SCOTT BOULEVARD AND I-70, BOONE COUNTY, MISSOURI

JOB NUMBER:

MoDOT PROJECT NUMBER NOT ASSIGNED

CITY OF COLUMBIA JOB NUMBER: C00312

# ENVIRONMENTAL ASSESSMENT

Submitted Pursuant to 42 U.S.C. 4332(2)(c)

U.S. Department of Transportation
Federal Highway Administration

and

The Missouri Department of Transportation

COOPERATING AGENCIES
U.S. Army Corps of Engineers

| | | |
|---|---|---|
| 8-28-12 | Peggy J. Casey | Program Dev. Team Leader |
| Date of Approval | For FHWA | Title |
| 08-29-12 | | Chief Engineer |
| Date of Approval | For MoDOT | Title |

The following persons may be contacted for additional information concerning this document:


Ms. Peggy Casey
Program Development Team Leader
FHWA Division Office
3220 West Edgewood, Suite H
Jefferson City, Missouri 65109
(573) 638-2620

Mr. Kevin Keith
Director
Missouri Dept. of Transportation
P.O. Box 270
Jefferson City, MO 65102
(573) 751-2803

# Scott Boulevard and I-70
# Final Environmental Assessment:

# Columbia, Boone County, Missouri

The Federal Highway Administration
and Missouri Department of Transportation
City of Columbia, Missouri

**August 2012**

# Table of Contents

# Table of Figures

# Table of Tables

# Appendices

List of Acronyms

| | |
|---|---|
| AJR | access justification report |
| APE | area of potential effect |
| CAA | Clean Air Act |
| CARES | Center for Applied Research and Environmental Systems |
| CATSO | Columbia Area Transportation Study Organization |
| CESQG | Conditionally Exempt Small Quantity Generator |
| Columbia ARC | Columbia Activity and Recreation Center |
| CRP | conservation reserve program |
| CWA | Clean Water Act |
| dB | decibel |
| DCD | diverging crossover diamond |
| EA | environmental assessment |
| EDR | Environmental Data Resources, Inc. |
| EPA | Environmental Protection Agency |
| ERNS | Emergency Response Notification System |
| ESA | Endangered Species Act |
| FEIS | Final environmental impact statement |
| FEMA | Federal Emergency Management Administration |
| FINDs | Facility Index System |
| FHWA | Federal Highway Administration |
| FPPA | Farmland Protection Policy Act |
| FSA | Farm Service Agency |
| GIS | geographic information systems |
| HCM | Highway Capacity Manual |
| HOV | high occupancy vehicle |
| IEA | Interchange Evaluation Area |
| ICU | intersection capacity utilization |
| ITS | intelligent transportation systems |
| LOS | level of service |
| LUST | leaking underground storage tanks |
| LWCF | Land and Water Conservation Fund |
| MDC | Missouri Department of Conservation |
| MDNR | Missouri Department of Natural Resources |
| MKT | Missouri-Kansas-Texas Parkway |
| MoDOT | Missouri Department of Transportation |
| MOE | measures of effectiveness |
| NAAQS | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act |
| NFIP | National Flood Insurance Program |
| NPDES | National Pollution Discharge Elimination System |
| NRCS | Natural Resource and Conservation Service |
| NRHP | National Register of Historic Places |
| NWI | National Wetlands Inventory |
| OHWM | ordinary high water mark |
| RCRA-CESQG | Resource Conservation and Recovery Act-Conditionally Exempt Small Quantity Generator |
| RCRA-NLR | Resource Conservation and Recovery Act-No Longer Regulated |
| PDO | property-damage-only crashes |
| SAFETEA-LU | Safe, Accountable, Flexible, Efficient Transportation Equity Act |
| SEMA | State of Missouri Emergency Management Agency |

| | |
|---|---|
| SDWA | Safe Drinking Water Act |
| SHPO | State Historic Preservation Office |
| SLM | sound level meter |
| TSM | transportation system management |
| TWSC | two-way stop control |
| UPARR | Urban parks and Recreational Recovery Act |
| USACE | United States Army Corps of Engineers |
| USDA | United States Department of Agriculture |
| USDOT | United States Department of Transportation |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| UST | underground storage tanks |
| VHT | vehicle hours traveled |
| VMT | vehicle miles traveled |
| WRP | wetland reserve program |
| WOUS | waters of the United States |

# Executive Summary

The City of Columbia, Missouri, and Boone County, Missouri, are planning to improve access to the area south of I-70 between Perche Creek and Stadium Boulevard, one of the region's key growth areas. Stadium Boulevard is the current access to I-70 for western Columbia, and currently operates at or over capacity. To help alleviate congestion at Stadium Boulevard and to provide the much-needed I-70 access to western and southern Columbia, a new freeway interchange at an extended Scott Boulevard is proposed.

Current levels of congestion put a strain on Stadium Boulevard. Access from I-70 into this part of Columbia is essential for local residents, the local business community centered on Stadium Boulevard and West Broadway, and emergency responders who provide service into this area. Various studies conducted over the past 10 years show a new I-70 interchange west of Stadium Boulevard would help alleviate congestion and improve access into this part of the city. An Access Justification Report (AJR) is being prepared as a parallel effort with the Environmental Assessment (EA).

The Interchange Evaluation Area (IEA) includes the outer limits of all of the interchange/outer road alternatives. Conceptual interchange configurations have been proposed for each alternative. Unknown engineering or other constraints may require a change in where the interchange is located. It is not unusual for interchange configurations to change in the design phase after NEPA approval. The alternatives will be evaluated in this NEPA document, but variations in design are expected during the design phase of the proposed project. This will streamline the NEPA clearance process if a design modification is required.

Preliminary concepts were reviewed by the public and refined to provide four final alternatives for consideration; Green, Brown, Orange and Yellow (**Figure ES-1**).

- The Brown alternative had the highest impacts of all alternatives to forested areas, parks, potential historic resources, and platted land.
- The Orange alternative was developed to the east of Strawn Road and would require an entirely new right-of-way south of I-70.
- The Yellow and Green alternatives were designed to use the existing Strawn Road south of I-70. The Yellow alternative interchange location is the furthest east, and the Green alternative interchange location is the furthest west.

The Yellow alternative was identified as the preferred alternative for a number of reasons: it provides for better spacing between the interchange ramp terminals and the outer road intersection on the north side of I-70; it provides for shorter travel distance for commuters; it does not require widening of the I-70 and Perche Creek bridges, while the Green alternative would require the widening of these bridges to accommodate acceleration and deceleration lanes. This makes the Yellow alternative (preferred) easier to construct with less of an impact to the traveling public. In addition, construction of the Yellow alternative (preferred) on the existing Strawn Road right-of-way is consistent with City of Columbia planning efforts.

Costs for the proposed Scott Boulevard and I-70 Interchange improvements for the Green, Brown, Orange, and Yellow (preferred) alternatives are shown in **Table ES-1**. Total project costs range from approximately $68 million for each of the Green and Yellow (preferred) alternatives to $85.5 million for the Brown

alternative including construction, right-of-way, utility relocation, and environmental remediation/mitigation costs.

A resource and cost analysis for all of the alternatives included a review of socioeconomic, cultural, natural resource, and environmental impacts (**Table ES-1**). The Yellow alternative (preferred) would include relocation of approximately 11 residences and displacement of 9 commercial and industrial facilities. Two federally endangered bats, the Indiana bat (*Myotis sodalis*) and the gray bat (*Myotis grisescens*) were considered in the project area for their use of forested areas and caves, respectively. The preferred alternative (Yellow) avoids forested areas. There are no known caves in the study area. Mitigation for impacts to potential habitat would include minimal tree removal in the floodplain and riparian corridors, survey of forested riparian areas for potential Indiana bat roost trees, avoiding the removal of potential roost trees during the maternity period (April 1 – October 31), and could include reforestation of floodplains and riparian corridors

There is an area of city-owned land south of I-70 and on the western edge of the IEA that is designated for park development in the future. For the preferred alternative (Yellow), the City of Columbia Parks and Recreation Department has agreed to grant an easement for the Scott Boulevard construction. The Scott Boulevard project could enhance the trail entrance to the park. There are no known NRHP eligible historic structures or archaeological sites that would be impacted by the construction of the preferred alternative (Yellow). A Programmatic Section 4(f) document for parkland or historic resources was prepared for the design and construction of the preferred alternative (Yellow) and was signed by FHWA on August 15, 2012 (Appendix B).

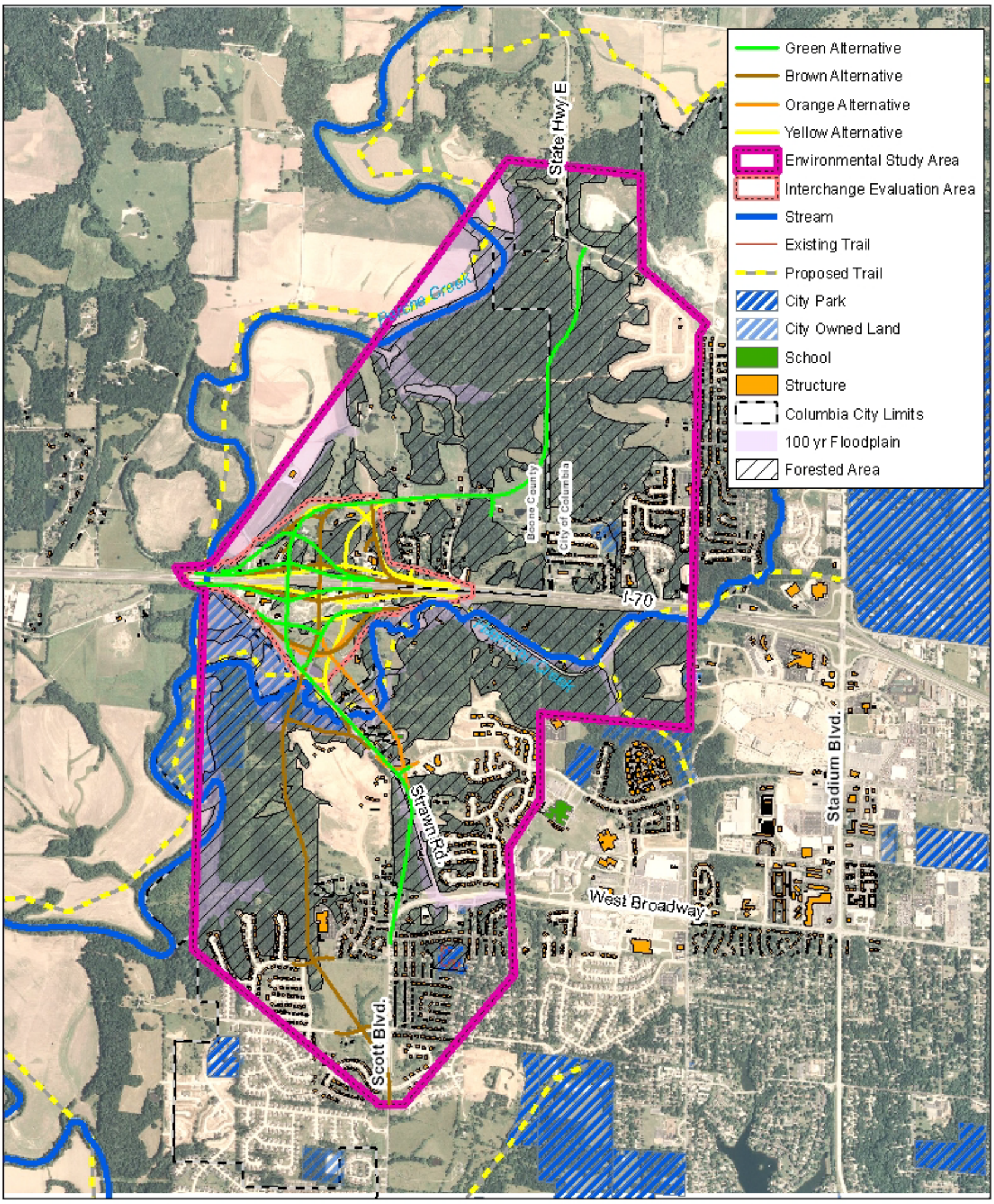



FIGURE ES-1
SCOTT BOULEVARD and I-70 AJR/EA

**Table ES- 1: Environmental Constraints Summary**

| | | ALTERNATIVES | | | | |
|---|---|---|---|---|---|---|
| **ENVIRONMENTAL CONSIDERATIONS** | Units | No Action | Green | Brown | Orange | Yellow |
| **PEDESTRIAN AND BICYCLE TRAIL CROSSINGS** | Number | 0 | 2 | 3 | 3 | 2 |
| **WATER QUALITY SURFACE WATER CROSSINGS** | Number | 0 | 45 | 47 | 44 | 44 |
| **WATERS OF THE U.S.** | | | | | | |
| Palustrine Forested Wetlands | acres | 0 | 1.10 | 1.10 | 0.96 | 1.10 |
| Palustrine Emergent Wetlands | acres | 0 | 0.08 | 0.02 | 0.02 | 0.06 |
| Palustrine Scrub-shrub Wetlands | acres | 0 | 0.08 | 0.08 | 0.08 | 0.08 |
| **TOTAL WETLAND ACREAGE** | acres | **0** | **1.26** | **1.20** | **1.06** | **1.24** |
| **OPEN WATER** | acres | **0** | **1.87** | **0.75** | **0.43** | **1.87** |
| Perennial Tributary Length | feet | 0 | 1,532 | 2,015 | 937 | 1,397 |
| Intermittent and Ephemeral Tributary Length | feet | 0 | 18,896 | 23,454 | 19,792 | 18,808 |
| **TOTAL TRIBUTARY LENGTH** | feet | **0** | **20,428** | **24,969** | **20,729** | **20,205** |
| **FLOODPLAIN IMPACTS** | | | | | | |
| 100-Year Floodplain Area | feet | 0 | 2,768 | 2,546 | 945 | 1,827 |
| 500-Year Floodplain Area | feet | 0 | 1,577 | 222 | 1,138 | 1,288 |
| FEMA Buyout Areas | number | 0 | 0 | 0 | 0 | 0 |
| **THREATENED AND ENDANGERED SPECIES AND PROTECTED COMMUNITIES** | | | | | | |
| Forested Habitat | acres | 0 | 129 | 181 | 146 | 143 |
| Riparian Forested Habitat | acres | 0 | 18 | 14 | 13 | 16 |
| Upland Forested Habitat | acres | 0 | 112 | 168 | 134 | 127 |
| **CULTURAL IMPACTS** | | | | | | |
| Recorded Archaeological Sites | Number | 0 | 5 | 5 | 5 | 5 |
| Newly Discovered Archaeological Sites | Number | 0 | 3 | 3 | 3 | 3 |
| Potential Historic Sites | Number | 0 | 12 | 16 | 13 | 13 |
| Architectural Sites | Number | 0 | 0 | 0 | 0 | 0 |
| **PARK AND RECREATION FACILITIES** | | | | | | |
| Proposed Parks Impacted | Number | 0 | 1 | 1 | 1 | 1* |
| Proposed Park Area Taken (City-Owned Property) | acres | 0 | 4.97 | 15.1 | 0.40 | 3.90 |
| 4(f) Properties | acres | 0 | 1 | 1 | 1 | 1* |
| **HAZARDOUS WASTE SITES** | Number | 0 | 6 | 6 | 6 | 6 |
| **FARMLAND IMPACTS** | | | | | | |
| Prime Farmlands | acres | 0 | 9.74 | 8.29 | 7.03 | 8.00 |
| Farmland of Statewide Importance | acres | 0 | 51.41 | 69.74 | 59.60 | 52.74 |
| Prime Farmland if protected from flooding | acres | 0 | 2.71 | 1.56 | 0.51 | 1.64 |
| NRCS Impact Rating | number | 0 | 153 | 153 | 153 | 154 |
| **ENGINEERING CONSIDERATIONS** | | | | | | |
| **LENGTH OF NEW CONSTRUCTION** | miles | 0 | 3.16 | 3.58 | 3.04 | 2.94 |
| | | | | | | |
| Preliminary Construction Costs Only (2009 dollars) | $ (Mil.) | 0 | | | | |
| Interchange | $ (Mil.) | 0 | $11.0 | $13.0 | $13.0 | $9.0 |
| Scott Boulevard North of I-70 | $ (Mil.) | 0 | $12.0 | $14.0 | $14.0 | $14.5 |
| Scott Boulevard South of I-70 | $ (Mil.) | 0 | $14.0 | $21.0 | $15.0 | $13.5 |
| Contingency | $ (Mil.) | | $9.5 | $12.0 | $10.5 | $9.5 |
| Subtotal | $ (Mil.) | 0 | **$46.5** | **$60.0** | **$52.5** | **$46.5** |
| Right-of-Way Costs | $ (Mil.) | 0 | $8.8 | $10.9 | $11.2 | $9.3 |
| Engineering | $ (Mil.) | 0 | $3.7 | $4.8 | $4.2 | $3.7 |
| Administration/Observation | $ (Mil.) | 0 | $3.7 | $4.8 | $4.2 | $3.7 |
| Utility Relocations | $ (Mil.) | 0 | $3.0 | $3.0 | $3.0 | $3.0 |
| Environmental Remediation/Mitigation | $ (Mil.) | 0 | $1.4 | $1.8 | $1.6 | $1.4 |
| Relocation Costs | $ (Mil.) | 0 | $0.4 | $0.2 | $0.4 | $0.4 |
| **TOTAL PROJECT COSTS** | **$ (Mil.)** | **0** | **$67.5** | **$85.5** | **$77.1** | **$68.0** |
| **TRAFFIC** | 2030 ADT | 0 | 27,000 | 22,000 | 27,000 | 28,000 |
| **SOCIOECONOMIC CONSIDERATIONS** | | | | | | |
| **Business and Residential Impacts** | | | | | | |
| Commercial/ Industrial (Total Takes) | Number | 0 | 10 | 0 | 11 | 9 |
| Commercial/ Industrial (Partial Takes) | Number | 0 | 9 | 19 | 8 | 8 |
| Residential (Total Takes) | Number | 0 | 11 | 1 | 6 | 11 |
| Residential (Partial Takes) | Number | 0 | 39 | 43 | 45 | 42 |
| Preliminary Platted Lots (Total Take) | Number | 0 | 5 | 6 | 2 | 2 |
| Preliminary Platted Lots (Partial Take) | Number | 0 | 18 | 29 | 24 | 24 |

* For the preferred alternative (Yellow), the City of Columbia Parks and Recreation Department has agreed to grant an easement for the Scott Boulevard construction.

# 1.0 PURPOSE AND NEED

The City of Columbia, Missouri, and Boone County, Missouri, are planning to improve access to the area south of I-70 between Perche Creek and State Route 740/Stadium Boulevard (referred to hereafter as Stadium Boulevard), one of the regions key growth areas. Stadium Boulevard is part of the state roadway system and is maintained by the Missouri Department of Transportation (MoDOT). Stadium Boulevard is the current access to I-70 for western Columbia, and currently operates at or over capacity. To help alleviate congestion at Stadium Boulevard and provide the much-needed I-70 access to western and southern Columbia, a new freeway interchange at an extended Scott Boulevard is proposed. An Access Justification Report (AJR) is being prepared as a parallel effort with the Environmental Assessment (EA). This chapter contains a summary of the transportation problem, the planning process, the development of the purpose and need and a review of previous studies.

## 1.1 Study Overview

The purpose of the Scott Boulevard and I-70 Interchange project is to alleviate congestion along West Broadway, Stadium Boulevard, and the Stadium Boulevard/I-70 interchange, and to improve access to the western portion of the City of Columbia. The project roadway improvements include a new interchange between Scott Boulevard and I-70. The interchange would provide an alternative connection between I-70 and the regional arterials, which would alleviate many of the congestion problems in the existing Stadium Boulevard to I-70 corridor. The southwestern portion of the City, south of I-70 between Perche Creek and Stadium Boulevard, is one of the City's growth areas. Critical issues influencing the location for the project include the ability to attract traffic, interchange spacing along I-70, connections to the regional arterial system, and topography, land use, and environmental factors. The regional project settings and environmental study area are shown in **Figure 1-1**. Existing roadway facilities are depicted in **Figure 1-2**.

## 1.2 Study Area

The environmental study area **(Figure 1-1 and Figure 1-2)** is roughly bounded by Perche Creek to the west, the proposed northern intersection of Scott Boulevard and Route E to the north, a south/north running line approximately aligned with Fairview Street to the east, and the intersection of Scott Boulevard and Rainbow Trout Drive to the south.

The traffic study area (**Figure 1-3**) includes:

- I-70 between the US 40/State Route UU interchange (mile marker 121, including the interchange) and the State Route 740/Stadium Boulevard interchange (mile marker 125)
- Stadium Boulevard between and including the intersections with the Interstate 70 Drive NW (I-70 Drive NW) to Broadway/State Route TT
- Scott Boulevard including the intersection with Broadway, proposed interchange with I-70 (including connections with the north and south frontage roads), and proposed intersection with Route E local road connections within this study segment

Logical termini were discussed in the AJR (Crawford, Bunte, Brammeier 2010). The logical termini were based on the 2030 CATSO transportation plan. This plan calls for a major arterial collector between Broadway and I-70 and a major collector connection between I-70 and Route E. Currently there is not a northern connection to Route E.

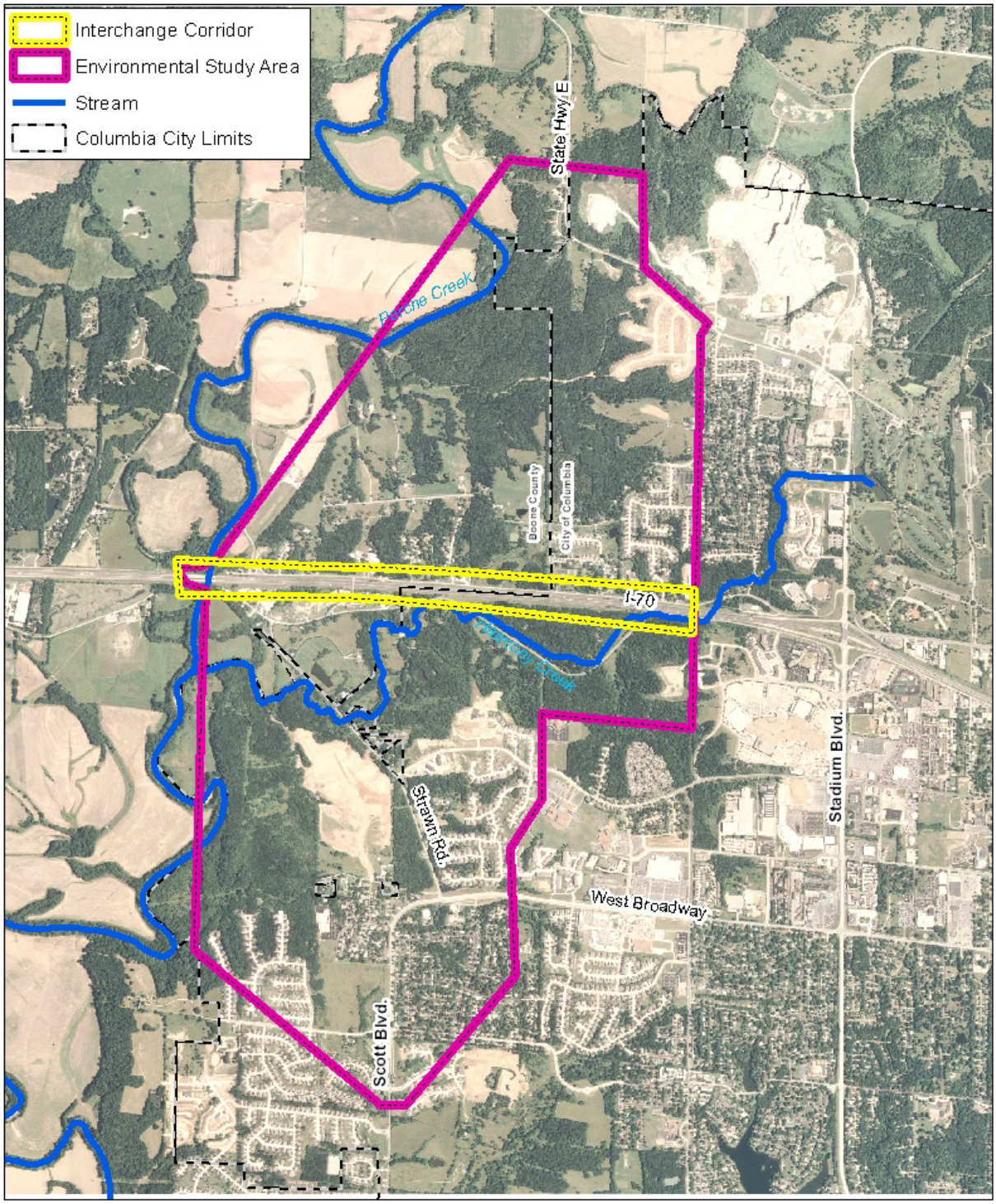



FIGURE 1-1
REGIONAL PROJECT SETTING
SCOTT BOULEVARD and I-70 AJR/EA

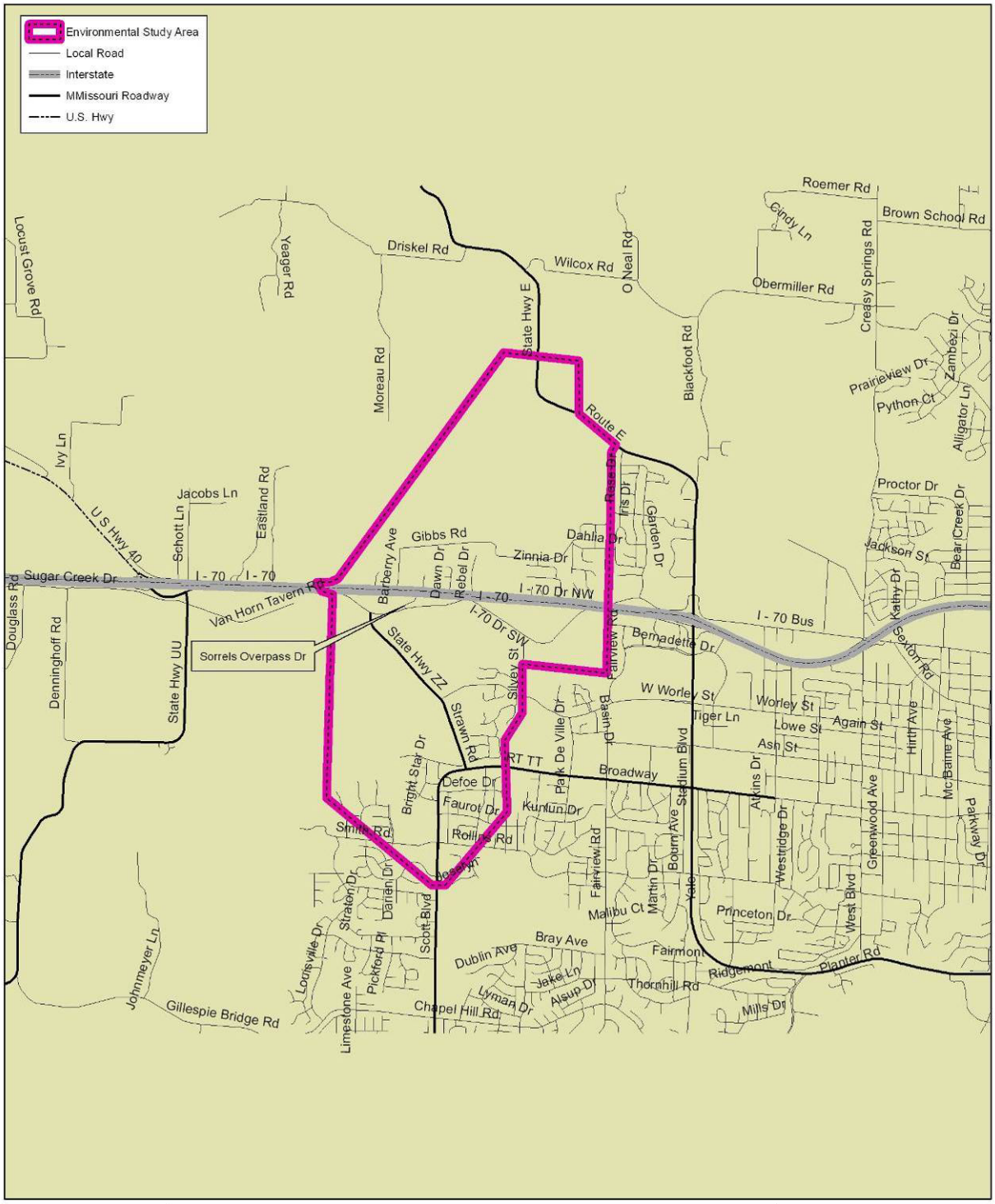
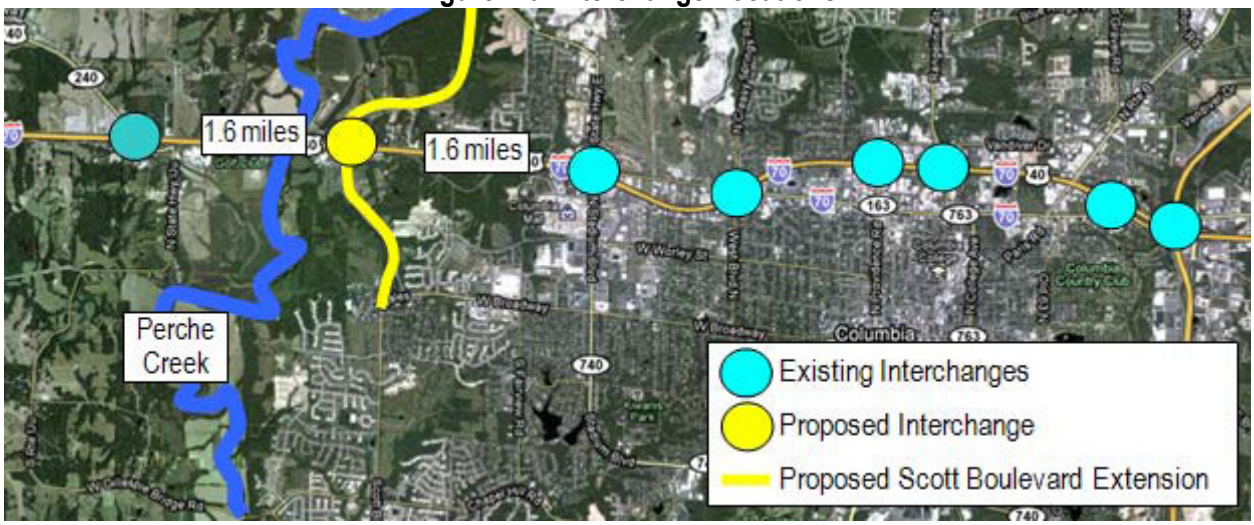



**FIGURE 1-2**
**EXISTING ROADWAY FACILITIES**
**SCOTT BOULEVARD and I-70 AJR/EA**

K:\Projects\2008-118 Scott Boulevard AJR-EA\MapData\EA_Figures_20100414\EA_Fig1-2_Road_20110125.mxd

**Figure 1-3: Interchange Locations**




## 1.3 Project History

The area south of I-70 between Perche Creek and Stadium Boulevard includes a number of new residential developments. Stadium Boulevard is the only practical way to access I-70 from this area, due largely to the barrier formed by Perche Creek. These circumstances put a strain on Stadium Boulevard. Good access from I-70 into this part of Columbia is essential for local residents, the local business community centered on Stadium Boulevard and West Broadway, and emergency responders who provide service into this area. Various studies conducted over the past 10 years show a new I-70 interchange west of Stadium Boulevard would help alleviate congestion and improve access into this part of the city. Previous studies related to the project are summarized below.

Stadium Boulevard Corridor Studies: A corridor study (Crawford, Bunte, Brammeier 2003) of Stadium Boulevard between I-70 and West Broadway evaluated the existing traffic constraints along Stadium Boulevard and the need for roadway and/or signal improvements to relieve this congestion. The study considered the traffic impacts associated with several approved and proposed developments in the surrounding area both in the near and long term, as well as the infrastructure that would be necessary to accommodate such growth.

The study concluded that the road network centered on Stadium Boulevard (Stadium Boulevard, West Broadway, etc.) was operating at capacity and was unstable. The cramped signal spacing at the north end of the study corridor causes backups when traffic is heavy. The number of existing lanes along Stadium Boulevard increases congestion. Daily traffic conditions can vary from congested yet flowing on lighter days to gridlock on heavier days with northbound backups extending from I-70 to West Broadway. Consequently, conditions at most intersections between I-70 and West Broadway are constrained.

The 2003 study recommended extensive improvements along Stadium Boulevard. However, even with these improvements, the study found that the improved corridor would be incapable of adequately accommodating future traffic. The study concluded that the underlying problem resides in the dependence upon Stadium Boulevard as the only viable means of access between I-70 and the southwestern portion of the City. Additionally, no other feasible "local" improvements exist that could accommodate projected

growth. The study therefore recommended investigating additional access to I-70 between Perche Creek and Stadium Boulevard.

Improve I-70 Studies: In December 2001, the Missouri Department of Transportation (MoDOT) completed the I-70 First Tier Improvement Statement, which determined that the best strategy for improving I-70 was to widen and reconstruct it. In October 2005, MoDOT completed the I-70 Second Tier Final Environmental Impact Statement (FEIS), which provided additional information on the location, basic design, impacts, and the cost of the preferred improvement alternative. In 2009, MoDOT completed a supplemental EIS which recommends truck-only lanes on I-70 across Missouri. The selected improvement alternatives were chosen to balance environmental concerns with community needs. The current Improve I-70 selected alternative in the Scott Boulevard study area includes:

- Mainline widening to eight lanes with grass medians west of US 40. Two lanes in each direction would be "general purpose" lanes and two lanes in each direction would be "truck-only" lanes.
- Mainline widening east of US 40, ultimately to ten lanes with two truck-only lanes in each direction and three general purpose lanes in each direction.
- Enhanced diamond interchange at US 40
- Tight diamond interchange at Stadium Boulevard with future fly-over ramps onto Fairview Road from westbound I-70 and from Fairview Road onto eastbound I-70

Detailed traffic modeling was conducted as a part of the Improve I-70 studies to explore the performance of various interchange concepts. This analysis revealed that in design year 2030, heavy volumes at the intersection of Bernadette Drive and Stadium Boulevard would cause the Stadium Boulevard/I-70 interchange to operate at an unacceptable Level of Service (LOS), thus validating the results of the 2003 traffic study (Crawford, Bunte, Brammeier 2003). This traffic study reported regional and area benefits of a Scott Boulevard Interchange. Table 1-1 provides the data reported.

| **Table 1- 1: Regional/Area Benefits of a Scott Boulevard and I-70 Interchange** |
|---|
| Regional Benefits |
| Decrease in vehicle hours traveled (VHT) of 1,100 hours per day |
| No change in vehicle miles traveled (VMT) |
| Decrease in volume to capacity ratio (V/C) of 1% |
| Increase in future capacity across I-70 of 7.5% |
| Area Benefits* |
| Decrease in V/C on Stadium, north of Broadway, of 14% |
| Decrease in V/C on Broadway, west of Stadium Boulevard, of 18% |
| Decrease in V/C on Broadway, east of Scott Boulevard, of 15% |
| Decrease in VMT on Broadway (32%) between Scott and Stadium Boulevards |
| Decrease in VHT on Broadway (34%) between Scott and Stadium Boulevards |
| Decrease in VMT on Fairview Road (2%) between Broadway and Kunlun Drive |
| Decrease in VHT on Fairview Road (4%) between Broadway and Kunlun Drive |
| *Area, in this context, means the immediate vicinity – Scott Boulevard to Stadium Boulevard/I-70 to Broadway |

The FEIS concluded, "So while the Scott interchange was not included as part of the preferred alternative for the Improve I-70 project, that is not intended to convey that the Scott interchange is not justifiable outside the context of the Improve I-70 project."

Columbia Area Transportation Study Organization (CATSO): On June 26, 2003, the CATSO Coordinating Committee approved an amendment to the Major Roadway Plan to include the extensions of Scott Boulevard and Route E to connect with I-70 at a location west of Stadium Boulevard. These roadways were identified as "placeholders," acknowledging that a new interchange was planned in the general vicinity but that the exact location would be determined at a later date. On December 9, 2004, CATSO upgraded the Scott Boulevard extension to I-70 from a placeholder to an identified project in the Major Roadway Plan.

## 1.4 Study Area Characteristics

The following section provides transportation facility characteristics including I-70 and major north-south and east-west roadways.

### 1.4.1 Study Area Characteristics

Access to I-70 from western Columbia is primarily provided by Stadium Boulevard. Stadium Boulevard is currently operating at or over capacity, and will continue to operate under congested conditions in the future, even with planned improvements. Although there is a nearby interchange to I-70 to the west (the I-70 and US 40 interchange) it is not considered a secondary point of access because access difficult for residents of western Columbia. Perche Creek forms a barrier to access this interchange. Gillespie Bridge Road is the nearest crossing of Perche Creek south of I-70 and is located almost three miles south of I-70. The City of Columbia has plans to enhance connections across Perche Creek by extending Broadway from Scott Boulevard to Route UU. Moreover, connections of the I-70 frontage roads across Perche Creek are part of MoDOT's Improve I-70 plans. However, even with these connections in place, the use of the US 40 interchange would result in three to five miles of adverse travel per trip for the predominant travel movements to and from the east. This is not a sustainable long-term solution.

I-70 connects Kansas City, St. Louis, and Columbia with the national interstate freeway system and is one of the most important transportation corridors in Missouri. The proposed Scott Boulevard and I-70 interchange would be located between existing interchanges at US 40 and Stadium Boulevard. Within the City of Columbia, I-70 is a four-lane divided expressway and carries approximately 67,000 vehicles per day.

Since the frontage roads are discontinuous, traffic operations during crashes or other freeway incidents between Stadium and US Route 40 can be problematic. The outer roads in this section of I-70 do not extend over Perche Creek, and freeway capacity reductions (such as lane reductions or total freeway closures) can cause significant traffic backups as traffic has no practical alternative to get around the incident.

### 1.4.2 Major North-South Roadways

Major north-south roadways are depicted in **Figure 1-2** and discussed below.

*Stadium Boulevard* provides major access to several University of Missouri Columbia academic and athletic facilities from I-70, US 63 and western Columbia. Within the study area, Stadium Boulevard is a five-lane signalized corridor with several large-scale commercial developments.

*Fairview Road* is a two-lane minor arterial from Bernadette Drive to north of Broadway, providing access to the Columbia Mall and other commercial land uses. From south of Broadway to Chapel Hill Road, it is a two-lane major collector serving primarily residential land uses. A creek crossing causes Fairview Road to intersect Worley Street via two offset intersections, creating a jog and hindering through traffic. MoDOT's Improve I-70 plans include the provision for future ramps from Fairview Road to and from the east on I-70 if required, to relieve traffic on Stadium Boulevard.

*Silvey Street* is a two-lane neighborhood collector primarily serving residential land uses between I-70 Drive SW (the south outer road) and Broadway.

*Sorrels Overpass Drive* is currently a two-lane overpass connecting the I-70 Drive NW and the I-70 Drive SW approximately 1.6 miles west of Stadium Boulevard; it is the only roadway crossing over I-70 between the Stadium Boulevard and US 40 interchanges. Sorrels Overpass Road carries very low traffic volume with only an auto salvage yard on the southern end of the road.

*Scott Boulevard* is primarily a four-lane major arterial connecting Broadway and Route KK. In its existing configuration, Scott Boulevard provides access and connectivity primarily to residential land uses in western Columbia to and from I-70 via Broadway and Stadium Boulevard. The City of Columbia is engaged in a multi-year, three-phase improvement plan upgrade of Scott Boulevard between Rollins Road and Route KK. Phase I is complete, with construction of Phase II scheduled for 2013, and Phase III construction scheduled for 2016. The first phase between Rollins Road and Brookview Terrace consisted of widening Scott Boulevard to four lanes plus a center median as well as adding bicycle lanes, new sidewalks on both sides of the road, and a pedestrian underpass just north of Chapel Hill Road. The second phase will improve Scott Boulevard between Brookview Terrace and Vawter School Road by extending bicycle lanes and sidewalks to connect to the MKT trail; raising the elevation of Scott Boulevard to reduce flooding; reconstructing the bridge over Hinkson Creek, and constructing a roundabout at the Scott/Vawter School Road intersection. The third phase between Vawter School Road and Route KK will result in two travel lanes divided by a grassy median with breaks at public streets in order to provide for left-turn lanes.

*Strawn Road (Route ZZ)* is currently a two-lane major collector between I-70 Drive SW and Broadway. This is the western-most north-south route providing access to residences between I-70 and Broadway. This roadway has chronic flooding issues where it crosses the Harmony Creek, which is a tributary of Perche Creek.

