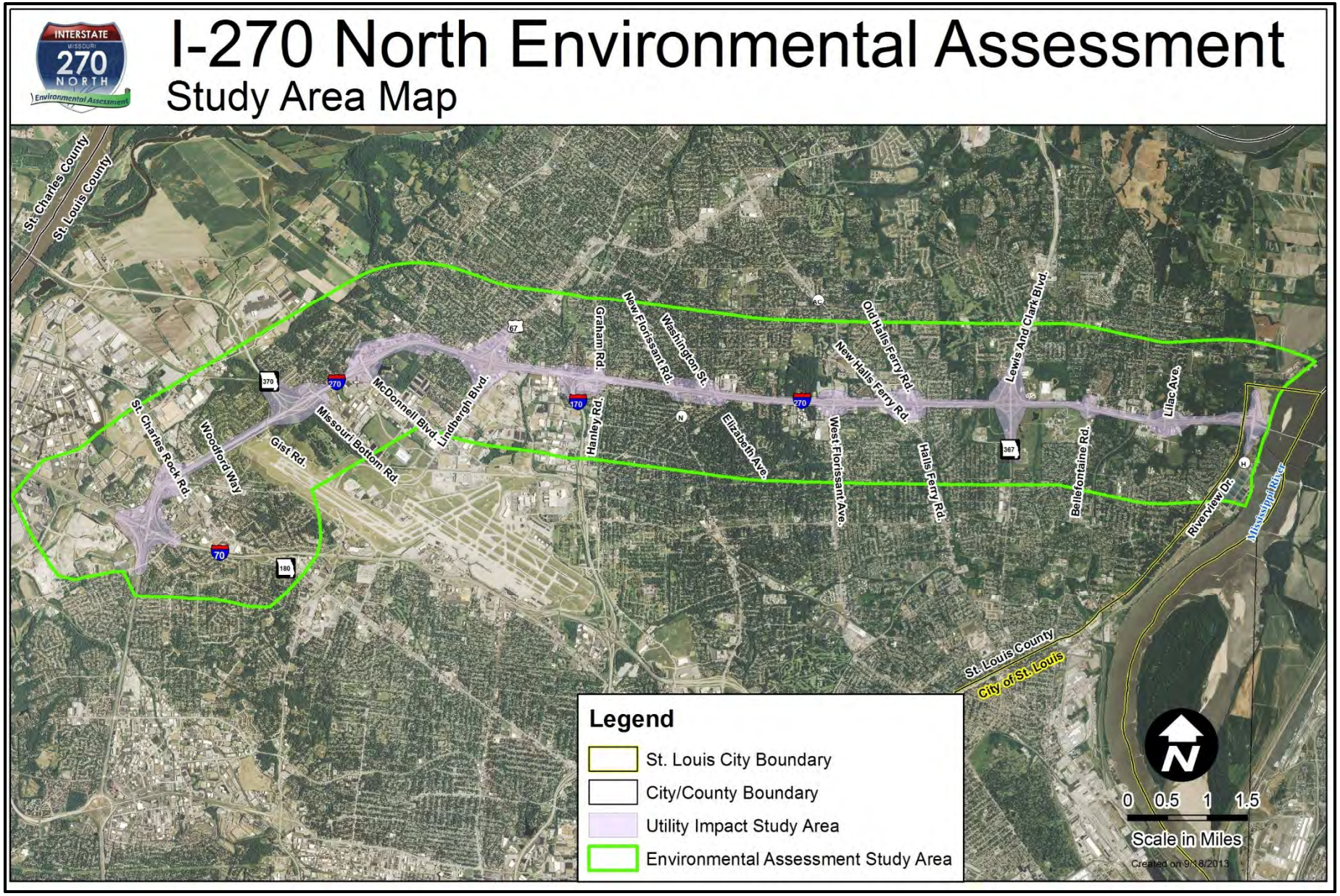


Figure 1-3. I-270 North Environmental Assessment Study Area

1.4 Configuration of I-270

This subsection summarizes the major elements of I-270 within the study area.

1.4.1 Mainline Corridor

According to the American Association of State Highway and Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets*, "designation of the basic number of lanes is fundamental to establishing the number and arrangement of lanes on a freeway. Consistency should be maintained in the number of lanes provided along any route of arterial character. Thus, the basic number of lanes is defined as a minimum number of lanes designated and maintained over a substantial length of a route, irrespective of changes in traffic volume and lane-balance needs." The number of basic lanes through the I-270 North EA study area are defined in **Table 1-2**.

Table 1-2. Basic Lane Configuration along I-270 (from west to east)

From	To	Distance (miles)	Number of Basic Lanes WB	Number of Basic Lanes EB	Total Number of Basic Lanes
West of I-70	East of St. Charles Rock Road	1.6	3	4	7
East of St. Charles Rock Road	West of Lindbergh Boulevard	4.0	4	4	8
West of Lindbergh Boulevard	West of Lilac Avenue	8.6	3	3	6
West of Lilac Avenue	Chain of Rocks Bridge	1.8	2	2	4

AASHTO's *A Policy on Geometric Design of Highways and Streets* defines an auxiliary lane as "the portion of the roadway adjoining the through lanes for speed change, turning, storage for turning, weaving, truck climbing, and other purposes that supplement through-traffic movement." The I-270 mainline has intermittent auxiliary lanes throughout the study area. Existing mainline and auxiliary lanes are 12 feet wide, which satisfies MoDOT's lane width criteria per Engineering Policy Guide (EPG) 231.3. Auxiliary lanes are used to balance the traffic load and maintain a more uniform LOS on the highway.

The majority of I-270 consists of a 12-foot median with paved shoulders and a concrete jersey-type barrier separating the EB and WB lanes. Most outside shoulders are 10 feet wide, which satisfies MoDOT's preference of 10-foot shoulders on major roadways per EPG 231.4. The majority of the inside shoulders are 5 feet wide, which does not meet the 10foot preference. One exception is within the I-170 interchange where the inside shoulders are 12 feet in width.

1.4.2 Crossroads and Pedestrian Facilities

There are numerous crossroads of I-270. **Table 1-3** summarizes each crossroad, including its functional classification, within the study area.

By and large, pedestrian facilities within the corridor are limited and disjoined. There are no sidewalks along MO 180/St. Charles Rock Road, McDonnell Boulevard, Lindbergh Boulevard, North Hanley Road/Graham Road, New Florissant Road, MO 367, Lilac Avenue, and Route H/Riverview (Riverview). Most of these roads have shoulders that are used by pedestrians. Disconnected sections of sidewalks exist along the remaining arterials. Most existing pedestrian facilities along these roadways do not meet Americans with Disabilities Act (ADA) standards.

Table 1-3. Major Crossroads (from West to East)

Crossroad	Crossroad/Interchange Type	Functional Classification
I-70	System Interchange	Interstate
St. Charles Rock Road	Service Interchange	Principal Arterial
Woodford Way Drive	Overpass	Minor Arterial
Gist Road	Overpass	Urban Collector
MO 370	System Interchange	Freeway
Missouri Bottom Road	Partial Interchange	Urban Collector
McDonnell Boulevard	Service Interchange	Principal Arterial
Lindbergh Boulevard	Service Interchange	Principal Arterial
I-170	System Interchange	Interstate
Hanley/Graham Road	Service Interchange	Principal Arterial
South Lafayette Street	Pedestrian Overpass	-
New Florissant Road	Service Interchange	Minor Arterial
McCluer High School	Pedestrian Overpass	Scheduled for Removal
Washington/Elizabeth Road	Service Interchange	North – Minor Arterial South -– Urban Collector
West Florissant Avenue	Service Interchange	Principal Arterial
New Halls Ferry Road	Service Interchange	Principal Arterial
Old Halls Ferry Road	Service Interchange	Minor Arterial
MO 367	Service Interchange	North – Freeway South – Principal Arterial
Bellefontaine Road	Service Interchange	Minor Arterial
Lilac Avenue	Service Interchange	Urban Collector
Riverview Drive	Service Interchange	North – Principal Arterial South – Urban Collector

1.4.3 Interchanges

Within the 16-mile study area, there are 19 interchanges. MoDOT's Access Management Guidelines recommend a spacing of 2 to 3 miles between interchanges on major roadways in urban areas; currently, no interchange spacing in the corridor meets these guidelines. These interchanges are described in **Table 1-4**.

Table 1-4. I-270 Study Area Interchange Descriptions

Interchange	Description
I-70/I-270 Interchange	Fully directional interstate to interstate (0.8 mile to St. Charles Rock Road interchange)
St. Charles Rock Road Interchange	Diamond interchange (1.7 miles to MO 370 interchange)
MO 370 Interchange	Fully directional interstate-to-interstate-type interchange (0.4 mile to Missouri Bottom)
Missouri Bottom Interchange	Partial diamond interchange (0.7 mile to McDonnell interchange)
McDonnell Interchange	Traditional full diamond (1.7 miles to Lindbergh interchange)
Lindbergh Interchange	Modified cloverleaf with WB collector-distributor (C-D) to separate weaving traffic from mainline I-270 (1.1 miles to I-170 interchange)
Lindbergh Interchange at Lynn Haven Lane/Taylor	Diamond interchange (0.3 mile from I-270 at Lindbergh interchange)
I-170 Interchange	Fully directional interstate-to-interstate (0.2 mile to Hanley/Graham Road interchange)
Hanley/Graham Road Interchange	Crossover slip ramps to Dunn Road for WB, diamond ramps for EB (1.0 mile to New Florissant interchange)
New Florissant Interchange	Crossover slip ramps to Dunn Road for WB, diamond ramps for EB (0.5 mile to Washington/Elizabeth interchange)
Washington/Elizabeth Interchange	Crossover slip ramps to Dunn Road for WB exit, no WB entrance, diamond ramps for EB (1.5 miles to West Florissant interchange)
West Florissant Interchange	Crossover slip ramps to Dunn Road for WB, diamond ramps for EB New Halls Ferry (0.7 mile to New Halls Ferry interchange)
New Halls Ferry Interchange	Crossover slip ramps to Dunn Road for WB, split-diamond interchange with Old Halls Ferry for EB (0.3 mile to Old Halls Ferry interchange)
Old Halls Ferry Interchange	Crossover slip ramps to Dunn Road for WB exit, no WB entrance, split-diamond interchange with New Halls Ferry) for EB exit (1.2 miles to MO 367 interchange)
MO 367 Interchange	Traditional cloverleaf (1.0 mile to Bellefontaine)
MO 367 Interchange at Dunn	Partial diamond Interchange south of Dunn Road with slip ramps north of Dunn Road (0.6 mile of I-270)
Bellefontaine Interchange	Crossover slip ramps to Dunn Road for WB, diamond ramps for EB Bellefontaine (1.0 mile to Lilac interchange)
Lilac Interchange	Traditional full diamond (1.2 miles to Riverview Drive interchange)
Riverview Drive Interchange	Traditional full diamond

1.4.4 Outer Road System

An important feature of the I-270 corridor is the outer road system that helps connect local roadways to I-270.

The northern outer road is a largely continuous two-way road known as Dunn Road. It generally parallels I-270 from McDonnell to Riverview Drive. The total length of Dunn Road adjacent to I-270 is 12.3 miles, covering roughly 80 percent of the study area. Dunn Road consists of one 12-foot lane in each direction of travel, with turn bays at intersections. The lanes at intersections are often less than 12 feet wide. Dunn Road provides access to private and commercial properties, including Christian Hospital Northeast and Hazelwood

East High School. A number of the signalized at-grade intersections along Dunn Road do not adhere to MoDOT's Access Management Guidelines.

Most existing pedestrian facilities throughout the I-270 corridor do not meet ADA standards. Sidewalks consist of a number of discontinuous segments. In areas with no sidewalks, the shoulders are used by pedestrians. In other non-sidewalk locations, pedestrian use is evident by the existence of "cow paths" that have formed when pedestrians repeatedly travel through vegetated properties. Additionally, the majority of the sidewalks are set back from the edge of shoulder, and provide no connection between the sidewalks and shoulders. Therefore, at these locations, the shoulders must accommodate bus stops.

The southern outer road is a relatively non-continuous two-way road known as Pershall Road. It generally parallels I-270 between Lindbergh and Riverview Drive. The total length of Pershall Road is roughly 6.7 miles (44 percent of the study area). Pershall Road consists of one 12-foot lane in each direction with turn bays at various intersections. There is a one-way segment between New Halls Ferry and Old Halls Ferry Road. The two-way portions of the south outer road provide access to a number of private, commercial, and institutional properties such as Saint Louis Community College – Florissant Valley. All entrances and public street connections to the south outer road are on the south side of the street. No direct access points are located between I-270 and the southern outer road. There is no sidewalk along either the north or south side of the south outer road. The shoulders are used by pedestrians to walk along the road and to access bus stops. In contrast to Dunn Road, slip ramps are not used to provide access to/from I-270. **Figure 1-4** shows the location of the outer roads.

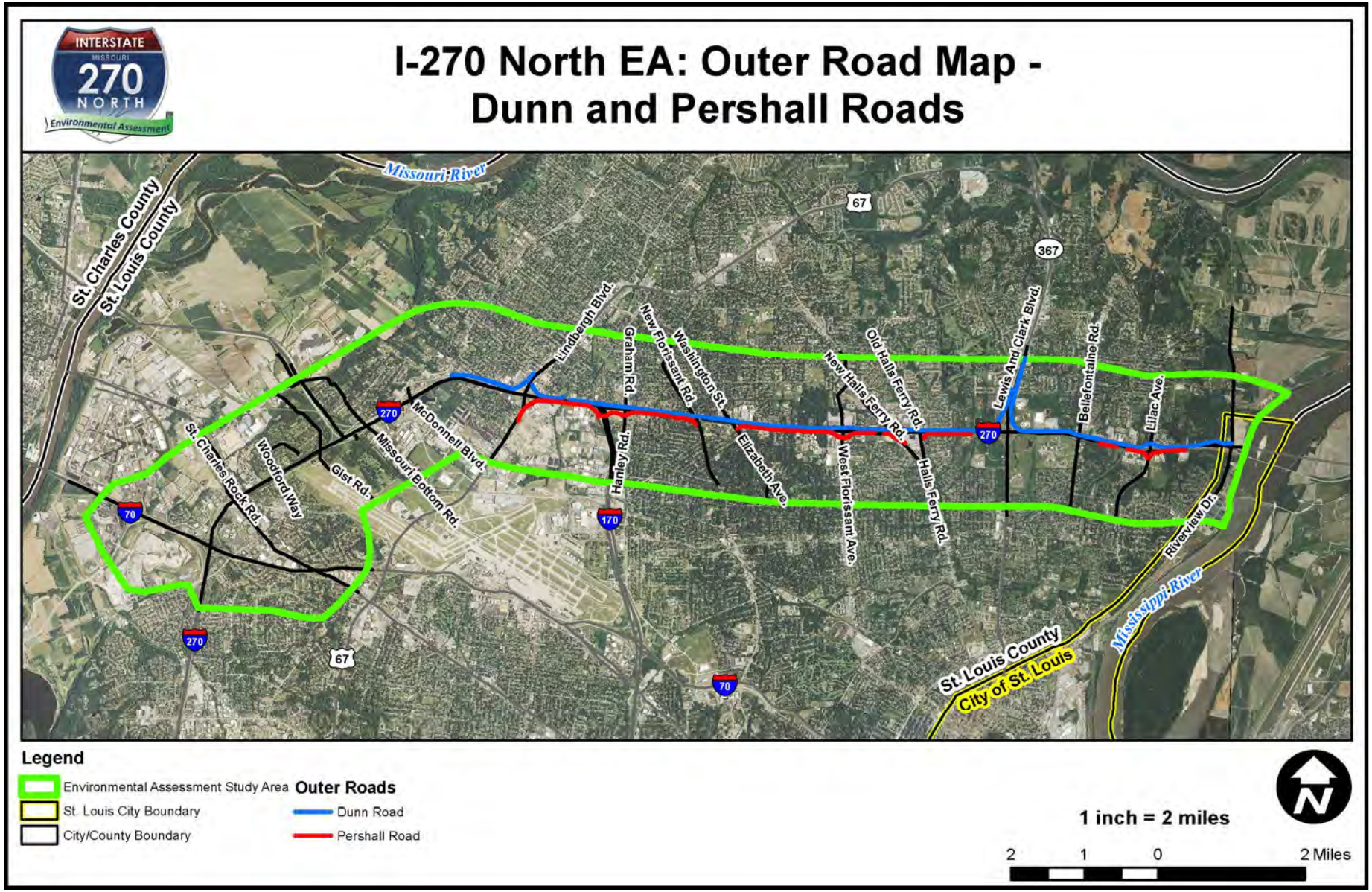


Figure 1-4. Outer Road System – Dunn Road and Pershall Road

SECTION 2

Purpose and Need

The term "Purpose and Need" refers to the transportation-related problems that a study is intended to address. The generation and evaluation of alternatives are conducted to develop the most appropriate solution to the identified problems. Ultimately, the identification of a preferred alternative will be based, in part, on how well it satisfies the study's Purpose and Need.

In its very broadest sense, the purpose of the I-270 North EA study can be defined as follows:

- The need to maintain the aging infrastructure along I-270
- The need to improve mobility and operations within the I-270 corridor
- The need to achieve accessibility consistent with the designated uses of I-270
- The need to improve safety within the I-270 corridor

These broad concepts can be defined through the specific transportation problems that affect the I-270 North EA study area. These problems are summarized below and relate to one or more of the basic needs listed above. These transportation problems are listed in no particular order, but are often interrelated. These will be discussed below within the framework of the following nine major elements.

The specific transportation problems that affect the I-270 North EA study area include the following:

1. Deteriorating Infrastructure along I-270
2. Deteriorating Operation of I-270
3. Inconsistent Interchange Operations
4. Inconsistent Operations along the Outer Road System
5. System Creates Safety Conflicts
6. Non-motorized Travel within Study Area is Difficult
7. Need to Accommodate Operations between Transit and Highway Users
8. Difficult Pathways to Important Destinations
9. Increasingly Inefficient Goods Movement

Major Element #1 – Deteriorating Infrastructure along I-270
The I-270 North corridor is among the oldest freeways in the Saint Louis area. Although portions of the corridor have been reconstructed or widened, much of the corridor's infrastructure has outlived or is nearing its usable life.

Major Element #2 – Deteriorating Operation of the I-270 Freeway
Many segments of I-270 throughout the study corridor have existing and future LOS that are below MoDOT's desired operating level.

Major Element #3 – Inconsistent Interchange Operations
Nineteen interchanges are located on I-70 within the 16-mile study area. Many challenges that travelers experience are the result of the tight spacing of interchanges and the numerous, and the closely spaced weaving sections that result. Specific transportation problems identified include the following:

- Weaving operations within the I-270 interchanges are difficult
- Substandard operations along the crossroads of I-270
- Low operating speeds within some of the interchange movements

Major Element #4 – Inconsistent Operations along the Outer Road System
Dunn Road and Pershall Road serve as north and south outer roads, respectively, to the I-270 mainline throughout most of the study area. These outer roads are used to distribute and collect traffic between local streets and freeway interchanges. The slip ramps to and from I-270 and Dunn Road create confusion for drivers and negatively affect operations on the outer road and I-270. In addition, several

gaps exist in Pershall Road at key locations, which limits the effectiveness of the outer road system to function as a collector and distributor of traffic between the freeway and local streets.

Major Element #5 – System Creates Safety Conflicts

According to crash data from MoDOT's Traffic Management System for the period between 2010 and 2014, 9,784 crashes occurred within the study area. This translates to approximately five crashes per day and one fatality every 2 months. While this is an oversimplification (because crashes are random events that do not happen at regular frequencies), the numbers nevertheless paint a picture of the frequency of crashes within the study area.

Major Element #6 – Non-motorized Travel within Study Area is Difficult

I-270 creates a substantial barrier to non-motorized movements. Most existing pedestrian facilities within the study area do not meet current ADA standards, such as curb ramps, and much of the existing sidewalks are discontinuous along the crossroads and outer roads or simply do not exist. As a result, the study area lacks connectivity along and across the I-270 corridor for bikes and pedestrians.

Major Element #7 – Need to Accommodate Operations between Transit and Highway Users

Transit operations in North County are substantial. Metro Transit, the Saint Louis region's main transit agency, reports that during a typical month, roughly 20 percent of MetroBus boardings in Missouri occur on routes that primarily serve North Saint Louis County. Access to transit and the ability for transit to move efficiently through this corridor is very important to residents and businesses. Metro currently operates 14 routes dedicated to the North County service area and a new MetroBus Transit Center on Pershall Road opened in summer 2015. As transit is an important mode of travel in North County, close coordination with Metro Transit on their operations and future plans will add to the effectiveness of overall travel in this corridor.

Major Element #8 – Difficult Pathways to Important Destinations

Urban environments pose challenges for motorists. This element examines the difficulties that are known to exist. Specifically, those difficulties are those that affect sustainable development and the ability to access opportunity. Specific transportation problems identified include the following:

- Unavailable movements
- Conflicting movements
- Physical constraints

Major Element #9 – Increasingly Inefficient Goods Movement

Much of the interstate, intrastate, and local freight movement in the Saint Louis region occurs along the I-70, MO 370, and I-270 corridor in North Saint Louis. Freight traffic is an important component in the local and regional economy. According to the NCS, approximately 17 percent of the roughly 90,000 to 141,000 vehicles that use I-270 daily are trucks; roughly 40 percent of the trucks are destined for local addresses in the Saint Louis region. Key challenges facing commercial truck drivers in the Saint Louis region include congestion, truck restrictions, access/connectivity, crashes, railroad grade crossings, and lack of parking.

The complete Purpose and Need Statement is contained in **Appendix B**.

SECTION 3

Alternatives Considered

This section describes the process used to develop and evaluate the range of alternatives for the I-270 North EA to correct the existing and future problems identified in the Purpose and Need Statement (**Section 2**). The development and evaluation of alternatives was based on engineering evaluations; agency coordination; consideration of social, economic, and environmental impacts; and public input. The alternatives retained for detailed analysis are described in this section. The justifications for eliminating alternatives from further consideration are also discussed. This section concludes by describing the Preferred Alternative and the justification for its identification.

3.1 Overview of the Alternative Development Process

Starting from an infinite number of ways to solve any problem, the process to identify the Preferred Alternative was based on a screening process that began by identifying a wide range of initial alternatives that could potentially address the transportation needs established by the study. These initial alternatives were called ***Conceptual Alternatives***. The Conceptual Alternatives were developed in accordance with principles of interstate design and appropriate design standards with consideration of existing planning goals, public involvement, potential environmental impacts, and engineering judgment. The primary screening tool used to evaluate the Conceptual Alternatives was an analysis of how well they could satisfy the study's Purpose and Need. Those that were determined to at least minimally satisfy the study's Purpose and Need were advanced for further consideration.

Starting with the Conceptual Alternatives, engineering evaluations (tempered by agency coordination; social, economic and environmental constraints; and public input) were conducted to develop configurations suitable for implementation. These alternatives were called the ***Reasonable Alternatives***. The Reasonable Alternatives were further developed and refined according to more detailed engineering analysis and known constraints, allowing for the establishment of preliminary study footprints. This allowed for detailed impact assessments, cost estimates, and traffic evaluations.

The alternative that best accomplishes the Purpose and Need for the proposed action, while avoiding, minimizing, or mitigating the impacts to the social and natural environment, was identified as the ***Preferred Alternative***. The Preferred Alternative is discussed throughout this document.

Pursuant to the circulation, coordination, and evaluation of this I-270 North EA, the Preferred Alternative may be accepted, refined, rejected, or replaced. If accepted, this alternative will then be known as the ***Selected Alternative***. The NEPA process will either determine that there are no significant impacts resulting from the Preferred Alternative (thus concluding with a Finding of No Significant Impact [FONSI]), or identify that there are significant impacts (thus requiring the preparation of an Environmental Impact Statement).

Figure 3-1 depicts the overall process of alternative development and evaluation.

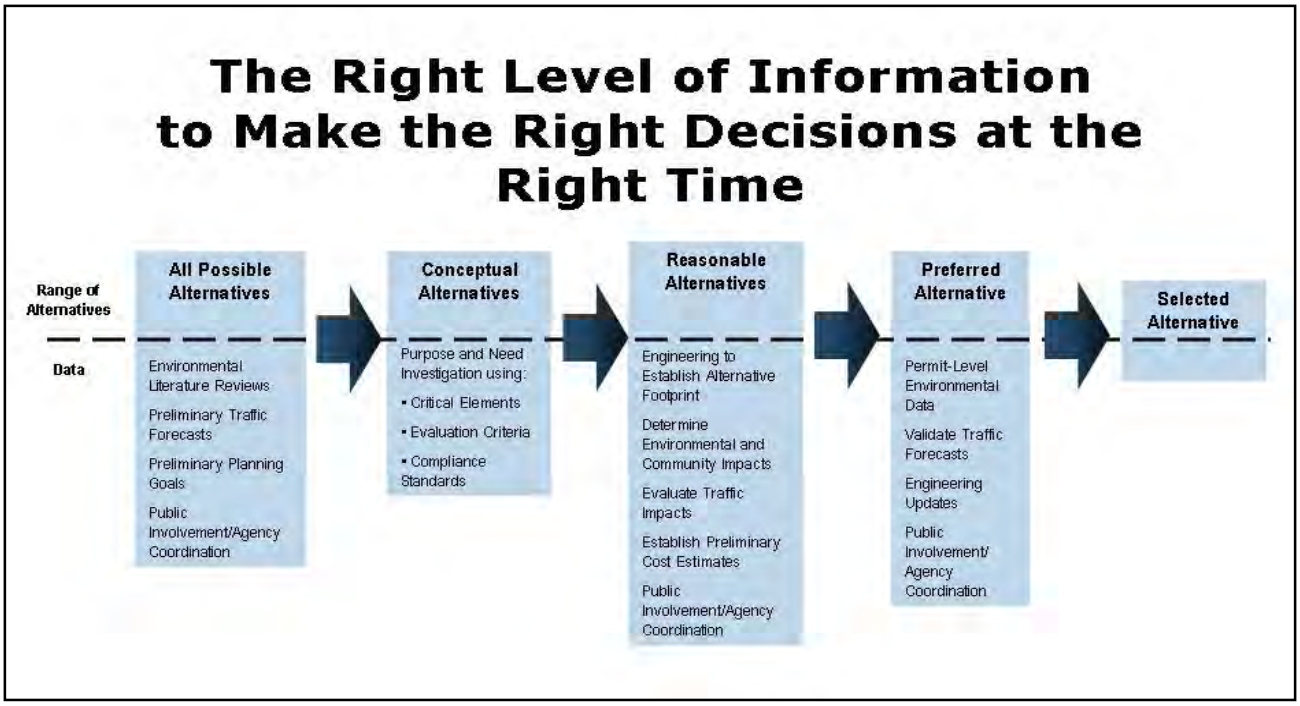


Figure 3-1. Process of Alternative Development and Evaluation

3.2 Development and Evaluation of Conceptual Alternatives

The Conceptual Alternatives represent the wide range of initial alternatives that could potentially address the transportation needs established by the study. Those that were determined to minimally satisfy the study's Purpose and Need were advanced for further consideration.

The heart of the I-270 North EA location study is the development and evaluation of alternatives to achieve the study's goals. This includes achieving the study's Purpose and Need, satisfying the goals of MoDOT, achieving the community's desires, and minimizing negative impacts to the human and natural environment. The initial round of alternative development was the identification of Conceptual Alternatives. The Conceptual Alternatives represented reasonably foreseeable solutions that could satisfy all transportation problems that affect the study area.

Out of a broad range of Conceptual Alternatives, only those alternatives that satisfied study's Purpose and Need moved on to become Reasonable Alternatives. To determine if an alternative satisfied the study's Purpose and Need, the alternative was qualitatively evaluated against the study's Purpose and Need elements. Alternatives determined to be substantially flawed in terms of one or more Purpose and Need elements were eliminated from further consideration.

A Conceptual Alternative had to be minimally consistent with all Purpose and Need elements identified for the I-270 North EA to be considered a Reasonable Alternative. This section summarizes the material contained in the Conceptual Alternative Screening and Reasonable Alternative Recommendations Technical Memorandum (available upon request).

3.2.1 Process Used to Develop Conceptual Alternatives

Conceptual Alternatives were developed using a process that involved three separate, but related, components. The first component was developing the configuration of the interstate mainline. The development of mainline alternatives focused on the number of basic lanes in each direction and the location and length of auxiliary lanes between interchanges. The second component involved developing and analyzing interchange configurations at the existing crossroads along I-270. The third component

involved developing the configuration of Dunn Road and Pershall Road, as well as the corresponding intersections with the crossroads along I-270.

For purposes of alternative development, the corridor was initially divided into 11 subareas with each subarea covering one or two interchanges and the associated portion of the mainline I-270. In each subarea, up to three conceptual interchange types and Dunn/Pershall Road configurations were developed. Alternative A in each subarea included interchange configurations with one-way Dunn Road and Pershall Road. Alternative B involved interchange configurations with two-way Dunn Road and Pershall Road. Alternative C included a third interchange type with two-way Dunn Road and Pershall Road. As long as the one-way and two-way outer roads transition in logical locations, the interchange alternatives presented in this document are interchangeable (e.g., interchange Alternative A could be paired with Alternative B or Alternative C at the next interchange). The configuration of Dunn Road and Pershall Road between Hanley/Graham Road and New Halls Ferry Road, however, had to be either all one-way or all two-way to satisfy operational requirements and meet driver expectancy.

Once the Conceptual Alternatives were identified, the subareas were combined into four map areas and renamed as Alternatives 1 and 2. This allowed for easier viewing of large portions of the corridor to provide a better understanding of how the alternatives worked from one interchange to the next. With the previously noted exception, individual interchange alternative configurations could still be mixed and matched.

3.2.2 Conceptual Alternatives Not Requiring Complete Rebuild

The wide range of initial alternatives included build alternatives as well as alternatives that do not require the construction of completely new facilities. These are described as follows.

3.2.2.1 No-Build Alternative

The No-Build Alternative for the I-270 North EA would consist of maintaining the current roadways in essentially their current condition. Routine maintenance would continue to be conducted, and occasional minor safety upgrades would be implemented. No capacity additions or major improvements would be made. Overall, the No-Build Alternative does nothing to meet the study Purpose and Need. It is described in this document to provide a baseline condition against which the changes associated with the other alternatives may be evaluated.

The No-Build Alternative assumes that no capacity additions on major improvements would be constructed, thus many impacts—positive and negative—associated with a new facility, would not occur. These impacts would include expenditure of funds, land use changes that include converting existing development or public lands into highway right-of-way, potential increased economic development, improved multi-modal accessibility and improved safety. The No-Build Alternative is not a no-cost concept as maintenance and repair of the existing roadway infrastructure would be needed to ensure the continued use of the corridor. Given the age of the corridor, maintenance costs are an increasing concern.

3.2.2.2 Transportation System Management and Travel Demand Management

Transportation System Management (TSM) solutions focus on improving the existing system, without construction of additional new infrastructure. TSM techniques include minor roadway upgrades, adding or upgrading traffic signals, and improving signage and route guidance. Minor roadway upgrades would generally be implemented within the existing right-of-way and could include interchange configuration improvements, surface street intersection improvements, construction of new turn lanes, and lane/shoulder widening. In many ways, the build alternatives being developed incorporate the essence of TSM solutions. Where the transportation problems are greater, more expansive new build solutions are necessary. Relying solely on TSM will not allow I-270 to operate as needed.

Travel Demand Management (TDM) solutions reduce congestion on existing transportation infrastructure. In that way, existing roadways can function acceptably for a longer time. For example, decreasing the dependency on single-occupant vehicles, altering the time and location of trips (flexible work hours), supporting ridesharing, and supporting increased transit use are typical TDM measures. These measures are also components of the emerging alternatives. For example, at the MO 370 interchange, one of the alternatives provides space for a potential park/ride facility (or other transit-related use). Likewise, bicycle/pedestrian uses are components of the study's Purpose and Need. The study team is also working directly with Metro Transit (the region's transit agency) and the trucking community to coordinate their needs, mission, and concerns. Accomplishing the study's goals will not be possible without incorporating TDM; however, neither will it solely rely on it.

3.2.3 Conceptual Build Alternatives

As described in **Section 3.2.1**, the Conceptual Alternatives were established in 11 separate subareas that were eventually combined into four map areas. The number of basic lanes on the interstate is the same for all alternatives. There are four basic lanes in each direction between I-70 and MO 367 and three basic lanes in each direction between MO 367 and the Chain of Rocks Bridge. The number, locations, and lengths of auxiliary lanes are dependent on the interchange and Dunn/Pershall Road configurations associated with each alternative.

Table 3-1 (at the end of this section) lists the conceptual interchange types along the study corridor. The Conceptual Alternatives were developed to address the transportation related problems referenced in the I-270 North EA Purpose and Need Statement. They are founded on basic urban freeway planning and design principles, and have been engineered to be feasible in three dimensions based on study design criteria. It should be noted that at the conceptual stage of development, there were no proposed changes to the interchanges at I-70, MO 370, and I-170.

Configuration of the Conceptual Alternatives

In each subarea, up to three conceptual interchange types and Dunn/Pershall Road configurations were developed:

- Alternative A uses interchange configurations with a one-way Dunn Road and Pershall Road system.
- Alternative B uses interchange configurations with a standard two-way Dunn Road and Pershall Road system.
- Alternative C uses an alternative interchange type with a two-way Dunn Road and Pershall Road.

Graphic depictions of the Conceptual Alternatives are shown in the Conceptual Alternatives and Screening Memo (available upon request).

3.2.4 Evaluation and Screening of the Conceptual Alternatives

A qualitative evaluation process was undertaken to screen the Conceptual Alternatives against the study's Purpose and Need, operational expectations, stakeholder interests, and environmental impacts. The following subsections identify the important conclusions drawn about the Conceptual Alternatives. These conclusions were drawn by consensus within MoDOT. Those alternatives eliminated from further consideration were determined as not being minimally consistent with the goals of MoDOT, the community's desires, and the minimization of negative impacts to the human and natural environment. The alternatives not explicitly eliminated within these subsections were deemed minimally consistent with the Purpose and Need and will be carried forward as Reasonable Alternatives.

3.2.4.1 Suitability of One-Way Outer Roads

Outside of the densest part of the corridor, roughly between Hanley/Graham Road and Old Halls Ferry Road, one-way configurations for Dunn Road and Pershall Road were considered and eliminated from consideration. These one-way configurations were designated as Conceptual Alternative A.

Alternative A in Subarea 03 (MO 370 to McDonnell Boulevard) is configured as a partial cloverleaf interchange at McDonnell Boulevard with reconfigured one-way Dunn and Pershall Roads. The one-way Dunn/Pershall Road configuration, which requires substantial new right-of-way acquisition (for re-construction of Pershall Road), does not contribute to improved mobility and operations within the I-270 corridor. Furthermore, it largely reduces accessibility to land uses along the proposed Pershall Road immediately west of Lindbergh due to distance between McDonnell Boulevard and Lindbergh Boulevard. To a slightly lesser degree, accessibility and mobility to/from land uses north of I-270 will also be reduced.

Elimination of Select One-Way Alternatives

Given the lack of benefits associated with the one-way Dunn Road and Pershall Road configuration, in Subareas 3, 4, 8, 9, 10, and 11, the project team and MoDOT concluded that Alternative A is not minimally consistent with the study's Purpose and Need and was therefore eliminated from further consideration.

Alternative A in Subarea 04 (Lindbergh Boulevard) is configured as a partial cloverleaf Interchange at Lindbergh Boulevard with one-way Dunn Road and Pershall Road through the interchange. The existing two-way Dunn Road north of I-270 is reconfigured as one-way. The existing two-way Brookes Drive south of I-270 and west of Lindbergh, is extended east to McDonnell Boulevard, converted to one-way, and becomes Pershall Road. The existing two-way Pershall Road south of I-270 and east of Lindbergh would also be converted to one way. The one-way Dunn/Pershall Road configuration, which requires a substantial amount of new construction for Pershall Road (west of Lindbergh), does not contribute to improved mobility and operations within the I-270 corridor. Furthermore, it reduces accessibility to land uses along the proposed Pershall Road. To a slightly lesser degree, accessibility and mobility to/from land uses north of I-270 will also be impacted. Similarly, the one-way Dunn/Pershall Road configuration negatively impacts accessibility and mobility east of Lindbergh Boulevard through the I-170 interchange to Hanley/Graham Road without notable mobility and operational benefits to the I-270 corridor.

Alternative A in Subarea 08 (MO 367) is configured as a partial cloverleaf interchange at MO 367 with a directional/fly-over ramp from EB I-270 to NB MO 367 and two-way Dunn Road and Pershall Road through the interchange. Near the western limit of the subarea, two-way Dunn Road would connect to one-way Dunn Road approaching Old Halls Ferry Road. To the east, two-way Dunn Road would continue to Bellefontaine Road where it could transition to a one-way Dunn/Pershall Road configuration. With no continuous existing Pershall Road south of I-270, the limitations resulting from the system interchange at MO 367, and the constraints associated with the Bellefontaine Conservation Area in the southeast quadrant of the interchange, a configuration with continuous one-way Dunn Road and Pershall Road was dismissed from consideration. Such a configuration would limit accessibility and mobility to/from land uses along existing Dunn Road and Pershall Road, including Christian Hospital Northeast. Furthermore, extending Pershall Road to the east through the MO 367 interchange and to Bellefontaine Road would be costly and would result in impacts to the Bellefontaine Conservation Area.

Alternative A in Subarea 09 (Bellefontaine Road) is configured as a diamond interchange at Bellefontaine Road with Dunn Road relocated to the north at Bellefontaine Road. Dunn Road and Pershall Road are configured as one-way east of Bellefontaine Road with the one-way Pershall Road being largely new construction to provide a connection to Lilac Avenue to the east. West of Bellefontaine Road, Dunn Road remains two-way as it provides a connection to MO 367 and Christian Hospital Northeast. The one-way Dunn/Pershall Road configuration, which requires substantial new construction for Pershall Road east of Bellefontaine Road, does not contribute to improved mobility and operations within the I-270 corridor. Furthermore, it negatively impacts accessibility to land uses along the existing Dunn Road east of Bellefontaine Road without notable operational benefits.

Alternative A in Subarea 10 (Lilac Avenue) is configured as a diamond interchange. Dunn Road and Pershall Road are located similarly to their existing configuration with the exception that they are converted to one way. Pershall Road is partially new construction both west and east of Lilac Avenue, providing connections

to Bellefontaine Road and Riverview Drive. The one-way Dunn/Pershall Road configuration, which requires substantial new construction for Pershall Road, does not contribute to improved mobility and operations within the I-270 corridor. Furthermore, it negatively impacts accessibility to land uses along the existing Dunn Road and severely compromises the accessibility of the land uses along Pershall Road west of Lilac Avenue without notable operational benefits.

Alternative A in Subarea 11 (Riverview Drive) is configured as a diamond interchange at Riverview Drive with one-way Dunn Road and Pershall Road. Existing Dunn Road is located close to its existing location and converted to one-way west of the existing rest area and Welcome Center. Pershall Road is newly constructed west of Riverview Drive, providing a connection to Lilac Avenue. The one-way Dunn/Pershall Road configuration, which requires substantial new construction for Pershall Road, does not contribute to improved mobility and operations within the I-270 corridor. Furthermore, it negatively impacts accessibility to land uses along the existing Dunn Road and severely compromises the accessibility of the land uses along Pershall Road west of Lilac Avenue without notable operational benefits.

Given the lack of benefits associated with the one-way Dunn Road and Pershall Road configuration, in Subareas 3, 4, 8, 9, 10, and 11, MoDOT concluded that Alternative A is not consistent with the study's Purpose and Need and was therefore eliminated from further consideration.

3.2.4.2 Suitability of Two-Way Outer Roads

Conceptual Alternatives B and C considered interchanges with two-way outer road systems. Few of these configurations were eliminated from consideration.

Alternative B in Subarea 06 (New Florissant Road to Washington Street/Elizabeth Avenue) is configured as a split diamond interchange with two-way Dunn Road relocated to the north at Washington Street/Elizabeth Avenue and one-way connector roads connecting New Florissant Road to Washington Street/Elizabeth Avenue. The WB connector road crosses under I-270 as it approaches New Florissant Road. This alternative is very similar in form and function to Alternative C in the same location. Alternative C is configured as a split diamond interchange with one-way connector roads and two-way Dunn Road. The configuration differs in that the connector roads are offset to the south of I-270, thus eliminating the need to relocate Dunn Road at Washington Street/Elizabeth Avenue. Eliminating this Dunn Road relocation eliminates substantial impacts along Dunn Road and Washington Street north of I-270 including a number of relocations. Given the considerable similarities in configuration and operational benefits of Alternatives B and C, MoDOT concluded that Alternative C is essentially an optimized configuration of Alternative B and as such, a separate consideration of Alternative B could be abandoned moving forward.

What Roadway Configuration did the Build Alternatives use?

The majority of existing I-270 included in the I-270 North EA study corridor has inside shoulder widths of 4 or 5 feet. With a 2-foot concrete barrier along centerline, the resulting existing median width is either 10 or 12 feet. In the development of the Conceptual Alternatives, and the refinement and analysis of the Reasonable Alternatives, it was assumed that, with few exceptions, the center median would ultimately be reconstructed as 12-foot, full-width inside shoulders in both directions of I-270. This results in a median width of 26 feet.

The assumption of reconstruction with full-width inside shoulders is not intended to exclude the possibility of partially reconstructing or rehabilitating portions of the corridor with 10- to 12-foot medians. Such rehabilitation or partial reconstruction with 10- to 12-foot median width may be pursued by MoDOT with the intention of maximizing existing infrastructure life, minimizing construction costs, and/or minimizing environmental impacts. The assumption of reconstruction with full-width inside shoulders should not be construed as project commitment.

The predictive safety analysis was based on the assumption of 12-foot, full-width inside shoulders. The results of these analyses formed the foundation of the safety-related performance measures. If MoDOT elects to rehabilitate or partially reconstruct portions of the corridor with an existing 10- to 12-foot median width, the predictive safety analysis will need to be re-run to evaluate the impacts of the narrower inside shoulders.

3.3 Development and Evaluation of Reasonable Alternatives

Based on the evaluation and coordination of the Conceptual Alternatives, a series of Reasonable Alternatives was developed. These configurations conform to the study's design standards, satisfy the study's Purpose and Need, and fulfill the study's desired operational characteristics and performance measures. These configurations represent changes to the I-270 corridor that will result in acceptable future conditions. The selection of a preferred alternative will be based on the differentials in impacts, costs, and performance/operating characteristics that they represent. This subsection summarizes the Reasonable Alternatives and outline the major differences in impacts, costs, and operations. **Section 4** provides greater detail regarding the impact determinations. **Section 6** examines the public outreach and agency coordination. These efforts included how well the Reasonable Alternatives satisfied stakeholder needs.

To simplify the presentation and analysis of the Reasonable Alternatives, the nomenclature used for the Conceptual Alternatives was altered. The Conceptual Alternatives used 11 subareas and configurations using alphabetical designators. The Reasonable Alternatives focus on four map areas and numerical designators. It is possible to draw a line connecting the Conceptual Alternatives to the Reasonable Alternatives.

The relationship between the Conceptual Alternatives and the Reasonable Alternatives is shown in **Table 3-1** (at the end of this section).

3.3.1 Configuration of Reasonable Alternatives

Depictions of the Reasonable Alternatives showing the study's footprint and important resources and impacts are shown in **Appendix A – Exhibits 4** and **5**.

The configurations of the Reasonable Alternatives are numbered and organized into four map areas. The configurations are interchangeable on an interchange-by-interchange basis with the exception of the portion of the corridor from Hanley/Graham Road to Old Halls Ferry Road. In this part of the corridor, Alternative 1 or Alternative 2 must be chosen across all interchanges within this area. The Reasonable Alternatives are described in the following subsections.

3.3.1.1 Reasonable Alternative 1

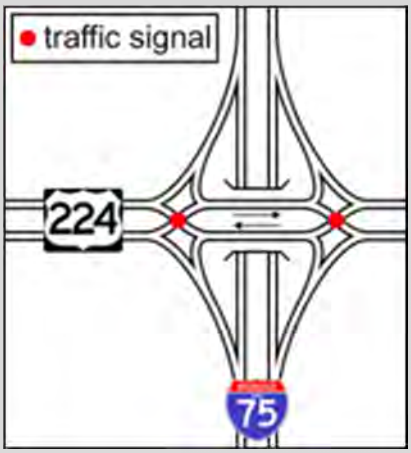
Map Area 1: I-70 to McDonnell Boulevard

Continuous auxiliary lanes (EB and WB) will be added between St. Charles Rock Road and MO 370. Shoulder and other ancillary lane characteristics will be improved. At St. Charles Rock Road, a diverging diamond interchange will replace the diamond interchange. A southbound (SB) auxiliary lane will be added through the MO 370 interchange. A new NB exit to Missouri Bottom Road (to separate from the existing exit serving MO 370 and Missouri Bottom Road) will be constructed. At McDonnell Boulevard, a diverging diamond interchange will replace the existing diamond interchange.

Map Area 2: McDonnell Boulevard to Hanley/Graham Road

The only alternative at the existing cloverleaf Lindbergh Boulevard interchange is a partial cloverleaf configuration. It will add an additional lane on I-270, east of Lindbergh. It will remove the WB collector-distributor road and the WB-to-SB loop ramp at Lindbergh Boulevard and replace them with a diamond ramp. Dunn Road will be grade-separated from the interchange. I-270 and Lindbergh interchange traffic will be

What is a Diverging Diamond Interchange?



One of the unique features included in several locations is the diverging diamond interchange. From any direction as traffic enters the interchange, a right exit is provided for the "right turns." Then the highway crosses over or under the opposing traffic of the same highway, so that traffic is now on the left side of the road. After the crossover, a direct left exit is given for the "left turns." The highway then crosses over or under both directions of the cross highway. It then receives the left turns of the cross highway from a left entrance ramp. After receiving this traffic, the highway crosses over or under the opposing highway of the same highway again to get on the right side of the road. Lastly, the highway receives the right turns from the cross highway.

Among its advantages are synchronized signals that substantially reduce delay. It increases the capacity of turning movements. It reduces the number of conflict points (14 for diverging diamond interchanges, 26 for conventional). There is better sight distance at turns. Wrong way entry to ramps is extremely difficult. Pedestrian crossings cover shorter distances.

Among the disadvantages of a diverging diamond interchange are driver unfamiliarity. Pedestrians may be required to cross free-flowing traffic. Free-flowing traffic on the non-freeway road is impossible. Exiting traffic cannot re-enter the freeway in the same direction, which creates the following issues:

It is difficult to implement stops for express transit buses.

Drivers who accidentally take the wrong exit must turn around somewhere along the crossroad.

Emergency management cannot use the exit and entrance ramps to allow freeway traffic to bypass a crash at the bridge.

An oversize load cannot use the exit and entrance ramps to bypass a low bridge.

separated from Taylor/Lynn Haven. An auxiliary lane will be added on EB I-270 between Lindbergh and I-170. Two-way Dunn Road and Pershall Road will be maintained largely in their existing locations. Shoulder and other ancillary lane characteristics will be improved.

Map Area 3: Hanley/Graham Road to Old Halls Ferry Road

The focus of Reasonable Alternative 1 is converting the outer road system (Dunn Road and Pershall Road) from a two-way system to a one-way system. There are two different variations under consideration (Variations 1 and 1a). The interchange ramps within this area will be consolidated into a split diamond configuration. Variation 1 will extend the split diamond configuration from West Florissant to Old Halls Ferry. Variation 1a will limit the split diamond to between West Florissant to New Halls Ferry. The improvements include the following:

- Addition of a basic lane EB and WB on I-270
- Improvement of shoulders and other ancillary lane characteristics
- Reconstruction of Dunn Road and Pershall Road into a one-way configuration
- Reconstruction of the interchanges from New Florissant Road to Washington Street/Elizabeth Avenue as a split diamond interchange (entrances and exits configured as slip ramps from Dunn Road and Pershall Road)
- Reconstruction of the interchanges from West Florissant Avenue to New Halls Ferry Road as a split diamond interchange (entrances and exits configured as slip ramps from Dunn Road and Pershall Road)
- Addition of additional ramps between New Florissant Road and Washington Street/Elizabeth Avenue (from I-270 EB to I-270 WB) and between West Florissant Avenue and New Halls Ferry Road (from I-270 EB to I-270 WB)
- Construction of EB Dunn Road to WB Pershall Road turnarounds at New Florissant Road and West Florissant Avenue
- Construction of a turnaround, in both directions, at New Halls Ferry Road
- Construction of additional overpass turnarounds in both directions of Dunn Road and Pershall Road between Washington Street/Elizabeth Avenue and West Florissant Avenue
- Addition of auxiliary lane(s) EB and WB on I-270 between interchanges

Map Area 4: East of Old Halls Ferry Road to Chain of Rocks Bridge

Starting at Old Halls Ferry Road, the improvement will maintain the existing Dunn Road and Pershall Road operation (two-way). An additional basic lane EB and WB on I-270, from Old Halls Ferry Road to MO 367, will be added. The only alternative at the existing cloverleaf MO 367 interchange is a partial cloverleaf configuration. It will use a fly-over ramp for the EB-to-NB movement. The MO 367 entrance ramp from Dunn Road and exit ramps to I-270 will be reconstructed with a grade-separated, braided ramp configuration. An additional auxiliary lane EB and WB on I-270, from MO 367 to Bellefontaine Road, will be added. At the Bellefontaine Road interchange, the existing diamond interchange will be reconfigured. The slip ramps will be removed and Dunn Road relocated. At the Lilac Avenue interchange, the existing diamond configuration will be modified. Most noticeably, the ramps will be moved closer to I-270. An additional basic lane EB and WB on I-270, from the Lilac Avenue interchange to Chain of Rocks Bridge, will be added. At the Riverview Drive interchange, the existing diamond configuration will be modified with extended ramp speed-change lanes (when Chain of Rocks Bridge is replaced).

3.3.1.2 Reasonable Alternative 2

Map Area 1: I-70 to McDonnell Boulevard

The existing numbers of I-270 lanes is maintained. Shoulder and other ancillary lane characteristics will be improved. At St. Charles Rock Road, the existing diamond interchange will be modified. The existing road will be widened and dedicated left-turn lanes added. At McDonnell Boulevard, a partial cloverleaf interchange will replace the existing diamond interchange. An additional new one-way outer road between Missouri Bottom and McDonnell Boulevard. In addition, a new underpass will connect the new one-way outer roads near Anglum Road.

Map Area 2: McDonnell Boulevard to Hanley/Graham Road

The only alternative at the existing cloverleaf Lindbergh Boulevard interchange is a partial cloverleaf configuration. It will add an additional lane on I-270, east of Lindbergh. It will remove the WB-to-SB loop ramp at Lindbergh with a direct connection to the north. Dunn Road will be extended through (under) the interchange. An auxiliary lane will be added on EB I-270 between Lindbergh and I-170.

Map Area 3: Hanley/Graham Road to Old Halls Ferry

The focus of Reasonable Alternative 2 is retaining the existing two-way outer road system. Like Reasonable Alternative 1, an addition through lane on I-270 will be constructed. The interchange ramps will also be consolidated into a split diamond configuration. Variation 2a will extend the split diamond configuration from West Florissant to Old Halls Ferry. Variation 2 will limit the split diamond to between West Florissant to New Halls Ferry (the opposite of Reasonable Alternative 1). The two-way configuration of Dunn Road and Pershall Road will be retained, although some sections of both roads would be relocated. An overpass at Lafayette Street will be added. The New Florissant Road and Washington Street/Elizabeth Avenue interchange is essentially a single interchange. The West Florissant and the Old Halls Ferry interchange is essentially a single interchange.

Map Area 4: East of Old Halls Ferry Road to Chain of Rocks Bridge

The only alternative at the existing cloverleaf MO 367 interchange is a partial cloverleaf configuration. It will use a fly-over ramp for the EB-to-NB movement. It will straighten the ramp from WB 270 to MO 367. It will transform the exit ramp on SB 367 to transition from freeway to arterial.

At the Bellefontaine Road interchange, the existing diamond interchange will be converted into a partial cloverleaf interchange. At the Lilac Avenue interchange, the existing diamond interchange will be converted into a partial cloverleaf interchange. At the Riverview Drive interchange, the existing diamond configuration will be converted into a partial cloverleaf interchange.

3.3.2 Performance/Operating Characteristics Summary

Table 3-2 (located at the end of this section) provides a summary of how the Reasonable Alternatives operate. The discussion is primarily comparative. All Reasonable Alternatives are considered to minimally satisfy the operational needs of the I-270 corridor. Table 3-2 is organized to facilitate comprehension of the detailed and similar configurations. It uses the map areas described previously. It summarizes the treatments and highlights the primary differences. The importance of these differences will depend largely on the individual stakeholder.

3.3.3 Environmental Impact Summary

Table 3-3 (located at the end of this section) provides a summary of the important environmental impacts associated with the Reasonable Alternatives. For the most part, the Reasonable Alternatives are contained within the existing I-270 right-of-way. No more than 79 acres of new right-of-way acquisition is expected. This increases the study's footprint by less than 7.8 percent. Most right-of-way acquisition is either limited to a narrow strip along the existing roadway frontage or through the acquisition of an entire tax map parcel for structure acquisitions. Consequently, direct impacts to the human and natural environment are limited.

Many impacts are identical among the alternatives. For example, all configurations will require a narrow strip acquisition from the Little Creek Nature Center. This minor impact will be coordinated thoroughly with the administrator. Other impacts are configuration-specific; for example, the one-way outer road system could potentially add to Metro Transit's operating costs and travel times. Most resources are not impacted by the reasonable alternatives.

