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\textsubscript{2}), ozone (O\textsubscript{3}), particulate matter (PM) (PM less than 10 and
2.5 microns in aerodynamic diameter [PM\textsubscript{10} and PM\textsubscript{2.5}]), sulfur dioxide (SO\textsubscript{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>
<thead>
<tr>
<th>Pollutant</th>
<th>Period</th>
<th>Primary Standard</th>
<th>Secondary Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>O\textsubscript{3}</td>
<td>8-hour</td>
<td>0.070 parts per million (ppm)</td>
<td>0.070 ppm</td>
</tr>
<tr>
<td>CO</td>
<td>1-hour</td>
<td>35 ppm</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>9 ppm</td>
<td>None</td>
</tr>
<tr>
<td>SO\textsubscript{2}</td>
<td>3-hour</td>
<td>None</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>1-hour</td>
<td>75 parts per billion (ppb)</td>
<td>None</td>
</tr>
<tr>
<td>NO\textsubscript{2}</td>
<td>Annual</td>
<td>53 ppb</td>
<td>53 ppb</td>
</tr>
<tr>
<td></td>
<td>1-hour</td>
<td>100 ppb</td>
<td>None</td>
</tr>
<tr>
<td>PM\textsubscript{10}</td>
<td>24-hour</td>
<td>150 micrograms per cubic meter (µg/m\textsuperscript{3})</td>
<td>150 µg/m\textsuperscript{3}</td>
</tr>
<tr>
<td>PM\textsubscript{2.5}</td>
<td>Annual</td>
<td>12 µg/m\textsuperscript{3}</td>
<td>15 µg/m\textsuperscript{3}</td>
</tr>
<tr>
<td></td>
<td>24-hour</td>
<td>35 µg/m\textsuperscript{3}</td>
<td>35 µg/m\textsuperscript{3}</td>
</tr>
<tr>
<td>Lead</td>
<td>3-month</td>
<td>0.15 µg/m\textsuperscript{3}</td>
<td>0.15 µg/m\textsuperscript{3}</td>
</tr>
</tbody>
</table>

Source: MDNR, Missouri 10 CSR 10-6.010 Ambient Air Quality Standards, updated April 21, 2016,
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)](image-url)
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 transportation 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.
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 NOx. 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 NOx. 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
terribly 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
SECTION 4 AFFECTED ENVIRONMENT AND IMPACTS

Table 4-3. Fire Stations in the Study Area

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

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

1. 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.

2. 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.

3. 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.

4. 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

<table>
<thead>
<tr>
<th>Facility</th>
<th>Address</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bellefontaine Habilitation Center</td>
<td>10695 Bellefontaine Road</td>
<td>Bellefontaine Neighbors</td>
</tr>
<tr>
<td>Christian Hospital</td>
<td>11133 Dunn Road</td>
<td>St. Louis</td>
</tr>
<tr>
<td>Christian Hospital Northwest</td>
<td>1225 Graham Road</td>
<td>Florissant</td>
</tr>
<tr>
<td>De Paul Health Center</td>
<td>12303 De Paul Drive</td>
<td>Bridgeton</td>
</tr>
</tbody>
</table>

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

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

### 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

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

**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.
Cultural Resources: Important Historic Resources Identified during the Archival Review

Legend
- Environmental Assessment Study Area
- National Register of Historic Places Site
- St. Louis City Boundary
- City/County Boundary
- Bridges and Culverts that may require Section 106 Evaluation
- Archaeological Site with Moderate Potential for Intact Resources

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 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.
In this area, the primary change in I-270 will be the addition of a U-Turn Ramp.

The Preferred Alternative has been modified to eliminate any building or property acquisition with the Ferguson Pine Meadows 1st Addition Historic District. A minor amount of property acquisition is required from a neighboring parcel.