*US 40 and Route UU* are two-lane minor arterials west of Perche Creek. The first interchange west of Stadium Boulevard along I-70 is the US 40 interchange with US 40 to the north and Route UU to the south of the interchange. The US 40 interchange is located three miles west of Stadium Boulevard. The next interchange along I-70 is at the intersection of Route J/O located three and a half miles further west. Route UU connects with Gillespie Bridge Road to the south, the only Perche Creek crossing between I-70 and Route K (not to be confused with Route KK). MoDOT's Improve I-70 plans include upgrading the existing interchange. However, the US Highway 40/Route UU interchange is not likely to divert a significant amount of the major traffic movements to/from the east from the Stadium Boulevard interchange. It is too far west and would result in too much adverse travel; even with enhanced connections across Perche Creek.

### 1.4.3 Major East-West Roadway

Major east-west roadways are shown in **Figure 1-2** and discussed here.

*MO Route E* is a two-lane minor arterial and is a continuation of Stadium Boulevard north of I-70. Traffic volumes along Stadium Boulevard decrease drastically north of I-70 on MO Route E away from the City of Columbia and the heavy commercial district. In its current configuration, MO Route E provides connectivity to the rural areas north of I-70, to the City of Columbia, and to I-70. There is potential for future residential developments in the vicinity of the northern city limits.

*Gibbs Road* is a two-lane road providing residential access to I-70 via Stadium Boulevard.

*I-70 Drive NW (north outer road)* is a two-lane minor collector located north of I-70 primarily providing access to residential land uses between Perche Creek and Stadium Boulevard. An extension of the I-70 Drive NW over Perche Creek to connect with US 40 is a viable future option. I-70 Drive NW.

*I-70 Drive SW (south outer road)* is a two-lane major collector located south of I-70, providing access to both residential and commercial land uses. Similar to the I-70 Drive NW, extension of I-70 Drive SW over Perche Creek to connect with US 40 would continue to be a viable future option.

West of Stadium Boulevard, *Bernadette Drive* is a four-lane major collector primarily providing access to several commercial entities including the Columbia Mall.

*Ash Street* is a two-lane major collector between Park de Ville Drive and College Avenue, primarily providing access to residential land uses. In the vicinity of Stadium Boulevard, Ash Street provides access to several commercial, institutional, and high-density residential developments near Stadium Boulevard. Ash Street provides an indirect cut-through connection between Stadium Boulevard and Broadway via Fairview Road, Park De Ville Drive and via Heather Lane.

*Worley Street* is a two-lane major collector between Strawn Road and Providence Road, primarily providing access to residential land uses. It continues east of Providence Road as Rogers Street and then becomes Paris Road, extending north of I-70 where it leads out of the City as Route B. In the vicinity of Stadium Boulevard, Worley Street provides access to several commercial developments including the Columbia Mall, and also provides connection between Fairview Road and Stadium Boulevard. There is ongoing residential development along Worley Street in the vicinity of Silvey Street.

*Broadway (Route TT)* is a four-lane major arterial with a fifth turning lane at major intersections, providing access to varying types of land uses across the City of Columbia. Broadway is the primary access to western Columbia from I-70. Broadway curves to the south and becomes Scott Boulevard toward the southwest part of the study area.

*Gillespie Bridge Road* is a two-lane minor arterial about two and half miles south of I-70. It is the only road that crosses Perche Creek between I-70 and Route K. This roadway does not offer any relief to the congestion at Stadium Boulevard because of substantial adverse travel.

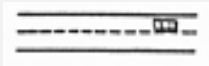
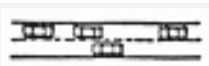
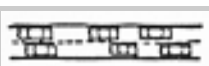
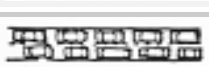
### 1.4.4 Existing Traffic Conditions: Capacity Analysis Methodology

The area south of I-70 between Perche Creek and Stadium Boulevard is one of the City of Columbia's growth areas. Stadium Boulevard is the only practical way to access I-70 from this area, due largely to the barrier formed by Perche Creek. These circumstances put a strain on Stadium Boulevard. This condition leads to daily congestion and gridlock along Stadium Boulevard between I-70 and Broadway.

Field observations show that the Stadium Boulevard corridor currently operates at capacity and is unstable. This condition is exacerbated by the close signal spacing on Stadium Boulevard near I-70. Daily fluctuations along the Stadium Boulevard corridor result in congested yet flowing conditions on light traffic days to gridlock on heavier days. Continuous vehicular queues can develop on Stadium Boulevard between I-70 and Broadway, constraining nearly all intersections. The existing interchange is not adequate to handle the very heavy travel demands, especially during the evening peak hour.

The study used nationally accepted methodology (Highway Capacity Manual and microsimulation) to evaluate capacity and traffic operations for the existing, no-build, and build conditions. Six Level of Service (LOS), established in the "Highway Capacity Manual" (HCM), are used to describe expected traffic conditions. As shown in **Table 1-2** below the range is LOS A ("Free Flow") through LOS F ("Breakdown Conditions").

**Table 1-2: Level of Service Descriptions**

| LEVEL OF SERVICE | | DESCRIPTION |
|---|---|---|
| A |  | Free flow. Low volumes and no delays. |
| B |  | Stable flow. Speeds restricted by travel conditions. Minor delays. |
| C |  | Stable flow. Speeds and maneuverability closely controlled due to higher volumes. |
| D |  | Stable flow. Speeds affected by change in operating conditions. High-density traffic restricts maneuverability. |
| E |  | Unstable flow. Low speeds, considerable delay, volumes at or near capacity. |
| F |  | Forced flow. Very low speeds, volumes exceed capacity, long delays with stop-and-go traffic. |

LOS was calculated for both the study freeway segments and intersections.

Intersection LOS is directly related to control delay. At signalized intersections, the LOS criteria differ from that at unsignalized intersections primarily because different transportation facilities create different driver expectations. The expectation is that a signalized intersection is designed to carry higher traffic volumes and, consequently, may experience greater delay than an unsignalized intersection. **Table 1-3** summarizes the LOS thresholds used in the analysis for intersections. Typically LOS D is considered acceptable on urban arterial roadways.

**Table 1-3: Intersection Level of Service Thresholds**

| Level of Service (LOS) | Control Delay per Vehicle (seconds/vehicle) | |
|---|---|---|
| | Signalized Intersections/Roundabouts | Unsignalized Intersections |
| A | ≤ 10 | 0-10 |
| B | > 10-20 | > 10-15 |
| C | > 20-35 | > 15-25 |
| D | > 35-55 | > 25-35 |
| E | > 55-80 | > 35-50 |
| F | > 80 | > 50 |

Freeway LOS is related to traffic density. Although speed is a major indicator of service quality to drivers, freedom to maneuver within the traffic stream and proximity to other vehicles, as measured by the density of the traffic stream, are equally noticeable concerns. Density increases as flow increases up to capacity, resulting in an MOE that is sensitive to a broad range of flows. For these reasons, density is the parameter used to define LOS for the freeway and ramp sections, as shown in **Table 1-4**. LOS D is typically considered acceptable on urban freeways.

**Table 1-4: Freeway Level of Service Criteria**

| Level of Service | Freeway Weaving Segment Density (pc/mi/ln)* | Merging and Diverging Segment Density (pc/mi/ln)* | Basic Freeway Segment Density (pc/mi/ln)* |
|---|---|---|---|
| A | 0 – 10 | 0 – 10 | 0 – 11 |
| B | > 10 – 20 | > 10 – 20 | > 11 – 18 |
| C | > 20 – 28 | > 20 – 28 | > 18 – 26 |
| D | > 28 – 35 | > 28 – 35 | > 26 – 35 |
| E | > 35 – 43 | > 35 | > 35 – 45 |
| F | > 43 | Demand exceeds capacity | > 45 |

* pc/mi/ln = passenger cars per mile per lane

The existing intersection operations analysis results are shown in **Table 1-5** for the morning peak hours from 7:00 to 8:00 A.M. and afternoon peak hours from 4:30 P.M. to 5:30 P.M. The highlighted areas of the tables signify intersections or roadway segments of concern. Red highlight indicates intersections/freeway segments operating at failing conditions and yellow highlight indicates traffic operations that are approaching failing conditions.

The table shows several intersections along Stadium Boulevard operating at LOS E/F during the evening peak hour, with almost all intersections close to or over capacity during the evening peak hour.

| Table 1- 5: Existing Conditions Intersections Analysis Results | | |
|---|---|---|
| **Intersections along Stadium Boulevard** | **Morning Peak Hour** | **Evening Peak Hour** |
| | **LOS** | **LOS** |
| I-70 Drive NW | B | B |
| I-70 Westbound Ramps | C | **E** |
| I-70 Eastbound Ramps | C | **F** |
| I-70 Drive SW (Side-Street Stop) | D | **F** |
| Bernadette Drive | C | **F** |
| Worley Street | C | **E** |
| Ash Street | C | **E** |
| Broadway Boulevard | C | **E** |

The existing freeway operations analysis results are summarized in **Table 1-6**. All basic freeway and merge/diverge segments along I-70 operate at acceptable conditions with LOS D or better during both peak hours.

Detailed analysis of the existing traffic conditions can be found in the I-70 and Scott Boulevard Access Justification Report (AJR), October 2011, which will be made available upon request.

| Table 1- 6: Existing Conditions Freeway Analysis Results | | | | |
|---|---|---|---|---|
| SECTION | DIRECTION | TYPE | Morning Peak Hour | Evening Peak Hour |
| | | | LOS | LOS |
| West of US 40 | Eastbound | Freeway | B | B |
| I-70 to US 40 Off-Ramp | Eastbound | Diverge | C | B |
| US 40 to I-70 On-Ramp | Eastbound | Merge | C | B |
| Between US 40 and Stadium Blvd | Eastbound | Freeway | C | B |
| I-70 to Stadium Blvd Off-Ramp | Eastbound | Diverge | C | B |
| Stadium Blvd to I-70 On-Ramp | Eastbound | Merge | C | C |
| East of Stadium Blvd | Eastbound | Freeway | D | C |
| East of Stadium Blvd | Westbound | Freeway | C | D |
| I-70 to Stadium Blvd Off-Ramp | Westbound | Diverge | C | D |
| Stadium Blvd to I-70 On-Ramp | Westbound | Merge | B | C |
| Between US 40 and Stadium Blvd | Westbound | Freeway | B | C |
| I-70 to US 40 Off-Ramp | Westbound | Diverge | B | C |
| US 40 to I-70 On-Ramp | Westbound | Merge | B | C |
| West of US 40 | Westbound | Freeway | A | B |

### 1.4.5 Year 2030 Traffic Forecasts

Year 2030 traffic forecasts were developed for the committed network (no-build). Committed projects are those that are likely to be constructed before 2030. The "committed network" was determined on the basis of discussions with the project's Core Team. The projects considered in our analysis include (**Figure 1-4**):

- Widening I-70: The Improve I-70 project calls for mainline I-70 to be widened through the study area to ten lanes with the center four lanes (two in each direction) being dedicated truck-only lanes. This plan allows for six general purpose lanes carrying a mixture of automobile and truck traffic. Funding has not been identified for this project. This study's geometric layouts (and associated cost estimates) and environmental clearances are being prepared assuming a worst-case scenario "footprint;" which includes MoDOT's plans for truck-only lanes. However, the traffic modeling completed for this study has evaluated the I-70 traffic operations from a "worst-traffic-case"

scenario (for freeway weaving, merging, and diverging) by assigning all trucks to the general purpose lanes.

- Widening Stadium Boulevard: MoDOT is working with the City of Columbia to widen Stadium Boulevard from the North Outer Road to south of Broadway. The existing five-lane, undivided roadway will be improved to a six-lane divided roadway with a median wide enough to accommodate dual left turns at intersections. Lanes will be added to Fairview Road from Worley Avenue north to the west entrance of the Columbia Mall and to Bernadette Drive from Fairview Road to Beverly Drive. These improvements are included in the future committed network analysis. This project will also modify the I-70 interchange configuration to a Diverging Crossover Diamond (DCD) to improve traffic flow and safety (**Figure 1-5**). All portions of the Stadium Boulevard Projects are scheduled to be let in the fall of 2012. Although the DCD project will improve traffic flow along Stadium Boulevard and access to I-70 in its current configuration, the Stadium Boulevard overpass will need to be reconstructed to accommodate additional freeway lanes when I-70 is widened per the Improve I-70 plans. The ultimate configuration of the Stadium Boulevard interchange would be reconsidered at that time. The committed network traffic analysis therefore assumes the Stadium Boulevard interchanges plans as shown in the current Improve I-70 Record of Decision.
- Broadway Extension: CATSO's 2030 long-range plan calls for an extension of Broadway to Route UU.
- Upgrade US 40 interchange: Improve I-70 calls for the US 40 interchange to be upgraded to a standard diamond interchange by relocating the eastbound on-ramp to the west. However, due to prevailing traffic patterns, it is uncertain whether or not this improvement will be constructed as shown in the Improve I-70 studies. Moreover, the time line of this improvement is uncertain and could occur after the proposed Scott Boulevard interchange is constructed. As such, this study assumed that the existing US 40 interchange would be improved and reconstructed in its current configuration. This represents the "worst-traffic-case" scenario from a freeway operations standpoint by (1) allowing all US 40 traffic to enter the network while (2) maintaining the existing eastbound on-ramp gore point. A gore point is a triangular piece of unused land where two roads split or merge. (A traditional diamond interchange would probably shift the eastbound on-ramp merging gore further to the west)

Two Improve I-70 projects are not included in the committed network. First, the I-70 outer-road connections across Perche Creek are not included in the committed network. Although these bridges are part of the Improve I-70 project and there is a local desire to provide a local connection across Perche Creek, the Core Team elected to leave them out of the committed network. Due to current financial constraints and economic conditions, their construction is questionable as a part of any initial construction project. The City has proposed a local connection across Perche Creek via an extension of West Broadway to Route UU. For the purpose of this study, this is the assumed future local connection across Perche Creek.

Second, the Improve I-70 Fairview fly-over ramps are not included in the committed network for traffic analysis. These ramps have been accommodated in the proposed Scott Boulevard interchange design. A new interchange at Scott Boulevard may draw enough traffic from Stadium Boulevard to preclude or postpone the need for these ramps. Leaving them out of the traffic analysis leaves more traffic on I-70 and thus represents a "worst-traffic-case" scenario for I-70 traffic. For these reasons, the Core Team elected to leave these ramps out of the committed network.

Traffic forecasts for the 2030 roadway network were generated based on analysis of population and traffic growth trends in the region and on outputs from the CATSO regional travel demand model. The City of Columbia and Boone County have experienced substantial population and traffic growth over the past few decades. This growth trend is expected to continue.

**Figure 1-4: Committed Roadway Network**

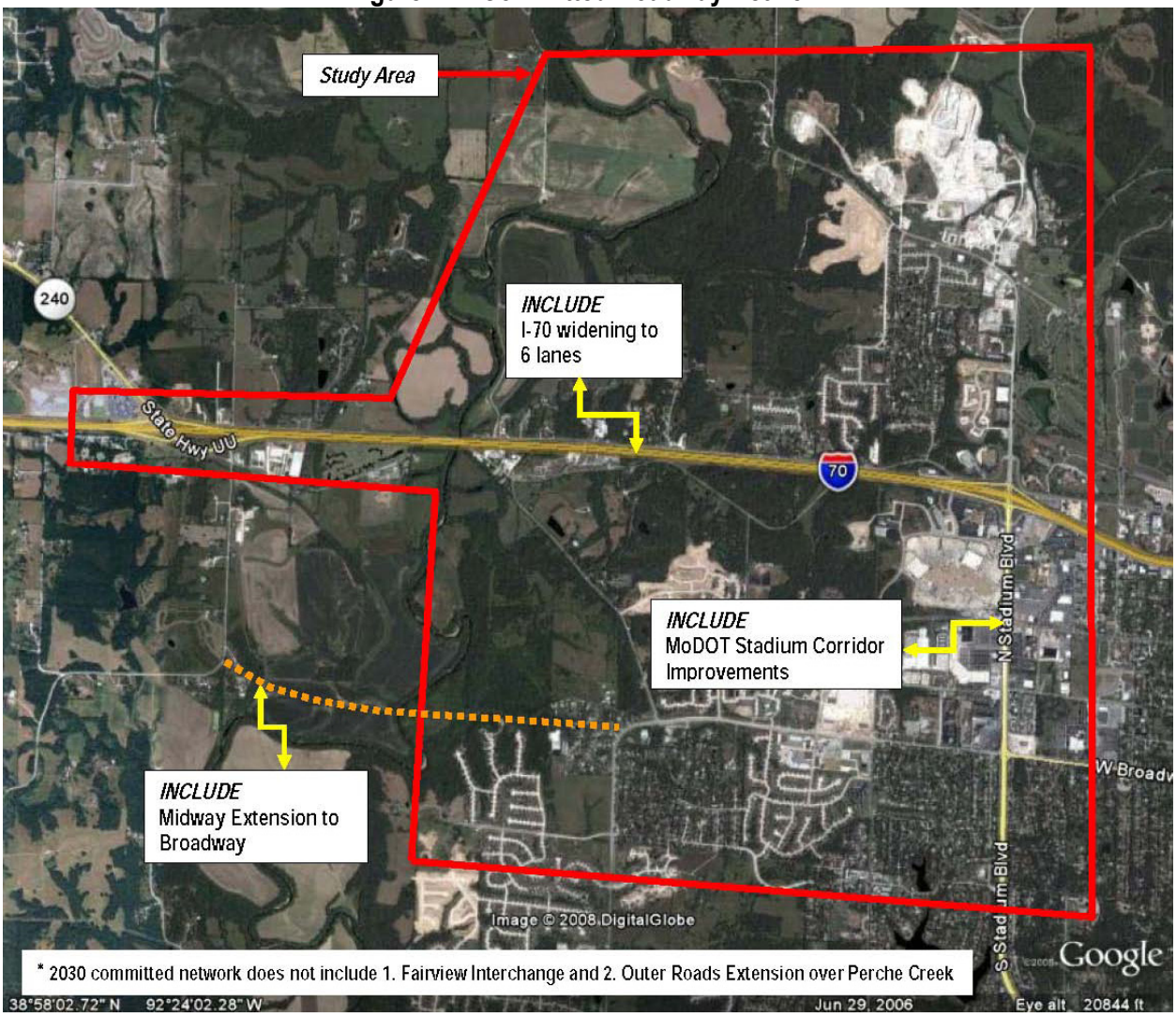
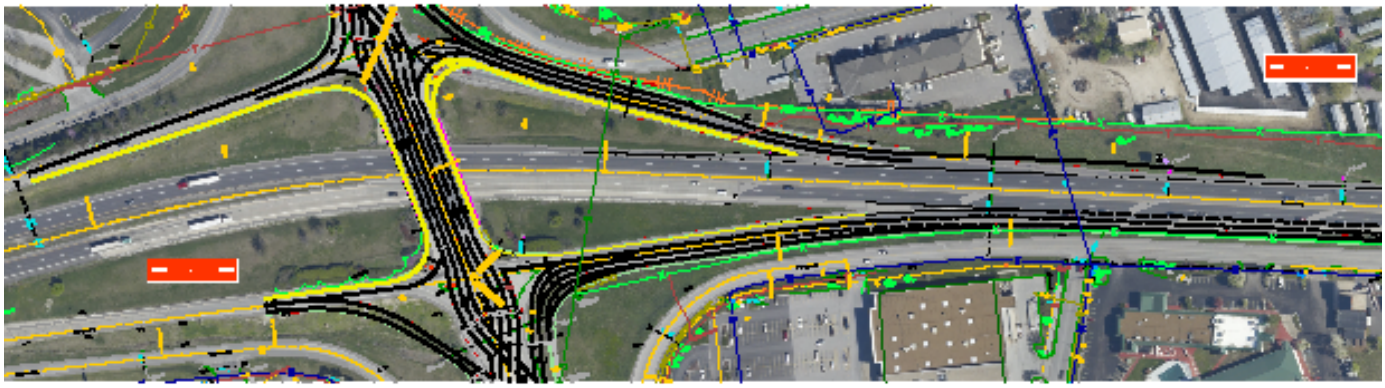


**Figure 1-5: I-70 Diverging Diamond Crossover Configuration**



ftp://ftp.modot.org/District5/DDI/

Our analysis of historic growth trends and CATSO model outputs assumes the following growth rates for design year 2030 committed network traffic:

- 20% increase in traffic volumes on all cross-streets along Stadium Boulevard
- 60% increase on US 40
- 20% increase on Stadium Boulevard north of I-70
- 50% increase on Broadway west of Stadium Boulevard
- 50% increase on Stadium Boulevard south of Broadway
- 60% increase on I-70 (Note: This growth cannot occur unless I-70 is widened in the future.)

2030 build alternative forecasts were generated based on traffic shifts from the committed network from CATSO model outputs.

The 2030 committed network intersection operations results are shown in **Table 1-7** and for the morning and evening peak hours.

**Table 1- 7: 2030 Committed Network Intersections Analysis Results**

| Intersections along Stadium Boulevard | Morning Peak Hour | Evening Peak Hour |
|---|---|---|
| | LOS | LOS |
| I-70 Drive NW | B | C |
| I-70 Westbound Ramps | C | D |
| I-70 Eastbound Ramps | C | **E** |
| I-70 Drive SW (Side-Street Stop) | B | B |
| Bernadette Drive | C | **F** |
| Worley Street | B | D |
| Ash Street | C | **F** |
| Broadway Boulevard | **E** | **F** |

The 2030 committed network freeway operations results are summarized in **Table 1-8**. Detailed analysis of the existing traffic conditions can be found in the I-70 and Scott Boulevard AJR.

**Table 1-8: 2030 Committed Network Freeway Analysis Results**

| SECTION | DIRECTION | TYPE | Morning Peak Hour | Evening Peak Hour |
|---|---|---|---|---|
| | | | LOS | LOS |
| West of US 40 | Eastbound | Freeway | B | B |
| I-70 to US 40 Off-Ramp | Eastbound | Diverge | C | B |
| US 40 to I-70 On-Ramp | Eastbound | Merge | C | C |
| Between US 40 and Stadium Blvd | Eastbound | Freeway | C | B |
| I-70 to Stadium Blvd Off-Ramp | Eastbound | Diverge | C | C |
| Stadium Blvd to I-70 On-Ramp | Eastbound | Merge | D | C |
| East of Stadium Blvd | Eastbound | Freeway | D | C |
| East of Stadium Blvd | Westbound | Freeway | C | D |
| I-70 to Stadium Blvd Off-Ramp | Westbound | Diverge | C | E |
| Stadium Blvd to I-70 On-Ramp | Westbound | Merge | B | C |
| Between US 40 and Stadium Blvd | Westbound | Freeway | B | C |
| I-70 to US 40 Off-Ramp | Westbound | Diverge | C | D |
| US 40 to I-70 On-Ramp | Westbound | Merge | B | C |
| West of US 40 | Westbound | Freeway | B | B |

As indicated in **Table 1-7**, several intersections along Stadium Boulevard would operate at failing conditions by 2030 with LOS E/F, especially during the evening peak hour. The analysis concluded that severe congestion would exist, even with committed network improvements. In fact, by 2030 the corridor would not have adequate capacity to service the anticipated travel demand. Even with the illustrated levels of congestion and delay, the analysis predicts an excess demand of 2 – 8% during the peak periods. Put another way, 8% of the vehicles in the year 2030 evening peak periods models never even make it onto Stadium Boulevard due to a lack of capacity. Moreover, the evening peak hour forecasted traffic volume of 2,230 vehicles per hour on the westbound off-ramp to Stadium Boulevard from I-70 is close to the theoretical capacity of the off-ramp. This may result in lane-changing failures on I-70, thus impacting the traffic flow on mainline I-70.

### 1.4.6 Safety Concerns

Crash statistics were compiled for I-70 between approximately the US 40/State Route UU interchange (mile marker 121, including the interchange) and the Business 70 interchange (mile marker 125) for the five-year period between 2005 and 2009 to determine the safety performance of this section of I-70. **Table 1-9** shows the total number of fatal, injury, and property-damage-only (PDO) crashes. **Figure 1-6** shows the distribution of crash severity, and **Figure 1-7** shows the crash type distribution in our study segment.

| | Table 1-9: Number of Crashes (2005-2009) Between Mile Markers 121 And 125 | | | | | |
|---|---|---|---|---|---|---|
| | **2005** | **2006** | **2007** | **2008** | **2009** | **Total** |
| **Fatality** | 0 | 1 | 1 | 1 | 2 | **5** |
| **Injury** | 15 | 15 | 13 | 13 | 19 | **75** |
| **PDO** | 37 | 30 | 36 | 51 | 58 | **212** |
| **Total** | **52** | **46** | **50** | **65** | **79** | **292** |

**Figure 1-6: Crash Severity Distribution (2005-2009) Between Mile Markers 121 and 125**

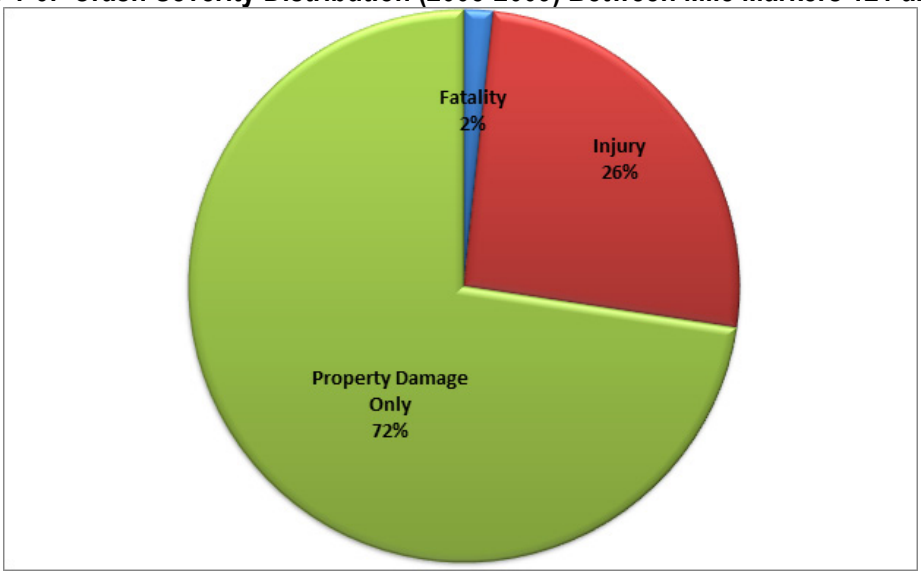
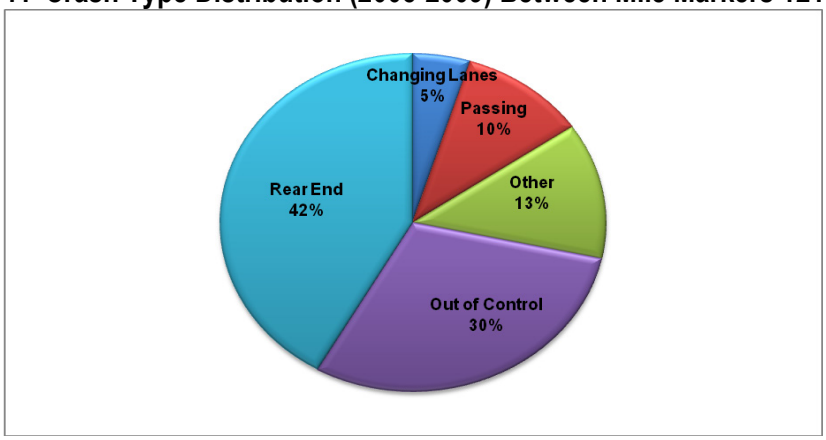


**Figure 1-7: Crash Type Distribution (2005-2009) Between Mile Markers 121 and 125**




These findings parallel those found in the Improve I-70 studies. Specifically, both studies report a high percentage of rear-end crashes. According to the Improve I-70 report, "rear-end crashes typically are associated with scenarios in which drivers are confronted with an unexpected speed differential, such as through trips confronted with slowdowns at interchange weaves". However, rear-end crashes can also occur from poor sight distance or unexpected stopping situations (construction, backups on freeway, unfamiliarity with area, etc). The Improve I-70 studies investigated some crash precursors for this section of I-70 to help determine causes for some of the higher crash rates[1]:

- Eastbound I-70 Perche Creek Bridge (approximately Mile Marker 122) – A high number of crashes occur on this bridge, suggesting that icy conditions may be a precursor.[2]
- Eastbound I-70 under Sorrels Overpass Road (approximately Mile Marker 123) – A high number of crashes occur under this bridge, suggesting sight distance and congested conditions may be precursors.
- MO 740/Stadium Boulevard (approximately Mile Marker 125) – A number of crashes occur on this bridge and south of the interchange, suggesting congested conditions and driver inattention may be precursors.

**Table 1-10** summarizes the crash rates for fatalities, injury accidents, PDO accidents, and all crashes developed during the crash analysis. The five-year crash rate for all MoDOT highways is 106.8 crashes/hundred million vehicle miles of travel (crashes/HMVMT). The crash rate for MoDOT highways in District 5 is 92.9 crashes/HMVMT. The total crash rate for this four-mile section of freeway is 78.9 crashes/HMVMT, which is lower than the statewide and regional averages.

[1] MoDOT's *Improve I-70 Second Tier Environmental Impact Statement* – Section 4—MoDOT Job No. J4I1341G page I-27
[2] Local experience suggests that many of the crashes at this location may also be related to congestion due to construction, maintenance, and incidents.

| Table 1-10: I-70 Crash Rates (2005-2009) Between Mile Markers 121 and 125 | |
|---|---|
| | **Crash Rate** |
| **Fatality** | 1.4 |
| **Injury** | 20.2 |
| **PDO** | 57.2 |
| **Total** | 78.9 |

The proposed interchange at Scott Boulevard could help relieve some of the congestion at the MO 740/Stadium Boulevard interchange, thereby enhancing the safety of mainline I-70. Additionally, a new interchange at Scott Boulevard could allow for more effective management of incidents on I-70, therefore reducing the frequency of secondary crashes.

The non-continuous nature of the I-70 frontage roads between Stadium Boulevard and Route US 40 can be especially problematic from a traffic operations standpoint during crashes or other freeway incidents. The outer roads in this section of I-70 do not extend over Perche Creek, and freeway capacity reductions (such as lane reductions or total freeway closures) can cause significant traffic queues as traffic has no practical alternative to get around the incident. A new interchange at an extended Scott Boulevard would provide MoDOT with increased flexibility in managing freeway incidents in this section of I-70.

**Major North-South Roadways**

*Stadium Boulevard* is primarily a four-lane expressway/major arterial that runs from US 63 in Southeast Columbia to north of I-70 in northwest Columbia where it becomes MO Route E. Stadium Boulevard (MO Route 740), US 63 and I-70 together result in a transportation corridor loop around the City of Columbia. Stadium Boulevard provides major access to several University of Missouri Columbia academic and athletic facilities from I-70, US 63 and western Columbia. Within the study area, Stadium Boulevard is a five-lane signalized corridor with several large-scale commercial developments.

MoDOT is working with the City of Columbia to widen Stadium Boulevard from the North Outer Road to south of Broadway. The existing five-lane, undivided roadway will be improved to a six-lane divided roadway with a median wide enough to accommodate dual left turns at intersections. The project will also modify the I-70 interchange configuration to a Diverging Crossover Diamond (DCD) to improve traffic flow and safety (**Figure 1-5**). Lanes will be added to Fairview Road from Worley Avenue North to the west entrance of the Columbia Mall and to Bernadette Drive from Fairview Road to Beverly Drive. All portions of the Stadium Boulevard Projects are scheduled to be let in the fall of 2012. The improvements are being funded by the City of Columbia, MoDOT, and three transportation development districts[3].

However, even with the planned improvements, Stadium Boulevard will continue to operate under congested conditions. Operations will degrade with continued residential growth in western Columbia. Traffic operations along Stadium Boulevard cannot be improved to the level needed to satisfy future traffic demands unless an additional interchange is constructed to the west. The proposed project would shift

[3] http://www.modot.org/central/major_projects/boone.htm

commuter traffic from Stadium Boulevard to Scott Boulevard, greatly improving traffic operations and the commercial environment along Stadium Boulevard.

Our review of crashes on Stadium Boulevard revealed 199 crashes in the vicinity of the I-70 interchange during the period between 2005 and 2009. **Table 1-11** shows that most of the crashes that occurred in this section along Stadium Boulevard were PDO and that there were no fatalities.

**Table 1-11: Number of Crashes (2005-2009) Between I-70 and Broadway**

| | 2005 | 2006 | 2007 | 2008 | 2009 | Total |
|---|---|---|---|---|---|---|
| **Fatality** | 0 | 0 | 0 | 0 | 0 | **0** |
| **Injury** | 2 | 11 | 10 | 9 | 16 | **48** |
| **PDO** | 27 | 37 | 25 | 35 | 27 | **151** |
| **Total** | **29** | **48** | **35** | **44** | **43** | **199** |

**Figure 1-8** shows the different crash types recorded in this section along Stadium Boulevard. Of these, 179 (90%) were rear-end crashes. This type of crash is clearly a result of the congestion at this location. **Figure 1-9** shows the crashes along Stadium Boulevard broken down by the day of the week. This measure shows that there are 50% more crashes on Fridays and Saturdays when these commercial corridors see higher traffic volumes. **Figure 1-10** shows the crashes by the time of day. As shown, 23% of the recorded crashes along this corridor were recorded during the 5 PM commuter hour.

**Figure 1-8: 2005-2009 Crash Distribution along Stadium Boulevard between I-70 and Broadway**

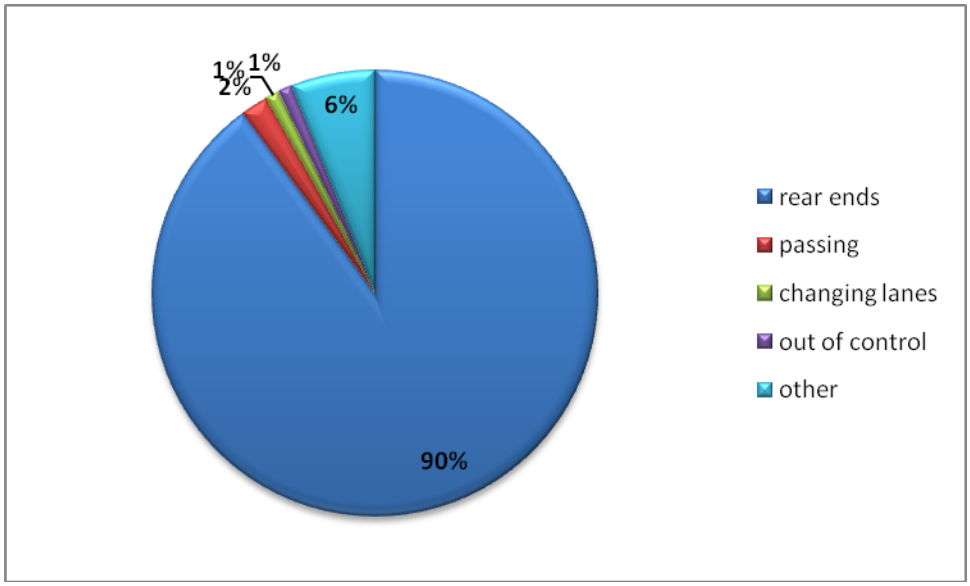


**Figure 1-9: 2005-2009 Crashes by Day of Week along Stadium Boulevard between I-70 and Broadway**

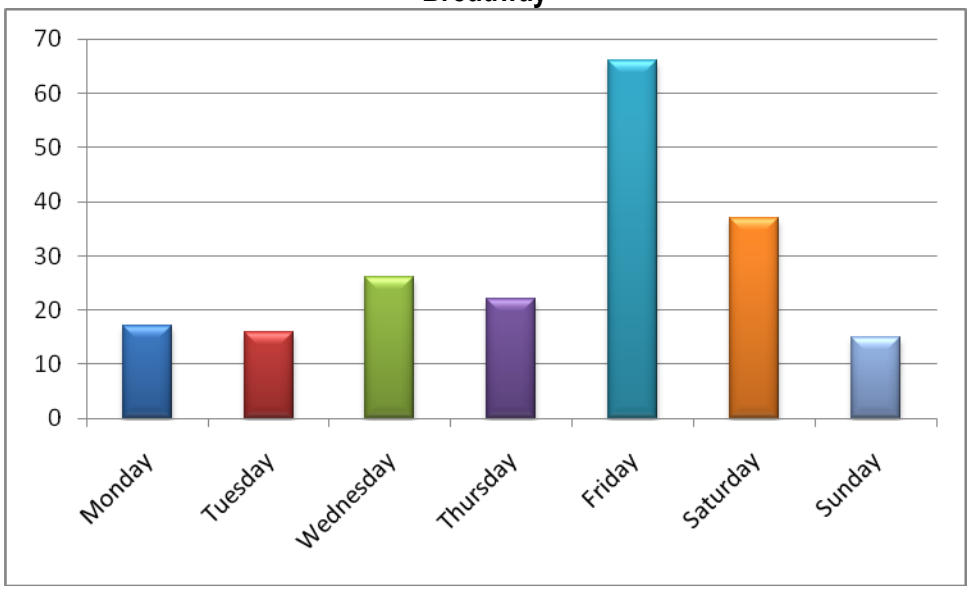
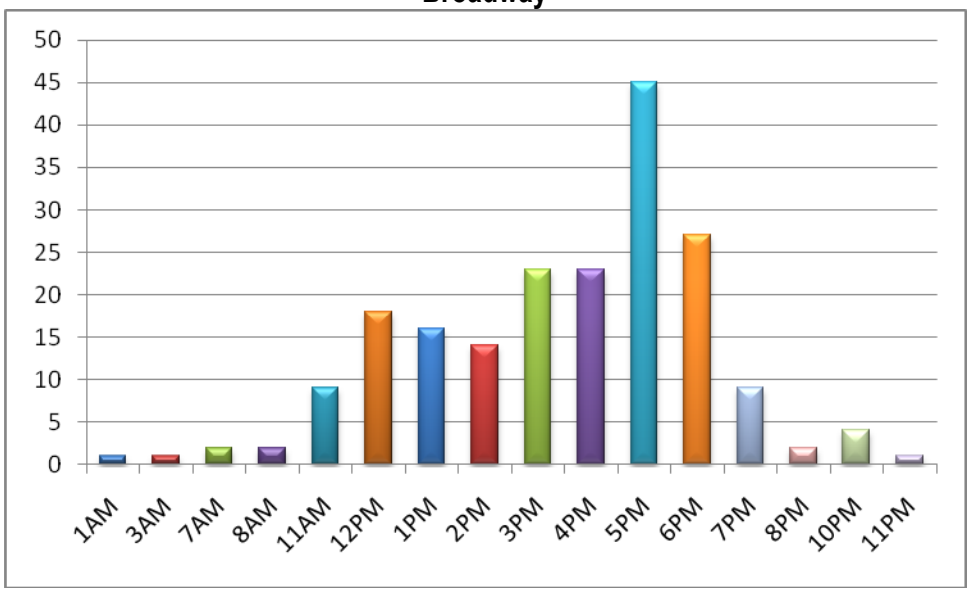



**Figure 1-10: 2005-2009 Crashes by Time of Day along Stadium Boulevard between I-70 and Broadway**




There have been a considerable number of crashes along Broadway between Stadium Boulevard and Scott Boulevard. **Table 1-12** shows the total number of fatal, injury, and property damage only crashes. The crash data also shows that 42% of recorded crashes were rear-end crashes.

| Table 1- 12: Number of Crashes (2005-2009) Between Stadium Boulevard and Scott Boulevard | | | | | | |
|---|---|---|---|---|---|---|
| | **2005** | **2006** | **2007** | **2008** | **2009** | **Total** |
| **Fatality** | 1 | 0 | 0 | 0 | 0 | **1** |
| **Injury** | 24 | 26 | 21 | 25 | 32 | **128** |
| **PDO** | 93 | 100 | 78 | 68 | 87 | **426** |
| **Total** | **118** | **126** | **99** | **93** | **119** | **555** |

**Table 1-13** shows the crash rate associated with this section of Broadway versus the state rate. The crash rates along Broadway are substantially higher.

| Table 1- 13: Crash Rates (2005-2009) Between Stadium Boulevard and Scott Boulevard | | | | | |
|---|---|---|---|---|---|
| | **2005** | **2006** | **2007** | **2008** | **2009** |
| **Crash Rate*** | 798.24 | 745.66 | 585.87 | 563.97 | 697.11 |
| **State Rate RT (Lettered Routes)** | 257.07 | 243.56 | 245.5 | 232.03 | Unknown |
| **State Rate Two-Lane** | 204.65 | 200.8 | 203.44 | 193.95 | Unknown |

*Crashes/hundred million vehicle miles of travel (HMVMT)

### 1.4.7 Access

Access to I-70 from southwestern Columbia is primarily provided by Stadium Boulevard. As previously discussed, Stadium Boulevard is currently operating at or over capacity. Stadium Boulevard alone simply cannot serve the I-70 access needs of southwestern Columbia. Although there is a nearby interchange to I-70 to the west (the I-70 and US 40 interchange) it is not a secondary point of access because it is inaccessible to residents of western Columbia. Perche Creek forms a barrier to access this interchange. Gillespie Bridge Road is the nearest crossing of Perche Creek south of I-70 and is located almost three miles south of I-70. The City of Columbia has plans to enhance connections across Perche Creek by extending Broadway from Scott Boulevard to Route UU. Moreover, connections of the I-70 frontage roads across Perche Creek are part of MoDOT's Improve I-70 plans. However, even with these connections in place, the use of the US 40 interchange would result in three to five miles of adverse travel per trip for the predominant travel movements to and from the east. This is not a sustainable long-term solution. Much of the remaining undeveloped land in western Columbia is already platted for residential development. Many of these subdivisions are currently under construction. A new interchange at an extended Scott Boulevard is needed to provide the access needs of this growing area.