3.3.4 Cost, Public Involvement, and Acquisition Impact Summary

Table 3-4 (located at the end of this section) presents a summary of the important cost, public involvement, and acquisition impacts associated with the Reasonable Alternatives. While this category probably has the greatest differences among the impacts associated with the Reasonable Alternatives, they are just one factor in decision-making. The structure acquisitions encompass different owners, but similar land use types. The sentiment that emerged from public engagement outlined in the Public Involvement Plan (discussed more thoroughly in **Section 6**) was distinct but from a relatively small population.

Construction costs were developed based on the expected 5 percent level of design. Examples of the items that could be calculated by area, length, or volume are pavement and base, bridges, and retaining/sound walls. The items not quantifiable used a stochastic method utilizing factors or metrics to quantify cost such as cost-per-mile, percentage of construction cost, or cost-per-interchange. The cost estimates have been updated to 2016 dollars. Technical memorandums describing the cost estimate methodology and the 2016 updating process are available upon request.

3.3.5 Changes from Reasonable Alternatives

Evaluation and coordination of the Reasonable Alternatives led to further investigations to improve their performance and reduce impacts. These changes were minor. To prevent confusion, the useful changes were incorporated into the Reasonable Alternatives presented in this document. These changes were ultimately incorporated into the Preferred Alternative.

3.3.6 Preferred Alternative Decision-Making Factors

The I-270 North EA corridor is large and complex. The stakeholders are numerous and diverse. The differences among the alternatives are subtle on a macro, or system basis, but distinct on a micro/property-specific basis. These factors make the Preferred Alternative recommendation difficult. This section will summarize the key decision-making factors that underlie the selection of the Preferred Alternative (Reasonable Alternative 1 with Variation 1a).

Figure 3-2 summarizes the important elements associated with the Preferred Alternative as identified in this I-270 North EA.

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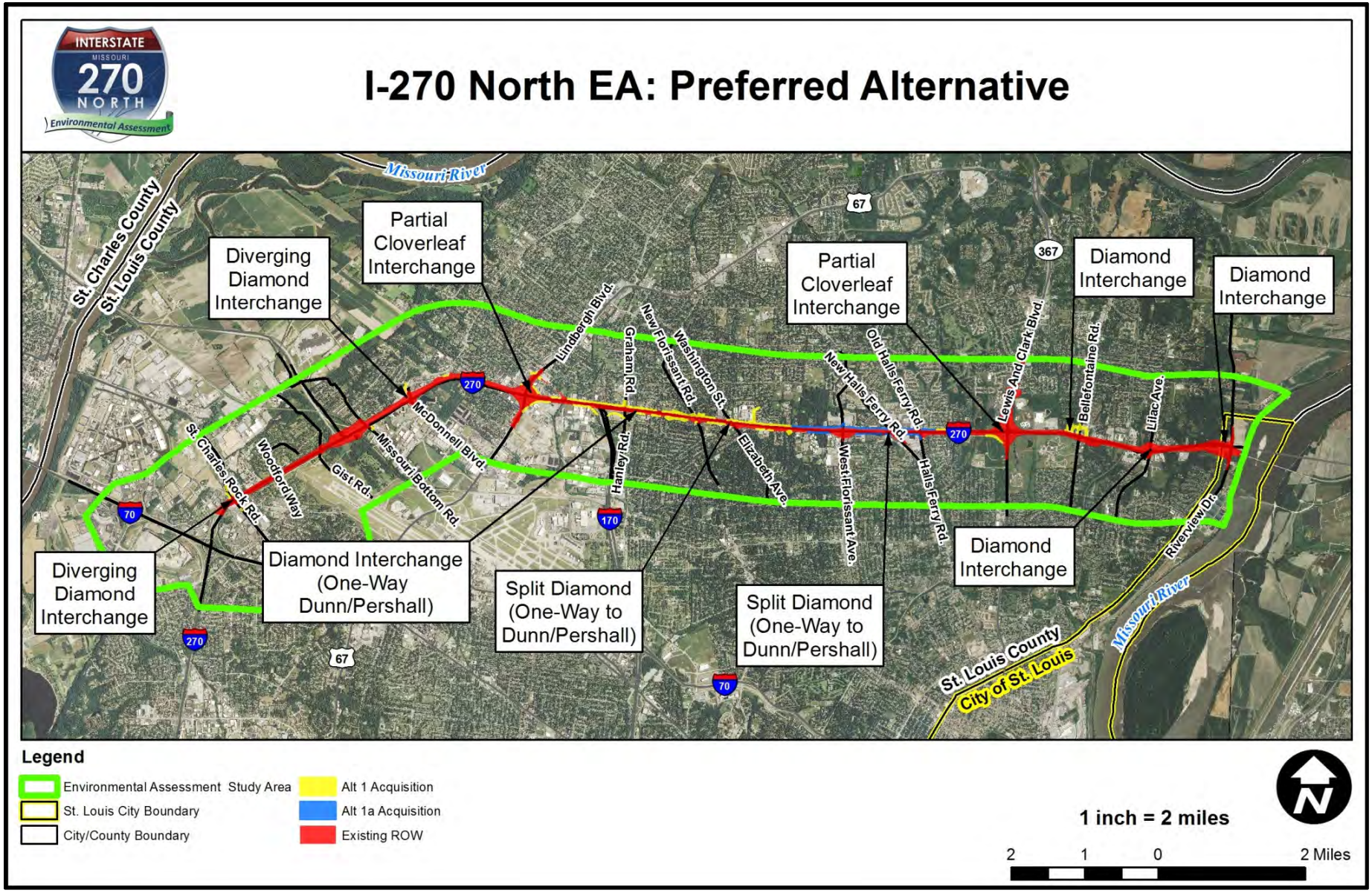

Figure 3-2. I-270 North Environmental Assessment Preferred Alternative

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3.3.6.1 Preferred Alternative Decision-Making Factors – Map Area #1[1]

In Map Area 1 (I-70 to McDonnell Boulevard) the major decisions points were among the interchange treatments at St. Charles Rock Road and McDonnell Boulevard. In both instances, a diverging diamond configuration was chosen. The differentiators are summarized as follows:

St. Charles Rock Road (diverging diamond – DDI)	**McDonnell Boulevard (diverging diamond – DDI)**
Greater public support	Greater public support
Continuity with other DDIs in area	Fewer relocations
Comparable costs and impacts	Maintains existing local traffic patterns
Eliminates traffic conflict points	Maintains existing land use patterns
Reduces delay	Less expensive
	Continuity

3.3.6.2 Preferred Alternative Decision-Making Factors – Map Area #2

In Map Area 2 (McDonnell Boulevard to Hanley/Graham Road), the major decision point was the configuration of the Lindbergh Boulevard interchange. Ultimately, a single configuration was chosen. This partial cloverleaf is applicable across all alternatives and addresses the required movements, desired LOS, and the constraints in the area.

3.3.6.3 Preferred Alternative Decision-Making Factors – Map Area #3

In Map Area 3 (Hanley/Graham Road to Old Halls Ferry Road), the major decision points were the configuration of the outer road system (Dunn/Pershall Road) and the configuration of the interchange ramps. The Preferred Alternative is Reasonable Alternative 1 with Variation 1a. Dunn/Pershall Road is converted to a one-way system throughout the length of Map Area #3. The interchange ramps within this area are consolidated into a split diamond configuration that extends to New Halls Ferry Road.

The differentiators between Alternative 1 and Alternative 2 are summarized as follows:

- On average, trips will be approximately 1.6 percent longer, but will take 5.5 percent less time to traverse
- Greater public support for a one-way configuration
- Fewer property acquisitions
- Fewer relocations
- Driveway operations improved
- Fewer predicted crashes
- Higher operational costs for Metro Transit
- Equivalent alterations to emergency medical services patterns
- Lower stream impacts
- Pedestrians expected to encounter fewer conflict points with automobiles (bicyclists may experience more)
- Less expensive
- Reduces traffic conflict points

[1] Because of the size of the project area, the map areas can only be practically depicted on large roll plots. To show the project in a more user-friendly way (and include them in hard copy versions of this document), **Appendix A** uses a template where the project is shown in a series of 13 sections. The Map Area boundaries are depicted in text.

3.3.6.4 Preferred Alternative Decision-Making Factors – Map Area #4

In Map Area 4 (Old Halls Ferry Road to Chain of Rocks Bridge), the Preferred Alternative is Reasonable Alternative 1. The major decision points were the interchange configurations for MO 367 (partial cloverleaf), Bellefontaine Road (diamond interchange), Lilac Avenue (diamond interchange), and Riverview Drive (diamond interchange). The differentiators are summarized as follows:

Greater public support
Fewer relocations
Maintains Lilac Avenue Park-and-Ride lot
Lower Dunn Road alterations
Avoids Great Rivers Greenway properties
Solutions appropriate to site locations

3.3.7 Preferred Alternative

Based on the evaluation of the Reasonable Alternatives, a Preferred Alternative emerged. This subsection summarizes the Preferred Alternative chosen for further consideration. The Preferred Alternative conforms to the study's design standards, satisfies the study's Purpose and Need, and fulfills the study's desired operational characteristics/performance measures, and minimizes impacts to the human and natural environment.

3.3.7.1 Configuration of the Preferred Alternative

The Preferred Alternative for this study is Reasonable Alternative 1 with the 1a variation between West Florissant Avenue and New Halls Ferry Road. The details of the lane work and transportation improvements associated with the Preferred Alternative is contained in **Appendix A – Exhibit 6**. The depiction of the Preferred Alternatives' footprint and important resources and impacts are shown in **Appendix A – Exhibit 4.** The specifics of the Preferred Alternative are described below.

In Area 1: I-70 to McDonnell Boulevard

- Add continuous auxiliary lanes between St. Charles Rock Road and MO 370, NB and SB
- Reconstruct the St. Charles Rock Road interchange as an improved interchange within the identified footprint
- Add SB auxiliary lane through the MO 370 interchange; maintain existing number of lanes NB
- Improve connections between northbound I-270, MO 370 and Missouri Bottom Road
- Reconstruct the McDonnell Boulevard interchange as an improved interchange within the identified footprint

In Area 2: McDonnell Boulevard to Hanley/Graham Road

- Add continuous auxiliary lanes between McDonnell Boulevard and Lindbergh Boulevard
- Reconstruct the Lindbergh Boulevard interchange as an improved interchange within the identified footprint
- Separate I-270 and Lindbergh Boulevard interchange traffic from Taylor/Lynn Haven
- Add basic lane EB and WB on I-270, east of Lindbergh Boulevard to Route 367

Preferred Alternative

The Preferred Alternative for the I-270 North EA project is Reasonable Alternative 1 with the 1a variation between West Florissant Avenue and New Halls Ferry Road.

The Preferred Alternative conforms to MoDOT's EPG, satisfies the project's Purpose and Need, and fulfills the project's desired operational characteristics/performance measures. It also minimizes impacts to the human and natural environment.

- Add auxiliary lane EB I-270 from Lindbergh Boulevard to I-170
- Maintain/improve two-way Dunn Road and Pershall Road, mainly in existing location

In Area 3: Hanley/Graham Road to Old Halls Ferry Road

- Add basic lane EB and WB on I-270
- Reconstruct Dunn Road and Pershall Road within the identified footprint, improving mobility and maintaining access. This includes conversion to a one way outer road system with turn-around connections where needed
- Reconstruct the interchanges between Hanley and New Halls Ferry as improved interchanges within the identified footprint
- Construct overpass turnarounds, U-turns and additional ramps, as necessary, to achieve environmental commitments, established LOS, mainline weaves, Vehicle Hours of Delay, and Average Speed performance measures identified in **Table 3-5**. The need for out of direction travel, along transit routes, will also be improved.
- Add auxiliary lane(s) EB and WB on I-270 between interchanges

In Area 4: Old Halls Ferry Road to Chain of Rocks Bridge

- Maintain/improve Dunn Road and Pershall Road, mainly in their existing locations and configurations
- Add basic lane EB and WB I-270 from Old Halls Ferry Road to MO 367
- Reconstruct the MO 367 interchange as an improved interchange within the identified footprint
- Add auxiliary lane EB and WB I-270 from MO 367 to Bellefontaine Road
- Reconstruct the Bellefontaine Road interchange as an improved interchange within the identified footprint
- Relocate Dunn Road to the north at Bellefontaine Road
- Maintain number of existing basic lanes from Bellefontaine Road to the Lilac Avenue interchange
- Reconstruct the Lilac Avenue interchange as an improved interchange within the identified footprint
- Add basic lane EB and WB on I-270 from the Lilac Avenue interchange to Chain of Rocks Bridge
- Reconstruct the Riverview Drive interchange as an improved interchange within the identified footprint

Figure 3-2 summarizes the important elements associated with the Preferred Alternative as identified in this I-270 North EA.

The Preferred Alternative as presented in this I-270 North EA is composed of alternative configurations that meet a set of minimum performance measures agreed upon prior to the development of study alternatives. In some cases, the Preferred Alternative exceeds the minimum level for a given set of performance measures. The minimum performance measures are listed in **Table 3-5**. The performance measures are broken out into corridor-wide measures, such as severe and fatal crashes, level of service, mainline weaves, vehicle hours of delay and average speed. The performance measures were also broken out into location-specific operational measures, such as lane configuration, access and exit details.

Because of the size and scope of the study, MoDOT intends to investigate all available study delivery options, including design-build and/or phased delivery. The engineering associated with various alternate project delivery options differs from those of the traditional design-bid-build approach. These differences are intended to identify uniquely innovative solutions and cost and time saving technologies. MoDOT intends to take full advantage of these savings while remaining consistent with the study's established performance measures and the study's Purpose and Need.

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Table 3-1. Pathway from Conceptual Alternatives to Reasonable Alternatives

Conceptual Alternative ID and Description		Location	Result	Reasonable Alternative ID	
CONCEPTUAL ALTERNATIVE SUBAREA 01: I-70 TO ST. CHARLES ROCK ROAD					REASONABLE ALTERNATIVE MAP AREA 1
C	Diverging Diamond Interchange	St. Charles Rock Road	Continued*	1	
B	Diamond Interchange		Continued	2	
CONCEPTUAL ALTERNATIVE SUBAREA 02: WOODFORD WAY DRIVE TO GIST ROAD					
B	Freeway with Auxiliary Lanes	St. Charles to MO 370	Continued*	1,2	
CONCEPTUAL ALTERNATIVE SUBAREA 03: MO 370 TO McDONNELL BOULEVARD					
A	**Partial Cloverleaf Interchange (One-Way)**	McDonnell Boulevard	**Eliminated**	**---**	
C	Diverging Diamond Interchange		Continued*	1	
B	Partial Cloverleaf Interchange		Continued	2	
CONCEPTUAL ALTERNATIVE SUBAREA 04: LINDBERGH BOULEVARD					REASONABLE ALTERNATIVE MAP AREA 2
A	**Partial Cloverleaf Interchange (One-Way)**	Lindbergh Boulevard	**Eliminated**	---	
B	Partial Cloverleaf Interchange		Continued*	1,2	
CONCEPTUAL ALTERNATIVE SUBAREA 05: I-170 TO HANLEY ROAD/GRAHAM ROAD					
A	Diamond Interchange (One-Way Dunn Road)	Hanley/Graham Road	Continued*	1	
B	Diamond Interchange (Two-Way)		Continued	2	
CONCEPTUAL ALTERNATIVE SUBAREA 06: NEW FLORISSANT ROAD TO WASHINGTON STREET/ELIZABETH AVENUE					
A	Split Diamond Interchange (One-Way)	New Florissant Road to Washington Street/Elizabeth Avenue	Continued*	1	
B	**Split Diamond Interchange with Offset Connector Roads (Two-Way)**		**Eliminated**	---	
C	Split Diamond Interchange (Two-Way)		Continued	2	
CONCEPTUAL ALTERNATIVE SUBAREA 07: WEST FLORISSANT AVENUE TO OLD HALLS FERRY ROAD					REASONABLE ALTERNATIVE MAP AREA 3
A	Split Diamond Interchange (One-Way)	to Old Halls Ferry Road	Continued*	1	
A1	Split Diamond Interchange (One-Way)	to New Halls Ferry Road	Continued*	1a	
C	Split Diamond Interchange (Two-Way)	to Old Halls Ferry Road	Continued	2	
B	Split Diamond Interchange (Two-Way)	to New Halls Ferry Road	Continued	2a	
CONCEPTUAL ALTERNATIVE SUBAREA 08: MO 367					REASONABLE ALTERNATIVE MAP AREA 4
~~A~~	**Partial Cloverleaf Interchange (One-Way)**	MO 367	**Eliminated**	---	
B	Partial Cloverleaf Interchange		Continued*	1,2	
CONCEPTUAL ALTERNATIVE SUBAREA 09: BELLEFONTAINE ROAD					
A	**Diamond Interchange (One-Way)**	Bellefontaine Road	**Eliminated**	---	
C	Diamond Interchange		Continued*	1	
B	Partial Cloverleaf Interchange		Continued	2	
CONCEPTUAL ALTERNATIVE SUBAREA 10: LILAC AVENUE					
A	**Diamond Interchange (One-Way)**	Lilac Avenue	**Eliminated**	---	
B	Diamond Interchange		Continued*	1	
C	Partial Cloverleaf Interchange		Continued	2	
CONCEPTUAL ALTERNATIVE SUBAREA 11: RIVERVIEW DRIVE					
A	**Partial Cloverleaf Interchange (One-Way)**	Riverview Drive	**Eliminated**	---	
C	Diamond Interchange		Continued*	1	
B	Partial Cloverleaf Interchange		Continued	2	

* This treatment will ultimately become part of the Preferred Alternative.

Table 3-2. Performance/Operating Characteristics Summary for the Reasonable Alternatives

Reasonable Alternative	Description	Key Features	Level of Service (2040)	Transit Impacts	Bike/Pedestrian Impacts	Freight Movement Impacts
AREA 1: I-70 TO MCDONNELL BOULEVARD						
ST. CHARLES ROCK ROAD						
Alternative 1	Diverging Diamond Interchange	• Synchronized signals reduce delay • Reduced number of conflict points	C	Unable to exit/ re-enter freeway in same direction	Can be more difficult to navigate	Easier to make turns for oversize/ overweight trucks
Alternative 2	Diamond Interchange	• Greater driver familiarity • Exiting traffic can re-enter freeway in same direction	C	--	Easier to navigate	--
MO 370 TO MCDONNELL BOULEVARD						
Alternative 1	Diverging Diamond Interchange	• Synchronized signals reduce delay • Reduced number of conflict points	C	Unable to exit/ re-enter freeway in same direction	Can be more difficult to navigate	Easier to make turns for oversize/ overweight trucks
Alternative 2	Partial Cloverleaf Interchange	• Loop ramp allows free flow NB to WB movements • New one-way connector improves traffic flow	C	--	--	Guardrail often damaged on loop ramps by trucks
AREA 2: EAST OF MCDONNELL BOULEVARD TO HANLEY ROAD/GRAHAM ROAD						
LINDBERGH BOULEVARD						
Alternative 1	Partial Cloverleaf Interchange	• Improved connection between WB 270 and NB Lindbergh • Improved connection for SB Lindbergh and WB I-270 • Eliminating loop ramp reduces conflicts/improves safety • Continuous Dunn Road under Lindbergh	D	--	Eliminating loop ramp improves navigation	Guardrail often damaged on loop ramps by oversize/ overweight trucks
AREA 3: HANLEY ROAD/GRAHAM ROAD TO OLD HALLS FERRY ROAD						
ONE-WAY OUTER ROAD SYSTEM						
HANLEY ROAD/GRAHAM ROAD				One-way outer road system could potentially add approximately $800,000 to Metro's annual operating costs and increase travel time and transfer fares for customers living/working along the one-way road sections	One-way outer roads tend to benefit pedestrians due to fewer conflict points	25 percent fewer crashes
Alternative 1	Diamond Interchange	• Dunn/Pershall Road operate as one-way outer roads • Access to/from I-270 via slip ramps	B			
NEW FLORISSANT ROAD TO WASHINGTON STREET/ELIZABETH AVENUE						
Alternative 1	Split Diamond Interchange	• Dunn/Pershall Road operate as one-way outer roads • Access to/from I-270 via slip ramps	C			
WEST FLORISSANT AVENUE TO OLD HALLS FERRY ROAD					One-way outer roads tend to result in out-of-direction travel for bicyclists creating more conflicts with automobiles	
Alternative 1	Split Diamond Interchange (to **Old** Halls Ferry)	• Dunn and Pershall operate as one-way outer roads • Access to/from I-270 via slip ramps • No direct ramps from WB I-270 to New Halls Ferry	C			
Alternative 1a	Split Diamond Interchange (to **New** Halls Ferry)	• Dunn and Pershall operate as one-way outer roads • Access to/from I-270 via slip ramps • No direct ramps from WB I-270 to Old Halls Ferry	C			
TWO-WAY OUTER ROAD SYSTEM						
HANLEY ROAD/GRAHAM ROAD				Two-way outer road system is considered to be the same as the No-Build or current routes	Two-way outer roads tend to create more conflicts for pedestrians	Ramp Connections to New Halls Ferry: 30 percent fewer crashes
Alternative 2	Diamond Interchange	• Dunn and Pershall Roads operate as two-way outer roads	B			
NEW FLORISSANT ROAD TO WASHINGTON STREET/ELIZABETH AVENUE						
Alternative 2	Split Diamond Interchange	• Dunn and Pershall Roads operate as two-way outer roads • New Florissant and Washington Street/Elizabeth Avenue operate as one interchange	D			
WEST FLORISSANT AVENUE TO OLD HALLS FERRY ROAD					Two-way outer roads tend to provide more direct travel routes for bicyclists	Ramp Connections to Old Halls Ferry: 32 percent fewer crashes
Alternative 2	Split Diamond Interchange (to **Old** Halls Ferry)	• Dunn and Pershall Roads operate as two-way outer roads • No direct ramps from WB I-270 to New Halls Ferry	D			
Alternative 2a	Split Diamond Interchange (to **New** Halls Ferry)	• Dunn and Pershall Roads operate as two-way outer roads • No direct ramps from WB I-270 to Old Halls Ferry	D			
AREA 4: EAST OF OLD HALLS FERRY ROAD TO RIVERVIEW DRIVE						
MO 367						
Alternative 1	Partial Cloverleaf Interchange	• Provides free flow movement from EB I-270 to MO 367 • Transitions SB MO 367 ramps from freeway to arterial • Removes loop ramps improving safety and operations	C	-	-	Guardrail often damaged on loop ramps by oversize/ overweight trucks
BELLEFONTAINE ROAD						
Alternative 1	Diamond Interchange	• Removes slip ramps • Relocates Dunn Road	B	-	-	-
Alternative 2	Partial Cloverleaf Interchange	• Removes slip ramps • Relocates Dunn Road • Loop ramp allows free flow NB to WB movements	B	-	-	Guardrail often damaged on loop ramps by oversize/ overweight trucks
LILAC AVENUE						
Alternative 1	Diamond Interchange	• Moves WB I-270 ramps closer to the freeway to avoid relocating Dunn Road	B	-	-	-
Alternative 2	Partial Cloverleaf Interchange	• Relocates a portion of Dunn Road • Loop ramp allows free flow NB to WB movements • Requires EB I-270 off-ramp to go under Dunn Road	B	-	-	Guardrail often damaged on loop ramps by oversize/ overweight trucks
RIVERVIEW DRIVE						
Alternative 1	Diamond Interchange	• Requires extension of ramps to the east when the bridge is replaced	B	-	-	-
Alternative 2	Partial Cloverleaf Interchange	• Moves all ramps to the west of Riverview Drive • Relocates Dunn Road	B	-	-	Guardrail often damaged on loop ramps by oversize/ overweight trucks

Table 3-3. Major Environmental Impact Summary for the Reasonable Alternatives

Reasonable Alternative	Description	Parks and Recreation Impacts	Environmental Justice Impacts	Waterway Impacts	Bike/Pedestrian Impacts	Traffic Noise Impacts
AREA 1: I-70 TO MCDONNELL BOULEVARD						
ST. CHARLES ROCK ROAD						
Alternative 1	Diverging Diamond Interchange	No property acquisition from Carrollton Disc Park; operational impacts are not expected.	Diverging diamond interchanges can limit some transit bus and emergency management services operations.	Nearly Identical Cowmire Creek Crossings	Depending on design, diverging diamond interchanges can require pedestrians to cross free-flowing traffic.	Existing traffic noise levels at Carrollton Apartments will require investigation of noise barriers; relative to traffic noise, the alternatives are roughly equivalent.
Alternative 2	Diamond Interchange		Alternative maintains existing roadway configuration.		-	
MCDONNELL BOULEVARD						
Alternative 1	Diverging Diamond Interchange	None	Diverging diamond interchanges can limit some transit bus and emergency management operations.	None	Depending on design, diverging diamond interchanges can require pedestrians to cross free-flowing traffic.	Relative to noise sensitive land uses in this area, the major difference among the alternatives is the use of an outer road between Missouri Bottom Road to McDonnell Boulevard.
Alternative 2	Partial Cloverleaf Interchange	None	Frontage Road between Missouri Bottom Road to McDonnell Boulevard (and Anglum Road connection) may improve neighborhood connectivity.	Larger footprint within MO 370 interchange will increase work within Cowmire Creek.	(1) Possible Park-and-Ride lot at Missouri Bottom Road may increase bike/ pedestrian opportunities (2) Possible bike/pedestrian connection at Anglum Road. (3) Frontage Road proposed adjacent to Garrett Elementary School.	
AREA 2: EAST OF MCDONNELL BOULEVARD TO HANLEY ROAD/GRAHAM ROAD						
LINDBERGH BOULEVARD						
Alternative 1	Partial Cloverleaf Interchange	No property acquisition from Brookes Park, but trees within right-of-way may be removed.	Improved interchange will benefit local users	None	Direct Dunn Road connection through Lindbergh interchange should improve bike/ pedestrian operations	Existing traffic noise levels in Brookes Park area will require investigation of noise barriers
AREA 3: HANLEY ROAD/GRAHAM ROAD TO OLD HALLS FERRY ROAD						
HANLEY ROAD/GRAHAM ROAD						
Alternative 1	Diamond Interchange (One-Way Dunn/Pershall Road)	No expected impacts to the Myers House.	One-way operation at Graham Road eliminates need for buttonhook entrance at New Florissant Road. Metro Transit estimates that one-way outer roads will increase their operating expenses.	None	One-way outer roads tend to benefit pedestrians (because of fewer conflict points). One-way outer roads tend to result in out-of-direction travel by bicyclists, thus creating more conflicts with automobiles.	Relative to traffic noise, there are limited difference between alternatives. Noise barrier investigations will be conducted wherever traffic noise impacts are expected.
Alternative 2	Diamond Interchange (Two-Way Dunn/Pershall Road)		To maintain two-way operation at Graham, a new overpass is necessary. EB Dunn Road traffic must use the overpass. The overpass causes displacements at South Lafayette and potential bike/pedestrian pathway impacts.		Existing pathways maintained to the extent possible.	
NEW FLORISSANT ROAD TO WASHINGTON STREET/ELIZABETH AVENUE						
Alternative 1	Split Diamond Interchange (One-Way Dunn/Pershall Road)	None	One-way operation at New Florissant Road and Washington Street is primarily within the existing corridor. Important exceptions include the creation of a connection between Dunn Road and Waterford, behind the Grandview Plaza Shopping Center and the possible mid-block crossover at Grandview Drive. If local vehicle operation is maximized, neighborhood impacts could be discernible. Metro Transit estimates that one-way outer roads will increase their operating expenses	Limited culvert extensions for Fountain Creek	One-way outer roads tend to benefit pedestrians (because of fewer conflict points). One-way outer roads tend to result in out-of-direction travel by bicyclists creating more conflicts with automobiles.	Relative to noise sensitive land uses in this area, the major difference among the alternatives is the realignment of Dunn Road near Washington Street and New Florissant Road. The traffic levels along the outer roads are minor components of the traffic noise level along I-270.
Alternative 2	Split Diamond Interchange (Two-Way Dunn/Pershall Road)	Reconfiguration of outer road will create a new road around the Gittemeier House. No expected impacts to the historic integrity of the site.	The buttonhook at New Florissant Road result in several displacements. Otherwise, two-way operation is mostly within the existing corridor.	Larger footprint at New Florissant Road may increase work within Fountain Creek	Buttonhook at New Florissant Road may increase travel distances. Intersection relocation may provide opportunity to better accommodate bikes/pedestrian.	

Table 3-3. Major Environmental Impact Summary for the Reasonable Alternatives

Reasonable Alternative	Description	Parks and Recreation Impacts	Environmental Justice Impacts	Waterway Impacts	Bike/Pedestrian Impacts	Traffic Noise Impacts
WEST FLORISSANT AVENUE TO OLD HALLS FERRY ROAD						
Alternative 1	Split Diamond Interchange (West Florissant Avenue to Old Halls Ferry Road – One-Way Dunn/Pershall Road)	Possible acquisition from Little Creek Nature Area. Acquisition limited to narrow linear strip along Dunn Road. Driveway will be improved as necessary to benefit the facility.	EB Dunn Road traffic from Old Halls Ferry Road to MO 367 will not be possible. Cut-through traffic may result. Metro Transit estimates that one-way outer roads will increase their operating expenses.	All alternatives have limited culvert extensions of existing culverts within Maline Creek tributaries at New Halls Ferry Road and Old Halls Ferry Road. These alternatives have no other impacts.	One-way outer roads tend to benefit pedestrians (because of fewer conflict points). One-way outer roads tend to result in out-of-direction travel by bicyclists creating more conflicts with automobiles.	Relative to noise sensitive land uses in this area, the major difference amongst the alternatives is the realignment of Dunn Road near West Florissant/New Halls Ferry/Old Halls Ferry Road. Noise sensitive receptors are limited, but the Little Creek Nature Area is in the area. The traffic levels along the outer roads are minor components of the traffic noise level along I-270.
Alternative 1a	Split Diamond Interchange (West Florissant Avenue to New Halls Ferry Road – One-Way Dunn/Pershall Road)		Additional turnaround provided from WB Dunn Road to EB I-270. Metro Transit estimates that one-way outer roads will increase their operating expenses.		One-way outer roads tend to benefit pedestrians (because of fewer conflict points). One-way outer roads tend to result in out-of-direction travel by bicyclists creating more conflicts with automobiles.	
Alternative 2	Split Diamond Interchange (West Florissant Avenue to New Halls Ferry Road – Two-Way Dunn/Pershall Road)		Under both two-way alternatives, Dunn Road will be realigned (in different ways) through the commercial areas between West Florissant Avenue and Old Halls Ferry Road.	This alternative has a new Dunn Road crossing of the Maline Creek, near New Halls Ferry Road.	A new Pershall Road segment will be created between New Halls Ferry and Old Halls Ferry. This will be located adjacent to I-270.	
Alternative 2a	Split Diamond Interchange (West Florissant Avenue to Old Halls Ferry Road – Two-Way Dunn/Pershall Road)			This alternative has the new Dunn Road crossing of the Maline Creek and a revised crossing of Maline Creek at Netherton Drive.	Informal vehicle connection between New Halls Ferry and Old Halls Ferry Road (within Home Depot parking lot) will be formalized, standardizing bike/pedestrian operation in this area.	
AREA 4: EAST OF OLD HALLS FERRY ROAD TO RIVERVIEW DRIVE						
MO 367						
Alternative 1	Partial Cloverleaf Interchange	No direct impacts to Bellefontaine Conservation Area.	-	Limited culvert extensions of existing culverts for Maline Creek tributaries.	-	None – areas of frequent human use approximately 500 feet from I-270.
BELLEFONTAINE ROAD						
Alternative 1	Diamond Interchange	None	-	New crossing of Watkins Creek for relocated Dunn Road and replacement of existing culverts elsewhere.	-	None – no noise sensitive receptors.
Alternative 2	Partial Cloverleaf Interchange	None	-	New crossing of Watkins Creek for relocated Dunn Road. The existing culverts will also be replaced.	Larimore Road closed. Outer road connection to Bellefontaine Road detoured to Larimore Parkway Drive—increasing trip lengths or increasing cut-through movements.	
LILAC AVENUE						
Alternative 1	Diamond Interchange	None	-	None	-	Existing roadway/receptor configuration is similar to proposed configuration.
Alternative 2	Partial Cloverleaf Interchange	None	-	None	Loop ramp eliminates Park-and-Ride lot.	Loop ramp brings WB I-270 exit ramp closer to the Northgate/Raintree apartment complex.
RIVERVIEW DRIVE						
Alternative 1	Diamond Interchange with Two-Way Dunn Road	No impact to Dundee Park or Watkins Estate.	-	Limited culvert extensions of existing culverts within Watkins Creek.	-	None – no noise sensitive receptors.
Alternative 2	Partial Cloverleaf Interchange	Planning needed to avoid encroachment on Watkins Estate. No impact to Dundee Park.	-		-	

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Table 3-4. Cost and Acquisition Summary for the Reasonable Alternatives

Reasonable Alternative	Description	Preliminary Structure Acquisition Estimates	Preliminary Property Acquisition Estimates	Total Estimated Construction Cost	Percentage of PIM #2 Respondents Viewing the Configuration as "Very Beneficial" or "Beneficial"
AREA 1: I-70 TO MCDONNELL BOULEVARD					
ST. CHARLES ROCK ROAD AREA					
Alternative 1	Diverging Diamond Interchange	None	Less than 1 acre	$58,300,000	80 percent
Alternative 2	Diamond Interchange	None	Less than 1 acre	$54,100,000	28 percent
MCDONNELL BOULEVARD AREA					
Alternative 1	Diverging Diamond Interchange	None	Less than 1 acre	$107,900,000	76 percent
Alternative 2	Partial Cloverleaf Interchange	• Three single-family residences east of Missouri Bottom Road (Villa Teresa) • Arby's and Auto World, Inc. in the northeastern quadrant of McDonnell Boulevard	± 5 acres	$155,100,000	41 percent
AREA 2: EAST OF MCDONNELL BOULEVARD TO HANLEY ROAD/GRAHAM ROAD					
LINDBERGH BOULEVARD AREA					
Alternative 1	Partial Cloverleaf Interchange	None	± 4 acres	$84,500,000	73 percent
AREA 3: HANLEY ROAD/GRAHAM ROAD TO OLD HALLS FERRY ROAD					
HANLEY ROAD/GRAHAM ROAD AREA					
Alternative 1	Diamond Interchange (One-Way Dunn)	• Two single-family residences at Pershall Road and Brackleigh Lane	Less than 2 acres	$59,000,000	78 percent
Alternative 2	Diamond Interchange (Two-Way)	• Two single-family residences at Pershall Road and Brackleigh Lane • Displacements at South Lafayette Street include Tires Wholesale, one single-family residence, Life Smile Dental, One Hour Cleaning, and one vacant commercial building	± 5 acres	$65,300,000	32 percent
NEW FLORISSANT ROAD TO WASHINGTON STREET/ELIZABETH AVENUE AREA					
Alternative 1	Split Diamond Interchange (One-Way Dunn/Pershall Road)	• Twenty-one single-family residences: six at Santa Cruz Drive, and fifteen between DuBourg Lane and Jean Drive • Plaza Duchesne: Kwik Mart and five others and Gary's A+ Auto/ Joe's Auto Mart • Creative Cuts: Pershall/Jean	± 13 acres	$103,500,000	78 percent
Alternative 2	Split Diamond Interchange (Two-Way Dunn/Pershall Road)	• Twenty-two single-family residences: five at Santa Cruz Drive, fourteen between DuBourg Lane and Jean Drive, and three at New Florissant Road • BP, Circle K, one office complex (three operations), Kling Orthodontics, Boain Dental, and one vacant commercial building • Creative Cuts: Pershall/Jean	± 13 acres	$115,100,000	32 percent
WEST FLORISSANT AVENUE TO OLD HALLS FERRY ROAD AREA					
Alternative 1	Split Diamond Interchange (to Old Halls Ferry Road – One-Way)	None	± 6 acres	$96,100,000	73 percent
Alternative 1a	Split Diamond Interchange (to New Halls Ferry Road – One-Way)	None	± 6 acres	$100,600,000	76 percent
Alternative 2	Split Diamond Interchange (to New Halls Ferry Road – Two-Way)	• Dobb's Tire at West Florissant Avenue • Applebee's, Crossings Shopping Center (five operations), ZX, Plumber's Supply, Mobil, and Donut Delite at New Hall's Ferry Roads	± 38 acres	$137,100,000	73 percent
Alternative 2a	Split Diamond Interchange (to Old Halls Ferry Road – Two-Way)	• Dobb's Tire at West Florissant Avenue • Two single-family residences at Landseer Drive • Applebee's, Popeye's, ZX, Plumber's Supply, Mobil, and Donut Delite at New Hall's Ferry Road	± 34 acres	$130,000,000	73 percent
AREA 4: EAST OF OLD HALLS FERRY ROAD TO RIVERVIEW DRIVE					
MO 367 AREA					
Alternative 1	Partial Cloverleaf Interchange	None	± 1 acres	$74,900,000	76 percent
BELLEFONTAINE ROAD AREA					
Alternative 1	Diamond Interchange	• Pizza Hut restaurant	± 8 acres	$35,900,000	59 percent
Alternative 2	Partial Cloverleaf Interchange	• Shell gasoline station, National Rent-to-Own, Saullo's Pizza, Larimore Liquor, and Laundromat	± 7 acres	$38,800,000	30 percent
LILAC AVENUE AREA					
Alternative 1	Diamond Interchange	None	None	$42,300,000	54 percent
Alternative 2	Partial Cloverleaf	None	Less than 1 acre	$41,100,000	22 percent
RIVERVIEW DRIVE AREA					
Alternative 1	Diamond Interchange	None	None	$36,700,000	63 percent
Alternative 2	Partial Cloverleaf	None	± 2 acres	$27,100,000	42 percent

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Table 3-5. Performance Measures (minimum acceptable levels) for the I-270 North EA

Corridor-Wide Measures			
Performance Measure	**Standard**	**Preferred Alternative Performance**	**Alternate Configuration Criteria**
Safety			
Severe Crashes	Percent Reduction over Design Year No-Build	Corridor-wide reductions over No-Build vary by subarea	Should achieve a reduction in Severe Crashes in all subareas compared to the No-Build as measured by following the Highway Safety Manual procedures and/or using the ISATe tool. Safety assumptions are included in **Appendix B**.
Fatal Crashes	Percent Reduction over Design Year No-Build	Corridor-wide reductions over No-Build vary by subarea	Should achieve a reduction in Fatal Crashes in all subareas compared to the No-Build as measured by following the Highway Safety Manual procedures and/or using the ISATe tool. Safety assumptions are included in **Appendix B.**
Access, Mobility, and System Reliability			
Level of Service	Design Year LOS E or better during Peak Hour	All mainline sections, ramps, and cross-road intersections within the study area operate at LOS E or better during Peak Hour	Should achieve LOS E on all mainline, ramps, and crossroad intersections during Peak Periods. LOS measured by applying Highway Capacity Manual (HCM) 2010 thresholds to density and delay results from the VISSIM model.
Mainline Weaves	Design Year LOS E or better during Peak Hour	All mainline weaves operate as LOS E or better during Peak Hour	Should achieve LOS E or better for all mainline weaves as measured by applying HCM 2010 thresholds to density results from the VISSIM model.
Vehicle Hours of Delay (VHD)	Reduction in Design Year VHD over No-Build	AM Peak reduction of 72 percent PM Peak reduction of 75 percent	AM Peak increase in average speed of at least 70 percent. PM Peak increase in average speed of VHD of at least 70 percent. Corridor-wide VHD reported directly from VISSIM.
Average Speed	Increase in Design Year Average Speed over No-Build – Defined by corridor-wide vehicle miles traveled (VMT)/vehicle hours traveled (VHT)	AM Peak increase of 36 percent PM Peak increase of 63 percent	AM Peak reduction of VHD of at least 30 percent. PM Peak reduction of VHD of at least 60 percent. Average speed is defined by corridor-wide VMT/VHT. Corridor-wide VMT and VHT are reported directly from VISSIM.

The location study conducted as part of the I-270 North EA assumes that, with few exceptions*, all bridges and roadway pavement will ultimately be reconstructed in accordance with the Preferred Alternative. Cost estimates and predictive safety analyses have been completed with this assumption. Reuse and/or rehabilitation of some pavements and bridge structures may be feasible while still meeting the overall performance measures and characteristic requirements of the Preferred Alternative, including safety criteria. Therefore, reuse or rehabilitation of existing infrastructure, in itself, will not be considered in conflict with the commitments set forth in this document provided that the configuration associated with reuse or rehabilitation of the infrastructure meet the minimum performance measures, characteristic requirements, and criteria committed to herein.

Note: *Exceptions include potential reuse of select mainline and ramp bridges within the MO 370 interchange and the I-170 interchange ramps.

Table 3-5. Performance Measures (minimum acceptable levels) for the I-270 North EA

Site-Specific Measures	
Location	**Preferred Alternative Features**
Mainline I-270 (between I-70 and Hanley/Graham Road)	Four basic lanes in each direction with auxiliary lanes as necessary to maintain I-270 operations.
Dunn/Pershall Road (between I-70 and Hanley/Graham Road)	Two-way Dunn and Pershall Roads in existing or realigned locations as required for mainline and crossroad operations and access.
St. Charles Rock Road Interchange	Improved interchange providing full access to/from I-270.
MO 370 Interchange	Improve EB I-270 exits for WB MO 370 and Missouri Bottom Road. Maintain all existing access to/from I-270.
Missouri Bottom Road Interchange	Improve EB I-270 exits for WB MO 370 and Missouri Bottom Road. Maintain all existing access to/from I-270.
McDonnell Boulevard Interchange	Improved interchange providing full access to/from I-270.
Lindbergh Boulevard Interchange	Improved interchange providing full access to/from I-270. Improve traffic traveling to/from Lindbergh Boulevard from/to I-270 from the Taylor/Lynn Haven interchange. Continuous two-way Dunn Road through interchange with grade separation with Lindbergh Boulevard. Continuous two-way Pershall Road from Lindbergh Boulevard to the east.
I-170 Interchange	Access to WB I-270 from both directions of Dunn Road. Maintain all existing access to/from I-270.
Mainline I-270 (between Hanley/ Graham Road and MO 367)	Four basic lanes in each direction with axillary lanes as necessary to maintain I-270 operations.
Dunn/Pershall Road (between Hanley/ Graham Road and MO 367)	One-way Dunn and Pershall Roads in existing or realigned locations between Hanley/Graham Road and New Halls Ferry Road and two-way Dunn and Pershall Roads in existing or realigned locations east of New Halls Ferry Road as required for operations and access.
Hanley/Graham Road to New Halls Ferry Road	Balanced/complementary ramp pairs. Access to/from each crossroad from/to I-270 with travel through two or fewer signals. Turnarounds as necessary to achieve the LOS and other study requirements.
MO 367 Interchange	Improved interchange providing full access to/from I-270. Free flow EB I-270 movements to NB MO 367. Eliminate weaving movements within the interchange. Free flow SB MO 367 movements to I-270.
Mainline I-270 (Between MO 367 and Mississippi River)	Three basic lanes in each direction with axillary lanes as necessary to maintain I-270 operations.
Dunn/Pershall Road (Between MO 367 and Mississippi River)	Two-way Dunn and Pershall Roads in existing or realigned locations as required for mainline and crossroad operations and access.
Bellefontaine Road Interchange	Improved interchange providing full access to/from I-270.
Lilac Avenue Interchange	Improved interchange providing full access to/from I-270.
Riverview Drive Interchange	Improved interchange providing full access to/from I-270.

SECTION 4

Affected Environment and Impacts

This section provides a discussion of the affected environment within the study area and a quantification of impacts — positive and negative. An understanding of the resources and impact was used in the development of the alternatives discussed in **Section 3**, leading to the Reasonable Alternatives and the Preferred Alternative. **Section 5** presents the study's environmental commitments. The affected environmental impacts are arranged alphabetically, as follows:

1. Air Quality
2. Community Resources
3. Construction Impacts
4. Cultural Resources
5. Demographics
6. Endangered and Threatened Species
7. Environmental Justice
8. Farmland
9. Geological Setting
10. Hazardous Materials
11. Land Use
12. Noise
13. Right-of-Way
14. Secondary and Cumulative Impacts
15. Section 4(f)
16. Section 6(f)
17. Socio-Economic Resources
18. Travel Patterns
19. Visual Resources
20. Water – Floodplains
21. Water – Streams and Watersheds
22. Water – Wetlands
23. Water – Water Quality

Both figures and exhibits are used in this text to help graphically depict the affected environment. Figures are graphics contained within the text. The figures generally show the resources across the entire study area. Exhibits are contained in **Appendix A**. Exhibits provide more detailed depictions of the study area, using a 13-sheet series. **Exhibit 1** covers natural resources. **Exhibit 2** covers human resources. **Exhibit 3** covers community resources**. Exhibit 4** covers the footprint and impacts associated with the Preferred Alternative, and **Exhibit 5** shows the footprint and impacts associated with the Reasonable Alternatives. **Exhibit 6** contains the detailed lane work and transportation improvements associated with the Reasonable Alternatives.

4.1 Air Quality

Air quality and pollution are general terms that refer to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants degrade the atmosphere by reducing visibility. They can also damage property, reduce the productivity or vigor of crops or natural vegetation, or reduce human or animal health.

4.1.1 Air Quality — Regulatory Background and Standards

Transportation can contribute to all of the nation's regulated air pollutants. Transportation Conformity, as required under the Clean Air Act, ensures that federally funded or approved transportation plans, programs, and projects conform to the air quality objectives established in State Implementation Plans (SIPs). MoDOT implements the conformity regulation in nonattainment and maintenance areas.

The Clean Air Act, as amended by the Clean Air Act Amendments of 1990, and other rules and regulations, such as the Control of Hazardous Air Pollutants from Mobile Sources rule promulgated by the U.S. Environmental Protection Agency (EPA), specifies environmental policies and regulations to promote and ensure acceptable air quality. These policies and regulations were adopted in the Final Conformity Rule (40 *Code of Federal Regulations* [CFR] Parts 51 and 93). EPA delegates authority to the Missouri Department

of Natural Resources (MDNR) for monitoring and enforcing air quality regulations in Missouri. MDNR developed the Missouri SIP to ensure conformity with the rule.

The Clean Air Act defines conformity as the following:

> *"Conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of such standards; and that such activities* (that is, approved transportation plans, programs, and projects in the state) *will not:*

- Cause or contribute to any new violation of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS in any area; or
- Delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in any area."

EPA established the NAAQS for the following major air pollutants, which are known as criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM) (PM less than 10 and 2.5 microns in aerodynamic diameter [PM_{10} and $PM_{2.5}$]), sulfur dioxide (SO_2), and lead. The "primary" standards have been established to protect the public health. The "secondary" standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the general welfare. Air quality in Missouri is defined with respect to conformity with the NAAQS. MDNR has adopted the standards for the criteria pollutants listed in **Table 4-1** in its air quality program.

Table 4-1. Criteria Pollutant Emission Standards

Pollutant	Period	Primary Standard	Secondary Standard
O_3	8-hour	0.070 parts per million (ppm)	0.070 ppm
CO	1-hour 8-hour	35 ppm 9 ppm	None None
SO_2	3-hour 1-hour	None 75 parts per billion (ppb)	0.5 None
NO_2	Annual 1-hour	53 ppb 100 ppb	53 ppb None
PM_{10}	24-hour	150 micrograms per cubic meter ($\mu g/m^3$)	150 $\mu g/m^3$
$PM_{2.5}$	Annual 24-hour	12 $\mu g/m^3$ 35 $\mu g/m^3$	15 $\mu g/m^3$ 35 $\mu g/m^3$
Lead	3-month	0.15 $\mu g/m^3$	0.15 $\mu g/m^3$

Source: MDNR, Missouri 10 CSR 10-6.010 Ambient Air Quality Standards, updated April 21, 2016, http://www.dnr.mo.gov/env/esp/aqm/standard.htm

4.1.2 Air Quality — Affected Environment

4.1.2.1 Attainment Status

EPA uses the term *attainment area* to describe those areas where air quality meets health standards for particular air borne pollutants. The area that includes the I-270 North EA corridor has been designated non-attainment for two pollutants—O_3 and $PM_{2.5}$.

Ozone

The entire eight-county Saint Louis region is now classified as a non-attainment area for the 8-hour O_3 standard and has been given a marginal non-attainment classification. The marginal non-attainment area includes Franklin, Jefferson, Saint Charles, and Saint Louis Counties and the City of Saint Louis in Missouri and Madison, Monroe, and Saint Clair Counties in Illinois.

Particulate Matter

In April 2005, EPA designated the entire eight-county Saint Louis region as being in non-attainment for $PM_{2.5}$. The $PM_{2.5}$ non-attainment area includes Franklin, Jefferson, Saint Charles, and Saint Louis Counties and the City of Saint Louis in Missouri and Madison, Monroe, and Saint Clair Counties in Illinois. Baldwin Township in Randolph County, Illinois, is also part of this non-attainment area. In February 2006, EWG conducted a Conformity Determination on the fiscal year 2006–2009 Transportation Improvement Program (TIP) (see **Figure 4-1**).

In 2006, the 24-hour (daily) standard was set at 35 micrograms per cubic meter ($\mu g/m^3$). The standard is met whenever the 3-year average of the annual 98th percentile of values at designated monitoring sites is less than or equal to 35 $\mu g/m^3$. In 2009, EPA found the Saint Louis area was in attainment of this standard.

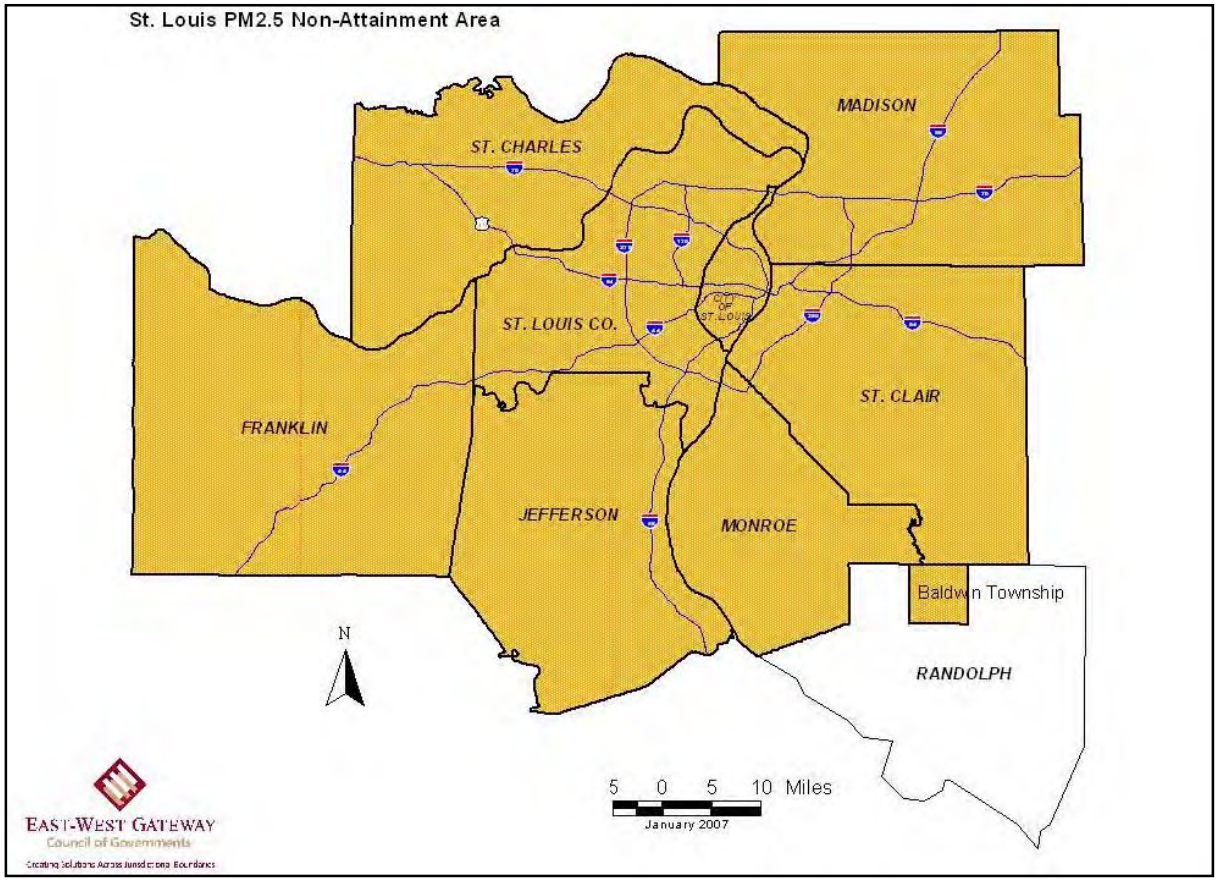

Figure 4-1. Saint Louis $PM_{2.5}$ Non-Attainment Area (April 2005)

In 2007, MDNR prepared a Saint Louis Transportation Conformity Rule and in 2010 MDNR proposed changes to the 2007 Transportation Conformity Rule. Until EPA approves this revision, the March 2007 Saint Louis Transportation Conformity Rule (approved December 2007) is still in effect.

In May 2011, EPA published a final rule stating that the Saint Louis $PM_{2.5}$ non-attainment area had attained the 1997 annual standard based on 2007 through 2009 quality assured monitor data. MDNR developed a maintenance plan and submitted it to EPA in August 2011, which is now under review.

On December 14, 2012, the EPA Administrator finalized the federal rule revising the annual $PM_{2.5}$ standard from 15 to 12 µg/m^3. In response to this, MDNR submitted attainment recommendations for the 2012 annual $PM_{2.5}$ standard. In its December 10, 2013 submission, it recommends an attainment/unclassifiable designation for St. Louis County and the entire multi-county region.