Legend

Ferguson Pine Meadows 1st Addition District

- **Blue**: Contributing
- **Teal**: Non-Contributing

- **Black**: Existing Right-of-Way
- **Yellow**: Property Acquisition - Preferred Alternative
- **Gray**: Structures

1 inch = 400 feet
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.
SECTION 4 AFFECTED ENVIRONMENT AND IMPACTS

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>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Louis County</td>
<td>993,529</td>
<td>1,016,315</td>
<td>998,954</td>
<td>0.5%</td>
</tr>
<tr>
<td>St. Louis City</td>
<td>396,685</td>
<td>348,189</td>
<td>319,254</td>
<td>-19%</td>
</tr>
<tr>
<td>St. Charles County</td>
<td>212,907</td>
<td>283,883</td>
<td>360,485</td>
<td>69%</td>
</tr>
<tr>
<td>I-270 North EA Study Area</td>
<td>163,210</td>
<td>155,609</td>
<td>147,015</td>
<td>-10%</td>
</tr>
</tbody>
</table>

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

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


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.
SECTION 4 AFFECTED ENVIRONMENT AND IMPACTS

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

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Typical Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray bat (<em>Myotis grisescens</em>)</td>
<td>Endangered</td>
<td>Caves, stream corridors near caves.</td>
</tr>
<tr>
<td>Indiana bat (<em>Myotis sodalis</em>)</td>
<td>Endangered</td>
<td>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.</td>
</tr>
<tr>
<td>Northern long-eared bat</td>
<td>Threatened</td>
<td>Hibernacula: caves and mines; summer habitat: similar to Indiana but will also use trees with cavities, cracks, and splits.</td>
</tr>
<tr>
<td><em>Myotis septentrionalis</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pallid sturgeon (<em>Scaphirhynchus albus</em>)</td>
<td>Endangered</td>
<td>Mississippi and Missouri rivers</td>
</tr>
<tr>
<td>Decurrent false aster (<em>Boltonia decurrens</em>)</td>
<td>Threatened</td>
<td>Disturbed alluvial soils</td>
</tr>
</tbody>
</table>
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 northeast from the I-270/Rte. H (Riverview Dr.) interchange. 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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Potential Habitat</th>
<th>No Potential Habitat (at this time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016 – 2025</td>
<td>2.4 acres</td>
<td>1.2 acres</td>
</tr>
<tr>
<td>2016 – 2035</td>
<td>254 acres</td>
<td>2.1 acres</td>
</tr>
<tr>
<td>2026 – 2035</td>
<td>34.3 acres</td>
<td>22.1 acres</td>
</tr>
<tr>
<td>2036 – 2045</td>
<td>10.4 acres</td>
<td>4.0 acres</td>
</tr>
<tr>
<td>Total</td>
<td>49.6 acres</td>
<td>29.4 acres</td>
</tr>
</tbody>
</table>

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.
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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. These populations are more heavily distributed in the eastern two-thirds of the study area.