## 1.5 Need for the Proposed Action

The area south of I-70 between Perche Creek and Stadium Boulevard is a growing area in the City of Columbia. Stadium Boulevard is the only practical way to access I-70 from this area, due largely to the barrier formed by Perche Creek. These circumstances put a strain on Stadium Boulevard. Access from I-70 into this part of Columbia is essential for local residents, the local business community centered on Stadium Boulevard and West Broadway, and emergency responders who provide service into this area. Various studies conducted over the past 10 years show a new I-70 interchange west of Stadium Boulevard would help alleviate congestion and improve access into this part of the city.

The Stadium Boulevard corridor in the vicinity of I-70 is already operating at capacity and is unstable. This condition is exacerbated by the close signal spacing on Stadium Boulevard near I-70. Daily fluctuations along the Stadium Boulevard corridor result in congested yet flowing conditions on light traffic days to gridlock on heavier days. Continuous vehicular backups can develop on Stadium Boulevard between I-70 and Broadway, constraining nearly all intersections.

MO Route E provides connectivity to the rural areas north of I-70, to the City of Columbia, and to I-70. While traffic volume along Stadium Boulevard decreases north of I-70 on MO Route E there is potential for future residential developments in the vicinity of the northern city limits.

This assessment shows that by year 2030, even with the addition of MoDOT's planned widening and other improvements along Stadium Boulevard, the interchange at I-70 as well as intersections along the corridor will continue to operate at or over capacity, especially in the evening peak hour. The analysis concludes that there is a strong need for an additional connection to I-70 to serve this rapidly growing southwestern part of the City of Columbia.

# 2.0 ALTERNATIVES

Alternatives that have been considered and the extensive studies that have been conducted to choose a preferred alternative for the proposed Scott Boulevard extension and for the location/configuration for the proposed I-70 interchange are provided in this Chapter. Alternatives, including the no-build alternative, Transportation System Management, and several build alternatives are considered here. A brief summary of alternatives development and the evaluation process is discussed.

## 2.1 Transportation System Management

FHWA policy defines "*Transportation System Management: All reasonable alternatives for design options, location and transportation system management type improvements (such as ramp metering, mass transit, and high occupancy vehicle (HOV) facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified.*"

The purpose of this criterion is to assure that all reasonable alternatives to new or revised access to the interstate have been considered in the form of system improvements and design options. The Transportation System Management (TSM) approach to congestion mitigation seeks to identify improvements to new and existing facilities of an operational nature. These techniques are designed to improve traffic flow and safety through better management and operation of existing transportation facilities. TSM strategies could include intersection improvements and signalization improvements, a freeway bottleneck removal program, and special events management strategies. These strategies are developed to reduce travel time and enhance system accessibility.

Intersection improvements, such as turning lanes, grade separations, pavement striping, signage and lighting, bus turnouts, and channelization of traffic, can greatly improve traffic flow operation on arterials and at intersections. Traffic signal enhancements include signal timing optimization, signal equipment upgrades, and system interconnection. Freeway and arterial bottleneck removal can consist of improving insufficient acceleration and deceleration lanes and ramps, sharp horizontal and vertical curves, narrow lanes and shoulders, inadequate signage and pavement striping, and other geometric characteristics. The identification and elimination of traffic bottlenecks can greatly improve traveling conditions and safety, especially during peak periods. TSM projects can complement the major capacity improvements and infrastructure by providing improved traffic flow on arterials and local streets. Descriptions of specific TSM projects for committed network projects can be found at http://www.stadiumimprovements.com/ and http://www.modot.org/central/major_projects/boone.htm.

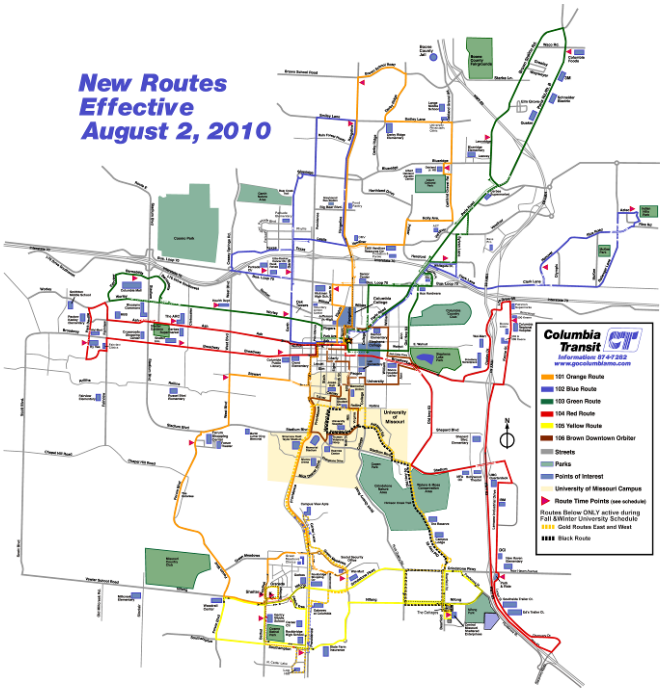
As discussed in Chapter 1.0 these types of improvements are being considered to improve operations along Stadium Boulevard and at the US Highway 40 interchange and are included in the study's suite of "committed improvements". However, this and previous studies have shown that TSM style improvements alone will not address future capacity deficiencies and provide for appropriate access to the western part of the City of Columbia.

TSM options, such as ramp metering and intelligent transportation systems (ITS), were considered in the I-70 and Scott Boulevard AJR. ITS applications are generally used for system-wide improvements. The proposed project focuses on a single interchange, and thus, ramp metering and ITS treatments would

result in only marginal benefits to the overall system. Future inclusion of ITS and/or ramp metering efforts would not be hindered by the construction of an interchange at Scott Boulevard.

Transit Concepts: Expanding transit services can often reduce the demand placed on the roadway network. There is one major transit service in the City, Columbia Transit. This public bus service has nine major routes throughout the City. There are currently three Columbia Transit and Para transit lines that run near the study area, as shown in **Figure 2-1** (http://www.gocolumbiamo.com/PublicWorks/Transportation/). Currently there are no Columbia Transit routes that run as far west as the proposed Scott Boulevard extension. The City of Columbia also has three other limited services in the area, OATS, Services for Independent Living, and the University of Missouri (Mizzou) shuttle service. OATS is a nonprofit service provider offering service to disadvantaged citizens. The Mizzou shuttle service runs Monday through Friday for students and campus employees to get from parking lots to campus buildings or shopping areas. Services for Independent Living is a nonprofit center that offers accessible transportation with door-to-door services for people with disabilities and senior citizens with services that run Sunday through Friday.

**Figure 2-1: Excerpt from City of Columbia Weekday Transit Map**




The proposed interchange project would not hinder any existing or proposed transit services. Rather, an extended Scott Boulevard could only help to facilitate enhanced future bus service and potentially enhance public transportation to western Columbia.

## 2.2 Alternative Development

Some of the critical issues influencing the location for a new interchange are the ability to attract traffic, interchange spacing along I-70, connections to the regional arterial system, and topography, land use, and environmental factors.

Ability to Attract Traffic: MoDOT is working with the City of Columbia to widen Stadium Boulevard from the I-70 Drive NW to south of Broadway (MoDOT job number J5S0842B). The existing five-lane, undivided roadway will be improved to a six-lane divided roadway with a median wide enough to accommodate dual left turns at intersections. The project will also modify the I-70 interchange configuration to a Diverging Crossover Diamond (DCD) to improve traffic flow and safety. Lanes will be added to Fairview Road from Worley Street north to the west entrance of the Columbia Mall and to Bernadette Drive from Fairview Road to Beverly Drive. All portions of the Stadium Boulevard Projects are scheduled to be let in the fall of 2012. The improvements are being funded by the City of Columbia, MoDOT, and three transportation development districts. However, even with the planned improvements, Stadium Boulevard will continue to operate under congested conditions. Operations will degrade further with continued residential growth in western Columbia. Traffic operations along Stadium Boulevard cannot be improved to the level needed to satisfy future traffic demands unless an additional interchange is constructed to the west.

Previous traffic models have shown that a new interchange (located between Stadium Boulevard and Perche Creek) would draw more traffic off of Stadium Boulevard the closer that it is located to Stadium Boulevard.

Interchange Spacing along I-70: Proximity of the new interchange to Stadium Boulevard is a critical factor due to the impact on freeway operations and resulting interchange cost. Closely spaced interchanges can result in substandard freeway weaving conditions. In order to accommodate the tighter spacing, it is often necessary to develop more elaborate interchange configurations, which can influence the cost of construction.

Connections to the Regional Arterial System: Freeway interchanges should provide effective connections to the regional road system. The proposed interchange would not fulfill its goal of diverting traffic from Stadium Boulevard without a strong connection to Scott Boulevard and West Broadway. Therefore, it is important to create a strong connection between the new interchange and the regional roads.

Topography, Land Use, and Environmental Factors: The area's topography lends itself to interchange placement at some locations but not at others. Perche Creek also presents an environmental barrier. All reasonable alternatives should be located far enough east to avoid impacting the creek and if possible, the I-70 structures over the creek. A few corridors are present where undeveloped land and/or existing right-of-way can provide the necessary roadway connections. A future connection located in one of these corridors would be a practical alternative. Finally, several environmental resources and potential impacts were considered such as residential, business, and public facilities, noise, parks, trails, and recreation facilities, pedestrian/bicycle facilities, historic and cultural resources, Waters of the U.S., floodplains, neighborhoods, communities, threatened and endangered species, hazardous waste sites, public water supplies, water quality, geology, and farmland resources. State and federal agencies were contacted to provide comments on the placement of the Interchange and local roads within the environmental study area. Their responses are included in Appendix A.

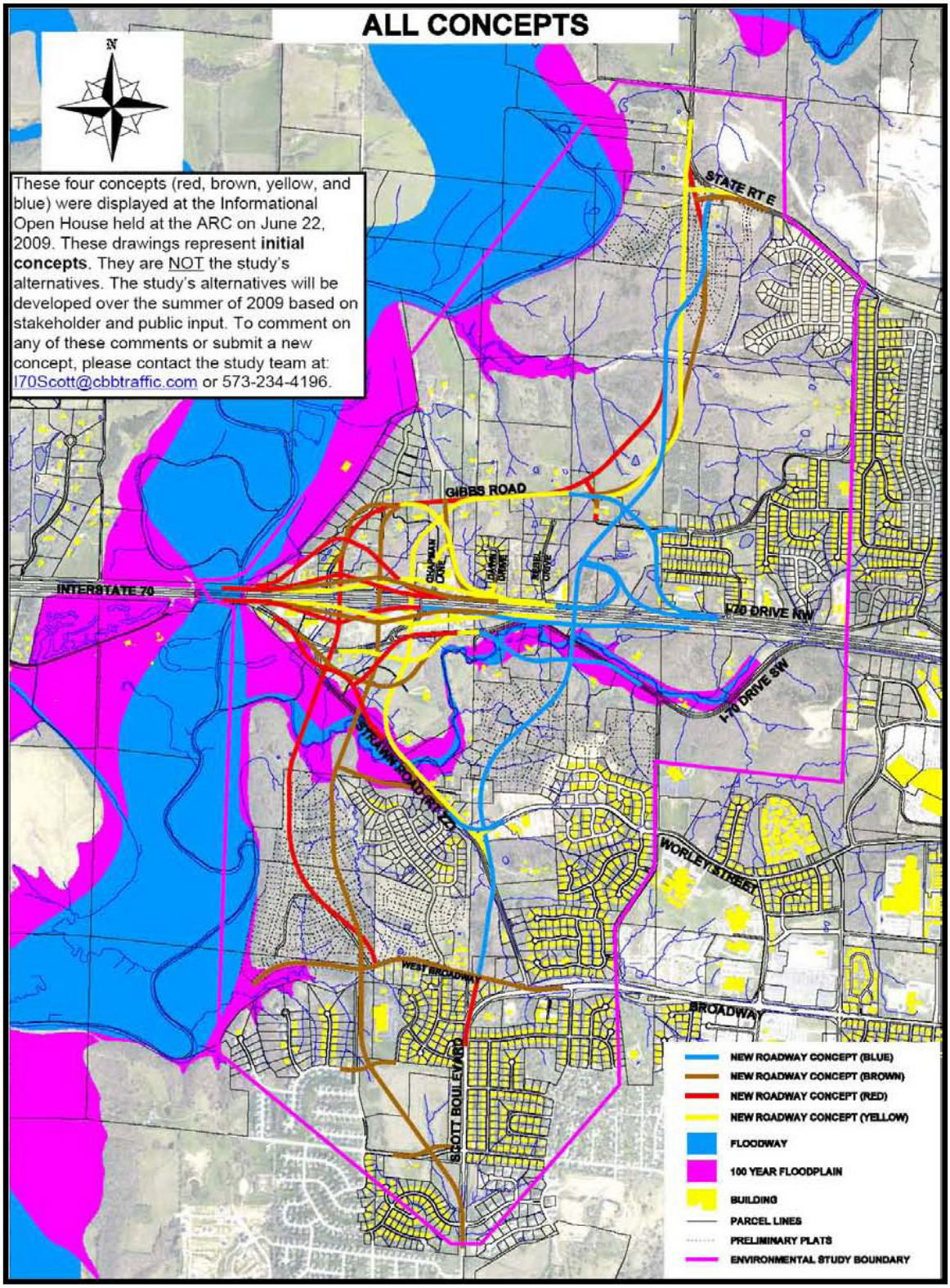
In an effort to capture as many legitimate ideas as possible a Study Team consisting of representatives from the City of Columbia, Boone County, MoDOT, FHWA, and the consultant team met on February 2,

2009, to consider various ideas for the interchange alignment/configuration and Scott Boulevard extension alignment. **Figure 2-2** shows a summary drawing of ideas discussed at the workshop.

**Figure 2-2: Alternatives -February 2, 2009 Workshop**


**Evaluation of Preliminary Concepts**: The ideas generated at the brainstorming workshop were refined based upon input from partner agencies and technical analysis (e.g., traffic flow, constructability, and environmental issues). As shown in **Figure 2-3**, four preliminary concepts (i.e., Red, Brown, Yellow, and Blue) were developed for further analysis. These concepts were presented to the public at an informational open house held on June 22, 2009. The four concepts encompass different alignments that run parallel to Perche Creek with Red being the westernmost alignment and Blue being the easternmost alignment. All four concepts are similar north of I-70 in how they extend to MO Route E.

**Figure 2-3: Alternatives –June 22, 2009**



The Red Concept was developed with the goal of avoiding neighborhood impacts by using the undisturbed platted land in the western portion of the study corridor. The alignment would cut through the platted land to the west, cross Harmony Creek and intersect Strawn, with the I-70 Drive SW connecting into Strawn to the east of the alignment. The interchange would require the widening of the I-70 bridge over Perche Creek to accommodate the auxiliary lanes.

The preliminary version of this concept included offset intersections along Broadway between Scott Boulevard from the south and the extension to the north, which is undesirable from a traffic flow perspective. This version would have also resulted in substandard spacing between the South Ramp terminal intersection and the I-70 Drive SW (only about half of the spacing suggested in MoDOT's Access Management Guidelines). Based on public comment and technical analysis, the Study Team concluded that the Red Concept could be salvaged if the offset intersections along Broadway were eliminated, outer road spacing be improved, and more room allowed for a future I-70 Drive SW crossing of Perche Creek. Eventually the Red Concept's interchange location was merged with the Yellow Concept's Scott Boulevard alignment south of I-70 to form the new Green alternative. The Red Concept's Scott Boulevard alignment was dropped because only one alignment west of Bellwood was needed and it was decided to use the Brown Concept's western Scott Boulevard alignment.

The Brown Concept made use of the Stone Valley Parkway (**Figure 2-3**) corridor south of Broadway, which is extended across Broadway in an attempt to address the offset intersections shown in the Red alignment. However, this results in a longer roadway than originally contemplated and makes the Brown the longest alignment. The Brown alignment follows the Red alignment towards I-70 but realigns Strawn to intersect the extended Scott Boulevard further to the south, which in turn allows the I-70 Drive SW to be pulled further to the south. The topography is challenging and retaining walls would be required along the creek. Because of the topographic grades it will likely be necessary to widen the I-70 bridge over Perche Creek to accommodate acceleration and deceleration lanes. The alternative has an offset intersection with the I-70 Drive NW in order to minimize impacts to existing homes. Tying the outer roads into the ramp terminals via roundabouts was considered but determined not feasible (due to capacity constraints at peak times).

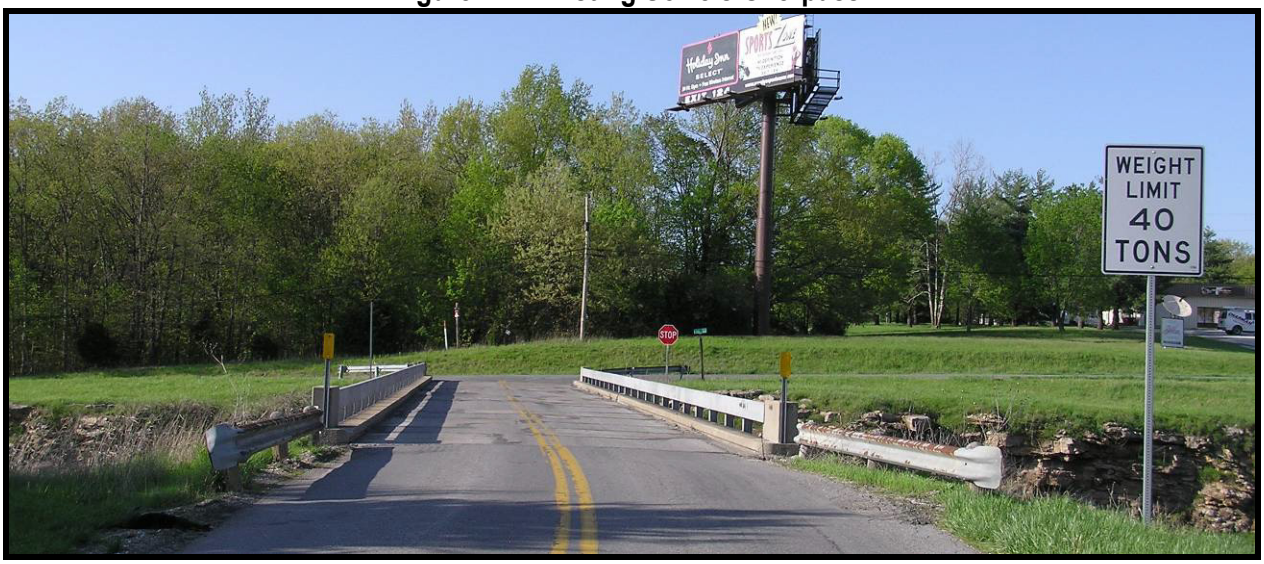
The Brown alignment garnered public support from some residents during the public meeting because of its low impact along existing Scott Boulevard and Strawn Road. However, this alignment also garnered opposition from residents along Haywood Court concerned about impacts to their neighborhood. The Brown concept also creates a longer route for motorists and concerns were raised that this may encourage cut-through traffic in the neighborhoods to the east of existing Scott Boulevard as motorists work their way downtown. The Brown Concept was adjusted slightly to form the Brown alternative.

The Yellow Concept was developed with the goal of using existing Strawn Road and the existing Sorrels Overpass. Using the Sorrels Overpass is not feasible due to the complications regarding the future widening of I-70 and the condition of the existing bridge (**Figure 2-4**). A new bridge will be required for the interchange. Topography at this location is conducive for interchange placement. Additionally, Strawn Road (the new Scott Boulevard extension) would be widened and reconstructed at a higher elevation to alleviate flooding issues.

The Yellow Concept extends Scott Boulevard across Broadway and then follows the existing alignment of Strawn Road. There would be some displacement impacts at the new intersection of Scott Boulevard and

Broadway and along existing Strawn Road, and the route is parallel to a tributary of Harmony Creek. This alternative provides for a connection to Worley Street. The alignment provides for an intersection with the I-70 Drive SW south of its existing alignment. It crosses I-70 in the proximity of Sorrels Overpass as a means of capitalizing on the existing grade differences. This alignment would not impact the I-70 bridge structures over Perche Creek. The I-70 Drive NW would connect to Gibbs Road.

**Figure 2-4: Existing Sorrels Overpass**



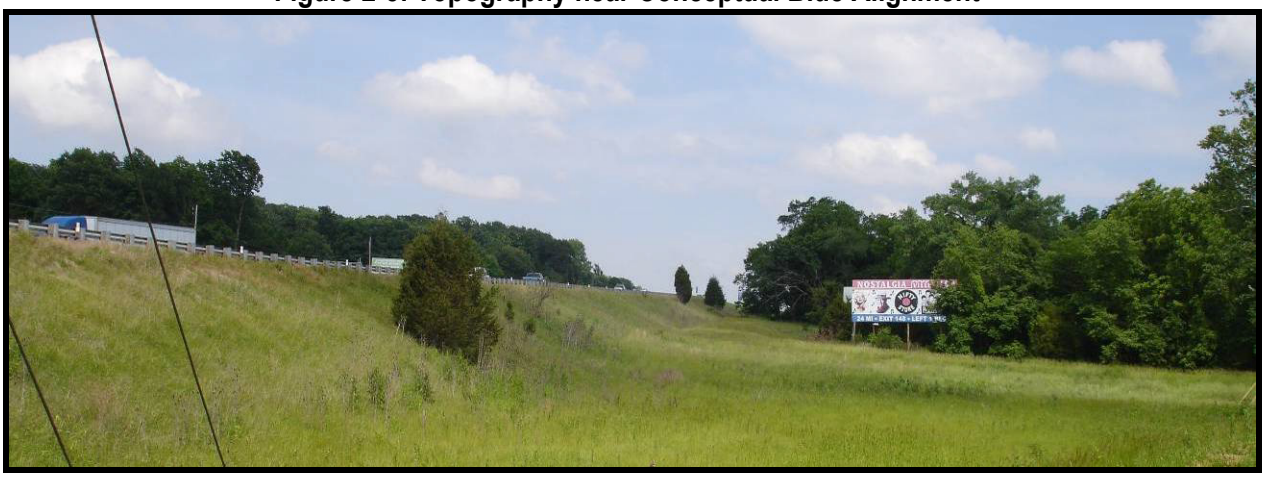

The Yellow Concept had substandard spacing between the South Ramp terminal intersection and the I-70 Drive SW (only about one-third of the spacing suggested in MoDOT's Access Management Guidelines). This spacing is driven by the location of the creek on the south side of I-70. Based on public comment and further technical analysis, the Study Team concluded that the Yellow Concept could be salvaged if the outer road spacing could be improved. This concept eventually became the Yellow alternative, with the intersection spacing issue ultimately addressed by grade-separating Scott Boulevard from the I-70 Drive SW and providing a connection as shown in **Figure 2-3**.

The Blue Concept was developed to provide for an alignment/interchange on the far eastern side of the study area. This route was the shortest of all conceptual alignments and would make use of the vacant Strawn School property and the Vintage Falls plat. The intersection of Scott Boulevard and Broadway would have been the same as the Yellow Concept. However, north of Strawn School the Blue alignment would have continued to the northeast, bisecting Vintage Falls. Strawn Road and Worley Street would intersect the Blue Concept directly opposite of one another. Folded ramps were provided on the north side of the interchange to avoid impacts to the residential area on Rebel Drive. The I-70 Drive NW would connect to Gibbs Road. A five-lane bridge across I-70 would be necessary and roundabouts would not be an option with this configuration because of the topography. The Blue interchange is the most expensive of the four concepts due to substantial grade differences creating the need for retaining walls along the ramps.

The Blue Concept has major constructability issues due to existing topography (**Figure 2-5**). As such, the cost of the interchange would be twice that of the others. Moreover, Vintage Falls Phase 1 is under

construction, and homes will likely be built along the proposed alignment by the time funding is available for right-of-way acquisition. Therefore, the Blue Concept would likely impact established neighborhoods by the time it would be constructed. Finally, the Blue Concept is not compatible with Improve I-70 plans. The interchange location would provide about 800 feet of freeway weaving distance to the Stadium Boulevard eastbound off-ramp and westbound on-ramp in the event that the Fairview flyover ramps are ever constructed. For these reasons, the Study Team dropped this concept from further analysis.

**Figure 2-5: Topography near Conceptual Blue Alignment**



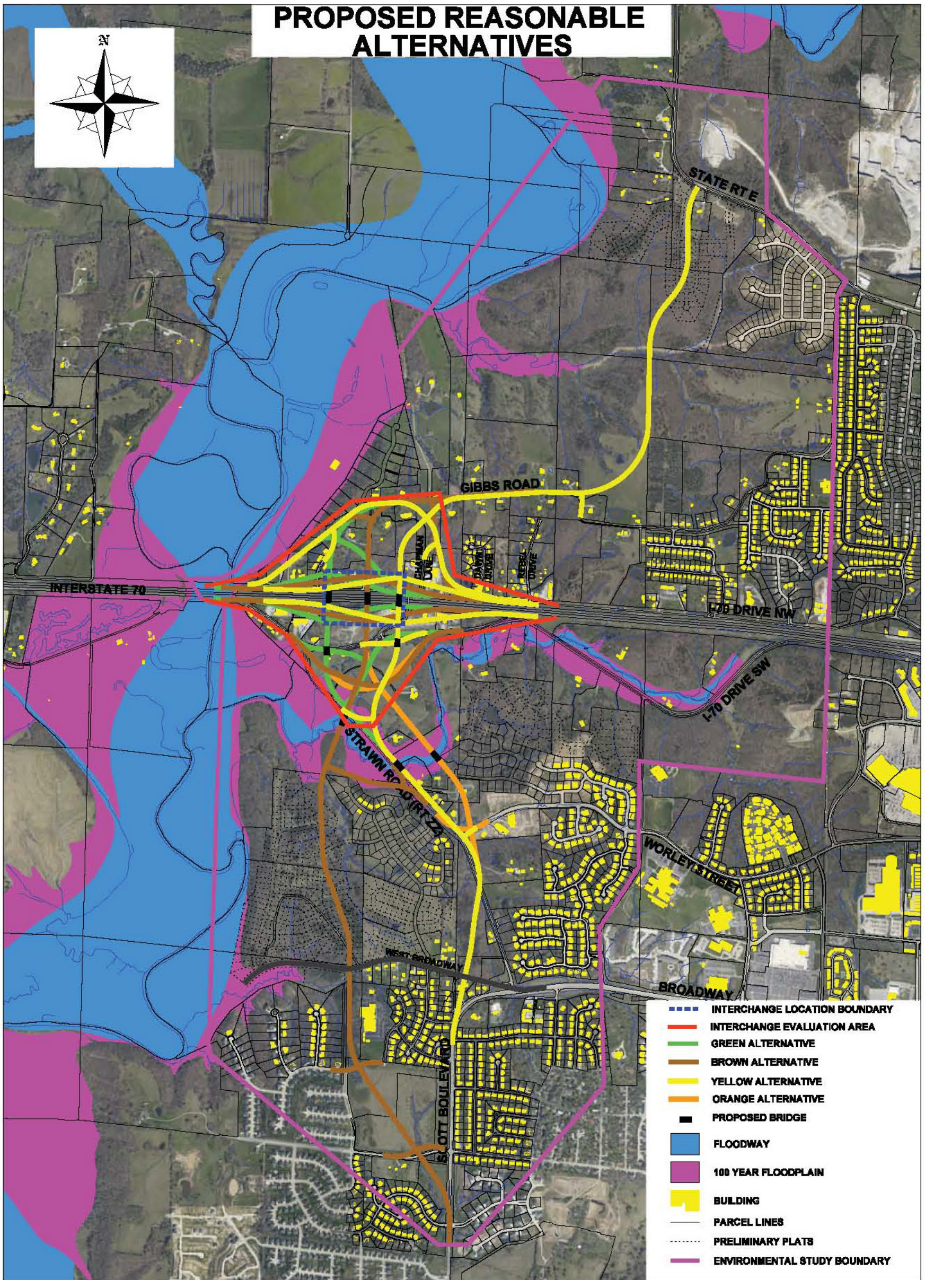
## 2.3 Reasonable Alternatives

Based on engineering and environmental analysis and input received from partner agencies and the public informational open house, four reasonable alternatives were created from the preliminary concepts. Brown, Green, Yellow, and Orange alternatives are shown in **Figure 2-6**.

### 2.3.1 Preliminary Environmental Screening of Alternatives

Environmental impacts were a factor in the screening of various alternatives. A 500' study corridor was used for a broad brush review of the Brown, Green, Yellow and Orange alternatives. For natural resource constraints (wetlands, streams, and protected species habitat) the comparison includes all resources in the environmental study corridor. For historic resources and archaeological resources, the comparison includes all resources in the environmental study corridor and a 100 ft buffer (preliminary Area of Potential Effect). Residences, businesses, schools, and potential, 4(f) resources impacts were calculated. For the purposes of providing environmental input for the preferred alternative (Yellow), impacts for the local road corridor were determined based on a 250' buffer around the centerline of the proposed alternative. For residential and commercial takes, impacts were assessed for resources within the study corridor and also that would likely be taken by construction of the alternative. A summary of the screening is found in **Table 2-1**.

**Figure 2-6: Reasonable Alternatives Considered**



| Table 2- 1: Scott Boulevard Environmental Constraints Preliminary Screening Summary | | | | | |
|---|---|---|---|---|---|
| **Environmental Consideration** | **Units** | **Green** | **Brown** | **Orange** | **Yellow** |
| **Corridor length** | miles | 3.16 | 3.58 | 3.04 | 2.94 |
| **Right of way requirements** | acres | 38 | 50 | 36 | 39 |
| **Structures impacted** | | | | | |
| Commercial /Industrial Total Takes | number | 10 | 0 | 11 | 9 |
| Residential Total Takes | number | 11 | 1 | 6 | 11 |
| Platted/Preliminary Platted lots | number | 23 | 35 | 26 | 26 |
| Proposed Parks Impacted | acres | 1 | 1 | 1 | 1* |
| Cultural Resources | number | 20 | 24 | 21 | 21 |
| Forested Habitat | acres | 129 | 181 | 146 | 143 |
| Streams-total length | feet | 20,428 | 24,969 | **20,729** | **20,205** |
| Wetlands | **acres** | 1.26 | 1.20 | 1.06 | 1.24 |

* For the preferred alternative (Yellow), the City of Columbia Parks and Recreation Department has agreed to grant an easement for the Scott Boulevard construction.

#### 2.3.1.1 No-Build Alternative

The no-build would keep the current configurations of Scott Blvd and I-70. Certain advantages and disadvantages are associated with the implementation of the no-build alternative. Other projects will be completed even if under the no-build alternative These projects are described in detail in section 1.4.5 and include (but are not limited to) widening I-70 and a Broadway extension.

The advantages of the no-build alternative include:

- No new additional construction costs
- No disruption in the existing land uses due to construction activities
- No right-of-way acquisition or associated disruption and cost
- No business, residential, agricultural, or natural resource impacts

The disadvantages of the no-build alternative include:

- Increased future traffic congestion on Stadium Drive
- Continued limited access to I-70 for southwestern Columbia

#### 2.3.1.2 Brown Alternative

The Brown alternative was brought forward intact from the Brown Concept with a few minor changes. This is the “western” alignment south of I-70 and the “center” interchange location. The Brown alternative has the longest corridor length and would require the most right-of-way while impacting the most preliminary platted lots, 4(f) properties, protected habitat, and stream.

#### 2.3.1.3 Green Alternative

The Green alternative was developed by using the far western Red interchange location from the preliminary concepts connecting to a Strawn Road alignment. This is the "center" alignment south of I-70 and the "western" interchange location. This alternative includes a grade separation for I-70 Drive SW and Scott Boulevard and provides an at-grade intersection further south via a jughandle. This provides improved intersection spacing between the South Ramp terminal and the I-70 Drive SW. The Green alternative has similar impacts to the Yellow and Orange alternatives. It stands out in that it would have considerably more 4(f) impacts.

#### 2.3.1.4 Orange Alternative

The Orange alternative was not a preliminary concept. It was developed based upon ideas generated at the June 22, 2009, open house. It was created by connecting the center interchange location to a new Scott Boulevard alignment, which would be slightly east of Strawn Road. This is the "eastern" alignment south of I-70 and the "center" interchange location. The Orange alternative has similar impacts to the Green and Yellow alternatives. It has the smallest 4(f) impacts of all of the preliminary alternatives.

#### 2.3.1.5 Yellow Alternative

The Yellow alternative was brought forward intact from the Yellow Concept with some modification. Similar to the Green alternative, the Yellow alternative has grade separation at I-70 Drive SW and Scott Boulevard. This is the "center" alignment south of I-70 and the "eastern" interchange location. The Yellow alternative has similar impacts to the Green and Orange alternatives, but would have the shortest corridor length.

The local road alignments north of I-70 are all identical past the east-west portion of Gibbs Road. All interchange alternatives replace (remove) the existing Sorrels Overpass. All bridge designs are based on the ten-lane section I-70 improvements.

## 2.4 Recommendation of a Preferred Alternative

A rigorous engineering, environmental (Chapter 3.0), and traffic operations analysis was conducted on the set of reasonable alternatives to determine a recommendation for a preferred alternative. A summary of major issues considered in this process is discussed below. In general, a series of three questions were asked in order to determine the recommendation for the preferred alternative.

Question 1: Is there an overriding benefit that would drive the selection of the Brown (far western) alternative? Engineering analysis showed that the Brown alternative is the longest (and most expensive) of the alternatives, and traffic analysis showed that it would carry less traffic than the other alternatives as some drivers would opt to use Strawn Road for travel to and from Broadway. Additionally, being the longest alternative, Brown has the most severe habitat impacts, the highest chances of major archeological impacts, and would have impacts to City-owned parkland south of I-70 and east of Perche Creek. While other alternatives have parkland impacts, the Brown alternative bisects the future park with the potential to impact over 15 acres of parkland in the environmental study corridor—the most of any alternative. Moreover, this alternative had the most risk for public controversy. While the alternative garnered a number of positive comments during the public meeting (primarily from homes near the intersection of Broadway and Scott Boulevard), it also received a number of negative comments during the public meeting (primarily from the Haywood Court neighborhood). The Brown alternative was originally considered to avoid residential areas. The City

tends to use existing road alignments as much as possible, and using the Strawn Road alignment would be consistent with this practice.

The Study Team could not find justification to recommend the Brown alternative as the preferred alternative.

Question 2: Is it preferable to choose an alignment that uses Strawn Road (i.e., Yellow and Green alternatives) over the Orange alternative?

- In general, the detailed analysis showed that the Orange, Yellow, and Green alternatives have similar costs, environmental impacts, and benefits. However, the Yellow and Green alternatives had a distinct advantage over the Orange alternative from the standpoint of consistency with past public policy. Specifically, the Bellwood and Vintage Falls plats (which are public record) show the Scott Boulevard extension using a Strawn Road alignment. These developments both dedicated land along the Strawn Road corridor for a future Scott Boulevard extension. These plats (and the dedicated right-of-way) could create a public expectation that a future Scott Boulevard Extension would make use of the existing Strawn Road corridor.
- The Yellow and Green alternatives would raise the elevation of the existing Strawn Road alignment and would alleviate the existing roadway flooding problems that occur there on a regular basis.
- Using the existing Strawn Road alignment provides greater flexibility in the placement of the I-70 interchange. Preliminary engineering shows that a Strawn Road alignment could make use of all three proposed interchange locations, while use of the Orange alignment allows for a much more restricted interchange "window". This could be important later in the process if unexpected problems are encountered which would require the interchange location to be shifted.
- The Yellow and Green alternatives provide outer road connections that are preferable to the Orange alternative. Specifically, the Orange alternative does not provide for continuous outer roads on the north side of I-70. Additionally, the Yellow and Green alternatives provide for a grade separated I-70 Drive SW at the I-70 interchange, which provides for better intersection spacing along Scott Boulevard.
- Using a Strawn Road alignment provides for more of an opportunity to "reuse" existing roadway, consistent with "Smart Growth" principles.

Based on this analysis the Study Team recommended a preferred alignment that would make use of the existing Strawn Road corridor.

Question 3: Which interchange location is preferable: Yellow or Green? Both are reasonable alternatives with similar costs and impacts. The ultimate location was determined based on the following considerations:

- The Yellow alternative provides for better spacing between the interchange ramp terminals and the outer road intersection on the north side of I-70.
- The Yellow alternative provides for slightly shorter travel distance for commuters.
- The Yellow alternative does not require widening of the I-70/Perche Creek bridges. The Green alternative would require the widening of these bridges to accommodate acceleration and

deceleration lanes. This makes the Yellow alternative easier to construct with less impact to the traveling public.

Based on this analysis, the Study Team recommended Yellow as the preferred alternative.

The preferred alternative (Yellow) was identified through public and agency involvement along with assessment of socioeconomic and environmental consequences. Selection of alternative will not be finalized until substantive comments from resource agencies and from the public hearing are fully evaluated and addressed.

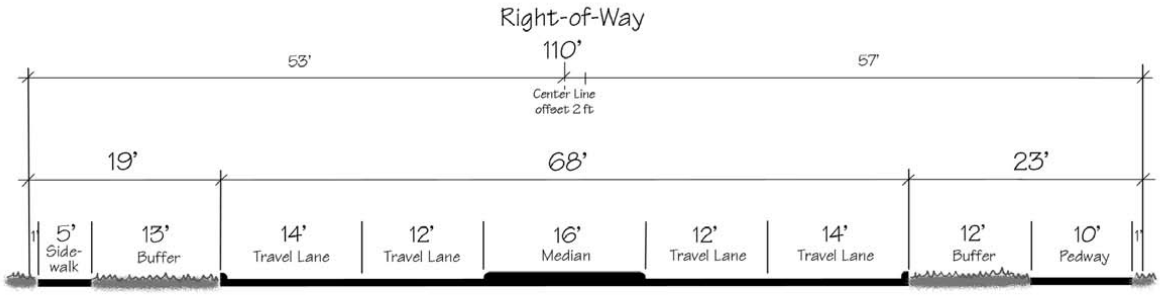
### 2.4.1 Description of the Preferred Alternative

The Yellow alternative (preferred) extends Scott Boulevard as a four-lane roadway (with turning lanes at intersections) across Broadway (under traffic signal control) and then generally follows along the existing alignment of Strawn Road (**Figure 2-6**). A signalized connection is provided to Worley Street. South of I-70 Scott Boulevard will be a Major Arterial (City of Columbia Option B; **Figure 2-7**) designed for 28,000 Average Daily Traffic with a design speed of 45 miles per hour (**Table 2-2**).