4.1.2.2 Effects of Non-Attainment Pollutants

Ozone

O_3 is a colorless, toxic gas found in both the Earth's upper and lower atmospheric levels. In the upper atmosphere, O_3 is a naturally occurring gas that helps to prevent the sun's harmful ultraviolet rays from reaching the earth. In the lower layer of the atmosphere, O_3 is human-made. Although O_3 is not directly emitted, it forms in the lower atmosphere through a chemical reaction between volatile organic compounds (VOCs) and nitrogen oxides (NO_x), which are emitted from industrial sources and from automobiles. Substantial O_3 formations are generally a concern in the summer. O_3 is the main ingredient of smog. O_3 enters the blood stream through the respiratory system and interferes with the transfer of oxygen, depriving sensitive tissues in the heart and brain of oxygen.

Particulate Matter

Particulate matter is composed of solid particles or liquid droplets that are small enough to remain suspended in the air. In general, particulate matter includes dust, soot, and smoke. These pollutants can be irritating but usually are not poisonous. Particulate matter can also include bits of solid or liquid substances that can be toxic. Of particular concern are $PM_{2.5}$, which is roughly 1/28 the diameter of a human hair. A substantial proportion of the $PM_{2.5}$ in the atmosphere is attributable to the combustion of fossil fuels. $PM_{2.5}$ can be formed in the atmosphere from gases such as SO_2, NO_x, and VOCs. When inhaled, particulate matter can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ are so tiny that they can penetrate deeper into the lungs and damage lung tissues.

4.1.2.3 Conformity

In accordance with the Clean Air Act Amendments of 1990, the Transportation Conformity process is intended to ensure that the programs and activities proposed in long-range transportations plans conform to the purpose of the SIPs for Air Quality. The SIPs contain the benchmarks against which progress is measured in meeting national goals for cleaner and healthier air is set out.

The updated long-range transportation plan (*Connected2045)* was approved on June 24, 2015, by EWG's Board of Directors. All elements of the Preferred Alternative are included in the long-range plan and are included in the region's air quality conformity analysis. The various projects are summarized in **Table 4-2**.

Table 4-2. I-270 Projects in the Long Range Plan

Project #	Location	Year of Expenditure Costs*	Period
2045019	I-170 To Lindbergh Boulevard (from east of McDonnell Blvd. to west of Hanley/Graham Rd.)	$93,000,000	2016-2025
2045018	Old Hall Ferry Road to Hanley/Graham Road (from east of Old Halls Ferry Rd. to west of Hanley/Graham Rd.)	$289,000,000	2016-2025
2045022	MO 367 Interchange (from east of Old Halls Ferry Rd. to east of Bellefontaine Rd.)	$107,000,000	2026-2035
2045020	Riverview Road to Lilac Avenue (from east of Bellefontaine Rd. to east of Riverview Dr.)	$163,000,000	2026-2035
2045021	McDonnell Boulevard to MO 370 (from east of McDonnell Blvd. to west of MO 370)	$86,000,000	2026-2035
2045023	Dorsett Road to MO 370 (from west of MO 370 to east of Dorsett Rd.)	$211,000,000	2036-2045

* Assumes 3% inflation per year

EWG, as the Metropolitan Planning Organization for the Saint Louis region, is the agency responsible for making the determination of conformity. The conformity finding relates to those pollutants produced by automobiles and other road transportation, generally described as mobile source emissions. The pollutants of concern in this region are the non-attainment pollutants — O_3 and PM.

For O_3, conformity focuses on the precursors of O_3 — VOCs and NO_x. The primary purpose of the conformity process is to ensure that predicted future mobile emissions resulting from planned and programmed transportation projects fall below the emission budget levels for both VOC and NO_x. Based on the analysis, the projects and programs included in *Connected2045* are found to be in conformity with the requirements of the Clean Air Act Amendments of 1990, the relevant sections of the Final Conformity Rule 40 CFR Part 93, and the procedures set forth in the Missouri State Conformity Regulations 10 CSR 10-5.480 for the 2008 eight-hour ozone standard. This Conformity Determination covers the St. Louis 2008 eight-hour ozone non-attainment area (Franklin, Jefferson, St. Charles, and St. Louis Counties and the City of St. Louis in Missouri and Madison, Monroe, and St. Clair Counties in Illinois).

For PM, conformity focuses on demonstrating that the predicted future mobile emissions resulting from planned and programmed transportation projects is less than the combined baseline emissions inventories developed for the $PM_{2.5}$ non-attainment area. Based on the analysis, the projects and programs included in *Connected2045* are found to be in conformity with the requirements of the Clean Air Act Amendments of 1990, the relevant sections of the Final Conformity Rule 40 CFR Part 93 and the procedures set forth in the Missouri State Conformity Regulations 10 CSR 10-5.480 for the 1997 annual $PM_{2.5}$ standard. This Conformity Determination covers the entire St. Louis non-attainment area (Franklin, Jefferson, St. Charles, and St. Louis Counties and the City of St. Louis in Missouri and Madison, Monroe, and St. Clair Counties and Baldwin Township in Randolph County in Illinois).

Details of these findings are documented in the report, *Air Quality Conformity Determination and Documentation (8-Hour and $PM_{2.5}$) for the 2045 Regional Transportation Plan.*

4.1.2.4 Other Pollutants — Greenhouse Gases/Climate Change

Science continues to expand our understanding of the impacts of anthropogenic greenhouse gas (GHG) emissions. The Council on Environmental Quality (CEQ) referenced climate change in its first Annual Report in 1970. Since the publication of that report, it has been determined that human activities have caused the carbon dioxide content of the atmosphere to increase to its highest level in at least 800,000 years. It is now well established that rising global atmospheric GHG emission concentrations are substantially affecting the Earth's climate. The nature of how Federal Agencies address GHG and climate changes is an evolving area of research.

In 2007, the Supreme Court decided in Commonwealth of Massachusetts versus EPA that carbon dioxide is a pollutant, subject to regulation under the Clean Air Act. Since that time, the federal government has taken a number of steps to regulate carbon dioxide emissions as part of an overall program addressing greenhouse gases (GHGs). For example, EPA has adopted a GHG Monitoring, Recordkeeping, and Reporting Rule that requires certain suppliers of fossil fuels or industrial GHGs to report to EPA on emissions from particular facilities. That rule does not apply to the activities contemplated by the I-270 North EA study.

Also, a number of federal agencies concluded it is not possible to link a project's emissions to particular climatic effects in a NEPA review. In particular, the *2010 Draft Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*, authored by the Council on Environmental Quality (CEQ), states that "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct lineage is difficult to isolate and to understand."

In 2016, the CEQ issued Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews (Published in Federal Register on August 5, 2016). The guidance provides specific and substantive procedures for addressing project-related GHG issues. This guidance applies to all EAs and EISs that commence on or after August 5, 2016. For ongoing EAs and EISs, like the I-270N EA, the guidance suggests that "agencies should consider applying this guidance to projects in the EIS or EA preparation stage if this would inform the consideration of differences between alternatives or address comments raised through the public comment process...." As is discussed in **Section 3**, the alternatives for this project investigated reconfigurations of the existing system. These alternatives are intended to increase the efficacy of the system, rather than to increase the number of users. Relative to GHG, the differences among the alternatives is minor-focused on elements like interchange designs and outer road configurations. These elements are not expected to measurably affect the levels of GHG inputs, among the alternatives. Additionally, climate change did not emerged during any of the public/stakeholder outreach conducted for the project (**Section 6**).

4.1.2.5 Mobile Source Air Toxics

In addition to the criteria pollutants discussed in **Section 4.1.1**, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Mobile source air toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted into the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

EPA identified the following seven compounds from mobile sources that are among the national and regional-scale cancer risk drivers: benzene; acrolein; formaldehyde; 1,3-butadiene; diesel exhaust; naphthalene; and polycyclic organic matter. While FHWA considers these the priority MSATs, the list is

subject to change and may be adjusted in consideration of future EPA rules. MSATs were included in the construction phase analysis for NEPA purposes.

In accordance with the FHWA Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA (March 2012), an MSAT analysis may be required for projects with sensitive land uses within 500 feet of the project area and create infrastructure/traffic changes that will negatively impact those land uses. While there are sensitive land uses in close proximity, the project changes will occur within the existing I-270 footprint. Very little new right-of-way will be acquired. Roadway lanes and interchanges will be altered to better accommodate the expected future traffic volumes. These changes are not intended to increase the number of users, but rather to better accommodate those who will inevitably use them. It is expected that the increased efficiency of the system will improve air quality. The project is expected to have no meaningful impact on traffic volumes or vehicle mix, thus the project is not expected to have a meaningful potential for MSAT effects. Consequently, the I-270 North EA does not require an MSAT analysis.

On October 18th, 2016 the Interim MSAT Guidance was updated. This update supersedes the December 2012 Interim Guidance. The primary updates include 1) the incorporation of an updated version of the Motor Vehicle Emissions Simulator (MOVES) and 2) an update on the status of scientific research on air toxics.

- The new version of the model is called MOVES2014a. Based on FHWA's analysis using MOVES2014a, diesel particulate matter (diesel PM) remains the dominant MSAT of concern for highway projects. MOVES2014a adds new options for the input of local VMT, includes minor updates to the default fuel tables, and corrects an error in MOVES2014 brake wear emissions.
- Relative to air toxics, analysis continues on the assessment of overall health risks. However, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. Nevertheless, it is confirmed that mobile sources are contributors of the MSAT compounds and that these are among the national and regional-scale cancer risk drivers or contributors.

The updated guidance continues to use the tiered approach with three categories for analyzing MSAT in NEPA documents, depending on specific project circumstances:

1. No analysis for projects with no potential for meaningful MSAT effects;
2. Qualitative analysis for projects with low potential MSAT effects; or
3. Quantitative analysis for projects with higher potential MSAT effects.

The exemption from analysis for projects with no meaningful impacts on traffic volumes or vehicle mix continues in the updated MSAT Guidance. Since the project is expected to have no meaningful impact on traffic volumes or vehicle mix, the conclusion that the I 270 North EA does not require an MSAT analysis is confirmed.

4.1.2.6 Project-Level Particulate Matter Hot-Spot Conformity Determination

Within a particulate matter non-attainment or maintenance area, as part of the NEPA process, a transportation project sponsor has to determine if a proposed major transportation project would be considered a "project of air quality concern." A project of air quality concern involves the following:

1. New highway projects that have a substantial number of diesel vehicles and expanded highway projects that have a substantial increase in the number of diesel vehicles:
    - Pursuant to the I-270 North EA Access Justification Report (AJR), it is anticipated that diesel vehicles will increase at a rate of less than 1 percent per year, the same as general traffic growth.
2. Projects affecting intersections that are at Level-of-Service D, E, or F with a substantial number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a substantial number of diesel vehicles related to the project:

- Pursuant to the I-270 North EA AJR, the percentage of heavy vehicles is less than 10 percent for all affected intersections.

3. New or expanded bus and rail terminals and transfer points that substantially increase the number of diesel vehicles congregating at a single location:
   - The I-270 North EA doesn't involve expanding a bus or rail terminal. However, there is a new MetroBus Transit Center constructed at 3142 Pershall Road. Coordination with Metro Transit regarding the Reasonable Alternatives concluded that a one-way frontage road system would increase the total bus travel by approximately 300 miles per week.
4. Projects in or affecting locations, areas, or categories of sites which are identified in the SIP as sites of violation or possible violation:
   - The I-270 North EA does not involve sites of violation or possible violation. On December 10, 2013, MDNR submitted attainment recommendations for the 2012 annual $PM_{2.5}$ standard; it recommends an attainment/unclassifiable designation for St. Louis County.

Based on these factors, a quantitative particulate matter hot-spot analysis is not required for the I-270 North EA. To confirm this conclusion, coordination the Inter Agency Consultation Group (IACG) was initiated. The IACG is a peer group consisting of representatives from East-West Gateway and federal, state and local air and transportation agencies. The IACG oversees the Conformity Determination process and reaches consensus on planning assumptions, analysis years, tests to be performed and motor vehicle emissions budgets. At its January 27, 2015, meeting, the IACG concurred that the I-270 North EA does not require a hot spot analysis.

4.1.3 Air Quality — Impacts

4.1.3.1 No-Build Alternative Impacts

The volume of traffic projected to occur as a result of the No-Build Alternative would contribute to increased emissions resulting in lower air quality within the study area. The volume of traffic projected within the study area would result in unacceptable levels of service, causing increased congestion and travel delay. Traffic congestion and delays contribute to the increase in idling times by vehicles at intersections and lower travel speeds along all roadways, which also result in lower air quality.

4.1.3.2 Build Alternatives Impact Summary

According to the conformity analysis, the projects and programs included in the updated long-range transportation plan (*Connected2045*), which includes the proposed I-270 improvements, were found to be in conformity with the requirements of the Clean Air Act. Therefore, the I-270 North was determined to not have an effect on regional air quality. On the contrary, the removal of congestion on the roadway system is expected to improve local and regional air quality. By improving levels of service, reducing travel times and maximizing the capacity of the facility, the improvements associated with the I-270 North EA would contribute to lower emissions from transportation sources within the study area, thereby improving air quality.

Controlling air toxics emissions became a national priority with the passage of the Clean Air Act. In 2007, EPA published a rule on the Control of Hazardous Air Pollutants from Mobile Sources, identifying a number of compounds emitted from mobile sources, seven of which are considered priority mobile source air toxics (MSATs) by FHWA. The purpose of this project is to better accommodate those who will inevitably use I-270 by re-constructing various elements of the existing roadway. This project has been determined to generate minimal air quality impacts for CAAA criteria pollutants and has not been linked with any special MSAT concerns. As such, this project will not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in MSAT impacts of the project from that of the No-Build Alternative. Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT

emissions to decline substantially over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOVES model forecasts a combined reduction of over 80 percent in the total annual emission rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 100 percent. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.

Construction activities may result in short-term impacts on air quality, including direct emissions from construction equipment and trucks, fugitive dust emissions from site demolition and earthwork, and increased emissions from motor vehicles and haul trucks on local streets. The Preferred Alternative is almost entirely contained within the existing right-of-way. These impacts would be temporary and localized to the area of construction and its immediate vicinity. Fugitive dust, suspended particulates, and emissions could occur during ground excavation, material handling and storage, movement of equipment at the site, and transport of material to and from the site. Fugitive dust could be a problem during periods of intense activity and would be aggravated by windy and/or dry weather conditions. The amount of emissions would depend on the type and number of equipment used. Contractors will be required to comply with all applicable local, state, and federal air pollution regulations.

Standard MoDOT operating procedures associated with air quality includes steps to minimize emissions from construction. Controlling construction emissions requires the development of a construction mitigation plan for implementation during construction. This construction mitigation plan will adhere to current MoDOT standards. The specific actions described in the construction mitigation plan may include the following:

- Spraying exposed soil with water or other suppressant to reduce emissions of PM_{10} and increase deposition of particulate matter
- Phasing construction to keep disturbed areas to a minimum; using wind fencing to reduce disturbance to soils
- Wetting down materials to be transported or using covered trucks to transport materials and wastes
- Promptly cleaning up spills of transported material on public roads
- Scheduling work tasks to minimize disruption of vehicle traffic on local streets
- Locating construction equipment and truck staging areas away from sensitive receptors, as practical, and in consideration of potential effects on other resources
- Providing wheel washers to remove particulate matter that would otherwise be carried offsite by vehicles to decrease deposition of particulate matter on area roadways

4.2 Community Resources

4.2.1 Community Resources — Regulatory Background and Standards

The legal definition of community and the human environment has undergone substantial modification as a result of court decisions stemming from NEPA-related litigation. The Council on Environmental Quality's (CEQ's) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act point-out that the human environment is to be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. Agencies need to assess not only, direct effects, but also aesthetic, historic, cultural, economic, social, or health effects, whether direct, indirect, or cumulative. The CEQ Regulations also contain provisions where economic or social and natural or physical environmental effects are interrelated. Consequently, NEPA documents will discuss/disclose all of these effects on the human environment. This section will discuss/disclose the municipal and public facilities contained within this large study area.

4.2.2 Community Resources — Affected Environment

The I-270 North EA is located within the northern portion of St. Louis County. Known as North County, it encompasses numerous municipalities and unincorporated areas and the northern city limits of Saint Louis. Specifically, the study area encompasses portions of the following 16 municipalities (see **Figure 4-2**):

- Bellefontaine Neighbors
- Berkeley
- Black Jack
- Bridgeton
- Calverton Park
- Castle Point
- Champ
- Dellwood
- Ferguson
- Florissant
- Glasgow Village
- Hazelwood
- Maryland Heights
- Spanish Lake
- City of Saint Louis
- Unincorporated St. Louis County

Several municipalities in the study area are located entirely north or south of I-270, some with borders at the I-270 corridor, such as Spanish Lake, Bellefontaine Neighbors, Ferguson, and Glasgow Village. However, a number of others span the I-270 corridor through the study area, including Florissant, Hazelwood, Bridgeton, Champ, Maryland Heights, City of Saint Louis, and unincorporated portions of St. Louis County.

Relative to transportation, North County is centrally located. It is near downtown Saint Louis, Saint Charles County, West St. Louis County, and downtown Clayton. Earth City and Park 370 business parks are both located in North County.

North County is also home to Lambert International Airport. Lambert is owned and operated by the City of Saint Louis. The airport controls approximately 3,970 acres of land. Between Saint Charles Rock Road and MO 370, land controlled by the airport is adjacent to I-270. Most of that land is in a former residential area that has been razed and left largely vacant. It is known as the Airport Buyout Area (see Sheets 2 and 3 of Exhibit 1 in **Appendix A**). To avoid impacts to the airport, no right-of-way acquisition is proposed in this area. No major elevation changes are proposed. Further, no construction or operation impacts are expected to the Lambert facilities or operations. However, the project lies within the applicable perimeters (10,000 feet and 5 miles) for potential impacts regarding development and changes in proximity to airports. Consequently, coordination with the Federal Aviation Administration has been underway throughout the project. It is an environmental commitment of this project to continue coordination of the Preferred Alternative with the Federal Aviation Administration to complete all necessary permitting.

The Missouri and Mississippi rivers border North County, and offers the option of barge transportation to area commerce. A number of sand and stone quarry docks are located along the Missouri River in North County, near US 67 north of the study area, and near I-70 and MO 370 west of the study area.

Railroads also serve the region. The Burlington Northern Santa Fe line crosses the I-270 North EA area between Lilac Avenue and Bellefontaine Road, and the Norfolk Southern line crosses between Missouri Bottom Road and MO 370. The nearest intermodal facility is in the City of Saint Louis.

4.2.2.1 Public Facilities and Services

Public services are provided by a variety of local and county entities within the I-270 North EA corridor. Some State of Missouri services are also present.

Fire protection is largely provided by St. Louis County through eight county fire districts that cross the study area and do not follow municipal boundaries (**Figure 4-2**). Most of these districts span the I-270 corridor. Three municipal fire departments (Hazelwood, Ferguson, and Berkeley) also provide fire protection for some areas. Nine fire stations are located within 1 mile of the I-270 North EA study area (**Table 4-3**).

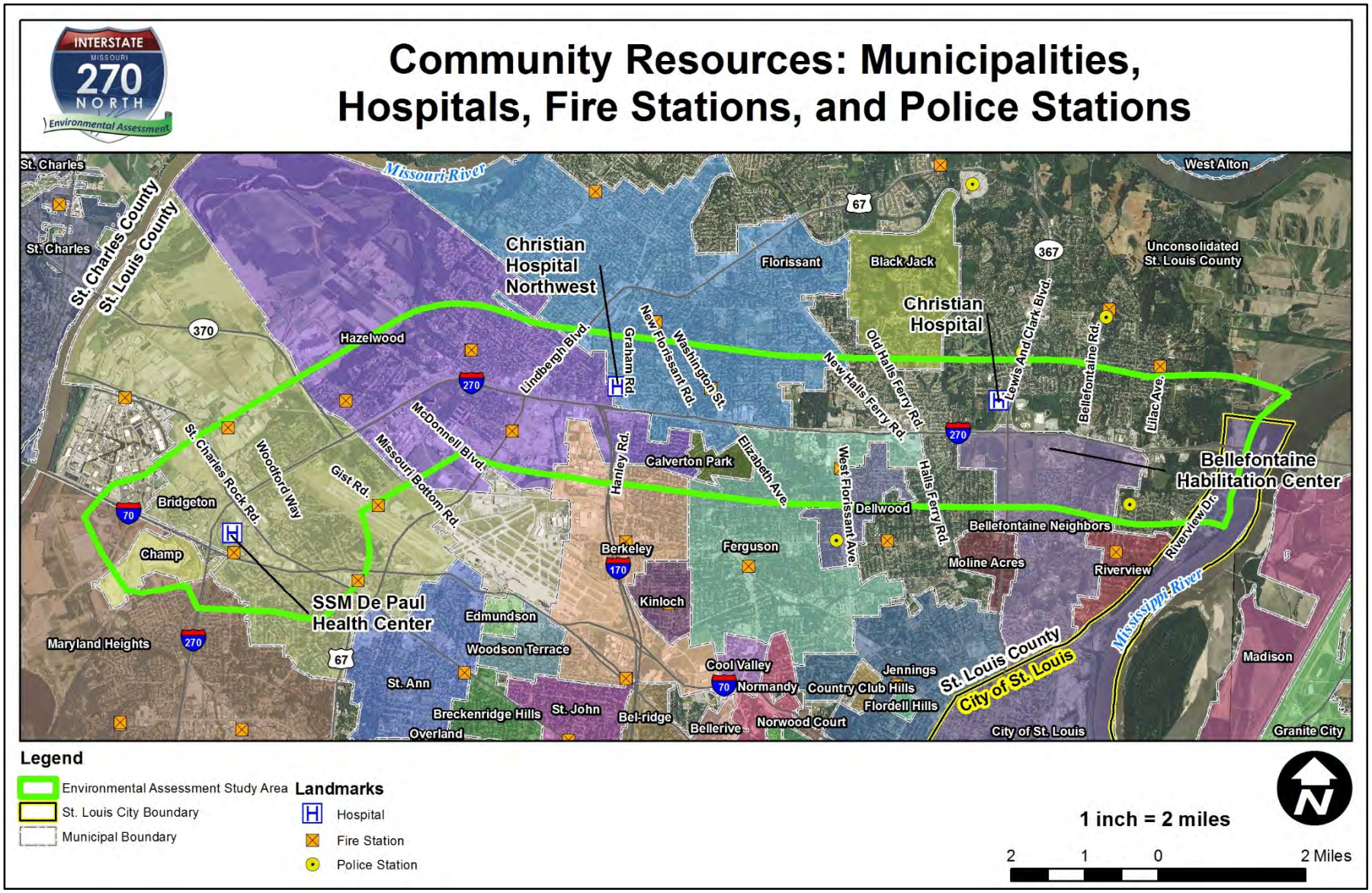

Figure 4-2. Community Map — Municipalities, Hospitals, Fire Stations, and Police Stations

Table 4-3. Fire Stations in the Study Area

Department/Station	Address	City
St. Louis County Fire District/Florissant Valley	1955 Washington Street	Florissant
St. Louis County Fire District/Pattonville-Bridgeton Terrace Firehouse 1	4008 Fee Road	Bridgeton
St. Louis County Fire District/Pattonville-Bridgeton Terrace Firehouse 2	12219 St Charles Rock Road	Bridgeton
St. Louis County Fire District/Robertson Firehouse 1	12641 Missouri Bottom Road	Hazelwood
St. Louis County Fire District/Robertson Firehouse 2	3820 Taussig Avenue	Hazelwood
Robertson Fire Department	12195 Gist Road	Bridgeton
Ferguson City Fire Department/Station 2	10701 West Florissant Avenue	Ferguson
Hazelwood City Fire Department/Station 1	6100 North Lindbergh Boulevard	Hazelwood
Hazelwood City Fire Department/Station 2	6800 Howdershell Road	Hazelwood

The hospitals and large medical care facilities located within the study area are shown in **Table 4-4** and on **Figure 4-2**.

De Paul Health Center is a Level II Trauma Center. It offers comprehensive medical care with 476-beds from its campus at the I-70-/I-270 interchange. Opened in 1828, it was the first hospital west of the Mississippi River and remains the oldest continuously existing business in St. Louis.

Bellefontaine Habilitation Center is one of six State-operated facilities to provide habilitation services to Missouri citizens with developmental disabilities and who have severe maladaptive behaviors or limited adaptive skills. Its campus immediately abuts the Bellefontaine Conservation Area.

Christian Hospital has more than 600 physicians on staff and a workforce of more than 2,500 health care professionals. Located on the northwest corner of the I-270/MO 367 interchange, it is a leader among hospitals in the St. Louis region. In particular, for its excellence in heart services and lifesaving cardiothoracic surgery, emergency medicine, neurosurgery, cancer treatment, radiology, urology, pulmonology, and radiation oncology.

Christian Hospital Northwest is 6 miles west of Christian Hospital on Graham Road in Florissant. It offers 24-hour emergency care and a variety of outpatient services and physician practices.

Table 4-4. Hospitals and Medical Care Facilities Located along the I-270 within the Study Area

Facility	Address	City
Bellefontaine Habilitation Center	10695 Bellefontaine Road	Bellefontaine Neighbors
Christian Hospital	11133 Dunn Road	St. Louis
Christian Hospital Northwest	1225 Graham Road	Florissant
De Paul Health Center	12303 De Paul Drive	Bridgeton

The First and Second St. Louis County Police precincts cover the study area. As shown in **Table 4-5**, local police from a number of municipalities cover portions of the study area. Only one station, the Glasgow Neighborhood Police station at 607 Shepley Drive, is within 1 mile of the I-270 North EA.

Table 4-5. Police Departments that Serve the Study Area

Department/Station	Address
St. Louis County Police, First Precinct	11815 Benham Road
St. Louis County Police, Second Precinct	1333 Ashby Road
City of Black Jack Police	12500 Old Jamestown Road
City of Dellwood Police	1415 Chambers Road
Glasgow Neighborhood Police	607 Shepley Drive
Spanish Lake Neighborhood Police	12131 Bellefontaine Road
St. Louis Metropolitan Police, Sixth District, North Patrol Division	4014 Union Boulevard

4.2.2.2 Schools and School Districts

North County is home to eight accredited public school districts. The study area crosses four of these school districts (Hazelwood, Riverview Gardens, Ferguson-Florissant, and Pattonville), plus a section of the St. Louis City School District. Four public schools and one outdoor laboratory (Little Creek Nature Area) are located along the I-270 corridor or along one of the frontage roads or intersecting roadways near interchanges (**Table 4-6**). McCluer High School fronts I-270 between Route N/New Florissant Road and Washington Street/Elizabeth Avenue. Hazelwood East High School and Hazelwood East Middle School are both located in the northeast quadrant of the I-270/MO 367 (Lewis and Clark Boulevard) interchange. Garrett Elementary School borders I-270 near MO 370 (Missouri Bottom Road). In addition to these public schools, the Saint Louis Community College — Florissant Valley campus is located at 3400 Pershall Road, west of West Florissant Avenue, and the North County Christian School is located along Dunn Road west of New Florissant Road (see **Exhibit 2** in **Appendix A**).

Table 4-6. Schools Located along the I-270 Corridor

School	Address (Nearest Crossroad)
Hazelwood School District	
Garrett Elementary	1400 Ville Rosa Lane, Hazelwood (McDonnell Boulevard)
Hazelwood East Middle School	1865 Dunn Road, Hazelwood (MO 367)
Hazelwood East High School	11300 Dunn Road, Hazelwood (MO 367)
Ferguson-Florissant School District	
Little Creek Nature Area (Special Purpose Area)	2295 Dunn Road, Hazelwood (West Florissant Avenue)
McCluer High School (and District Transportation Department)	1896 S New Florissant Road, Florissant (New Florissant Road)
Others	
North County Christian School	845 Dunn Road, Florissant (New Florissant Road)
St. Louis Christian College	1360 Grandview Drive, Florissant (Washington/Elizabeth)
St. Louis Community College, Florissant Valley Campus	3400 Pershall Road, Florissant (West Florissant Avenue)

4.2.3 Community Resources — Impacts

4.2.3.1 No-Build Alternative Impact Summary

The No-Build Alternative would have no direct effect on fire stations, police stations, hospitals, or schools identified within the study area. No construction would occur on or in proximity to the properties that would directly affect these community services.

The traffic congestion currently experienced in the study area would continue, and travel efficiency will continue to decline. In this way, the No-Build Alternative could have a negative impact on the movement of emergency vehicles and school buses in the study area.

4.2.3.2 Build Alternatives Impact Summary

No fire stations or police stations will be directly affected by the proposed improvements.

The Reasonable Alternatives and the Preferred Alternative have been configured to avoid impacts to hospitals and schools located along the corridor.

All work in the area of the medical centers will remain within the existing right-of-way. In the area of Christian Hospital, Dunn Road will remain two-way under both Reasonable Alternatives, and existing driveways will remain open. Bellefontaine Road will not be modified at the entrance to the Bellefontaine Habilitation Center, and work along I-270 will remain within the existing right-of-way. In the area of De Paul Health Center, the St. Charles Rock Road interchange will be modified, including the intersection of Mareschall Lane, which is one of three access points to the medical center complex. The roadway is expected to remain open during construction, but travel patterns will likely be modified at times. Full movement, alternative access is available to the medical center from De Paul Drive, approximately 0.25 mile south along St. Charles Rock Road, and from McKelvey Road. Therefore, the project is expected to have minimal impacts to access to the medical center.

Improvements to I-270 in the area of Garrett Elementary will require a narrow strip of right-of-way, but will not affect any school facilities. All work in the area of Hazelwood East Middle School and High School will remain within the existing right-of-way. Dunn Road in the area of the Hazelwood schools will remain two-way for both Reasonable Alternatives, and the current access from Dunn Road will be maintained.

Pershall Road will be modified near McCluer High School for both Reasonable Alternatives. A retaining wall is proposed along Pershall Road to minimize impacts at McCluer High School for both Reasonable Alternatives. All work would remain within the existing right-of-way, affecting no school property, under the Preferred Alternative. A narrow strip of right-of-way would be needed for Alternative 2, which would include modifying some of the parking area north of the school buildings, but otherwise would affect no school facilities. Access to the school from New Florissant Road will not be modified.

At North County Christian School, Dunn Road will be modified to one-way with the Preferred Alternative, and would remain two-way with Alternative 2. For both alternatives, the existing driveways to the school will remain. Given its convenient location between Graham Road and New Florissant Road, the modification of traffic flow to one-way would not meaningfully impact access to the school.

A small amount of permanent right-of-way is expected from the Little Creek Nature Center, an outdoor laboratory for the Ferguson-Florissant School District. The impact will be limited to acquiring a narrow strip of right-of-way along the Dunn Road frontage of the property. The existing driveway or other temporary access will remain open during construction. No permanent or temporary impact to the operation of this property is expected from either Reasonable Alternative. MoDOT has coordinated with the Ferguson-Florissant School District regarding this right-of-way acquisition. This impact is discussed further in **Section 4.15**, *Section 4(f)*.

The Reasonable Alternatives and the Preferred Alternative are not anticipated to diminish the emergency service coverage in the study area. However, some emergency response routes would be modified with the Preferred Alternative, because sections of Dunn Road and Pershall Road would be changed from two-way to one-way. Coordination with service providers uncovered that interchange ramp changes will also affect routing. Nevertheless, access to all properties would be maintained. The Reasonable Alternatives could have a positive effect on these services by generally improving the travel efficiency along the local roadways.

Similarly, the project will not permanently affect school transportation. Some school bus routes may be modified to accommodate changes in traffic direction along some frontage roads.

Coordination with Metro Transit suggests, "A one-way outer road system could potentially add approximately $800,000 to Metro Transit's annual operating costs and increase travel time and transfer fares for customers living/working along the one-way road sections." As discussed in **Section 6**, Metro staff served on the study's Technical Advisory Committee. As engaged members of the Committee, throughout the study, Metro's staff played an important role in helping to determine how best to minimize adverse impacts to Metro's bus operations on the corridor. Nevertheless, the analysis in support of Metro's operations in a converted one-way outer road system showed an impact of approximately $800,000 to Metro Transit's annual operating costs and increase travel by 300 miles per day. As the project progresses, MoDOT is committed to investigating any modifications that might improve the situation. Our Environmental Commitments, relative of Metro Transit, is for construction coordination (#1), acquisition and relocation assistance in accordance with the Uniform Act (#12) and impact minimization (#16).

4.3 Construction Operations

4.3.1 Construction — Regulatory Background and Standards

Construction impacts would result from utility relocations, building the proposed roadway improvements, and other related construction activities, which are commonly short-term and temporary in nature. Typical construction impacts may include air, water, and noise pollution and disposal of construction debris. Surface transportation traffic patterns in the study area may also be altered during construction. MoDOT has developed a series of Standard Specifications for Highway Construction. These specifications include, but are not limited to, air, noise, and water pollution control measures to minimize construction impacts. The Standard Specifications for Highway Construction also include traffic control and safety measures. MoDOT would implement these standards as a part of the construction of the project.

4.3.2 Construction — Impacts

4.3.2.1 Air Quality

Construction activity would cause temporary air quality impacts. These short-term effects would include increased emissions from heavy diesel construction vehicles and equipment, and increased dust from grading operations. Emissions from construction vehicles and equipment would be controlled in accordance with emission standards prescribed under state and federal regulations. Dust generated by construction activities would be minimized by the implementation of dust control measures, such as water sprinkling and applications of calcium chloride to control dust and other airborne particulates. Contractors would be required to comply with Missouri's statutory regulations regarding air pollution control and adherence to construction permit and contract conditions.

4.3.2.2 Water Quality

Water quality impacts during construction activities could include increased sediments to stormwater due to runoff from erodible material exposed during construction. Stormwater runoff is addressed by MoDOT's Sediment and Erosion Control Program, which would be included within the contract specifications to address temporary erosion and sedimentation during construction. MoDOT's best management practices

(BMPs) reduce impacts to the aquatic environment to minimal levels. BMPs cover most activities needed to restore the construction area to an acceptable condition. This would include cleanup, shaping, replacing topsoil, and establishing vegetative cover on all disturbed bare areas, as appropriate.

MoDOT will adhere to the conditions of the TS4 permit applicable at the time of construction.

4.3.2.3 Noise

Noise from heavy construction equipment and haul trucks would result in unavoidable short-term impacts. Residents adjacent to the roadway would be most impacted by construction noise. Contractors may be required to equip and maintain muffling equipment for trucks and other machinery to minimize noise emissions. Operations with high temporary noise levels, such as pile driving, may require abatement restrictions placed upon it such as work hour controls and maintenance of muffler systems.

4.3.2.4 Waste Disposal

Specifications and procedures for the disposal of wastes resulting from construction activity would be developed with consideration given to the MDNR Solid Waste Management Program. This program emphasizes the need to develop uses and markets for recycled and recyclable materials in construction activities. These materials could include waste tires, rubberized asphalt, ground glass subgrade, structural steel, plastic lumber, and paints that use recycled glass. Further, any potential hazards in the right-of-way would be identified and handled in accordance with all applicable regulations. In addition, the construction specifications would include requirements to prohibit the contractor from inappropriately disposing of any pollutants, such as fuels, lubricants, raw sewage, or other harmful substances.

Impacts would be mitigated by adherence to construction permit and contract conditions. Materials resulting from clearing and grubbing, demolition, or other operations (except materials to be retained) would be removed from the project, or otherwise properly disposed of by the contractor. It is anticipated there would not be excess fill for the project that would need to be disposed of. Fill material or borrow needed for project construction would be determined by the contractor, including the source and disposition of borrow, as well as any environmental requirements. Construction impacts would be more fully known when more detailed design plans have been completed. MoDOT will continue to work with the public and other stakeholders to address construction-related concerns.

4.3.2.5 Utility Disruptions

Phone, cable, water, and wastewater/stormwater facilities, are all types of utility-related disruptions that are leading causes of delay that occur during the construction phase of highway projects, according to the National Cooperative Highway Research Program. It is well known that uncoordinated utility relocation activities cause expensive delays and disruptions. When utility relocations cannot be avoided, early and frequent coordination, cooperation, and communication result in more timely and efficient relocation activities. MoDOT pursues techniques to reduce utility-related disruptions, minimize costs, and accelerate construction. No discernible differences among the Reasonable Alternatives, relative to utility disruptions, have been identified to date.

Environmental commitments relative to utility relocation issues include the commitment for a MoDOT-approved maintenance of traffic plan. Construction schedules, road closures, and detours will be coordinated with police forces and emergency services to reduce impact to response times of these agencies. Further, the design process will include periodic consultation with utility owners to ensure compatibility of the roadway design with continued service, proper design of any utilities requiring relocation, construction techniques, and timing and technical assistance during construction.

Several rail crossings exist with the project corridor. Early and frequent coordination, cooperation, and communication with the representative of the railroads is an environmental commitment of this project. Similarly, when utility relocations cannot be avoided, early and frequent coordination, cooperation, and communication is an environmental commitment of this project.

4.4 Cultural Resources

The term "cultural resource" is not defined in NEPA. However, NEPA does require that agencies consider the effects of their actions on all aspects of the "human environment." Humans relate to their environment through their culture. Important elements of the human/cultural environment are preserved to retain a community's sense of history. Thus, the term "cultural resources" has come to encompass historic properties under NEPA. Historic properties typically encompass districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places (NRHP). For ease of discussion, this subsection will focus on cultural resources in terms of architectural resources and archaeological resources.

4.4.1 Cultural Resources —Regulatory Background and Standards

Federal approvals associated with the I-270 North EA are subject to compliance with the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR 800). NHPA Section 106 requires that the federal agency responsible for an undertaking consider the effects of its actions on historic properties. Historic properties are those listed on or determined eligible for listing on the NRHP. Historic properties could include historic-period resources (e.g., existing buildings or structures), as well as below ground archeological resources of historic (e.g., early American) or pre-historic (e.g., pre-contact Native American) origins. In addition, registered graves are protected by Missouri Statute 214.131-132, and unmarked human graves and burial mounds are protected by Missouri Statute RSMO 194.400-401 and the Native American Graves Protection and Repatriation Act of 1990.

Section 106 regulations require consultation with MDNR, the State Historic Preservation Office (SHPO), with consulting parties (those persons with interests in historic properties) and the federal Advisory Council on Historic Preservation (ACHP). These entities are provided opportunities to comment on the proposed project and its effects on historic properties, and the federal agency must consider these comments and seek ways to avoid, minimize, or mitigate adverse effects. If the agency officials, SHPO, and ACHP agree on how the adverse effect will be resolved, they develop a Memorandum of Agreement (MOA) or Programmatic Agreement (PA). The MOA or PA stipulates the measures to be taken to avoid, minimize, or mitigate the adverse effect.

4.4.2 Cultural Resources — Affected Environment

In accordance with current practice, a series of evaluations was conducted to investigate cultural resources in the vicinity of the I-270 North EA corridor. The evaluations started with an Archival Review (a review of the existing literature). The Archival Review covered a broad area. Based on the results and the Reasonable Alternatives, a Phase I Architectural Study was conducted. Finally, a Phase I Archaeological Survey was conducted for the Preferred Alternative.

4.4.2.1 Resources Identified during the Archival Review

The complete Archival Review (and all cultural reports) for the I-270 North EA is available upon request. The Archival Review was conducted at SHPO in Jefferson City, Missouri. The area of potential effect (APE) is identical to the I-270 North EA study area depicted on **Figure 4-3A**.

The archival review identified a number of NRHP-listed properties and districts, bridges, and culverts in the study area.

Architectural Resources

National Register of Historic Places Listed Properties

The archival review revealed nine NRHP-listed properties and districts are present in the I-270 North EA study area. The closest properties to I-270 and in the general vicinity of the Reasonable Alternatives include the following:

- The Utz-Tesson House
- The Taille de Noyer House
- The John B. Meyer House and Barn
- The Gittemeier House

These resources are shown on **Figure 4-3A** and **Appendix A (Exhibit 2)**.

The Utz-Tesson House, originally located at 615 Utz Lane, was listed on the NRHP in 1973. The house was nominated to the NRHP for architecture as a "relatively refined country house" that "survives in nearly original condition and integrity." The period of significance of the house was the 19th century. In 1997, the house was purchased by the City of Hazelwood and, in 2003, moved to its present location in Brookes Park.

In 1980, the Taille de Noyer House was listed on the NRHP. It was considered significant as the only remaining building in the area associated with John Mullanphy. The Ferguson-Florissant R-2 School District obtained the land. In 1960, the home was moved 200 yards west to make room for the school district's expansion. It resides on the McCluer High School campus.

The John B. Myers House is located at 180 Dunn Road. It was added to the NRHP in 1974 and the boundary was expanded into a district in 1977 to include the barn and grounds. The home was significant for architecture as one of the few remaining Classical Revival style houses from the Victorian Era that survived in a relatively unaltered state. It is also listed as a Historic Landmark in Florissant.

The Gittemeier House located at 1067 Dunn Road, while not being listed on the NRHP, was determined to be eligible for listing by MoDOT. It also is considered a Local Historic Landmark in Florissant. Restoration of the home began in 1990. Today the building is home to Historic Florissant, Inc. and contains an office, book store, and resource center.

Bridges and Culverts

Two bridges and five culverts are located in the study area (**Figure 4-3A**). The closest to I-270 and in the general vicinity of the Reasonable Alternatives include the following:

- Bridge J0493 (1931), reinforced concrete deck girders for the I-270/Burlington Northern Santa Fe railroad crossing
- Culvert J0513 (1931), triple-cell box culvert for Watkins Creek at I-270
- Culvert J0522 (1931), triple-cell box culvert for Watkins Creek at I-270
- Culvert J0888 (1931), double-cell box culvert for Maline Creek at I-270

Pursuant to coordination with MoDOT's Historic Preservation staff, it is their opinion that these pre June 30, 1956 structures do not meet the VI-III-b exemption and as such are covered by the Interstate Exemption. (Federal Register Vol 70 No 46, March 10, 2005, 11928).

Burial Areas

The study area contains both recorded historic and prehistoric burial areas that are protected by Missouri Statutes. None are in proximity to the Reasonable Alternatives.

4.4.2.2 Archaeological Resources

A records and literature search of the I-270 North EA study area was conducted at the SHPO in Jefferson City. The search revealed 79 archaeological sites within the study area from 63 archaeological surveys.

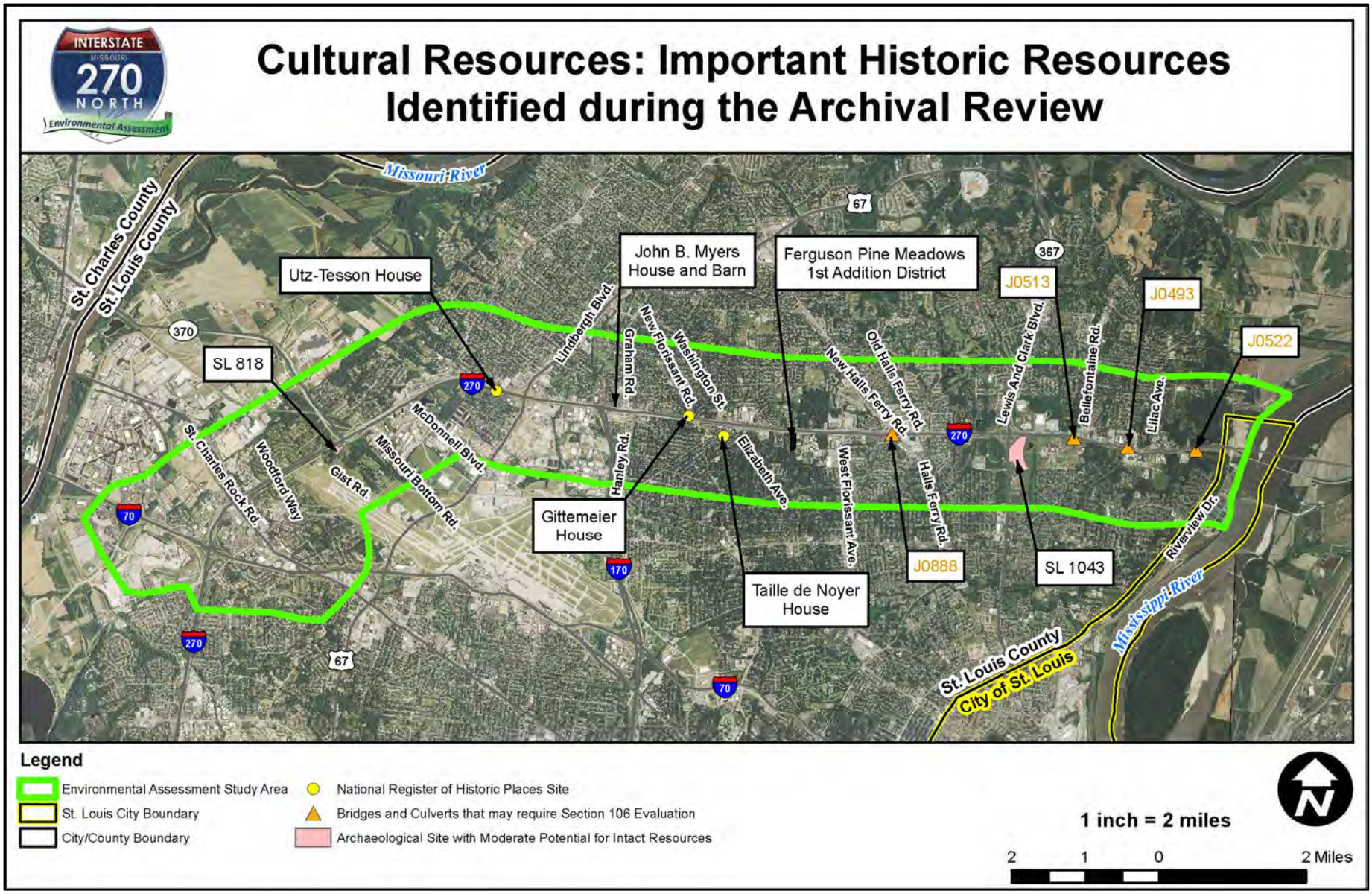

Figure 4-3A. Cultural Resources — Important Historic Resources

Relative to the potential for intact cultural resources, the highest rating was moderate (77 percent were low, very low, or destroyed). Of the 18 sites rated moderate, only the following two are in the general vicinity of the Reasonable Alternatives:

- SL 0818 is located on the Lambert Airport. It was identified as part of the airport's master plan. It was identified as a habitation site — both prehistorically and in the 18th century.
- SL 1043 is located at the Bellefontaine Conservation Area (southeast quadrant of the I-270/MO 367 interchange). It was identified as part of an improvement project for the conservation area. It was identified as a historic farmstead.

Overall, there appears to be low potential for intact cultural resources in the study area. There are a few less developed portions of the study area where a moderate potential exists. This is particularly the case where park areas have been set aside and minimal disruption has taken place — in addition to the areas surrounding the NRHP properties and districts (that remain at that their original locations). Overall, the remains of privies, wells, and cisterns are the most probable types of historic features to still exist. These features are typically deep and therefore most likely to remain intact over time despite land use changes.

4.4.2.3 Phase I Architectural Study

The objective of the I-270 architectural study was to identify, assess effects, and document all architectural resources (i.e., buildings, structures, objects, bridges, districts, and landscapes) within the architectural APE associated with the Reasonable Alternatives and the Preferred Alternative. In cooperation with the Historic Preservation staff of MoDOT, the architectural APE is defined as the property parcels that touch the I-270 North EA footprint, where the footprint is outside the existing Interstate right-of-way and where there are buildings within 100 feet of the new right-of-way.

The architectural study of the I-270 North APE resulted in the identification of 353 parcel properties. All properties within the APE were assessed for NRHP eligibility.

The Architectural Study confirmed the following findings of the Archival Review regarding the NRHP properties in the immediate vicinity of the Reasonable Alternatives for the I-270 North EA:

- **The Myers residence**, located at 180 Dunn Road, was placed on the NRHP on December 3, 1974, and in 1978, the house and barn were designated as a NRHP district. This two-story, masonry residence with a limestone foundation, brick walls, and two-story double portico porch was constructed beginning in 1869. The Myers property is eligible under Criteria C for architecture with the period of significance being 1869–1870, the duration of construction. Parcel lines are the significant boundary.
- **The Taille de Noyer** is located on the McCluer High School property. The boundary is the fence that surrounds the Taille de Noyer and separates it from the school. It was placed on the NRHP in 1979 for social and humanitarian significance under Criteria B. The northern log portion is one-and-one-half stories and the southern balloon frame portion is two stories with the entire building clad in weatherboard.
- **The Gittemeier House** is recommended for the NRHP. According to Gretchen Crank, of Historic Florissant, Inc., they are in the process of nominating the Gittemeier House to the NRHP (personal communication). This two-story German vernacular residence has a limestone basement, brick walls, and a side-gabled asphalt roof. It is eligible for the NRHP under Criteria C for architecture with its significant boundaries being the parcel lines. The period of significance is ca.1860, the approximate date of construction.
- **The Utz-Tesson House** was listed on the NRHP in 1973. The house was nominated to the NRHP for architecture as a "relatively refined country house" that "survives in nearly original condition and integrity." Because of configuration of the APE, the Utz-Tesson House was excluded from the

Architectural Study. The Utz-Tesson House is located within Brookes Park and is outside the study area for the Preferred Alternative.

The architectural study also identified a historical district eligible for the NRHP. **The Ferguson Pine Meadows 1st Addition District** is located along Starlight Drive in Ferguson (see **Figure 4-3B** and **Appendix A, Exhibit 2)**. The boundaries of the district are Pershall Avenue to the north, Moonlight Drive to the west, and the St. Louis Community College-Florissant valley campus to the east. The district is recommended as eligible under Criterion C, for architecture as an example of Contemporary style of architecture. It contains 12 contributing houses and four non-contributing houses. The district as a whole retains a high degree of integrity within this post-World War II style.

The architectural study also identified two public schools, one church, 25 subdivisions, 21 commercial buildings, and 114 residential buildings constructed prior to 1969 within the APE. Included in the 114 residential buildings are 108 single-family, five multi-family, and one condominium. The majority of these properties are altered and many have additions. All of these properties lack integrity and the significance of any association to historic event, any important persons, and physical characteristics or design, therefore, they are not recommended for the NRHP. No bridges and culverts located in the APE are recommended for the NRHP.

4.4.2.4 Phase I Archaeological Survey

The archaeological survey focused on the Preferred Alternative (Reasonable Alternative 1 with variation 1a) Much of this area had been previously disturbed. Most of this disturbance was caused by the original construction of the Interstate, but commercial and residential development along the corridor has added to the disruptions.

One new archaeological site was identified. Site 23SL2379 was represented by three chert flakes found within shovel tests. The small scatter of artifacts at site 23SL2379 could indicate that this site was used for only short durations. It is unlikely that intact cultural features exist at this location, therefore, the site is not eligible for the NRHP. No further work is recommended at site 23SL2379.

Re-evaluation of seven previously recorded archaeological sites (SL0101, SL546, SL549, SL607, SL818, SL1043 and SL2228) uncovered no evidence of these sites within the current construction easement and revealed that past construction activities would have destroyed the sites, so no further work is recommended in these areas. The survey was unable to safely access sites SL545, SL547, and SL548. All three sites are located with the northeast portion of the I-270/MO 370 interchange and it is likely construction in the area has destroyed these remains. However, it is recommended that construction proceed with caution at this location, especially near site SL545 where historic burials were reported.

No other archaeological resources were identified during the archaeological survey.

4.4.3 Cultural Resources — Impacts

Pursuant to coordination with the MDNR SHPO, the Preferred Alternative was determined to have No Adverse Effect on historic properties. The SHPO project number is 078-SL-14. The SHPO concurrence letter is contained in **Appendix D**.

4.4.3.1 No-Build Alternative Impact Summary

The No-Build Alternative would have no direct effect on the eligible cultural resources identified within the study area. No construction would occur on or in proximity to the properties that would directly affect the resources.