Table 4-11. Percentage of Population by Ethnic Background

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

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

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


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

<table>
<thead>
<tr>
<th>Population</th>
<th>Under 18</th>
<th>Over 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Louis County</td>
<td>23.5%</td>
<td>14.9%</td>
</tr>
<tr>
<td>St. Louis City</td>
<td>21.5%</td>
<td>11.2%</td>
</tr>
<tr>
<td>St. Charles County</td>
<td>24.9%</td>
<td>12.6%</td>
</tr>
<tr>
<td>I-270 North EA Study Area</td>
<td>24.3%</td>
<td>13.9%</td>
</tr>
<tr>
<td>Missouri</td>
<td>23.5%</td>
<td>14.3%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Population</th>
<th>Percent with Zero-Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Louis County</td>
<td>6.8%</td>
</tr>
<tr>
<td>St. Louis City</td>
<td>21.4%</td>
</tr>
<tr>
<td>St. Charles County</td>
<td>3.4%</td>
</tr>
<tr>
<td>I-270 North EA Study Area</td>
<td>6.4%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Address</th>
<th>Status</th>
<th>Actions</th>
<th>Material(s)</th>
<th>Map Location of 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Former Sweeny Sunoco</td>
<td>3063 McKelvey</td>
<td>Empty Lot</td>
<td>MDNR legal review</td>
<td>Petroleum</td>
<td>1</td>
</tr>
<tr>
<td>One Hour Cleaner</td>
<td>8482 Pershall Road</td>
<td>Active</td>
<td>No reported releases</td>
<td>Chlorinated solvents</td>
<td>6</td>
</tr>
<tr>
<td>Bernadette Print Group and</td>
<td>8950 Pershall Road</td>
<td>Closed</td>
<td>Former smaller quantity generator with past violations</td>
<td>VOCs</td>
<td>6</td>
</tr>
<tr>
<td>Bernadette Business Forms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interlock Pharmacy Systems LLC</td>
<td>345 Dunn</td>
<td>Active</td>
<td>Large quantity generator and hazardous waste biennial reporter</td>
<td>Heavy metals, ignitable hazardous</td>
<td>7</td>
</tr>
<tr>
<td>Allied Systems and Metro Truck</td>
<td>9050 A and B Pershall</td>
<td>Closed</td>
<td>Closed site with active aboveground gasoline pumps</td>
<td>Petroleum</td>
<td>6</td>
</tr>
<tr>
<td>One Hour Cleaner</td>
<td>8410 Pershall Road</td>
<td>Active</td>
<td>Conditionally exempt small quantity generator</td>
<td>Chlorinated solvents</td>
<td>7</td>
</tr>
<tr>
<td>Paramount Dry Cleaners</td>
<td>62 Grandview Plaza</td>
<td>Closed</td>
<td>No reported releases</td>
<td>Chlorinated solvents</td>
<td>8</td>
</tr>
<tr>
<td>Shell/Circle K Gas Station</td>
<td>1545 New Florissant</td>
<td>Active</td>
<td>Active groundwater monitoring program</td>
<td>Petroleum and chlorinated solvents</td>
<td>7</td>
</tr>
<tr>
<td>Ryder Truck</td>
<td>12655 Pennridge</td>
<td>Active</td>
<td>Reported LUST</td>
<td>Petroleum</td>
<td>2</td>
</tr>
<tr>
<td>Former Grandview Texaco</td>
<td>1625 Dunn Road</td>
<td>Empty Lot</td>
<td>Historic gas station</td>
<td>Petroleum</td>
<td>12</td>
</tr>
<tr>
<td>Gateway Cleaners</td>
<td>11294 Florissant</td>
<td>Empty Lot</td>
<td>No reported releases</td>
<td>Chlorinated solvents</td>
<td>9</td>
</tr>
<tr>
<td>Dunn Road ZX</td>
<td>3555 Dunn Road</td>
<td>Active</td>
<td>Active groundwater monitoring program</td>
<td>Petroleum</td>
<td>9</td>
</tr>
<tr>
<td>GEM Cleaner</td>
<td>1795 Dunn Road</td>
<td>Empty Lot</td>
<td>USTs removed and No Further Action issued</td>
<td>Chlorinated solvents</td>
<td>8</td>
</tr>
<tr>
<td>Former Circle K</td>
<td>11011 Bellefontaine</td>
<td>Empty Lot</td>
<td>LUST and MDNR action</td>
<td>Petroleum</td>
<td>12</td>
</tr>
<tr>
<td>MO Cigarette and Liquor Outlet</td>
<td>1375 Dunn Road</td>
<td>Active</td>
<td>Historic LUST and MDNR action</td>
<td>Petroleum</td>
<td>12</td>
</tr>
<tr>
<td>Production Products</td>
<td>1285 Dunn Road</td>
<td>Active</td>
<td>Former international paper company facility</td>
<td>Paper-making chemicals</td>
<td>12</td>
</tr>
<tr>
<td>Bellefontaine BP</td>
<td>10846 and 10844</td>
<td>Active</td>
<td>Leaking UST reported</td>
<td>Petroleum</td>
<td>12</td>
</tr>
<tr>
<td>Former Zephyr Service Station</td>
<td>1173 Dunn Road</td>
<td>Empty Lot</td>
<td>No cleanup or closure records</td>
<td>Petroleum</td>
<td>12</td>
</tr>
<tr>
<td>Former Airfield Improvement &amp;</td>
<td>801 Dunn Road</td>
<td>Empty Lot</td>
<td>No cleanup or closure records</td>
<td>Undetermined</td>
<td>7</td>
</tr>
<tr>
<td>Repair</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jomico Metal Fabricators</td>
<td>1194 Pershall Road</td>
<td>Active</td>
<td>Large quantity generator</td>
<td>Multiple chemicals, corrosive waste</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>and wastewater sludge</td>
<td></td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>Land Use</th>
<th>Percentage of Study Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-Family</td>
<td>38.8%</td>
</tr>
<tr>
<td>Vacant/Agriculture</td>
<td>17.0%</td>
</tr>
<tr>
<td>Industrial/Utility</td>
<td>12.7%</td>
</tr>
<tr>
<td>Commercial</td>
<td>10.6%</td>
</tr>
<tr>
<td>Institution</td>
<td>9.2%</td>
</tr>
<tr>
<td>Multi-Family</td>
<td>5.2%</td>
</tr>
<tr>
<td>Park/Recreation</td>
<td>3.4%</td>
</tr>
<tr>
<td>Common Ground/Open Space</td>
<td>3.1%</td>
</tr>
</tbody>
</table>