**Table 2- 2: Scott Boulevard Design Criteria**

| Design Criteria | **Scott Boulevard (South of I-70)** | **Scott Boulevard (North of I-70)** |
|---|---|---|
| Functional Classification | Major Arterial | Major Collector |
| Average Daily Traffic (2030) | 28,000 | 7,000 |
| Design Speed | 45 mph | 35 mph |
| Clear Zone | 16' cut/28' fill | 16' cut/18' fill |
| Typical Section | Major Arterial-Option B | Major Collector-Option A |

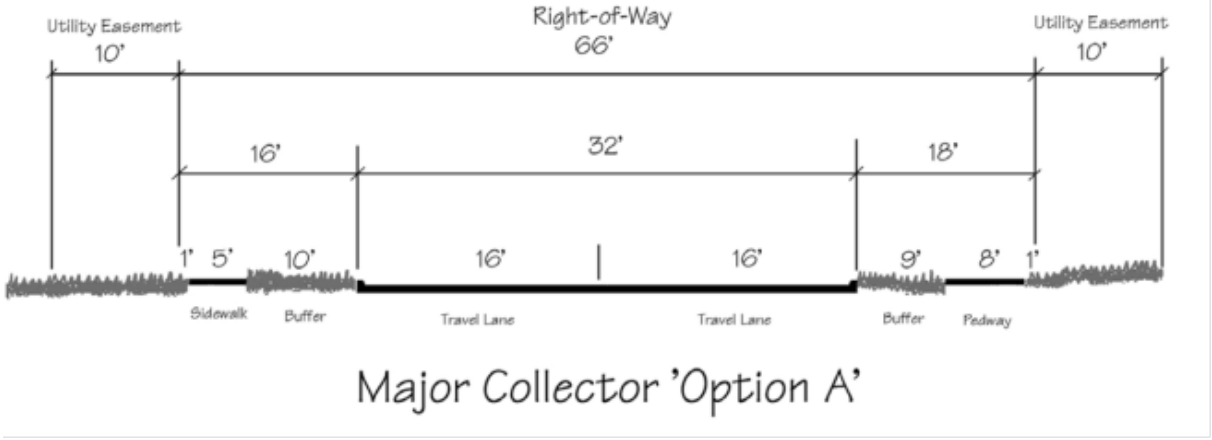
**Figure 2-7: Scott Boulevard South of I-70**




Major Arterial - Option 'B'

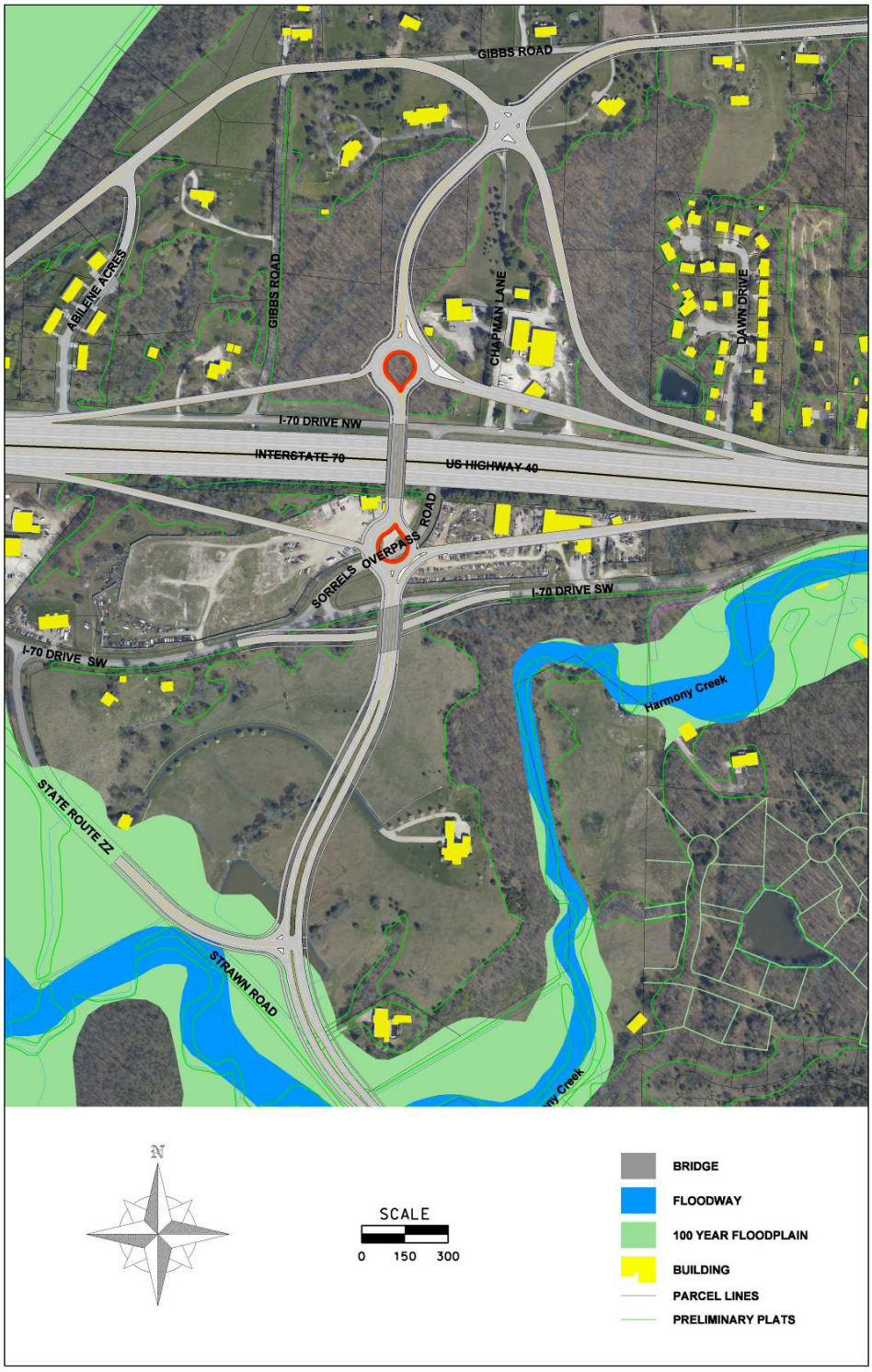
North of I-70 Scott Boulevard will be a Major Collector (City of Columbia Option A; **Figure 2-8**) designed for 7,000 Average Daily Traffic with a design speed of 35 miles per hour (**Table 2-1**).

**Figure 2-8: Scott Boulevard North of I-70**




The interchange will result in a grade separation at Scott Boulevard and the I-70 Drive SW. The I-70 Drive SW will connect to the interchange using the existing Strawn Road. The interchange is a typical diamond interchange with roundabouts at the ramp terminals and a three lane bridge (**Figure 2-9**).

**Figure 2-9: Scott Boulevard Interchange at I-70 (Yellow-Preferred)**



North of the interchange, Scott Boulevard is configured with two to three lanes (depending on the need for turning bays). The I-70 Drive NW is configured as a traditional two-way stop-controlled intersection which could be signalized if future traffic volumes warrant. A roundabout is not appropriate at this location due to the steep grades. This intersection could become particularly important from a system-wide traffic management standpoint for freeway incident management on I-70. Local agencies and MoDOT have discussed constructing an outer road bridge across Perche Creek on the north side of I-70. If this bridge is constructed, traffic could be routed to the I-70 Drive NW when I-70 is closed for an incident. The alignment then follows the Gibbs Road alignment to the east, and turns north to intersect with MO Route E. The MO Route E intersection would be configured as a roundabout to balance traffic flows and enhance safety.

### 2.4.2 2030 Yellow Alternative (Preferred) Operating Conditions with Scott Interchange

As described earlier, the Yellow alternative (preferred) extends Scott Boulevard from Broadway to MO Route E with an interchange at I-70. The following is a description of lane and intersection configurations for the extension:

North of I-70 to MO Route E: Two-lane roadway with left-turn storage bays at intersections
- MO Route E – Roundabout
- Gibbs Road – Unsignalized Side-Street Stop Control
- I-70 Drive NW - Unsignalized Side-Street Stop Control

I-70 Interchange: Three-lane roadway over I-70
- Westbound Ramps – Two-lane Turbo Roundabout
- Eastbound Ramps – Two-lane Turbo Roundabout

South of I-70 to Broadway: Four-lane roadway with left-turn storage bays at intersections
- I-70 Drive SW – Grade-Separation
- I-70 Drive SW Loop – Signalized
- I-70 Drive SW / I-70 Drive SW Loop - Unsignalized Side-Street Stop Control
- Bellwood - Unsignalized Side-Street Stop Control with U-turn at Worley
- Worley Street – Signalized
- Broadway – Signalized

A turbo roundabout is a special type of multi-lane roundabout that eliminates lane-changing within the roundabout. Traffic safety, speed and capacity are enhanced as a result.

The Yellow alternative (preferred) provides for LOS D or better at all intersections along Scott Boulevard and Stadium Boulevard during the morning and evening peak hours (**Table 2-3**). Similarly, all freeway segments on I-70 from US Highway 40 to Stadium Boulevard operate at LOS D or better (**Table 2-4**). Thus, the recommended Yellow alternative (preferred) provides significant improvements over 2030 committed network operations both for Stadium Boulevard and I-70.

By year 2030 under current conditions, even with the addition of MoDOT's planned widening and other improvements along Stadium Boulevard, the interchange at I-70 as well as intersections along the corridor will continue to operate at or over capacity especially in the evening peak hour. The analysis concludes that

there is a strong need for an additional connection to I-70 to serve this rapidly growing southwestern part of the City of Columbia.

**Table 2- 3: 2030 Yellow Alternative (Preferred) Intersections Analysis Results**

| Intersections along Stadium Boulevard | AM Peak Hour | PM Peak Hour |
|---|---|---|
| | LOS | LOS |
| I-70 Drive NW | B | B |
| I-70 Westbound Ramps | B | B |
| I-70 Eastbound Ramps | B | B |
| I-70 Drive SW (Side-Street Stop) | A | B |
| Bernadette Drive | C | D |
| Worley Street | C | C |
| Ash Street | C | C |
| Broadway Boulevard | D | D |
| **Intersections along Scott Boulevard** | | |
| Route E (Roundabout) | A | A |
| Gibbs Road (Side-Street Stop) | B | B |
| I-70 Drive NW | C | C |
| I-70 Westbound Ramps (Roundabouts) | B | C |
| I-70 Eastbound Ramps (Roundabouts) | A | B |
| I-70 Drive SW | A | B |
| Bellwood (Side-Street Stop) | C | C |
| Worley Street | A | A |
| Broadway Boulevard | C | D |

| Table 2- 4: 2030 Yellow Alternative (Preferred) Freeway Analysis Results | | | | |
|---|---|---|---|---|
| SECTION | DIRECTION | TYPE | AM Peak Hour | PM Peak Hour |
| | | | LOS | LOS |
| West of US 40 | Eastbound | Freeway | B | B |
| I-70 to US 40 Off-Ramp | Eastbound | Diverge | C | B |
| US 40 to I-70 On-Ramp | Eastbound | Merge | C | C |
| Between US 40 and Scott Blvd | Eastbound | Freeway | C | B |
| I-70 to Scott Blvd Off-Ramp | Eastbound | Diverge | C | C |
| Scott Blvd to I-70 On-Ramp | Eastbound | Merge | C | C |
| Between Scott Blvd and Stadium Blvd | Eastbound | Freeway | C | B |
| I-70 to Stadium Blvd Off-Ramp | Eastbound | Diverge | D | C |
| Stadium Blvd to I-70 On-Ramp | Eastbound | Merge | D | C |
| East of Stadium Blvd | Eastbound | Freeway | D | C |
| East of Stadium Blvd | Westbound | Freeway | C | D |
| I-70 to Stadium Blvd Off-Ramp | Westbound | Diverge | C | D |
| Stadium Blvd to I-70 On-Ramp | Westbound | Merge | B | D |
| Between Stadium Blvd and Scott Blvd | Westbound | Freeway | B | D |
| I-70 to Scott Blvd Off-Ramp | Westbound | Diverge | C | D |
| Scott Blvd to I-70 On-Ramp | Westbound | Merge | B | C |
| Between US 40 and Scott Blvd | Westbound | Freeway | B | C |
| I-70 to US 40 Off-Ramp | Westbound | Diverge | C | D |
| US 40 to I-70 On-Ramp | Westbound | Merge | B | C |
| West of US 40 | Westbound | Freeway | B | B |

Specifically, without the proposed Scott Boulevard interchange several intersections along Stadium Boulevard will operate at failing conditions by 2030 with LOS E/F, especially during the evening peak hour. The Yellow alternative (preferred) will improve traffic conditions by providing LOS D or better. Moreover, without the proposed Scott Boulevard interchange, evening peak period traffic volumes of 2,230 vehicles per hour are forecasted for the westbound Stadium Boulevard off-ramp. These volumes are close to the

theoretical capacity of the off-ramp, resulting in the freeway segment operating at LOS F with lane-changing failures on I-70. The Yellow alternative (preferred) improves this condition to LOS D and improves mainline I-70 operations.

The preferred alternative (Yellow) would improve safety. The proposed Scott Boulevard interchange would reduce traffic volumes on Broadway by shifting I-70 traffic from Stadium Boulevard to Scott Boulevard. Essentially less traffic will help reduce congestion, thus reducing crashes. Additionally, the proposed Scott Boulevard extension would remove the curve at the Broadway and Scott Boulevard intersection.

Traffic operations were also evaluated to determine the impact of a new interchange at an extended Scott Boulevard if I-70 is not widened. The results show that the construction of the proposed interchange at Scott Boulevard will neither create nor relieve traffic congestion on a four-lane I-70. The traffic modeling shows similar levels of interstate queuing and freeway traffic delays for both the Scott Boulevard interchange "build" and "no-build" scenarios (Crawford, Bunte, Brammeier, 2010).

In summary, the Yellow alternative (preferred) provides acceptable traffic operations on Scott Boulevard and greatly improves traffic conditions on Stadium Boulevard and mainline I-70. A new Scott Boulevard interchange would provide for substantial improvement over anticipated 2030 committed network operations.

### 2.4.3 2030 Yellow Alternative (Preferred) Operating Conditions with Major North-South Roadways

The possible effects to major north-south roadways due to the Yellow alternative (preferred) are discussed below.

Stadium Boulevard: The proposed project would shift commuter traffic from Stadium Boulevard to Scott Boulevard, greatly improving traffic operations and the commercial environment along Stadium Boulevard (Crawford, Bunte, Brammeier 2010).

Fairview Road: MoDOT's Improve I-70 plans include the provision for future ramps from Fairview Road to and from the east on I-70 if required, to relieve traffic on Stadium Boulevard. However, a new interchange at Scott Boulevard may draw enough traffic from Stadium Boulevard to preclude or postpone the need for these ramps.

Silvey Street: proposed Scott Boulevard interchange will probably not impact traffic on Silvey Street.

Sorrels Overpass Drive: The proposed Scott Boulevard interchange bridge over I-70 would replace this structure.

Scott Boulevard: A new interchange on I-70 west of Stadium Boulevard would provide enhanced access to I-70 from western Columbia and would relieve congestion along the Stadium Boulevard corridor and interchange with I-70. As part of the proposed Scott Boulevard interchange along I-70, Scott Boulevard would be extended from Broadway across I-70 to MO Route E. This extension of Scott Boulevard would provide a four-lane major arterial south of I-70 and a two-lane major collector north of I-70. Additionally, this new interchange project would eliminate the "curve" at the intersection along Scott Boulevard at Broadway.

Strawn Road (Route ZZ): The proposed Scott Boulevard extension would widen and elevate this roadway, ultimately solving the roadway flooding issues. The roadway's functional classification would be upgraded from a major collector to a major arterial. Several of the residents along Strawn Road would be impacted by the proposed Scott Boulevard extension.

US 40 and Route UU: The proposed Scott Boulevard interchange could potentially cause traffic shifts from the US 40 interchange. However, traffic shifts are likely negligible because of the very small traffic volumes to and from the west on I-70 accessing US 40 interchange.

### 2.4.4 2030 Yellow Alternative (Preferred) Operating Conditions with Major East-West Roadways

The possible effects to major east-west roadways due to the Yellow alternative (preferred) are discussed below.

MO Route E: The proposed Scott Boulevard extension would likely shift traffic from MO Route E and away from the Stadium Boulevard interchange to the new interchange, predominantly to and from the west.

Gibbs Road: The proposed Scott Boulevard extension would utilize the Gibbs Road alignment between I-70 Drive NW and Barberry Avenue and would impact residences along this stretch. However, Gibbs Road would connect with the new Scott Boulevard extension west of Barberry Avenue and would provide enhanced access to I-70.

I-70 Drive NW (Interstate 70 Drive NW): The proposed Scott Boulevard interchange would relocate the I-70 Drive NW slightly to the north at the interchange. I-70 Drive NW travel patterns would shift with the new interchange due to additional access to I-70.

I-70 Drive SW (Interstate 70 Drive SW): The proposed Scott Boulevard interchange includes a grade separation over the I-70 Drive SW and connections between Scott Boulevard and the I-70 Drive SW. This configuration increases the spacing between the I-70 Drive SW signal and the interchange and provides increased future development opportunities. I-70 Drive SW travel patterns would shift with the new interchange due to additional access to I-70.

Bernadette Drive: Because of its location and function, the proposed project would have marginal impacts on Bernadette Drive.

Ash Street: The new interchange at Scott Boulevard is anticipated to result in reduced traffic volumes along Ash Street west of Stadium Boulevard by substantially reducing the cut-through traffic from Stadium Boulevard accessing Broadway.

Worley Street: The new interchange at Scott Boulevard will have minimal impacts to traffic patterns on Worley Street.

Broadway (Route TT): While there may be some limited relief for western Columbia traffic by providing an additional connection to I-70, adverse travel limits the attractiveness for the predominant I-70 traffic movements to and from the east.

Gillespie Bridge Road: The proposed interchange is not anticipated to change traffic patterns on this roadway.

## 2.5 Costs

Costs for the proposed Scott Boulevard local road and I-70 Interchange improvements for the Green, Brown, Orange and Yellow (preferred) alternatives are shown in **Table 2-5**. Total project costs range from approximately $68 million for the Green and Yellow (preferred) to $85.5 million for the Brown alternative. Preliminary construction costs include the costs of interchanges and local road segments. Right-of-way cost here include an estimate of acquisition, damages to the remainder, condemnation and settlement costs as well as overhead and contingency costs. Right-of-way costs are discussed in detail in Chapter 3.0. A preliminary estimate of costs for engineering, administration and observation, utility relocation, business and residential relocations and environmental remediation/mitigation are included. The final selection of an alternative will not be made until impacts, agency comments and the public comments are considered.

**Table 2- 5: Cost for Scott Boulevard and I-70 Interchange Project**

| Cost Factor | Units | Green | Brown | Orange | Yellow (Preferred) |
|---|---|---|---|---|---|
| **Corridor length** | miles | 3.2 | 3.6 | 3.0 | 2.9 |
| **Preliminary Construction Cost** | | | | | |
| Interchange | $ (Mil) | $11.0 | $13.0 | $13.0 | $9.0 |
| Scott Blvd North of I-70 | $ (Mil) | $12.0 | $14.0 | $14.0 | $14.5 |
| Scott Blvd South I-70 | $ (Mil) | $14.0 | $21.0 | $15.0 | $13.5 |
| Contingency | $ (Mil) | $9.5 | $12.0 | $10.5 | $9.5 |
| **Subtotal Preliminary Construction Cost** | $ (Mil) | **$46.5** | **$60.0** | **$52.5** | **$46.5** |
| Right of way costs | | | | | |
| Subtotal Right-of-Way Acquisition Cost | $ (Mil) | $5.9 | $7.2 | $7.6 | $6.2 |
| Damages to the Remainder Cost (15% of Subtotal) | $ (Mil) | $0.9 | $1.0 | $1.1 | $0.9 |
| Condemnation and Settlement Costs (25% of Subtotal) | $ (Mil) | $1.5 | $1.8 | $1.9 | $1.6 |
| Overhead and Contingency Costs ($4,500 per take) | $ (Mil) | $0.5 | $0.9 | $0.6 | $0.6 |
| **Subtotal Right-of-Way Acquisition Cost** | $ (Mil) | **$8.8** | **$10.9** | **$11.2** | **$9.3** |
| Engineering (8% of Preliminary Construction Costs Subtotal) | $ (Mil) | $3.7 | $4.8 | $4.2 | $3.7 |
| Administration and Observation (8% of Preliminary Construction Costs Subtotal) | $ (Mil) | $3.7 | $4.8 | $4.2 | $3.7 |
| Utility Relocation | $ (Mil) | $3.0 | $3.0 | $3.0 | $3.0 |
| Environmental Remediation/Mitigation Costs (3% of Preliminary Construction Costs Subtotal) | $ (Mil) | $1.4 | $1.8 | $1.6 | $1.4 |
| Relocation of Business and Residences | $ (Mil) | $0.4 | $0.2 | $0.4 | $0.4 |
| **Total Project Cost** | $ (Mil) | **$67.5** | **$85.5** | **$77.1** | **$68.0** |

# 3.0 ENVIRONMENTAL IMPACTS

The following chapter is a discussion of project affected environment and environmental impacts. Screening of alternatives was completed using an environmental study corridor that is 500 feet in width for the local roads and a buffered interchange within the Interchange Evaluation Area. A matrix of environmental impacts was developed along with preliminary cost estimates, and a preferred alternative was selected; (See Section 2.3). The various impact analysis study limits are described below:

- Study Corridor: The study corridor is a 500-foot buffer surrounding the proposed improvements for the local roads. MoDOT and the State Historic Preservation Office (SHPO) concurred on the study corridor for archaeological and historic architectural resources. For the screening of historic architectural resources an additional 50 feet on both sides of the environmental study corridor was considered.

- The Interchange Evaluation Area (IEA): Conceptual interchange configurations have been proposed for each alternative to include the outer limits of each of the interchange/outer road alternatives with a buffered interchange up to 500 feet in width. Unknown engineering or other constraints may require a change in where the interchange is located. It is not unusual for interchange configurations to change in the design phase after alternatives analysis and compliance under NEPA is completed. The IEA was identified and the alternatives were evaluated in this NEPA document, but variations in design are expected during the design phase. This identification of the IEA will streamline the NEPA clearance process if a design modification is required.

- Conceptual Right-of-Way: The conceptual right-of-way includes and area large enough to account for construction and right-of-way activities. The screening of the residential and commercial property was performed within the study corridor and an additional screening was performed for residential and commercial properties that would likely be taken by construction of the alternative in the conceptual right-of-way.

A review of the alternatives was performed to identify design opportunities and to identify potential socioeconomic, cultural, and natural resources in the alternatives. Field studies were performed in March and April of 2010. Available resource maps, geographic information systems (GIS) data, and Center for Applied Research and Environmental Systems (CARES) GIS data were used to develop the initial environmental constraints map. The City of Columbia, Missouri, and Boone County provided GIS data. Cultural and historic records were reviewed in the State Historic Preservation Office (SHPO) and data was provided in GIS format by the Missouri Department of Natural Resources (MDNR). For the preferred alternative (Yellow) a detailed survey of jurisdictional waters and cultural resources was performed and that data is included in the following sections. Environmental impacts are summarized in the Environmental Constraints Matrix which is included in the Executive Summary as **Table ES-1** and shown graphically in figures throughout Chapter 3.0.

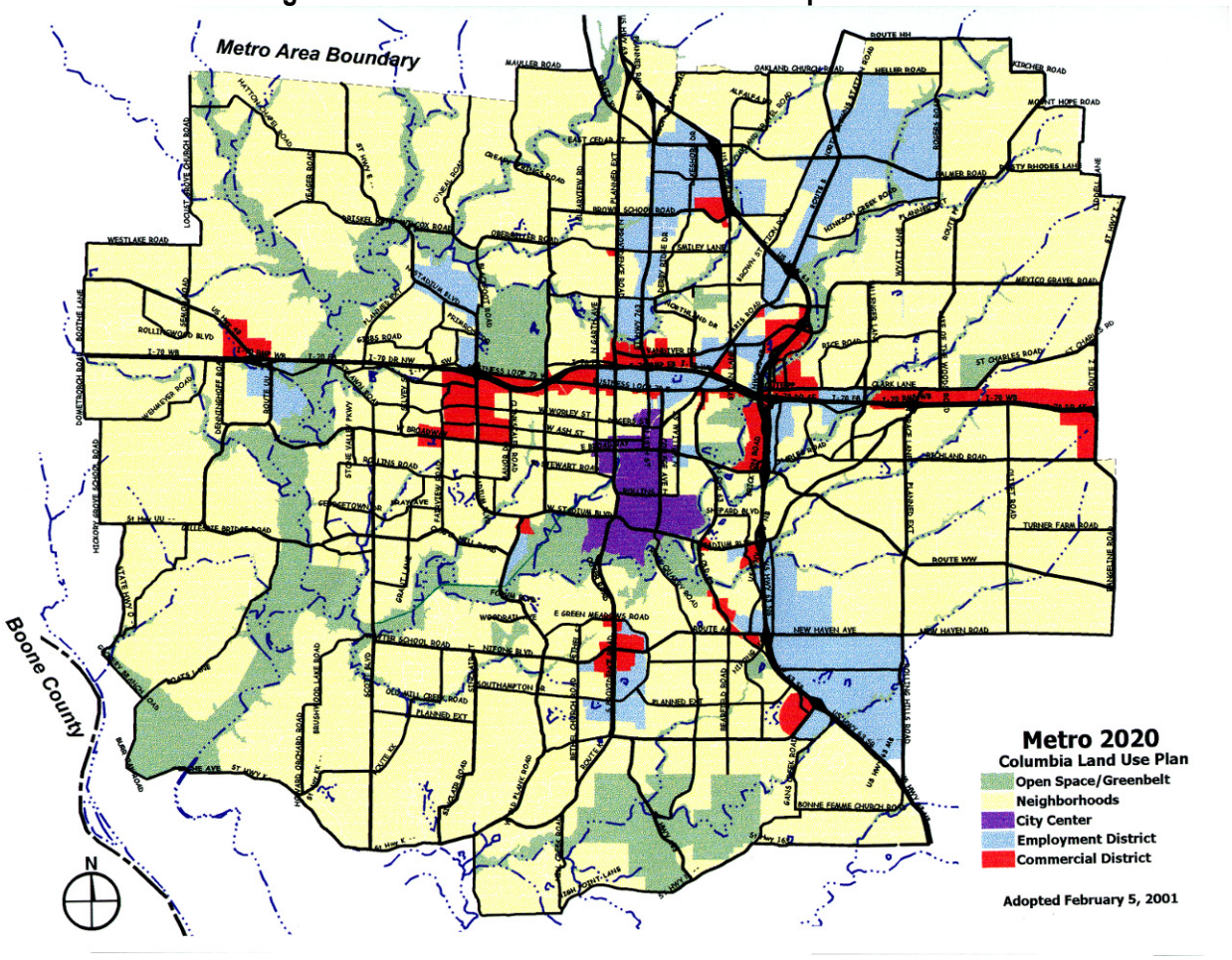
## 3.1 Land Use

This section of the report discusses current development and planned land uses including local and/or state governmental plans and policies. In addition, transportation planning in the study area is discussed.

### 3.1.1 Land Use Patterns

Current land use patterns were reviewed including land use trends, current zoning, and general land use practices in the study area. The majority of the study area is currently zoned and utilized residential. Areas adjacent to I-70 are zoned light industrial and some areas are zoned as agricultural. The City of Columbia land use plan, shown on **Figure 3-1** shows the area as predominantly neighborhoods with some open space. The area north of I-70 is less developed than the area south of I-70. Forested uplands occur throughout the study area. No cropland is found in the study area, although prime farmland soils do occur in the study area. All of the current alternatives would preserve the current land use patterns for the local road portion of the project. The interchange may result in the conversion of light industrial and residential areas to retail developments with I-70 frontage road access. However, there are no current plans for such conversion.

**Figure 3-1: Land Use in the Columbia Metropolitan Area**

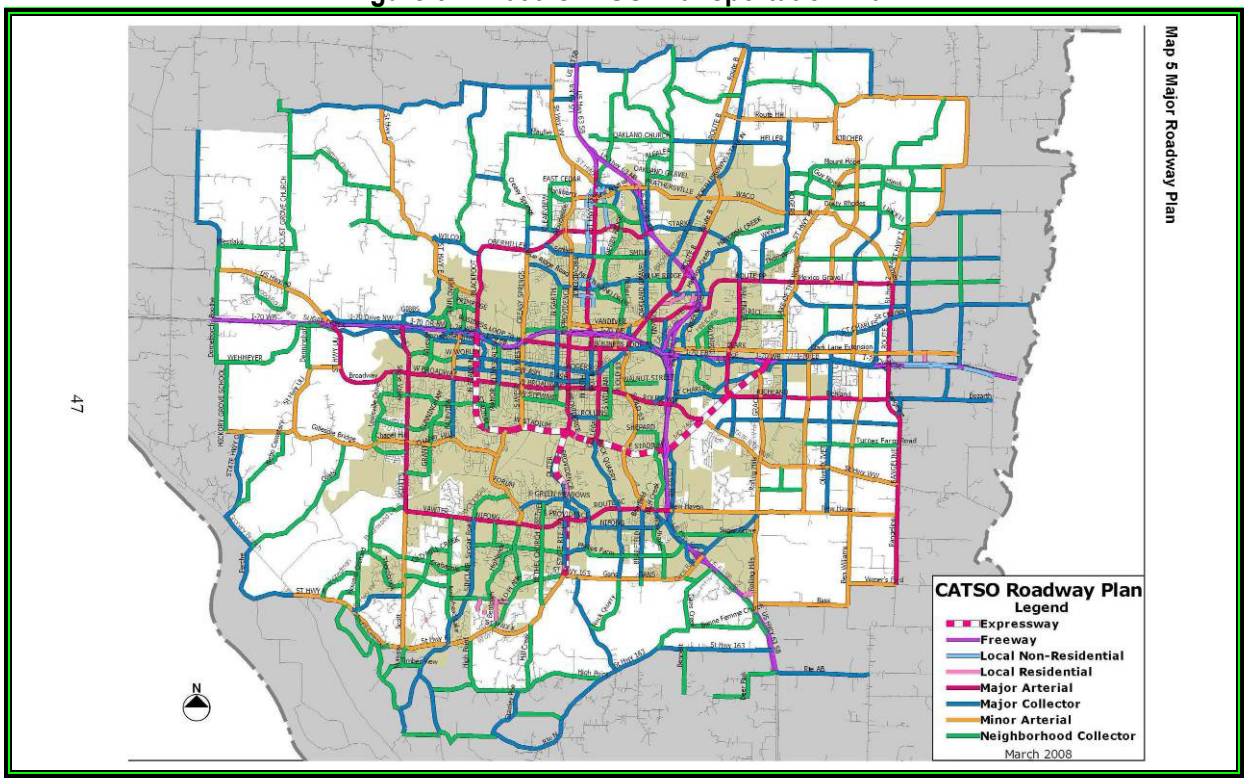



### 3.1.2 Transportation Land Use Plans

The Scott Boulevard extension to I-70 has been elevated from a placeholder to an identified project in the Major Roadway Plan (**Figure 3-2**). The CATSO 2030 long-range plan states that design and functional classification of each roadway in the Major Roadway Plan must be appropriate to provide for the following: (1) design continuity, (2) adequate main lane capacity, (3) access for adjacent tracts, and (4) functionality

with the roadway network. The CATSO Plan shows future population growth in western Columbia and traffic volume growth along Stadium Boulevard, with new development (both residential and commercial) driving the increase in traffic volumes. The Scott Boulevard and I-70 interchange alternatives consider and are consistent with local and regional land use and transportation plans.

**Figure 3-2: 2030 CATSO Transportation Plan**




Travel Patterns: The facility would impact travel patterns in the project area. The build alternatives would improve access to western Columbia by diverting I-70 traffic from the Stadium Boulevard interchange to the proposed Scott Boulevard Interchange (See Section 2.4.2 to 2.4.5).

## 3.2 Farmland Impacts

The FPPA requires coordination with the Natural Resource and Conservation Service (NRCS) and Farm Service Agency (FSA) to determine whether agricultural resources and support services will be affected for the project. The FPPA regulates the impacts to farmland of statewide importance, prime farmland, prime farmland if drained, prime farmland if protected from flooding, Conservation Reserve Program (CRP) lands, and wetland reserve program (WRP) lands. The NRCS Web Soil Survey was used to identify these features (USDA 2008). CRP and WRP resources will not be affected by any of the alternatives and would be avoided in the IEA.

Based on soil characteristics, the NRCS has classified about 41% of the land in Boone County as prime farmland. Prime farmland is land best suited to food, feed, forage, fiber, and oilseed crop and is available for these uses. Farmland of statewide importance includes lands not considered prime due to slope, drainage, or flooding, but that can produce high yields of crops when treated and managed according to

modern farming methods. Within the alternatives there are areas of farmland of statewide importance, prime farmland, and prime farmland if protected from flooding. Generally, these areas are found on ridge tops and floodplains. Though there are areas of prime farmland and farmland of statewide importance, no crop production activities are present within any of the alternatives.

The NRCS provided comments on the study area (NRCS 2008). The NRCS does not foresee any significant impacts to prime or statewide important farmland in this area (NRCS 2008). A farmland conversion impact rating was completed in cooperation with the NRCS and is found in Appendix A.

Impacts to prime farmland soils, farmland of statewide importance, and prime farmland if protected from flooding are summarized in **Table 3-1**. The acreages in the table are approximate and are based on a conceptual design for each alternative. Each alternative has been evaluated by NRCS to provide an impact score. The score is evaluated based on several factors including: area of farmland being converted, regional farmland statistics, and other relevant factors. If total points from this evaluation exceed 160, alternatives must be considered. This EA already considers four alternatives, none of which has a score exceeding 160. The project will not have a significant impact on prime farmlands.

**Table 3- 1: Scott Boulevard and I-70 Interchange Prime Farmland Impacts**

| PRIME FARMLANDS | Units | No Action | Green | Brown | Orange | Yellow (Preferred) |
|---|---|---|---|---|---|---|
| Prime Farmland Soils | acres | 0 | 9.74 | 8.29 | 7.03 | 8.00 |
| Farmland of Statewide Importance | acres | 0 | 51.41 | 69.74 | 59.60 | 52.74 |
| Prime Farmland if Protected from Flooding | acres | 0 | 2.71 | 1.56 | 0.51 | 1.64 |
| NRCS Impact Rating | number | 0 | 153 | 153 | 153 | 154 |

## 3.3 Social and Economic Characteristics

Social and economic characteristics are reviewed for the study area. The review includes demographics, income characteristics, and population projections.

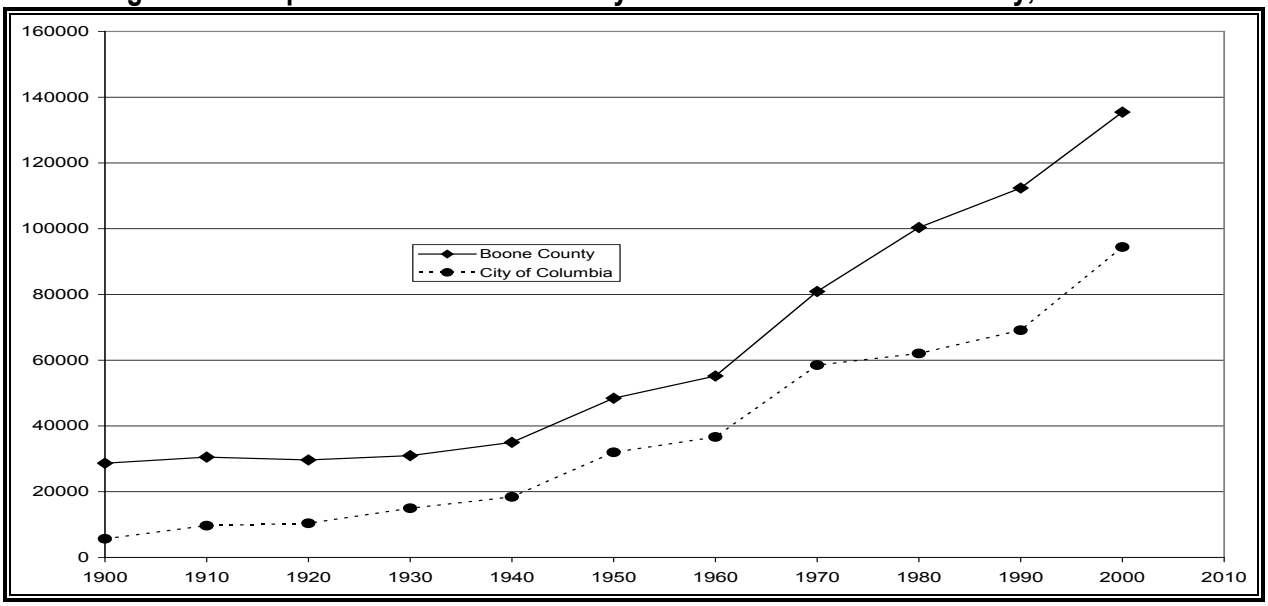
Demographics and Income: The income characteristics of the study area were derived from year 2000 census data. The economic data in the 2000 census uses 1999 incomes. The tabulation areas for income characteristics are done by census block groups. Income characteristics were also compared to the City of Columbia, Boone County, and the state of Missouri, as shown in **Table 3-2**. The median household income for Columbia and Boone County is $33,729 and $47,434, respectively. The Missouri median household income is $46,847. Within the study area median household income is $41,576.

| Table 3- 2: Scott Boulevard and I-70 Interchange Study Area Demographics | | | | |
|---|---|---|---|---|
| | Study Area | Columbia | Boone County | Missouri |
| Population | 2,776 | 94,428 | 156,377 | 5,988,927 |
| Minorities | 10% | 18% | 14% | 15% |
| Age > 65 | 11% | 9% | 9% | 14% |
| Median household income of region | $41,576 | $33,729 | $47,434 | $46,847 |
| Families in poverty | 9% | 12% | 17% | 14% |

Note: Based on 2000 census data and 2006/2009 quick fact estimates

Population: Columbia is a fast-growing community in mid-Missouri. From 2000 to 2006, Columbia's population grew by 10.8% (http://quickfacts.census.gov/qfd/states/29/2915670.html). Population in the region is based on the CATSO regional travel demand model. The City of Columbia and Boone County have experienced substantial population growth and resulting traffic growth over the past few decades. The growth is expected to continue (**Figure 3-3**). The University of Missouri Columbia is located in the city and offers a steady employment base for residents. Population for the City of Columbia was 94,428 in 2000, and 156,377 for Boone County. Population documented in the study area in 2000 was 2,776.

**Figure 3-3: Population Trends for the City of Columbia and Boone County, Missouri**




Minorities in the area include African American, American Indian, Asian, and others. The City of Columbia is approximately 18% minority; Boone County and the state of Missouri are 14 to 15% minorities. In the study area, 10% of the population was minority **Table 3-2**. The potential for minority concentrations exists north of I-70 on Dawn Drive and Rebel Drive. For the City of Columbia, families in poverty comprise approximately 12%, for Boone County 17%, and for Missouri 14%. In the study area families in poverty comprise about 9%.

The Brown alternative would impact residential development in the Overlook development, which is a preliminary plat. All of the alternatives would require business and residential relocations (discussed in Sections 3.5, 3.6, and 3.7). None of the alternatives would have permanent, adverse impact on economic growth and development or result in a negative impact to the regional competitive position.

## 3.4 Public Facilities

Public facilities are important community resources and include schools, hospitals/health care facilities, churches, senior citizen facilities, child care centers, and homeless shelters. Public facilities support services and activities typically provided by government and non-profit institutions. The physical condition, operating standards, accessibility, and availability of these facilities and services are influential in shaping community life and are a reflection of the community's values. The quality and availability of these resources influence local development and tangibly affect an area's perceived quality of life.

Fire stations, emergency medical service facilities, and police stations are not expected to be directly affected by the project. Travel patterns for fire, emergency services, and police service calls may be temporarily affected by construction-related activities. In the long run, the project could have positive impacts to emergency response by addressing congestion and improving response times for fire trucks, emergency vehicles, and police personnel.

The impact analysis for public facilities was completed within the conceptual right-of-way as described in the beginning of Chapter 3.0. There is one public facility, Christian Fellowship School that occurs in the study corridor of the Brown alternative (see **Figure 3-4b**). Strawn School will be affected by the Orange alternative but the school is no longer a public facility. It has been purchased by a citizen for use as a private residence. There are no public facilities that would be impacted by the construction of the preferred alternative (Yellow).

## 3.5 Residential Impacts

Residential impacts include an assessment of impacts to neighborhoods, platted land, preliminary platted land and residential takes.

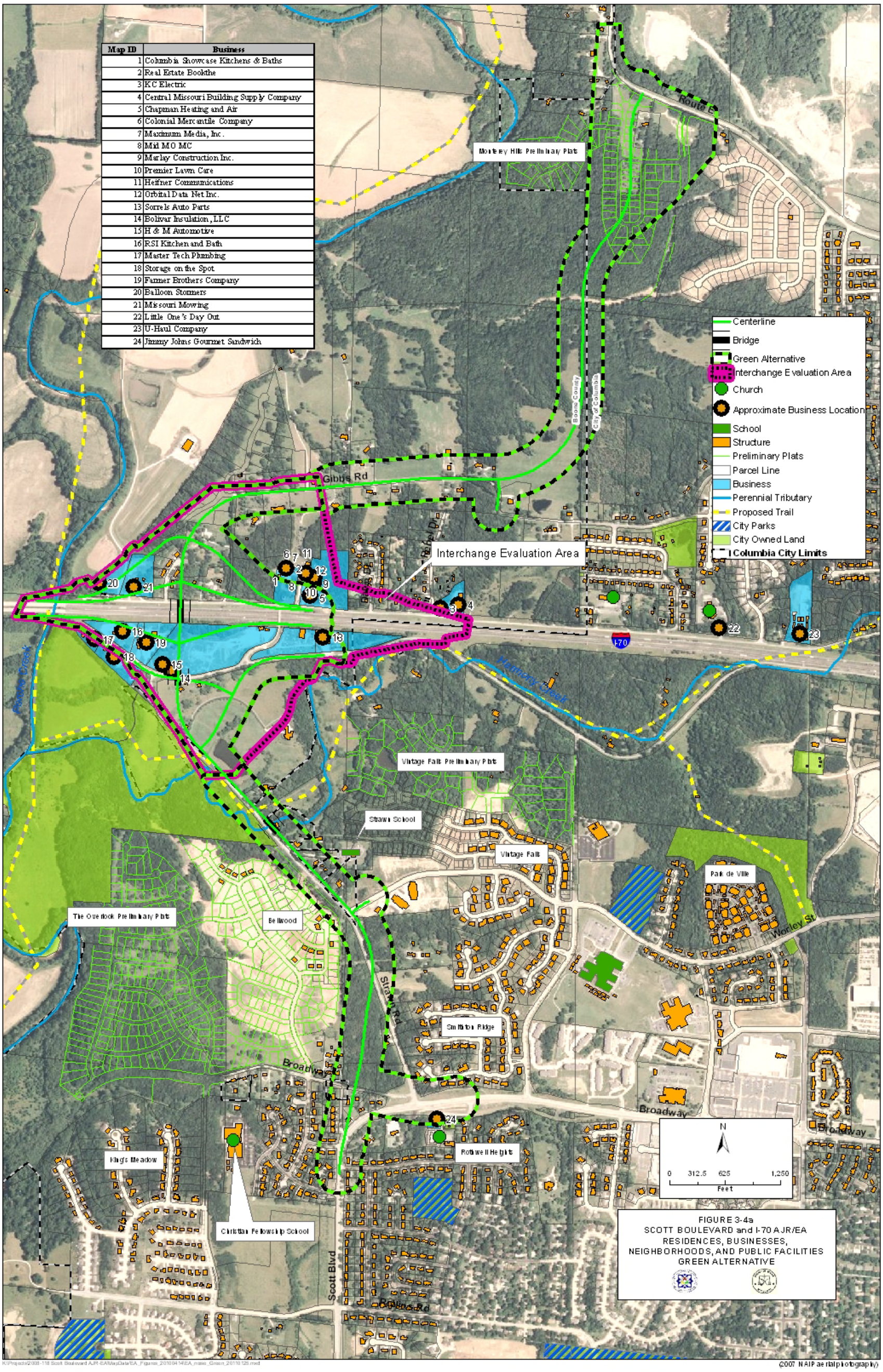
Neighborhoods in the Study Area

The potential impact of transportation projects to neighborhoods generally includes relocating residents, dividing the neighborhood into smaller neighborhoods, and relocating local businesses. The construction of roadways can separate one part of a neighborhood from another and discourage neighbors from interacting with each other. On a larger scale, however, new roadways connect places and can foster increased interaction between neighborhoods and activity centers such as employment and shopping districts, schools, churches, community services, and parks. New roadways can also increase accessibility for use by public safety officials. There are numerous established and relatively new residential developments as well as platted land in the study area. In addition, there are small clusters of homes without a formal designation that function as neighborhoods.