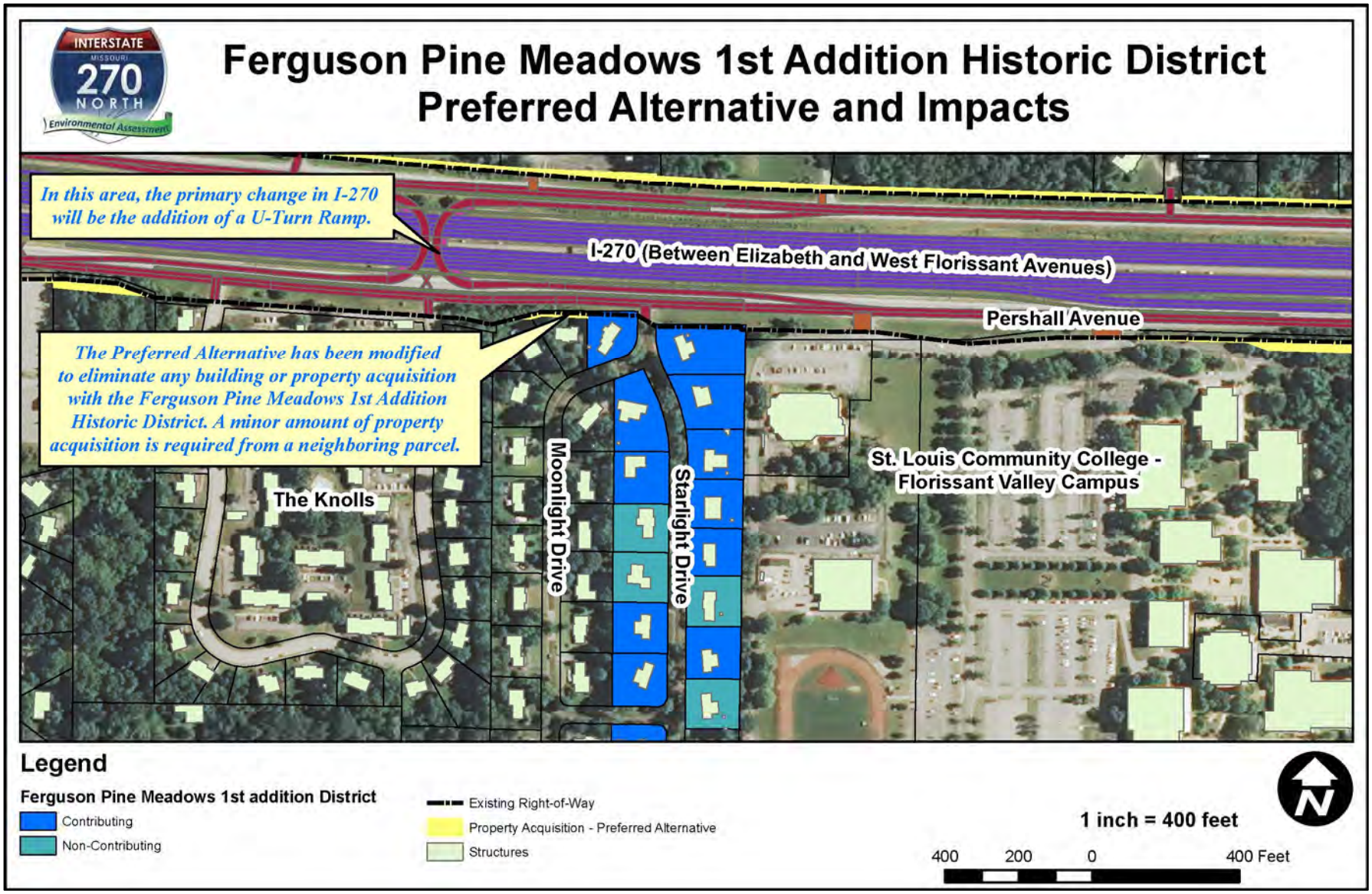

Figure 4-3B. Ferguson Pine Meadows 1st Addition Historic District Preferred Alternative and Impacts

4.4.3.2 Build Alternatives Impact Summary

The Reasonable Alternatives have been configured to avoid known cultural resources.

Relative to the NRHP architectural parcels, impacts are minimal:

- For the Myers residence, the parcel lines are the significant boundary. The Reasonable Alternatives avoid acquisition of new right-of-way. Therefore, the proposed improvements to I-270 North may cause only indirect erosion effects on the area of the property adjacent to Dunn Road.
- The Taille de Noyer is located on McCluer High School property. The boundary is the fence that surrounds the Taille de Noyer and separates it from the school and I-270. Consequently, improvements to I-270 will have no adverse effects on this property.
- For the Gittemeier House, the parcel lines are the significant boundary. Reasonable Alternative 2 would create a loop ramp around the house. This would have an adverse effect on the property by impeding public access and causing erosion. Reasonable Alternative 1 (the Preferred Alternative) will avoid acquisition of new right-of-way. Consequently, it will only cause indirect erosion effects on the south and east sides of the property.
- The Utz-Tesson House is currently located in Brookes Park. Consequently, improvements to I-270 will have no adverse effects on this property.

Relative to the Ferguson Pine Meadows 1st Addition District, the Preferred Alternative was modified to avoid property acquisitions. The revisions allowed for the Preferred Alternative to qualify for a No Adverse Effect determination. The approach used was to implement cross-section reductions outside of mainline I-270. This would preserve the possibility of a full-build along mainline I-270 without additional design exceptions. The following summarizes how the Preferred Alternative will avoid the Ferguson Pine Meadows 1st Addition District (see **Figure 4-3B**):

- There are no building acquisitions in this area.
- There's just a small amount of property acquisition, from an adjacent parcel outside of the district.
- At the nearest contributing structure in the historic district, there will be no property acquisition.
- The distance between the nearest contributing structure in the historic district and the right-of-way line is approximately 15 to 20 feet.
- The primary change to I-270 is the addition of a U-Turn ramp.
- In the vicinity of the historic district, the U-Turn ramp is elevated, which creates a barrier between I-270 and the historic district.
- The U-Turn ramp will be approximately 10 feet high in relationship to the new location of Pershall Road.
- Pershall Road will be a two-lane, one-way road.
- Pershall Road will be relocated approximately 20 feet closer to the historic district.
- The centerline of existing Pershall Road is approximately 56 feet from the existing right-of-way line.
- The centerline of proposed Pershall Road is approximately 36 feet from the existing right-of-way line.
- Pershall Road will be near or just above existing grade.

The approximately 18 feet between the edge of the shoulder on Pershall Road and the right-of-way line will be used for construction easements, utility lines, and possible pedestrian/bicycle facilities.

4.5 Demographics

4.5.1 Demographics — Regulatory Background and Standards

Demographics are the quantifiable characteristics of a population. This subsection discusses population size and housing. Other statistics relating to race, income, age, disabilities, employment, and transportation are discussed in other sections.

Several distinct geographies of U.S. Census data were used to describe the demographic conditions. St. Louis County, Saint Charles County, and St. Louis City are the largest regional units used to compile regional indicators. For the immediate study area (that area within at least 1 mile on either side of the portion of I-270, between I-70 and Chain of the Rocks Bridge), the data from census tracts was used to provide the demographic profile.

4.5.2 Demographics — Affected Environment

4.5.2.1 Population

In the 2010 census, a total of 147,000 people were recorded within the census tracts that intersect the I-270 North EA study area. The population in the area has been declining over the past several decades. The area experienced a 5 percent decrease in population from 1990 to 2000, and another 5 percent decrease between 2000 and 2010. **Table 4-7** summarizes total population numbers in the study area.

Many demographic indicators in St. Louis City and the study area followed the same patterns—overall reductions in population. With a relatively stable regional population, the trend was movement to outer portions of St. Louis County and to adjacent counties, such as Saint Charles County. **Figure 4-4** shows the location of the census tracts within the I-270 North EA study area and the 2010 population for those 30 tracts.

Table 4-7. Total Populations

Population	1990	2000	2010	Percent Change
St. Louis County	993,529	1,016,315	998,954	0.5%
St. Louis City	396,685	348,189	319,254	-19%
St. Charles County	212,907	283,883	360,485	69%
I-270 North EA Study Area	163,210	155,609	147,015	-10%

Source: Missouri 2010 TIGER Census Data (MSDIS)

4.5.2.2 Households and Housing

The average household size in the study area is two to three people. This number is consistent with St. Louis County as a whole.

In the census tracts that comprise the study area, approximately 77 percent of the housing units are single-family houses, and nearly all of the rest are duplexes, townhouses, or apartment buildings. Mobile homes comprise a very small percentage of the housing in the study area and St. Louis County as a whole.

Owners occupy approximately two thirds of the housing units in the I-270 North EA study area (**Table 4-8**). The median value of owner-occupied units is approximately $122,000. The remainder of the housing units are occupied by renters. The ratio of owners to renters in the study area is very near the ratio for St. Louis County as a whole.

Table 4-8. Percentage Population by Housing

Population	Owner Occupied	Renter Occupied	Single-Family Residences	Two to Four Units per Building	More than Four Units per Building	Mobile Homes
St. Louis County	72.1%	27.9%	76.8%	6.4%	16.5%	0.3%
St. Louis City	45.4%	54.6%	46.8%	30.1%	22.8%	0.3%
St. Charles County	80.6%	19.4%	81.2%	4.6%	11.0%	3.2%
I-270 North EA Study Area	69.1%	30.9%	76.9%	5.3%	17.1%	0.7%

Source: U.S. Census Bureau, American Fact Finder, 2014, http://factfinder2.census.gov

4.5.3 Demographics — Impacts

4.5.3.1 No-Build Alternative Impact Summary

The No-Build Alternative would have no direct impact on the population in the study area. However, the forces tending to cause emigration from the area will remain. Based on historical trends, it is expected that the population may continue to decrease.

4.5.3.2 Build Alternatives Impact Summary

The Reasonable Alternatives are not expected to have a direct impact on the local population, except for the relocation of a number of residents and businesses. Acquisition and relocation of affected residential and commercial properties will be in accordance with the relocation procedures established in the Uniform Act (**Section 4.13**, *Right of Way*).

Assuming most residents and businesses will elect to remain in the vicinity, the project will have no appreciable negative impact on the size of the local population. With the improvement to traffic LOS on local roadways, it is possible that the project would encourage new residents and businesses to relocate into the project area and have a positive impact on the local population.

4.6 Endangered and Threatened Species

4.6.1 Regulatory Background

Under Section 7 of the Federal Endangered Species Act, FHWA is required to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat.

The State of Missouri also protects state-listed species under Rule 3 CSR 10-4.111 of the Missouri Wildlife Code. The rule prohibits the importation, transportation, sale, purchase, taking, or possession of listed species.

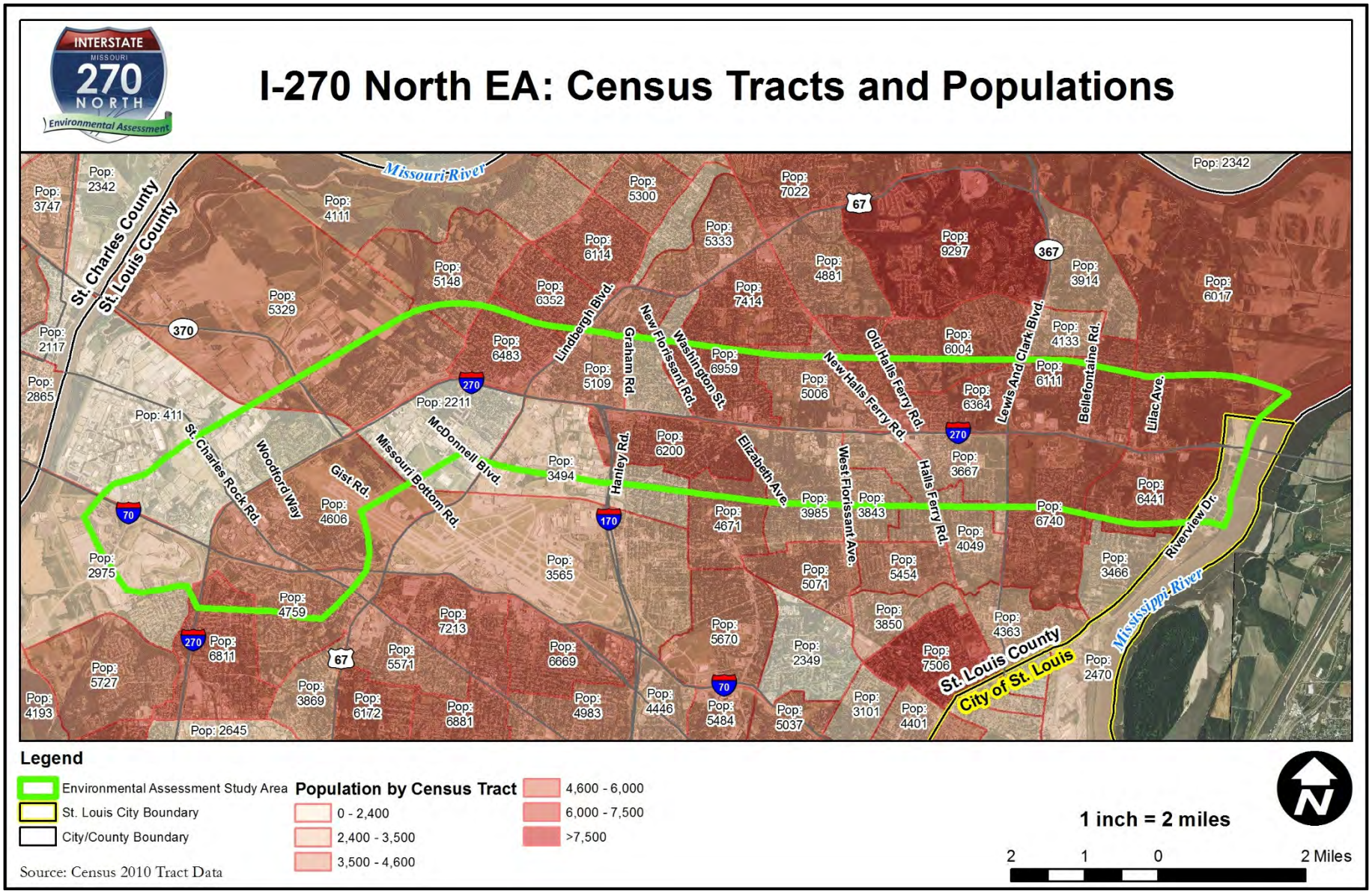

Figure 4-4. Demographics Map — Census Tracts and Populations

4.6.2 Affected Environment

Much of the project corridor is in a highly developed and ecologically disturbed area of St. Louis County. There is little forested area and most trees are located along streets in adjacent suburban areas and in patches along the interstate and associated interchanges in un-mowed and unmanaged areas. Invasive non-native species such as callery pear (*Pyrus calleryana*) and bush honeysuckle (*Lonicera sp.*) are common. In fact, nearly the entire understory of treed areas within the project corridor is dominated by bush honeysuckle. These areas would be expected to support common fauna that are adapted to fragmented and urbanized areas (opossum, raccoon, coyote, small rodents, European starling, house sparrow, and American crow).

East of Highway 367, tree cover adjacent to the project corridor is more extensive. Although not forested, the 133-acre Bellefontaine Conservation Area owned by the Missouri Department of Conservation is southeast of the I-270/Hwy 367 interchange. The area is mainly used for urban fishing. Common mammals such as those listed above, in addition to waterfowl and mourning dove would likely be found in this area.

Between Lilac Avenue and Riverview Drive (Rte. H), adjacent tree cover reaches the highest densities along the project corridor. Watkins Creek winds through this area, flowing from southwest to northeast before emptying into the Mississippi River about a half mile north of I-270. The understory of the riparian area of this creek is densely covered with *Lonicera sp*. In this area, subdivisions near Hwy 367 and scattered houses and roads both north and south of the project corridor create varying degrees of fragmentation. Near the interstate, invasive bush honeysuckle is the exclusive understory plant, outcompeting native vegetation and preventing natural ecological succession. While there are no records of sensitive species in these areas according to the MDC Natural Heritage Database (current as of September 2016), the wooded areas away from the interstate would be expected to contain a wider range of species than would be found in much of the western corridor. Red fox, deer, red and gray squirrels, blue jay, garter snakes, and green frogs are examples of likely inhabitants in this area.

The USFWS online Information and Planning for Conservation (IPaC) database was accessed to obtain an official species list (Consultation Code 03E14000-2016-SLI 2103) on 8/31/2016. The list identified five species that may occur within Saint Louis County, Missouri, that need to be considered in an effects analysis for this project. There are no federally designated critical habitats within the project corridor. **Table 4-9** summarizes the listed species and their associated habitat.

TABLE 4-9. Federally Listed Threatened, Endangered, and Proposed Species

Species	Status	Typical Habitat
Gray bat (*Myotis grisescens*)	Endangered	Caves, stream corridors near caves.
Indiana bat (*Myotis sodalis)*	Endangered	Hibernacula: caves and mines; summer habitat: Indiana bats can occur in forested areas of the state where they may utilize suitable summer roost trees with exfoliating bark.
Northern long-eared bat *Myotis septentrionalis*	Threatened	Hibernacula: caves and mines; summer habitat: similar to Indiana but will also use trees with cavities, cracks, and splits.
Pallid sturgeon (*Scaphirhynchus albus*)	Endangered	Mississippi and Missouri rivers
Decurrent false aster (*Boltonia decurrens*)	Threatened	Disturbed alluvial soils

Correspondence with the Missouri Department of Conservation (MDC) yielded a Natural Heritage Review Report that showed no existing records of state or federally listed endangered species within one mile of the project area. Field investigations did not identify high quality potential habitats for state or federally listed species. The project's field investigations confirm this conclusion. The Natural Heritage Review Report is contained in **Appendix D.**

4.6.3 Effects of Proposed Action

Section 3.3.5 contains a complete description of the preferred reconfiguration of the corridor. Both reasonable alternatives are similar, but there are some differences in tree clearing amounts due to differences in interchange design and outer road configurations. Since tree clearing within the corridor is the main component of the action that may affect federal trust species, the details of this portion of the action are described below in the discussion of the effects on Indiana and northern long-eared bats.

Pallid Sturgeon

Pallid sturgeons are mainly bottom feeders that extract their food (primarily small fishes and invertebrates) from river bottoms. They occur mainly within the Missouri and Mississippi rivers. These rivers contain strong currents in the main river channels, along with firm sand substrates. According to the US Fish and Wildlife Service, reasons for pallid sturgeon decline are the creation of impoundments and deep uniform channels. Pallid sturgeons prefer a diversity of depths and velocities. A determination of No Effect has been made for the pallid sturgeon because neither of the project alternatives will have an impact on either the Missouri or Mississippi Rivers.

Decurrent False Aster

Decurrent false aster is a perennial plant that occasionally reaches heights of over 6 feet. Historically, this plant was found in wet prairies, marshes, and along the shores of some rivers and lakes. Current habitats include riverbanks, old fields, roadsides, mudflats, and lake shores. Conservation efforts include wetland protection, low-intensity agriculture, and avoidance of herbicide use. It is currently listed as Endangered by the Missouri Department of Conservation and as Threatened by the U.S. Fish and Wildlife Service. It is declining due to loss of historic river floodplains and wetland habitat, which is caused by the construction of levees and locks and dams along the Illinois and Mississippi rivers, which have prevented flooding in many areas. Disturbance in the form of flooding is required for this species to persist in an area. Presently it is known to occur only in St. Charles County. The nearest record is approximately 3 miles to the northeast from the I-270/Rte. H (Riverview Dr.) interchange. This record is in Columbia Bottom Conservation Area and there are other records within the boundaries of that resource. The I-270 project corridor is outside of the floodplain. A determination of No Effect has been made for decurrent false aster because neither of the project alternatives impact any known populations of this species, and suitable habitat is not present within the project corridor.

Gray Bat

Gray bats utilize caves and mines during all seasons. They use these features to hibernate during the winter, migrate between them during the spring and fall, and rear their young in suitable caves and mines during the summer. However, they do not use the same underground habitats throughout the year. There are no caves or mines in the project corridor according to the Missouri Speleological Society Cave Database (MSS, current as of February 2016). The nearest known cave is approximately 3 miles to the north (Coldwater Creek Cave). According to the MSS Cave Database and the Missouri Natural Heritage Database (current as of September 2016) there are no records for any federal or state listed species at that cave, or any other cave within a 10-mile radius of the project area. The nearest gray bat records are approximately 17 miles to the southwest. Because no suitable habitat for gray bats will be impacted by either of the project alternatives, a no effect determination has been made for this species.

Indiana and Northern Long-eared Bat

Indiana and northern long-eared bats also use caves and mines to hibernate during the winter. However, both species roost and raise their young in trees with suitable characteristics during the summer. Suitable trees contain loose and sloughing/peeling bark, cavities, snags, or splits where bats can hide and seek protection from the elements. Isolated trees and those near major highways are usually not considered good habitat.

The nearest Indiana bat and northern long-eared bat records in Missouri are approximately 16 and 17 miles to the southwest, respectively according to the MDC Natural Heritage Database. The Illinois Natural History Survey conducted presence/absence surveys using mist nets in August 2016 for a future project involving the I-270 bridge over the Mississippi (Chain of Rocks Bridge). Surveys were conducted on both the Illinois and Missouri sides of the river. Those conducted on the Missouri side were between the east end of the I-270 project corridor and the river so the results are relevant to the portion of this project near Rte. H/Riverview Drive. During two nights of netting on the Missouri side, only two big brown bats were captured. No listed bats were detected. An emergence survey was also conducted at the existing bridge to determine if any bats are roosting on the bridge. None were observed. The area where the surveys were conducted contains mature trees adjacent to the river. Additionally, the US Army Corps of Engineers conducted mist netting on Chouteau Island in the Mississippi approximately 5 years ago. No federally listed species were captured but Northern long-eared bats may have been detected acoustically (J. Mengelkoch, INHS, personal communication).

Woodland habitat is limited in the vicinity of I-270 within the project corridor. The dominance of non-native and immature tree species in undeveloped areas, and the sparse/ patchy nature of the urban landscape make it unlikely that substantial summer roosting habitat exists within much of the project area. However, even in this highly urbanized area adjacent to a major interstate, there are blocks of trees containing individuals that have suitable roosting characteristics, with larger blocks of forest at the east end of the project compared to the rest of the project.

Approximately 79 acres of trees could be cleared as a worst-case scenario in the preferred alternative (see the potential habitat map in **Appendix D**). Both alternatives clear much of the same treed areas. However, there are small (<1/2 acre) differences in clearing at most interchanges, but larger differences associated with the locations of the north outer road in several areas. At the West Florissant Interchange and the north outer road, Alternative 2 could require as many as 10 acres of additional clearing beyond what is required for the Preferred. At the Riverview Drive Interchange and the north outer road, Alternate 2 would require approximately two acres more clearing than the Preferred Alternate. However, at Bellefontaine, the location of the north outer road in the Preferred Alternate results in approximately 1 acre more than Alternative 2. In summary, the Preferred Alternate would result in less tree clearing (approximately 79 acres) than Alternative 2 (approximately 90 acres).

MoDOT Environmental Specialists conducted a preliminary reconnaissance for suitable habitat along the entire corridor in March 2015. The survey revealed areas where suitable habitat was present (approximately 49 acres), but no quantitative assessments (counts of suitable roost trees) were conducted at that time. Because the project will be constructed in phases beginning in 2016 and conclude in 2045 (see phasing map in **Appendix D**), assessments of suitable trees in areas that will not be impacted for 10 - 20 years are not biologically relevant since habitat changes over time. Trees that are currently suitable can fall rendering them unusable to bats. Conversely, currently healthy trees can die and develop suitable characteristics as they deteriorate. Therefore, it is unknown exactly how many trees within the 49 acres of suitable habitat would qualify as suitable roost or maternity trees. **Table 4-10** illustrates the amount of tree clearing by phase that could take place.

Table 4-10. Tree clearing by phase for the Preferred Alternative

Phase	Potential Habitat	No Potential Habitat (at this time)
2016 – 2025	2.4 acres	1.2 acres
2016 – 2035	254 acres	2.1 acres
2026 – 2035	34.3 acres	22.1 acres
2036 – 2045	10.4 acres	4.0 acres
Total	49.6 acres	29.4 acres

A second reconnaissance survey to areas previously determined to contain potential habitat was conducted on November 3, 2016. The purpose of this survey was to photograph those areas (See photographs in **Appendix D**) to provide a rough picture of suitable trees and to assess the level of disturbance and ecological function within the treed areas. The survey confirmed that all areas containing mature trees have a thick, nearly impenetrable understory of bush honeysuckle. This cover prevents recruitment of native tree and understory species. Native forest floor plant species are largely absent. Mature trees are in varying states of health. Some areas (i.e., southeast of Bellefontaine, west of the welcome center at Riverview) contain mature oaks and pines that are in good health but contain a few suitable roost characteristics for bats (Photos 7, 9; **Appendix D**). Others (i.e., southwest of Lindbergh, southwest quadrant of the Riverview interchange) contain scattered, individual trees in decline that contain some suitable roost characteristics (Photos 3 – 5, 11 – 14; **Appendix D**). Cottonwood, sycamore, and Siberian elm are common in these areas.

All areas of tree clearing are between 50 and 425 feet from the interstate or other road. As such, these areas are exposed to continuous traffic noise, lights, and exhaust. Even the areas farthest from the interstate at the east end of the project are exposed to the constant drone of large trucks. Bats can become habituated to noise and vibrational disturbances, but large paved roads with high traffic counts can result in a barrier effect for bats, preventing them from crossing or roosting close by. If bats are using the wooded areas to the north and south, they may not enter into the proposed clearing areas to roost or forage. Clearing these areas is not likely to adversely affect bats that may be inhabiting areas of forest farther from the interstate. On the north side of Dunn Road east of Riverview Drive, only a narrow strip (approximately 50 feet) of tree clearing may take place. This leaves the majority of the forested area to the north untouched. On the south side, in the largest area of proposed tree clearing on the project, the hillside faces the interstate and does not contain many suitable roosts (see Photos 11 – 13; **Appendix D**).

Farther west at the Bellefontaine interchange, proposed clearing to the southeast would take place on a hillside dominated by large mature oaks. Much of the hillside faces the interstate and would be exposed to the same disturbances previously mentioned (Photo 7; **Appendix D**). To the south, tree cover is relatively thick but is fragmented by subdivisions and local streets. The treed areas around Bellefontaine are basically islands with only tenuous connections to the rest of the urban forest via narrow and disturbed riparian corridors along Watkins Creek and its tributaries.

As previously mentioned, the rest of the corridor contains isolated strips of trees adjacent to the interstate with little or no connection to larger treed areas farther away. These areas are unlikely to support any bats, even in trees that contain suitable roost characteristics. Their proximity to the interstate and the highly developed landscapes surrounding them would likely prevent bats from utilizing these areas.

The removal of trees in some areas of this project would likely result in no effect on listed bat species. At the east end, given the more extensive treed areas associated with the Watkins Creek watershed and greater number of identified potentially suitable summer roost trees, if clearing is conducted during the winter months when Indiana and northern long-eared bats would be hibernating in caves, tree clearing is not likely to adversely affect bats. However, the lengthy timeline of the project phasing warrants re-evaluation of bat habitat status prior to the construction of each phase. Habitat conditions change over time and new

locations for bats are discovered as surveys are conducted and opportunistic observations are made and reported to resource and regulatory agencies. Currently the first phase, which extends from west of Hazelwest Dr. to Sugartrail Drive, contains a few narrow strips of trees adjacent to the Interstate where some trees with suitable characteristics were noted in March 2015 and November 2016. Even though their proximity to the interstate and highly developed areas severely limits their efficacy as suitable habitat, tree clearing for this phase of the project will be restricted to winter months (November 1 to March 31) as an added conservation measure to protect bats. Construction on the first phase is not likely to begin until sometime in 2017. Subsequent phases will be re-evaluated during the project development process. Winter clearing of suitable roost trees will be employed as a conservation measure for all phases of the project. Coordination with the USFWS and the MDC will take place during all phases of the project to ensure that the determination of "not likely to adversely affect" is still valid and to ensure all appropriate conservation measures are employed to remove adverse effects to bats. In summary, considering the total area of habitat potentially impacted by this project, determinations of "may effect, not likely to adversely affect" have been made for Indiana and northern long-eared bats. FHWA is asking for concurrence from the USFWS for these determinations. Environmental commitments regarding endangered species include:

1. All tree clearing will be conducted in the winter months when bats are in hibernation (November 1 – March 31)
2. During the project development process for each phase, potential impacts to threatened and endangered species will be re-evaluated, and coordination with both MDC and the USFWS will take place to verify that the "not likely to adversely affect" determinations for listed bats remain valid.

4.7 Environmental Justice

4.7.1 Environmental Justice — Regulatory Background and Standards

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, signed on February 11, 1994, requires federal agencies to take appropriate and necessary steps to identify and address disproportionately high and adverse human health or environmental effects of their actions on minority and low-income communities or populations. EO 12898 seeks to ensure that the proposed transportation activity will do the following:

- 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
- Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process
- Prevent the denial of, reduction in, or substantial delay of, the receipt of benefits by minority and low-income populations

EO 12898 does not define the terms "minority" or "low income." However, guidance provided by CEQ describes these terms in the context of an EJ analysis. The following definitions taken from CEQ guidance are unique to EJ analysis and were used to identify minority and low-income populations living near the study area:

Minority Individual: A minority individual is classified by the U.S. Census Bureau as belonging to one of the following groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black (not of Hispanic Origin), and Hispanic. Minority populations, according to the CEQ guidelines, should be identified where either (1) the minority population of the affected area exceeds 50 percent, or (2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

Low-income Population: Low-income populations are identified where individuals have incomes below the U.S. Department of Health and Human Services poverty guidelines. A low-income population is either a group of low-income individuals living in proximity to one another or a set of individuals who share common conditions of environmental exposure or effect.

Therefore, the following criteria were developed to identify EJ populations in the study area:

- Census block groups where the minority population or the population below the poverty level in the block group equals or exceeds 50 percent of the population in that census block group
- Census block groups where the percentage of the minority or below poverty population is at least 10 percent higher than the minority or below poverty population percentage for St. Louis County

4.7.2 Environmental Justice — Affected Environment

4.7.2.1 Minority Populations

Impacts to racial minorities are an essential component of an EJ analysis. The non-white population comprises just over half of the St. Louis City population and approximately one third of the St. Louis County population. Minorities comprise more than half of the population in the census tracts in the I-270 North EA study area (**Table 4-11**).

The percentage of the St. Louis County population that consists of minorities is around 29.7 percent. The threshold for the EJ analysis is 10 percent higher than the county average, or approximately 32.7 percent. As seen on **Figure 4-5**, numerous block groups along the I-270 corridor exceed the threshold, and several exceed 50 percent minorities. These populations are more heavily distributed in the eastern two-thirds of the study area.

EJ Populations and I-270 North

The poverty level threshold for the EJ analysis is 11.5 percent. Census data show few block groups that exceed this EJ threshold.

The minority population threshold for the EJ analysis is 32.7 percent. Numerous block groups along the I-270 corridor exceed the threshold, and several exceed 50 percent. These populations are most heavily distributed in the eastern two-thirds of the study area.

Table 4-11. Percentage of Population by Ethnic Background

Population	White	Black or African-American	Asian	Other	Two or More Races
St. Louis County	70.3%	23.3%	3.5%	1.0%	1.9%
St. Louis City	43.9%	49.2%	2.9%	1.6%	2.4%
St. Charles County	90.7%	4.1%	2.2%	1.2%	1.8%
I-270 North EA Study Area	45.8%	49.9%	1.2%	1.0%	2.1%

Source: U.S. Census Bureau, American Fact Finder, 2014, http://factfinder2.census.gov

Low-Income Populations

Overall, the percentage of the population within the study area below the poverty level is less than either St. Louis County or St. Louis City (**Table 4-11a**).

Table 4-11a. Percentage of Population with Income below Poverty Levels

Population	Median Income	Average Income	Percent of Population below Poverty Level
St. Louis County	$58,485	$84,081	10.5%
St. Louis City	$34,384	$49,735	27.0%
St. Charles County	$71,416	$84,007	5.4%
I-270 North EA Study Area	$45,917	$54,275	7.0%

Source: U.S. Census Bureau, American Fact Finder, 2014, *http://factfinder2.census.gov*

The percentage of the St. Louis County population below the poverty level is around 10.5 percent. The threshold for the EJ analysis is 10 percent higher than the county average, or approximately 11.5 percent.

For the block groups in the study area, the most recent poverty data available is from Census 2000. These block group data show few block groups that exceed the EJ threshold (**Figure 4-6**).

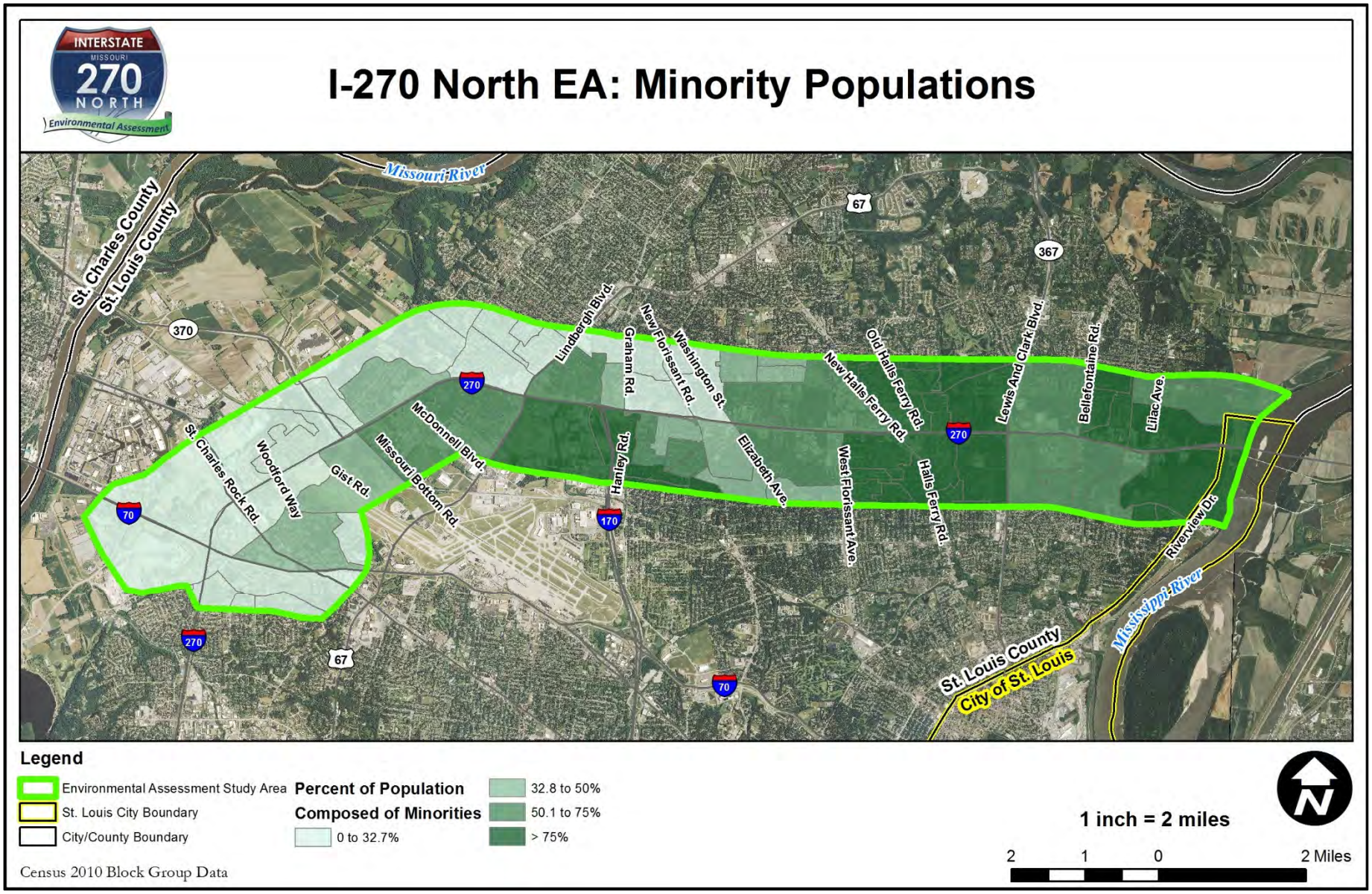

Figure 4-5. Minority Populations (by Block Group)

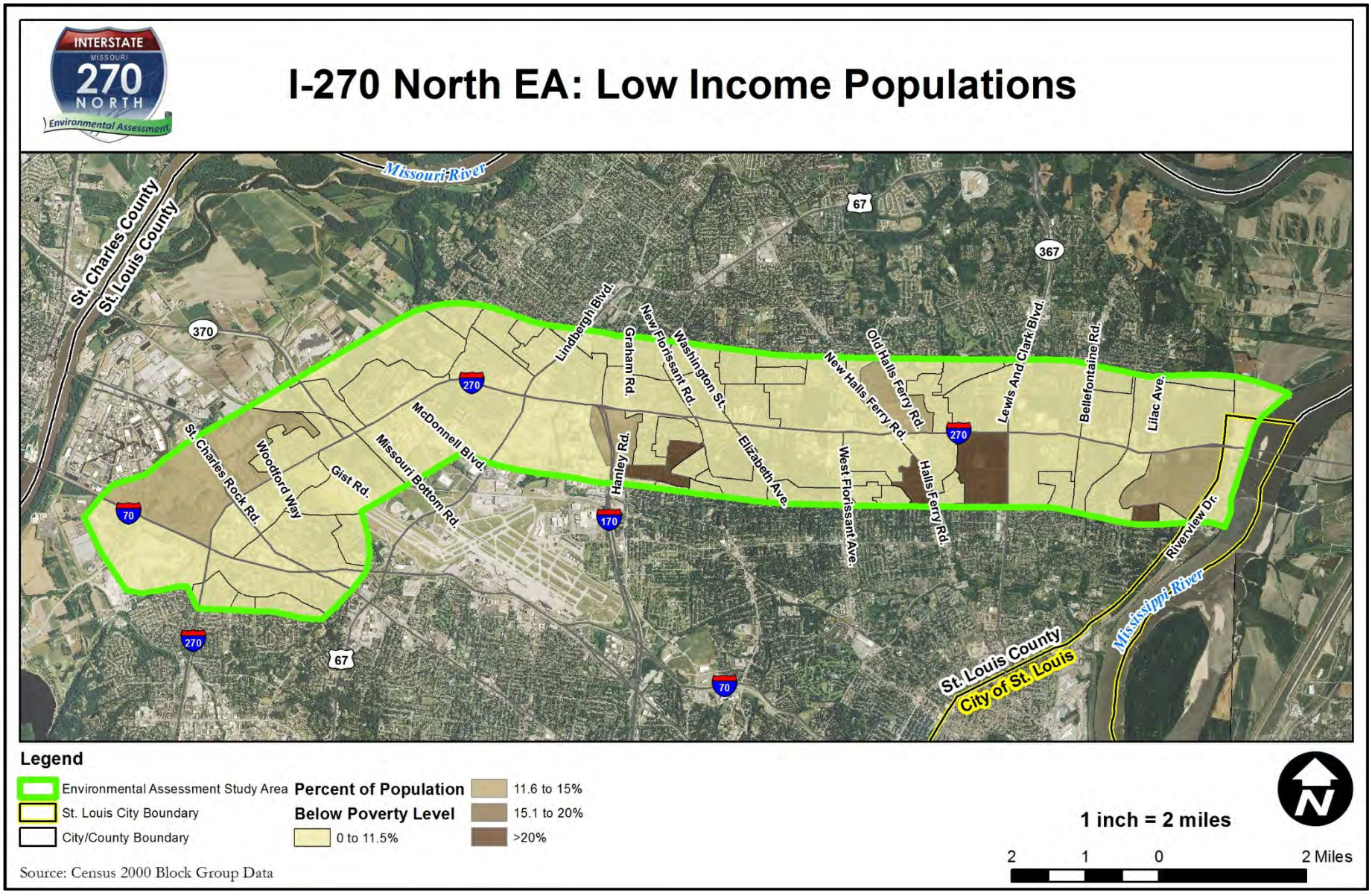

Figure 4-6. Low Income Populations (by Block Group)

4.7.2.2 Age

Age plays an important role in transportation planning and the assessment of EJ impacts. Householders without cars (including young people) and the elderly are two age categories that are particularly susceptible to negative impacts as a result of projects like the improvement of I-270 North. They are more likely to rely on others for transportation. They may use transit more. Bicycles and walking are often important modes of transportation. As shown in **Table 4-12**, the I-270 North EA study area has populations in line with the applicable benchmarks. Roughly one in seven residents are over 65. Roughly one in four residents is under 18.

Table 4-12. Percentage of Population under 18 and over 65

Population	Under 18	Over 65
St. Louis County	23.5%	14.9%
St. Louis City	21.5%	11.2%
St. Charles County	24.9%	12.6%
I-270 North EA Study Area	24.3%	13.9%
Missouri	23.5%	14.3%

Source: Missouri 2010 TIGER Census Data (MSDIS)

4.7.2.3 Disabled Populations

Approximately 11.6 percent of the population of St. Louis County as a whole has a disability, including hearing, vision, cognitive, ambulatory, or self-care disability. For the census tracts that comprise the study area, the range is from approximately 5 to 32 percent. Tracts toward the center of the study area and tracts northwest of the I-70 interchange have the higher percentage of the population with disabilities, although tracts with percent disabled populations greater than the St. Louis County average are distributed along nearly the entire corridor.

4.7.2.4 Zero-Vehicle Households

On average, 6 to 7 percent of the households in the I-270 North EA study area have no personal vehicles available (**Table 4-13**). The range across the census tracts in the study area is as low as 0.4 percent to as high as 18 percent.

Table 4-13. Percent Households with Zero Vehicles

Population	Percent with Zero-Vehicles
St. Louis County	6.8%
St. Louis City	21.4%
St. Charles County	3.4%
I-270 North EA Study Area	6.4%

Source: U.S. Census Bureau, American Fact Finder, *http://factfinder2.census.gov*

The lack of personal transportation indicates people in these households rely on other transportation, likely transit, but may also include walking and biking. The zero-vehicle households are distributed widely across the study area (**Figure 4-7**).

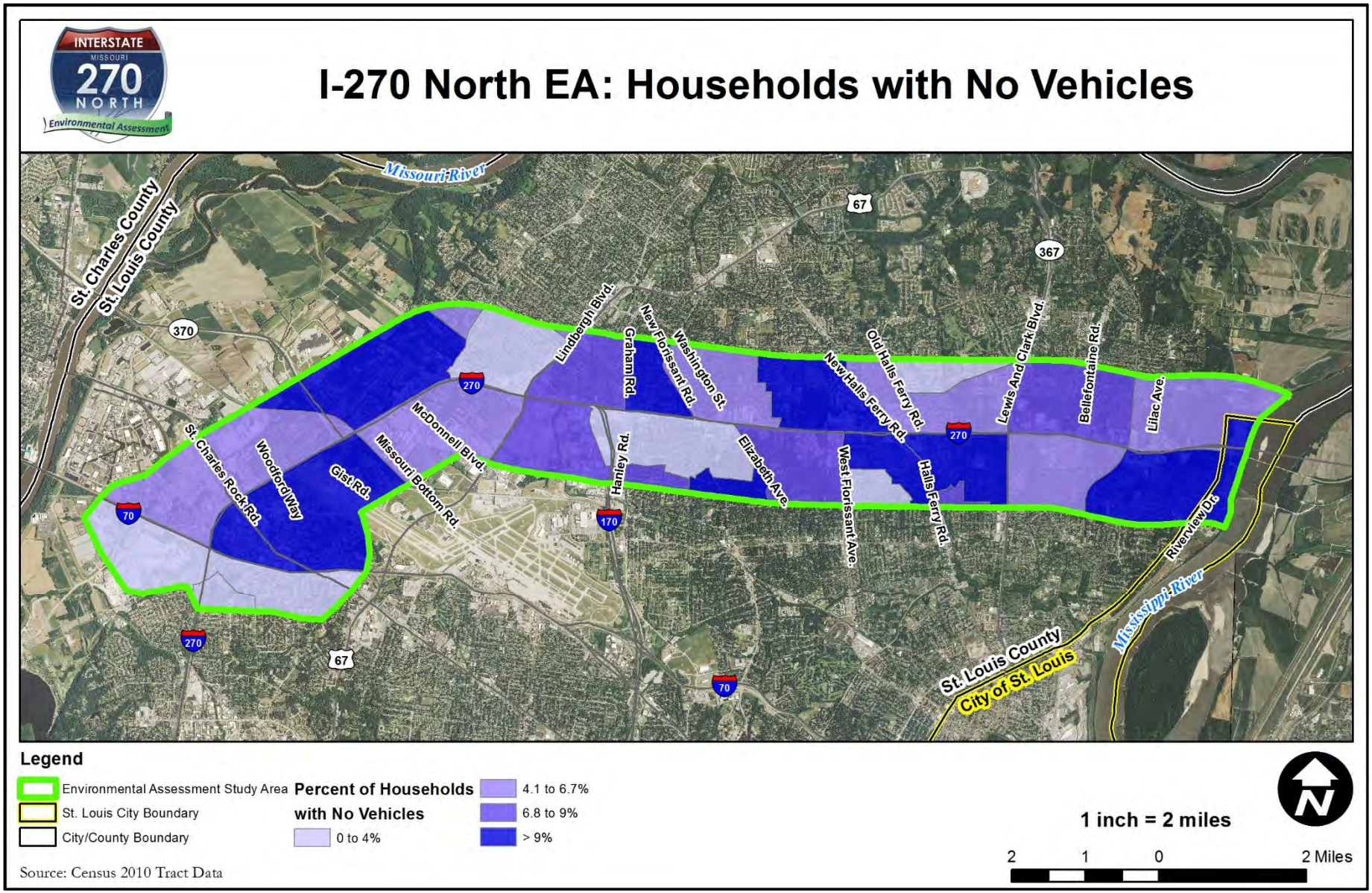

Figure 4-7. Zero Vehicles Households

The ability to access public transportation is essential to those living along the corridor. The Bi-State Development Agency (Metro Transit) provides public transit bus service throughout the study area. MetroBus routes extend along each major cross road, as well as sections of Dunn Road and Pershall Road parallel to I-270. Several routes also travel portions of I-270, I-170, and I-70 (**Figure 4-10**). Many MetroBus routes connect to MetroLink light rail stations. The MetroLink light rail service provides rapid access from North County to downtown Saint Louis and to western Illinois.

Metro Transit completed a new transit center and bus garage in North County on Pershall Road, between West Florissant Avenue and New Halls Ferry Road.

Based on the percentages of the population classified as young (less than 16), older (age 65 or above), low income, or who have disabilities, the North Corridor Study (2012) determined the Transit Needs Index, developed by Metro Transit, to identify areas with higher public transit needs. According to that analysis, most of the study area is considered to have low or average transit need. However, there are three areas of high need within 1 mile of the I-270 North EA, along New Florissant Road (Calverton Park/Hazelwood), West Florissant Avenue (Dellwood), and between Halls Ferry Road and Lewis and Clark Boulevard (Castle Point).

4.7.3 Environmental Justice — Impacts

The analyses of potential impacts to EJ populations focus on the following three major areas:

1. Direct Acquisition of Property/Real Estate from EJ Populations
2. Disruptions to EJ Populations from Construction Activities
3. Travel Pattern Alterations that Particularly Affect EJ Populations

4.7.3.1 Direct Acquisition of Property/Real Estate from Environmental Justice Populations

Much of the work associated with the Reasonable Alternatives will be conducted within the existing right-of-way. However, some new right-of-way acquisition is expected, as follows:

- Property acquisitions vary from a low of 35.5 acres from 233 parcels for the Preferred Alternative to a high of 78.9 acres from 275 parcels for Reasonable Alternative 2. Most of this acquisition is from narrow strips along the interface between the highway right-of-way and the adjacent parcels. The impacts of these acquisitions are not expected to be substantial.
- Structure displacements vary from a low of 23 residences and 9 commercial operations for the Preferred Alternative to a high of 28 residences from residences and 31 commercial structures for Reasonable Alternative 2/2a.

The acquisition of entire residential properties will largely take place along Dunn Road and Pershall Road between Hanley/Graham Road and New Florissant Road, and are nearly evenly distributed north and south of the I-270 corridor. A few other residential acquisitions would occur along Pershall Road between Elizabeth and West Florissant Roads, on Dunn Road east of Old Halls Ferry Road, and on a residential street near Missouri Bottom Road. Most total-take commercial and industrial properties are near the New Florissant, New Halls Ferry, and Bellefontaine Roads.

Relative to poverty populations, the majority of the properties that would be wholly or partially acquired fall in block groups below the threshold for EJ poverty populations. Only three properties that would be totally acquired, two residential properties along Landseer Drive at Dunn Road and one commercial property, fall into a block group above the threshold (approximately 12 percent). One residence would be acquired for all alternatives, the other two only for Alternative 2a. This impact represents less than 10 percent of all of the total acquisitions of the alternatives. Therefore, no alternatives appear to have a disproportionately high and adverse effect on low-income populations (**Figure 4-8**).

Relative to minority populations, numerous block groups along the I-270 corridor exceed the threshold, and several exceed 50 percent minorities. The block groups where most total acquisitions would occur for either

Alternatives 1 or 2, between Graham Road and New Florissant Road, range from less than 14 percent minorities (north of I-270) to greater than 45 percent minorities (south of I-270). Acquisitions are nearly equally distributed in this area along both sides of I-270.

Where other residential and commercial total acquisitions would occur, near New Halls Ferry Road, Bellefontaine Road, and near Missouri Bottom Road, minority populations exceed the threshold along both sides of I-270. Based on this data, any improvement beyond the existing right-of-way would potentially affect these populations. Therefore, while Reasonable Alternative 1, with a smaller footprint, would have less right-of-way impact on neighboring properties and require fewer relocations, impacts to minorities could occur no matter which alternative is selected because of the prevalence of these populations in the study area. There are no Reasonable Alternatives that would meet the project's Purpose and Need and avoid impacts to neighboring properties. Therefore, it is concluded that the impact of the project is not disproportionately high or adverse to minority populations (**Figure 4-9**).

4.7.3.2 Disruptions to Environmental Justice Populations from Construction Activities

The potential construction impacts associated with the Reasonable Alternatives and the methods to minimize any impacts using mitigation measures are discussed in **Section 4.3**. This analysis applies to the potential impacts of construction of both of the Reasonable Alternatives on minority and low-income populations.

Construction impacts would result from utility relocations, building the proposed roadway improvements, and other related construction activities, which are commonly short-term and temporary in nature. Typical construction impacts may include air, water, and noise pollution and disposal of construction debris. Surface transportation traffic patterns in the study area may also be altered during construction. MoDOT has developed a series of Standard Specifications for Highway Construction. These specifications include, but are not limited to, air, noise, and water pollution control measures to minimize construction impacts. The Standard Specifications for Highway Construction also include traffic control and safety measures. MoDOT would implement these standards as a part of the construction of the project to minimize health and safety concerns for residents and others in the construction area.

Impacts would be minimized by adherence to construction permit and contract conditions. Materials resulting from clearing and grubbing, demolition, or other operations (except materials to be retained) would be removed from the project, or otherwise properly disposed of by the contractor. It is anticipated that there would not be excess, excavated earth materials from the project that would need to be disposed of. Fill material or borrow needed for construction of the project would be determined by the contractor, including the source and disposition of borrow, as well as any environmental requirements. Construction impacts would be more fully known when more detailed design plans have been completed. MoDOT will continue to work with the public and other stakeholders to address construction-related concerns.