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 Alternative 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**

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Reasonable Alternative 1 (excluding 1a)</th>
<th>Reasonable Alternative 2 (excluding 2a)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Impact (acres)</td>
<td>Percentage of Total Impacted Area</td>
</tr>
<tr>
<td>Commercial</td>
<td>16</td>
<td>43%</td>
</tr>
<tr>
<td>Single Family</td>
<td>7</td>
<td>20%</td>
</tr>
<tr>
<td>Industrial/Utility</td>
<td>6</td>
<td>16%</td>
</tr>
<tr>
<td>Vacant/Agriculture</td>
<td>4</td>
<td>12%</td>
</tr>
<tr>
<td>Institution</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td>Multi Family</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Recreation</td>
<td>&lt;1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Common Ground/Open Space</td>
<td>&lt;1</td>
<td>&lt;1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>36</strong></td>
<td><strong>79</strong></td>
</tr>
</tbody>
</table>

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.
I-270 North EA: Land Use Map

Legend
- Environmental Assessment Study Area
- St. Louis City Boundary
- City/County Boundary

Land Use
- Duplex/Townhome
- Park
- Recreational
- Commercial
- Industrial/Utility
- Single Family
- Multi-Family
- Vacant/Agriculture

1 inch = 2 miles

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

<table>
<thead>
<tr>
<th>Activity Category</th>
<th>Activity Criteria</th>
<th>Evaluation Location</th>
<th>Activity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>57 60</td>
<td>Exterior</td>
<td>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.</td>
</tr>
<tr>
<td>B</td>
<td>67 70</td>
<td>Residential</td>
<td>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.</td>
</tr>
<tr>
<td>C</td>
<td>67 70</td>
<td>Exterior</td>
<td>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.</td>
</tr>
<tr>
<td>D</td>
<td>52 55</td>
<td>Interior</td>
<td>Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.</td>
</tr>
<tr>
<td>E</td>
<td>72 75</td>
<td>Exterior</td>
<td>Undeveloped lands that are not permitted for development.</td>
</tr>
</tbody>
</table>

Notes:

1. The $L_{eq}$ and $L_{10}$ 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.
SECTION 4 AFFECTED ENVIRONMENT AND IMPACTS

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

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)