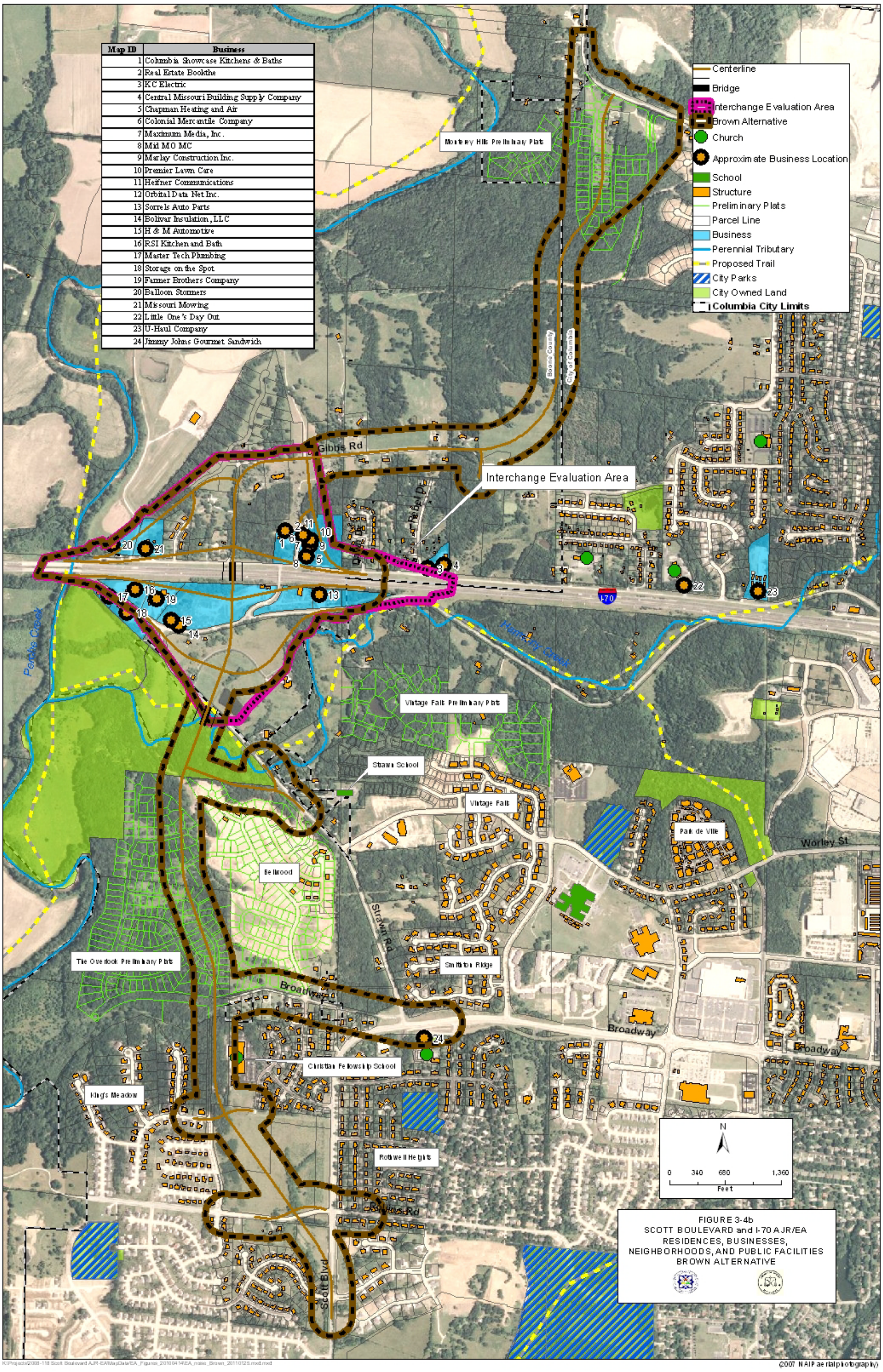
The November 2008 List of Neighborhood Associations and Contacts (City of Columbia 2008c) indicates there are seven neighborhood associations within the study area. They include King's Meadow, Bellwood, Rothwell Heights, Smithton Ridge, Vintage Falls, Park de Ville, and Monterey Hills. Residential

developments, neighborhoods, and plats affected by the alternatives are discussed below (**Figure 3-4a to 3-4d**). Other small residential concentrations include the Dawn Drive and Rebel Drive to the northeast of

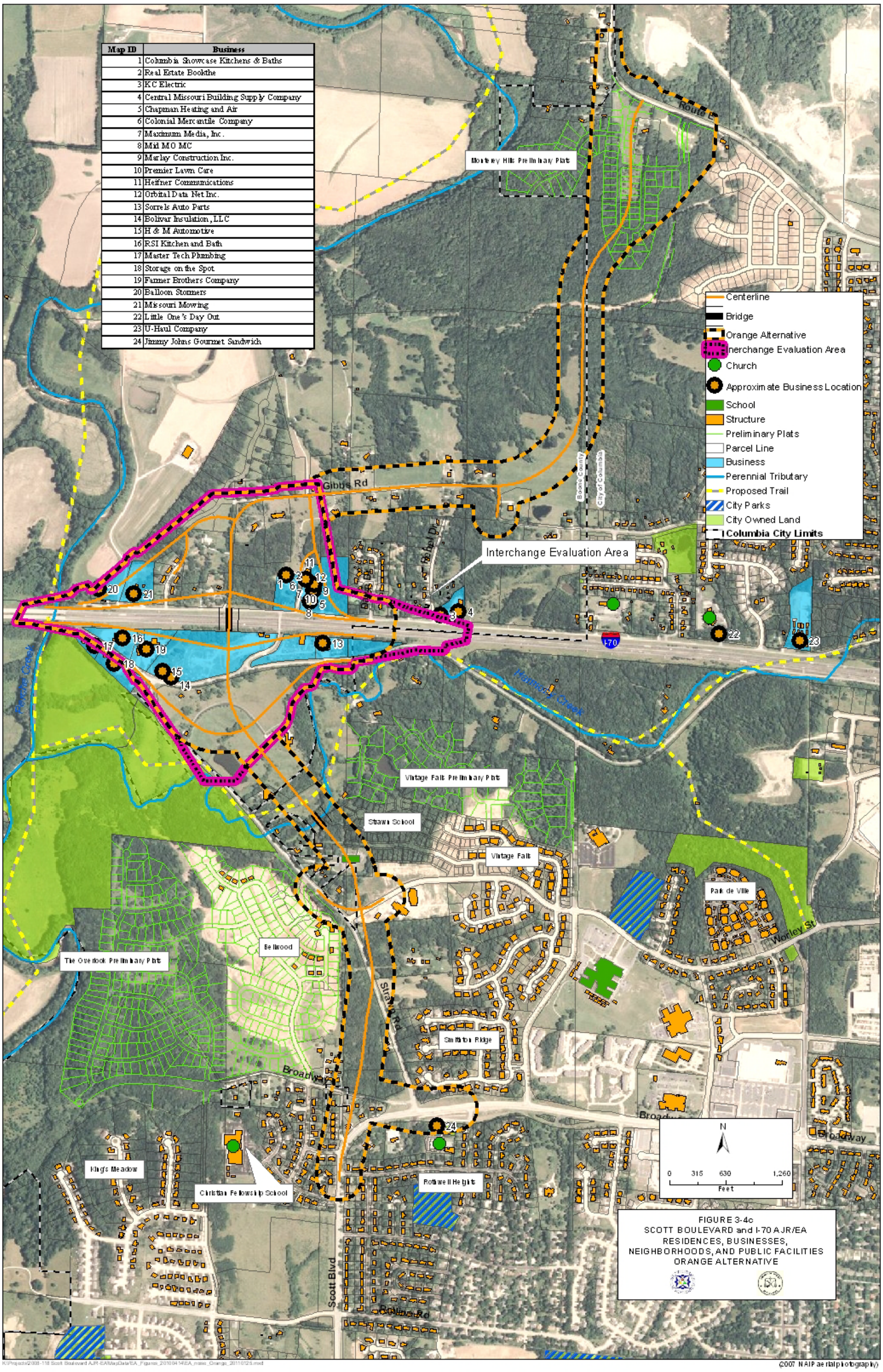
| Map ID | Business |
|---|---|
| 1 | Columbia Showcase Kitchens & Baths |
| 2 | Real Estate Bookthe |
| 3 | KC Electric |
| 4 | Central Missouri Building Supply Company |
| 5 | Chapman Heating and Air |
| 6 | Colonial Mercantile Company |
| 7 | Maximum Media, Inc. |
| 8 | Mid MO MC |
| 9 | Marlay Construction Inc. |
| 10 | Premier Lawn Care |
| 11 | Heffner Communications |
| 12 | Orbital Data Net Inc. |
| 13 | Sorrels Auto Parts |
| 14 | Bolivar Insulation, LLC |
| 15 | H & M Automotive |
| 16 | RSI Kitchen and Bath |
| 17 | Master Tech Plumbing |
| 18 | Storage on the Spot |
| 19 | Farmer Brothers Company |
| 20 | Balloon Stompers |
| 21 | Missouri Mowing |
| 22 | Little One's Day Out |
| 23 | U-Haul Company |
| 24 | Jimmy Johns Gourmet Sandwich |

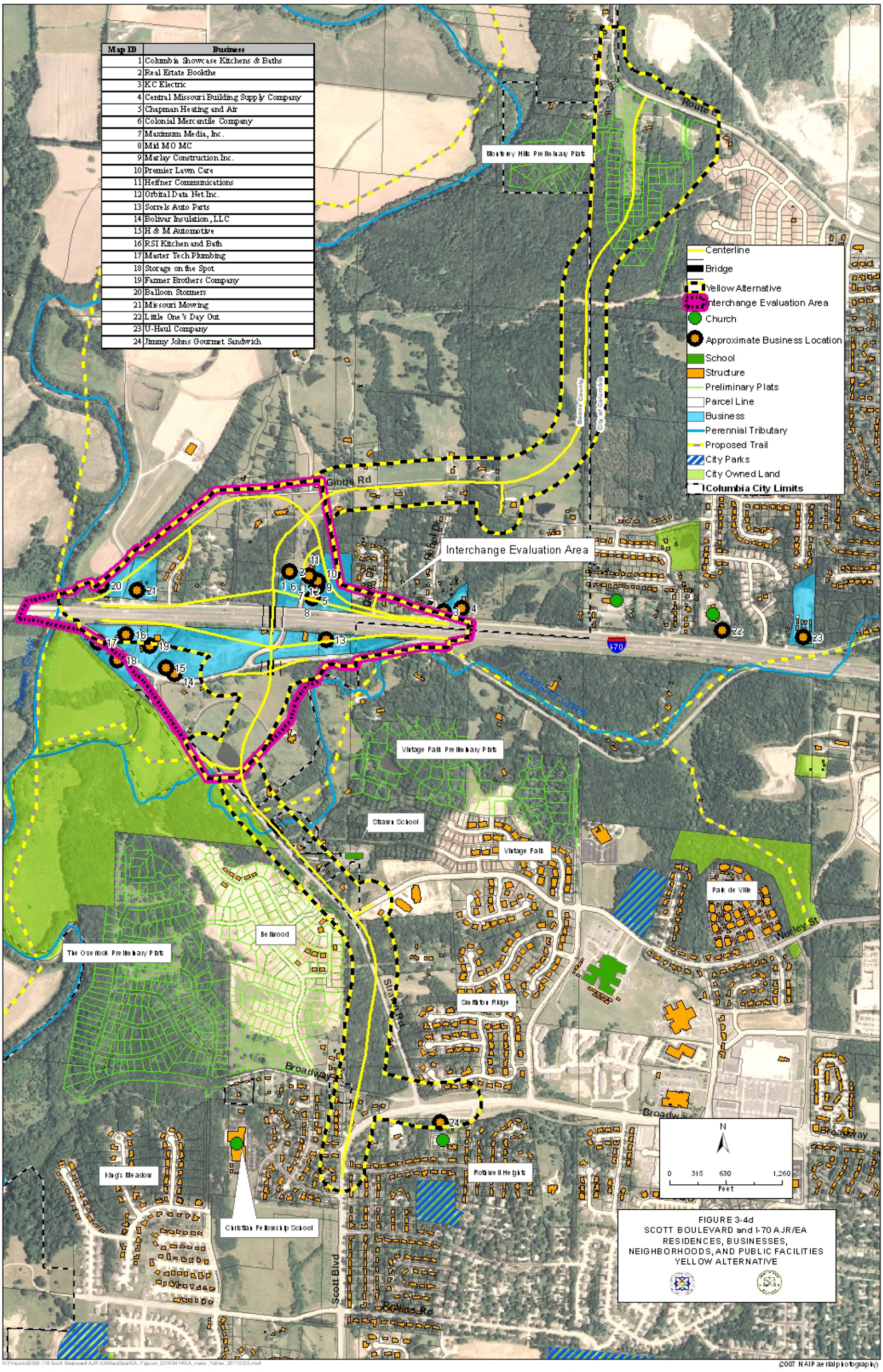


| Map ID | Business |
|---|---|
| 1 | Columbia Showcase Kitchens & Baths |
| 2 | Real Estate Bookthe |
| 3 | KC Electric |
| 4 | Central Missouri Building Supply Company |
| 5 | Chapman Heating and Air |
| 6 | Colonial Mercantile Company |
| 7 | Maximum Media, Inc. |
| 8 | Mid MO MC |
| 9 | Marlay Construction Inc. |
| 10 | Premier Lawn Care |
| 11 | Heffner Communications |
| 12 | Orbital Data Net Inc. |
| 13 | Sorrels Auto Parts |
| 14 | Bolivar Insulation, LLC |
| 15 | H & M Automotive |
| 16 | RSI Kitchen and Bath |
| 17 | Master Tech Plumbing |
| 18 | Storage on the Spot |
| 19 | Farmer Brothers Company |
| 20 | Balloon Stompers |
| 21 | Missouri Mowing |
| 22 | Little One's Day Out |
| 23 | U-Haul Company |
| 24 | Jimmy Johns Gourmet Sandwich |



| Map ID | Business |
|---|---|
| 1 | Columbia Showcase Kitchens & Baths |
| 2 | Real Estate Bookthe |
| 3 | KC Electric |
| 4 | Central Missouri Building Supply Company |
| 5 | Chapman Heating and Air |
| 6 | Colonial Mercantile Company |
| 7 | Maximum Media, Inc. |
| 8 | Mid MO MC |
| 9 | Marlay Construction Inc. |
| 10 | Premier Lawn Care |
| 11 | Heffner Communications |
| 12 | Orbital Data Net Inc. |
| 13 | Sorrels Auto Parts |
| 14 | Bolivar Insulation, LLC |
| 15 | H & M Automotive |
| 16 | RSI Kitchen and Bath |
| 17 | Master Tech Plumbing |
| 18 | Storage on the Spot |
| 19 | Farmer Brothers Company |
| 20 | Balloon Stompers |
| 21 | Missouri Mowing |
| 22 | Little One's Day Out |
| 23 | U-Haul Company |
| 24 | Jimmy Johns Gourmet Sandwich |




Map ID | Business
1 Columbia Showcase Kitchens & Baths
2 Real Estate Bookthe
3 KC Electric
4 Central Missouri Building Supply Company
5 Chapman Heating and Air
6 Colonial Mercantile Company
7 Maximum Media, Inc.
8 Mid MO MC
9 Marlay Construction Inc.
10 Premier Lawn Care
11 Heffner Communications
12 Orbital Data Net Inc.
13 Sorrels Auto Parts
14 Bolivar Insulation, LLC
15 H & M Automotive
16 RSI Kitchen and Bath
17 Master Tech Plumbing
18 Storage on the Spot
19 Farmer Brothers Company
20 Balloon Stompers
21 Missouri Mowing
22 Little One's Day Out
23 U-Haul Company
24 Jimmy Johns Gourmet Sandwich
Monterey Hills Preliminary Plats
Route B
Centerline
Bridge
Yellow Alternative
Interchange Evaluation Area
Church
Approximate Business Location
School
Structure
Preliminary Plats
Parcel Line
Business
Perennial Tributary
Proposed Trail
City Parks
City Owned Land
Columbia City Limits
Boone County
City of Columbia
Gibbs Rd
Rebel Dr
Interchange Evaluation Area
Bonnie Creek
Hinkson Creek
I-70
Vintage Falls Preliminary Plats
Strawn School
Vintage Falls
Park de Ville
Norley St
The Overlook Preliminary Plats
Bellwood
Strawn Rd
Smithton Ridge
Broadway
Rothwell Heights
Kings Meadow
Christian Fellowship School
Scott Blvd
Gibbs Rd
N
0 315 630 1,260
Feet
FIGURE 3-4d
SCOTT BOULEVARD and I-70 AJR/EA
RESIDENCES, BUSINESSES,
NEIGHBORHOODS, AND PUBLIC FACILITIES
YELLOW ALTERNATIVE
K:\Projects\2008-118 Scott Boulevard AJR-EA\MapData\EA_Figures_20100414\EA_roses_Yellow_20110125.mxd
©2007 NAIP aerial photography)

the IEA, and the area to the east of the Christian Fellowship School in the southwest region of the study area.

Platted Land North of I-70: There is substantial undeveloped acreage north of I-70 with the potential for future residential neighborhoods. Most of this land is unplatted at this time. However, the Scott Boulevard extension will bisect the Monterey Hills Preliminary Plats, which lies at the tie-in point between the Scott Boulevard extension and MO Route E. This plat contains 99 sites; none are under construction. The connection of the interchange to Route E that would traverse and impact lots in Monterey Hills Preliminary Plats is common to all of the study alternatives.

Platted Land South of I-70: Bellwood Plat, The Overlook Preliminary Plats, Vintage Falls which is partially developed, and Vintage Falls Preliminary Plats are located south of I-70. None of the plats south of I-70 would be impacted by the recommended preferred alternative (Yellow).

- The Bellwood, a partially developed subdivision, is located north of Broadway on the west side of Strawn Road. There are two phases to this development with the first phase containing 96 sites and phase two containing 73 sites. Phase one is approximately 18% built out, and will not be impacted by any of the Scott Boulevard alternatives under study. The Brown alternative study corridor includes lots within Bellwood, but these could likely be avoided during construction (**Figure 3-4b**).
- The Overlook Preliminary Plats are located just south of Bellwood phase two. This plat contains 200 sites; currently no sites are under construction. The Brown alternative would traverse and impact the Overlook Preliminary Plats (**Figure 3-4b**).
- The Vintage Falls Plats and Vintage Falls Preliminary Plats are located north of Worley Street east of Strawn Road. This development contains 147 sites and is approximately 21% built out. Vintage Falls Plats and Vintage Falls Preliminary Plats would not be affected by any of the build alternatives.

Residences

Residences throughout the study area were avoided to the extent possible in the planning of study alternatives. Each study alternative was analyzed for impacts to residential properties. Residential impacts included any residence or residential property impacted within the study corridor. While a higher number of residential properties are located within the study corridor it is likely that fewer would be impacted by an alternative. In addition to an analysis of impacts within the study corridor impacts were also analyzed within an estimated conceptual right-of-way. Impacts to residential tracts of land without a residence, preliminary platted lots, and platted lots were also calculated. Impacts were assessed using the following guidelines:

- All residences, plats, and preliminary plats were assessed within the study corridor if any impacts occurred.
- A total take was assessed within the conceptual right-of-way in situations where roadway improvements would restrict access, or would directly eliminate a residence.
- A partial take was assigned within the conceptual right-of-way where roadway improvements would impact a smaller portion of the property, did not restrict access and did not directly impact the residence.
- For partial takes damages to the remainder are discussed in Acquisition Impacts (Section 3.3.6).

| Table 3- 3: Scott Boulevard and I-70 Interchange Residential Impacts | | | | | | |
|---|---|---|---|---|---|---|
| **RESIDENTIAL PROPERTY** | **Units** | **No Action** | **Green** | **Brown** | **Orange** | **Yellow (Preferred)** |
| Residences in Study Corridor | number | 0 | 67 | 80 | 79 | 81 |
| Residences in Conceptual Right-of-Way (Total Takes) | number | 0 | 11 | 1 | 6 | 11 |
| Residences in Conceptual Right-of-Way (Partial Takes) | number | 0 | 39 | 43 | 45 | 42 |
| Sum of Total and Partial Residential Takes in the Conceptual Right-of-Way | number | 0 | 50 | 44 | 51 | 53 |
| Platted Lots in Study Corridor | number | 0 | 18 | 59 | 21 | 18 |
| Platted lots in Conceptual Right-of-Way (Total Takes) | number | 0 | 0 | 0 | 0 | 0 |
| Platted lots in Conceptual Right-of-Way (Partial Takes) | number | 0 | 0 | 0 | 3 | 0 |
| Preliminary Platted Lots in Study Corridor | number | 0 | 77 | 176 | 73 | 74 |
| Preliminary Platted lots in Conceptual Right-of-Way (Total Takes) | number | 0 | 21 | 31 | 21 | 21 |
| Preliminary Platted lots in Conceptual Right-of-Way (Partial Takes) | number | 0 | 15 | 64 | 15 | 15 |
| Tract of Land in Study Corridor | number | 0 | 37 | 52 | 46 | 39 |
| Tract of Land in Conceptual Right-of-Way (Total Takes) | number | 0 | 5 | 6 | 2 | 2 |
| Tract of Land in Conceptual Right-of-Way (Partial Takes) | number | 0 | 18 | 29 | 24 | 24 |
| Sum of Total and Partial Plats/Tracts in Study Corridor | number | 0 | 132 | 287 | 140 | 131 |
| Sum of Total and Partial Plats/Tracts in Conceptual Right-of-Way | number | 0 | 59 | 130 | 65 | 62 |

**Table 3-3** is a summary of the impacts within the study corridor and the approximate partial and total takes for the various alternatives based on a conceptual corridor (conceptual right-of-way) large enough to account for construction and right-of-way activities (**Figure 3-4a to 3-4d**). Residential impacts for each alternative are discussed below.

### 3.5.1 No Action Alternative

The No Action alternative would have no impact to residential developments or neighborhoods.

### 3.5.2 Green Alternative

The total residential, platted, preliminary platted, tract of land within the study corridor would be 199 and 109 within the conceptual right-of-way (**Figure 3-4a**). From the IEA north to Route E, the local road alternative is identical for all study alternatives. This segment of the project requires 21 total takes and 15 partial takes in Monterey Hills Preliminary Plats. Residential impacts for the northern segment would include 11 partial takes along Gibbs before the alignment turns north and goes through undeveloped forested land. A total of seven tracts of land would be partially impacted in the northern segment between Gibbs Road and the Monterey Hills preliminary plats.

Approximately 39 residences would be partial takes and 11 would be total takes as a result of the Green alternative. Residential impacts occur along Gibbs Road and Abiliene Acres Drive, adjacent to Strawn Road, and where the alternative diverts from Strawn Road and intersects with Broadway and Scott Boulevard to the South. No preliminary platted lots would be impacted. Approximately 18 tracts of land would be partial takes. Most of these are located in the IEA and some are adjacent to Strawn Road. Approximately 5 tracts of land would be total takes located along Gibbs Road and Abiliene Acres Drive.

### 3.5.3 Brown Alternative

The total residential, platted, preliminary platted, tract of land within the study corridor would be 367 and 174 within the conceptual right-of-way (**Figure 3-4b**). Residential impacts resulting from the northern segment of the alternative were detailed in the discussion of the Green alternative.

In addition to the northern segment impacts approximately 43 residences would be partial takes and 1 would be total takes as a result of the Brown alternative. Residential impacts occur along Gibbs Road and Abiliene Acres Drive, along where Broadway is proposed to extend east to connect with the Brown alternative, and south of the proposed Broadway and proposed Scott Boulevard intersection south to where the alignment merges with Scott Boulevard. Within the Overlook and Bellwood subdivisions approximately 49 preliminary platted lots would be partial takes and 10 would be total takes. Approximately 29 tracts of land would be partial takes. Approximately 6 tracts of land would be total takes located along along Gibbs Road and Abiliene Acres Drive. The partial and total tract takes are located in the IEA and south of the proposed Broadway and proposed Scott Boulevard intersection to where the alignment merges with Scott Boulevard.

### 3.5.4 Orange Alternative

The total residential, platted, preliminary platted, tract of land within the study corridor would be 219 and 116 within the conceptual right-of-way (**Figure 3-4c**). Residential impacts resulting from the northern segment of the alternative were detailed in the discussion of the Green alternative.

In addition to the northern segment impacts approximately 34 residences would be partial takes and 6 would be total takes as a result of the Orange alternative. The locations of the residential impacts of the Orange alternative are similar to impacts of the Green alternative except for the southern segment of the alternative south of the IEA. South of the IEA the alternative parallels Strawn Road to the east and results in some different partial and total takes. No preliminary platted lots would be impacted. Approximately 24 tracts of land would be partial takes. Most of these are located in the IEA and some are east of Strawn Road. Approximately 2 tracts of land would be total takes located near Abiliene Acres Drive and Dawn Drive.

### 3.5.5 Yellow Alternative (Preferred)

The total residential, platted, preliminary platted, tract of land within the study corridor would be 212 and 115 within the conceptual right-of-way (**Figure 3-4d**). Residential impacts resulting from the northern segment of the alternative were detailed in the discussion of the Green alternative.

In addition to the northern segment impacts, approximately 31 residences would be partial takes and 11 would be total takes as a result of the Yellow alternative (preferred). The locations of residential impacts are similar to that of the Green alternative except for within the IEA. The interchange for this alternative is

further east and could impact residences along Dawn and Rebel drives as well as residences along Gibbs Road and Abiliene Acres Drive. No preliminary platted lots would be impacted. Approximately 24 tracts of land would be partial takes. Most of these are located in the IEA and some are adjacent to Strawn Road. Approximately 2 tracts of land would be total takes located near Abiliene Acres Drive and Dawn Drive.

Residential impacts will be minimized in the final design of the preferred alternative (Yellow) to the extent it is feasible.

### 3.6 Business and Industrial Impacts

Business and industrial areas are located throughout the study area, with the concentration of these located near I-70 in the proposed IEA (**Figure 3-4a to 3-4d**). Businesses affected by the project would be relocated following the procedures outlined in the Uniform Relocation Assistance Act of 1970, Public Law 91-646 which is discussed further in Section 3.7 Acquisition Impacts.

There are approximately 24 businesses near or within the alternatives **(Table 3-4**).

Businesses and industrial impacts included properties within a conceptual right-of-way and properties where the right-of-way access to the business was altered. Impact assessment was detailed in a Technical Memorandum (LBG, 2011a) and is summarized below:

- For businesses or industries with buildings outside a conceptual right-of-way, consideration was given to whether roadway improvements would impair the operating function of the building (i.e. ingress/egress, parking area, operations).
- A total take was assessed in situations where roadway improvements would impair functionality so that an owner could not operate.
- A partial take was assigned where roadway improvements would impact a portion of the property, but not the functionality of the business or industry.

| Table 3- 4: Scott Boulevard/I-70 Interchange Business and Industrial Impacts | | | | | |
|---|---|---|---|---|---|
| **Map ID** | **Business** | **Green** | **Brown** | **Orange** | **Yellow (Preferred)** |
| 1 | Columbia Showcase Kitchens & Baths | P | P | P | P |
| 2 | The Real Estate Book | P | P | P | P |
| 3 | KC Electric | N | N | N | N |
| 4 | Central Missouri Building Supply Company | N | N | N | N |
| 5 | Chapman Heating and Air | T | P | T | T |
| 6 | Colonial Mercantile Company* | T | P | T | T |
| 7 | Maximum Media, Inc.* | T | P | T | T |
| 8 | Mid MO MC* | T | P | T | T |
| 9 | Marlay Construction, Inc. | T | P | T | T |
| 10 | Premier Lawn Care | T | P | T | T |
| 11 | Heifner Communications* | T | P | T | T |
| 12 | Orbital Data Net, Inc. | T | P | T | T |
| 13 | Sorrels Auto Parts | P | P | T | T |
| 14 | Bolivar Insulation, LLC | T | P | T | P |
| 15 | H & M Automotive | T | P | T | P |
| 16 | RSI Kitchen and Bath | P | P | P | P |
| 17 | Master Tech Plumbing | P | P | P | N |
| 18 | Storage on the Spot | P | P | P | N |
| 19 | Farmer Brothers Company | P | P | P | P |
| 20 | Balloon Stormers | P | P | P | P |
| 21 | Missouri Mowing | P | P | P | P |
| 22 | Little One's Day Out | N | N | N | N |
| 23 | U-Haul Company | N | N | N | N |
| 24 | Jimmy Johns Gourmet Sandwich | N | N | N | N |

P=Partial Take; T=Total Take; N=No Impact
*Businesses are located in the same parcel as Chapman Heating and Air.

### 3.6.1 No Build

There would be no business impacts under the No Build Scenario.

### 3.6.2 Green Alternative

The Green alternative has 19 partial and total takes combined as described in **Table 3-4** and depicted in **Figure 3-4a**. Construction of the Green alternative would require 10 total takes including Chapman Heating and Air, Colonial Mercantile Company, Maximum Media, Inc., Mid MO MC, Marlay Construction, Inc, Premier Lawn Care, Heifner Communications, Orbital Data Net, Inc, Bolivar Insulation, LLC, and H&M Automotive. There would be 9 partial takes including Columbia Showcase Kitchens and Baths, The Real

Estate Book, Sorrel's Auto Parts, RSI Kitchen and Bath, Master Tech Plumbing, Storage on the Spot, Farmer Brothers Company, Balloon Stormers, and Missouri Mowing.

### 3.6.3 Brown Alternative

The Brown alternative has 19 takes (**Figure 3-4b**). All of the takes would be partial and would include Columbia Showcase Kitchens & Baths, The Real Estate Book, Chapman Heating and Air, Colonial Mercantile Company, Maximum Media, Inc., Mid MO MC, Marlay Construction, Inc., Premier Lawn Care, Heifner Communications, Orbital Data net, Inc., Sorrels Auto Parts, Bolivar Insulation, LLC, H&M Automotive, RSI Kitchen and Bath, Master Tech Plumbing, Storage on the Spot, Farms Brothers Company, Balloon Stormers and Missouri Mowers.

### 3.6.4 Orange Alternative

The Orange alternative has 19 takes; 11 total takes and 8 partial takes (**Figure 3-4c**). Total takes would include Chapman Heating and Air, Colonial Mercantile Company, Maximum Media, Inc., Mid MO MC, Marlay Construction, Inc., Premier Lawn Car, Heifner Communications, Orbital Data Net, Inc., Sorrels Auto Parts, Bolivar Insulation, LLC, and H&M Automotive. Partial takes include Columbia Showcase Kitchens & Baths, The Real Estate Book, RSI Kitchen and Bath, Master Tech Plumbing, Storage on the Spot, Farmer Brothers Company, Balloon Stormers, and Missouri Mowing.

### 3.6.5 Yellow Alternative (Preferred)

The Yellow alternative (preferred) has 17 takes; 9 total takes and 8 partial takes (**Figure 3-4d**). Total takes for the Yellow alternative (preferred) include Chapman Heating and Air, Colonial Mercantile Company, Maximum Media, Inc, Mid MO MC, Marlay Construction, Inc., Premier Lawn Care, Heifner Communications, Orbital Data Net, Inc., and Sorrels Auto Parts. Partial takes would include Columbia Showcase Kitchens & Baths, The Real Estate Book, Bolivar Insulation, LLC, H&M Automotive, RSI Kitchen and Bath, Farmers Brothers Company, Balloon Stormers, and Missouri Mowing.

Business impacts will be avoided to the maximum extent feasible during the design of the interchange. For those businesses that cannot be avoided, MoDOT acquisition and relocation policies and costs are discussed in Section 3.7.

## 3.7 Acquisition Impacts

Residents, property owners, and businesses affected by the project would be relocated following the procedures outlined in the Uniform Relocation Assistance Act of 1970, Public Law 91-646 (Federal Register 1970). The Uniform Act is carried out without discrimination and in compliance with Title VI (the Civil Rights Act of 1964), the President's Executive Order on Environmental Justice, and the Americans with Disabilities Act. The acquisition and relocation program will be conducted in accordance with the Uniform Act of 1070, as amended. Accordingly:

> *The Uniform Act, as well as Missouri State laws, requires that just compensation be paid to the owner of private property taken for public use. The appraisal of fair market value is the basis of determining just compensation to be offered the owner for the property to be acquired.*

> *An Appraisal is defined as a written Statement independently and impartially prepared by a qualified appraiser setting forth an opinion of defined value of an adequately described property as of a specific date, supported by the presentation and analysis of relevant market information.*

Acquisition impacts summarized here include any residence, residential property, business or business property impacted by a conceptual right-of-way. Impacts to residential tracts and commercial tracts of land without a facility, preliminary platted lots, and platted lots were also calculated. Severances are tracts that are bisected by an alternative. Owner access to severed parcels was also considered in Acquisition Impacts. Each build alternative would require some amount of new, permanent right of way (**Table 3-5**). Should any additional temporary construction easements be needed impacts will be addressed in the final design phase. MoDOT District right-of-way staff and environmental staff were consulted to develop a right-of-way acquisition cost. Impact assessment was detailed in a Technical Memorandum (LBG, 2011a) and summary costs are provided in **Table 3-5**.

There would be no costs for acquisition for the no build alternative. Total acquisition costs would range from $8.8 Million for the Green alternative to $11.2 Million for the Orange alternative. Acquisition costs for the preferred alternative would be $9.3 Million.

| Table 3- 5: Scott Boulevard Improvements and I-70 Interchange Acquisition Impacts | | | | | |
|---|---|---|---|---|---|
| | **unit** | **Green** | **Brown** | **Orange** | **Yellow (Preferred)** |
| Total Right-of-Way Land Area | **acre** | 120.88 | 162.89 | 137.89 | 131.74 |
| Total Properties Acquired (Partial and Total Takes) | **number** | 122 | 190 | 123 | 128 |
| Total Cost of Business or Industrial Acquisitions | **$** | **$3,476,740** | **$5,847,793** | **$5,823,555** | **$3,907,135** |
| Total Cost of Residential Acquisitions (with houses) | **$** | **$1,801,800** | **$534,920** | **$1,291,450** | **$1,873,300** |
| Total Cost of Residential without a house Acquisitions | **$** | **$551,870** | **$495,660** | **$352,000** | **$368,940** |
| Total Cost of Platted Lots Total Takes: Platted Lots | **$** | **$0** | **$0** | **$59,224** | **$0** |
| Total Cost of Preliminary Platted Lots | **$** | **$100,100** | **$342,650** | **$97,680** | **$100,100** |
| **Subtotal Right-of-Way Acquisition Cost** | **$** | **$5,930,510** | **$7,221,023** | **$7,623,909** | **$6,249,475** |
| Damages to the Remainder Cost (15% of Subtotal) | $ | $889,576 | $1,083,153 | $1,143,586 | $937,421 |
| Condemnation and Settlement Costs (25% of Subtotal) | $ | $1,482,627 | $1,805,255 | $1,905,977 | $1,562,368 |
| Overhead and Contingency Costs ($4,500 per take) | $ | $549,000 | $855,000 | $553,500 | $576,000 |
| **Total Right-of-Way Acquisition Cost** | **$** | **$8,851,713** | **$10,964,431** | **$11,226,972** | **$9,325,264** |

## Relocation

The Civil Rights Act of 1964 and the Relocation Assistance Program provides benefits available to residential and business displacees (including Last Resort Housing, if applicable). Accordingly:

> *Any displaced owner-occupant or tenant of a dwelling who qualifies as a displaced person is entitled to payment of his or her actual moving and related expenses, as the MoDOT determines to be reasonable and necessary. A displaced owner-occupant who has occupied a displacement dwelling for at least 180 days is also eligible to receive up to $22,500 for a replacement housing payment which includes the amount by which the cost of a replacement dwelling exceeds the acquisition cost of the displacement dwelling, increased interest costs and incidental costs. A displaced owner-occupant who has occupied a displacement dwelling for at least 90 days but less than 180 days and a tenant who has occupied a displacement dwelling for at least 90 days, is entitled to a payment not to exceed $5,250 for either a rental or down payment assistance.*
>
> *Any displaced business, farm operation, or nonprofit organization which qualifies as a displaced person is entitled to payment of their actual moving and related expenses, as the MoDOT determines to be reasonable and necessary. In addition, a business, farm, or nonprofit organization may be eligible to receive a payment, not to exceed $10,000 for expenses incurred in reestablishing their business, farm operation, or nonprofit organization at a replacement site.*
>
> *A displaced business may be eligible to choose to receive a fixed payment in lieu of the payments for actual moving and related expenses, and actual reasonable reestablishment expenses. The payment amount for this entitlement alternative is based on the average net earnings of the business. This fixed payment amount cannot be less than $1,000 or more than $20,000.*

## Relocation Costs

For this project the relocation costs are $15,000/unit for businesses, and $25,000/unit for residential **(Table 3-6)**. There are many comparable residential areas around the city of Columbia. Approximately 260 comparable residential properties are currently listed near the project area in the City of Columbia, including 208 residential listings and 52 rental properties (Homes.com 2012). Approximately 48 commercial properties are also listed in the City of Columbia (Homes.com 2012). A large commercial area along Stadium Drive could be used for business relocation.

**Table 3- 6: Scott Boulevard Improvements and I-70 Interchange Relocation Costs**

| BUSINESS | unit | Green | Brown | Orange | Yellow (Preferred) |
|---|---|---|---|---|---|
| Total Takes: Business or Industrial | number | 5 | 13 | 14 | 9 |
| Cost of Business Relocation ($15,000 per unit) | $ | $75,000 | $195,000 | $210,000 | $135,000 |
| Total Takes: Residential | number | 11 | 1 | 6 | 11 |
| Cost of Residential Relocation ($25,000 per unit) | $ | $275,000 | $25,000 | $150,000 | $275,000 |
| **Total Relocation Cost** | **$** | **$350,000** | **$220,000** | **$360,000** | **$410,000** |

There would be no relocation costs for the No Build alternative. Relocation costs for the study alternatives range from $220,000 to $410,000. The preferred alternative has the highest relocation costs of all study alternatives resulting from 9 business/industrial relocations and 11 residential relocations.

## 3.8 Environmental Justice

Executive Order 12898 mandates that federal agencies incorporate environmental justice analysis into their policies, programs, and practices. Environmental justice addresses project impacts on low-income and minority populations. The United States Department of Transportation (USDOT) has three major objectives regarding environmental justice:

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

Executive Order 12898 focuses federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities (Exec. Order No. 12898, 1994). The Executive Order directs federal agencies to develop environmental justice strategies to aid federal agencies in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Executive Order also is intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income community's access to public information and an opportunity for public participation on matters relating to human health or the environment. Environmental justice considerations apply when a community has the following characteristics:

- Residents must be a minority and/or low income group.
- Residents must be excluded from the environmental policy setting and/or decision-making process.
- Residents must be subject to a disproportionate impact from one or more environmental hazards.
- Residents must experience a disparate implementation of environmental regulations, requirements, practices, and activities in their communities.