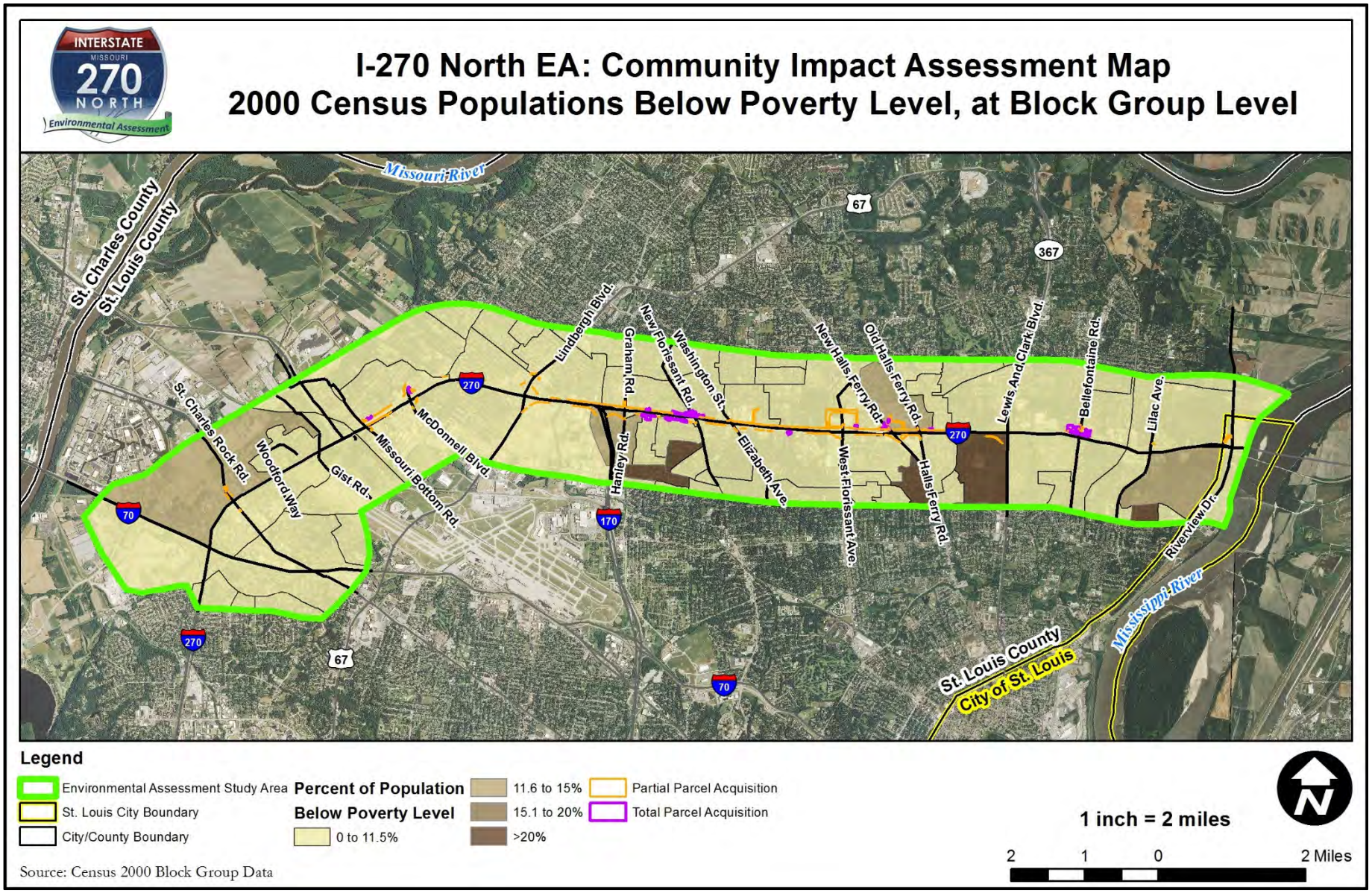

Figure 4-8. Community Impact Assessment Map, 2000 Census Populations Below Poverty Level, at Block Group Level

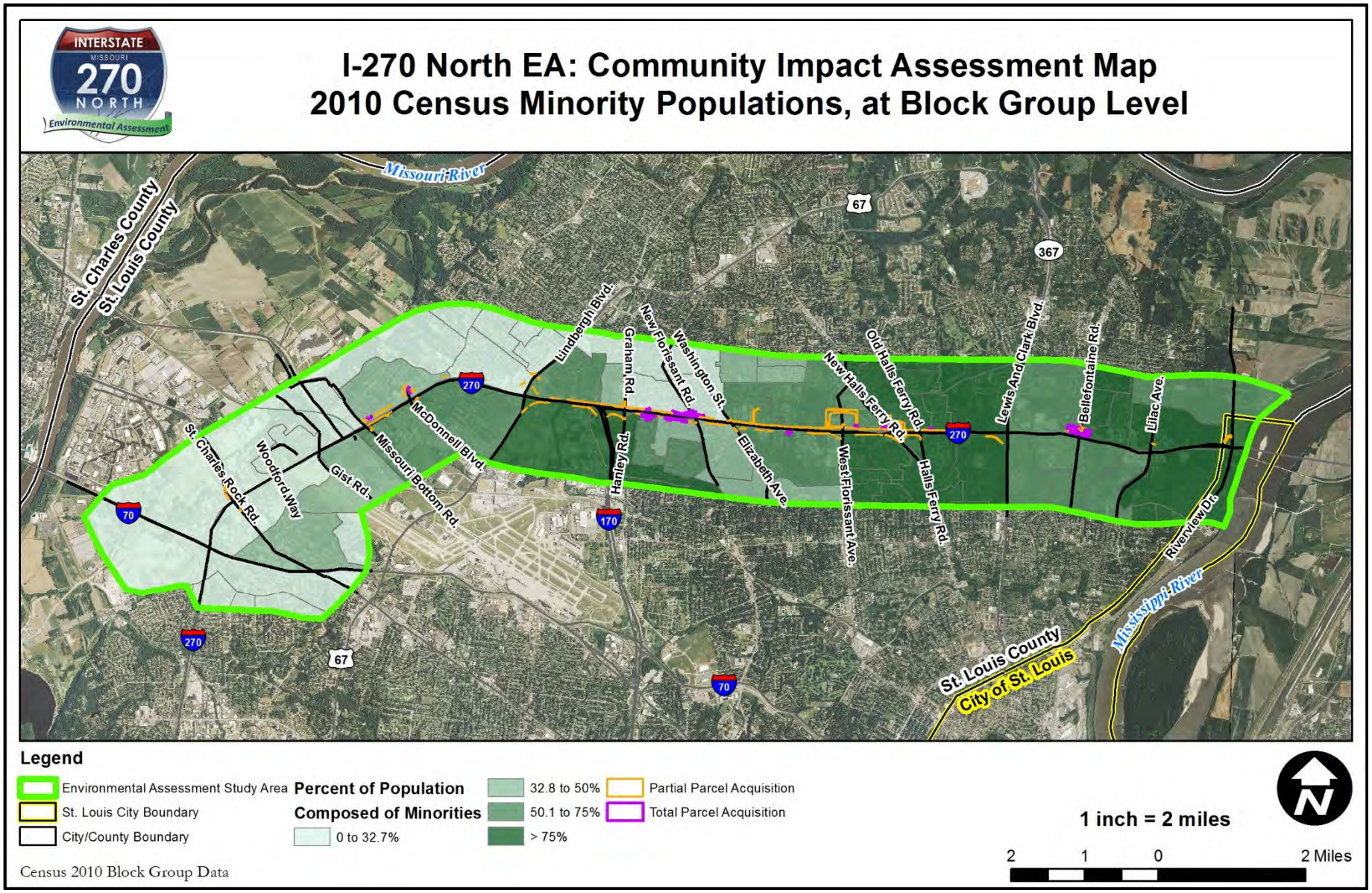

Figure 4-9. Community Impact Assessment Map, 2010 Census Minority Populations, at Block Group Level

4.7.3.3 Travel Pattern Alterations that Particularly Affect Environmental Justice Populations

An AJR was completed in compliance with federal policy on modifications in access to the Interstate system. Within the AJR, the analysis of operations and safety concludes that the proposed changes to the Interstate system will not have substantial adverse impact on the mainline lanes, ramps, ramp intersections, or on the local street network. Relative to the Preferred Alternative, the AJR addressed the following:

- The one-way outer road system between Hanley/Graham Road and Old Halls Ferry Road best improves the traffic operations and safety of the corridor.
- The Preferred Alternative does not have a substantial adverse impact on the safety and operation of the Interstate facility or on the local street network based on both the current and the planned future traffic projections.
- Freeway and intersection LOS, network delay and speeds, and number of crashes are all anticipated to improve compared to the No-Build Alternative.

Based on these findings, it has been concluded that disproportion impacts to EJ populations are unlikely. The complete AJR is available upon request. Travel pattern impacts are discussed more expansively in **Section 4.18**.

Another resource traditionally important to EJ populations is access to transit. Coordination with Metro Transit suggests that a one-way outer road system could potentially increase travel time and transfer fares for customers living/working along the one-way road sections. As discussed in **Section 6**, Metro staff served on the study's Technical Advisory Committee. As engaged members of the Committee, throughout the study, Metro's staff played an important role in helping to determine how best to minimize adverse impacts to Metro's bus operations on the corridor. Nevertheless, the analysis in support of Metro's operations in a converted one-way outer road system showed an impact of approximately $800,000 to Metro Transit's annual operating costs and increase travel by 300 miles per day. As the project progresses, MoDOT is committed to investigating any modifications that might improve the situation. Our Environmental Commitments, relative of Metro Transit, is for construction coordination (#1), acquisition and relocation assistance in accordance with the Uniform Act (#12) and impact minimization (#16).

One-way operation at New Florissant and Washington is primarily within the existing corridor. Important exceptions include the creation of a connection between Dunn Road and Waterford Drive, behind the Grandview Plaza Shopping Center, and the possible mid-block crossover at Grandview Drive. This may increase traffic in these neighborhoods.

Figure 4-10 depicts the Metro system in the vicinity of the study.

4.7.3.4 Environmental Justice and Standard MoDOT Operating Procedures

Many standard MoDOT operating procedures include steps that will minimize impacts to Environmental Justice populations. During the design and implementation of the Preferred Alternative, MoDOT is committed to obtaining necessary permits and performing other actions that would minimize and mitigate the impacts of the project on the environment. Many will also benefit local residents and businesses, including EJ populations, such as:

- Relocation assistance will be provided for all businesses, non-profit organizations, and residents that must be relocated. Assistance would be provided by MoDOT in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act. Relocation assistance under the program will be made available without discrimination to all who will be relocated.
- Improvements included as a part of this project will comply with ADA.

- A MoDOT-approved maintenance of traffic plan will be developed and implemented for the construction phases of the project. Construction schedules, road closures, and detours will be coordinated with police forces and emergency services to reduce impact to response times of these agencies.
- The design process will include periodic consultation with utility owners to ensure compatibility of the roadway design with continued service, proper design of any utilities requiring relocation, construction techniques, and timing and technical assistance during construction.
- During the final design process, MoDOT will consider options to minimize new right-of-way acquisition. The potential minimization of right-of-way acquisitions will not impact the ability of the project to satisfy the Purpose and Need approved by NEPA.
- BMPs will be implemented to minimize soil erosion and sedimentation. Methods for stormwater management, during and after construction, will be in accordance with the MoDOT's Standard Specifications Book for Highway Construction and the project's National Pollutant Discharge Elimination System stormwater permit.
- If encountered during construction, appropriate study and remediation of hazardous waste sites will be performed, as needed, to minimize exposure of construction workers and the public to hazardous wastes and to ensure proper disposal of contaminated earth and other substances. This includes proper disposal of demolition debris in accordance with Missouri state law.
- Dust control during construction will be performed in accordance with MoDOT's standard methods, which require application of water or approved dust control measures on haul roads and during grading. Pavement material batch plants will be situated in accordance with MoDOT's Standard Specifications Book for Highway Construction or any special provisions developed during coordination with MDNR regarding air quality standards and emissions. Portable material plants will be operated in accordance with MDNR air quality requirements/guidelines. A permit must be obtained from MDNR to open burn or open burn with restrictions.
- To reduce the impacts of construction noise, MoDOT has special provisions in construction contracts that require all contractors to comply with all applicable local, state, and federal laws and regulations relating to noise levels permissible within and adjacent to the project construction site. Construction equipment would be required to have mufflers constructed in accordance with the equipment manufacturer's specifications. Further, MoDOT would monitor project construction noise and require noise abatement in cases where the criterion is exceeded.
- MoDOT's Noise Policy will be used to address permanent traffic noise impacts. Where appropriate, possible noise abatement types and locations are discussed in this document. In accordance with established procedure, the traffic noise analysis will be updated during the design phase.
- MoDOT is committed to minimizing unnecessary lighting impacts. Efficient lighting and equipment will be installed, where appropriate, to optimize the use of light on the road surface while minimizing light intruding on adjacent properties.
- MoDOT will continue to work with representatives of EJ populations, especially as the specifics of access, non-motorized users, sidewalks, paved shoulders, lighting, and mass transit are developed."

4.7.3.5 Coordination with EJ Population Representatives

As part of the study's effort to reach out to EJ populations, it was decided to discuss the study with influential spokespeople for the low income/minority populations. This resulted in a series of in-person interviews. The following interviews were held:

- May 5, 2016 Matt Unrein, Assistant City Manager, City of Ferguson
- August 17, 2016 Kimberly Lackey, Staff Attorney, Paraquad

- August 22, 2016 Vanessa Garcia, Assistant Director, Hispanic Chamber of Commerce of Greater St. Louis
- August 23, 2016 Ella M. Jones, Councilwoman, City of Ferguson
- August 23, 2016 Delrish Moss, Police Chief, City of Ferguson
- August 23, 2016 Hazel Erby, Councilwoman, St. Louis County
- August 26, 2016 Heather Navarro, Executive Director, Missouri Coalition for the Environment
- August 29, 2016 Reverend Susan Sneed, Metro Congregations United

The interviews were largely freeform. The study team presented basic background facts about the study, including its status and completion. The presentation discussed the study's goals, its recommendations, public involvement efforts to date, funding, and the anticipated public hearing. Invitations were issued for the public hearing and to review the I-270 North EA. Questions about the study were fielded. Among the most common issues that would affect low income and minority populations were the following:

- Accommodations for non-motorized users
- Concerns with existing slip ramps to and from Dunn Road
- The importance of access and its effect on neighboring communities
- Pedestrian use in the area and safety along and across I-270
- Sidewalks, paved shoulders, and lighting
- How the one-way system accommodates pedestrians
- Business impacts as a result of access alterations

These concerns and needs were acknowledged, and plan details were explained. The importance of developing safe accommodations was noted. The study team offered assurances that these will be examined more thoroughly when a project is selected for construction and detailed design is initiated. Continued coordination will be a component of the project.

4.8 Farmland

4.8.1 Farmland — Regulatory Background and Standards

In accordance with the Farmland Protection Policy Act (FPPA), the impact of a federally funded project is coordinated with the Natural Resources Conservation Service (NRCS) to determine whether agricultural resources and support services are substantially affected.

4.8.2 Farmland — Affected Environment

The I-270 North EA is located in a highly urbanized area. Active farms or commercial agricultural production are limited to isolated areas in the study area. It is expected that conversions will occur as soon as viable development projects emerge. **Exhibit 1 (Appendix A)** shows the limited agricultural parcels along I-270.

Because the study area falls almost entirely within the urban areas on the U.S. Geological Survey (USGS) topographic mapping and the Census 2010 mapping formal coordination relative to the FPPA is not required (**Figure 4-11**). The small portions of the study area outside of the USGS urban area are not located in agricultural use zones and will not require right-of-way acquisition.

Agricultural resources are very limited within the I-270 North EA study area.

Based on a review of the Reasonable Alternatives, the following conditions exist:

- The alternatives follow existing roads and highways in an urban developed area.

- The study area falls almost entirely within an urban area as defined by the USGS topographic map or census map.
- The small portion of the study area outside of the USGS urban area will not experience right-of-way acquisition for any area in agricultural use.
- No loss of prime or statewide important farmland will occur.
- Encroachment on land currently in some form of nominal agricultural use is very limited. The Reasonable Alternatives (including the Preferred Alternative) are expected to have limited direct impacts to currently cultivated farmlands. Right-of-way acquisition of agricultural lands is expected to be less than 0.5 acre for any Reasonable Alternative — all within the urban developed area.
- A No-Build Alternative would have no direct impact on farmlands or farm services.

4.8.3 Farmland — Impacts

The FPPA does not apply to this project, and a Farmland Conversion Impact Rating was not prepared. NCRS is included as a contact agency in the Agency Collaboration Plan (**Section 6.5**). The submission of this document will conclude FPPA coordination.

4.9 Geological Setting

4.9.1 Geological Setting — Regulatory Background and Standards

The evaluation of available geologic and geotechnical information for the study area focused on key construction considerations and potential construction risks. That data is summarized in this subsection.

MoDOT has developed a series of Standard Specifications for Highway Construction. These specifications include accommodation of geological features. MoDOT would implement these standards as a part of the design and construction of the project.

4.9.2 Geological Setting — Affected Environment

According to the U.S. Department of Agriculture Soil Survey, onsite soils are generally well drained, moderately permeable silt loams. The surficial soil in the study area are primarily alluvium consisting of gravel, sand, and silt on flood plains of major rivers and smaller streams. These alluvium deposits are typically 10 to 215 feet thick. The uppermost bedrock unit in the eastern portion of the corridor is primarily the Middle Pennsylvanian-age Marmaton Group. The formation is composed of mainly intercalated shale, limestone, clay, and coal. This formation is up to 80 feet thick.

In a project funded by the Missouri State Emergency Management Agency, major geotechnical hazards were identified for the Saint Louis area. The hazards include collapse potential, landslide potential, and liquefaction potential. These are depicted on **Figure 4-12**.

4.9.3 Geological Setting — Impacts

Collapse potential correlates with locations of underground mines and sinkholes

Landslide potential is based on slope and lithology. Landslide is considered probable if the slope is 12 percent or greater and correlated with a formation known to contain shale, unconsolidated sediments, or surficial materials greater than or equal to 20 feet thick, and if the slope is greater than 20 percent.

Soil liquefaction potential was determined using existing surficial materials and floodplain alluvium maps. Alluvium deposits and artificial deposits are generally loose and unconsolidated and have liquefaction potential. The exception is alluvium in losing streams, which are indicative of a lower water table, thus reducing the potential for liquefaction in the area.

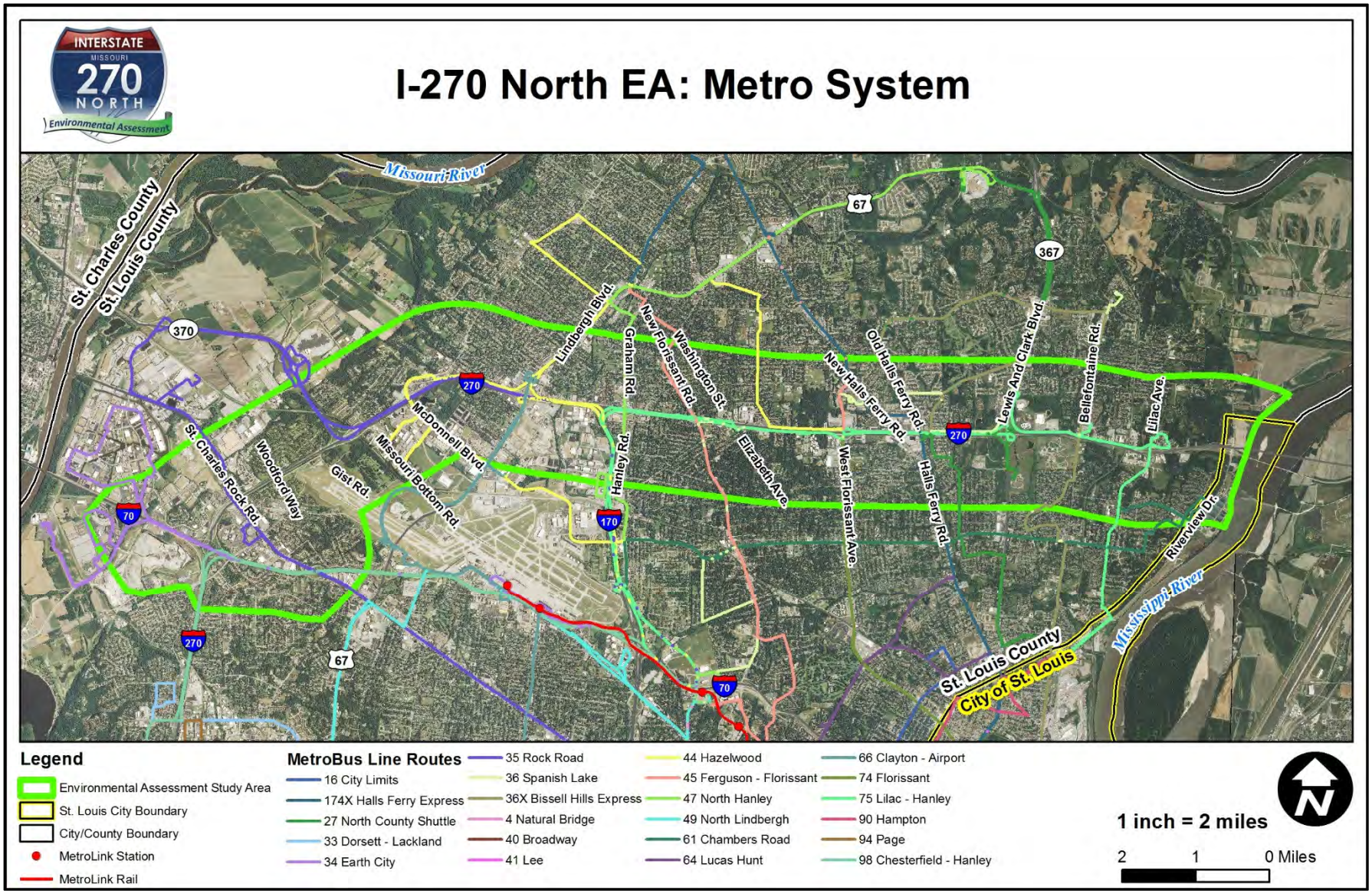

Figure 4-10. Metro Transit System

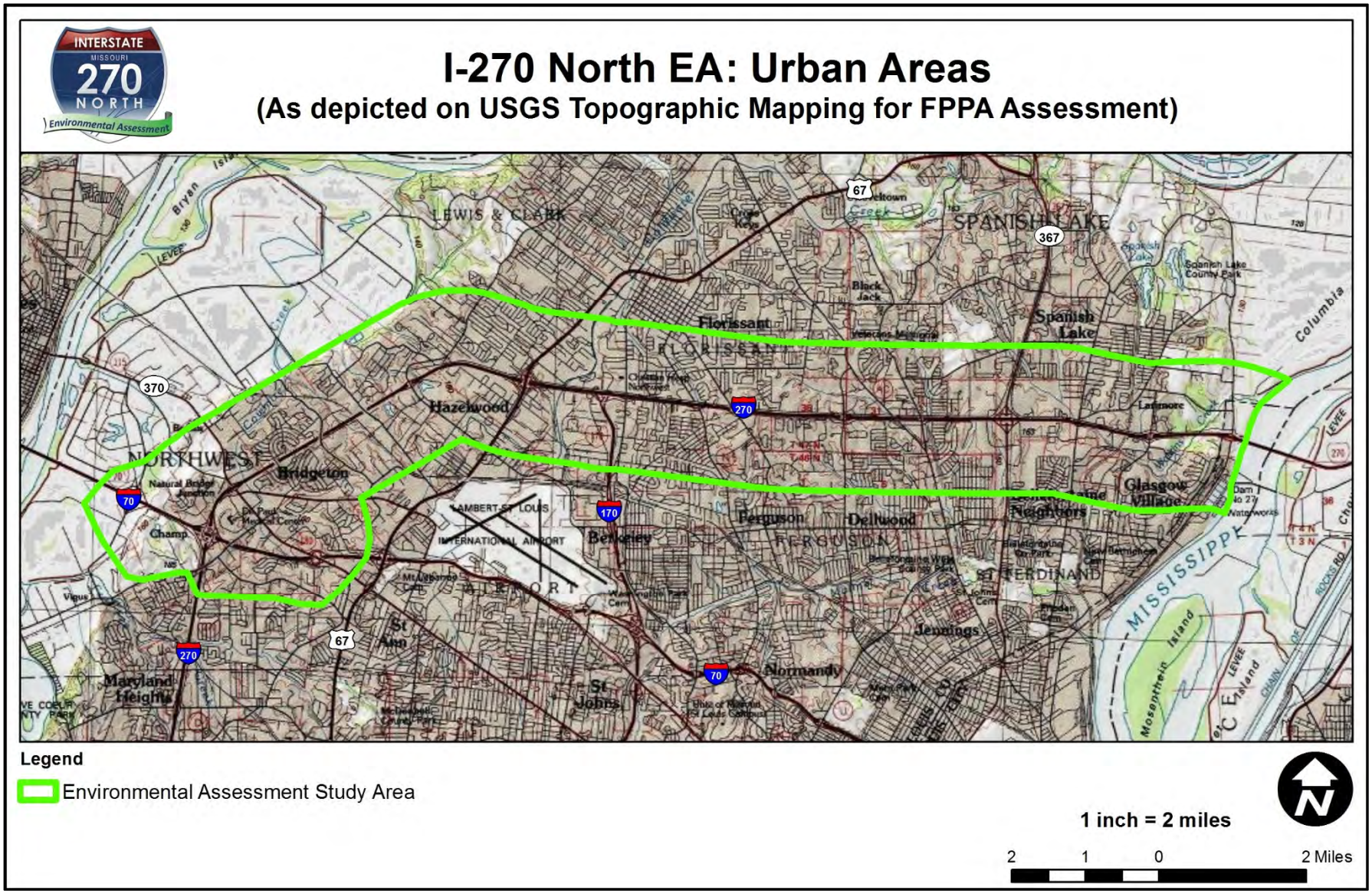

Figure 4-11. Urban Areas for Farmland Protection Policy Act Assessment

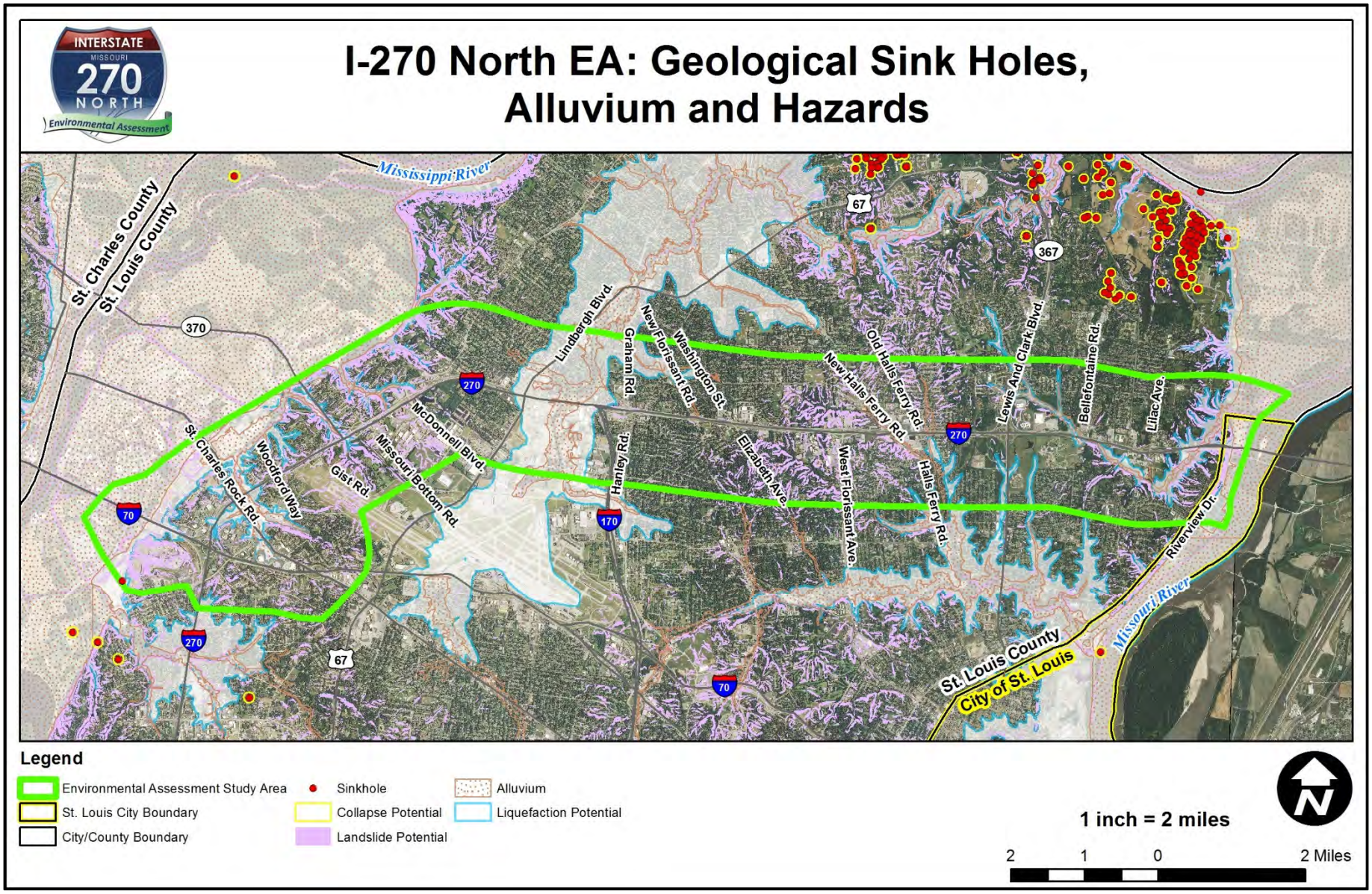

Figure 4-12. Geological Sink Holes, Alluvium, and Hazards

4.10 Hazardous Materials

4.10.1 Hazardous Materials — Regulatory Background and Standards

Hazardous substances, defined in various ways under a number of regulatory programs, are dangerous or potentially harmful to human health or the environment when not managed properly. Hazardous wastes may be generated from specific industrial or manufacturing processes or from commercial businesses. Solid wastes comprise a broad range of materials that include garbage, refuse, sludge, non-hazardous industrial waste, municipal wastes, and hazardous waste. Both hazardous and solid waste can be solid, liquid, or gas.

Hazardous materials and wastes fall under the following regulatory programs:

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) governs cleanup of contaminated sites. These sites have been reported to EPA by states, municipalities, private companies, and private persons, pursuant to Section 103 of CERCLA. Sites evaluated under CERCLA that pose serious threats to human health and the environment are placed on the National Priorities List and are commonly referred to as Superfund sites.
- Resource Conservation and Recovery Act (RCRA) governs hazardous wastes and handlers of hazardous wastes subject to reporting requirements (Threshold Planning Quantities) under Sections 311, 312, and 313 of the Superfund Amendment and Reauthorization Act (SARA). These sites generate, transport, store, treat, and/or dispose of hazardous waste as defined by RCRA.
- Emergency Response Notification System is a national database published by EPA that lists sites where reported releases of hazardous substances and petroleum have occurred.
- Other federal and state programs—MDNR also maintains databases in accordance with federal regulations that provide information on facilities with underground storage tanks (USTs), leaking underground storage tanks (LUSTs), spills reported under MDNR's Environmental Emergency Response Section, and dry cleaning facilities.

4.10.2 Hazardous Materials — Affected Environment

To identify the current environmental conditions within the I-270 North EA study area, a database search was conducted by EDR, Inc. The databases searched conform to the ASTM International (ASTM) Standard E 1527-00 and included the appropriate federal and state databases. In addition to the database search, field reconnaissance was conducted within the corridors identified by the Reasonable Alternatives to verify the database information retrieved and to identify any other properties of potential environmental concern. A copy of the Hazardous Material Site Inventory is available upon request.

Using this information, the potential facilities of concern were identified. To assess these facilities, the best professional judgment standard was used. The focus of the assessment of potential facilities of concern focused on (1) the contaminants that could be present, (2) the toxicity and mobility of these contaminants, and (3) geological factors that could influence the migration of possible contaminants.

4.10.2.1 Sites of Potential Concern

Based on a review of the Hazardous Material Site Inventory, 20 facilities were identified that pose a potential for environmental concern and possible contamination within, adjacent, or near the study area.

The facilities are identified in **Table 4-14**. Their locations are shown on **Exhibit 2 (Appendix A)**.

Table 4-14. Sites of Potential Concern

Site Name	Address	Status	Actions	Material(s)	Map Location _ of 13
Former Sweeny Sunoco	3063 McKelvey	Empty Lot	MDNR legal review	Petroleum	1
One Hour Cleaner	8482 Pershall Road	Active	No reported releases	Chlorinated solvents	6
Bernadette Print Group and Bernadette Business Forms	8950 Pershall Road	Closed	Former smaller quantity generator with past violations	VOCs	6
Interlock Pharmacy Systems LLC	345 Dunn	Active	Large quantity generator and hazardous waste biennial reporter	Heavy metals, ignitable hazardous waste, others	7
Allied Systems and Metro Truck	9050 A and B Pershall Road	Closed	Closed site with active aboveground gasoline pumps	Petroleum	6
One Hour Cleaner	8410 Pershall Road	Active	Conditionally exempt small quantity generator	Chlorinated solvents	7
Paramount Dry Cleaners	62 Grandview Plaza	Closed	No reported releases	Chlorinated solvents	8
Shell/Circle K Gas Station	1545 New Florissant	Active	Active groundwater monitoring program	Petroleum and chlorinated solvents	7
Ryder Truck	12655 Pennridge	Active	Reported LUST	Petroleum	2
Former Grandview Texaco	1625 Dunn Road	Empty Lot	Historic gas station	Petroleum	12
Gateway Cleaners	11294 Florissant	Empty Lot	No reported releases	Chlorinated solvents	9
Dunn Road ZX	3555 Dunn Road	Active	Active groundwater monitoring program	Petroleum	9
GEM Cleaner	1795 Dunn Road	Empty Lot	USTs removed and No Further Action issued	Chlorinated solvents	8
Former Circle K	11011 Bellefontaine	Empty Lot	LUST and MDNR action	Petroleum	12
MO Cigarette and Liquor Outlet	1375 Dunn Road	Active	Historic LUST and MDNR action	Petroleum	12
Production Products	1285 Dunn Road	Active (new use)	Former international paper company facility	Paper-making chemicals	12
Bellefontaine BP	10846 and 10844 Bellefontaine	Active	Leaking UST reported	Petroleum	12
Former Zephyr Service Station	1173 Dunn Road	Empty Lot	No cleanup or closure records	Petroleum	12
Former Airfield Improvement & Repair	801 Dunn Road	Empty Lot	No cleanup or closure records	Undetermined	7
Jomico Metal Fabricators	1194 Pershall Road	Active	Large quantity generator	Multiple chemicals, corrosive waste and wastewater sludge	12

1

4.10.2.2 Superfund Sites

Two Superfund sites are located in the vicinity of I-270.

Westlake Landfill Superfund Site

Westlake Landfill is located on a 200-acre parcel about 1 mile north of the I-70 interchange within the city limits of Bridgeton, Missouri (http://westlakelandfill.com/History.aspx). The site contains a mixture of radiological-contaminated soils, municipal refuse, and construction/demolition debris. The portions of the Westlake Landfill closest to I-270 are visible on Sheet 2 of 13 of **Exhibit 2 (Appendix A)**.

Saint Louis Airport/Hazelwood/Futura Coatings Co. Site/Coldwater Creek

The Saint Louis Airport/Hazelwood Interim Storage/Futura Coatings Co. site consists of three areas used for storing radioactive and other wastes from uranium processing operations conducted in Saint Louis by the Atomic Energy Commission (AEC) and its successor, the U.S. Department of Energy. Radioactive metal scrap and drums of waste were stored in the airport area in uncovered and unstabilized piles from 1947 to the mid-1960s, when they were transferred 0.5 mile northeast to AEC's Hazelwood Interim Storage (HIS) area. Buildings in the airport area were razed, buried, and covered with clean fill after 1967. In 1969, the land was conveyed to the Lambert Saint Louis Airport Authority. HIS and the Futura Coatings Co. plant cover 11 acres adjacent to Latty Avenue, Coldwater Creek, and Hanley Avenue. In 1966, Continental Mining and Milling Co. acquired the property and recovered uranium from wastes purchased from AEC's Saint Louis operations. In 1967, the company sold the property, and by 1973 most processing residues had been removed. Under the direction of the Nuclear Regulatory Commission, the present owner excavated contaminated soil and is storing it in two large piles in the eastern portion of the 11 acres. Since the 1970s, the Futura Coatings Co., a manufacturer of plastic coatings, has leased the western portion. The chemicals of concern include uranium, thorium, and radium in sediment and soil. Investigations and removals are ongoing at this site (http://www.epa.gov/superfund/sites/npl/nar1244.htm). In 2005, a Record of Decision was finalized to outline the cleanup of this site (also known as the St. Louis Airport Sites). The cleanup is being administered by the U.S. Army Corps of Engineers (USACE) under the Formerly Utilized Sites Remedial Action Program (FUSRAP).

EPA conducted a radiological survey in 2013 to identify areas of elevated gamma radiation in the Coldwater Creek area. The study showed surface gamma emissions consistent with background levels throughout the Coldwater Creek survey area (http://www.epa.gov/superfund/sites/npl/nar1244.htm). Coldwater Creek passes under I-270 in the corridor.

The portions of the Saint Louis Airport/Hazelwood Interim Storage/Futura Coatings Co. site closest to I-270 are visible on Sheet 6 of 13 of **Exhibit 2 (Appendix A)**.

4.10.2.3 Wells

There are numerous wells within the area. These are primarily monitoring wells, private wells, and oil/gas test wells. It is likely that most of the private wells are no longer in use as the area has municipal water supply; however, additional investigation will be necessary (during detailed design/construction) to determine if the wells are still present and active. If the work will encroach on any of these wells, they will need to be properly abandoned in accordance with Missouri Well Construction Rules (http://www.dnr.mo.gov/pubs/pub2175.pdf), and an alternate source of water (such as connection to the municipal water supply) provided, as needed. The well data is contained in the Hazardous Material Site Inventory.

4.10.3 Hazardous Materials — Impacts

4.10.3.1 No-Build Alternative Impact Summary

The No-Build Alternative would have no additional impacts on these sites. Because no new right-of-way would be required, no new encroachments would occur. Maintenance of existing bridges, culverts, parking areas, and multi-use trails would continue and could potentially affect these sites.

4.10.3.2 Build Alternatives Impact Summary

Sites of Potential Concern

All 20 facilities that pose a potential for environmental concern are close enough to the Reasonable Alternatives to assume to be affected by the construction of either alternative. Site-specific Phase I and Phase II testing would need to be conducted in the areas of planned construction to evaluate whether contamination was actually present, and at what concentrations.

Several identified sites have known contamination. It is believed there is a moderate to high (likely) risk that these six facilities may adversely impact a construction project.

- Former Sweeny Sunoco, 3063 McKelvey Road: Located outside the Preferred Alternative footprint, this is currently an empty lot. According to records, this site was formerly a gas station called Sweeny Sunoco. It has been in a groundwater monitoring program and the groundwater plume is stable and the site is under legal review for activity use and limitation by MDNR. Given its location, impacts are unlikely.
- Shell /Circle K Gas Station, 1545 New Florissant: Records indicate that groundwater monitoring is currently being performed due to groundwater contamination from a leaking UST. This location was previously a dry cleaner in 1961. There is a risk from soil and groundwater contamination from historic and current site activities. A narrow strip of right-of-way acquisition is expected along Dunn Road. Disposal of contaminated soils are the expected limits of project impact.
- Dunn Road ZX, 3555 Dunn Road: Currently, an active gas station with a groundwater monitoring program due to a leaking UST. According to records, MDNR requested additional groundwater monitoring and noted that soil contamination may not be fully delineated and that site chemicals may be impacting a nearby surface water body, Maline Creek. There is a potential risk of exposure from soil or groundwater. Project work is contained within the existing right-of-way, but disposal of contaminated soils is possible.
- Former Circle K, 11011 Bellefontaine Road: Currently a Shell gas station, records dealt with a former Circle K gas station with a leaking UST. Records show that MDNR has not approved closure of this site, requiring additional groundwater and surface water sampling of Watkins Creek. The potential impacts to site soil and groundwater from this UST have not been delineated. The Preferred Alternative will re-route Dunn Road around the Bellfontaine interchange; Dunn Road will be abandoned adjacent to the gas station. No right-of-way acquisition is expected. Consequently, impacts seem unlikely.
- MO Cigarette and Liquor Outlet, 1375 Dunn Road: A gas station operates on this site. Records suggest a historic leaking UST. MDNR has contacted the site owners notifying them that the extent of soil and groundwater impacts have not been delineated and that additional investigation is required. Project work is contained within the existing right-of-way, but disposal of contaminated soils is possible.
- Bellfontaine BP, 10846 and 10844 Bellefontaine Road: There are three records for this area. Currently, there is an active gas station at this property. The reports suggest soil contamination, possibly associated with a leaking UST. There is no record of cleanup activities, so there is a potential for exposure to petroleum products in soil or groundwater at this location. Project work is contained within the existing right-of-way, but disposal of contaminated soils is possible.

The remainder of the 20 sites are believed to constitute a low to moderate (unlikely) risk to be adversely impacted by the Reasonable Alternatives.

Phase I Environmental Site Assessments will be conducted, by the contractor (in coordination with MoDOT and prior to construction) for the properties to be acquired in accordance with ASTM Method E1527- 05 and/or 40 CFR Part 312 to satisfy the ”all appropriate inquiry” requirement for CERCLA liability. An “all appropriate inquiries” assessment is a necessary component for persons seeking to establish CERCLA’s innocent landowner defense in 42 USC 9607(b)(3), the bona fide prospective purchaser defense in 42 USC 9607(r), or the contiguous property owner defense in 42 USC 9607(q).

If contamination is known or suspected, construction workers should be notified, by the contractor, so that precautions can be taken to protect the workers and minimize potential exacerbation of the contamination. During construction activities, any excess contaminated soil or groundwater should be handled, managed, and disposed of in accordance with appropriate local, state, and/or federal rules and regulations, by the contractor in coordination with MoDOT.

If encountered during construction, appropriate study and remediation of hazardous waste sites will be performed by the contractor, as needed, to minimize exposure of construction workers and the public to hazardous wastes and to ensure proper disposal of contaminated earth and other substances. This includes proper disposal of demolition debris in accordance with Missouri state law.

Superfund Sites

The known Superfund sites (Westlake Landfill and the Saint Louis Airport/Hazelwood/Futura Coatings Co. site/Coldwater Creek complex) are also believed to constitute a moderate to high risk to adversely impact the construction of the Reasonable Alternatives. Coordination with the FUSRUP was part of this study. The utility support component of the 2005 Record of Decision will remediate areas where the project will conduct earthwork within the FUSRAP ROD boundary (basically between Lindbergh and I-170). Coordination with the USACE will continue as the project progresses.

Prior to any earthwork within the St. Louis Airport Sites FUSRAP Record of Decision boundary (between Lindbergh and I-170) will be coordinated, by MoDOT, with the USACE (Department of the Army, St. Louis District, Corps of Engineers, 8945 Latty Avenue, Berkeley, Missouri 63134). Earthwork plans, volumes of materials, timing and construction limits are important elements needed for the utility support component of the 2005 Record of Decision.

Wells

There are numerous wells within the area. These are primarily monitoring wells, private wells and oil/gas test wells. It is likely that most private wells are no longer in use as the area has municipal water supply; however, the contractor shall conduct additional investigation as necessary (during detailed design/construction) to determine if the wells are still present and active. If the work will encroach on any wells, they will need to be properly abandoned, by the contractor, in accordance with Missouri Well Construction Rules (http://www.dnr.mo.gov/pubs/pub2175.pdf), and alternate sources of water (such as connection to the municipal water supply) provided, as needed.

There are also currently groundwater use restrictions for portions of the study area. If construction is required in these areas, the contractor (in coordination with MoDOT) will obtain additional information regarding depth to groundwater to insure construction workers are properly equipped to work under these conditions.

4.11 Land Use

4.11.1 Land Use — Regulatory Background and Standards

The Council on Environmental Quality's (CEQ's) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act point-out that the human environment is to be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. The CEQ Regulations also contain provisions where economic or social and natural or physical environmental effects are interrelated. Consequently, NEPA documents will discuss/disclose all of these effects on the human environment. This section will discuss/disclose the land uses contained within this large study area.

4.11.2 Land Use — Affected Environment

4.11.2.1 Land Uses

According to the parcel data provided by St. Louis County and recent aerial photography, about 44 percent of the I-270 North EA study area comprises residential properties, including both single- and multi-family housing (**Table 4-15**). Commercial, industrial, and institution (including schools, churches, and hospitals) comprise another 33 percent. Vacant or agricultural ground comprises about 17 percent. Parks and other open spaces cover the remaining 6 percent.

Table 4-15. Land Use in the Study Area

Land Use	Percentage of Study Area
Single-Family	38.8%
Vacant/Agriculture	17.0%
Industrial/Utility	12.7%
Commercial	10.6%
Institution	9.2%
Multi-Family	5.2%
Park/Recreation	3.4%
Common Ground/Open Space	3.1%

Residential land uses are spread across the study area (**Figure 4-13**). Institutional, industrial, and commercial land uses are somewhat concentrated around the interchanges.

4.11.2.2 Zoning

As the large majority of the land in the study area is developed, the zoning designations are generally consistent with the existing land uses. There are a few large undeveloped parcels within the study area. The larger vacant lands in the western half of the study area are associated with industrial parks near Lambert Saint Louis International Airport. In the eastern half of the study area, larger vacant parcels are zoned residential or commercial in anticipation of future development, excluding the Bellefontaine Conservation Area and nearby agricultural land at the Lewis and Clark Boulevard interchange.

4.11.2.3 Terrestrial Habitats

Undeveloped land adjacent to I-270 is rare. The structure of terrestrial habitats is largely dependent upon the date of last disturbance/clearing. Fragments of grassland, scrub/shrub habitat and hardwood forest are

present. Most areas have large edges, exposing most of the fragments to the sun — little deep shade is present. These fragments are limited in utility to most wildlife. **Exhibit 1** (**Appendix A**) is sufficiently detailed to identify the nature, location, and configuration of terrestrial habitats.

4.11.3 Land Use — Impacts

4.11.3.1 No-Build Alternative Impact Summary

The No-Build Alternative would have no direct impact on any land uses in the study area.

4.11.3.2 Build Alternatives Impact Summary

The total impacts vary between the Reasonable Alternatives. Overall, Reasonable Alternative 2 would have a greater total impact. Based on the land uses recorded for each parcel in St. Louis County, nearly half of the land affected by both alternatives would be to commercial properties, although the actual commercial land area affected by Reasonable Alternative 2 would be twice that of Reasonable Alternative 1 (**Table 4-16**).

Proportionately, Reasonable Alternative 1 would have a greater impact on residential property (single-family and multi-family combined), but actually less total impact than Reasonable Alterative 2. Reasonable Alternative 2 would have a considerably larger impact on institutional and recreational properties. The majority of those impacts are on currently vacant properties.

It is important to note that much of the total acquisition for each alternative is comprised of narrow strip takes along the frontage of properties. The predominant use of these properties is not expected to change because of the acquisition. Only those properties that will be acquired in their entirety (**Section 4.13**, *Right of Way*) will actually change from their current use.

Localized changes in land use of adjacent properties could accompany either Reasonable Alternative, as a result of changes in traffic patterns. However, the predominant commercial, industrial, and residential land uses in the study area are not expected to change because of the project.

Table 4-16. Land Use Impacts

	Reasonable Alternative 1 (excluding 1a)		Reasonable Alternative 2 (excluding 2a)	
Land Use	**Impact (acres)**	**Percentage of Total Impacted Area**	**Impact (acres)**	**Percentage of Total Impacted Area**
Commercial	16	43%	33	43%
Single Family	7	20%	8	11%
Industrial/Utility	6	16%	4	5%
Vacant/Agriculture	4	12%	4	5%
Institution	2	7%	20	26%
Multi Family	1	2%	3	4%
Recreation	<1	<1%	6	8%
Common Ground/Open Space	<1	<1%	1	1%
Total	36		79	

4.12 Noise

Noise is typically defined as unwanted sound. Noise and sound are physically the same, but the difference is in the opinion of the receiver. A sound is produced by a source that has induced vibrations in the air. The vibration produces alternating bands of relatively dense and sparse particles of air, spreading outward in all directions from the source — much like ripples after a stone is thrown into a pool of water. The result of the air movement is sound waves that radiate in all directions and may be reflected and scattered.

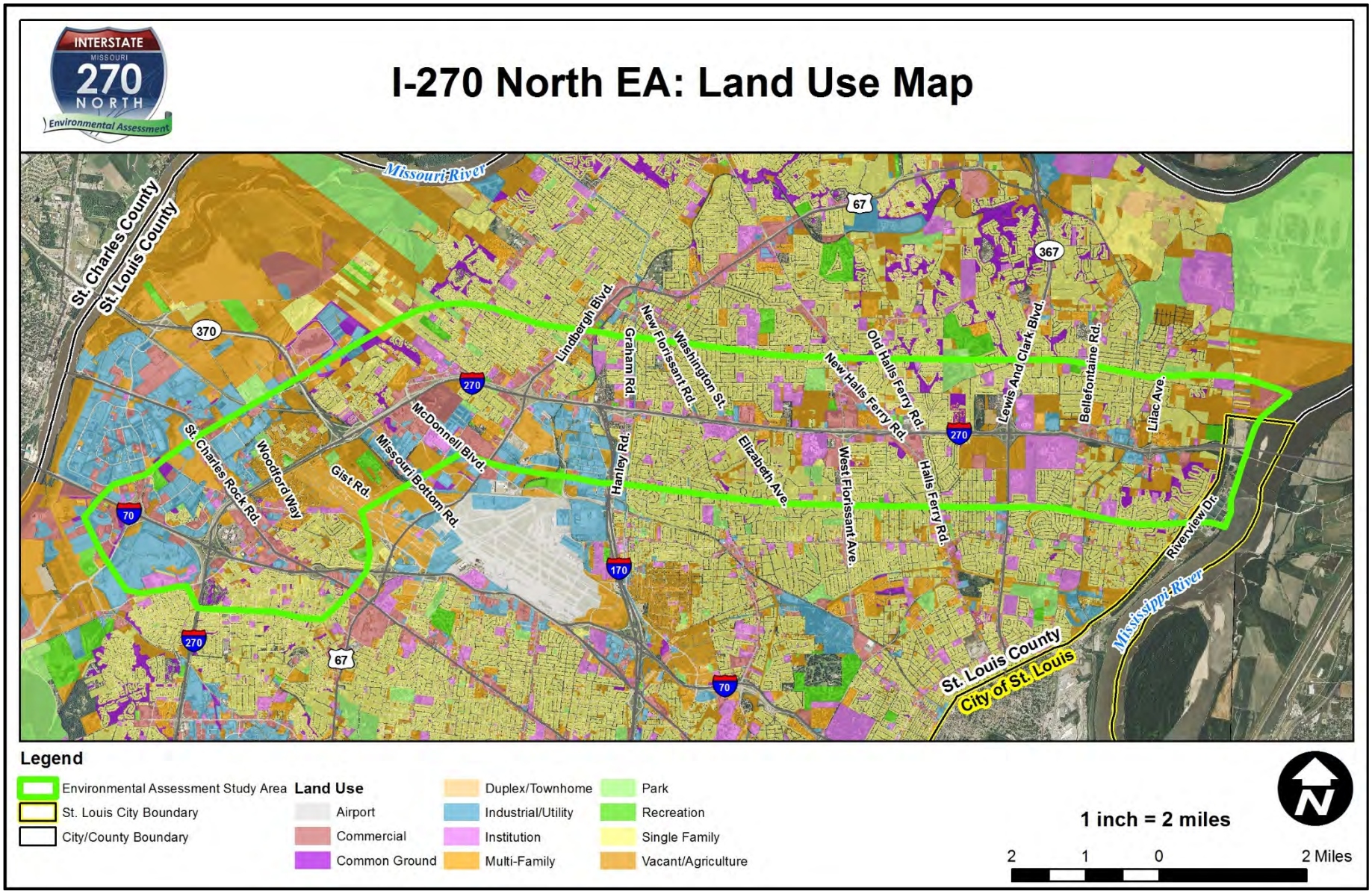

Figure 4-13. Land Use Map

Sound is measured by its pressure or energy in terms of decibels (dB). The dB is based on a logarithmic scale and therefore not directly additive as in a linear scale. For example, if a sound of 60 dB is added to another sound of 60 dB, the total is a 3 dB increase to 63 dB, not a doubling to 120 dB. The human ear can perceive a wide range of sound. At the low end of the dB scale, very faint sounds of less than 10 dB can be heard, yet at the high end of the dB scale, extremely loud sounds of more than 100 dB can also be heard. Except in carefully controlled laboratory experiments, a 1-dB change in sound levels cannot be perceived by humans. Outside the laboratory, a 3-dB change in sound levels is considered a just-perceivable difference. An increase of 10 dB is usually perceived as being twice as loud. Traffic-noise levels are typically calculated in A-weighted decibels (dBA). A-weighting deemphasizes lower-frequency sounds below 1,000 hertz (1 kilohertz [kHz]) and higher-frequency sounds above 4 kHz. A-weighting is the measure most used for traffic and environmental noise throughout the world, as it provides a high degree of correlation with human annoyance and health effects.

The actual impact of sound is not a function of loudness alone. The time of day during which sound occurs and the duration of the sound are also important. In addition, most sound that lasts for more than a few seconds is variable in its intensity. The sound descriptor used for this study is the Leq. The Leq is the equivalent steady-state sound level that, in a stated period, contains the same acoustical energy as the time-varying sound level during the same period. The Leq (h) is the energy-average of the A-weighted sound levels occurring during a 1-hour period, in decibels (i.e., a 1-hour Leq).

4.12.1 Noise — Regulatory Background and Standards

The I-270 North EA is a Type I project that requires a noise analysis. Type I projects include the physical alteration of a highway such that the topography between the traffic noise sources and noise receptors is altered, potentially affecting the traffic noise environment. FHWA procedures for highway noise analysis and abatement contained in 23 CFR 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, were used to identify and evaluate potential noise impacts associated with the I-270 North EA. Evaluation of the traffic-noise impacts expected from construction of a road involves the following:

- Identification of existing activities and developed lands that may be affected by traffic noise from the roadway
- Prediction of traffic-noise levels with and without construction of the proposed project
- Determination of existing noise levels
- Determination of traffic-noise impacts
- Feasibility and reasonableness of noise abatement measures for reducing or eliminating noise impacts

FHWA has determined Noise Abatement Criteria (NAC) for different land uses (i.e., activity categories) as described in **Table 4-17**. For the purpose of traffic noise analysis, the use of a property adjacent to a transportation improvement is classified according to the human activities that occur or are expected to occur within the property boundaries. Noise abatement is considered when a traffic noise impact is predicted. Traffic noise impacts occur when the predicted existing or future highway traffic noise levels approach or exceed the NAC, or when predicted existing or future highway traffic noise levels substantially exceed the existing highway traffic noise level, even though the predicted level may not exceed the NAC. The term “approach” is considered to be 1 dBA less than the appropriate NAC. Therefore, a sensitive noise receptor is considered affected if the noise level is predicted to be 66 dBA or higher for exterior areas of residential land uses. MoDOT defines a “substantial increase” as an increase of 15 dBA or more above the existing noise level.

Table 4-17. Noise Abatement Criteria

Activity Category	Activity Criteria[1] $L_{eq(h)}$	Activity Criteria[1] $L_{10(h)}$	Evaluation Location	Activity Description
A	57	60	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B[2]	67	70	Exterior	Residential
C	67	70	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	52	55	Interior	Auditoriums, daycare centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E[2]	72	75	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F
F	-	-	-	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, and electrical), and warehousing
G	-	-	-	Undeveloped lands that are not permitted for development

Notes:

[1] The $L_{eq(h)}$ and $L_{10(h)}$ Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.

[2] Includes undeveloped lands permitted for development for this activity category.

4.12.2 Noise — Affected Environment

4.12.2.1 Study Areas and Noise Measurements

For the noise analysis, a study area of approximately 500 feet from I-270, between I-70 and Chain of the Rocks Bridge, was established. Within that area, Noise Study Areas were established. Existing noise measurements were made at these locations. A technical memorandum outlining this process is contained in **Appendix D**.

Twenty-eight Noise Study Areas were established. In each Noise Study Area, the Reasonable Alternatives will add capacity, involve roadways on new locations, result in changes in vehicle mix, alter the existing vertical or horizontal roadway alignments, move travel lanes closer to the receptors, add auxiliary lanes, or alter existing shielding. Those areas that will not experience those changes were not evaluated further. Additionally, if there are no outdoor areas of frequent human use, the land use was not considered a Noise Study Area.