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

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

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Reasonable Alternative Description</th>
<th>Preliminary Property Acquisition Estimates</th>
<th>Acquisition Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Partial Acquisition (acres)</td>
<td>Full Acquisition (acres)</td>
</tr>
<tr>
<td>AREA 1: I-70 TO MCDONNELL BOULEVARD</td>
<td></td>
<td>Parcels</td>
<td>Parcels</td>
</tr>
<tr>
<td>Reasonable Alternative 1</td>
<td>Diverging Diamond Interchanges at St. Charles Rock Road and McDonnell Boulevard</td>
<td>1.6</td>
<td>0</td>
</tr>
<tr>
<td>Reasonable Alternative 2</td>
<td>Diamond Interchange at St. Charles Rock Road and Partial Cloverleaf at McDonnell Boulevard</td>
<td>5.6</td>
<td>2.3</td>
</tr>
<tr>
<td>AREA 2: EAST OF MCDONNELL BOULEVARD TO HANLEY ROAD/GRAHAM ROAD</td>
<td>Partial Cloverleaf Interchange at Lindbergh Boulevard</td>
<td>3.8</td>
<td>0.0</td>
</tr>
<tr>
<td>AREA 3: HANLEY ROAD/GRAHAM ROAD TO OLD HALLS FERRY ROAD</td>
<td>Diamond and Split Diamond Interchanges with One-Way Dunn/Pershall (Split Diamond between West Florissant to Old Halls Ferry)</td>
<td>12.7</td>
<td>8.3</td>
</tr>
<tr>
<td>Reasonable Alternative 1a</td>
<td>Diamond and Split Diamond Interchanges with One-Way Dunn/Pershall (Split Diamond between West Florissant to New Halls Ferry)</td>
<td>12.6</td>
<td>8.3</td>
</tr>
<tr>
<td>Alternative</td>
<td>Reasonable Alternative Description</td>
<td>Preliminary Property Acquisition Estimates</td>
<td>Acquisition Totals</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Partial Acquisition (acres)</td>
<td>Parcels</td>
</tr>
<tr>
<td>Reasonable Alternative 2</td>
<td>Diamond and Split Diamond Interchanges with Two-Way Dunn/Pershall (Split Diamond between West Florissant to New Halls Ferry)</td>
<td>36.4</td>
<td>132</td>
</tr>
<tr>
<td>Reasonable Alternative 2a</td>
<td>Diamond and Split Diamond Interchanges with Two-Way Dunn/Pershall (Split Diamond between West Florissant to Old Halls Ferry)</td>
<td>33.3</td>
<td>111</td>
</tr>
</tbody>
</table>

**AREA 4: EAST OF OLD HALLS FERRY ROAD TO RIVERVIEW DRIVE**

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Reasonable Alternative Description</th>
<th>Preliminary Property Acquisition Estimates</th>
<th>Acquisition Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Partial Acquisition (acres)</td>
<td>Parcels</td>
</tr>
<tr>
<td>Reasonable Alternative 1</td>
<td>Partial Cloverleaf Interchange at MO 367 and Diamond Interchanges at Bellefontaine, Lilac, and Riverview</td>
<td>3.3</td>
<td>14</td>
</tr>
<tr>
<td>Reasonable Alternative 2</td>
<td>Partial Cloverleaf Interchanges at MO 367, Bellefontaine, Lilac, and Riverview</td>
<td>5.1</td>
<td>10</td>
</tr>
<tr>
<td>ALTERNATIVE</td>
<td>REASONABLE ALTERNATIVE DESCRIPTION</td>
<td>PRELIMINARY STRUCTURE ACQUISITION ESTIMATES</td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------</td>
<td>--------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>SAINT CHARLES ROCK ROAD AREA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reasonable Alternative 1</td>
<td>Diverging Diamond Interchange</td>
<td>• None</td>
<td></td>
</tr>
<tr>
<td>Reasonable Alternative 2</td>
<td>Diamond Interchange</td>
<td>• None</td>
<td></td>
</tr>
<tr>
<td><strong>MCDONNELL BOULEVARD AREA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reasonable Alternative 1</td>
<td>Diverging Diamond Interchange</td>
<td>• None</td>
<td></td>
</tr>
</tbody>
</table>
| 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