Approximately 10% of the population in the study area is minority. For the City of Columbia and Boone County demographic profile, 18% and 14%, minorities are found, respectively. Census data indicates that median household income for the study area ($41,576) is above that of the City of Columbia median household income ($33,729), but is below the Boone County median household income ($47,434), and the State of Missouri median household income ($46,847); **Table 3-2**. The families in poverty demographic for the study area is 9%, which is less than the demographic for Columbia (12%), Boone County (17%) and Missouri (14%). General trends were further refined by field observations in the study area.

Two neighborhoods just north of I-70 along Rebel Drive and North Dawn Drive that border the IEA would be impacted by the preferred alternative (Yellow) (**Figures 3-4a to 3-4d** ). This area, when compared to the rest of the study area, includes some of the lowest incomes per household. Economic census data is not available for an area this small. The census data for income per household and median value of the houses includes wealthier adjacent properties. These results may be biased and therefore would indicate that this area has a higher income than may actually be the case. The best data available to estimate the income level of the people living in this area is tax assessor data which shows the value of the houses. This data does not directly reflect income level, but it is the best means to formulate a logical estimate.

Homes along Rebel Drive and North Dawn Drive have a large range of appraised values ($15,000 to $60,000) based on Boone County Tax Assessor Data. They include duplexes, four-plexes, and single family residences. The 2000 census data for the census tract (Census Tract 14) that includes the Rebel Drive and North Dawn Drive area show that the median value of the houses for the tract is $94,900. This indicates that the values of the houses around the Rebel Drive and North Dawn Drive area are higher. The median household income for the census tract is $43,268.

Potential environmental justice considerations include impacts in the Dawn/Rebel Drive area which will include 3 total takes and 4 partial takes as a result of the preferred alternative (Yellow). The 3 total takes include one single family residence and two duplexes. The single family residence is valued at $70,000 and the median value of the houses for the tract is $94,900. Approximately 5 families will be displaced. In comparison to the rest of the impacts for the preferred alternative (Yellow) the total takes of the Dawn/Rebel Drive area make up 27% of the takes with 8 other total takes being outside of this area. The preferred alternative (Yellow) will partially impact 42 other residences. The 4 partial takes in the Dawn/Rebel Drive area make up 10% of the partial takes. Currently, there are no low-income or minority residences that have been excluded from decision making. The low minority and poverty rate percentages and relocation numbers discussed above are strong evidence that there are no disproportionately high and adverse human health or environmental impacts on minorities and/or low income populations by any of the build alternatives. A noise analysis has been completed for the preferred alternative. While the 2010 census is complete the data is not available for the city of Columbia at the present time. All information included is based on the 2000 census data and the 2006/2009 quick fact estimates (http://quickfacts.census.gov/qfd/states /29/2915670.html).

### 3.9 Pedestrian and Bicycle Facilities

Pedestrian and bicycle facilities could include streets, sidewalks, and community, city, county, and state trails. The City of Columbia has an extensive pedestrian and bicycle trail system. The bicycle facilities include various types of trails depending on the type of user. The bicycle trails include three types of routes:

Class I: Bicycle routes used exclusively by bicycles and pedestrians
Class II: Bicycle lanes along existing public streets, separated from vehicle traffic by painted stripes
Class III: Signs on existing public streets designating bicycle routes, with no vehicle separation

The major mode of pedestrian travel in the City of Columbia is the sidewalk system located along the public right-of-way. In addition to sidewalks, the metro area also has the MKT (Missouri-Kansas-Texas) Parkway (a pedestrian and bicycling facility) and two other greenbelt trails (Bear Creek Trail and the Hinkson Creek Trail).

The CATSO 2025 Transportation Plan (CATSO 2007) replaced the previous Master Bicycle Plan with a more comprehensive pedestrian/bicycle network called Pednet. The Pednet plan includes a proposed park located north of I-70 east of Perche Creek (**Figure 3-4a to 3-4d**) and a proposed trail and greenbelt area south of I-70 along Harmony Creek. There is also an area of city-owned land south of I-70 and on the western edge of the IEA that is designated to be a park in the future. City of Columbia Parks and Recreation reports that the proposed park south of I-70 will be funded in 2014, but the greenbelt areas are not currently funded (Saitta 2011). In addition, the City of Columbia Parks and Recreation Department has agreed to grant an easement for the Scott Boulevard construction (Appendix A; Hood, 2011). The Scott Boulevard project could enhance the trail entrance to the park. Department of Transportation Act Section 4(f) considerations are discussed in Section 3.21 Public Lands, Parks and Recreation.

City of Columbia Parks and Recreation Department reported that there is no Land and Water Conservation Fund (LWCF) Act or Urban Parks and Recreational Recovery (UPARR) Act funding associated with the existing trail or greenbelt located in the study area of the environmental study corridors of proposed alternatives (Saitta 2008). The City of Columbia was selected as a community to participate in the FHWA's Non-Motorized Transportation Pilot Program, referred to as GetAbout Columbia, which involves federal funding to build infrastructure. The existing trails (**Figure 3-4a to 3-4d**) and greenbelts located in the study area and in alternative environmental corridors are not associated with funding received from this program. Pedestrian and bicycle impacts are summarized in **Table 3-7** and are described for each alternative.

**Table 3- 7: Scott Boulevard and I-70 Interchange**

| PEDESTRIAN AND BICYCLE TRAIL | Units | No Action | Green | Brown | Orange | Yellow (Preferred) |
|---|---|---|---|---|---|---|
| Trail Crossings | Number | 0 | 2 | 3 | 3 | 2 |

### 3.9.1 No Action Alternative

The No Action alternative would have no impact upon pedestrian and bicycle trails.

### 3.9.2 Green Alternative

The Green alternative would cross a proposed pedestrian and bicycle trail at two locations (**Figure 3-4a**): south of I-70 ramp at the west end of the IEA and at a second location along Strawn Road, south of the IEA. Scott Boulevard, south of I-70 is proposed as a Major Arterial Option B (**Figure 2-7**). Design standards include a Pedway/Sidewalk with an 8 foot wide Pedway on one side and a 5 foot wide sidewalk on the other side constructed 1 foot inside the right of way. Along Strawn Road, south of the interchange, the planned trail could be designed as part to the Green alternative.

### 3.9.3 Brown Alternative

The Brown alternative would cross a proposed pedestrian and bicycle trail at three locations: south of I-70 ramp at the west end of the IEA, where Strawn Road crosses Harmony Creek, and further south on Strawn Road (**Figure 3-4b**). Since the Brown alternative goes through a proposed park, this represents an opportunity to incorporate a pedway into the road design as well as park access. The City of Columbia Parks and Recreation has concurred with providing an easement for alternative corridors along Strawn Road. For the Brown alternative, the roadway would bisect the park property. Close coordination with the City of Columbia Parks and Recreation would be required and potentially Section 4(f) compliance

associated with the local road construction. Section 4(f) is discussed in Section 3.22 Public Lands, Parks and Recreation.

### 3.9.4 Orange Alternative

The Orange alternative would cross a proposed pedestrian and bicycle trail at three locations: south of I-70 ramp at the west end of the IEA, at the southern tip of the IEA, and just north of the where the Orange alternative crosses Harmony Creek (**Figure 3-4c**). The current trail crossing of Strawn Road near Harmony Creek is a perpendicular crossing. Pedway and sidewalk options could be incorporated if the trail design is refined.

### 3.9.5 Yellow Alternative (Preferred)

The Yellow alternative (preferred) would cross a proposed pedestrian and bicycle trail at two locations: (**Figure 3-4d**) south of I-70 ramp at the west end of the IEA and at a second location along Strawn Road, south of the IEA. These represent two opportunities to incorporate the trail as part of the design of the roadway facility.

For the preferred alternative (Yellow), the City of Columbia Parks and Recreation Department has agreed to grant an easement for the Scott Boulevard construction (Appendix A; Hood, 2011). The Scott Boulevard project could enhance the trail entrance to the park.

## 3.10 Air Quality

The Clean Air Act (CAA) requires the adoption of air quality standards, quality control regions, and state implementation plans. The federal government established the National Ambient Air Quality Standards (NAAQS), to protect public health, safety and welfare from known or anticipated effects of sulfur dioxide, particulate matter, carbon monoxide, nitrogen dioxide, ozone, and lead. In addition to these pollutants, the State of Missouri established additional criteria for hydrogen sulfide and sulfuric acid.

Transportation can contribute to four of the six NAAQS pollutants: ozone, carbon monoxide, particulate matter, and nitrogen dioxide. National ambient air quality standards are presented in **Table 3-8**. Transportation conformity with the NAAQS, as required by the CAA, ensures that federally funded or approved transportation plans, programs, and projects conform to the air quality objectives established in State Implementation Plans. MoDOT is responsible for implementing the conformity regulation in nonattainment and maintenance areas. However, the Scott Boulevard study area is located in a non-classified area as defined by the Environmental Protection Agency (EPA) through the CAA. Therefore, the transportation conformity requirements do not apply to this project. All of the alternatives, including the No-Build alternative, would generate only minimal air quality impacts and are not subject to any other air quality analysis.

| Table 3- 8: National Ambient Air Quality Standards | | | |
|---|---|---|---|
| **Criteria Air Pollutant** | **Averaging Time** | **Primary Standard** | **Secondary Standard** |
| Carbon Monoxide | 1-Hour Maximum[a] | 40 mg/m$^3$ [b] (35 ppm[c]) | |
| | 8-Hour Maximum[a] | 10 mg/m$^3$ (9 ppm) | |
| Lead | 3-Month Arithmetic Mean | 1.5 g/m$^3$ [d] | Same As Primary |
| Nitrogen Dioxide | Annual Arithmetic Mean | 100 g/m$^3$ (0.05 ppm) | Same As Primary |
| Ozone | 1-Hour Average[a] | 0.12 ppm (235 g/m$^3$) | Same As Primary |
| | 8-Hour Average[e] | 0.08 ppm (157 g/m$^3$) | Same As Primary |
| Particulate Matter ($PM_{10}$) | Annual Arithmetic Mean<br>24-Hour Average[f] | 50 g/m$^3$<br>150 g/m$^3$ | Same As Primary |
| Particulate Matter ($PM_{2.5}$) | Annual Arithmetic Mean[g]<br>24-Hour Average[h] | 15 g/m$^3$<br>65 g/m$^3$ | Same As Primary |
| Sulfur Dioxide | 24-Hour Maximum[a] | 365 g/m$^3$ (0.14 ppm) | |
| | Annual Arithmetic Mean | 80 g/m$^3$ (0.03 ppm) | |
| | 3-Hour Maximum[a] | | 1300 g/m$^3$ (0.5 ppm) |

**a** Not to be exceeded more than once a year for primary and secondary standards
**b** **mg/m$^3$** Milligrams per cubic meter
**c** **ppm** Part per million
**d** **g/m$^3$** Micrograms per cubic meter
**e** Established for a 3-year average of the fourth highest daily maximum concentration.
**f** Established for a 3-year average of the 99$^{th}$ percentile of data
**g** Established for a 3-year average
**h** Established for a 3-year average of the 98$^{th}$ percentile of data

## 3.11 Noise

*Noise* is basically defined as unwanted sound. It is emitted from many sources including airplanes, factories, railroads, and motor vehicles. Highway noise, or traffic noise, is usually a composite of noises from engine exhaust and tire-roadway interaction. The magnitude of noise is usually described by its sound pressure. Since the range of sound pressure varies greatly, a logarithmic scale is used to relate sound pressures to some common reference level, usually the decibel (dB). Sound pressures described in decibels are called sound pressure levels and are often defined in terms of frequency-weighted scales (A, B, C, or D).

**Table 3-9** indicates that most individuals in urbanized areas are exposed to fairly high noise levels from many sources as they go about their daily activities. The degree of disturbance or annoyance from unwanted sound depends essentially on three factors:

- The amount and nature of the intruding noise;
- The relationship between background noise and the intruding noise; and
- The type of activity occurring where the noise is heard.

**Table 3- 9: Examples of Common Sounds: A-weighted Sound Level in Decibels (dBA)**

| A-weighted | Overall Level | Noise Environment |
|---|---|---|
| 120 | Uncomfortably loud (32 times as loud as 70 dBA) | Military jet airplane takeoff at 50 feet. |
| 100 | Very loud (8 times as loud as 70 dBA) | Jet flyover at 1,000 feet.<br>Locomotive pass-by at 100 feet. |
| 80 | Loud (2 times as loud as 70 dBA) | Propeller plane flyover at 1,000 feet.<br>Diesel truck 40 mph at 50 feet. |
| 70 | Moderately loud | Freeway at 50 feet from pavement edge at 10 a.m.<br>Vacuum cleaner (indoor). |
| 60 | Relatively quiet (1/2 as loud as 70 dBA) | Air condition unit at 100 feet.<br>Dish washer at 10 feet (indoor). |
| 50 | Quiet (1/4 as loud as 70 dBA) | Large transformers.<br>Small private office (indoor). |
| 40 | Very quiet (1/8 as loud as 70 dBA) | Birds calls.<br>Lowest limit of urban ambient sound. |
| 10 | Extremely quiet | Just audible (1/64 as loud as 70 dBA) |
| 0 | | Threshold of hearing. |

Source: Federal Agency Review of Selected Airport Noise Analysis Issues, 1992.
Modified by The Louis Berger Group, Inc., 2010.

### 3.11.1 Requirements

On July 13, 2010, the Federal Highway Administration published a final rule in the federal register amending the Federal regulations on the Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR 772), effective July 13, 2011. The final rule gives state highway agencies six months from the publication date of the final rule to update their traffic noise policies and another three months for FHWA review. As the noise analysis was conducted prior to the date on which state highway agencies are required to update their traffic noise policies, the noise study was prepared pursuant to the former 23 CFR 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, reissued as FHWA Policy and Guidance document dated June, 1995. These procedures have been adopted by the Missouri Department of Transportation (MoDOT) in *Traffic Noise Policy: Highway Traffic Noise Analysis and Abatement Guidelines,*

dated September 1997. As part of these procedures, the FHWA has established noise abatement criteria based on the noise sensitivity of various land uses to motor vehicle noise for projects requiring federal funds or approval. These criteria, adopted by MoDOT, are presented in **Table 3-10** and were used as part of the impacts evaluation. In this report, all receptors evaluated are categorized as FHWA Activity Category B, with the exception of measurement site M6, which is categorized as FHWA Activity Category C.

**Table 3- 10: Noise Abatement Criteria in dB(A) (NAC)**

| Activity Category | Noise Abatement Criteria ($L_{eq}$) | Description of Activity Category |
|---|---|---|
| A | 57 (exterior) | Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of these qualities is essential if the area is to continue to serve its intended purpose. |
| B | 67 (exterior) | Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals. |
| C | 72 (exterior) | Developed lands, properties or activities not included in Categories A or B above. |
| D | — | Undeveloped lands. |
| E | 52 (interior) | Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums. |

* Source: Missouri Department of Transportation, Traffic Noise Policy
Leq – The average sound level over a given period of time expressed in dBA.

According to FHWA 23 CFR Part 772 and MoDOT, a project is defined as having noise impacts when:

- Sound levels approach or exceed the noise abatement criteria (NAC) given in **Table 3-10**. Noise levels that approach the criteria are defined by the FHWA and MoDOT as occurring at one (1) dBA less than the NAC; or
- There is a substantial increase in the sound levels relative to existing conditions, which is defined by MoDOT to be at least 15 dBA.

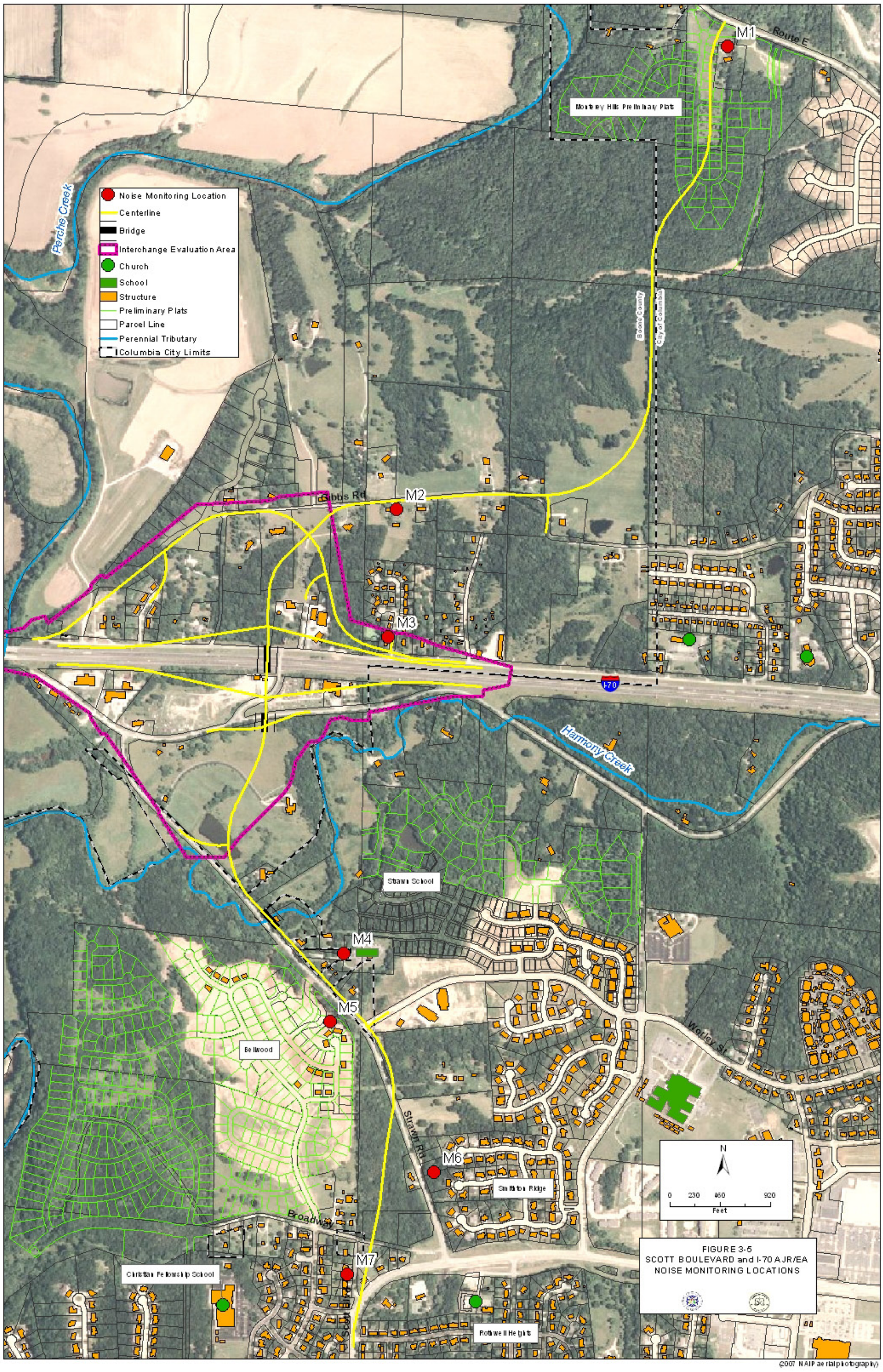
Existing Conditions Methodology, Approach and Data Sources: Noise measurements were conducted in accordance with techniques described in the FHWA Report Number FHWA-DP-96-046, *Measurements of Highway-Related Noise*, (1996). Short-term noise measurements were conducted in November and December of 2010 (LBG 2011c). The noise measurements were conducted at sites representing noise sensitive uses, such as residential and institutional land uses, in close proximity to the proposed project (i.e., within 500 feet of the proposed roadway edge of pavement). Multiple short-term measurements during

AM (7:00 AM to 8:00 AM) and PM (4:30 PM to 5:30 PM) peak traffic periods were conducted to reflect noise variations during different periods of the day. The primary noise source for all measurement sites was traffic along West Gibbs Road, Wales Road, Route ZZ, Route E, Dawn Drive, and near Strawn School, located on North Strawn Road. Secondary noise sources included neighborhood activities and overhead aircraft (**Figure 3-5**). Methods for determining existing noise levels are summarized in a Technical Memorandum (LBG 2011c) and in **Table 3-11** below.

**Table 3- 11: Noise Measurement Results**

| Map ID | Address | Type of Receptor | Date | Period | Leq |
|---|---|---|---|---|---|
| **M1** | 3408 N. Stadium Blvd (State Route E) | Residence | 12/7/2010 | AM Peak | 55.4 |
| | | | 12/7/2010 | PM Peak | 54.6 |
| **M2** | 4298 W. Gibbs Road | Residence | 12/7/2010 | AM Peak | 51.5 |
| | | | 12/7/2010 | PM Peak | 50.1 |
| **M3** | Dawn Drive | Residence | 12/2/2010 | AM Peak | 65.3 |
| | | | 12/5/2010 | PM Peak | 65.9 |
| **M4** | Strawn School Rd | Residence | 12/2/2010 | AM Peak | 50.7 |
| | | | 12/8/2010 | PM Peak | 51.3 |
| **M5** | 306 Cedar Falls | Residence | 12/2/2010 | AM Peak | 51.8 |
| | | | 12/14/2010 | PM Peak | 55.0 |
| **M6** | Hwy ZZ | Commercial | 11/30/2010 | AM Peak | 53.1 |
| | | | 12/1/2010 | PM Peak | 54.8 |
| **M7** | 15 Wales Street | Residence | 11/30/2010 | AM Peak | 57.9 |
| | | | 12/1/2010 | PM Peak | 57.2 |

Source: The Louis Berger Group, Inc., December 2010.


Noise Monitoring Location
Centerline
Bridge
Interchange Evaluation Area
Church
School
Structure
Preliminary Plats
Parcel Line
Perennial Tributary
Columbia City Limits
Perche Creek
Monterey Hills Preliminary Plats
M1
Route E
Boone County
City of Columbia
Gibbs Rd
M2
M3
I-70
Harmony Creek
Strawn School
M4
M5
Bellwood
Strawn Rd
Worley St
M6
Smithton Ridge
Broadway
M7
Christian Fellowship School
Rothwell Heights
N
0 230 460 920
Feet
FIGURE 3-5
SCOTT BOULEVARD and I-70 AJR/EA
NOISE MONITORING LOCATIONS
©2007 NAIP aerial photography

### 3.11.2 Noise Impacts

Modeling and impact assessment was only conducted for the Yellow alternative (preferred) since it is the preferred alternative. Noise modeling of future year 2030 No-Build alternative and Yellow alternative (preferred) conditions was conducted by utilizing the FHWA's Traffic Noise Model (TNM) 2.5. In general, the traffic noise modeling process incorporates a large number of variables that describe various types of vehicles operating at different speeds through a continuously changing highway configuration and surrounding terrain.

An assessment of traffic noise mitigation was not conducted since noise impacts associated with the Proposed Project were not predicted or mitigation would simply not be feasible and/or reasonable based on the limited number of impacts identified and locations of such impacts. A review of impacts including future no build noise levels and build noise levels for noise study areas is presented below and summarized in **Table 3-12**.

**Monterey Hills Preliminary Plats** – This region is represented primarily by measurement site M1 which is comprised of two individual existing residences along Route E, one of which is measurement site M1, in addition to the Monterey Hills Preliminary Plats, for a total of approximately 47 residences.

No Build: Within this region of analysis, 2030 No Build alternative PM peak hour noise levels are predicted to range between 39.9 and 57.1 dBA depending on the proximity to Route E (**Table 3-12**). The maximum predicted PM peak hour noise level of 57.1 dBA would occur on two lots closest to Route E that are part of the proposed Monterey Hills Preliminary Plats. Lower noise levels would occur within the Monterey Hills Preliminary Plats where no roadway currently exists.

Build Alternatives: As depicted in **Table 3-12**, 2030 Yellow alternative (preferred) PM peak hour noise levels are predicted to range between 48.8 and 64.9 dBA among the two existing residences and the Monterey Hills Preliminary Plats. Therefore, traffic noise levels are not predicted to approach or exceed the FHWA NAC of 67 dBA for residential receptors.

**Receptors North of I-70** – This region is represented by primarily by measurement sites M2 and M3. It is comprised of a number of individual residences located along the existing Gibbs Road and I-70 as well as clusters of residences located along Dawn Drive and Rebel Drive, for a total of approximately 58 residences.

No build: Year 2030 No Build alternative PM peak hour noise levels within this region are predicted to range between 41.4 and 70.7 dBA. The maximum predicted noise levels would occur along I-70 due to the high volume of traffic and high speed on that roadway, whereas lower noise levels would occur along the existing Gibbs Road at greater distances from I-70.

Build Alternatives: As depicted in **Table 3-12**, Year 2030 Yellow alternative (preferred) PM peak hour noise levels in this region are predicted to range between 48.7 and 69.8 dBA. Noise levels that approach or exceed the FHWA NAC of 67 dBA are predicted to occur at those residences within closest proximity to I-70 due to the high traffic volumes and speed on that roadway. Such impacts are not a result of the proposed Scott Boulevard or the realigned I-70 Drive NW that forms an intersection with the proposed Scott

Boulevard. As such, impacts are not predicted to occur within this region of analysis as a result of the proposed project.

**Receptors North of Bellwood and East of Scott Boulevard** – This region of analysis is represented primarily by measurement site M4 (**Table 3-12**). It consists of four individually scattered residences south of I-70, on the east side of the proposed Scott Boulevard and existing Strawn Road.

No build: Year 2030 No Build alternative PM peak hour noise levels are predicted to range between 50.9 and 62.3 dBA, where the maximum predicted noise level occurs at the receptor within closest proximity to I-70 and I-70 Drive SW (i.e. the South Outer Road).

Build Alternatives: Year 2030 Yellow alternative (preferred) PM peak hour noise levels are predicted to range between 58.8 and 63.2 dBA (**Table 3-12**). Relative to 2030 No Build noise levels, which are anticipated to be similar to existing conditions due to limited background traffic growth on Strawn Road, noise levels are predicted to increase by 6 to 8 dBA at three of the four residences in this region. Although traffic noise levels are anticipated to increase, such increases would not be considered substantial per MoDOT's policy. Additionally, noise levels are not predicted to approach or exceed the FHWA NAC of 67 dBA for residential receptors at any of the sites. Therefore, traffic noise impacts are not predicted to occur under the 2030 Yellow alternative (preferred) within this region.

**Bellwood Residences** – This region of analysis is represented primarily by measurement site M5 (**Table 3-12**). It is comprised of the Bellwood residential subdivision east of the existing Strawn Road and north of Broadway. This region also contains a few existing residences just north of Broadway that are not part of the Bellwood development. A total of approximately 43 residences are represented within 500 feet of the proposed Scott Boulevard.

No Build: Year 2030 No Build alternative PM peak hour noise levels are predicted to range between 49.5 and 55.2 dBA, where the highest predicted noise levels occur mainly within the first row of homes closest to Strawn Road.

Build Alternatives: Year 2030 Yellow alternative (preferred) PM peak hour noise levels within this region are predicted to range between 53.3 and 62.5 dBA. Since noise levels are not predicted to approach or exceed the FHWA NAC of 67 dBA for residential receptors, and substantial increases in traffic noise levels are not predicted, traffic noise impacts are not anticipated within this region.

**Smithton Ridge Residences** – This region is represented primarily by measurement site M6 (**Table 3-12**). It is comprised of the Smithton Ridge residential development east of Strawn Road and just north of Broadway, two individual residences just east of Strawn Road and the commercial property on which measurement site M6 was taken. Approximately 12 residences and 1 commercial property are represented.

No Build: Year 2030 No Build alternative PM peak hour noise levels are predicted to range between 51.4 and 65.1 dBA. The highest predicted noise levels occur at residences located on Daylily Court whose backyards face Broadway. These residences are within closest proximity to Broadway, which accommodates considerably higher traffic volumes compared to Strawn Road.

Build Alternatives: Year 2030 Yellow alternative (preferred) PM peak hour noise levels are predicted to range between 54.4 and 64.1 dBA (**Table 3-12**). Relative to 2030 No Build alternative noise levels, 2030 Yellow alternative (preferred) noise levels are predicted to decrease slightly because the area would be located further from Scott Boulevard under the 2030 Yellow alternative (preferred) due to the westward shift of the alignment. Since noise levels are not predicted to approach or exceed the FHWA NAC of 67 dBA for residential receptors and 72 dBA for commercial sites, and substantial increases in traffic noise levels are not predicted to occur, traffic noise impacts are not anticipated in the region.

**Residences West of Existing Scott Boulevard** – This region is represented primarily by measurement site M7 (**Table 3-12**). It is comprised of a residential neighborhood on the west side of the existing Scott Boulevard and west of the Rothwell Heights residential development. A total of approximately 43 residences are represented in this region.

No Build: Year 2030 No Build alternative PM peak hour noise levels are predicted to range between 50.5 and 67.5 dBA. Noise levels in excess of the FHWA's NAC occur at R72 and R74, which are representative of residences whose backyards are located along the existing Scott Boulevard.

Build Alternatives: Year 2030 Yellow alternative (preferred) PM peak hour noise levels within this region are predicted to range between 51.4 and 68.3 dBA. Property access issues would need to be considered with construction of a noise barrier that is long enough to achieve the 5 dBA insertion loss at first-row receivers required by MoDOT feasibility and reasonableness criteria. Walls constructed in this area could not be continuous along the proposed Scott Boulevard as it would have to be "broken" at Mt. Carmel Lane and Christian Fellowship Road to allow for traffic to turn to and from these streets. Creating gaps in noise walls may create "flanking" of noise around the edges of the barrier and thereby increase noise levels. As such, it would not be feasible or reasonable to consider a noise barrier for the impacts predicted in this area.

**Rothwell Heights Residences** – This region is represented by modeling individual receptors and is comprised of the Rothwell Heights residential development east of the existing Scott Boulevard (see **Table 3-12**). A total of approximately 42 residences are located in this region.

No Build: Year 2030 No Build alternative PM peak hour noise levels are predicted to range between 53.8 and 67.4 dBA. The highest predicted noise levels occur at residences located within the first row of homes closest to the existing Scott Boulevard.

Build Alternatives: Year 2030 Yellow alternative (preferred) PM peak hour noise levels within this region are predicted to range between 53.4 and 68.4 dBA depending on proximity to Scott Boulevard (**Table 3-12**). Noise levels would exceed the FHWA NAC of 67 dBA for residential receptors at one residence located on Defoe Drive whose yard fronts Scott Boulevard. However, it would not be reasonable to construct noise mitigation for one residence as a noise barrier would far exceed MoDOT's cost per benefited residence criterion of $30,000. At all other locations within this area, noise levels are predicted to increase or decrease, relative to 2030 No Build alternative noise levels, due to the reconfigured intersection of Broadway and Scott Boulevard. Since it is not reasonable to construct noise mitigation for one residence and all other residences are predicted to experience noise levels below the FHWA NAC of 67 dBA for residential receptors, consideration of noise mitigation is not warranted for this region.

| Table 3- 12: 2030 No Build and Build Yellow Alternative (Preferred) Noise Levels | | |
|---|---|---|
| **Receptor Area** | **2030 No Build Alternative Modeled Noise Level Range (dBA)** | **2030 Build Alternative Modeled Noise Level Range (dBA)** |
| **Monterey Hills Preliminary Plats** | 39.9 to 57.1 | 48.8 to 64.9 |
| **Receptors North of I-70** | 41.4 to 70.7 | 48.7 to 69.8 |
| **Receptors North of Bellwood and East of Scott Boulevard** | 50.9 to 62.3 | 58.8 to 63.2 |
| **Bellwood Residences** | 49.5 to 55.2 | 53.3 to 62.5 |
| **Smithton Ridge Residences** | 51.4 to 65.1 | 54.4 to 64.1 |
| **Residences West of Existing Scott Boulevard** | 50.5 to 67.5 | 51.4 to 68.3 |
| **Rothwell Heights Residences** | 53.8 to 67.4 | 53.4 to 68.4 |

## 3.12 Water Quality

Different types of water bodies offer different benefits or uses. A lake can be used for irrigation, to capture flood waters, to prevent sediment from reaching a stream, or for recreation, etc. A stream can be used for recreation, irrigation, or could provide benefits to wildlife, etc. Wetlands can filter pollution or have wildlife benefits. Groundwater can be used for irrigation or drinking. A water body such as a lake, stream, or wetland, can have one use/benefit or multiple uses/benefits. Water quality means different things for different bodies of water. The EPA sets water quality standards based on the benefits and uses of the water body. The MDNR classifies the uses of water bodies.

There are lakes, streams, and wetlands within the study area. Water quality considerations include impacts to surface waters, groundwater, and wellhead protection areas that would damage the use or benefit of that water body.

### 3.12.1 Surface Water

Surface water bodies include any feature that has water present above ground. This includes streams, lakes, and wetlands.

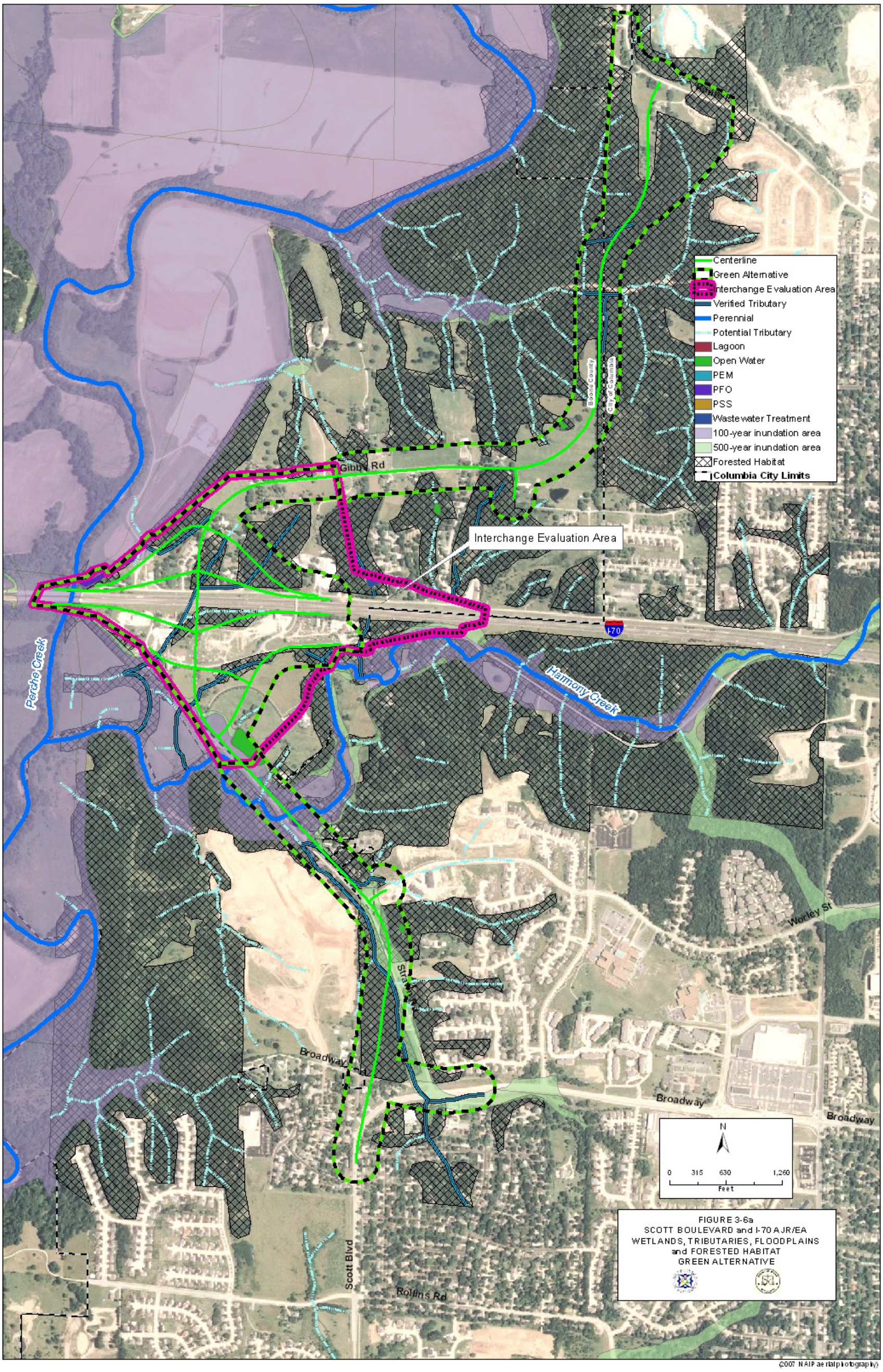
The proposed Scott Boulevard and I-70 project is located within the watershed of the Missouri River- Lower Missouri-Moreau Watershed. Major tributaries include Perche Creek and Harmony Creek. A large percentage of the Columbia metropolitan and suburban areas are within these watersheds which exhibit

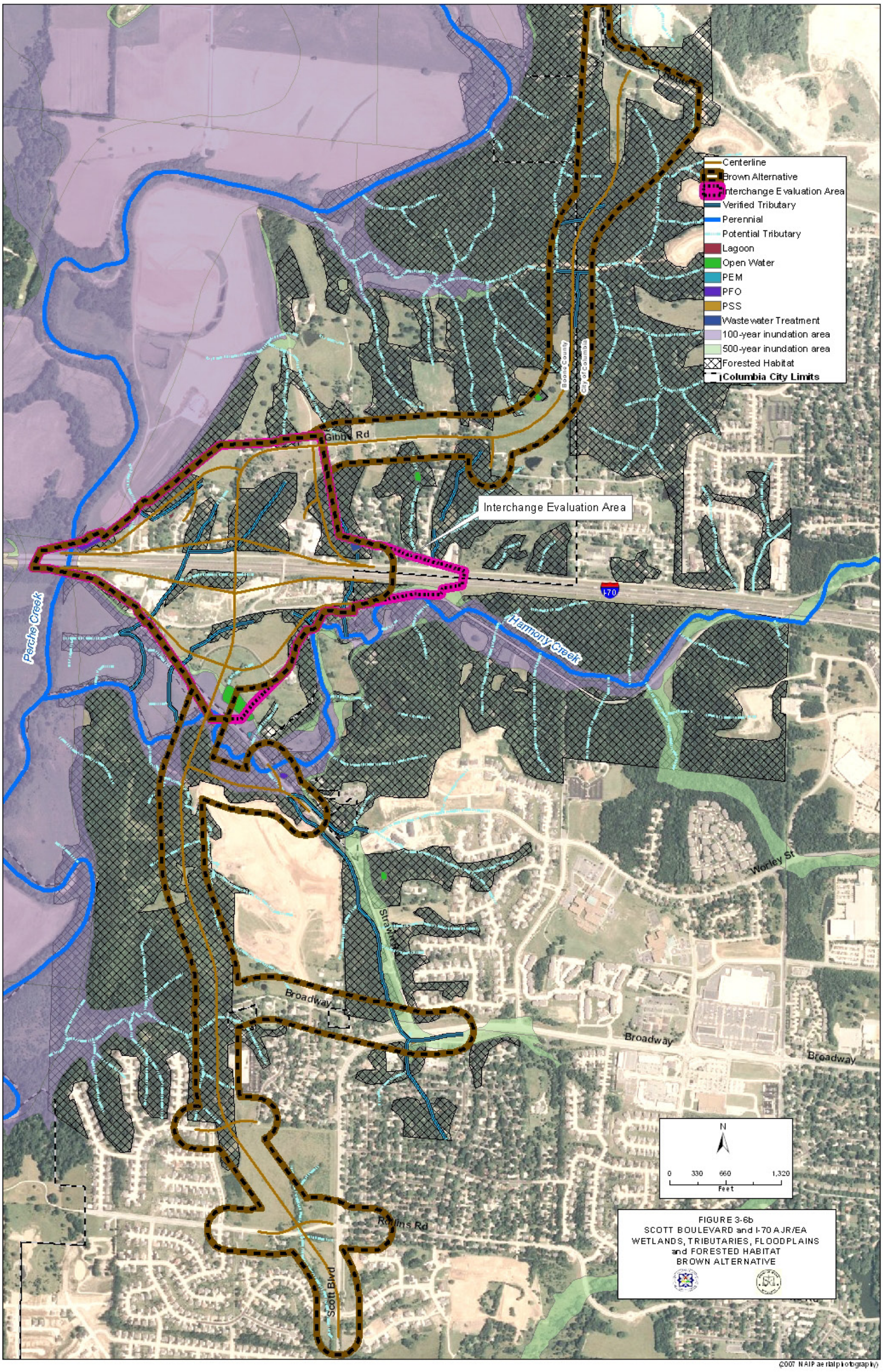
water quality characteristic of both urban and agricultural lands**.** Impacts to tributaries are discussed further in Section 3.14.