The Noise Study Areas underwent initial noise monitoring. This data will primarily be used for validating/calibrating the Traffic Noise Model, but also provides useful background data for the conditions within the study area. The monitoring data is summarized in the technical memorandum (**Appendix D**). As might be expected, unshielded areas in proximity to I-270 experience noise levels that generally exceed the NAC for residential uses. Noise levels as high as 72 dBA were encountered during monitoring.

Figure 4-14 shows the location of the Noise Study Areas and the noise levels encountered during 2014 measurements.

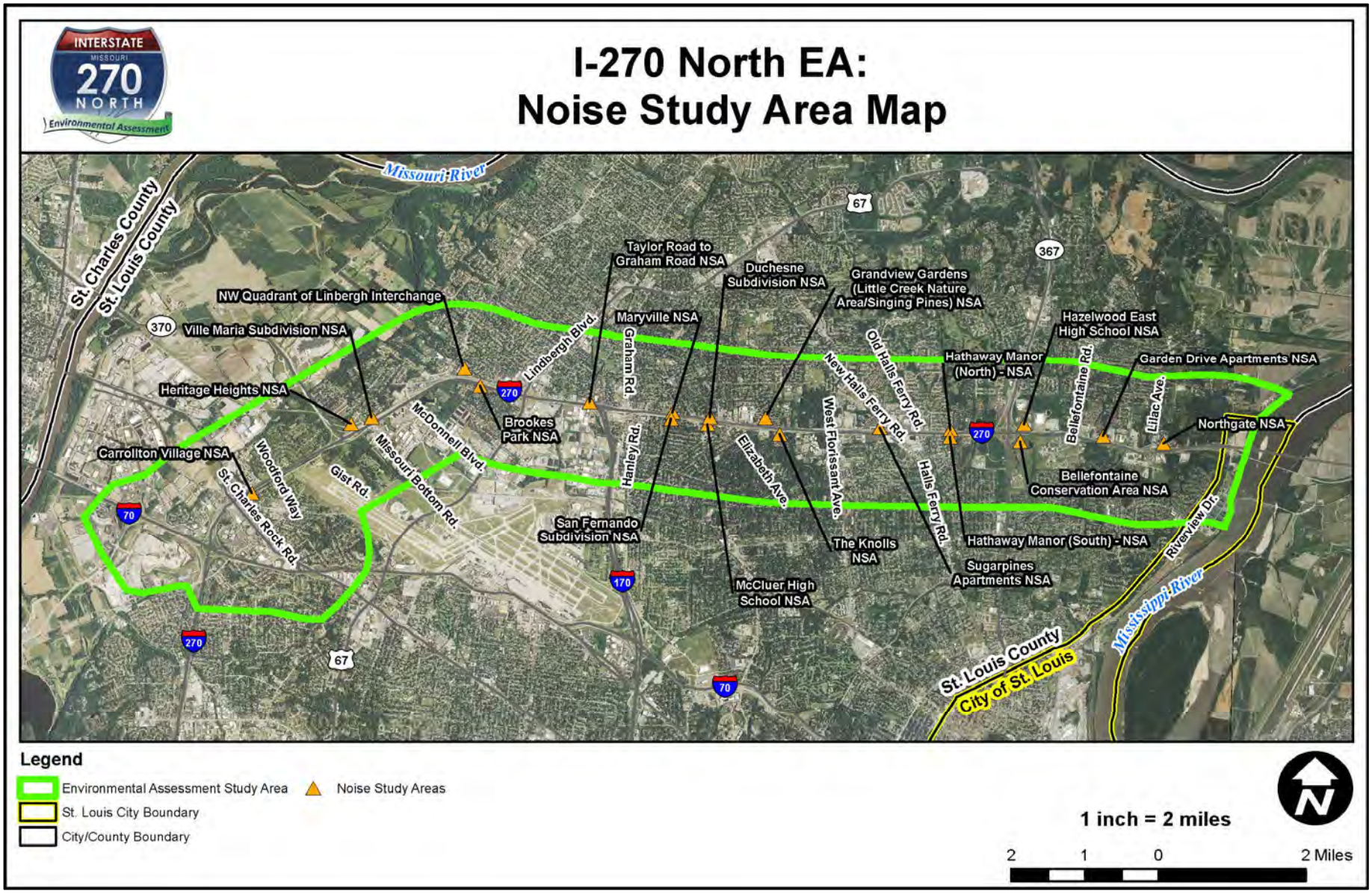

Figure 4-14. Noise Study Area Map

4.12.2.2 Modeled Peak-Hour Noise Levels and Traffic Noise Impacts

Existing and Future (2040) conditions were modeled for all Noise Study Areas. These noise receptor locations were selected to provide full coverage and representation of all sensitive receptors within the study area. **Table 4-18** summarizes the 2040 traffic noise levels at the selected receptor locations.

Table 4-18. Predicted Existing/Future Peak-Hour Noise Levels

Noise Study Area	Existing Noise Levels (dBA)	Future (2040) Noise Levels (dBA)	Traffic Noise Impact?
Carrollton Village Condominiums	57.3 – 62.6	64.9 - **71.7**	**YES**
Heritage Heights	53.3 – 59.4	58.6 – **69.9**	**YES**
Ville Maria Subdivision	59.3 – 65.0	63.6 – **77.3**	**YES**
Northwest Quadrant of Lindbergh Boulevard Interchange	57.9 – 65.0	63.8 – **76.9**	**YES**
Brookes Park	59.7 – 63.0	**66.2 – 78.5**	**YES**
Taylor Road to Graham Road	59.3 – **66.5**	69.3 – **74.8**	**YES**
Maryville Subdivision	61.1 – 63.8	62.4 – **75.5**	**YES**
San Fernando Subdivision	62.9 – **69.0**	**74.3 – 78.6**	**YES**
Duchesne Subdivision	63.4 – **68.1**	**74.1 – 75.7**	**YES**
McCluer High School	60.0 – 64.5	**69.1 – 74.8**	**YES**
Grandview Gardens	62.7 – **68.5**	65.3 – **77.9**	**YES**
The Knolls	61.2 – 64.6	62.6 – **78.8**	**YES**
Sugarpines Apartments	55.9 – 60.4	59.9 – **71.9**	**YES**
Grandview Gardens and Little Creek Nature Area/Singing Pines	62.7 – **68.5**	**68.3 – 71.1**	**YES**
Hathaway Manor (N)	55.9 – 65.3	57.1 – **77.2**	**YES**
Hathaway Manor (S)	57.7 – 63.8	60.8 – **76.9**	**YES**
Bellefontaine Conservation Area	62.7	65.8	NO
Hazelwood East High School	53.0	55.9	NO
Garden Drive Apartments	57.6 – 59.4	54.0 – 59.5	NO
Northgate Apartments	64.2 – 64.6	68.8 – **73.7**	**YES**

Based on the modeled traffic noise conditions, a traffic noise impact was identified for most Noise Study Areas. Noise abatement is examined in the following subsections. The Noise Study Report is **available upon request.**

4.12.3 Noise — Impacts

4.12.3.1 No-Build Alternative Impact Summary

The No-Build Alternative maintains the existing roadway configuration. Noise changes associated with traffic conditions associated with the No-Build Alternative are considered nominal.

4.12.3.2 Build Alternatives Impact Summary

A barrier analysis was conducted for the receptors that would experience a traffic noise impact. A barrier must be both feasible and reasonable to be recommended for further consideration.

Noise Barrier Feasibility

MoDOT defines feasibility as follows:

> *Feasibility is the ability to provide abatement in a given location considering the acoustic and engineering limitations of the site. Acoustic feasibility refers to noise abatement measure(s) ability to achieve the minimum noise reduction at impacted receptors. MoDOT requires at least a 5 dBA insertion loss for a minimum of 67 percent of first-row, impacted receivers for noise abatement to be considered feasible. Engineering feasibility refers primarily to physical constraints and other constructability constraints, such as topography, access, drainage, safety, maintenance, and presence of other noise sources. In general, if these factors are too extreme or cannot be accommodated in providing the minimum noise reduction, noise abatement will be deemed unfeasible. For reasons of safety (primarily wind load and clear space concerns), a noise wall's height is limited to 20 feet. This criterion alone cannot be used to consider noise abatement unreasonable.*

The noise analysis identified the first-row receivers and evaluated if a 20-foot noise barrier could achieve a 5-dBA insertion loss for 67 percent of the impacted first-row receivers (approaching/exceeding NAC). The summary of the feasibility analysis, for the Preferred Alternative, is contained in **Table 4-19**. All but three Noise Study Areas were able to achieve the minimum feasibility requirements. The feasible barriers will be examined further for reasonability.

Noise Barrier Reasonability

For the receptors that could achieve the feasibility standard, the barrier analysis was continued to investigate reasonability. MoDOT defines reasonability as follows:

- Noise abatement measures shall not exceed 1,300 square feet per benefitted receptor.
- Noise abatement measures must provide a benefit of a minimum of 7 dBA for 67 percent of first-row receptors.

The reasonability noise analysis began by identifying the first-row receivers and evaluating if a 20-foot noise barrier could achieve a 7-dBA insertion loss for first-row receivers. If first-row receivers could achieve the 7-dBA goal, the barrier would be optimized to determine if the 1,300-square-foot limit could be achieved. Noise barriers along I-270 are preferred (in the right-of-way between the outer roads and I-270). This can create gaps where the proposed ramps enter/exit the corridor. However, they were also evaluated in those areas where it was possible to examine a noise barrier placed along the outer road. Outer road barriers were limited by driveway and intersections. For non-residential land uses, equivalent dwelling unit calculations were developed based on the roadway frontage of the nearby residential properties.

The reasonability noise analysis identified the first-row receivers and evaluated if a 20-foot noise barrier could achieve a 7-dBA insertion loss for first-row receivers. If first-row receivers could achieve the 7-dBA goal, the barrier would be optimized to determine if the 1,300-square-foot limit could be achieved.

The summary of the reasonability analysis, for the Preferred Alternative, is contained in **Table 4-20**.

Table 4-19. Feasibility Summary for Future Peak-Hour Noise Conditions (Preferred Alternative)

Noise Study Area	First-Row Receivers (Dwelling Units or Equivalent)	First-Row Impacted Receivers (2040)	Impacted First-Row Receivers Receiving a 5-dBA Insertion Loss from a Maximum Height Barrier (20 feet)		Is a Noise Barrier Feasible?
			Number	Percentage	
Carrollton Village Condominiums	24	24	24	100%	**YES**
Heritage Heights	28	16	0	0%	NO
Ville Maria Subdivision	34	28	28	100%	**YES**
Northwest Quadrant of Lindbergh Boulevard Interchange	19	19	19	100%	**YES**
Brookes Park	24	24	24	100%	**YES**
Taylor Road to Graham Road	62	37	27	59%	NO
Maryville Subdivision (outer road barrier)	17	17	17	100%	**YES**
San Fernando Subdivision	20	20	18	90%	**YES**
Duchesne Subdivision (outer road barrier)	8	8	6	75%	**YES**
McCluer High School	10	10	10	100%	**YES**
Grandview Gardens and Little Creek Nature Area/Singing Pines	26	22	18	82%	**YES**
The Knolls	19	19	2	11%	NO
Sugarpines Apartments	13	8	6	75%	**YES**
Hathaway Manor (N)	33	31	30	97%	**YES**
Hathaway Manor (S)	34	32	30	94%	**YES**
Bellefontaine Conservation Area	No Traffic Noise Impacts				
Hazelwood East High School	No Traffic Noise Impacts				
Northgate Apartments	48	16	9	56%	NO
Garden Drive Apartments	No Traffic Noise Impacts				

Table 4-20. Reasonability Summary for Future Peak-Hour Noise Conditions (Preferred Alternative)

		First-Row Receivers Receiving a 7-dBA Insertion Loss from a Maximum Height Barrier (20 feet)		Optimized Barrier:		
Noise Study Area	**First-Row Receivers (Dwelling Units or Equivalent)**	**Number**	**Percentage**	**Square Feet per Benefitted Receptor**	**Percentage of (first row) Benefitted Receptor**	**Is a Noise Barrier Reasonable?**
Carrollton Village Condominiums	24	24	100%	932	67%	**YES**
Heritage Heights		Not Feasible				
Ville Maria Subdivision	34	34	100%	1,281	94%	**YES**
Northwest Quadrant of Lindbergh Boulevard Interchange	19	19	100%	1,312	100%	**YES**
Brookes Park	24	24	100%	1,308	100%	**YES**
Taylor Road to Graham Road		Not Feasible				
Maryville Subdivision (outer road barrier)	17	17	100%	1,147	100%	**YES**
San Fernando Subdivision	20	7	35%	N/A	N/A	NO
Duchesne Subdivision (outer road barrier)	8	5	63%	2,229	5	NO
McCluer High School	10	10	100%	5,804	100%	NO
Grandview Gardens (and Little Creek Nature Area/Singing Pines)	26	9	35%	N/A	N/A	NO
The Knolls		Not Feasible				
Sugarpines Apartments	13	6	46%	N/A	N/A	NO
Hathaway Manor (N) (outer road barrier)	33	20	61%	N/A	N/A	NO
Hathaway Manor (S)	34	30	88%	816	65%	**YES**
Bellefontaine Conservation Area		No Traffic Noise Impacts				
Hazelwood East High School		No Traffic Noise Impacts				
Northgate Apartments		Not Feasible				
Garden Drive Apartments		No Traffic Noise Impacts				

1

For the receptors that could achieve the feasibility standard, barrier analysis was continued to investigate reasonability. To be recommended for further consideration, a barrier must be both feasible and reasonable. MoDOT defines reasonability as the ability for noise barriers to achieve a maximum of 1,300 square feet per benefitted receptor and must provide a benefit of a minimum of 7 dBA for 67 percent of first-row receptors.

The Noise Study Areas that are both feasible and reasonable include the following:

- Carrollton Village Condominiums
- Ville Maria Subdivision
- Brookes Park
- Northwest Quadrant of the Lindbergh Boulevard Interchange (Kindercare, Library and St. Martin De Porres)
- Marysville (with an outer road barrier at St. Cornelius Lane)
- Hathaway Manor (South)

Each of these noise barrier assessments are summarized below.

Carrollton Village Condominiums

Even with the adjoining disc golf course excluded from the analysis, a noise barrier protecting the condominium buildings is reasonable. There are 48 apartment units (24 ground floor/24 second floor). Twenty-four of these are first-row receivers. The area of frequent human use for the first-floor units was a ground-level patio. The area of frequent human use for the second-floor units was an elevated balcony. Using a 1,094-foot-long barrier, that averaged 13.63 feet tall, 16 first-row receivers achieved the 7-dBA insertion loss. This results in an area per benefitted dwelling unit of 932 square feet.

Ville Maria Subdivision

This area includes several apartments with ground-level areas of frequent human use, numerous single-family homes, and a single equivalent dwelling unit for the Garrett Elementary school playground. Fifty-seven dwelling units were accounted for in the model. With a 20-foot maximum barrier, all 34 first-row receivers receive a 7-dBA insertion loss. Optimizing the barrier resulted in a 17-foot barrier (3,100 feet long) that benefitted 32 of the first-row receivers and 10 second-row receivers. This results in an area per benefitted dwelling unit of 1,281 square feet.

Brookes Park

There are 24 equivalent first-row dwelling units in this area. This includes eight for Brookes Park and 16 for the road-front single-family homes. Fifty-one dwelling units were accounted for in the model. With a 20-foot maximum barrier, all 24 first-row receivers receive a 7-dBA insertion loss. Optimizing the barrier resulted in an average 15.4-foot-tall barrier 3,473 feet long. This 53,633-square-foot barrier provides a 7-dBA insertion loss at 41 equivalent dwelling units (1,308 square feet per benefited receiver).

Northwest Quadrant of the Lindbergh Boulevard Interchange (Kindercare/Library and Saint Martin De Porres)

The Kindercare/Library NSA contains too few receivers to support a reasonable noise barrier. Consequently, it was joined to the Saint Martin De Porres NSA. There are 19 equivalent first-row dwelling units for the Kindercare, the Prairie Commons Library (outdoor garden), the La Petite Academy, and the fields at Saint Martin De Porres. Fifty-three dwelling units were accounted for in the model. With a 20-foot maximum barrier, all 19 first-row receivers receive a 7-dBA insertion loss, as do all of the other modeled receivers. It is not possible to optimize the barrier with only first-row receivers. Optimizing the barrier using all receivers

can be done using a barrier that averages 14.5 feet tall and 4,542 feet long. This 65,612-square-foot barrier provides a 7-dBA insertion loss at 50 equivalent dwelling units (1,312 square feet per benefited receiver).

Marysville (with an outer road barrier at St. Cornelius Lane)

A noise barrier along I-270 is not reasonable. An outer road barrier protecting only St. Cornelious Lane is both feasible and reasonable. Using an 18-foot barrier, that is 1,100 feet long, all 17 first row receivers receive a 7 dBA insertion loss (1,165 square feet per receiver).

Hathaway Manor (South)

The Hathaway subdivision is located between Old Halls Ferry Road and the MO 367 interchange. Because of the unusual configurations, several different iterations were investigated to find a reasonable barrier configuration. There are 34 first-row dwelling units (32 receive a traffic noise impact). With a 20-foot maximum barrier (4,000 feet long), 30 of the 34 first-row receivers receive a 7-dBA insertion loss (88 percent). With a 14-foot barrier, a total of 63 dwelling units will receive an insertion loss of 7 dBA.

4.13 Right-of-Way

4.13.1 Right-of-Way — Regulatory Background and Standards

Right-of-way defines the areas necessary to construct and maintain the main roadways and necessary outer roadways, entrances and crossroads. Areas for maintenance and utilities are also provided for. The minimum width of right-of-way established for each project is that necessary to accommodate construction and provide proper maintenance of the roadway. Right-of-way plans are developed together with the detailed construction plans.

Acquisition and relocation of affected residential and commercial properties will be in accordance with the relocation procedures established in the Uniform Act. The Uniform Act and Missouri state laws require that just compensation be paid to the owner(s) of private property taken for public use. The Uniform Act is carried out without discrimination and in compliance with Title VI (the Civil Rights Act of 1964), the President's EO on EJ, and ADA.

4.13.2 Right-of-Way — Affected Environment

The existing right-of-way within the I-270 North corridor stretches unbroken, north to south, from Dunn Road to Pershall Road. The development of alternatives will investigate how to contain alternatives within the existing right-of-way envelope. The configuration of the existing right-of-way is depicted on **Exhibit 2 (Appendix A)**.

The majority of existing I-270 has inside shoulder widths of 4 feet or 5 feet. With the 2-foot concrete barrier along centerline, the resulting existing median width is 10 feet or 12 feet. In the development of the alternatives, it was assumed that the center median would be reconstructed with 12-foot, full-width inside shoulders in both directions of I-270. This results in a median width of 26 feet. This assumption was made with the intention of providing a conservative approach for the project cost estimates and maximizing flexibility by clearing a project footprint that can accommodate reconstruction with full-width inside shoulders. The assumption of reconstruction with full-width inside shoulders is not intended to exclude other treatments. The assumption of reconstruction with full-width inside shoulders should not be construed as project commitment.

Possession of the right-of-way is necessary before roadway improvement can begin. The acquisition of right-of-way for transportation improvements is a complex undertaking. All activities associated with this acquisition, including those applicable to title search, appraisal, negotiations, payments, closings, condemnation, possession, and other related activities, will be identical, and will be identically applied in all dealings with property owners from whom lands, property, or rights must be acquired for transportation

purposes without regard to the owner's race, color, religion, national origin, sex, age, ancestry, or physical ability. Federal regulations governing right-of-way acquisitions are found in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, along with accompanying federal regulations 23 CFR Part 710 and 49 CFR Part 24. Compliance with these regulations are required if federal funds are used to finance any portion of the improvement project.

4.13.3 Right-of-Way — Impacts

4.13.3.1 Property Acquisition

The No-Build Alternative would not require additional right-of-way; therefore, there would be no residential or business acquisitions, displacements, or relocations.

Table 4-21 identifies the potential right-of-way acquisition impacts associated with the Reasonable Alternatives. These acquisitions are based on planning-level engineering. The actual extent of acquisition will change as design plans are completed. There may also be opportunities to use temporary or permanent easements in lieu of acquisitions, which would be determined during the design phase.

Table 4-21 also depicts right-of-way acquisition in terms of full and partial acquisitions. With full acquisition, the entire tract or parcel would be acquired. With partial acquisition, a narrow strip taking is required along the property's frontage with the existing I-270 right-of-way. Partial acquisitions are considered only if the primary structure could remain in place and the remainder of the property could function as a viable entity.

The cumulative property acquisitions can be summarized as follows:

- Reasonable Alternative 1: Total acquisition of 35.7 acres from 247 parcels
- Reasonable Alternative 1 with variation 1a: Total acquisition of 35.5 acres from 233 parcels
- Reasonable Alternative 2: Total acquisition of 78.9 acres from 275 parcels
- Reasonable Alternative 2 with variation 2a: Total acquisition of 46.4 acres from 256 parcels

The Preferred Alternative is Alternative 1 with variation 1a. It minimizes both the number of parcels affected by acquisition, as well as the total amount of property that will need to be acquired to build the project.

4.13.3.2 Structure Displacements

The No-Build Alternative would not require additional right-of-way; therefore, there would be no residential or business acquisitions, displacements, or relocations.

Table 4-22 identifies the residential and commercial displacements (structure removal) associated with the Reasonable Alternatives. These acquisitions are based on planning-level engineering. In most cases, these are coincident with full parcel acquisitions. As design plans are completed, there may be opportunities to avoid some of the identified displacements.

The cumulative displacements can be summarized as follows:

- Reasonable Alternative 1: 23 residences 9 commercial operations
- Reasonable Alternative 1 with variation 1a: 23 residences 9 commercial operations
- Reasonable Alternative 2: 28 residences 31 commercial operations
- Reasonable Alternative 2 with variation 2a: 30 residences 27 commercial operations

The Preferred Alternative is Alternative 1 with variation 1a. It minimizes the number of displacements required to build the project.

4.13.3.3 Relocation Availability

Each Reasonable Alternative would require relocation of residential and commercial/industrial properties. A review of available residential and commercial property in St. Louis County shows a broad range of types

and locations available. Based on the extent of available properties, the relocations are expected to be readily absorbed into the local market. It is not anticipated that there will be difficulty finding adequate replacement properties for those who are displaced. Relocation resources are available, without discrimination, to all residential properties and businesses impacted by the project.

Among the affected residential properties, there appears to be two primary types. Bungalows are smaller with living areas under 1,000 square feet. Built in the 1950s, the appraised values are in the $50,000 range. The larger ranches vary in size between 1,300 and 2,100 square feet. Also built in the 1950s, their appraised values range upwards of $122,000, more typically less than $100,000. Searches for comparable single-family houses found numerous examples. For instance, in the 63135 zip code, over 100 examples were available. Similar levels of vacancies exist all along the I-270 corridor.

Among the affected commercial properties, similar searches found retail availability through the area. Just within Florissant, Bridgeton, and Hazelwood, 35 office sites are currently available and 102 retail sites are available. It appears that adequate replacement facilities would be available for those displaced because of the project. Redevelopment within the immediate area is also possible.

Table 4-21. Potential Right-of-Way Acquisition Impacts Associated with the Reasonable Alternatives

Alternative	Reasonable Alternative Description	Preliminary Property Acquisition Estimates				Acquisition Totals	
		Partial Acquisition (acres)	Parcels	Full Acquisition (acres)	Parcels	Area (acres)	Parcels
AREA 1: I-70 TO MCDONNELL BOULEVARD							
Reasonable Alternative 1	Diverging Diamond Interchanges at St. Charles Rock Road and McDonnell Boulevard	1.6	15	0	0	1.6	15
Reasonable Alternative 2	Diamond Interchange at St. Charles Rock Road and Partial Cloverleaf at McDonnell Boulevard	5.6	27	2.3	5	7.9	32
AREA 2: EAST OF MCDONNELL BOULEVARD TO HANLEY ROAD/GRAHAM ROAD							
Reasonable Alternative 1	Partial Cloverleaf Interchange at Lindbergh Boulevard	3.8	46	0.0	0	3.8	46
AREA 3: HANLEY ROAD/GRAHAM ROAD TO OLD HALLS FERRY ROAD							
Reasonable Alternative 1	Diamond and Split Diamond Interchanges with One-Way Dunn/Pershall (Split Diamond between West Florissant to Old Halls Ferry)	12.7	137	8.3	30	21.0	167
Reasonable Alternative 1a	Diamond and Split Diamond Interchanges with One-Way Dunn/Pershall (Split Diamond between West Florissant to New Halls Ferry)	12.6	123	8.3	30	20.8	153

Table 4-21. Potential Right-of-Way Acquisition Impacts Associated with the Reasonable Alternatives

Alternative	Reasonable Alternative Description	Preliminary Property Acquisition Estimates				Acquisition Totals	
		Partial Acquisition (acres)	Parcels	Full Acquisition (acres)	Parcels	Area (acres)	Parcels
Reasonable Alternative 2	Diamond and Split Diamond Interchanges with Two-Way Dunn/Pershall (Split Diamond between West Florissant to New Halls Ferry)	36.4	132	21.2	49	57.6	181
Reasonable Alternative 2a	Diamond and Split Diamond Interchanges with Two-Way Dunn/Pershall (Split Diamond between West Florissant to Old Halls Ferry)	33.3	111	20.2	51	53.5	162
AREA 4: EAST OF OLD HALLS FERRY ROAD TO RIVERVIEW DRIVE							
Reasonable Alternative 1	Partial Cloverleaf Interchange at MO 367 and Diamond Interchanges at Bellefontaine, Lilac, and Riverview	3.3	14	6.0	5	9.3	19
Reasonable Alternative 2	Partial Cloverleaf Interchanges at MO 367, Bellefontaine, Lilac, and Riverview	5.1	10	4.9	7	10.0	17

Table 4-22. Residential and Commercial Displacements (Structure Removal) Associated with the Reasonable Alternatives

ALTERNATIVE	REASONABLE ALTERNATIVE DESCRIPTION	PRELIMINARY STRUCTURE ACQUISITION ESTIMATES
		SAINT CHARLES ROCK ROAD AREA
Reasonable Alternative 1	Diverging Diamond Interchange	• None
Reasonable Alternative 2	Diamond Interchange	• None
		MCDONNELL BOULEVARD AREA
Reasonable Alternative 1	Diverging Diamond Interchange	• None
Reasonable Alternative 2	Partial Cloverleaf Interchange	• Three single-family residences east of Missouri Bottom Road (Villa Teresa) • Arby's and Auto World, Inc. in the northeast quadrant of McDonnell Boulevard
		LINDBERGH BOULEVARD AREA
Reasonable Alternative 1	Partial Cloverleaf Interchange	None
		HANLEY ROAD/GRAHAM ROAD AREA
Reasonable Alternative 1	Diamond Interchange (One-Way Dunn/Pershall)	• Two single-family residences at Pershall Road and Brackleigh Lane
Reasonable Alternative 2	Diamond Interchange (Two-Way Dunn/Pershall)	• Two single-family residences at Pershall Road and Brackleigh Lane. • Displacements at South Lafayette Street include Tires Wholesale, one Single-family residence, Life Smile Dental, One Hour Cleaning, and one vacant commercial building
		NEW FLORISSANT ROAD TO WASHINGTON STREET/ELIZABETH AVENUE AREA
Reasonable Alternative 1	Split Diamond Interchange (One-Way Dunn/Pershall)	• Twenty-one single-family residences: six at Santa Cruz Drive, and fifteen between DuBourg Lane and Jean Drive • Plaza Duchesne: Kwik Mart and five others and Gary's A+ Auto/Joe's Auto Mart • Creative Cuts: Pershall/Jean

Table 4-22. Residential and Commercial Displacements (Structure Removal) Associated with the Reasonable Alternatives

ALTERNATIVE	REASONABLE ALTERNATIVE DESCRIPTION	PRELIMINARY STRUCTURE ACQUISITION ESTIMATES
Reasonable Alternative 2	Split Diamond Interchange (Two-Way Dunn/Pershall)	• Twenty-two single-family residences: five at Santa Cruz Drive, fourteen between DuBourg Lane and Jean Drive, and three at New Florissant • BP, Circle K, one office complex (three operations), Kling Orthodontics, Boain Dental and one vacant commercial building • Creative Cuts: Pershall/Jean
		WEST FLORISSANT AVENUE TO OLD HALLS FERRY ROAD AREA
Reasonable Alternative 1	Split Diamond Interchange (West Florissant to Old Halls Ferry — One-Way Dunn/Pershall)	• None
Reasonable Alternative 1a	Split Diamond Interchange (West Florissant to New Halls Ferry — One-Way Dunn/Pershall)	• None
Reasonable Alternative 2	Split Diamond Interchange (West Florissant to New Halls Ferry — Two-Way Dunn/Pershall)	• Dobb's Tire at West Florissant • Applebee's, Crossings Shopping Center (five operations), ZX, Plumber's Supply, Mobil, and Donut Delite at New Hall's Ferry
Reasonable Alternative 2a	Split Diamond Interchange (West Florissant to Old Halls Ferry — Two-Way Dunn/Pershall)	• Two single-family residences at Landseer Drive • Dobb's Tire at West Florissant • Applebee's, Popeye's, ZX, Plumber's Supply, Mobil, and Donut Delite at New Hall's Ferry
		MO 367 AREA
Reasonable Alternative 1	Partial Cloverleaf Interchange	• None
		BELLEFONTAINE ROAD AREA
Reasonable Alternative 1	Diamond Interchange	• Pizza Hut restaurant
Reasonable Alternative 2	Partial Cloverleaf Interchange	• Shell gasoline station, National Rent-to-Own, Saullo's Pizza, and Larimore Food and Liquor and Laundromat

Table 4-22. Residential and Commercial Displacements (Structure Removal) Associated with the Reasonable Alternatives

ALTERNATIVE	REASONABLE ALTERNATIVE DESCRIPTION	PRELIMINARY STRUCTURE ACQUISITION ESTIMATES
		LILAC AVENUE AREA
Reasonable Alternative 1	Diamond Interchange	• None
Reasonable Alternative 2	Partial Cloverleaf Interchange	• None
		RIVERVIEW DRIVE AREA
Reasonable Alternative 1	Diamond Interchange with Two-Way Dunn Road	• None
Reasonable Alternative 2	Partial Cloverleaf Interchange	• None

4.14 Secondary and Cumulative Impacts

4.14.1 Secondary and Cumulative — Regulatory Background and Standards

The CEQ defines cumulative impacts as the impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7). Direct effects are caused by the project and occur at the same time and place. Indirect (secondary) effects are caused by the specific project and are later in time or further removed. The focus of this subsection is on the secondary and cumulative impacts.

4.14.2 Secondary and Cumulative — Affected Environment

As part of the development of the I-270 North EA, potential secondary impacts were identified early in the process. Originally, the study area for the North Corridor Study focused solely on the most congested areas of the corridor. The study area was expanded to include the entire area from I-70 to the Illinois border. This decision was made, in part, to allow the system to operate as intended and avoid unanticipated impacts outside of the NCS work area. Additionally, the work area is almost entirely contained within the existing footprint.

A cumulative impact, according to 40 CFR 1580.7, is defined as, “The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.” According to FHWA, a cumulative impact includes the total effect on a natural resource, ecosystem, or human community, and the total of all impacts to a particular resource that have occurred, are occurring, and would likely occur as a result of past, present, and future activities or actions of federal, non-federal, public, and private entities.

4.14.3 Secondary and Cumulative — Impacts

4.14.3.1 No-Build Alternative Impact Summary

The No-Build Alternative would maintain existing traffic patterns. The study’s AJR discusses the consequences of the No-Build Alternative. **Section 4.18.1** summarizes the major findings of the AJR.

4.14.3.2 Build Alternatives Impact Summary

Secondary Impacts

The Preferred Alternative will generally provide the same access as the existing conditions while substantially improving the operations and safety of the corridor. All access points connect to public roads and provide for all traffic movements, with the exception of Missouri Bottom Road, which is currently already a partial access interchange. Operations have been improved throughout the corridor and particularly at system-to-system interchanges located at Lindbergh Boulevard and MO 367. Safety has been improved from Hanley/Graham to Bellefontaine by the elimination of the existing slip ramps to and from the two-way outer road (Dunn Road). The proposed corridor will be designed to meet current federal and state design, operational and safety standards, where reasonable and feasible. Where this is not possible, the Preferred Alternative will minimally maintain the conditions represented by the existing corridor configuration. These will be detailed as part of the MoDOT design exception process. As a result of this comprehensive approach, the outer road system will be improved relative to traffic operation and safety. The Preferred Alternative does not have a substantial adverse impact on the safety and operation of the Interstate facility or on the local street network based on both the current and the planned future traffic

projections. Freeway and intersection LOS, network delay and speeds, and number of crashes are all anticipated to improve compared to the No-Build Alternative.

Consequently, secondary impacts are anticipated mostly from construction. Typical impacts would result from utility relocations, building the proposed roadway improvements, and other related construction activities, which are commonly short-term and temporary in nature. Typical construction impacts may include air, water, and noise pollution and disposal of construction debris. Surface transportation traffic patterns in the study area may also be altered during construction. MoDOT has developed a series of Standard Specifications for Highway Construction. These specifications include, but are not limited to, air, noise, and water pollution control measures to minimize construction impacts. The Standard Specifications for Highway Construction also include traffic control and safety measures. MoDOT would implement these standards as a part of the construction of the project.

Cumulative Impacts

The vast majority of project impacts would occur during construction, and therefore the cumulative impacts are shortened to that timeframe and restricted to specific areas. The cumulative impacts focused primarily on the construction period of the project because the project is essentially rebuilding existing transportation infrastructure. Other than the I-270 North EA, all projects identified in the AJR, the NCS, and the Purpose and Need Statement are considered reasonably foreseeable (these documents are available upon request). Discussion of the expected cumulative impacts as they relate to pertinent environmental issues is provided as follows.

Transportation

The I-270 North EA is a component of the TIP and long-range plan (*Connect2045*). Its completion will allow all other transportation projects to proceed in conformity with the region's goals. Post construction, operations will improve. During construction, the traffic impact analysis presented in the TIP and long-range plan have taken a cumulative perspective to predict traffic conditions during the construction. Micro-scale transportation issues can be addressed as the detailed designs are produced.

Land Use

Various land use plans apply across the I-270 North EA study area. These land use plans all assume a functional I-270 corridor. They are expected to continue regardless of whether or not the project proceeds.

Socio-Economic Conditions

There is no evidence that the construction of the I-270 North EA will have anything other than a temporary, site-specific impact on the socio-economic conditions of the study area. This may be in part due to the phasing that will be necessary to construct the entire project. While construction will disrupt traffic in one area, other nearby areas will be relatively unaffected. The project's maintenance of traffic plans will maintain mobility throughout the community during project construction.

Air Quality

The reconstruction of I-270 is identified in the TIP. The air quality impacts of those projects are cumulatively accounted for in the approved SIP, which includes the Air Quality Conformity Report, demonstrating that the mobile source emissions from the TIP projects adhere to all EPA emissions ceilings. The improved operation of the corridor is expected to be a net benefit. Construction activity would cause temporary air quality impacts. These short-term effects would include increased emissions from heavy diesel construction vehicles and equipment, and increased dust from grading operations. Emissions from construction vehicles and equipment would be controlled in accordance with emission standards prescribed under state and federal regulations. Dust generated by construction activities would be minimized by the implementation of dust control measures, such as water sprinkling and applying calcium chloride to control dust and other airborne particulates. Contractors would be required to comply with Missouri's statutory regulations regarding air pollution control and adherence to construction permit and contract conditions.

Noise

Noise from heavy construction equipment and haul trucks would result in unavoidable short-term impacts. Residents adjacent to the roadway would be most impacted by construction noise. Contractors may be required to equip and maintain muffling equipment for trucks and other machinery to minimize noise emissions. Operations with high temporary noise levels, such as pile driving, may need to have abatement restrictions placed upon it such as work hour controls and maintenance of muffler systems.

Water Resources

Water quality impacts during construction activities could include increased sediments to stormwater due to runoff from erodible material exposed during construction. Stormwater runoff is addressed by MoDOT's Sediment and Erosion Control Program, which would be included within the contract specifications to address temporary erosion and sedimentation during construction. MoDOT's BMPs reduce impacts to the aquatic environment to minimal levels. BMPs cover most activities needed to restore the construction area to an acceptable condition. That will include cleanup, shaping, replacing topsoil, and establishing vegetative cover on all disturbed bare areas, as appropriate.

Biological Resources

The area surrounding I-270 is primarily an urban environment, with no notable biological resources. The project would not change this condition and neither would any other project in the general vicinity.

Historic Resources

Historic resources are limited in the area surrounding the I-270. The project would not change this condition and neither would any other project in the general vicinity.

Visual and Aesthetic Resources

In general, construction is not expected to result in changes to the overall visual and aesthetic appearance of the area beyond that described in **Section 4.19**.

4.15 Section 4(f)

A Section 4(f) property is any publicly owned land of a public park, recreational area, or wildlife and waterfowl refuge of national, state, or local significance or land of an historic site of national, state, or local significance (public or private).

4.15.1 Section 4(f) — Regulatory Background and Standards

As noted in 23 CFR 774.3, a transportation project approved by FHWA may not use a Section 4(f) property unless the following are determined:

1. There is no feasible and prudent avoidance alternative, as defined in 23 CFR 774.17, to the use of land from the property
2. The action includes all possible planning, as defined in 23 CFR 774.17, to minimize harm to the property resulting from such use

When is publicly owned land considered to be a park, recreation area, or wildlife and waterfowl refuge?

Answer: Publicly owned land is considered to be a park, recreation area or wildlife and waterfowl refuge when the land has been officially designated as such by a Federal, State or local agency, and the officials with jurisdiction over the land determine that its primary purpose is as a park, recreation area, or refuge. Primary purpose is related to a property's primary function and how it is intended to be managed. Incidental, secondary, occasional or dispersed activities similar to park, recreational or refuge activities do not constitute a primary purpose within the context of Section 4(f). Unauthorized activities, such as ad hoc trails created by the public within a conservation area, should not be considered as part of FHWA's determination of Section 4(f) applicability.

Source: SECTION 4(f) POLICY PAPER
Office of Planning, Environment and Realty
Project Development and Environmental Review
Washington, DC 20590
July 20, 2012

If it is determined that an action would result in the "use" of a Section 4(f) resource, then the lead federal agency, in this case FHWA, is required to prepare a Section 4(f) evaluation.

4.15.2 Section 4(f) — Affected Environment

Based on field investigations and records reviews, a number of potential Section 4(f) resources were identified.

4.15.2.1 Recreational Resources

The recreational properties closest to I-270 and in the general vicinity to the Reasonable Alternatives include the areas discussed below.

Carrollton Disc Park (Section 4[f] Resource)
Managed by the City of Bridgeton, this disc golf course is located on Lambert Airport buy-out land between St. Charles Rock Road and Woodford Way (south side of I-270). Located at an abandoned residential subdivision, the facility has 18 holes and limited signage to guide participants on a self-guided round of disc golf. It was developed using Land and Water Conservation Funds. Disc hole #8 is immediately adjacent to the I-270 right-of-way fence.

Bridgeton Airport Park (Non-Section 4[f] Resource)
Located among the Lambert Airport buy-out land, this former park is now abandoned and used by the Bridgeton Road Department as a storage depot. It is near the Woodford Way overpass on the north side of I-270.

Freebourn Park (Non-Section 4[f] Resource)
References to a Freebourn Park emerged during archival searches. The referenced site is located on Gist Road in the Lambert Airport buy-out zone (south side of I-270). An exact location was never determined. No areas in this region are open to the public, for any purpose.

Playground at Garrett Elementary School (Section 4[f] Resource)
A typical children's jungle gym-type set is located adjacent to the Garrett Elementary School (1400 Ville Rosa Lane, Hazelwood). The site serves substantial walk-on use during non-school hours. The extent of the Section 4(f) resource is limited to the immediate area of the school.

Gardens at Prairie Commons Library (Section 4[f] Resource)
Located at 915 Utz Lane, Hazelwood, this public library has a public garden, a picnic area, and park benches. The Section 4(f) resource is limited to this area. The closest gardens are less than 100 feet from Dunn Road. Much of the garden is actually in MoDOT right-of-way.

Ball Field at St Martin de Porres (Non-Section 4[f] Resource)
This large school/church complex includes numerous ball fields and other associated recreational facilities. It is not open to the public and is not a Section 4(f) resource.

Brookes Park (Section 4[f] Resource)
Located in the southwestern quadrant of the I-270/Lindbergh Boulevard interchange, Brookes Park is 3.4 acres with bathrooms, picnic pavilion and sites, playgrounds, and historic buildings. The Utz-Tesson House is located in Brookes Park. It is open to the public and administered by the City of Hazelwood.

Ball Fields at North County Christian School (Non-Section 4[f] Resource)
This large school complex includes numerous ball fields and other associated recreational facilities. It is not open to the public and is not a Section 4(f) resource.

Ball Fields at McCluer High School (Non-Section 4[f] Resource)
This large school complex includes numerous ball fields and other associated recreational facilities. It is not open to the public and is not a Section 4(f) resource.

Little Creek Nature Area (Non-Section 4[f] Resource)
The Little Creek Nature Area is administered by the Ferguson-Florissant School District. It is located at 2295 Dunn Road (Florissant). The 97-acre outdoor facility has hiking trails. While the hiking trails are nominally open to the public, the primary use of the facility is education, not recreation. The facility's most important elements are the class rooms, agricultural demonstration displays and museum. In 2013, a total of 13,424 visitors were reported by the Ferguson-Florissant School District. All these groups were invited to the facility, and nearly all were school students. Ferguson-Florissant school students accounted for 79 percent of the total. No records of non-group recreational users were available.

According to the materials provided by the Little Creek Nature Area (**Appendix D**), the instructional programs offered at the Nature Area provide a curriculum for pre-K to Grade 12 students. Programs provide students with a hands-on experience, which cultivates a life-long interest in the natural world. Little Creek is open Monday through Friday, from 9:00 a.m. to 4:00 p.m. The trails are not open to the public on weekends or after normal business hours, except by reservation or during special events. The nature area's mission statement as summarized in their management plan is:

> "*In the forty years it has been in operation, Little Creek Nature Area has adapted its mission and focus to the changing needs of the school district and community it serves. As efforts to boost student achievement have intensified in recent years, the programs offered by the Nature Area have been refocused to meet this challenge for both students and their teachers. "*

The primary purpose of the Little Creek Nature Area is educational; all other activities are incidental. Consequently, the facility is not considered a Section 4(f) resource. This determination was made after coordination with the Officials with Jurisdiction. The meeting minutes from the in-person meetings are contained in **Appendix D**.

During an onsite meeting, the school district stressed its strong feelings relative to the importance of the facility. They consider it unique and sensitive. At the time of the meeting, the Reasonable Alternatives suggested that very minor property acquisition would occur. This would be limited to acquiring a narrow strip of right-of-way along the Dunn Road frontage of the property. The total acquisition is estimated at 0.5 acre. There would be limited temporary construction-related impacts during the improvement of Dunn Road. The existing driveway or other temporary access will remain open during construction. Overall, the study team expected that enhancements would be beneficial to the users of the Little Creek Nature Area. The School District responded with sensitivity to noise and the loss of trees.

While not a Section 4(f) site, MoDOT acknowledges the unique status of the Little Creek Nature Area. Consequently, an environmental commitment (**Section 5**, Commitment # 15) of this project is to ensure that appropriate avoidance efforts are incorporated into the final construction plans.

Bellefontaine Conservation Area (Section 4[f] Resource)
Bellefontaine Conservation Area is in the southeast quadrant of the I-270/MO 367 interchange within the city of Bellefontaine Neighbors. The site was previously owned by the Missouri Department of Mental Health and was transferred to the Conservation Department in 1995. The area is open daily from sunrise until 30 minutes after sunset.

Ball Fields at Hazelwood East High School and Middle School (Non-Section 4[f] Resource)
This large school complex includes numerous ball fields and other associated recreational facilities. It is not open to the public and is not a Section 4(f) resource.

Dundee Park (Non-Section 4[f] Resource)
References to a Dundee Park emerged during archival searches. The referenced site is located on the south side of I-270 nearest to Riverview Drive. An exact location was never determined. No areas in this region are open to the public, for any purpose.

Watkins Estate (Non-Section 4[f] Resource)
A large area is owned by the Metropolitan Parks and Recreation District on the north side of I-270 nearest to Riverview Drive. There is no public access.

These resources are shown on **Figure 4-15** and **Exhibit 1 (Appendix A)**.

4.15.2.2 Historic Resources

For the purposes of Section 4(f), a historic site includes any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP.

Initial planning was assisted by the Archival Review performed in compliance with the NHPA. The Archival Review showed that nine NRHP-listed properties and districts are present in the I-270 North EA study area. Following the development of the Reasonable Alternatives, an Architectural Study was conducted. The APE encompassed all property parcels that touch the I-270 North EA footprint. The APE also included where the footprint is outside the existing I-270 right-of-way and where there are buildings within 100 feet of the new right-of-way. The Architectural Study resulted in the evaluation of 353 property parcels. No previously unidentified historic resources were identified. Consequentially, there are no additional potential architectural Section 4(f) resources in the vicinity of the Reasonable Alternatives. The complete Architectural Study is available upon request.

An Archaeology Study was conducted for archaeological resources. For the Archaeological Study, the APE encompassed all of the property parcels that touch the I-270 North EA footprint. The APE also included where the footprint is outside the existing Interstate right-of-way and where there were areas of moderate potential, within 100 feet of the new right-of-way. The Archaeological Study concluded that there are no archaeological Section 4(f) resources in the vicinity of the Reasonable Alternatives.

Consequently, the following historic properties are of interest relative to Section 4(f):

The Utz-Tesson House
The Utz-Tesson House, originally located at 615 Utz Lane, was listed on the NRHP in 1973. In 1997, the house was purchased by the City of Hazelwood and in 2003, moved to its present location in Brookes Park.

The Taille de Noyer House
In 1980, the Taille de Noyer House was listed on the NRHP. It currently resides on the McCluer High School campus.

The John B. Myers House
The John B. Myers House is located at 180 Dunn Road. It was added to the NRHP in 1974 and the boundary was expanded into a district in 1977 to include the barn and grounds.

The Gittemeier House
The Gittemeier House is located at 1067 Dunn Road. According to Gretchen Crank of Historic Florissant, Inc., they are in the process of nominating the Gittemeier House to the NRHP (personal communication). This two-story German vernacular residence has a limestone basement, brick walls, and a side-gabled asphalt roof. It is eligible for the NRHP under Criteria C for architecture with its significance boundaries being the parcel lines. The period of significance is ca.1860, the approximate date of construction. Reasonable Alternative 2, improvement to I-270 North, would have an adverse effect on the property by impeding public access and causing erosion. All other Reasonable Alternatives would only cause indirect erosion effects on the south and east sides of the property.

The Ferguson Pine Meadows 1st Addition District
The Architectural Study identified this residential subdivision as a historical district eligible for the NRHP. This district is located along Starlight Drive in Ferguson. See **Figure 4-3B** and **Appendix A (Exhibit 2)**. The boundaries of the district are Pershall Avenue to the north, Moonlight Drive to the west, and the Saint Louis Community College-Florissant Valley campus to the east. The district is recommended as eligible under

Criterion C, for architecture as an example of Contemporary style of architecture. It contains 12 contributing houses and four non-contributing houses. The district as a whole retains a high degree of integrity within this post-World War II style.

4.15.2.3 Wildlife and Waterfowl Refuges

There are no wildlife or waterfowl refuges that meet the Section 4(f) definition in the I-270 North EA study area.

4.15.3 Section 4(f) — Impacts

4.15.3.1 No-Build Alternative Impact Summary

The No-Build Alternative would have no direct effect on the Section 4(f) properties identified within the study area. No construction would occur on or in proximity to the properties that would directly affect the resources.

4.15.3.2 Build Alternatives Impact Summary

The Reasonable Alternatives and the Preferred Alternative have been configured to avoid Section 4(f) properties as noted below.

- **Carrollton Disc Park:** No right-of-way acquisition (see Sheet 2 of 13 of **Appendix A**).
- **Playground at Garrett Elementary School:** No right-of-way acquisition. The Preferred Alternative will not alter the configuration of I-270 near the school (Reasonable Alternative 2 would have added an outer road parallel to I-270 adjacent to the school and an underpass at Anglum Road) (see Sheet 4 of 13 of **Appendix A**)**.**
- **Gardens at Prairie Commons Library:** No right-of-way acquisition (see Sheet 4 of 13 of Exhibit 6 - **Appendix A**). However, it appears that much of the garden is actually in MoDOT right-of-way. Because the roadway/intersection re-configuration in this area is minimal, it is not expected that the garden will require disruption. If impacted, MoDOT has made it an environmental commitment to coordinate with the library relative to appropriate relocation measures.
- **Brookes Park:** No right-of-way acquisition (see Sheet 5 of 13 of **Appendix A**). The mature trees within the existing right-of-way may be cleared because of the project.
- **Bellefontaine Conservation Area:** No right-of-way acquisition (see Sheet 11 of 13 of **Appendix A**).
- **The Utz-Tesson House:** No right-of-way acquisition from Brookes Park (see Sheet 5 of 13 of **Appendix A**). The mature trees within the existing right-of-way may be cleared because of the project.
- **The Taille de Noyer House:** No right-of-way acquisition from McCluer High School campus (see Sheet 7 of 13 of **Appendix A**).
- **The John B. Myers House:** No right-of-way acquisition (see Sheet 6 of 13 of **Appendix A**). In this area, narrow right-of-way acquisition from Dunn Road frontage is common; the Reasonable Alternatives were reconfigured to avoid this at the Myers House.
- **The Gittemeier House:** No right-of-way acquisition (see Sheet 7 of 13 of **Appendix A**). Reconfiguring the New Florissant Road intersection required consideration of the Gittemeier House. The Preferred Alternative maintains the existing configuration while avoiding right-of-way acquisition. Reasonable Alternative 2 used a loop road around the Gittemeier House. No right-of-way acquisition is necessary, but access to the building will change from existing Dunn Road to the loop ramp.
- **The Ferguson Pine Meadows 1st Addition Historic District:** The Preferred Alternative has been reconfigured to avoid right-of-way acquisition. Coordination with the SHPO resulted in a No Adverse

Effect determination. Consequently, the project will have a de minimis impact. For historic sites, a de minimis impact means that FHWA has determined (in accordance with 36 CFR Part 800) that either no historic property is affected by the project or that the project will have "no adverse effect" on the historic property.

4.16 Section 6(f)

4.16.1 Section 6(f) — Regulatory Background and Standards

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965 (16 U.S. Code [USC] 4601-4 to 4601-11) protects recreational lands purchased or improved using funding from LWCF. Any conversion of Section 6(f) lands for highway right-of-way must be compensated with replacement lands of equal value, location, and usefulness.

State and local governments often obtain grants through the LWCF Act to acquire or make improvements to parks and recreation areas. Section 6(f) of this act prohibits the conversion of property acquired or developed with these grants to a non-recreational purpose without the approval of the U.S. Department of the Interior's (DOI's) National Park Service. Section 6(f) directs the DOI to ensure that replacement lands of equal value, location, and usefulness are provided as a condition of such conversions.

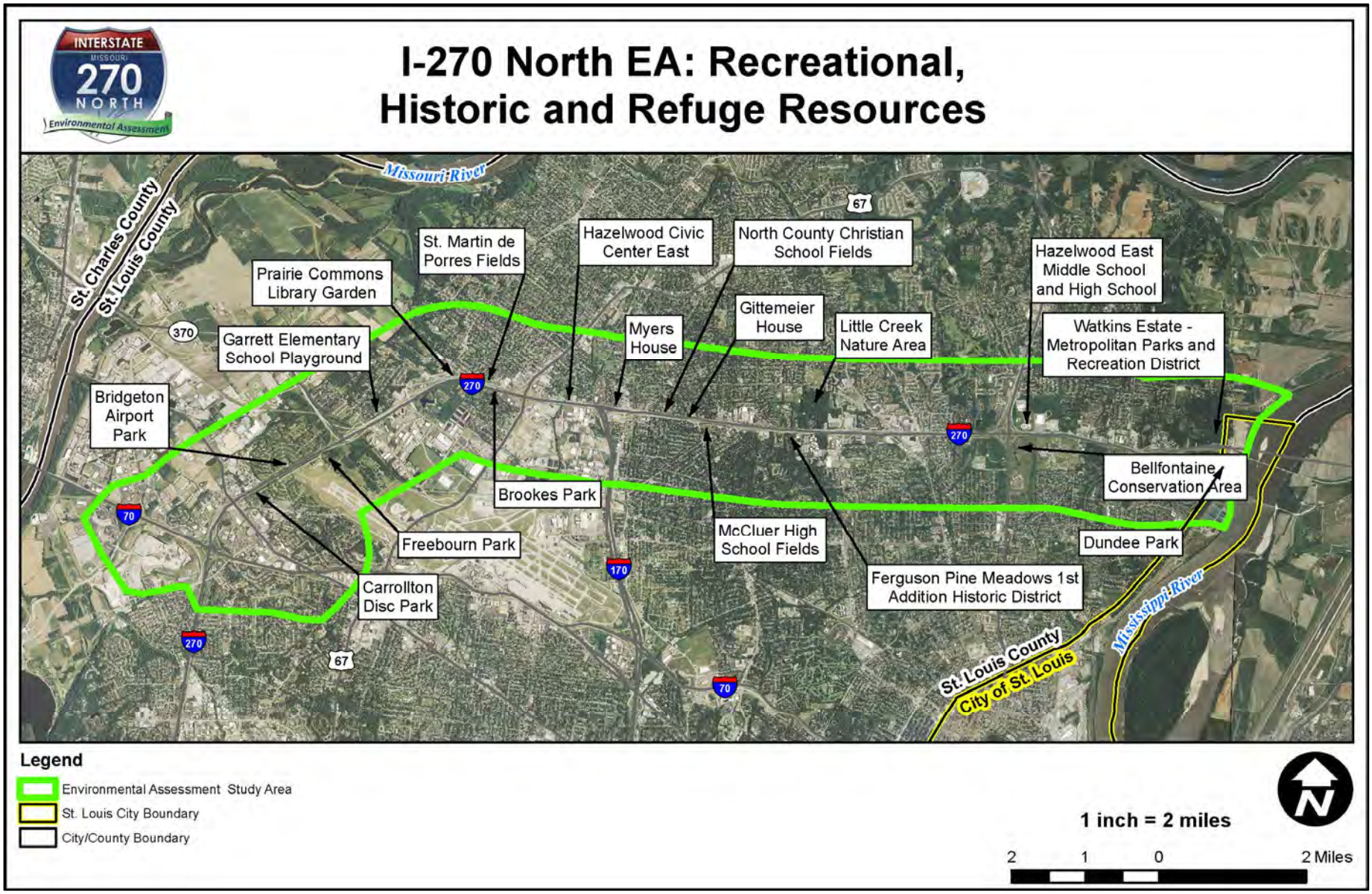

Figure 4-15. Recreational, Historic and Refuge Resources

4.16.2 Section 6(f) — Affected Environment

Coordination with MDNR was used to identify Section 6(f) resources in proximity to the I-270 North EA study area.