<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>REASONABLE ALTERNATIVE DESCRIPTION</th>
<th>PRELIMINARY STRUCTURE ACQUISITION ESTIMATES</th>
</tr>
</thead>
</table>
| 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 |
| 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 |
| Reasonable Alternative 1 | Partial Cloverleaf Interchange                                                                  | • None                                                                                                    |
| 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

<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>REASONABLE ALTERNATIVE DESCRIPTION</th>
<th>PRELIMINARY STRUCTURE ACQUISITION ESTIMATES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LILAC AVENUE AREA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reasonable Alternative 1</td>
<td>Diamond Interchange</td>
<td>• None</td>
</tr>
<tr>
<td>Reasonable Alternative 2</td>
<td>Partial Cloverleaf Interchange</td>
<td>• None</td>
</tr>
<tr>
<td><strong>RIVERVIEW DRIVE AREA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reasonable Alternative 1</td>
<td>Diamond Interchange with Two-Way Dunn Road</td>
<td>• None</td>
</tr>
<tr>
<td>Reasonable Alternative 2</td>
<td>Partial Cloverleaf Interchange</td>
<td>• None</td>
</tr>
</tbody>
</table>
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.

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.

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

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.

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>
<thead>
<tr>
<th>Table 4-23. Household Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
</tr>
<tr>
<td>St. Louis County</td>
</tr>
<tr>
<td>St. Louis City</td>
</tr>
<tr>
<td>St. Charles County</td>
</tr>
<tr>
<td>I-270 North EA Study Area</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Employment Status</th>
<th>All Communities in Study Area</th>
<th>St. Louis County, Missouri</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Persons in Category</td>
<td>Percentage of Total</td>
</tr>
<tr>
<td>Population 16 years and over</td>
<td>414,337</td>
<td>795,958</td>
</tr>
<tr>
<td>In labor force</td>
<td>276,996</td>
<td>66.85%</td>
</tr>
<tr>
<td>Civilian labor force</td>
<td>276,661</td>
<td>66.77%</td>
</tr>
<tr>
<td>Employed</td>
<td>239,546</td>
<td>57.81%</td>
</tr>
<tr>
<td>Unemployed</td>
<td>37,115</td>
<td>8.96%</td>
</tr>
<tr>
<td>Armed Forces</td>
<td>335</td>
<td>0.08%</td>
</tr>
<tr>
<td>Not in labor force</td>
<td>137,341</td>
<td>33.15%</td>
</tr>
</tbody>
</table>

### INDUSTRY

<table>
<thead>
<tr>
<th>Industry</th>
<th>All Communities in Study Area</th>
<th>St. Louis County, Missouri</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry, fishing and hunting, and mining</td>
<td>774</td>
<td>0.32%</td>
</tr>
<tr>
<td>Construction</td>
<td>10,099</td>
<td>4.22%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>21,793</td>
<td>9.10%</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>6,058</td>
<td>2.53%</td>
</tr>
<tr>
<td>Retail trade</td>
<td>24,577</td>
<td>10.26%</td>
</tr>
<tr>
<td>Transportation and warehousing and utilities</td>
<td>12,478</td>
<td>5.21%</td>
</tr>
<tr>
<td>Information</td>
<td>6,230</td>
<td>2.60%</td>
</tr>
<tr>
<td>Finance and insurance, and real estate, rental, and leasing</td>
<td>16,875</td>
<td>7.04%</td>
</tr>
<tr>
<td>Professional, scientific, and management, and administrative and waste management services</td>
<td>26,416</td>
<td>11.03%</td>
</tr>
<tr>
<td>Educational services and health care/social assistance</td>
<td>61,248</td>
<td>25.57%</td>
</tr>
<tr>
<td>Arts, entertainment, and recreation, and accommodation and food services</td>
<td>28,631</td>
<td>11.95%</td>
</tr>
<tr>
<td>Other services, except public administration</td>
<td>12,237</td>
<td>5.11%</td>
</tr>
<tr>
<td>Public administration</td>
<td>12,130</td>
<td>5.06%</td>
</tr>
</tbody>
</table>

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.