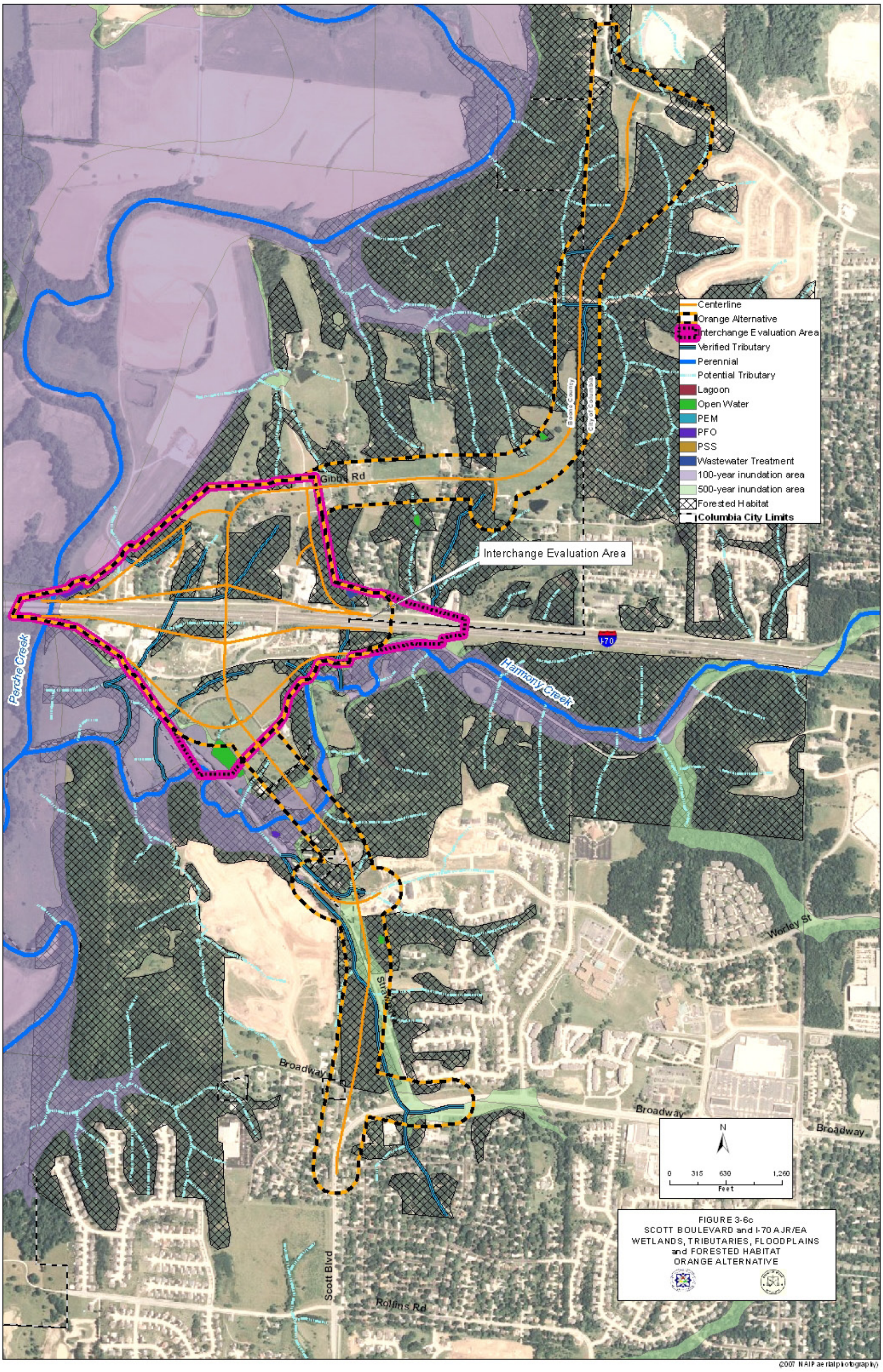
Two large tributaries are located within the study areas, Perche Creek and Harmony Creek. Only Perche Creek has an MDNR classification and use designation. The MDNR classifies Perche Creek as having permanent flow. Perche Creek has usage designations including livestock and wildlife watering, fishing, boating and canoeing, and whole body contact. Erosion from agricultural fields and urban runoff are water quality considerations for Perche Creek.

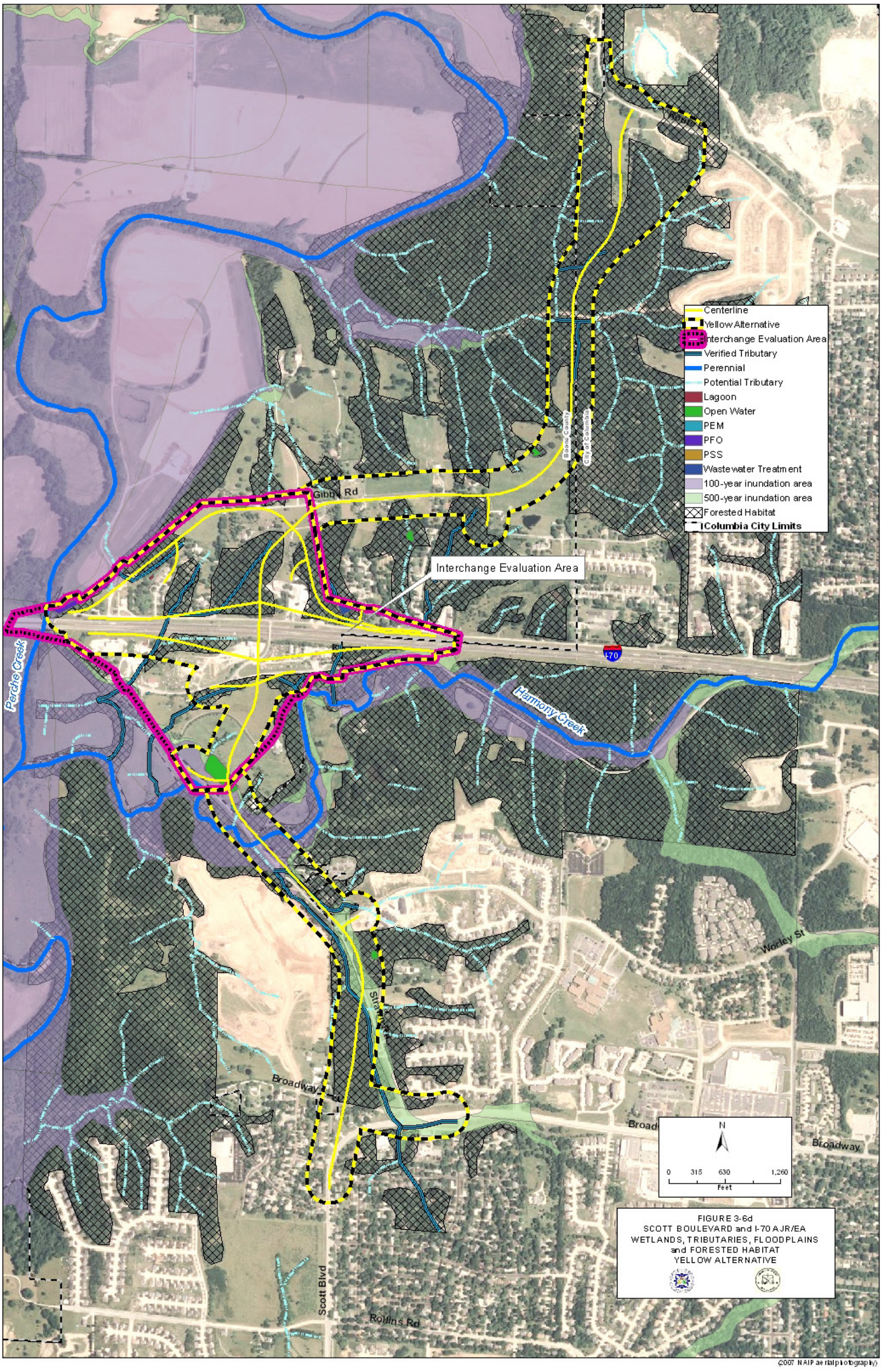
Unnamed surface tributaries occur within the study area. These tributaries are predominately of intermittent to ephemeral flow regimes. Down cutting of banks occurs where these resources traverse through erodible soils. Tributary corridors usually have an adjacent riparian forest.

Surface water crossings were counted for various alternatives. The Green alternative would impact 45 tributaries and wetlands. The Brown alternative will cross 47 tributaries and wetlands. The Orange alternative would cross 44 tributaries and wetlands. The preferred alternative (Yellow) would cross 44 tributaries and wetlands (**Figure 3-6a to 3-6d**). **Table 3-13** details surface water crossings in the study area.


Centerline
Green Alternative
Interchange Evaluation Area
Verified Tributary
Perennial
Potential Tributary
Lagoon
Open Water
PEM
PFO
PSS
Wastewater Treatment
100-year inundation area
500-year inundation area
Forested Habitat
Columbia City Limits
Gibbs Rd
Interchange Evaluation Area
I-70
Perche Creek
Hinkson Creek
Worley St
Broadway
Broadway
Broadway
Scott Blvd
Rollins Rd
N
0 315 630 1,260
Feet
FIGURE 3-6a
SCOTT BOULEVARD and I-70 AJR/EA
WETLANDS, TRIBUTARIES, FLOODPLAINS
and FORESTED HABITAT
GREEN ALTERNATIVE
©2007 NAIP aerial photography


Centerline
Brown Alternative
Interchange Evaluation Area
Verified Tributary
Perennial
Potential Tributary
Lagoon
Open Water
PEM
PFO
PSS
Wastewater Treatment
100-year inundation area
500-year inundation area
Forested Habitat
Columbia City Limits
Gibbs Rd
Interchange Evaluation Area
I-70
Perche Creek
Harmony Creek
Worley St
Broadway
Broadway
Broadway
Rollins Rd
Scott Blvd
N
0 330 660 1,320
Feet
FIGURE 3-6b
SCOTT BOULEVARD and I-70 AJR/EA
WETLANDS, TRIBUTARIES, FLOODPLAINS
and FORESTED HABITAT
BROWN ALTERNATIVE
©2007 NAIP aerial photography


Centerline
Orange Alternative
Interchange Evaluation Area
Verified Tributary
Perennial
Potential Tributary
Lagoon
Open Water
PEM
PFO
PSS
Wastewater Treatment
100-year inundation area
500-year inundation area
Forested Habitat
Columbia City Limits
Boone County
City of Columbia
Gibbs Rd
Interchange Evaluation Area
I-70
Perche Creek
Harmony Creek
Worley St
Broadway
Broadway
Broadway
Scott Blvd
Rollins Rd
N
0 315 630 1,260
Feet
FIGURE 3-6c
SCOTT BOULEVARD and I-70 AJR/EA
WETLANDS, TRIBUTARIES, FLOODPLAINS
and FORESTED HABITAT
ORANGE ALTERNATIVE
©2007 NAIP aerial photography


Centerline
Yellow Alternative
Interchange Evaluation Area
Verified Tributary
Perennial
Potential Tributary
Lagoon
Open Water
PEM
PFO
PSS
Wastewater Treatment
100-year inundation area
500-year inundation area
Forested Habitat
Columbia City Limits
Gibbs Rd
Interchange Evaluation Area
I-70
Perche Creek
Harmony Creek
Worley St
Broadway
Scott Blvd
Rollins Rd
N
0 315 630 1,260
Feet
FIGURE 3-6d
SCOTT BOULEVARD and I-70 AJR/EA
WETLANDS, TRIBUTARIES, FLOODPLAINS
and FORESTED HABITAT
YELLOW ALTERNATIVE
©2007 NAIP aerial photography

| Table 3- 13: Scott Boulevard and I-70 Surface Waters Crossings | | | | | | |
|---|---|---|---|---|---|---|
| **SURFACE WATER CROSSINGS** | Units | No Action | Green | Brown | Orange | Yellow (Preferred) |
| Waterway Crossings* | Number | 0 | 45 | 47 | 44 | 44 |

*Includes wetlands, open waters, and tributaries

Water quality impacts would be similar for all build alternatives. Short-term impacts to surface water quality would arise primarily during the construction phase of the project. Impacts such as erosion, siltation, an increase in nutrient levels or the discharge of fuels, lubricants, or other harmful contaminants during construction could occur. Best management practices would be implemented to minimize sediment and erosion in these waters. In addition, contract specifications would require implementation of Best Management Practices to prevent petroleum products, other toxic substances, and construction debris from entering water or otherwise contaminating the riparian or stream environment. The City of Columbia has also adopted its own guidance for stream setbacks.

The project will be subject to the National Pollution Discharge Elimination System (NPDES) requirements of the Clean Water Act (CWA). An NPDES permit will be required and will limit the amount of pollutants that can leave a job site and requires the implementation of erosion controls. All construction activities will comply with the existing rules and regulations of governmental agencies having jurisdiction over wetlands and waters of the U.S. in the area. These measures will diminish possible impacts to water quality.

### 3.12.2 Groundwater

The Missouri River alluvium provides a productive source of groundwater to the Columbia metropolitan area. Groundwater is the primary source of drinking water in the City of Columbia. The City of Columbia originally used groundwater from deep bedrock wells located throughout the metropolitan area. Currently, water for the City of Columbia is pumped from a shallow alluvial well field located on land bordering the Missouri River southwest of the city in McBaine, Missouri, in an area known as McBaine Bottom. Groundwater pumped from the wells is piped to the McBaine Water Treatment Plant. The wellfield and McBaine Water Treatment Plant are located five miles southwest of the project area. Since the project is five miles away from the wellfield, the McBaine Bottom wellfield or the recharge of the wells would not be affected.

### 3.12.3 Wellhead Protection Area

All public water supply systems are regulated by the Safe Drinking Water Act (SDWA) of 1974 (USEPA 2008a). The SDWA authorizes the USEPA to set national drinking water standards. The USEPA, states, and public water systems work together to ensure that these standards are met. The wellfield and McBaine Water Treatment Plant are located five miles southwest of the study area. The project would not affect the McBaine Bottom wellfield or the recharge of the wells. Implementation of best management practices to protect surface waters would reduce the risk of contamination of groundwater resources. These measures include sediment and erosion control, spill protection during construction, and long-term stormwater runoff treatment measures.

### 3.13 Jurisdictional Waters of the U.S.

A jurisdictional water of the U.S. (WOUS) may include a tributary, lake, or wetland. Some of these water bodies are protected by the CWA because of the natural resource services, habitat and societal benefits they provide. The U.S. Army Corps of Engineers (USACE) administers regulatory oversight for all work in jurisdictional WOUS under Section 404 of the CWA. The USACE was contacted regarding the potential presence of jurisdictional waters within the study area (Appendix A). A Section 404 permit will be required for the construction of the Scott Boulevard Interchange and local road improvements. The project may qualify for a Nationwide Permit 14 (Linear Transportation Crossings), but could need an Individual permit. Avoidance and minimization of the resources will be completed where possible. Mitigation is typically required for impacts greater than 0.10 acres. Mitigation measures will include riparian plantings and bank stabilization methods for road crossings of streams. In the event the project requires a nationwide permit a separate request for Section 401 water quality certification will not be required as it is typically included as a part of the USACE issuance of the nationwide permit. In the event a Section 404 Individual Permit is required for the project, a formal request for Section 401 water quality certification must be submitted to the MDNR. Impacts to tributaries, wetlands, and other WOUS would require coordination and permitting with the USACE, USEPA and MDNR and a jurisdictional waters determination and Section 404/401 Permit Application will be submitted to the USACE in the design phase of the project.

For this study, topographic maps, the National Wetland Inventory (NWI) maps and aerial photographs were reviewed. In addition, a team of biologists completed a field review of the study area. The review was completed from public roads (drive-by) for the Green, Brown, Orange and Yellow (preferred) alternatives. For the preferred alternative (Yellow) a team completed a field survey on all properties where landowners granted permission.

Numerous NWI features are located within the study area (USDOI 2008; **Figure 3-6a to 3-6d**). Potential tributaries were identified by using topographic maps. Areas that have topographic signatures and landscape settings typical to tributaries were identified as potential tributaries using the topographic map (USGS 1985). Potential tributaries identified in the study area may be jurisdictional aquatic resources and were used to determine impacts. Final jurisdiction will be determined by completing an on-site assessment that will be reviewed by the USACE and the EPA.

Jurisdictional WOUS in the project area include open water, wetlands, and potential tributaries (**Figure 3-6a to 3-6d**; **Table 3-14)**. Impacts to jurisdictional waters are discussed in the following sections.

**Table 3- 14: Scott Boulevard and I-70 Interchange Impacts to Jurisdictional Waters**

| WATERS OF THE U.S. | Units | No Action | Green | Brown | Orange | Yellow (Preferred) |
|---|---|---|---|---|---|---|
| Open Waters | acres | 0 | 1.87 | 0.75 | 0.43 | 1.87 |
| Palustrine Emergent Wetland | acres | 0 | 0.08 | 0.02 | 0.02 | 0.06 |
| Palustrine Scrub-shrub Wetland | acres | 0 | 0.08 | 0.08 | 0.08 | 0.08 |
| Palustrine Forested Wetland | acres | 0 | 1.10 | 1.10 | 0.96 | 1.10 |
| Sum of All Wetland Types | acres | 0 | **1.26** | **1.20** | **1.06** | **1.24** |
| Perennial Streams | feet | 0 | 1,532 | 2,015 | 937 | 1,397 |
| Intermittent and Ephemeral Tributaries | feet | 0 | 18,896 | 23,454 | 19,792 | 18,808 |

### 3.13.1 Ponds and Lakes

Open waters, such as ponds and lakes, help the environment by slowing down sediment from streams and removing potential flood waters during rain events. They provide water quality benefits and unique habitat that all types of species benefit from. To lessen the damage to the environment the USACE will require mitigation for all impacts to jurisdictional open waters. Mitigation could be in the form of creating a similar habitat nearby, or paying a not-for-profit entity that already has created this habitat (a mitigation bank) or that will create the habitat when the need arises (in-lieu fee).

Ponds and man-made lakes are sometimes regulated by USACE depending on their surface water connection to streams, tributaries, rivers and associated wetlands and floodplains. For this study, all ponds and man-made lakes (open waters) were considered, regardless of USACE jurisdiction. Open waters in the study area are man-made origin and the majority of these were probably constructed for livestock watering (**Figure 3-6a to 3-6d**). The surface water source is typically surface runoff directed through tributaries.

All of the alternatives have two common open water features; a large livestock watering pond at the southern edge of the IEA, and a smaller livestock watering pond just east of where Gibbs Road turns south and diverges from the study area. A third pond, probably used for recreation and aesthetics, is found southeast of the intersection of Strawn Road and Worley Street and is within the Green, Orange, and Yellow (preferred) alternatives (**Figures 3-6a to 3-6d**).The comparison of alternatives is described here (**Table 3-14**).

#### 3.13.1.1 No Action Alternative

The No Action alternative would have no impact upon open waters.

#### 3.13.1.2 Green Alternative

Approximately 1.87 acres of open water is within the study corridor. There are three open waters in the Green study corridor (**Figure 3-6a**). A majority of this acreage (1.36 acres) is from the IEA open water. The livestock watering pond east of Gibbs Road is 0.14 acres. The recreation pond near Strawn road is 0.37 acres. This alternative and the Yellow alternative (preferred) have the most open water acreage of all the alternatives.

#### 3.13.1.3 Brown Alternative

Approximately 0.75 acres of open water is within the study corridor. There are two open waters in the Brown study corridor. **Figure 3-6b** shows the location of the open waters. A majority of this acreage (0.61 acres) is from the IEA open water. The livestock watering pond east of Gibbs Road is 0.14 acres. The recreation pond is not within the study corridor. This alternative has more open water than the Orange alternative, but less than the Green and Yellow (preferred).

#### 3.13.1.4 Orange Alternative

Approximately 0.43 acres of open water is within the study corridor. **Figure 3-6c** shows the location of the open waters. There are three open waters in the Orange study corridor. A total of 0.16 acres of the IEA open water is within the study corridor. The livestock watering pond east of Gibbs Road is 0.14 acres. The recreation pond near Strawn road is 0.13 acres. This alternative has the least open water of all the alternatives.

#### 3.13.1.5 Yellow Alternative (Preferred)

Approximately 1.87 acres of open water is within the study corridor. **Figure 3-6d** shows the location of the open waters. There are three open waters in the Yellow alternative (preferred) study corridor. A total of 1.37 acres of the IEA open water is within the study corridor. The livestock watering pond east of Gibbs Road is 0.14 acres. The recreation pond near Strawn road is 0.36 acres. This alternative has the second most amount of open water acreage.

Although 1.87 acres are found in the 500 ft. study corridor, it is likely that only 1.09 acres of open water would be impacted. All of this impact will be from the removal of the IEA open water. The likely construction impacts are based on a conceptual design.

### 3.13.2 Wetlands

Wetlands are a type of special aquatic site defined as:

"Those areas 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" (USACE 1987).

Wetlands are a valuable part of the local landscape. They play a role in water quality by filtering water before it reaches groundwater systems, they trap floodwaters, and they provide unique habitat for all sorts of species including migratory birds. It is important to replace the function of wetlands when they are impacted by construction. The USACE regulates mitigation of wetlands to ensure that the value of these types of habitat is recovered.

Recognizing the variety of beneficial functions performed by wetlands, Executive Order 11990 (Wetlands Protection) mandates consideration of wetlands impacts, as does Missouri's Executive Order 96-03. A no-net loss of national wetlands policy is mandated under Executive Order 11990. Section 404 of the CWA of 1977 authorizes the USACE to regulate the discharge of dredged or fill material in all WOUS, including wetlands. Wetlands are subject to USACE jurisdiction if a "significant nexus" (connection) is established with a navigable water or jurisdictional tributary.

Palustrine emergent wetlands, palustrine scrub-shrub wetlands, and palustrine forested wetlands are present within project alternatives.

Palustrine Emergent Wetlands: Palustrine emergent wetlands occur as topographic depressions. Emergent wetlands are permanently to seasonally inundated. Plants found in this type of wetland are herbaceous.

Palustrine Scrub-shrub Wetlands: Palustrine scrub-shrub wetlands occur as topographic depressions. Scrub-shrub wetlands are permanently to seasonally inundated. Plants found in this type of wetland are herbaceous plants, young trees, and shrubs.

Palustrine Forested Wetlands: Palustrine forested wetlands occur as topographic depressions in forested areas. Forested wetlands are semi-permanently to seasonally inundated. Plants found in this type of wetland are herbaceous plants, shrubs, and larger trees.

#### 3.13.2.1 No Action Alternative

The No Action alternative would have no impacts to wetlands.

#### 3.13.2.2 Green Alternative

There are two emergent, one scrub-shrub and two forested wetlands within the Green alternative. One emergent wetland is located just south of the IEA and is the result of water from a pond overflow being trapped slowed by the Strawn Road embankment. It has an area of 0.06 acre. The scrub-shrub wetland is south of Broadway near the Broadway and Strawn Road intersection. It is a mixture of forested and herbaceous vegetation. It has an area of 0.08. The forested wetland is southeast of where Harmony Creek crosses Strawn Road. It is a result of overflow water from Harmony Creek. It has an area of 0.14 acre. The wetlands in the IEA include an emergent wetland southeast of the intersection of SW I-70 Drive and Strawn Road. It is a roadside ditch wetland and has a total area of 0.02 acre. A larger forested wetland exists on the west edge of the IEA north of I-70. It has a total area of 0.96 acre. The total area of wetlands in the Green alternative is 1.26 acres.

#### 3.13.2.3 Brown Alternative

The same forested and scrub-shrub wetland and their associated acreages discussed in the Green alternative are located within the Brown alternative with the exception of the emergent wetland located just south of the IEA. The total area of wetlands in the Brown alternative (including the IEA wetlands) is 1.20 acres.

#### 3.13.2.4 Orange Alternative

The same scrub-shrub wetland and its associated acreage discussed in the Green alternative are located within the Orange alternative along with the forested and emergent wetland located in the IEA. The total area of wetlands in the Orange alternative (including the IEA wetlands) is 1.06 acres.

#### 3.13.2.5 Yellow Alternative (Preferred)

The wetlands and their acreage within the Yellow alternative (preferred) buffer are identical to the Green alternative with the exception of the emergent wetland located in the IEA. The total area of wetlands in the Yellow alternative (preferred) (including the IEA wetlands) is 1.24 acres.

Although 1.24 acres are found in the 500 ft. study corridor, it is likely that only 0.20 acre of wetland impacts would occur from construction of the Yellow alternative (preferred). The wetlands bordering Strawn Road would likely be impacted. One emergent wetland (0.6 acres) is located just south of the IEA and is the result of water from a pond overflow being trapped slowed by the Strawn Road embankment. One forested wetland (0.14 acre) is southeast of where Harmony Creek crosses Strawn Road. Most of the IEA wetlands, including the large forested wetland, would be avoided. The likely construction impacts are based on a conceptual design.

### 3.13.3 Tributaries

There are three types of streams (or tributaries): perennial, intermittent, and ephemeral. Perennial streams flow year round in typical years. The perennial tributaries in the study area are located in woodland corridors. Intermittent tributaries receive water supply from groundwater and flow at certain times of the year in most years. Ephemeral tributaries do not have a groundwater source and are supplied by rainfall

events. Typically, the intermittent and ephemeral tributaries within the alternatives are located in woodland corridors.

Tributaries are important because their natural corridors are beneficial to water quality and wildlife. Natural streams and the vegetation that surrounds them help filter pollution and decrease erosion. The stream itself provides a unique flowing aquatic habitat, and is essential as a food and water source to some terrestrial animals as well.

The USACE and EPA regulate tributaries and determine what is jurisdictional (what they regulate). Perennial tributaries are jurisdictional. Intermittent and ephemeral tributaries with flows of 3 months or longer are typically jurisdictional WOUS. For tributaries with flows of less than 3 months, a significant nexus or connection to a larger, jurisdictional stream must be established before the USACE or the EPA can assert jurisdiction. The USACE will make a final determination as to whether a tributary is ephemeral or intermittent and whether or not it is jurisdictional. The jurisdictional boundary of tributaries is the ordinary high-water mark (OHWM) of the tributary which is defined as:

> "An ordinary high-water line on the shore established by fluctuations of water and indicated by physical characteristics such as clear, natural lines impressed on the bank, shelving, changes in soils, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas (33CFR328.3)".

A review of the USGS National hydrography dataset and topographic maps was completed for the study area. For the Green, Brown, and Orange alternatives, tributary lengths were estimated using GIS. For the preferred alternative (Yellow), a pedestrian survey was completed to the extent that property owner access was granted. The average width and length of each tributary was used to calculate the total acreage of tributaries.

Impacts to streams and tributaries are summarized in **Table 3-14**, shown in **Figure 3-6a to 3-6d,** and summarized by alternative in sections below.

#### 3.13.3.1 No Action Alternative

The No Action alternative would have no impact on tributaries.

#### 3.13.3.2 Green Alternative

A total of 1,532 feet of perennial stream is located within the green alternative. A majority of this includes a section of Harmony creek that crosses the 500 foot buffer south of the IEA. Portions of Perche Creek are within the IEA. A total of 18,896 feet of intermittent and ephemeral tributary are found throughout the green alternative. Most of these are tributaries found in the upper watershed north of I-70.

#### 3.13.3.3 Brown Alternative

A total of 2,015 feet of perennial stream is located within the brown alternative. A majority of this includes a section of Harmony creek that crosses the 500 foot buffer south of the IEA. Portions of Perche Creek are within the IEA. A total of 23,454 feet of intermittent and ephemeral tributary are found throughout the brown alternative. Most of these are tributaries found in the upper watershed in the southwestern portion of the Brown alternative and North of I-70.

#### 3.13.3.4 Orange Alternative

A total of 937 feet of perennial stream is located within the orange alternative. A majority of this includes a section of Harmony creek that crosses the 500 foot buffer south of the IEA. Portions of Perche Creek are within the IEA. A total of 19,792 feet of intermittent and ephemeral tributary are found throughout the orange alternative. Most of these are tributaries found in the upper watershed north of I-70.

#### 3.13.3.5 Yellow Alternative (Preferred)

A total of 1,397 feet of perennial stream is located within the yellow alternative (preferred). A majority of this includes a section of Harmony creek that crosses the 500 foot buffer south of the IEA. Portions of Perche Creek are within the IEA. A total of 18,808 feet of intermittent and ephemeral tributary are found throughout the yellow alternative (preferred). Most of these are tributaries found in the upper watershed north of I-70.

Likely impacts due to the yellow alternative (preferred) include approximately 167 linear feet of perennial tributary including Harmony Creek. Approximately 5,035 feet of intermittent and ephemeral tributaries would be impacted by the Yellow alternative (preferred). A total of 5,202 feet of streams and tributary would be impacted by the preferred alternative (**Figure 3-6d**).

Stream impacts will be avoided to the extent possible during the design phase of the project. Bank stabilization techniques, culvert design and grading can be accomplished in a manner that minimizes impacts to natural waterways. The City of Columbia owns property located between Perche Creek and Strawn Road in the Perche Creek floodplain (**Figure 3-7a to 3-7d**). The city-owned property, currently proposed as a park, may be a suitable mitigation site for project stream and wetland impacts. If needed, a compensatory mitigation plan will be developed in cooperation with USACE. The plan will be based on an assessment of actual projected loss of wetland and stream area and function and will be in compliance with FHWA no-net-loss policy.

### 3.14 Wildlife Impacts

Wildlife impacts were assessed by analyzing the different types of habitat that would be affected by the alternatives. There are various types of habitat found throughout the study area. Upland forests, riparian floodplain forest, and pastures account for the majority of habitat.

Upland Forest: City of Columbia Code of Ordinances Section 12A-49 Article III regulates the loss of climax forest at land development sites greater than one acre. The City of Columbia defines climax forest as “any woodland community of over twenty thousand square feet which is dominated by climax species such as oak, hickory, sugar maple or bottomland hardwoods such as river birch, basswood, sycamore, and hornbeam and which includes an area of 5,000 square feet with a maximum aspect ratio of 4:1.” A minimum of 25% of any climax forest area on any tract of land subject to land preservation requirements shall be maintained by the City of Columbia (City of Columbia 2008a). Alternative impacts on forested areas are summarized in Section 3.16. The Brown alternative crosses over more forested area in the southwestern project area; more than any of the other alternatives south of I-70. A majority of forested area in the study area is platted for development. North of I-70, the Monterey Hills preliminary plats would impact forested habitat, to the south of I-70, the Overlook preliminary plats would impact forested habitat.

Riparian Forest: Riparian forest, north of I-70 are found along unnamed tributaries that discharge into Perche Creek. South of I-70, riparian forested areas occur along Harmony Creek and in the floodplain of Perche Creek. The City of Columbia Parks and Recreation Department manage a forested area that is largely the floodplain at the confluence of Harmony and Perche Creek.

Pasture: Near Gibbs Road, there is more residential development and less forest. Some pasture land is located near Gibbs Road. South of I-70 the area is more developed. Near the southern reach of the IEA the alternatives cross through some agricultural land mixed with forested floodplain.

Both terrestrial and aquatic fauna would be impacted by construction of the Scott Boulevard and I-70 Interchange alternatives. Habitat loss and habitat fragmentation are the primary impacts. Habitat loss would directly affect those animal species that depend on the habitat for food, cover, shelter, water, nesting sites, breeding grounds, and travel corridors. Habitat fragmentation is the process by which continuous tracts of natural landscape are broken into smaller, isolated units by development. The alternatives would interrupt animal movements, isolate species, and create artificial edges which favor the invasion of weedy plants and opportunistic edge species to varying degrees. Fragmentation results in a decrease in habitat type and a decrease in the apportionment of the remaining habitat into smaller, more isolated pieces. Smaller, more isolated habitat fragments may benefit species that prefer the increased edge habitats and adversely affect species preferring interior forest habitat.

Terrestrial and aquatic bird species would be impacted by the loss of forest, grassland, and wetland habitat. While adequate areas outside the project area remain, linear corridors would be formed by the development of the new roadway. Construction during nesting season may affect sensitive species as described in Section 3.16. The increased noise levels during highway construction and operation would create nearby habitats with less than desirable conditions for sensitive and more secretive species.

Mammals would also be impacted by the loss of habitat due to highway construction and operation. Woodland species such as white-tailed deer, squirrel, skunk, and shrew would be directly impacted by the loss of forest habitat. Although less severe, mammals using open-field-type habitats would be impacted by severing travel corridors. Habitat fragmentation would disrupt movement patterns for species that prefer corridors for travel such as raccoon and the striped skunk. Some species like the white-footed mouse and eastern chipmunk are corridor-dependent species. Wildlife-related automobile accidents would also increase with any of the alternatives.

Construction and operation of any of the full-build alternatives would impact aquatic fauna. Temporary impacts to aquatic fauna would occur at stream crossings. Increased turbidity and sedimentation would be the primary construction impacts. The decreased visibility may affect mobility and short-term spawning habits. Decreased light penetration would result in a short-term reduction in food supplies (macroinvertebrates). However, most aquatic faunal populations would return to pre-project conditions following construction. Best management practices will be implemented to minimize sediment and erosion in these waters. In addition, contract specifications will require implementation of Best Management Practices to prevent petroleum products, other toxic substances, and construction debris from entering water or otherwise contaminating the riparian or stream environment. The City of Columbia has also adopted its own guidance for stream setbacks.

North of I-70 every alternative would impact forested habitat in the area between Gibbs road and the northern connection of Scott Boulevard to Route E. Monterey Hills preliminary plat is a private development that is planned and would impact forested habitat. South of I-70 the Brown alternative would have the greatest impacts to contiguous forested area. The Overlook preliminary plats are a planned private development that would impact forested habitat. In addition, the Brown alternative would impact the forested riparian confluence of Perche Creek and Harmony Creek. Riparian areas in the Brown alternative are protected under Section 404, and are considered Section 4(f) properties because of a planned park in the area. For this and other engineering reasons the Brown alternative was avoided. The preferred alternative (Yellow) would be primarily along developed corridor and would minimize new habitat fragmentation impacts in the area. Impacts to forested areas are discussed relative to threatened and endangered species in Section 3.16.

### 3.15 Threatened and Endangered Species and Protected Communities

Threatened and endangered species and species of conservation concern are protected under state and federal laws. Federal status is derived from the provisions of the Endangered Species Act (ESA) which is administered by the U.S. Fish and Wildlife Service (USFWS). The ESA protects against the taking of any individuals, which includes harming, harassing, pursuing, killing, etc., of these species as well as impacting their critical habitats. Impacts to the species or their habitat would require consultation with the USFWS. State-listed endangered species listed in the *Wildlife Code of Missouri* under Rule 3CSR10-4.111 are protected by the State Endangered Species Law 252.240. Species of conservation concern that appear in the *Missouri Communities and Species of Concern Checklist* are afforded special legal protection (MDC 2011a).

The USFWS was contacted regarding the potential presence of federally threatened and endangered species within the environmental study area; Appendix A. The USFWS agreed that no federally listed threatened and endangered species occur within the project area (USFWS 2008). They determined that floodplain, wetland, and riparian areas associated with Perche Creek watershed provide the highest quality fish and wildlife habitat in the study area. The USFWS recommended that the project alignments be designed to avoid impacts to these sensitive environmental areas. If these areas are avoided, the USFWS would have no objections to the project. If these areas cannot be avoided, further consultation with the USFWS would be required.

The Missouri Department of Conservation (MDC) was contacted regarding the potential presence of threatened and endangered species, species of local concern, and communities of concern within the study area. The MDC has determined that no federally listed threatened and endangered species are known to occur within the study area. Several state listed species occur in the area of Perche Creek. Federally listed gray bats (*Myotis grisescens*) and Indiana bats (*Myotis sodalis*) may be transient users of Perche Creek as they have been recorded elsewhere on the creek (MDC 2008). **Table 3-15** provides a summary of species that occur in Boone County.

| Table 3- 15: Scott Boulevard and I-70 Interchange Threatened and Endangered Species in Boone County | | | | |
|---|---|---|---|---|
| **Common Name** | **Scientific Name** | **Habitat** | **Federal Status** | **State Status** |
| **MAMMALS** | | | | |
| Gray Bat | *Myotis grisescens* | Riparian forests, caves | E | E |
| Indiana Bat | *Myotis sodalis* | Riparian forests, caves | E | E |
| **FISH** | | | | |
| Flathead Chub | *Platygobio gracilis* | Pools in small creeks; large, turbid rivers | -- | E |
| Topeka Shiner | *Notropis topeka* | Small, quiet pools in clear upland creeks | E | E |
| **PLANTS** | | | | |
| Running Buffalo Clover | *Trifolium stoloniferum* | Open woodlands, grasslands, stream banks, floodplains in the southern two-thirds of Missouri | E | E |
| Virginia Sneezeweed | *Helenium virginicum* | Wet meadows, fields, ditched roads, and on sinkhole pond margins | T | E |

Plant Species: Running buffalo clover is a federally and state endangered species; no occurrences have been documented in the study area. Running buffalo clover is found in open woodlands, grasslands, stream banks, and floodplains in the southern two-thirds of Missouri. Running buffalo clover occurs in Boone County. In the study area, there is little to no habitat for this species (**Table 3-15**).

Fish species: There have been no records in the study area of flathead chub (state endangered) and Topeka shiner (federally and state endangered). The flathead chub may be found in pools of small creeks or in large, turbid rivers. The Topeka shiner inhabits small, quiet pools in clear upland creeks. The species do occur in Boone County. In the study area, there is little to no habitat for these species (**Table 3-15**).

Gray Bat: The gray bat is federally and state endangered. Gray bats live the majority of their lives in caves. In the winter they prefer deep vertical caves. In the summer they roost in caves along rivers. These caves are in limestone karst areas of the southeastern United States. Karst features have been recorded in Boone County; none have been identified in the study area. No caves have been identified within any alternative.

Indiana Bat: Indiana bats are federally and state endangered. Indiana bats hibernate in caves or abandoned mines in winter. In the summer months, Indiana bats migrate to summer habitat in wooded areas. Males roost alone or in small groups; female maternity roost colonies are typically in trees under loose bark or in dead or dying trees. Preferred tree species include shagbark hickory (*Carya ovata*) and large white oaks (*Quercus alba*). Colonies of females can be up to a hundred or more. Indiana bats also forage in or along the edges of forested areas. Indiana bats use riparian and upland forests near perennial waterways for spring maternity roost colonies. Forested riparian corridor along Perche Creek, Harmony

Creek, and their tributaries, as well as upland and bottomland forests are suitable transient summer habitat for Indiana bats.

Intact forested areas in the project area occur north of I-70 in the area proposed for the local road connection to Route E. Riparian forests occur along Harmony Creek and its tributaries. South of I-70 and east of Perche Creek and west of Strawn Road, there is a large forested area that has not been developed that would be traversed by the Brown alternative (**Figure 3-6a to 3-6d**).

Riparian Forest, upland forest, and potential climax forest are all potential summer habitat for the Indiana bat and potentially the gray bat. The alternatives were reviewed to determine the acreage of forested area that would be cleared within the right-of-way. **Table 3-16** is a summary of forested habitat within the alternatives.

No Build: The No Action alternative would have no impact upon forested communities or other habitat.

Build Alternatives: A majority of the upland forest is found north of I-70 in an undeveloped area between Gibbs Road and Route E. This area is present in all of the alternatives. Riparian forest is found within the floodplain of Harmony Creek south of I-70 and within the floodplain of Perche creek on the west edge of the IEA. The Green, Orange, and Yellow (preferred) alternatives have very similar amounts of forested habitat. There is more forested habitat within the Brown alternative because it crosses a larger undeveloped forested area south of I-70. Forested habitat can be seen in **Figure 3-6a to 3-6d**.

The Yellow alternative is the preferred alternative. Likely impacts to forested habitat include approximately 143 acres of riparian and upland forest. Approximately 15 acres of riparian habitat (predominantly forested) within the floodplain of Harmony creek south of I-70 would likely be impacted. Approximately 127 acres of upland forested habitat, mostly north of I-70 between Gibbs Road and Route E, would be impacted as shown in **Figure 3-6d**.

Avoidance, minimization, and mitigation measures may be required by the USFWS and/or MDC for impacts to protected species or their habitat. These measures may include the following:

- Minimal tree removal in the floodplain and riparian corridors
- Survey of forested riparian and upland areas for potential Indiana bat roost trees
- If removal of potential roost trees is required, tree removal will be avoided during the maternity period (April 1 – October 31)
- Mitigation measures may include reforestation of floodplains and riparian corridors

**Table 3- 16: Scott Boulevard and I-70 Interchange Forested Habitat Impacts**

| PROTECTED SPECIES HABITAT | Units | No Action | Green | Brown | Orange | Yellow (Preferred) |
|---|---|---|---|---|---|---|
| Forested Area in the Study Corridor | acres | 0 | 129.45 | 181.65 | 146.31 | 143.21 |
| Riparian Forest (and other riparian habitat)* | acres | 0 | 17.58 | 14.05 | 12.68 | 15.72 |
| Upland Forest | acres | 0 | 111.87 | 167.60 | 133.63 | 127.49 |

*Riparian Forest within the study area includes the forested areas within the 100-year and 500-year floodplain.

Migratory Bird Treaty Act: The Migratory Bird Treaty Act of 1918 was created to regulate and render it unlawful to hunt, take, pursue, wound, kill, sell, posses, or transport birds or their eggs, feathers, or nests unless federally permitted under regulation. Construction activities could have an effect on breeding birds if disturbance or construction practices disrupt reproduction during the breeding season or result in the wounding or killing of individual birds or loss of a nest. Efforts will be made to reduce the likelihood of migratory bird disturbance. [This could be in the form of seasonal restrictions of construction activities for bridge- or structure-nesting birds during breeding season, for example between April 1 and July 31 for cliff swallows on bridges. This could also be in the form of minimizing vegetative disturbance in high quality migratory bird habitat, especially during primary breeding season for whatever that/those species might be.] These efforts could include adjusting construction timing and minimization of ecological impacts to good quality habitat which may include wetlands, riparian forests, flood plain areas, etc.