Based on a review of the LWCF database, the only Section 6(f) property is the Carrollton Disc Golf course in Bridgeton. The facility is managed by the City of Bridgeton and is located on the Lambert Airport buy-out area. The location of the Carrollton Disc Golf course is visible on **Figure 4-16** and **Exhibit 1,** Sheet 2 of 13 in **Appendix A**. Hole #8 is closest to I-270. At this location, the course is immediately adjacent to the chain-link right-of-way fence.

No other Section 6(f) resources were identified in proximity to the I-270 North EA study area.

Figure 4-16. Typical Views of the Carrollton Disc Park — the Welcome Sign, the Land and Water Conservation Fund Funding Sign, and the Proximity of the Course to I-270

4.16.3 Section 4(f) — Impacts

4.16.3.1 No-Build Alternative Impact Summary

The No-Build Alternative would have no direct effect on the Section 6(f) properties identified within the study area. No construction would occur on or in proximity to the properties that would directly affect the resources.

4.16.3.2 Build Alternatives Impact Summary

Near the Carrollton Disc Golf course, the Reasonable Alternatives are contained within the existing I-270 right-of-way. Consequently, the Reasonable Alternatives would have no direct effect on Section 6(f) properties. No construction would occur on or in proximity to the properties that would directly affect the resources.

4.17 Socio-Economic Resources

4.17.1 Socio-Economic Resources — Regulatory Background and Standards

The Council on Environmental Quality's (CEQ's) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act point-out that the human environment is to be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. The CEQ Regulations also contain provisions where economic or social and natural or physical environmental effects are interrelated. Consequently, NEPA documents will discuss/disclose all of these effects on the human environment. This section will discuss/disclose the socio-economic conditions within this large study area.

4.17.2 Socio-Economic Resources — Affected Environment

4.17.2.1 Household Income

For the census tracts within the study area, the median household income (the value at the midpoint of the population, where half of the population is above and half is below) is around $46,000 per year, ranging from around $21,000 per year to $63,000 per year by census tract (**Table 4-23**). The average household income is $54,275 per year, and ranges from around $29,000 to $100,000 per year by tract. Both the median and average household income is notably less than St. Louis County as a whole.

Table 4-23. Household Income

Population	Median Income	Average Income
St. Louis County	$58,485	$84,081
St. Louis City	$34,384	$49,735
St. Charles County	$71,416	$84,007
I-270 North EA Study Area	$45,917	$54,275

Source: U.S. Census Bureau, American Fact Finder, *http://factfinder2.census.gov*

4.17.2.2 Employment Rates

Based on the 2008 through 2012 estimates in the U.S. Census Bureau, American Community Survey, the communities in the study area have a labor force that comprises approximately 67 percent of the total population aged 16 years or older. Approximately 9 percent of the labor force in these communities is unemployed, compared with approximately 5.6 percent for St. Louis County as a whole (**Table 4-24**).

4.17.2.3 Types of Employment and Notable Employers

Educational services and health care and social assistance industries employ the largest percentage of people in the affected communities (about 26 percent), followed by arts, entertainment, recreation, and accommodation and food services (12 percent); professional, scientific, and management, and administrative services (11 percent); retail (10 percent); and manufacturing (9 percent). Although at slightly different percentages, these same industries are the top employers for St. Louis County as a whole.

Healthcare is a leading-edge industry in the study area. The Christian Hospital in the northwestern quadrant of the I-270/MO 367 interchange employs more than 2,500 people. The DePaul Health Center in the northeastern quadrant of the I-270/I-70 interchange employs approximately 2,300 people. Other major employers in the study area include American Airlines, Boeing, Emerson, Ford, GKN, IBM, UPS, and Lambert Saint Louis International Airport, which employs more than 11,000 people.

Larger industrial and office parks, with a number of heavy and light industries are located near the interchanges at I-70, James McDonnell Boulevard, Lindbergh Boulevard, and I-170. Large retail centers are located near these same interchanges, as well as at the Washington Street, West Florissant Avenue, Halls Ferry Road, and Bellefontaine Road interchanges.

Table 4-24. Employment in the Study Area

	All Communities in Study Area		St. Louis County, Missouri	
	Total Persons in Category	Percentage of Total	Total Persons in Category	Percentage of Total
EMPLOYMENT STATUS				
Population 16 years and over	414,337		795,958	
In labor force	276,996	66.85%	533,564	67.0%
Civilian labor force	276,661	66.77%	532,730	66.9%
Employed	239,546	57.81%	487,834	61.3%
Unemployed	37,115	8.96%	44,896	5.6%
Armed Forces	335	0.08%	834	0.1%
Not in labor force	137,341	33.15%	262,394	33.0%
INDUSTRY				
Agriculture, forestry, fishing and hunting, and mining	774	0.32%	2,074	0.4%
Construction	10,099	4.22%	21,501	4.4%
Manufacturing	21,793	9.10%	49,753	10.2%
Wholesale trade	6,058	2.53%	15,540	3.2%
Retail trade	24,577	10.26%	54,740	11.2%
Transportation and warehousing and utilities	12,478	5.21%	21,857	4.5%
Information	6,230	2.60%	12,695	2.6%
Finance and insurance, and real estate, rental, and leasing	16,875	7.04%	45,414	9.3%
Professional, scientific, and management, and administrative and waste management services	26,416	11.03%	60,093	12.3%
Educational services and health care/social assistance	61,248	25.57%	122,242	25.1%
Arts, entertainment, and recreation, and accommodation and food services	28,631	11.95%	43,888	9.0%
Other services, except public administration	12,237	5.11%	22,897	4.7%
Public administration	12,130	5.06%	15,140	3.1%

Source: U.S. Census Bureau, American Fact Finder, 2014, *http://factfinder2.census.gov*

4.17.3 Socio-Economic Resources — Impacts

4.17.3.1 No-Build Alternative Impact Summary

The No-Build Alternative would affect no employers and would have no direct impact on the local economy and household income.

4.17.3.2 Build Alternatives Impact Summary

The Reasonable Alternatives will not directly affect any major employers identified in the study area. The reconstruction of some interchanges may have a temporary effect on commuters and freight delivery, but access to all major employers will remain open through construction.

Neither alternative would acquire large commercial facilities (such as shopping centers or department stores), so that most commerce will remain in the area. Roadway improvements will be designed to minimize impacts to access drives and traffic movement to and from the commercial operations along frontage roads and cross roads.

The Reasonable Alternatives will acquire select commercial properties. As described in **Section 4.13**, *Right of Way*, all commercial businesses will be relocated in accordance with the relocation procedures established in the Uniform Act, and there are ample properties for the relocation of these commercial businesses in the immediate vicinity. Searches for commercial properties similar to those that could be relocated found retail availability through the area. Within Florissant, Bridgeton, and Hazelwood, 35 office sites are currently available and 102 retail sites are available. It appears that adequate replacement facilities would be available for those displaced because of the project. Redevelopment within the immediate area is also possible. Based on the extent of available properties, the relocations are expected to be readily absorbed into the local market.

4.18 Travel Patterns

4.18.1 Travel Patterns — Regulatory Background and Standards

The Missouri Department of Transportation (MoDOT), in cooperation with the Federal Highway Administration (FHWA), proposes improving this portion of I-270. This portion of the I-270 corridor is vital to serving the greater St. Louis regional transportation demands including commuters, transit, and local and national freight movements.

I-270 is the primary ring road around Saint Louis, connecting many population and employment centers in the region. The I-270 North corridor is predominately an eight-lane Interstate facility with auxiliary lanes between interchanges. Beginning on the west end of the study area and progressing east, I-270 transitions from eight basic lanes to six lanes at Lindbergh Boulevard and then to four lanes at Lilac Avenue. It is a regional and national freight route as well as a heavily used commuter corridor. Trucks traveling from the west on I-70 to points east and north generally use I-270. From a commuter perspective, I-70 and MO 370 bring commuters from Saint Charles County to the I-270 corridor; I-170 distributes commuters to Clayton and other points toward the City Center. MO 367 connects St. Louis City with Alton, Illinois. Other major roadways linked by I-270 include St. Charles Rock Road, McDonnell Boulevard/Howdershell Road, US 67/Lindbergh Boulevard, Hanley Road/Graham Road, New Florissant Road (Route N), West Florissant Avenue, and New Halls Ferry Road, which serve Bridgeton, Hazelwood, Florissant, and numerous other local municipalities. The predominant traffic flow is westbound in the morning and eastbound in the afternoon.

4.18.2 Travel Patterns — Affected Environment

4.18.2.1 Access Justification

In conjunction with the I-270 North EA, an I-270 North AJR was prepared. The investigation of the problems facing I-270 uncovered the need to modify or consolidate interchange operations to improve the corridor's operations and safety. The AJR was completed in compliance with federal policy on modifications in access to the Interstate system. The AJR is available upon request.

The purpose of the AJR is to request conceptual approval for modifications in interchange access on the I-270 corridor within the limits of the study area. There are 8 requirements for an AJR pursuant to the Federal Highway Administration's Policy and Procedures for New or Revised Interstate Access Approval in Missouri (August 2010). The eight requirements (and the major findings) include:

- Existing and Future No-Build Operational and Safety Analysis: Overall traffic will increase by just over 20 percent by the year 2040. Over 13,000 total crashes with 243 fatalities or disabling injuries are predicted for the mainline I-270 corridor over a 20-year period.
- Transportation System Management and Alternatives Analysis: The Preferred Alternative meets the performance measures developed prior to the development of the project alternatives and performs better than other Reasonable Alternatives.
- Future Build Operational and Safety Analysis: The Level of Service on mainline I-270 is reported at LOS D or better. The Preferred Alternative is anticipated to have nearly 20 percent fewer crashes than the No-Build.
- Access Connections and Design: The Preferred Alternative will generally provide the same access as the existing conditions while improving the operations and safety of the corridor.
- Consistency with Transportation Plans: The Preferred Alternative will be planned and constructed consistent with local and regional planning efforts and land use plans for the state, the St. Louis region, St. Louis County and St. Louis City.
- Consistency with Future Access Plans: There are no proposed or committed plans to add any new interchange access to I-270 within the study area for the proposed project.
- Coordination with Future Development: Appropriate coordination has occurred between existing and planned development, area stakeholders and the proposed I-270 transportation system improvements.
- Coordination with the NEPA Process: The NEPA process is anticipated to be complete in December 2016.

Access Justification Report

An AJR was prepared in compliance with federal policy on modifications in access to the Interstate system. Relative to the Preferred Alternative:

- The one-way outer road system between Hanley/Graham Road and Old Halls Ferry Road best improves the traffic operations and safety of the corridor.
- The Preferred Alternative does not have an adverse impact on the safety and operation of the Interstate facility or on the local street network based on both the current and the planned future traffic projections.
- Freeway and intersection LOS, network delay and speeds, and number of crashes are all anticipated to improve compared to the No-Build Alternative.

4.18.2.2 Multi-Modal Resources

According to Metro Transit, transit ridership and demand in northern St. Louis County is high and growing. They also find it difficult to effectively serve the type of low-density residential neighborhoods that exist in North County. Potential customers often have to walk farther to access a bus stop and vehicles must travel farther to pick up fewer riders. However, Metro Transit believes that these communities are becoming increasingly more transit dependent, especially as older residents continue to age in place and fewer households own an automobile.

Metro Transit also currently operates 14 routes dedicated to the North County service area. *Feeder routes* collect riders from lower-density residential neighborhoods and move them to transfer points where they can catch express routes or other direct routes to high-demand destinations, such as Downtown Saint Louis, Clayton, or a MetroLink station. The feeder routes that directly affect I-270 include #27 North County Shuttle, #36 Spanish Lake, #44 Hazelwood, #45 Ferguson-Florissant, and #75 Lilac-Hanley. *Corridor routes* provide access to apartment complexes, jobs, shopping, schools, and other services that tend to be located along major arterials. The corridor routes that directly affect I-270 include #35 Rock Road, #47 North Hanley, and #74 Florissant. *Employer routes* are designed to specifically service regional employment centers or other geographic job clusters. The #34 Earth City circulates between numerous job sites and crosses I-270 via I-70. *Express and limited-service routes* meet consumer demand for rush hour commuting with express bus service. In the study area, these include #36X Bissell Hills Express, #174X Halls Ferry Express, and #66 Clayton-Airport.

Figure 4-17. Metro North County Transit Center during Construction

In addition to the buses using the I-270 corridor, there are numerous bus stops. In general, these are along Dunn Road and Pershall Drive—often very close to the road. The extent of the bus stations within the study area are shown on **Exhibit 3 (Appendix A)**. Sidewalks along Dunn Road consist of a number of discontinuous segments. The majority of the sidewalks in place are set back from the edge of shoulder and provide no connection to the shoulders. Bus stops are located in some areas with offset sidewalk or no sidewalk. As a result, the transit riders must use the shoulder of Dunn Road as a place of refuge while they wait for the bus to arrive. Narrow shoulders providing the only service to accommodate pedestrian access to bus stops is a problem along the corridor. There are no sidewalks along the road on either side of Pershall Drive. The shoulders are being used to accommodate pedestrians.

To better serve the needs of this area of the region, Metro Transit purchased land for the Metro North County Transit Center and Maintenance Facility. The site is located at 3140 Pershall Drive, between West Florissant Avenue and New Halls Ferry Road. The 3-acre site is the seventh MetroBus center (**Figure 4-17**) and the third with a climate-controlled waiting area. Amenities include the following:

- Indoor, climate-controlled waiting area
- Public restrooms
- Concession area
- Digital messaging boards
- Ten MetroBus bays
- Two Call-A-Ride bays
- Park-ride spaces for customers
- Bus maintenance area
- Dispatch center

4.18.3 Travel Patterns — Impacts

4.18.3.1 No-Build Alternative Impact Summary

The No-Build Alternative would maintain existing traffic patterns. The study's AJR discusses the consequences of the No-Build Alternative.

The No-Build Alternative would have no direct effect on the multi-modal operations within the study area. No construction would occur on or in proximity to the properties that would directly affect the resources.

4.18.3.2 Build Alternatives Impact Summary

The AJR examines I-270 in several ways, including traffic operations, safety, access connections, and design. The AJR will be summarized in the following subsections.

Traffic Operational and Safety Analysis

Within the AJR, the analysis of operations and safety must conclude that the proposed changes to the Interstate system will not have a substantial adverse impact on the mainline lanes, ramps, ramp intersections, or on the local street network. The analysis must be based on the current and the planned future traffic projections.

Within the analysis, each Reasonable Alternative considered the different interchange types and the different outer road system configurations. The committed Long-Range Transportation Plan projects were incorporated. The basic through-lane structure of four lanes in each direction from I-70 to MO 367 and three lanes in each direction from MO 367 to the east into Illinois was used (the use of auxiliary lanes varies). Traffic forecasts used an origin-destination matrix, with the starting and ending points of all future trips held constant among the alternatives. However, the path between these points could change based on changes to the roadway network. VISSIM software was used to analyze and compare alternatives.

Relative to AM Peak Hour Traffic Operations, both alternatives are able to fix the bottlenecks that exist in the current network by lengthening ramps, reconfiguring interchanges, eliminating or lengthening weaves, or adding lanes. Reasonable Alternative 1 is able to improve LOS to D or better for the freeway and for intersections throughout the study corridor. Reasonable Alternative 2 is able to achieve the same except at the westbound on-ramp from Missouri Bottom Road.

Relative to PM Peak Hour Traffic Operations, other than congestion at Washington and Derhake, along with New Halls Ferry and Pershall Road, both alternatives are able to improve the bottlenecks that exist in the current network by lengthening ramps, reconfiguring interchanges, eliminating or lengthening weaves, or adding lanes. Reasonable Alternatives 1 and 2 show some LOS F segments on I-70 and I-170, but these conditions are not congested enough to limit the traffic getting to I-270 for analysis. All LOS on mainline I-270 is reported at LOS D or better. Both Reasonable Alternatives show LOS F conditions at the Washington and Derhake intersection.

To determine the pros and cons of a one-way versus two-way outer road system, travel times were considered to and from 17 key locations. For each location, travel times were calculated to and from I-270 at Lindbergh Boulevard and at MO 367. This data shows that due to the one-way outer roads, there is some out direction travel evidenced by additional total distance, but only by about 4 percent. Despite the longer distance, however, the one-way outer roads have less total travel time and a higher average speed, due to better operations and less congestion on the one-way roads.

Network measures of effectiveness were collected from the VISSIM model for the two Reasonable Alternatives. According to the measures of effectiveness, Reasonable Alternative performance improves compared to the No-Build Alternative. The average speed for all roadways improved over the No-Build Alternative, but also improved over existing average speeds, even with 27 years of traffic growth. Reasonable Alternative 1 showed the best network-wide performance.

Access Connections

Within the AJR, the analysis of access must conclude that the proposed changes to the Interstate system will provide for all traffic movements.

The Preferred Alternative offers modifications of interchanges along the corridor to improve capacity, safety, and accessibility, with the only substantial access modification occurring at Old Halls Ferry Road (consolidation of access with New Halls Ferry Road). The existing interchanges located from Hanley/Graham Road to Bellefontaine Road feature slip ramps on the north side to and from Dunn Road. The slip ramps onto the two-way outer road result in more conflict points than a one-way outer road that may impact

safety. The Preferred Alternative through this section of the corridor will feature one-way outer roads with slip ramp access from Hanley/Graham Road to Old Halls Ferry Road to reduce conflict points and improve safety and performance.

Multi-Modal Impacts

Multi-modal impacts will fall into two broad categories—traffic pattern alterations affecting vehicles and infrastructure alterations more directly affecting individuals.

Traffic Pattern Alterations

The analysis of operations and safety concluded that the proposed changes to the Interstate system would not have a substantial adverse impact on the mainline lanes, ramps, ramp intersections, or the local street network.

To determine the pros and cons of a one-way versus two-way outer road system, travel times were considered. This data shows that due to the one-way outer roads, there is some out direction travel evidenced by additional total distance. The increased travel was considered low (about 4 percent). Despite the longer distance, the one-way outer roads have a lower total travel time and a higher average speed, due to better operations and less congestion on the one-way roads.

Coordination with Metro Transit suggests, "A one-way outer road system could potentially add approximately $800,000 to Metro Transit's annual operating costs and increase travel time and transfer fares for customers living/working along the one-way road sections." As discussed in **Section 6**, Metro staff served on the study's Technical Advisory Committee. As engaged members of the Committee, throughout the study, Metro's staff played an important role in helping to determine how best to minimize adverse impacts to Metro's bus operations on the corridor. Nevertheless, the analysis in support of Metro's operations in a converted one-way outer road system showed an impact of approximately $800,000 to Metro Transit's annual operating costs and increase travel by 300 miles per day. As the project progresses, MoDOT is committed to investigating any modifications that might improve the situation. Our Environmental Commitments, relative of Metro Transit, is for construction coordination (#1), acquisition and relocation assistance in accordance with the Uniform Act (#12) and impact minimization (#16).

Infrastructure Alterations

As discussed previously, the Reasonable Alternatives presented in this document are interchangeable. They also represent the "worst-case" yet reasonable scenario for likely impacts of the project, and offer a footprint within which any number of reasonable options might be proposed. The alternatives offered in this document do not limit the specific design features that may be included in a Preferred Alternative. However, the footprint used within the environmental analysis is expected to accommodate the alternatives that future designers may propose.

Relative to multi-modal operations, the intersection types, sidewalk configurations, and pedestrian facilities will greatly influence the operation of multi-modal movements. The detailed engineering will focus on how this infrastructure will be configured to achieve the project's relevant performance measures.

4.19 Visual Resources

4.19.1 Visual Resources — Regulatory Background and Standards

The methodology for the analysis of visual resources is governed by FHWA DOT-FH-11-9694 and American Society of Landscape Architects visual assessment guidelines. Field investigations and photographic analysis were the primary techniques used to assess visual resources. The analysis focused on viewers and the visual resources that appear within their viewshed or angle of view.

The visual analysis of an environment is composed of two sections. First, the project setting is discussed. This includes evaluating the regional landscape, the landscape units, and the project viewsheds. Second, the existing visual resources, viewer groups and viewer responses are examined.

This subsection describes the existing visual resources and impacts that result from the construction, operation, and maintenance of the study area. This subsection also describes the type and quality of sensitive viewers located near the study area. Visual resource impacts were identified as they relate to potentially sensitive viewpoints.

4.19.2 Visual Resources — Affected Environment

4.19.2.1 Introduction and Important Terms

The criteria used to determine visual quality ratings are vividness, intactness, and unity. None of these criteria are individually equal to the visual quality and all three criteria must rate high to indicate high visual quality:

- Vividness is the visual power of the landscape components as they combine to form distinctive visual patterns.
- Intactness is the visual integrity of the landscape, natural or human-made, and its freedom from encroaching elements.
- Unity is the ability of the landscape's individual visual elements to combine in a coherent manner.

Visual impact is a function of the viewer's response to the visual environment. Following are the two primary groups of viewers for highway projects:

- Viewers who use the project facility (views from the road)
- People who have a view of the project facility from an adjacent viewpoint (views of the road)

4.19.2.2 Visual Resources in the Study Area

The visual landscape is a combination of various factors, including landform, land cover, vegetation, and human-made developments. For this study, the landform is generally flat within the exception of the area surrounding the four creeks found within the study area. The land cover varies depending on the location within the study area. The vegetation in the study area is sporadic. The human-made developments vary greatly throughout the study area. The blocky nature of urban development tends to limit views.

The visual impacts of a project can be varied because the areas are visually distinct. The study area can be divided into several landscape units or "outdoor rooms" containing similar visual characteristics. The boundaries of these landscape units occur where there is a change in the visual character of the area. There are two main determinations of the visual boundaries of these landscape units—topography and landscape components. Topography is the relief or the terrain of an area. Landscape components are anything located above the surface of an area such as vegetation, streams, buildings, and roads.

The following landscape units were determined through the review of Digital Elevation Models, recent aerial photography, and onsite surveys:

- **Lambert Airport Area**—Lambert Airport is located across a large area between St. Charles Rock Road and MO 370. This area is characterized by a mix of commercial, light industrial, and abandoned residential land uses. See **Figure 4-18**.
- **McDonnell Boulevard Industrial Park**—The Mallinckrodt Pharmaceuticals headquarters is in the southeastern corner of the I-270/McDonnell Boulevard interchange. This area is a typical campus setting with large buildings and broad lawns/ponds.

- **Brookes Park**—This community park is in the southwestern corner of the I-270/Lindbergh Boulevard interchange. This area is characterized by the park and adjacent residential areas.
- **Bellefontaine Conservation Area**—The area is in the southeastern corner of the I-270/MO 367 interchange. The area is predominantly grassland and small ponds. The highways are clearly visible in the existing landscape.
- **Mississippi River**—At the eastern end of the study area is the Mississippi River. The river is over 3,000 feet wide at this spot. The river is roughly at an elevation 400 feet above mean sea level. The river is bordered by a narrow and steep bluff, in some places exceeding 100 feet high.

4.19.3 Visual Resources — Impacts

4.19.3.1 No-Build Alternative Impact Summary

The No-Build Alternative would not alter the visual environment within the study area.

4.19.3.2 Build Alternatives Impact Summary

Lambert Airport Area

Differences among the Reasonable Alternatives, relative to visual impacts, are minimal. This subsection summarizes the visual resource impacts that may result from the construction, operation, and maintenance of the study area.

- **Orientation:** Lambert Airport is located across a large area between St. Charles Rock Road and MO 370. This area is characterized by a sparse mix of commercial, light industrial, and abandoned residential land uses.
- **Existing Visual Quality/Character:** From this view (from the Gist Road overpass), few airport elements are visible. In the background of **Figure 4-19** is the border fence for the airport. A few pieces of infrastructure are visible.
- **Proposed Project Features:** At this location, I-270 work is limited to widening (adding through-lanes).
- **Change to Visual Quality/ Character:** Views to and from I-270 and Lambert Airport are almost completely obscured by existing topography.
- **Viewer Response:** Viewers are extremely limited.

Figure 4-18. Lambert Airport Area

- **Resulting Visual Impact:** The Reasonable Alternatives will have almost no impact.

McDonnell Boulevard Industrial Park

- **Orientation:** The Mallinckrodt Pharmaceuticals headquarters is located in the southeast corner of the I-270/McDonnell Boulevard interchange.

- **Existing Visual Quality/ Character:** This area is a typical campus setting with large buildings and broad lawns/ponds (**Figure 4-19**). There are direct and unobstructed views between the landscaped industrial park and I-270.

Figure 4-19. McDonnell Boulevard Industrial Park

- **Proposed Project Features:** The McDonnell interchange will be reconstructed. However, all Reasonable Alternatives will maintain the basic configuration on the southeastern quadrant.
- **Change to Visual Quality/ Character:** Removal of vegetation, from within the right-of-way only, is expected. No new right-of-way acquisition is proposed. New elements will include standard roadway features such as fencing. New signage may be visible from some vantages. The roadway configuration will appear unaltered.
- **Viewer Response:** Viewers from the campus to the roadway are expected to be most sensitive to any project changes. Large-scale usage of the grounds was not in evidence. The few walker/joggers are not expected to find the changes disagreeable.
- **Resulting Visual Impact:** Overall, the visual quality impact on this view may be marginally negative. The visual qualities of intactness and unity may be affected by the additional elements (signs and fences) and by the removal of vegetation from within the existing I-270 right-of-way.

Brookes Park

- **Orientation:** Brookes Park is a community park in the southwestern corner of the I-270/Lindbergh interchange.
- **Existing Visual Quality/Character:** The park includes historic structures, grass lawns play areas, and a gazebo. It is bordered by I-270, large car dealerships, and single-family residences.
- **Proposed Project Features:** The Lindbergh Boulevard interchange will be reconstructed. However, all Reasonable Alternatives will maintain the basic configuration on the southwestern quadrant. No right-of-way acquisition is required.

- **Change to Visual Quality/Character:** Removal of vegetation, from within the right-of-way only, is expected. As is visible in **Figure 4-20**, the vegetative hedge between the park and I-270 is relatively meager. Its removal may result in a noticeable change to the visual environment. I-270N may be more visible to park users. It is unlikely that attendant roadway elements (fences and signs) will be visible. The roadway configuration will appear unaltered. A noise barrier would eliminate this change.

Figure 4-20. Brookes Park

- **Viewer Response:** Viewers from the park are expected to be sensitive to changes opening the views to the roadway. A fence/ visual barrier is expected to be preferable.
- **Resulting Visual Impact:** Overall, the visual quality impact on this view may be marginally negative.

Bellefontaine Conservation Area

- **Orientation:** The Bellefontaine Conservation Area is in the southeastern corner of the I-270/MO 367 interchange.
- **Existing Visual Quality/Character:** The area is predominantly grassland and small ponds. There are parking lots and a limited amount of walking trails. Access to unimproved areas is difficult because of the scrubby nature of the vegetation. I-270 and MO 367 are clearly visible in the existing landscape. **Figure 4-21** shows the nearest cloverleaf ramp to the most remote area of usage. The elevated portion of the ramp is clearly visible.

Figure 4-21. Bellefontaine Conservation Area

Proposed Project Features: The MO 367 interchange will be reconstructed. The existing cloverleaf interchange will be altered. In the quadrant adjacent to the Bellefontaine Conservation Area, the loop ramp will be replaced by a fly-over ramp. The fly-over ramp will have to be tall enough to cross over both MO 367 and I-270. This will make it more visible. The nearest ramp to the Bellefontaine Conservation Area, the ramp from northbound MO 367 to EB I-270, will remain unchanged.

- **Change to Visual Quality/Character:** The fly-over ramp will be more visible to park users. The distances involved makes its impact muted.
- **Viewer Response:** Viewers from the park are expected to be most sensitive to changes. Roadway views exist currently. The anticipated changes are not expected to be troublesome.
- **Resulting Visual Impact:** Overall, the visual quality impact on this view may be marginally negative.

Mississippi River

- **Orientation:** At the eastern end of the study area is the Mississippi River (**Figure 4-22**). The river is over 3,000 feet wide at this spot. The river is roughly at an elevation 400 feet above mean sea level. The river is boarded by a narrow and steep buff, up to an elevation of over 500 feet.
- **Existing Visual Quality/ Character:** Views in this area vary greatly from roadway elements, river commerce infrastructure, floodway elements, and wooded bluffs.
- **Proposed Project Features:** At this location, I-270 work is limited to reconstructing the existing Riverview Drive interchange.

Figure 4-22. Mississippi River from I-270

- **Change to Visual Quality/Character:** The limitations imposed by the existing bridge limit the alterations possible to the roadway.
- **Viewer Response:** Viewers are extremely limited. The primary view will be from the Old Chain of Rocks Bridge.
- **Resulting Visual Impact:** Because of the limitations imposed by the existing bridge, the visual impacts are expected to be low.

4.20 Water — Floodplains

Floodplains are low-lying, flat, or nearly flat areas of land adjacent to rivers, streams, and other water courses, that are periodically inundated with water due to natural events.

4.20.1 Floodplains — Regulatory Background and Standards

The Federal Emergency Management Agency (FEMA) under the National Flood Insurance Program (NFIP) prepares Flood Insurance Rate Maps to identify areas that are prone to flooding. These maps show the limits of the regulatory floodway, the 100-year floodplain, and the 500-year floodplain. A regulatory floodway is defined as the channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood (typically, the 100-year flood) without cumulatively increasing the water surface elevation by more than a designated height. A 100-year flood is defined as a flood that has a 1 percent chance of being equaled or exceeded in magnitude in any given year. The 100-year floodplain is any area that would be covered by water during a 100-year flood event. FEMA has mandated that projects can cause

"no rise" in the flow within the regulatory floodway, and no more than a 1-foot cumulative rise of the flood elevation within the 100-year floodplain. For projects in an incorporated municipality, the local municipality issues the floodplain development permits. In the case of projects proposed within regulatory floodways, a "No Rise" certificate, if applicable, would be obtained prior to issuance of a floodplain development permit.

The State Emergency Management Agency (SEMA) is the agency that operates the flood buyout program in the State of Missouri. The purpose of this program is to purchase property developed in the floodplain and to remove all structures located on the property. This aids in restoring the floodplain and reducing the amount of money paid out as a result of flood insurance claims. Federal money is used to fund the flood buyout program, thus other federally funded projects may not be located on property that was purchased as part of a FEMA/SEMA flood insurance buyout program. Correspondence with SEMA revealed that there were no SEMA-buyout properties located within the I-270 North EA study area.

EO 11988, Floodplain Management, directs federal agencies to take action to reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. Federal agencies must provide public notice of proposed actions in floodplains and make a finding that there is no practicable alternative before taking action that would encroach on a 100-year floodplain.

The FHWA floodplain encroachment policy requires the avoidance of longitudinal encroachments wherever practicable. If longitudinal floodplain encroachments cannot be avoided, the degree of encroachment should be minimized to the extent practicable. Generally, any increase in the 100-year water surface elevation produced by a longitudinal encroachment on a NFIP floodplain should not exceed the 1 foot allowed by the federal NFIP standards.

4.20.2 Floodplains — Affected Environment

Both St. Louis County and the City of Saint Louis participate in the NFIP and have adopted flood insurance studies to identify flood hazards for floodplain management and flood insurance purposes. The current 100-year floodplain boundaries are shown on **Figure 4-23**. Floodplains that cross the existing portions of I-270 are limited. The floodplain distribution can be summarized as follows:

- The Riverview Drive interchange is entirely within the Mississippi River floodplain.
- The Cowmire Creek floodplain crosses I-270 at several locations in the vicinity of the St. Charles Rock Road interchange and the McDonnell Boulevard interchange.
- The Coldwater Creek floodplain crosses I-270 between the Lindbergh Boulevard interchange and I-170.
- The upper portion of the Maline Creek floodplain crosses I-270 in the vicinity of New Halls Ferry and Old Halls Ferry Roads.
- The Watkins Creek floodplain (part of the Maline Creek/Mississippi River watershed—but directly discharging to the Mississippi River) crosses I-270 at the Bellefontaine interchange and near Riverview Drive.

4.20.3 Floodplains — Impacts

4.20.3.1 No-Build Alternative Impact Summary

The No-Build Alternative would have no additional impacts on floodplains or floodways. Because no new right-of-way would be required, no new floodplain encroachments would occur. Maintenance of existing bridges, culverts, parking areas, and multi-use trails within the floodplain would continue and would only result in additional encroachments in the floodplain from compliance requirements.

4.20.3.2 Build Alternatives Impact Summary

The Reasonable Alternatives are primarily improvements to the existing infrastructure, thus floodplain impacts are expected to be limited. **Table 4-25** summarizes the expected Reasonable Alternative impacts. In terms of its ability to preserve the existing amount of floodplain storage, the Reasonable Alternatives are considered roughly equivalent.

Table 4-25. Stream and Floodplain Impact Table

Reasonable Alternative		Floodplain Impacts
ST. CHARLES ROCK ROAD		
Reasonable Alternative 1	Diverging Diamond Interchange	Nearly identical Cowmire Creek crossings
Reasonable Alternative 2	Diamond Interchange	Nearly identical Cowmire Creek crossings
MCDONNELL BOULEVARD		
Reasonable Alternative 1	Diverging Diamond Interchange	None
Reasonable Alternative 2	Partial Cloverleaf Interchange	Larger footprint within MO 370 interchange will increase work within Cowmire Creek
LINDBERGH BOULEVARD		
Reasonable Alternative 1	Partial Cloverleaf Interchange	None
HANLEY ROAD/GRAHAM ROAD		
Reasonable Alternative 1	Diamond Interchange (One-Way Dunn/Pershall Road)	None
Reasonable Alternative 2	Diamond Interchange (Two-Way Dunn/Pershall Road)	None
NEW FLORISSANT ROAD TO WASHINGTON STREET/ELIZABETH AVENUE		
Reasonable Alternative 1	Split Diamond Interchange (One-Way Dunn/Pershall Road)	Limited culvert extensions for Fountain Creek
Reasonable Alternative 2	Split Diamond Interchange (Two-Way Dunn/Pershall Road)	Larger footprint at New Florissant Road may increase work within Fountain Creek
WEST FLORISSANT AVENUE TO OLD HALLS FERRY ROAD		
Reasonable Alternative 1	Split Diamond Interchange (to Old Halls Ferry — One-Way)	All alternatives have limited culvert extensions of existing culverts within Maline Creek tributaries at New Halls Ferry and Old Halls Ferry Roads; these alternatives have no other impacts
Reasonable Alternative 1a	Split Diamond Interchange (to New Halls Ferry — One-Way)	
Reasonable Alternative 2	Split Diamond Interchange (to New Halls Ferry — Two-Way)	This alternative has a new Dunn Road crossing of Maline Creek, near New Halls Ferry Road
Reasonable Alternative 2a	Split Diamond Interchange (to Old Halls Ferry — Two-Way)	New Dunn Road crossing of Maline Creek and a revised crossing of Maline Creek at Netherton Drive
MO 367		
Reasonable Alternative 1	Partial Cloverleaf Interchange	Limited culvert extensions of existing culverts for Maline Creek tributaries
BELLEFONTAINE ROAD		
Reasonable Alternative 1	Diamond Interchange	New crossing of Watkins Creek for relocated Dunn Road and replacement of existing culverts elsewhere
Reasonable Alternative 2	Partial Cloverleaf Interchange	New crossing of Watkins Creek for relocated Dunn Road and replacement of existing culverts elsewhere

Table 4-25. Stream and Floodplain Impact Table

Reasonable Alternative		Floodplain Impacts
LILAC AVENUE		
Reasonable Alternative 1	Diamond Interchange	None
Reasonable Alternative 2	Partial Cloverleaf Interchange	None
RIVERVIEW DRIVE		
Reasonable Alternative 1	Diamond Interchange with Two-Way Dunn Road	Limited culvert extensions of existing culverts within Watkins Creek
Reasonable Alternative 2	Partial Cloverleaf Interchange	Limited culvert extensions of existing culverts within Watkins Creek

Obtaining appropriate floodplain permits is an environmental commitment of this project.

EO 11988 and the Federal-Aid Highway Guide (23 CFR 650 Subpart A) require federal agencies to avoid long- and short-term adverse impacts associated with the occupancy and modification of floodplains. In implementing EO 11988, it is FHWA's policy to do the following:

- Encourage prevention of uneconomic, hazardous, or incompatible use and development in the floodplain
- Avoid longitudinal or other significant encroachments where practicable
- Minimize impacts that adversely affect base floodplains
- Restore and preserve the natural and beneficial floodplain values
- Avoid support of incompatible floodplain development
- Be consistent with the intent of the Standards and Criteria of the NFIP and local floodplain management

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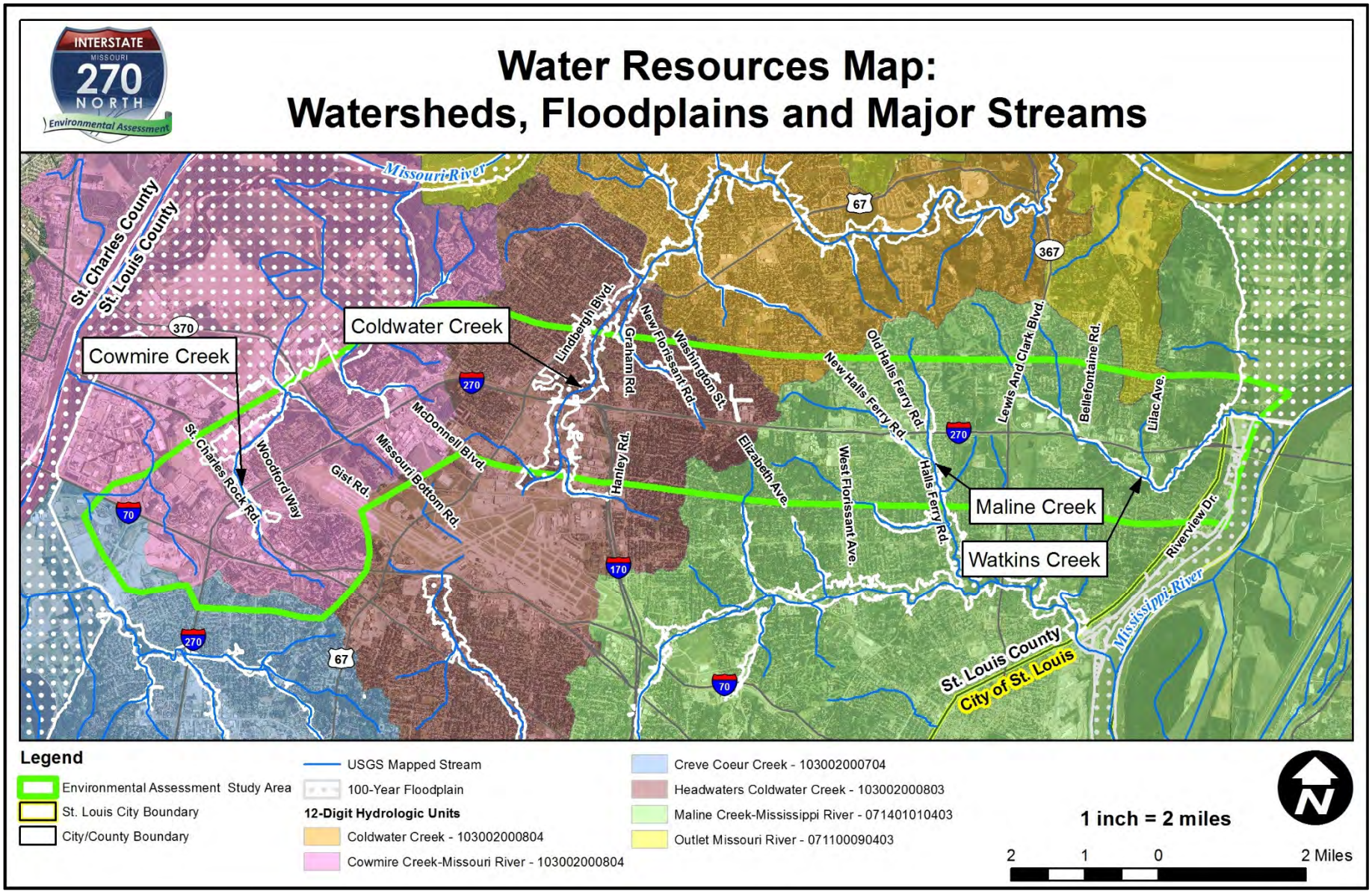

Figure 4-23. Watersheds, Floodplains, and Major Streams

The Preferred Alternative will minimize floodplain impacts. It adheres to EO 11988. The Preferred Alternative will comply with "No-Rise" requirements and, if applicable, obtain appropriate floodplain development permit. It will impact no SEMA-buyout properties. It adheres to the FHWA floodplain encroachment policy.

4.21 Water — Streams and Watersheds

Waters of the United States include navigable waters, tributaries to navigable waters, interstate waters and their tributaries, and all adjacent wetlands. This subsection addresses the water and tributary portion of Waters of the United States.

4.21.1 Streams and Watersheds — Regulatory Background and Standards

Impacts to Waters of the United States in St. Louis County, including impacts from highway projects, are regulated by the Saint Louis District of the USACE under Section 404 of the Clean Water Act. Any discharge of fill requires permitting.

The streams in the study area exist within a highly urbanized environment. All waterways have been substantially altered from pre-settlement conditions. The waterways have been channelized and generally have limited natural floodplain area. The stream banks of these waterways are heavily armored throughout the watershed, and the channels are connected to the combined sewer overflows of the Saint Louis Metropolitan Sewer District. Despite their modification, however, their presence within the dense urban environment offers some of the only refuge for wildlife in the study area.

4.21.2 Streams and Watersheds — Affected Environment

The I-270 North EA study area crosses several watersheds in the Missouri and Mississippi River basins. The watersheds, from west to east, include the following:

- Creve Coeur Creek/Missouri River (HUC-12: 103002000703)
- Cowmire Creek/Missouri River (HUC-12: 103002000801)
- Headwaters of Coldwater Creek/Missouri River (HUC-12: 103002000802)
- Coldwater Creek/Missouri River (HUC-12: 103002000803)
- Outlet Missouri River (HUC-12: 103002000804)
- Maline Creek/Mississippi River (HUC-12: 071401010401)

The distribution of the watersheds is shown on **Figure 4-24**.

4.21.3 Streams and Watersheds — Impacts

4.21.3.1 No-Build Alternative Impact Summary

The No-Build Alternative may cause negligible water quality impacts from erosion and sedimentation during pavement and structure maintenance activities over and near waterways. Potential impacts associated with highway operations (runoff) and maintenance activities (herbicide application and deicing) would be unchanged from current conditions.

4.21.3.2 Build Alternatives Impact Summary

The Reasonable Alternatives may cause temporary water quality impacts from erosion and sedimentation during construction activities. Relative to stream impacts, the Reasonable Alternatives are very similar. **Table 3-5** identifies the comparative impacts. Permanent impacts include new construction, which will modify the stream banks. Detailed design will be necessary to determine whether lengthening or replacing existing structures will be necessary, and to what extent. Nearly all stream encroachment will occur within the existing right-of-way; exceptions include the following:

- **Fountain Creek at New Florissant Road:** In this area, Fountain Creek is a contained within a concrete sluice (**Figure 4-24**). The Preferred Alternative (Reasonable Alternative 1/1a) will require a minimal amount of new right-of-way acquisition at this location. Reasonable Alternative 2 requires a substantially larger footprint and will likely relocate the course of the waterway (**Sheet 7** of **13**, **Exhibits 4** and **5 in Appendix A**).

Figure 4-24. Existing Fountain Creek Conditions

- **Maline Creek at New Halls Ferry/Old Halls Ferry Roads**: In this area, tributaries to Maline Creek are conveyed through the I-270 corridor by a number of structures (**Figure 4-25**). The Preferred Alternative is expected to have impacts limited to culvert extensions. Reasonable Alternatives 2 and 2a will result in a new Dunn Road crossing, near New Halls Ferry Road (**Sheet 9** of **13**, **Exhibit 5**, **Appendix A**). This impact will be limited to a relatively small area before it crosses the I-270 corridor. Reasonable Alternative 2a would have an additional crossing in the vicinity of Netherton Drive. Reasonable Alternative 2a intends to route outer road traffic along existing Netherton Drive, and the crossing may require work to accommodate roadway improvements. The tributary is contained within a concrete swale.

Figure 4-25. Existing Maline Creek Conditions

- **Watkins Creek at Bellefontaine Road**: In this area, Watkins Creek is conveyed through the I-270 corridor by a number of structures (**Figure 4-26**). The Preferred Alternative is expected to result in a new crossing of Watkins Creek for a relocated Dunn Road (**Sheet 12** of **13**, **Exhibit 4**, **Appendix A**). The new crossing will occur behind the existing Shell gasoline station. Reasonable Alternative 2 will also result in a different, but similar, new crossing (**Sheet 12** of **13**, **Exhibit 5**, **Appendix A**). The existing Shell gasoline station will be relocated in Reasonable Alternative 2.

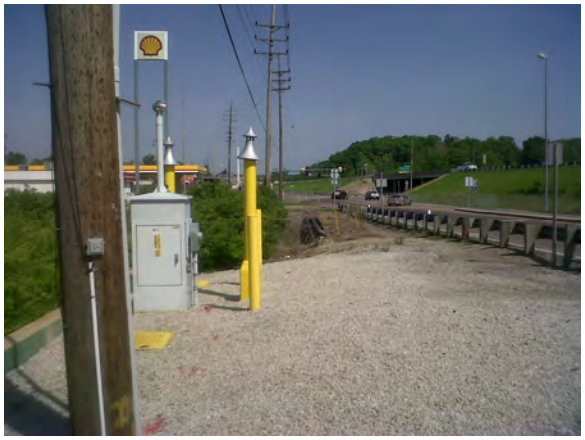

Figure 4-26. Existing Watkins Creek Conditions

Obtaining a jurisdictional determination from USACE is an environmental commitment of this project.

MoDOT will coordinate with USACE and MDNR/IEPA to ensure compliance with Sections 401 and 404 of the Clean Water Act. This will address impacts to streams, wetlands, and other Waters of the United States during the design process. Clean Water Act permits will require a detailed delineation and evaluation of waters and wetlands affected by the project and minimization of impacts. It is anticipated that this project will be processed as a Section 404 Individual Permit including an Individual Section 401 Water Quality Certification (WQC).

4.22 Water — Wetlands

USACE defines wetlands as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

4.22.1 Wetlands — Regulatory Background and Standards

Impacts to wetlands and Waters of the United States in St. Louis County, including impacts from highway projects, are regulated by the Saint Louis District of the USACE under Section 404 of the Clean Water Act.

4.22.2 Wetlands — Affected Environment

There are few wetlands in the proximity of the study area due to the long history of urban development. The National Wetland Inventory maps produced by USFWS identified very few wetlands (**Figure 4-27**).

A field review during May 2014 encountered no wetlands within the footprint of any of the study's Reasonable Alternatives.

4.22.3 Wetlands — Impacts

4.22.3.1 No-Build Alternative Impact Summary

The No-Build Alternative would have no additional impacts on wetlands.

4.22.3.2 Build Alternatives Impact Summary

A field review during May 2014 encountered no wetlands within the footprint of the Reasonable Alternatives.

Obtaining a jurisdictional determination from USACE is an environmental commitment of this project.

MoDOT will coordinate with USACE and MDNR/IEPA to ensure compliance with Sections 401 and 404 of the Clean Water Act. This will address impacts to streams, wetlands, and other Waters of the United States during the design process. Clean Water Act permits will require a detailed delineation and evaluation of waters and wetlands affected by the project and minimization of impacts. It is anticipated that this project will be processed as a Section 404 Individual Permit including an Individual Section 401 Water Quality Certification (WQC).

4.23 Water — Water Quality

Water resources for the I-270 North EA study include named or unnamed streams, wetlands, and floodplains. Each were discussed in separate sections of this document. Water quality is measured by the ability of water resources to support beneficial uses, both by humans and wildlife. Waters of the State of Missouri are classified for the protection of aquatic life, livestock and wildlife watering, and fish consumption by humans.

4.23.1 Water Quality — Regulatory Background and Standards

Section 305(b) of the Federal Water Pollution Control Act of 1972, generally referred to as the Clean Water Act, requires states to report to the U.S. Congress and EPA on the quality of the surface and groundwater resources of the state. The 305(b) report is submitted once every 2 years and must explain how the resource quality of water is determined in terms of the degree to which predefined beneficial uses (i.e., designated uses) of those waters are attained (i.e., supported). When any designated use for any water body is not fully supported (i.e., impaired), the state must report potential reasons (causes and sources) for the impairment. MDNR produces the biannual 305(b) report and 303(d) Impaired Waters Listings report. MDNR defines the categories of designated/beneficial uses and establishes a set of water quality criteria for each use (10 CSR 20-7). Missouri has established 15 separate categories, and each body of water may have more than one beneficial use associated with it. MDNR estimates that 60 percent of its stream miles and 90 percent of its lakes have been assessed; the assessed water bodies are categorized as “Full Support of Uses” or “Non-Supporting of Uses.” Of the amount assessed, approximately 17 percent of the stream miles and 48 percent of the lakes are classified as Non-Supporting. In addition, under the state’s Water Quality Standards, water resources are evaluated to determine if eligible for inclusion as an Outstanding National Resource Water or Outstanding State Resource Water. These designated waters have been determined to contain national recreational and ecological significance or as a high-quality water of the state with aesthetic, recreational, or scientific value.

Provisions of the Clean Water Act and related state rules and regulations also require a TS4 permit when the facility serves a population of 1,000 or more within an urbanized area or are located outside an urbanized area serving a jurisdiction with a population of at least 10,000 and a population density of 1,000 people per square mile or more. MoDOT has an TS4 general permit, obtained from MDNR. It requires MoDOT to operate under a Storm Water Management Plan comprised of control measures, such as the following:

- Public Education and Outreach
- Public Participation and Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Control
- Post Construction Runoff Control

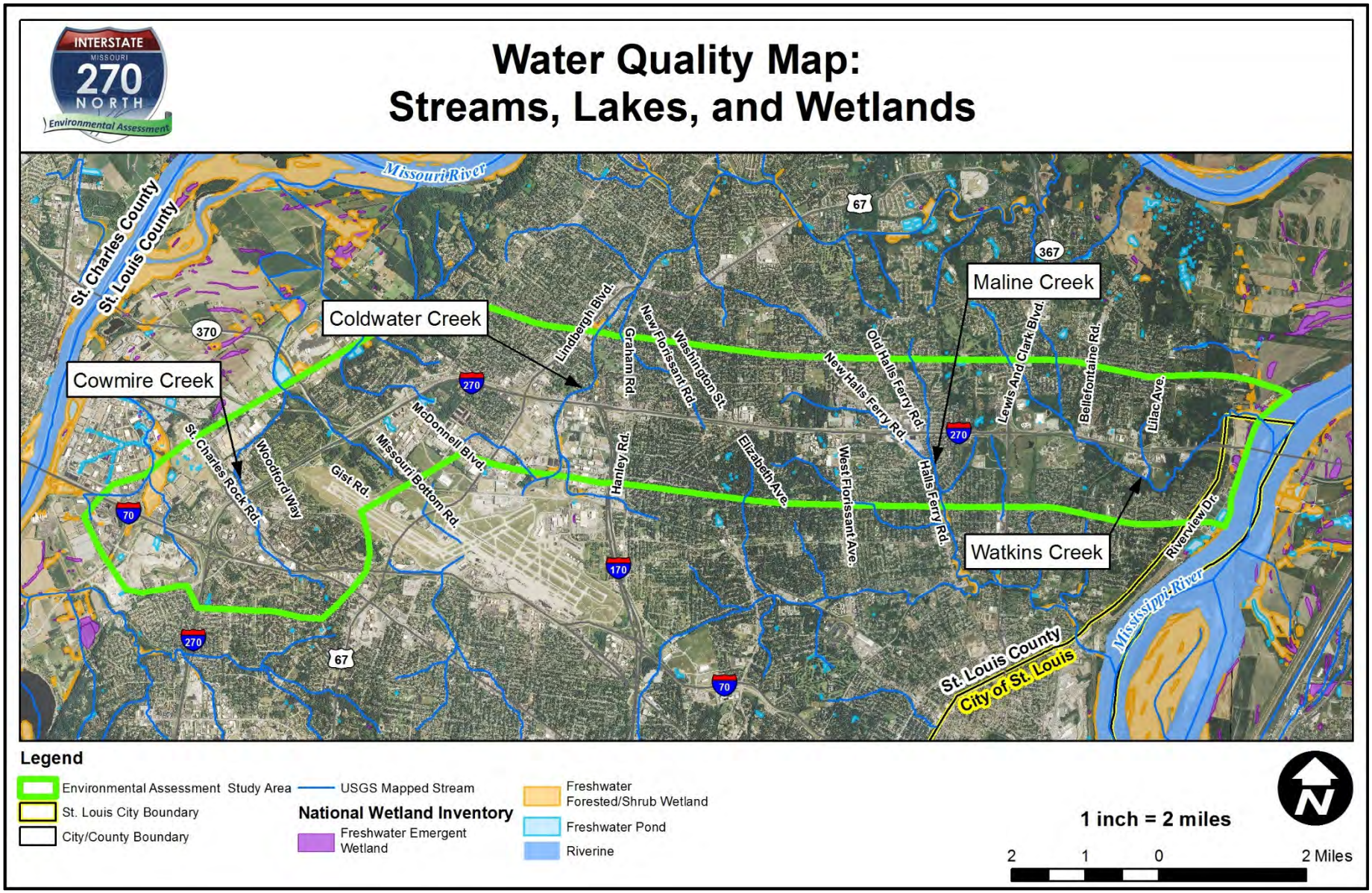

Figure 4-27. Streams, Lakes, and Wetlands

4.23.2 Water Quality — Affected Environment

The study area lies within several watersheds. None of the waterways are listed as an Outstanding National or State Resource Water.