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.

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.
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.

- **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.

• **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.

• **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.

**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.
SECTION 4 AFFECTED ENVIRONMENT AND IMPACTS

- **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.

- **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

<table>
<thead>
<tr>
<th>Reasonable Alternative</th>
<th>Floodplain Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ST. CHARLES ROCK ROAD</strong></td>
<td></td>
</tr>
<tr>
<td>Reasonable Alternative 1</td>
<td>Diverging Diamond Interchange</td>
</tr>
<tr>
<td>Reasonable Alternative 2</td>
<td>Diamond Interchange</td>
</tr>
<tr>
<td><strong>MCDONNELL BOULEVARD</strong></td>
<td></td>
</tr>
<tr>
<td>Reasonable Alternative 1</td>
<td>Diverging Diamond Interchange</td>
</tr>
<tr>
<td>Reasonable Alternative 2</td>
<td>Partial Cloverleaf Interchange</td>
</tr>
<tr>
<td><strong>LINDBERGH BOULEVARD</strong></td>
<td></td>
</tr>
<tr>
<td>Reasonable Alternative 1</td>
<td>Partial Cloverleaf Interchange</td>
</tr>
<tr>
<td><strong>HANLEY ROAD/GRAHAM ROAD</strong></td>
<td></td>
</tr>
<tr>
<td>Reasonable Alternative 1</td>
<td>Diamond Interchange (One-Way Dunn/Pershall Road)</td>
</tr>
<tr>
<td>Reasonable Alternative 2</td>
<td>Diamond Interchange (Two-Way Dunn/Pershall Road)</td>
</tr>
<tr>
<td><strong>NEW FLORISSANT ROAD TO WASHINGTON STREET/ELIZABETH AVENUE</strong></td>
<td></td>
</tr>
<tr>
<td>Reasonable Alternative 1</td>
<td>Split Diamond Interchange (One-Way Dunn/Pershall Road)</td>
</tr>
<tr>
<td>Reasonable Alternative 2</td>
<td>Split Diamond Interchange (Two-Way Dunn/Pershall Road)</td>
</tr>
<tr>
<td><strong>WEST FLORISSANT AVENUE TO OLD HALLS FERRY ROAD</strong></td>
<td></td>
</tr>
<tr>
<td>Reasonable Alternative 1</td>
<td>Split Diamond Interchange (to Old Halls Ferry — One-Way)</td>
</tr>
<tr>
<td>Reasonable Alternative 1a</td>
<td>Split Diamond Interchange (to New Halls Ferry — One-Way)</td>
</tr>
<tr>
<td>Reasonable Alternative 2</td>
<td>Split Diamond Interchange (to New Halls Ferry — Two-Way)</td>
</tr>
<tr>
<td>Reasonable Alternative 2a</td>
<td>Split Diamond Interchange (to Old Halls Ferry — Two-Way)</td>
</tr>
<tr>
<td><strong>MO 367</strong></td>
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</tr>
<tr>
<td>Reasonable Alternative 1</td>
<td>Partial Cloverleaf Interchange</td>
</tr>
<tr>
<td><strong>BELLEFONTAINE ROAD</strong></td>
<td></td>
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<tr>
<td>Reasonable Alternative 1</td>
<td>Diamond Interchange</td>
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<tr>
<td>Reasonable Alternative 2</td>
<td>Partial Cloverleaf Interchange</td>
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### Table 4-25. Stream and Floodplain Impact Table

<table>
<thead>
<tr>
<th>Reasonable Alternative</th>
<th>LILAC AVENUE</th>
<th>Floodplain Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reasonable Alternative 1</td>
<td>Diamond Interchange</td>
<td>None</td>
</tr>
<tr>
<td>Reasonable Alternative 2</td>
<td>Partial Cloverleaf Interchange</td>
<td>None</td>
</tr>
</tbody>
</table>

| 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
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 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](image)

• **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](image)

• **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.
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.