Watkins Creek is identified on the 303(d) Impaired Waters list. Watkins Creek was listed for impairment due to chloride concentrations and *E. coli* bacteria. Beneficial uses include Livestock and Wildlife Watering, Protection of Warm Water Aquatic Life and Human Health-Fish Consumption, and Secondary Contact Recreation. The impairments triggered the need for a total maximum daily load (TMDL) report for the water body. The *E. coli* bacteria TMDL and Implementation Plan was approved by EPA on July 13, 2016. A TMDL report sets the pollutant reduction goal necessary to improve state-listed impaired waters.

Coldwater Creek and Maline Creek are listed on the 2014 proposed 303(d) list. These streams are designated for Livestock and Wildlife Watering, Protection of Warm Water Aquatic Life and Human Health-Fish Consumption, and Whole-Body Contact Recreation. Both streams are impaired for Whole-Body Contact Recreation because of coliform bacteria and for Protection of Warm Water Aquatic Life because of high chlorides from urban runoff/storm sewers. The *E. coli* bacteria TMDL and Implementation Plan for Coldwater Creek is in draft form.

Cowmire Creek does not have any use designations in the water quality standards.

4.23.3 Water Quality — Impacts

Water quality impacts could include increased sediments to stormwater due to runoff from erodible material exposed during construction. Stormwater runoff is addressed by MoDOT's Sediment and Erosion Control Program, which would be included within the contract specifications to address temporary erosion and sedimentation during construction. MoDOT's best management practices (BMPs) reduce impacts to the aquatic environment to minimal levels. BMPs cover most activities needed to restore the construction area to an acceptable condition. This would include cleanup, shaping, replacing topsoil, and establishing vegetative cover on all disturbed bare areas, as appropriate. MoDOT currently holds a general municipal separate storm sewer system (TS4) permit. MoDOT will adhere to the conditions of the TS4 permit applicable at the time of construction.

This project will result in the disturbance of more than 1 acre of total land area. Accordingly, it is subject to the requirement for a National Pollutant Discharge Elimination System permit for stormwater discharges from the construction sites. Requirements applicable to such a permit will be followed, including the preparation of a Stormwater Pollution Prevention Plan. Such a plan will identify potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the construction site and shall describe and ensure the implementation of practices that will be used to reduce the pollutants in discharges associated with construction site activity and to ensure compliance with the terms of the permit.

BMPs will be implemented to minimize soil erosion and sedimentation. Methods for stormwater management, during and after construction, will be in accordance with the MoDOT's Standard Specifications Book for Highway Construction and the project's National Pollutant Discharge Elimination System permit. BMPs to control sediment loss from the site during construction will be outlined in the Stormwater Pollution Prevention Plan. Additionally, permanent BMPs will be integrated into the Preferred Alternative to capture a portion of the roadway runoff during storm events for passive treatment and removal of contaminants flowing from the roadway to the waterways during precipitation. These BMPs have not been identified in preliminary design, but may include items such as bioswales or sand filters. The appropriate BMPs will be fully developed during final design.

SECTION 5

Environmental Commitments

During the design and implementation of the Preferred Alternative, MoDOT is committed to obtaining necessary permits and performing other actions that would minimize and mitigate the impacts of the project on the environment. In addition to adhering to the provisions of MoDOT construction standards depicted in the Engineering Policy Guide, the following specific environmental commitments are summarized in this section.

1. MoDOT will coordinate with local emergency services, Metro, and schools in advance of any roadway changes that would disrupt normal travel patterns.
2. MoDOT will ensure that the contractor develops a MoDOT-approved maintenance of traffic plan.
3. MoDOT will coordinate, cooperate, and communicate, as required, with the representatives of the railroads located in the corridor throughout the project.
4. MoDOT will coordinate, cooperate, and communicate with affected utility companies located in the corridor throughout the project.
5. The SHPO has provided Section 106 concurrence for the Preferred Alternative.

MoDOT will continue coordination with the SHPO related to the Section 106 process should design modifications and/or construction activities result in impacts to the following properties:

- The Myers residence (180 Dunn Road) is a house and barn with the NRHP boundary as the parcel lines.
- The Gittemeier House (1067 Dunn Road) is two-story German vernacular residence with the NRHP boundary as the parcel lines.
- The historic district at the Ferguson Pine Meadows 1st Addition subdivision (approximately ¾ miles east of the Washington/Elizabeth interchange).
- Archaeological sites SL545, SL547, and SL548, located in the northeastern portion of the I-270/MO 370 interchange. These sites were not safely accessible and therefore MoDOT will ensure that contractor construction proceeds with caution at this location, especially near SL545 where historic burials were reported.

MoDOT will assist FHWA with continued Native American Tribal coordination.

6. MoDOT will ensure that:

- All tree clearing will be conducted in the winter months when bats are in hibernation (November 1 – March 31), and;
- During the project development process for each phase, potential impacts to threatened and endangered species will be re-evaluated, and coordination with both MDC and the USFWS will take place to verify that the “not likely to adversely affect” determinations for listed bats remain valid.

7. MoDOT will ensure that all structures scheduled for demolition are inspected for asbestos-containing material and lead-based paint. MoDOT and the contractor shall submit all required demolition notices, abatements notices, and project notifications to MDNR as required by regulation prior to beginning demolition activities. Asbestos-containing material and demolition debris will be disposed according to state and federal regulations. The reports of these inspections for asbestos and the presence of lead-based paint will be included in the construction bid proposal.

8. MoDOT will ensure that any known and unknown hazardous waste sites that are found during project construction are handled in accordance with Federal and State laws and regulations. If regulated solid or hazardous wastes are found during construction activities, the MoDOT construction inspector will direct the contractor to cease work at the suspect site. The construction inspector will contact the appropriate environmental specialist to discuss options for remediation. The environmental specialist, the construction office, and the contractor shall develop a plan for sampling, remediation and continuation of project construction. Independent consulting, analytical and remediation services shall be contracted if necessary. As necessary, the MDNR and USEPA will be contacted for coordination and approval of required remediation activities.
9. MoDOT will coordinate with the USACE related to any required excavation or other land disturbance within the St. Louis Airport Sites FUSRAP Record of Decision boundary. Coordination will begin prior to the commencement of construction for each project phase that affects the Decision boundary and will continue through the duration of construction activities for the project phase.
10. MoDOT will upgrade existing pedestrian facilities to be ADA compliant and provide additional pedestrian and bicycle connectivity where reasonable.
11. MoDOT will provide feasible and reasonable noise abatement for areas along the corridor that are considered impacted. A preliminary (NEPA stage) noise analysis was conducted as part of this study. That analysis recommended noise barriers at six locations along the corridor. Further analysis may be needed depending upon alignment changes. MoDOT will use the Noise Policy in place at that time to conduct the analysis and final recommendations will be made at a later design stage. At that time, if noise abatement is found to be feasible and reasonable, MoDOT will seek the input of impacted property owners and residents before deciding on building noise barriers.

    As construction will likely be phased, feasible and reasonable noise abatement will be provided based on the location and limits of I-270 construction in each phase. For a given area, noise abatement will be constructed in parallel with the roadway improvements for the corresponding area.

Statement of Likelihood

The preliminary noise analysis found noise barriers were feasible and reasonable at the following locations:

- **Ville Maria Subdivision:** Between mile markers 22.2 and 22.7.
- **Brookes Park:** Between mile markers 24.3 and 25.9.
- **Northwest Quadrant of Lindbergh Boulevard Interchange (Kindercare/Library and Saint Martin De Porres):** Between mile markers 24.0 and 24.9.
- **Marysville:** Between mile markers 26.25 and 26.75 located along the outer road at St. Cornelius Lane.
- **Carrollton Village Condominiums:** Between mile markers 20.8 and 21.1.
- **Hathaway Manor (South):** Between mile markers 30.7 and 31.4.

12. MoDOT will administer the acquisition and relocation of affected residential, non-profit, and commercial properties in accordance with the relocation procedures established in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.
13. MoDOT will consider options to minimize new right-of-way acquisition.
14. MoDOT will closely monitor project changes that may result in Section 4(f) impacts. Section 4(f) resources adjacent to the I-270 North corridor are as follows:

- **Carrollton Disc Park – L**ocated on Lambert Airport buy-out land between St. Charles Rock Road and Woodford Way (south side of I-270), this disc golf course was developed using Land and Water Conservation Funds.
- **Playground at Garrett Elementary School –** Located adjacent to Garrett Elementary School (1400 Ville Rosa Lane, Hazelwood). The extent of the Section 4(f) resource is limited to the immediate area of the school.
- **Gardens at Prairie Commons Library – L**ocated at 915 Utz Lane, Hazelwood. This public library has a public garden, a picnic area, and park benches. It appears that some of the garden is actually in MoDOT right-of-way. Because the roadway/intersection re-configuration in this area is minimal, it is not expected that the garden will require disruption. If impacted, MoDOT will coordinate with the library relative to appropriate relocation measures.
- **Brookes Park – L**ocated in the southwestern quadrant of the I-270/Lindbergh Boulevard interchange, Brookes Park is administered by the City of Hazelwood.
- **Bellefontaine Conservation Area – Bellefontaine Conservation Area is in the southeastern quadrant of the I-270/MO 367 interchange. The site is administered by the Missouri Department of Conservation Department.**
- **The Utz-Tesson House – T**he Utz-Tesson House is located in Brookes Park. Right-of-way acquisition and disruptions affecting usage should be avoided.
- **The Taille de Noyer House – T**he Taille de Noyer House currently resides on the McCluer High School campus, hundreds of feet from I-270.
- **The John B. Myers House –** The John B. Myers House is located at 180 Dunn Road (northwestern quadrant of the Graham Road intersection). The parcel lines are the significance boundary.
- **The Gittemeier House –** The Gittemeier House is located at 1067 Dunn Road (northwestern quadrant of the New Florissant Road intersection). The parcel lines are the significance boundary.
- **The Ferguson Pine Meadows 1st Addition District – T**his NRHP district is located along Starlight Drive in Ferguson. The boundaries of the district are Pershall Road to the north, Moonlight Drive to the west, and the Saint Louis Community College-Florissant Valley campus to the east.

15. MoDOT will work with the administrators of the Little Creek Nature Area, a non-Section 4(f) resource, to investigate opportunities to minimize impacts, provide a visual buffer of trees/shrubs, and incorporate potential driveway improvements.
16. MoDOT will work with Metro to investigate reasonable roadway modifications that further improve efficiencies for Metro's operations.

Required Permits

1. MoDOT will coordinate the Preferred Alternative with the Federal Aviation Administration to complete necessary permitting.
2. MoDOT will adhere to the conditions of the TS4 (Transportation Separate Storm Sewer System) permit applicable at the time of construction.
3. MoDOT will conduct an engineering analysis for the build alternative prior to submission of the floodplain development permit application to the Missouri State Emergency Management Agency. The contractor shall obtain a floodplain development permit and "no-rise" certification.
4. MoDOT will obtain authorization by an Individual Clean Water Act Section 404 Permit from the USACE including Section 401 Water Quality Certification from MDNR/IEPA.

5. MoDOT will follow the requirements, including a Stormwater Pollution Prevention Plan, for the required National Pollutant Discharge Elimination System permit for stormwater discharges from the construction site(s).

SECTION 6

Comments and Coordination

Public involvement and agency coordination have been essential to the development of the I-270 North EA. This section summarizes the activities and methods associated with stakeholder involvement.

Recognizing the value that stakeholders bring to the transportation planning process, the study team employed several tools to ensure there were adequate opportunities for involvement throughout the study. The study's Public Involvement Plan (PIP) was guided by both NEPA's requirements for public involvement and Context Sensitive Solutions (CSS). CSS is an approach to planning that helps ensure that the recommended alternative of a project "fits" into the surroundings of the area and balances costs, safety, environmental impacts, and the project's goals. Stakeholder involvement is critical to this approach and helps build awareness and understanding. Ultimately, public involvement should lead to a final outcome that reflects an interdisciplinary collaborative process and includes input from anyone with a stake in the project.

The current iteration of the PIP (and all public involvement/agency coordination materials) is included in **Appendix C**. The following sections summarize the major elements of the PIP.

On June 23, 2016, MoDOT issued a press release announcing the resumption of the environmental study of I-270 North. The I-270 North EA was put on hold in early 2015 due to agency budget shortfalls (see **Appendix C)**. The press release identified that partial funding for the initial elements of the I-270 North Corridor in the 2017-2021 State Transportation Improvement Program.

Post-Project Suspension Coordination

In early 2015, the I-270 North EA project was suspended as part of a funding shortfall. The project was restarted in mid-2016. Overall, the basic nature of the project is unchanged from the suspension including alternatives, construction methods, and techniques. Some techniques, such as cost estimating and crash evaluations, have evolved. As necessary, those have been updated. New information, such as the updated long-range transportation plan (Connected2045), were also incorporated into the analysis. As necessary, impact analyses were also updated based on new or revised regulations. Public involvement and stakeholder coordination was restarted and is documented here.

6.1 Stakeholder Briefings

Public involvement for the I-270 North EA kicked off with stakeholder briefings from May 2013 to July 2013. Stakeholder briefings were held with elected officials, community leaders, subdivision trustees, business owners, and developers within the study corridor. These briefings allowed the team to uncover potential issues that would affect the study. **Table 6-1** identifies the stakeholder briefing attendees.

The briefings included an introduction to the study and the assessment process. A set of 14 standardized questions were used to set a baseline for stakeholder concerns. These questions ranged from what issues people encounter when traveling the corridor to how they want to be engaged during the study.

The most pressing concern for these stakeholders was congestion and perceived dangerous traffic flow patterns at interchanges and at on- and off-ramps. The complete Stakeholder Briefing Report is included in **Appendix C.**

Table 6-1. Stakeholder Briefing Attendees

First Name	Last Name	Title	Organization
Kim	Bakker	Director of Community Relations	SSM DePaul Health Center
Michelle	Beckham	Shift Manager	Burger King
Heather	Blacketer	Regional VP Leasing, Central Region	Brixmor Property Group (Clocktower Plaza)
Vessie	Bradley	Trustee	Summerwood Condominiums
Conrad	Bowers	Mayor	City of Bridgeton
Marielle	Brown	Bicycle and Pedestrian Planning Manager	Trailnet
Hazel	Erby	St. Louis County Councilwoman (1st District)	St. Louis County Council
Tina	Garrison	Vice President Operations	DePaul Hospital
Brian	Goldman	President/CEO	Northwest Chamber of Commerce
Jerry	Grimmer	Councilman – Ward 2	City of Bridgeton
Kitty	Harrison	Marketing Manager	Johnny Londoff Chevrolet, Inc.
Damon	Harvey	Pastor's Assistant	Grow 2 Go Church (St. Louis Christian Center)
Mrs.	Carr	Pastor's Assistant	Grow 2 Go Church (St. Louis Christian Center)
Sean	Hogan	President	DePaul Hospital
Don	Hood	City Administrator, Chief of Police	City of Bridgeton
Bishop L.O.	Jones	Founder	Greater Grace Church
Kimberly	Lackey	Attorney	Paraquad
Johnny	Londoff	Owner	Johnny Londoff Chevrolet, Inc.
Carolyn	Marty	President	Greater North County Chamber of Commerce
Daryl	Meese	Lay Minister	North Hills United Methodist Church
Heather	Navarro	Executive Director	MO Coalition for the Environment
Mike	O'Mara	St. Louis County Councilman (4th District)	St. Louis County Council
Rev. Susan	Sneed	Reverend and Community Organizer	Metropolitan Congregations United
Darryl	Vandiver		The Desco Group (Grandview Plaza)
Honorable Ann	Wagner	Congresswoman, 2nd District of Missouri	U.S. Congress
Almaree	Williams	Trustee	Hanaway Manor South Subdivision

Since the study re-start, one of the most painful developments in northern St. Louis County was the events in Ferguson. While those events didn't occur within the I-270 North EA study area, they affected the larger community, including the transportation community. As part of the study's effort to reach out, it was decided to make additional efforts to discuss the study with influential spokespeople for the low income/minority populations. This resulted in a series of in-person interviews. The following interviews were held:

- May 5, 2016 Matt Unrein, Assistant City Manager, City of Ferguson
- August 17, 2016 Kimberly Lackey, Staff Attorney, Paraquad

- August 22, 2016 Vanessa Garcia, Assistant Director, Hispanic Chamber of Commerce of Greater St. Louis
- August 23, 2016 Ella M. Jones, Councilwoman, City of Ferguson
- August 23, 2016 Delrish Moss, Police Chief, City of Ferguson
- August 23, 2016 Hazel Erby, Councilwoman, St. Louis County
- August 26, 2016 Heather Navarro, Executive Director, Missouri Coalition for the Environment
- August 29, 2016 Reverend Susan Sneed, Metro Congregations United

The interviews were largely freeform. The study team presented basic background facts about the study, including its status and completion. The presentation discussed the study's goals, its recommendations, public involvement efforts to date, funding, and the anticipated public hearing. Invitations were issued for the public hearing and to review the I-270 North EA. Questions about the study were fielded. Among the most common issues that would affect low income and minority populations were the following:

- Accommodations for non-motorized users
- Concerns with existing slip ramps to and from Dunn Road
- The importance of access and its effect on neighboring communities
- Pedestrian use in the area and safety along and across I-270
- Sidewalks, paved shoulders, and lighting
- How the one-way system accommodates pedestrians
- Business impacts as a result of access alterations

These concerns and needs were acknowledged, and plan details were explained. The importance of developing safe accommodations was noted. The study team offered assurances that these will be examined more thoroughly when a project is selected for construction and detailed design is initiated. Continued coordination will be a component of the project.

6.2 Commuter Surveys

In August 2013, a survey team was used to administer a short questionnaire to gauge the attitudes and concerns of commuters using I-270. The survey team visited bus stops and gas stations throughout the corridor and used iPads loaded with survey software to administer the six-question survey. In all, 150 surveys were completed. The questions and top answers are summarized as follows:

1.	Main reason to use I-270?	Work (39 percent), work/shop/play (31 percent)
2.	How do you use I-270?	Car (70 percent)
3.	Issues encountered on I-270?	Congestions delays (65 percent)
4.	Where are these encountered?	Dunn and West Florissant were the most common responses
5.	Main problem to solve?	Safety at ramps (very important 83 percent)
6.	Type of respondent?	Commuter (48 percent)/resident of unincorporated North Saint Louis (27 percent)

The complete Commuter Survey Report is attached in **Appendix C**.

6.3 Small Group Presentations

Small group presentations are an effective method for reaching populations who may not have transportation to attend study-sponsored events, such as public meetings, or who have other special interests. Presentations to groups such as condominium associations, subdivision trustees, chambers of commerce, senior citizen organizations, and churches are the most common. On an as-needed basis, the study team made themselves available to meet with various groups requesting a presentation.

The typical presentation included a 15-minute slide show, followed by an open-ended question-and-answer session. The slide show discussed the study status and schedule. Particular audience interests were also typically a focus. Most questions focused on aesthetics, bike/pedestrian access, slip ramps, business impacts, the status of the Chain of Rocks Bridge reconstruction, and freight.

Since September 2013, the study team has made numerous presentations including the following:

- Saint Louis County Economic Council and Planning Department
- Drive Time, Inc.
- Northwest Chamber of Commerce
- Village of Calverton Park
- John Bommarito Auto Group
- Saint Louis Christian College
- City of Bellefontaine Neighbors
- City of Florissant Mayor
- Boeing
- City of Bridgeton
- Krispy Kreme Restaurant
- DePaul Health Center
- Christian Hospital
- North County Christian School
- McCluer High School
- Lambert-St. Louis International Airport
- Gas Stations (Mobil and Circle K)
- Land Developers (Brixmor, L3Corporation, and Daniels Realty Group)
- City of Hazelwood
- City of Ferguson

During the I-270 North corridor study, elected officials participated in the Community Advisory Group (CAG). For the I-270 North EA, elected officials were invited to briefings. This allowed for more meaningful dialogue. In addition to local elected officials, invitations were extended to U.S. Senator Claire McCaskill, U.S. Senator Roy Blunt, U.S. Representatives Lacy Clay and Ann Wagner, Missouri State Senators Gina Walsh and Maria Chappelle-Nadal, and the nine Missouri State Representatives who represent the corridor. Meetings were scheduled a few days before each of the two public informational meetings.

Figure 6-1 is a typical agenda for the small group presentations. Meeting summaries are included in **Appendix C**.

Figure 6-1. Typical Agenda for a Small Group Presentation

6.4 Agency Collaboration

As part of the PIP (**Appendix C**), an Agency Collaboration Plan was developed to define the process by which the study team would communicate information about the I-270 North EA to the interested federal and non-federal governmental agencies.

The standard for identifying potential agencies for collaboration was federal and non-federal governmental agencies that may have an interest in the project because of their jurisdictional authority, special expertise, local knowledge, and/or statewide interest. The definition of "governmental" was broadened to include any organization with an official mandate. The following agencies were identified as potentially interested in the I-270 North EA:

- US Fish and Wildlife Service (USFWS)
- Federal Aviation Administration
- National Parks Service
- Missouri State Emergency Management Agency (SEMA)
- Saint Louis County Department of Highways and Traffic
- Saint Louis County Department of Parks and Recreation
- Metro Transit
- East-West Gateway
- Federal Emergency Management Agency (FEMA)
- U.S. Coast Guard
- U.S. Army Corps of Engineers (USACE)
- U.S. Environmental Protection Agency (EPA)
- U.S. Department of Agriculture, Natural Resource Conservation Service
- Illinois Department of Transportation
- Missouri Department of Natural Resources (MDNR)
- Missouri Department of Conservation
- Missouri Federal Assistance Clearinghouse
- Missouri State Historic Preservation Organization (SHPO)

The goal of the collaboration process is to provide the agencies, which may have an interest in the study, the data they need to provide relevant input. Two primary mechanisms were developed. First, specific opportunities (collaboration points) were defined. These collaboration points are key points in the study development process, where agency input is most powerful. The anticipated points of contact are (1) when the Draft Purpose and Need is produced, (2) when Reasonable Alternatives are established, and (3) when a Preferred Alternative begins to emerge. All collaboration will occur through review/response of supplied data packages. A second coordination mechanism is specifically to invite the agencies to all public involvement meetings.

Collaboration Point #1 was distributed in December 2013. This collaboration point focused on introducing the study and the transportation problems (Purpose and Need) that affect the study area. In addition to the Draft Purpose and Need Statement, the materials provided to the agencies included all public involvement materials, detailed mapping, and the North Corridor Study. The only substantive comment came from MDNR. It identified the locations of landfills in the study's vicinity.

Collaboration Point #2 was distributed in May 2014. This collaboration point focused on identifying the Reasonable Alternatives under consideration. The materials provided included most of the materials and references developed for the study's second public involvement meeting. Again, minimal formal responses were received in response to this distribution of materials. However, informal dialog increased during this timeframe as a result of the cumulative effects of the study's outreach efforts. This dialog covered a broad array of typical topics, focused mostly on understanding the specifics of the alternatives. The Agency Collaboration Plan successfully raised the profile of the I-270 North EA and engaged the interested parties.

Pursuant to the resumption of the study in 2016, a letter was sent to the regulatory agencies. The distribution list was updated. Both the letter and the updated distribution list are contained in **Appendix C.** It explained the resumption of the environmental study of I-270 after it was put on hold in early 2015 because of agency budget shortfalls. It explained that the study team is currently working on finalizing the EA. Once accepted by FWHA, the EA will be circulated for comment and a Location Public Hearing will be conducted. The acceptance of the EA is expected in early fall 2016. Once accepted, a CD/DVD copy of the EA will be sent for review and comment.

The status of the partial funding for the I-270 North Corridor was also explained.

6.5 Community Advisory Group

As part of the PIP (**Appendix C**), a CAG was established to assist in developing a comprehensive understanding of the study and refining potential solutions. CAG members were broadly categorized in two areas—municipal/service stakeholders (such as municipal engineers and fire chiefs) and general interest stakeholders (such as residents, business owners, and commuters).

To engage the CAG, a series of meetings were held. The CAG meeting summaries are contained in **Appendix C**.

6.5.1 CAG Meeting 1

The primary goal of the first meeting was to explain the how the public involvement associated with the North Corridor Study relates to the I-270 North EA and to work with the group to identify/validate their key issues, goals, and desires. A clear definition of the CAG's roles and expectations were reviewed. A preview of the first Public Information Meeting was also provided.

CAG Meeting 1 was held on July 16, 2013, at the Hazelwood Civic Center (8969 Dunn Road). Each of the 24 attendees received a binder containing an agenda (**Figure 6-2**), a study area map, a copy of the meeting's presentation slides, a fact sheet, Newsletter #1, and the announcement for the study's first Public Informational Meeting.

A presentation outlining the study was given by key team members. MoDOT Project Manager Lisa Kuntz reviewed CAG member roles, CAG meeting rules/guidelines, study decision-making authority, and the timing of future CAG meetings. MoDOT North Area Engineer Larry Welty presented a study description and background discussion. MoDOT Senior Environmental Specialist Matt

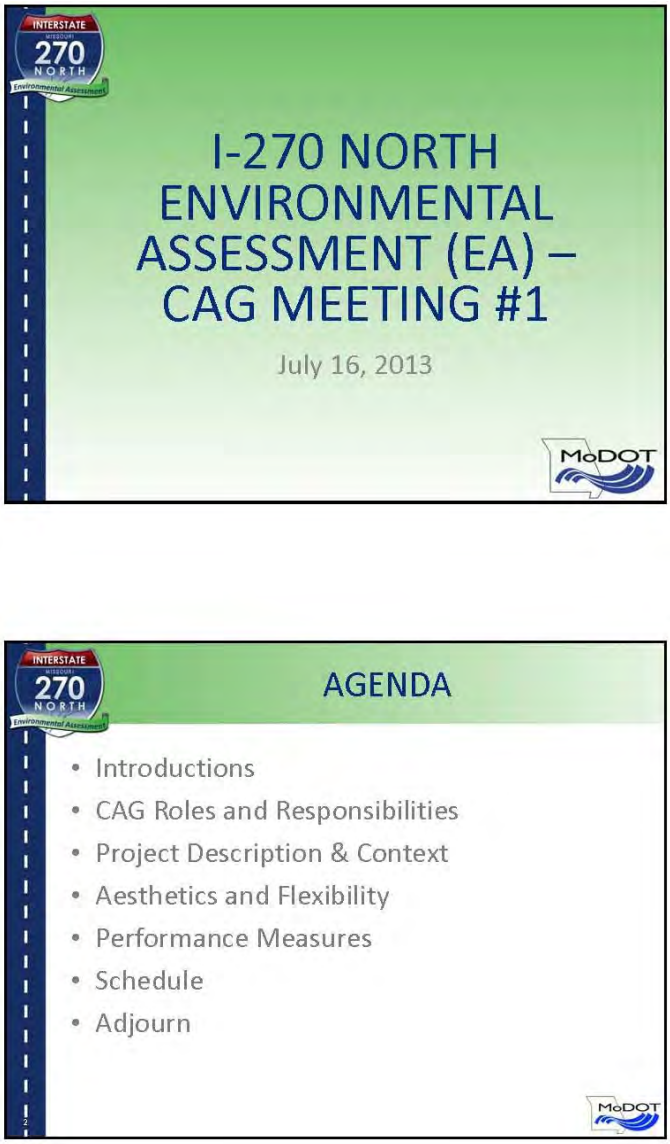

Figure 6-2. Agenda for CAG Meeting 1

Burcham provided information on the NEPA process.

Meeting 1 also included a group exercise intended to identify specific issues along the I-270 North EA corridor. Attendees reviewed large-scale maps and noted/discussed issues that affected them or their constituents. Issues were recorded and circulated for use by the study team and at future CAG meetings. The meeting concluded with a presentation/discussion on the topics of aesthetics, flexibility, and performance measures.

6.5.2 CAG Meeting 2

CAG Meeting 2 focused on the Purpose and Need identified for the study, the performance measures, and evaluation criteria that will be applied to the Build Alternatives, and the initial iterations of the Conceptual Alternatives.

Meeting 2 was held on October 29, 2013, at the Lewis and Clark Branch of the Saint Louis County Library. Each of the 17 attendees received an agenda and a copy of the meeting's slideshow. The presentation addressed the Fundamental Principles of Urban Freeway Planning and Design. The overall purpose was to establish a basic understanding of how and why alternatives are being developed. The tradeoffs associated with different scenarios were also considered. The philosophical approach taken by the study team was to allow the systems roads to carry traffic as intended. Freeways handle long trips, outer roads handle trips between interchanges, and local roads provide access to individual residences and businesses.

The CAG was also briefed on the Conceptual Alternatives for two of the study's sub-areas. This included a presentation on the iconography for the Interstate, the outer roads, the number of lanes, and direction of travel on that road. The methodology associated with dividing the corridor into 11 sub-areas was discussed, as were pedestrian, bicycle, and transit accommodations.

6.5.3 CAG Meeting 3

CAG Meeting 3 presented the Conceptual Alternatives for all portions of the study corridor. Meeting 3 was held on December 10, 2013, at the Florissant Valley Branch of the Saint Louis County Library. To facilitate the alternatives review, four tables were set up with each focusing on a portion of the corridor and showing the Conceptual Alternatives for that area. As the CAG was shown the Conceptual Alternatives, MoDOT encouraged questions and comments. The details of each alternative in each area were described to the CAG. In addition, tradeoffs were presented so that the CAG could get a better understanding of the potential benefits and impacts of each alternative. Much of the conversation was focused on the benefits of a one-way outer road system compared to a two-way outer road system. Many of the CAG members offered input related to existing Interstate operations, safety concerns, concerns about emergency services access, and locations where congestion and weaving challenges occur on a regular basis.

6.5.4 CAG Meeting 4

CAG Meeting 4 presented and discussed the Preferred Alternative. Meeting 4 was held on November 18, 2014, at the Florissant Valley Branch of the Saint Louis County Library. After a PowerPoint presentation, the CAG was invited to view the Preferred Alternative on 200-scale maps placed on tables. The improvements were summarized from the west end of the I-270 North EA corridor at I-70 to the east end at Chain of Rocks Bridge. Key changes were identified at each interchange location and questions were encouraged.

6.5.5 CAG Meeting 5

CAG Meeting 5 was held on August 18, 2016. The meeting's goals include the specifics of the study re-start, a review of the Preferred Alternative, and a discussion of next steps.

6.6 Technical Advisory Committee

As the membership list for the CAG was assembled, it became clear that many more people were interested in the study than could be effectively accommodated in a single group. Consequently, a second stakeholder group was established. Known as the Technical Advisory Committee (TAC), this group was populated with individuals with a background in engineering, infrastructure design, and other technical backgrounds. This allowed for a different type of discussion than was possible with the CAG. The TAC is primarily composed of representatives from Metro Transit, EWG, Saint Louis County Highways and Traffic, MoDOT, and Lambert-Saint Louis International Airport.

To engage the TAC, a series of workshops were planned/held. The TAC meeting summaries are contained in **Appendix C**.

6.6.1 TAC Workshop 1

The first TAC workshop was held on May 28, 2013, at the MoDOT Transportation Management Center. The meeting focused on introducing the study and introducing the participants.

CH2M Project Manager Buddy Desai facilitated the meeting. His presentation included the following information:

- **Project Details**—The purpose of performing an EA was explained including a discussion of the expanded study area from I-70 to the Mississippi River, the desire to maintain flexibility for innovative contracting methods, and the study's aggressive 18-month schedule, which will require efficient review periods and timely input.
- **Role of the Technical Advisory Committee**—As the technical staff for their respective agencies, the goal is to receive input/advise during the development, analysis, refinement, and selection of study solutions.
- **Project Context**—A summary of the conditions and context of the existing corridor was presented.

The remainder of the meeting was an open discussion regarding the importance and meaning of the I-270 North EA to the participants. TAC members provided many detailed opinions and much specific study-related data. The meeting summary contains extensive specifics on the participants' opinions.

6.6.2 TAC Workshop 2

TAC Workshop 2 was held on June 20, 2013, at the MoDOT Transportation Management Center. The meeting focused on corridor planning and corridor sizing.

TAC Workshop 2 proceeded with CH2M Project Manager Buddy Desai facilitating the meeting. The presentation, given by CH2M Senior Technical Advisor Tim Neuman, covered the following topics:

- Existing conditions and projected traffic
- Infrastructure conditions
- Lane continuity
- Existing LOS
- Existing land use

The concept of corridor sizing around a master or ultimate planning vision for the corridor was presented. The building blocks for corridor planning is the basic number of continuous lanes along the corridor, which define the base capacity. In terms of a basic lane plan, there is an important distinction between having a plan and implementing a plan. Having a long-term basic lane plan does not obligate any individual project to construct the full basic lane plan. It simply allows each individual project to be designed and constructed in such a way that it does not preclude the ultimate basic lane plan from being constructed in the future or result in the tear out and replacement of infrastructure that has not met its design life.

MAP-21 establishes performance-based planning and decision-making. American Association of State Highway and Transportation Officials (AASHTO) has developed a number of recommended performance measures based on goal areas specified by MAP-21.

The remainder of the meeting was an open discussion and a group exercise associated with performance measures.

6.6.3 TAC Workshop 3

TAC Workshop 3 was held on October 8, 2013. The goals of this workshop were to discuss the principles of freeway planning, to examine the process for alternatives development, and to present the available portions of the Conceptual Alternatives. The details of each alternative were described and discussed.

6.6.4 TAC Workshop 4

TAC Workshop 4 was held on November 18, 2013. The goals of this workshop were to present the Conceptual Alternatives for the full corridor and to discuss the performance measures to be used to analyze them. To allow for more detailed attention, the TAC was broken into two groups. Each was given roughly 2 hours of review.

6.6.5 TAC Workshop 5

A fifth TAC workshop was held on November 13, 2014. The workshop presented and discussed the Preferred Alternative. The Preferred Alternative presentation discussed (1) study history, 2) flexibility in design, 3) the Preferred Alternative, and 4) next steps. The remainder of the meeting allowed for one-on-one review of the Preferred Alternative. This provided the opportunity to review and provide feedback on the Preferred Alternative.

6.6.6 2016 TAC Update

A letter was sent to the TAC members before the study resumed. The letter is the same as provided to the regulatory agencies and contained in **Appendix C.** It provides the members with the data they need to understand the status of the study, the Preferred Alternative, the anticipated conclusion of the NEPA process, and the nature of the available funding for design, right-of-way, or construction.

6.7 Public Involvement Meetings

Public meetings represent an important opportunity for direct engagement with the larger, general public. Two public informational meetings were held.

Both meetings were open houses and interactive. Study team members staffed display boards and were available to discuss, explain, and help attendees understand the information so they could provide

feedback. Comment forms were available. Tape recorders were also on hand for attendees who preferred to leave oral comments.

The public meetings were announced using a variety of methods (**Figure 6-3**), including emails to people on the study's mailing list, the study's website, study newsletters, organizations' newsletters, advertisements, flyers, church bulletins, media, social media.

6.7.1 Public Informational Meeting 1

The meeting was held on July 30, 2013, at Saint Louis Community College at Florissant Valley. The purpose of the open house was for attendees to learn about the study and to share their experiences traveling the corridor. This information was intended to help the study team develop solutions.

Eighty-five people attended the open house. Study team members manned five stations that included 30 informational display boards. The stations included (1) a study overview, (2) a review of NEPA, (3) a summary of the issues, goals, and vision for I-270, (4) a discussion of performance measures, and (5) a station for involvement and input.

The heart of the meeting was Station #3, which included large-scale corridor maps where attendees could mark on the maps with dots where they encounter problems when traveling the area. Study team members were on hand at the stations to document the dots and any corresponding information attendees provided. Participants could also mark locations on the maps where they knew of any environmental issues.

There were six questions on the comment form with a seventh area for any additional comments. Fifty-seven attendees completed a comment form. Additionally, five people completed a comment form online and one person mailed comments. Thus, 63 people provided input.

The most important solution to attendees is upgrading the interchanges/intersections followed by addressing the safety concerns at the slip ramps. A more detailed summary of the comment forms is contained in the meeting summary in **Appendix C**.

MoDOT News Release

Jack Wang, MoDOT Multimedia Services/Customer Relations

July 30, 2013

Public Shares Experiences Traveling I-270 North at Open House

ST. LOUIS - Residents living in North St. Louis County shared their experiences traveling along I-270 tonight as part of a public open house sponsored by the Missouri Department of Transportation (MoDOT). The open house at St. Louis Community College at Florissant Valley was the first public event for the recently launched *I-270 North Environmental Assessment*. This 18-month environmental study will propose solutions for the corridor from the I-70 interchange to the Chain of Rocks Bridge. "We wanted to hear directly from citizens about the problems and issues they face traveling along this section of I-270," said Larry Welty, North Area Engineer at MoDOT. "Their input will help us define the transportation problem that needs to be solved and the information to support it. This is an important first step in an environmental study." During the next several months, solutions will be identified and evaluated for their potential social, economic and environmental impact. Considering such impacts early in the planning process allows for them to be avoided, minimized or mitigated. This is all part of the environmental study, which is required by the federal government under the National Environmental Policy Act of 1969 (NEPA).

I-270 is a vital commuter and commercial corridor that connects five interstates and several other routes in the St. Louis Metropolitan Area. The study is intended to address safety, mobility, congestion, accessibility, and aging infrastructure along I-270 in North St. Louis County. If nothing is done to improve the corridor, the current traffic, safety and infrastructure problems will continue to worsen.

The study will conclude in the fall of 2014 when the Federal Highway Administration (FHWA) reviews and approves the study's findings and conclusions. For more information about the *I-270 North Environmental Assessment*, visit www.modot.gov/stlouis/I-270North.htm

Figure 6-3. News Release for Public Involvement Meeting 1

6.7.2 Public Informational Meeting 2

Public Informational Meeting 2 was held on March 18, 2014, at the Hazelwood Civic Center East. The purpose of the open house was for attendees to learn about the study's Reasonable Alternatives.

Ninety-two people attended the open house. Study team members manned five stations that included the following:

1. Project Overview—This station included an overview video describing the study.
2. Purpose and Need—This station summarized the transportation problems that this study will address.
3. Alternatives—This station presented the Reasonable Alternatives.
4. Impacts and Benefits—This station discussed how the potential solutions will perform.
5. Input and Next Steps—Comment forms manual and iPads versions were available.

The heart of the meeting was Station #3, which included large-scale maps depicting the Reasonable Alternatives (**Figure 6-4**). Copies were mounted to the meeting room halls. Other copies were mounted to long tables. Study team members were on hand to explain the alternatives under consideration.

The preferences expressed at the meeting are summarized in **Table 6-2**. A more detailed summary of the comment forms is contained in the meeting summary in **Appendix C.**

In addition to the physical meeting, virtual public meetings were held on March 19, 2014 (at noon), and March 20, 2014 (at 8:00 pm). These live chat sessions presented the same information as the physical meeting. They also included a narrated study overview video, as well as four videos explaining the various Reasonable Alternatives along the corridor. Although the virtual attendance was low, it furthered the study team's efforts to engage as many stakeholders as possible.

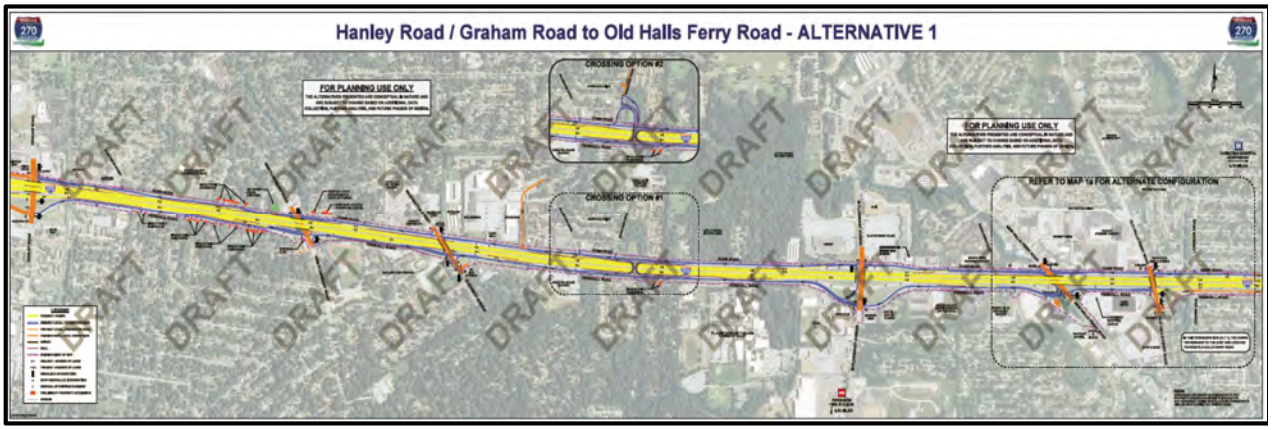

Figure 6-4. Typical Example of Public Informational Meeting 2 Exhibit

6.8 Project Website

A study website (**Figure 6-5**) was developed to serve as the main portal for all information regarding the EA. Visitors are able to learn about the study, get updates, and download the technical documents. They are also able to submit comments and sign up for the study's mailing list. For those unable to attend the public meetings, the information displayed at these meetings are uploaded to the website, along with comment forms so they can participate electronically.

The study website is located at http://www.I-270North.org.

Figure 6-5. I-270 North EA Website

6.9 Communications Materials

As part of the process to kick-off this complex study, two handouts were developed. These were intended as broad summaries that could be distributed to anyone interested in the study.

The first was a fact sheet. It describes the EA, its purpose, and the process, including a timeline. The purpose of the fact sheet is to help ensure that the correct study information is being communicated to the public.

The second handout was an informational newsletter. This newsletter introduced the study, outlined important milestones, and announced the first public open house.

These documents are contained in **Appendix C**.

Table 6-2. Reasonable Alternative Preferences at Informational Meeting 2 on March 18, 2014

Reasonable Alternative	Description	Percentage of PIM #2 Respondents Viewing the Configuration as "Very Beneficial' or "Beneficial"
AREA 1: I-70 TO MCDONNELL BOULEVARD		
ST. CHARLES ROCK ROAD		
Alternative 1	Diverging Diamond Interchange	80 percent
Alternative 2	Diamond Interchange	28 percent
MCDONNELL BOULEVARD		
Alternative 1	Diverging Diamond Interchange	76 percent
Alternative 2	Partial Cloverleaf Interchange	41 percent
AREA 2: EAST OF MCDONNELL BOULEVARD TO HANLEY ROAD/GRAHAM ROAD		
LINDBERGH BOULEVARD		
Alternative 1	Partial Cloverleaf Interchange	73 percent
AREA 3: HANLEY ROAD/GRAHAM ROAD TO OLD HALLS FERRY ROAD		
HANLEY ROAD/GRAHAM ROAD		
Alternative 1	Diamond Interchange (One-Way Dunn/Pershall)	78 percent
Alternative 2	Diamond Interchange (Two-Way Dunn/Pershall)	32 percent

Table 6-2. Reasonable Alternative Preferences at Informational Meeting 2 on March 18, 2014

Reasonable Alternative	Description	Percentage of PIM #2 Respondents Viewing the Configuration as "Very Beneficial' or "Beneficial"
NEW FLORISSANT ROAD TO WASHINGTON STREET/ELIZABETH AVENUE		
Alternative 1	Split Diamond Interchange (One-Way Dunn/Pershall)	78 percent
Alternative 2	Split Diamond Interchange (Two-Way Dunn/Pershall)	32 percent
WEST FLORISSANT AVENUE TO OLD HALLS FERRY ROAD		
Alternative 1	Split Diamond (to Old Halls Ferry – One-Way)	73 percent
Alternative 1a	Split Diamond (to New Halls Ferry – One-Way)	76 percent
Alternative 2	Split Diamond (to New Halls Ferry – Two-Way)	73 percent
Alternative 2a	Split Diamond (to Old Halls Ferry – Two-Way)	73 percent
AREA 4: EAST OF OLD HALLS FERRY ROAD TO RIVERVIEW DRIVE		
ROUTE 367		
Alternative 1	Partial Cloverleaf Interchange	76 percent
BELLEFONTAINE ROAD		
Alternative 1	Diamond Interchange	59 percent
Alternative 2	Partial Cloverleaf Interchange	30 percent
LILAC AVENUE		
Alternative 1	Diamond Interchange	54 percent
Alternative 2	Partial Cloverleaf Interchange	22 percent
RIVERVIEW DRIVE		
Alternative 1	Diamond Interchange with Two-Way Dunn Road	63 percent
Alternative 2	Partial Cloverleaf Interchange	42 percent

1

SECTION 7

References

7.1 Environmental Laws and Regulations

Federal Statutes

- ADA, 42 USC
- Civil Rights Act of 1964, 42 USC 2000d et seq.
- Clean Air Act of 1970, 42 USC 7401
- Clean Water Act of 1972, 33 USC 1251 et seq.
- CERCLA of 1980, as amended by the SARA of 1986, 42 USC 103
- Department of Transportation Act of 1966, 49 USC 303
- Endangered Species Act of 1973, 16 USC 1531
- Federal Water Pollution Control Act of 1972
- LWCF Act of 1964
- NEPA of 1969, 42 USC 4321
- NHPA of 1966, Section 106, 16 USC 470
- RCRA, 42 USC 6901
- Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, 23 USC 101
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970

Federal Regulations

- 23 CFR 650A, Location and Hydraulic Design of Encroachments on Flood Plains
- 23 CFR 652, Pedestrian and Bicycle Accommodations and Projects
- 23 CFR 771, Environmental Impact and Related Procedures
- 23 CFR 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise
- 36 CFR 60, NRHP
- 36 CFR 800, Protection of Historic Properties
- 40 CFR 93, Determining Conformity of Federal Actions to State or Federal Implementation Plans
- 40 CFR 1508, Terminology and Index

Executive Orders

- EO 11988, Floodplain Management
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Federal Agency Orders

- DOT Order 5610.2, Environmental Justice in Minority Populations and Low-Income Populations
- DOT Order 5650.2, Floodplain Management and Protection
- DOT Order 5680.1, Final Order to Address Environmental Justice in Minority Populations and Low-Income Populations
- DOT Order 6510.2, EJ
- DOT Order 6640.23, FHWA Actions to Address Environmental Justice In Minority Populations and Low-Income Populations

Federal Agency Guidance Documents

- CEQ EJ, Guidance Under NEPA
- FHWA Guidance on EJ and NEPA
- FHWA Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents

State of Missouri Statutes

- Missouri State Regulations 3 CSR 10-4.111, Wildlife Code: General Provisions, Endangered Species
- Missouri State Regulations 10 CSR 10-5.480, Saint Louis Area Transportation Conformity Requirements
- Missouri State Regulations 10 CSR 10-6.010, Ambient Air Quality Standards
- Missouri State Regulations 10 CSR 20-7, Water Quality

7.2 Reference Documents

- AASHTO, *A Policy on Geometric Design of Highways and Streets*, 2004.
- AASHTO, *Roadside Design Guide*, 4th Edition, 2011.
- Association of American Railroads, Rail Intermodal Keeps America Moving. http://www.aar.org/Economy/~/media/AAR/BackgroundPapers/Intermodal20Nov202009.ashx.
- CEQ, NEPA's Forty Most Asked Questions. http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm.
- DOT, Federal Transit Administration, and EWG, *Metro South Study – Alternative Analysis and Draft EIS*, 2005.
- EWG, *Air Quality Conformity Determination and Documentation (8-Hour O_3 and $PM_{2.5}$) for the Regional Transportation Plan 2040 and the 2012–2015 Transportation Improvement Program (Fiscal years 2012-2015 TIP),* June 2011.
- EWG, *Regional Transportation Plan 2040* (RTP 2040), June 29, 2011.
- EWG, *Regional Transportation Plan 2040*, 2011.
- EWG, Regional Transportation Plan 2045 (Connect 2045)
- EWG, *St. Louis County's Strategic Transportation Infrastructure Plan for Renewing the Region and Promoting Sustainable Growth*, 2011.
- Farmland Protection Policy Act, 7 USC 4201, et seq. http://www.farmlandinfo.org/index.cfm?function=article_view&articleID=29480. Accessed March 29, 2012.
- Federal Transit Administration, EWGCOG, Metro Transit, and MoDOT, *Saint Louis Metro South MetroLink Extension EA,* 2005.
- FEMA, *Flood Insurance Rate Maps, City of St. Louis*, Missouri.
- FEMA, *Flood Insurance Rate Maps, St. Louis County*, Missouri.
- FHWA, *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, 2011
- FHWA, *FHWA Highway Traffic Noise: Analysis and Abatement Guidance*, FHWA-HEP-10-025, December 2011.
- FHWA, *Freight Analysis Framework*. http://www.ops.fhwa.dot.gov/freight/index.cfm.
- FHWA, *Guidance for Preparing and Processing Environmental and Section (F) Documents*, October 20, 1987.

- FHWA, Office of Planning, Environment and Realty, Project Development and Environmental Review, *Section 4(f) Policy Paper,* July 20, 2012. http://www.environment.fhwa.dot.gov/4f/4fpolicy.asp. Accessed September 3, 2012.
- FHWA, *Travel Model Improvement Program*, Volpe National Transportation Systems Center, USDOT, April 27, 2009. http://media.tmiponline.org/clearinghouse/tmip/peer_review/evaluation/evaluation.pdf.
- LWCF Act, 16 USC 4601-4 et seq, 1964.
- MDNR, Ambient Air Quality Standards, Missouri 10 CSR 10-6.010, July 31, 2011. http://www.dnr.mo.gov/env/esp/aqm/standard.htm.
- MDNR, Website: http://dnr.mo.gov/env/wpp/waterquality/305b/.
- MDNR, Website: http://dnr.mo.gov/env/wpp/waterquality/303d.htm.
- Metro Transit, *Moving Transit Forward: Saint Louis Regional Long-Range Transit Plan Executive Summary*, 2010.
- Metro Transit, *Moving Transit Forward: St. Louis Regional Long-Range Transit Plan*, 2010.
- MoDOT, *District 6 Traffic Volume and Commercial Vehicle Count Map*, 2010.
- MoDOT, *Engineering Policy Guide*.
- MoDOT, *Policy Statement on Highway Noise Abatement*, effective July 13, 2011. http://epg.modot.org/index.php?title=127.13_Noise.
- NHPA, 16 USC 470f, Section 106, 1966.
- Parsons Brinckerhoff Quade & Douglas Inc., *St. Louis County Arterial Study – Existing and Future Conditions*, April 30, 2003.
- Parsons Brinckerhoff Quade & Douglas, Inc., *Saint Louis County Arterial Study* (South Study Area), 2005.
- Realtor.com search, conducted May 2014.
- St. Louis County Department of Highways and Traffic, *Summary of Automatic Traffic Volume Counts*, revised December 31, 2007.
- St. Louis County, *Access Management Guidelines*, June 2008. http://www.stlouisco.com/Portals/8/docs/Document%20Library/highways/Publications/access_management_guidelines_06-2008.pdf.
- St. Louis County, *Design Criteria for the Preparation of Improvement Plans.* http://www.stlouisco.com/Portals/8/docs/Document%20Library/highways/Design_Criteria/sec50_40.pdf.
- St. Louis County, *St. Louis County Strategic Plan*, 2012.
- St. Louis County, *St. Louis County's Transportation Vision for 2030 and Beyond*, 2011.
- Strategic Land Use Plan, *Map of the St. Louis Comprehensive Plan*, 2005.
- Texas A&M Transportation Institute, *2011 Annual Urban Mobility Report*.
- Transportation Research Board, *Highway Capacity Manual*, 2010.
- U.S. Census Bureau, *2006–2010 American Community Survey Estimate*.
- U.S. Census Bureau, American Fact Finder. http://factfinder2.census.gov.

- U.S. Census Bureau, U.S. Census Bureau Data, 2010. http://www.Census.gov/hhes/www/poverty/data/incpovhlth/2010/tables.html.
- U.S. Department of Agriculture, Soil Conservation Service, *Soil Survey of the District of Columbia*, July 1976. http://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/district_of_columbia/DC1976/DC1976.pdf.
- U.S. Department of Justice, *2010 ADA Standard for Accessible Design*, September 15, 2010.
- USFWS, Endangered Species, Online Database. http://www.fws.gov/midwest/endangered/lists/missouri-cty.html. Accessed February 2012.