### 3.16 Geologic Features

Mississippian- and Pennsylvanian-age limestone's are the primary bedrock types across Boone County (MDNR 2002). The limestone bedrock, particularly the highly permeable Mississippian-age limestone, is prone to the development of sinkholes and caves, known as karst geologic features. Karst features range from sinkholes, vertical shafts, losing streams, and springs, to complex underground drainage systems and caves. These features are a result of the dissolving action of water on carbonate bedrock.

The MDNR has identified sinkhole areas in Boone County, including areas northwest of Columbia and southwest of Columbia (MDNR 2008b). Few karst features are recorded in heritage records (MDC 20011a). The MDNR indicates that there are no known karst features in the study area or the design corridor. Although no known karst features are located within the study area, the bedrock material in the project area is suitable for the creation of karst features. Through the design and construction of the project, the discovery of karst features is possible and, if found, may require coordination with the MDNR and the MDC and may require specific design criteria. The MDC recommends that a vegetative buffer zone of at least a 100-foot radius should be maintained on all sides around caves, sinkholes, and springs. Karst areas also provide an important filtration system for groundwater. Groundwater is particularly susceptible to contamination from the surface in karst areas because the sinkholes provide direct connections to the groundwater. It is important to avoid rerouting waterways and drainage patterns in karst areas (MDC 2011c).

The limestone bedrock located throughout the environmental study area is valuable as an agricultural lime additive as well as for construction uses. There are no mine features located within the environmental study area. There are two large limestone mines located approximately 0.35 mile east of the study area near the northern connection.

### 3.17 Floodplains

Floodplains are areas that are prone to inundation by floodwater. In the study area floodplains are generally adjacent to larger perennial streams, but can be found along smaller streams as well. For the EA, floodplains are categorized as either a 100-year floodplain or a 500-year floodplain. Construction within floodplains can cause changes in the outer boundaries of the 100-year and 500-year floodplains. Often times houses, business, and agricultural land are found within the floodplain. Construction that causes and increase in the area of the floodplain could mean that more structures or useful land would be damaged during a flood. This is why these areas need to be protected from change and regulated so that

construction activities do not increase the floodplain area. Executive Order 11988 requires federal agencies to avoid, to the extent possible, the long-term and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Agencies are directed to take action to reduce the risk of flood loss, to minimize the impacts of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains.

The Scott Boulevard and I-70 Interchange study area contains land included within a Federal Emergency Management Administration (FEMA) 100-year floodplain and the regulatory floodway. The study area contains FEMA floodplains along tributaries of Perche Creek, along Harmony Creek, and along tributaries of Harmony Creek (**Figure 3-6a to 3-6d**). Floodplains are defined in two categories: 100-year floodplain and the regulatory floodway. The 100-year floodplain is defined as the area inundated by the 100-year flood, i.e., a 1% chance excedance flood event and is designated as the A zone on a flood insurance rate map (FIRM). The regulatory floodway is the main channel of a river or watercourse and the adjacent land areas that must be reserved in order to discharge the base flood.

The National Flood Insurance Program (NFIP) regulates development within floodplains. The City of Columbia and Boone County are participant communities in the NFIP. The State of Missouri Emergency Management Agency (SEMA) was contacted regarding the potential presence of regulatory floodplains (Appendix A). SEMA determined that any development located within a special flood hazard area, as identified by FEMA, must meet the requirements of the City of Columbia and/or Boone County. A permit from the City of Columbia and/or Boone County would be required for these areas prior to commencement of any construction activities (SEMA 2008). Crossings will be designed consistent with SEMA, City of Columbia, and Boone County floodplain and management goals and objectives. Regulatory floodway development permits require a no-rise certification and a statement that the proposed work would not increase the water elevations in the regulatory floodway.

The City of Columbia charter Section 29-22 District F-1, Floodplain Overlay District, regulates floodplains and floodways (City of Columbia 2008b). The FIRMs are used to determine which lands this ordinance applies to. The ordinance states that all numbered and unnumbered “A” zones are subject to regulation. Various A zones are located adjacent to Perche and Harmony Creeks.

FEMA manages programs to assist communities in buyouts of properties that are to be set aside from future development and are restricted to only public activities or use as open space (Strange 2008). FEMA manages the following programs: Hazard Mitigation Grant Program; Flood Mitigation Assistance; and the Unmet Needs program, all involving deed restrictions to the property obtained from the funds. In addition, after the flood of 1993, the Community Development Block Grant provided funds to communities for buyouts and placed deed restrictions for development on these sites. In Missouri, SEMA administers post-acquisition compliance and monitoring. The Flood Disaster Protection Act of 1973, as amended by the Disaster Relief and Emergency Assistance Act of 1988 (The Stafford Act), identified the use of disaster relief funds under Section 404 for the Hazard Mitigation Grant Program (HMGP), including the acquisition and relocation of flood damaged property. The Volkmer Bill further expanded the use of HMGP funds under Section 404 to “buyout” flood damaged property, which had been affected by the Great Flood of 1993. None of these sites are located within the study area (McNabb 2008; Huddleston 2008).

All of the alternatives under further consideration, except for the No Action Alternative, would impact floodplains in the study area and therefore no practicable alternative exists to avoid impacts to floodplains. FEMA floodplain impacts are primarily in Perche Creek, Harmony Creek, and their tributaries. **Table 3-17** describes the length of road that will cross the 100 and 500-year floodplains. These crossings can be seen on **Figure 3-6a to 3-6d**. The Green and Yellow (preferred) alternatives cross similar distances of floodplain. These crossings are mostly south of I-70 at the Harmony Creek crossing and adjacent to the unnamed stream that parallels Strawn Road. The Brown alternative avoids much of the 500-year floodplain of the unnamed stream adjacent to Strawn Road by going further west outside of the floodplain. The Orange is offset to the east of Strawn Road and avoids some floodplain crossings as well.

Strawn Road historically has chronic flooding issues where it crosses Harmony Creek, a tributary of Perche Creek. The preferred alternative (Yellow) would widen and elevate this roadway, ultimately solving the roadway flooding issues. The roadways functional classification would be upgraded from a major collector to a major arterial.

During the design of the preferred alternative (Yellow), the crossings of all base floodplains will be designed and constructed in compliance with applicable floodplain regulations, including Executive Order 11988. There will be no increases in base flood elevations attributable to implementation of these roadway improvements. During the design process, a detailed hydraulic analysis of the flows and water surface elevations will be made in accordance with the requirements of FEMA and the U.S. Army Corps of Engineers. This analysis will ensure the absence of any encroachments upon regulatory floodways as well as avoid any adverse impacts. The proposed action conforms to applicable state of Missouri and local floodplain protection standards. During the design process, further coordination will be conducted with SEMA and/or the local floodplain authority.

**Table 3- 17: Scott Boulevard and I-70 Interchange Floodplain Impacts**

| FLOODPLAIN | Units | No Action | Green | Brown | Orange | Yellow (Preferred) |
|---|---|---|---|---|---|---|
| 100 year | feet | 0 | 2,768 | 2,546 | 945 | 1,827 |
| 500 year | feet | 0 | 1,577 | 222 | 1,138 | 1,288 |

## 3.18 Wild and Scenic Rivers

There are no streams or rivers within the study area that are either part of the national Wild and Scenic River System or under study for designation to that system. Therefore, the proposed project will not impact the National Wild and Scenic Rivers System or potential candidates to the system.

## 3.19 Cultural Resources

Cultural resources are the physical remains of human activity which may include archaeological sites, historic buildings, structures, bridges, landscapes, objects, mounds, and burial grounds. As part of the NEPA process, Section 106 of the National Historic Preservation Act of 1966, requires that project sponsors consider how the proposed project could impact cultural resources eligible for listing or listed on the National Register of Historic Places (NRHP) based on the following criteria:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and;

(a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
(b) That are associated with the lives of persons significant in our past; or
(c) That embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
(d) That has yielded, or may be likely to yield, information important in history or prehistory.
(National Park Service 1974)

The proposed project location must be reviewed by the State Historic Preservation Office and other consulting parties in the Section 106 process. The Archival Review and Cultural Resources Survey Report were submitted to and reviewed by the SHPO. The SHPO provided a letter of concurrence on April 3, 2012 stating that there will be no historic properties affected and, therefore, they have no objections to the initiation of project activities (Appendix A). Section 106 encourages, but does not require, the preservation of eligible cultural resources. When adverse effects on these resources are unavoidable, those adverse effects must be mitigated. A Memorandum of Agreement (MOA) is prepared specifying the mitigation measures that will be completed. The MOA is legally binding on all signing parties.

Section 4(f) of the Department of the Transportation Act of 1966 (discussed in greater detail in the Public Lands, Parks and Recreation; Section 3.21) also protects certain kinds of historic places. Federally funded actions cannot impact Section 4(f) eligible sites unless there is no feasible and prudent way to avoid the site.

To comply with Section 106 and Section 4(f), cultural resources are identified and then evaluated to determine whether any are eligible for listing on the NRHP. Every reasonable effort to avoid impacts to NRHP-eligible properties is made in the planning of the project. A review of previous cultural resource surveys was completed to determine what resources have been already identified in the Scott Boulevard study area (ARC 2008). A drive-by survey was conducted to determine the present condition of known cultural resources. The location of these resources in relation to the four proposed alternatives was assessed. Information obtained from this analysis assisted in the selection of the preferred alternative (Yellow).

### 3.19.1 Archival Review of Cultural Resources

The archival review identified previously recorded archaeological sites within or near the study area. In general, four types of prehistoric archaeological resources were present: villages, campsites, lithic scatters, and mounds. In addition, the location of 19th and 20th century farmsteads, one 20th century bridge, one culvert, and a school were identified during the historical archival search.

Prehistoric Villages, Camps, Lithic Scatter, and Mounds: The archival review suggested the types of prehistoric sites previously identified within the study area as well as provided insights suggesting the potential for undocumented prehistoric sites. This analysis indicated that there was a potential for

prehistoric resources dating from as early as 13,000 years ago to as recent as the mid 1700s. Identified within this area were potentially significant prehistoric resources such as camps or villages. These habitation sites, occupied on a temporary (used as part of a seasonal round) or permanent basis, had the potential of containing various features (e.g., houses, storage pits, earth ovens, hearths, and nut or other processing pits) and a diversity of artifacts. These remains could provide new insights concerning the lives of the prehistoric residents of this region. Lithic scatters may also exist, which represent locations where chert was quarried and worked or where other resources were processed. Burial mounds have been identified on the bluff tops overlooking Perche Creek. These earthworks and other burial locations are protected by Missouri statute RSMO 194.400-401 and on the federal level by the Native American Graves Protection and Repatriation Act of 1990.

The archival review of the study area indicated that there were 19 prehistoric cultural resources within the study area but only five are within or near the four proposed alternatives (**Table 3-18**).

**Table 3- 18: Prehistoric Cultural Resources Within the Proposed Alternatives**

| Feature name or ID number | Description | 500 Foot Proposed Alternative Location |
|---|---|---|
| 23BO333 | Prehistoric Village Site | Green, Brown, Orange and Yellow (Preferred) |
| 23BO346 | Prehistoric Campsite | Green, Brown, Orange and Yellow (Preferred) |
| 23BO347 | Prehistoric Village Site | Green, Brown, Orange and Yellow (Preferred) |
| 23BO847 | Prehistoric Campsite | Green, Brown, Orange and Yellow (Preferred) |
| 23BO2318 | Prehistoric Lithic Scatter | Green, Brown, Orange and Yellow (Preferred) |

Historical Farmsteads and Schools: The archival review suggested that there is also the potential for historical remains within the study area. Prior to the Civil War, the area was populated by residents predominately from the Upper South. They moved into the region during the 1820s and early 1830s. Some of these people used slave laborers to operate their farms and to maintain their households. The largest slave holders, Jefferson Garth and James Gordon, likely lived outside of the Scott Boulevard study area, but they did have agricultural fields and pastures within this area, that were likely maintained by the slave laborers. Most of the farmers within the area, however, had only a few or no slaves including James Arnold, John Barnes, Jonathan Freeman, Daniel Grant, James King, James McMickel, John Robinson, Robert Scott, John Tiffer, William Smith, and Merit Vallandingham. Their homes could be impacted by the proposed road construction as could the former homes of slaves, outbuildings, and structures, e.g., wells, cisterns, and privies. It is possible that some of the building may still exist or they exist as archaeological remains.

After the Civil War, many of the families owning larger farms continued to exist, but they now depended on hired farm laborers instead of slaves to do most of the work. Most of these laborers were immigrants, primarily from Germany. The homes of these laborers were often placed away from the owner's residence on scattered places on the farm. Information associated with these places could provide unique information on how these foreigners adjusted to an American lifestyle. After the 1880s, the larger farms were divided into smaller plots. Many of the smaller plots were acquired by descendants or new arrivals to

the area including immigrant families or their children. Sites dating to this time have the potential of providing new information into how farming families handled the economic depressions that occurred in the 1890s and 1930s.

Historical cemeteries are protected by Missouri Statute 214.131-132. The archival review, however, revealed that no cemeteries exist within the study area.

The archival review indicated that there were many farmsteads within the proposed study area, with 24 of these historical farms and the Strawn School located within or near the four proposed alternatives (**Table 3-19**). None of the identified historical farmsteads or the Strawn School will be impacted by the proposed construction of the preferred alternative (Yellow).

**Table 3- 19: Historic Cultural Resources Within the Proposed Alternatives**

| Feature name or ID number | Description | 500 Foot Proposed Alternative Location |
|---|---|---|
| Strawn School | 19th – 20th Century School | Green, Orange, and Yellow (Preferred) |
| J. Graham Residence/Tolson Residence | 19th Century Farmstead/20th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| Robert L. Coleman Residence/Shadrock Residence | 19th Century Farmstead/20th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| W. Hall Residence | 19th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| Wright Residence | 19th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| R.B. Coleman Residence | 19th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| Vallandingham Residence/Lowery Residence | 19th Century Farmstead/20th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| Vallandingham Residence/Jacobs Residence | 19th Century Farmstead/20th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| McMickle Residence | 19th Century Farmstead | Brown |
| Brown Residence/Wilson Residence | 19th Century Farmstead/20th Century Farmstead | Brown |
| Scott Residence | 19th Century Farmstead | Brown |
| Daley Residence | 19th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| Ravenscraft Residence | 19th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| Gordon Residence | 19th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| McAlester Residence | 19th Century Farmstead | Green, Orange and Yellow (Preferred) |
| R. F. Hall Residence | 19th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| Tolson Residence | 20th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| Shadrack Residence | 20th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| Wright Residence | 20th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |

| Table 3- 19: Historic Cultural Resources Within the Proposed Alternatives | | |
|---|---|---|
| **Feature name or ID number** | **Description** | **500 Foot Proposed Alternative Location** |
| Via Residence | 20th Century Farmstead | Green, Orange and Yellow (Preferred) |
| Lowery Residence | 20th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| Martha McMickle Residences | 20th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| Wilson Residence | 20th Century Farmstead | Brown |
| Turner Residence | 20th Century Farmstead | Green, Brown, Orange and Yellow (Preferred) |
| Scott Residence | 20th Century Farmstead | Brown |

An archival review was also conducted to identify previously nominated architectural properties, structures, landscapes, or objects placed on the NRHP or considered eligible for inclusion. A drive-by of the study area was also conducted to determine if there were any previously unknown properties that could be eligible for the NRHP. These investigations revealed that no NRHP properties existed within the proposed study area and the drive-by suggested that there were no properties potentially eligible for the NRHP.

The Historic Preservation Section of MoDOT provided a list of bridges within the study area. This list shows a total of six bridges and three culverts within the study area. Most of these date to the 1920s when Highway 40 was constructed, or the 1950s when I-70 was constructed. These bridges and culverts had been examined during the proposed improvements to I-70. None of the bridges or culverts was deemed eligible for the NRHP.

Impacts to cultural resources are summarized by alternative in sections below.

#### 3.19.1.1 No Action Alternative
The No Action alternative would have no impact upon cultural resources.

#### 3.19.1.2 Green Alternative
Twenty historic cultural resources are located within the Green alternative. Five prehistoric cultural resources were identified during the archival review of the Green alternative. No NRHP properties existed within the Green alternative and the drive-by suggested that there were no properties potentially eligible for the NRHP.

#### 3.19.1.3 Brown Alternative
Twenty-two historic cultural resources are located within the Brown alternative. Five prehistoric cultural resources were identified during the archival review of the Brown alternative. No NRHP properties existed within the Brown alternative and the drive-by suggested that there were no properties potentially eligible for the NRHP.

#### 3.19.1.4 Orange Alternative
Twenty historic cultural resources are located within the Orange alternative. Five prehistoric cultural resources were identified during the archival review of the Orange alternative. No NRHP properties existed within the Orange alternative and the drive-by suggested that there were no properties potentially eligible for the NRHP.

#### 3.19.1.5 Yellow Alternative (Preferred)

The Yellow alternative (preferred) was evaluated within the appropriate archaeological and architectural areas of potential effects (APE) as described in the sections below. Archaeological surveys (ARC 2011) included shovel tests for the entire length of archaeological APE. Landowner properties were numbered consecutively from North to South and given an additional designation based on period of construction, occurrence within the architectural APE, and properties that were denied access during the architectural surveys. A historic bridge investigation identified all bridges and documented all bridge resources constructed prior to 1964.

### 3.19.2 Archaeological Survey

An archaeological survey was conducted of the Yellow alternative (preferred) within the archaeological APE. The archaeological APE consisted of the area where direct impact could occur that was approximately 250 feet wide. This survey resulted in the re-evaluation of three previously recorded sites (23BO346, 23BO347, and 23BO2318) and the identification of three new sites (23BO2455, 23BO2456, and 23BO2457) (**Table 3-20**). All of these sites appear to have been severely disturbed by past construction or contained only a limited number of artifacts. The lack of artifact diversity suggested that these sites were used for only limited times as special function camps and there is little chance of significant remains (e.g., cooking pits or houses) existing at these locations. None of the sites appear to meet the criteria for nomination to the National Register.

**Table 3- 20: Scott Boulevard and I-70 Interchange-Archaeological Impacts**

| Feature name or ID number | Description | Recommended NRHP Eligible |
|---|---|---|
| 23BO346 | Prehistoric Campsite, destroyed | No |
| 23BO347 | Prehistoric Village Site, destroyed | No |
| 23BO2318 | Light Prehistoric Lithic Scatter | No |
| 23BO2455 | Light Prehistoric Lithic Scatter | No |
| 23BO2456 | Light Prehistoric Lithic Scatter | No |
| 23BO2457 | Light Prehistoric Lithic Scatter | No |

### 3.19.3 Architectural Properties

Architecture within the architectural, 350 foot wide, APE was evaluated to determine if the proposed construction will have a direct or indirect impact on eligible properties. A total of 14 properties were evaluated within this corridor (**Table 3-21**). Two properties numbered AD25* and AD44* were evaluated from public roads due to access issues. Based on the data gathered, neither AD25 nor AD44 were NRHP eligible. AD44 and AD25 are residences that were altered with an addition. Properties that were evaluated consisted mostly of residences with a few agricultural buildings dating to the 1920s to 1960s. The few

remaining farmsteads reflected the transition of the area from rural agricultural to suburban communities. None of the buildings or structures were considered eligible for the NHRP according to Criterion A (local, state, and national historic context and had no association to historic events), Criterion B (associated with any person of individual significance) or Criterion C (integrity and significance in association with their physical design or architectural construction).

Bridges and culverts within the preferred alternative (Yellow) were also evaluated. Only one bridge (A-0491) and one culvert (NO745) were constructed before 1965 (**Table 3-22**). Neither the bridge nor culvert were on the NRHP or considered eligible for the NRHP. During the course of the current survey they were reevaluated and it is recommended that the previous evaluation stand.

**Table 3- 21: Scott Boulevard and I-70 Interchange-Architectural Impacts**

| Property Number | Address | Style | Construction Date | Recommended NRHP Eligible |
|---|---|---|---|---|
| 14 | 4298 W. Gibbs Rd. | Vernacular Gable Front | 1930s & 1952 | No |
| AD25* | 4563 W. Gibbs Rd. | Vernacular Ranch | 1940s & 1958 | No |
| AD44* | 4875 I-70 Drive NW | Vernacular Ranch | 1940s & 1957 | No |
| 52 | 4701 I-70 Drive NW | Craftsman with Massive Additions | 1927 | No |
| 62 | 98 N. Dawn Dr. | Vernacular Minimal Traditional | 1961 | No |
| 63 | 4107 I-70 Drive NW | Vernacular Minimal Traditional | 1951 | No |
| 64 | 4103 I-70 Drive NW | Vernacular Ranch | 1958 | No |
| 70 | 5050 I-70 Drive SW | Vernacular Gable Front | 1963 | No |
| 83b | 902 Strawn Rd. | Vernacular Craftsman | 1920s | No |
| 85a | Route ZZ & Strawn Rd. | Machine Shed | 1920s | No |
| 86 | 502 Strawn Rd. | Vernacular Ranch | 1955 | No |
| 90 | 316 Strawn Rd. | Vernacular Ranch | 1963 | No |
| 105a | 4221 Wales | Vernacular Split Level | 1962 | No |
| 105b | 4221 Wales | Small Shed | 1962 | No |

Unable to evaluate buildings except from public roadways.

**Table 3- 22: Scott Boulevard and I-70 Interchange-Bridge Impacts**

| Bridge/ Culvert Number | Location | Style | Construction Date | NRHP Eligible |
|---|---|---|---|---|
| A-0491 | Carries Sorrels Overpass over Interstate 70 | Stringer/Multibeam Bridge | 1958 | No |
| N0745 | Near Property 82 on Strawn Road. Culvert for Harmony Creek | Three Span Culvert | 1958 | No |

### 3.20 Public Lands, Parks and Recreation

Section 4(f) of the USDOT Act of 1966 (now codified at 49 U.S.C. 303 and 23 U.S.C. 138) was designed to preserve historic sites, public park and recreation lands, and wildlife and waterfowl refuges. A Section 4(f) property is any publicly owned park, public land, or any historic site eligible for inclusion on the NRHP that falls under the purview of Section 4(f) of the USDOT Act of 1966. Relevant passages state that:

(a) It is the policy of the United States Government that special effort is made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.

(b) The Secretary of Transportation shall cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agriculture, and with the States, in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities.

(c) The Secretary may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, recreation area, refuge, or site) only if —

(1) There is no feasible and prudent alternative to using that land; and

(2) The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

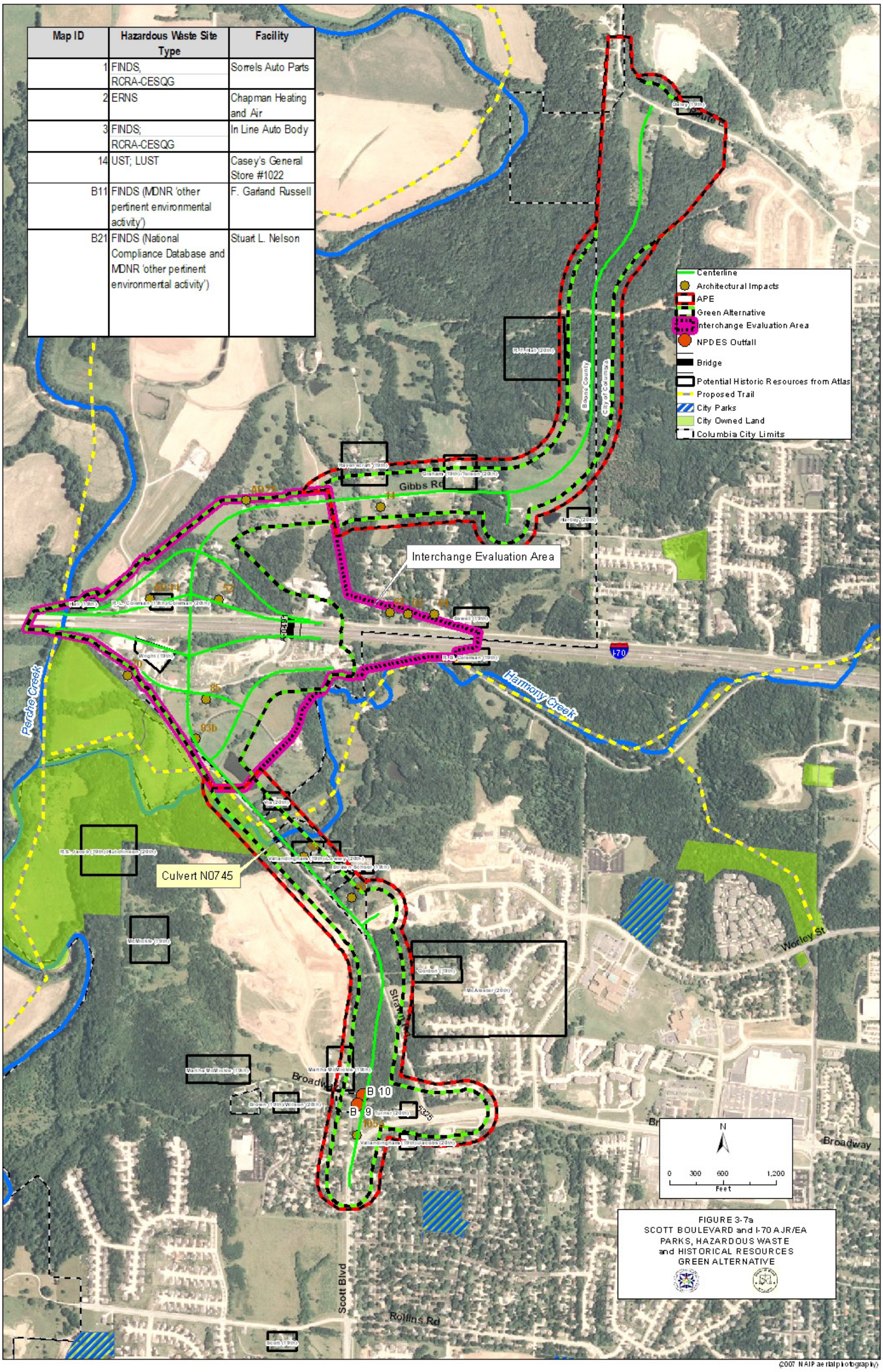
Section 4(f) mandates that all USDOT-funded transportation projects must avoid impacts to public parkland, unless it is successfully demonstrated that no feasible and prudent alternative exists that avoids "use" or impacts to the park.

Section 6(f) is part of the LWCF Act, which was implemented to provide restrictions on the conversion of public recreation facilities funded with LWCF federal grants. The LWCF Act provides funds for the

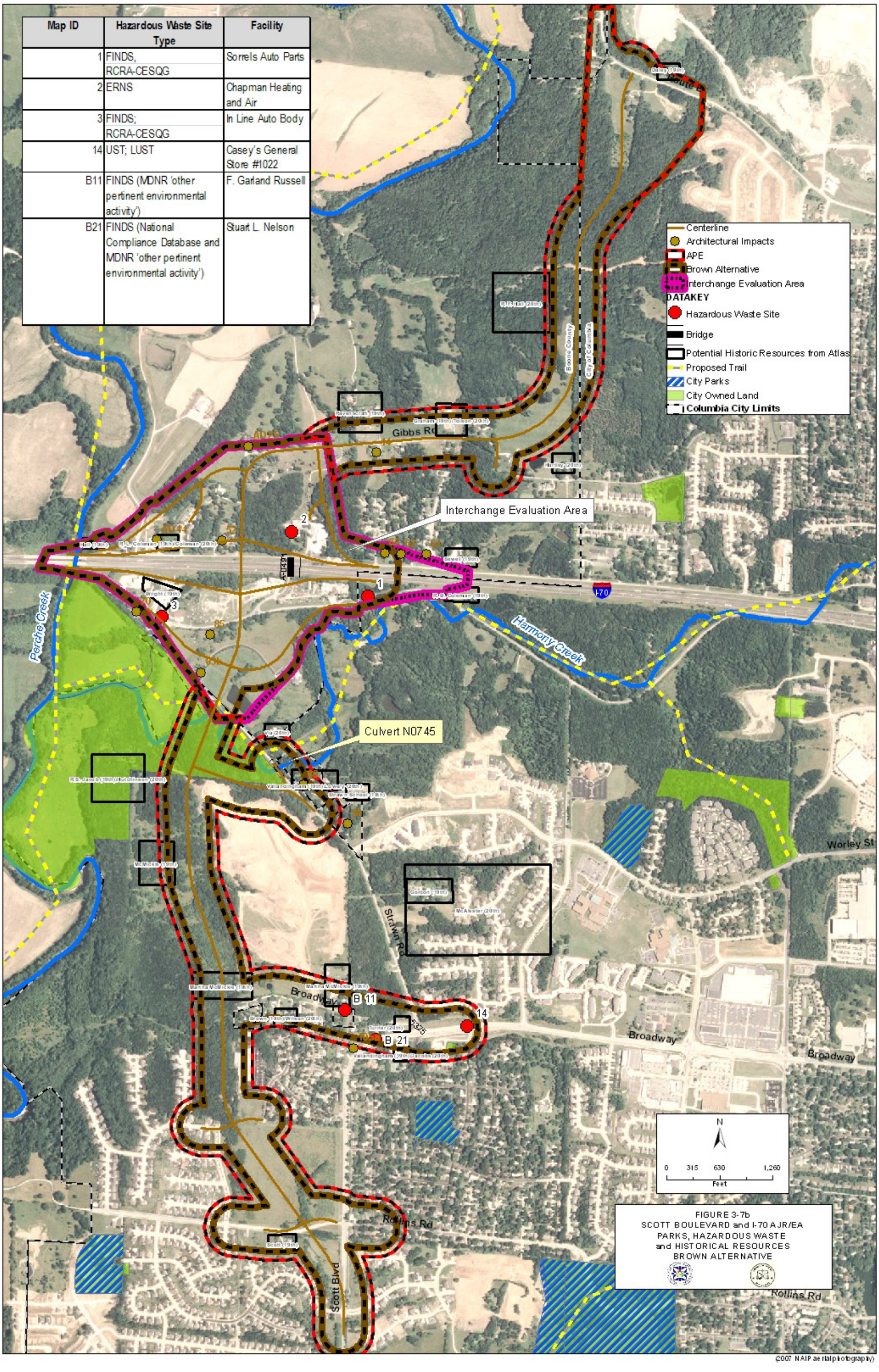
acquisition and development of public outdoor recreation facilities that could include community, county, and state parks, trails, fairgrounds, conservation areas, boat ramps, shooting ranges, etc. LWCF-assisted facilities require mitigation that includes replacement land of at least equal monetary value and recreational utility. The City of Columbia, Parks and Recreation, reports that there are no LWCF or UPARR (Saitta 2008) in the design corridor. The Boone County Board of Parks Commission reports that there are no county parks and recreation facilities in the design corridor (Elkin 2008).

There is one proposed trail in the study area that is discussed in Section 3.9. Pedestrian and Bicycle Facilities section (**Figure 3-7a to 3-7d**). There is an area, that is approximately 128 acres, of city-owned land south of I-70 and on the western edge of the IEA that is designated to be a park in the future. City of Columbia Parks and Recreation reports that the proposed park south of I-70 will be funded in 2014, but the greenbelt areas are not currently funded (Saitta 2011). Park impacts are summarized in **Table 3-23** and summarized below.

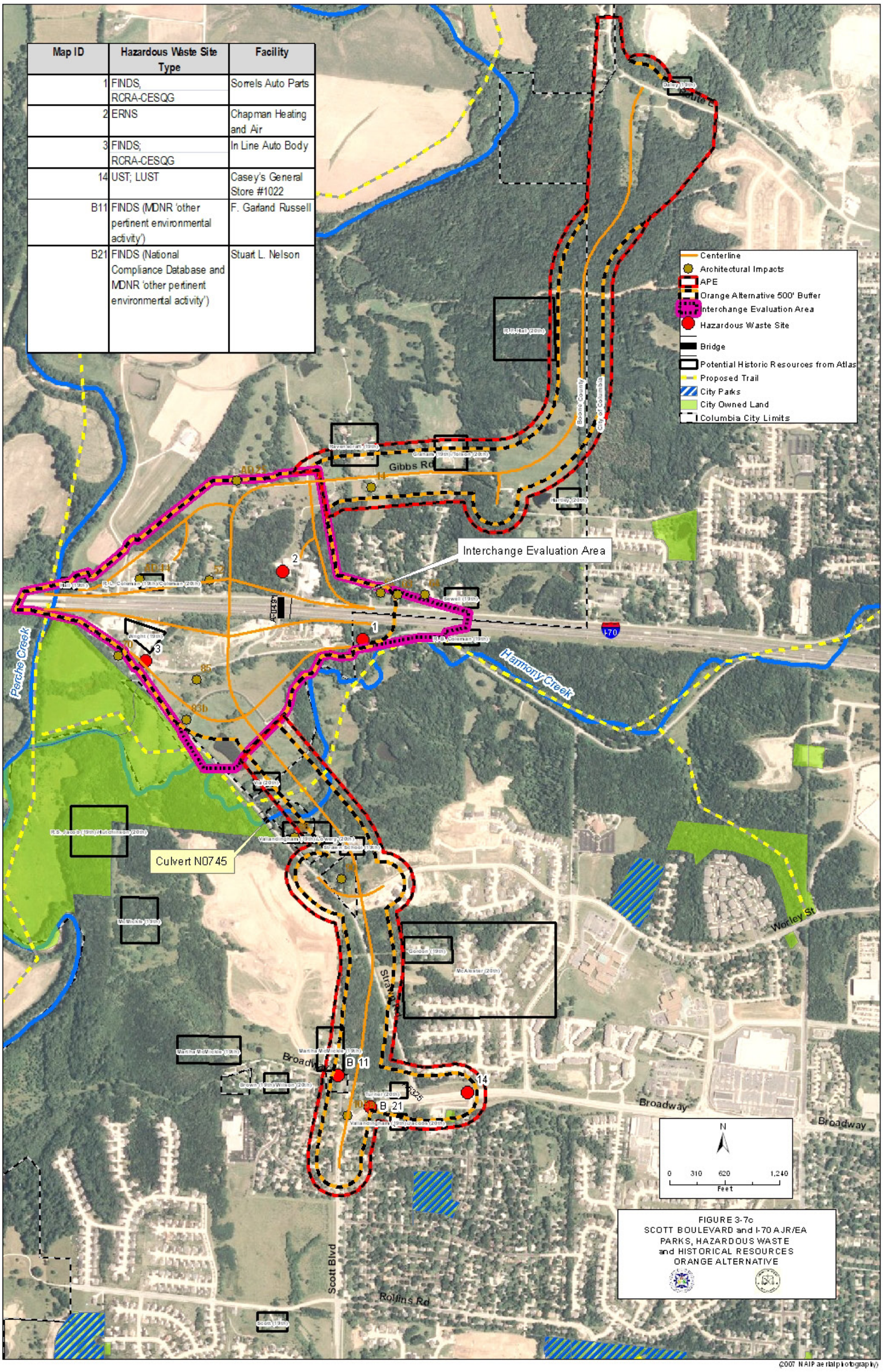
| Map ID | Hazardous Waste Site Type | Facility |
|---|---|---|
| 1 | FINDS, RCRA-CESQG | Sorrels Auto Parts |
| 2 | ERNS | Chapman Heating and Air |
| 3 | FINDS; RCRA-CESQG | In Line Auto Body |
| 14 | UST; LUST | Casey's General Store #1022 |
| B11 | FINDS (MDNR 'other pertinent environmental activity') | F. Garland Russell |
| B21 | FINDS (National Compliance Database and MDNR 'other pertinent environmental activity') | Stuart L. Nelson |



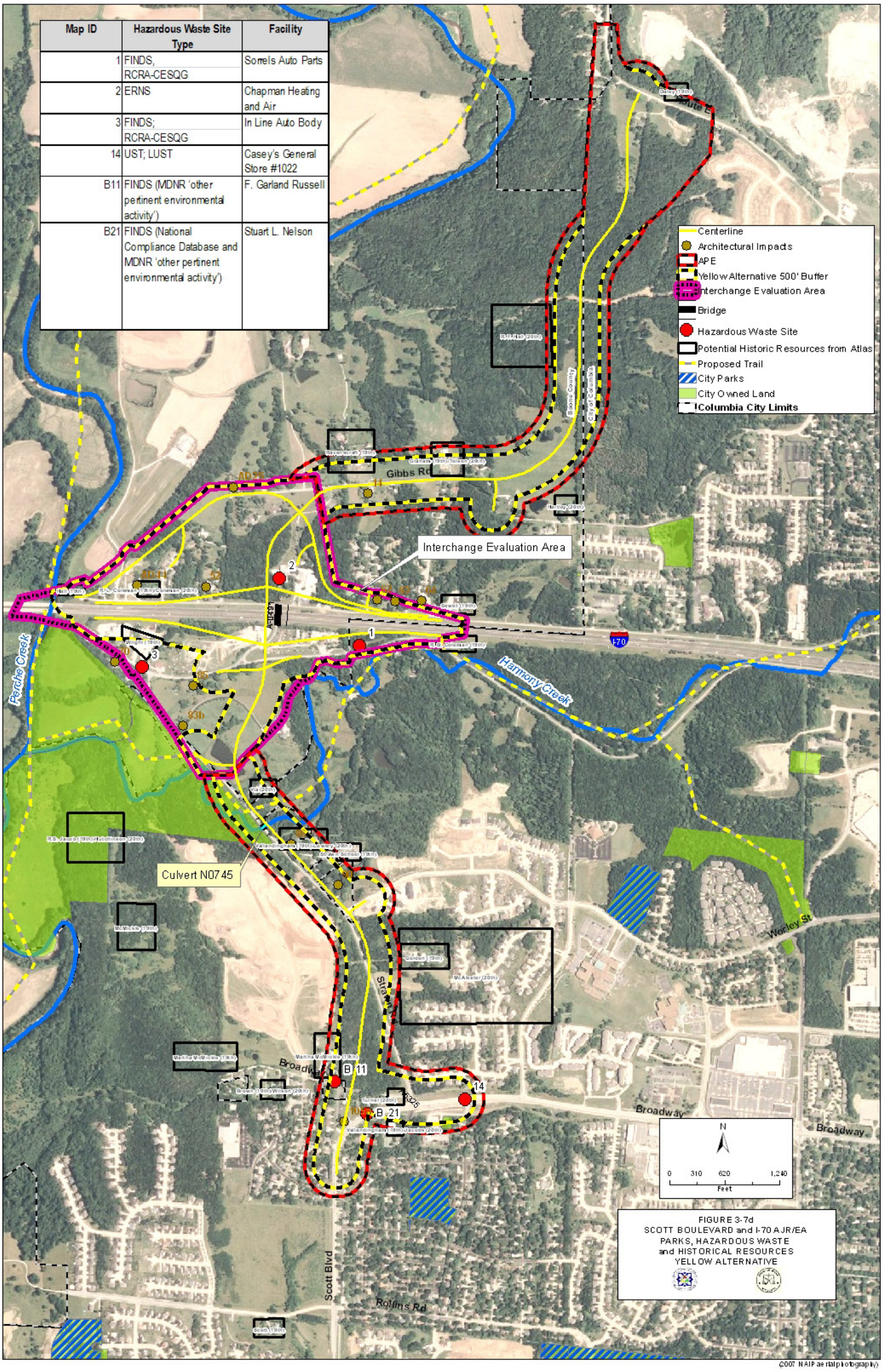
| Map ID | Hazardous Waste Site Type | Facility |
|---|---|---|
| 1 | FINDS, RCRA-CESQG | Sorrels Auto Parts |
| 2 | ERNS | Chapman Heating and Air |
| 3 | FINDS; RCRA-CESQG | In Line Auto Body |
| 14 | UST; LUST | Casey's General Store #1022 |
| B11 | FINDS (MDNR 'other pertinent environmental activity') | F. Garland Russell |
| B21 | FINDS (National Compliance Database and MDNR 'other pertinent environmental activity') | Stuart L. Nelson |



| Map ID | Hazardous Waste Site Type | Facility |
|---|---|---|
| 1 | FINDS; RCRA-CESQG | Sorrels Auto Parts |
| 2 | ERNS | Chapman Heating and Air |
| 3 | FINDS; RCRA-CESQG | In Line Auto Body |
| 14 | UST; LUST | Casey's General Store #1022 |
| B11 | FINDS (MDNR 'other pertinent environmental activity') | F. Garland Russell |
| B21 | FINDS (National Compliance Database and MDNR 'other pertinent environmental activity') | Stuart L. Nelson |



| Map ID | Hazardous Waste Site Type | Facility |
|---|---|---|
| 1 | FINDS, RCRA-CESQG | Sorrels Auto Parts |
| 2 | ERNS | Chapman Heating and Air |
| 3 | FINDS; RCRA-CESQG | In Line Auto Body |
| 14 | UST; LUST | Casey's General Store #1022 |
| B11 | FINDS (MDNR 'other pertinent environmental activity') | F. Garland Russell |
| B21 | FINDS (National Compliance Database and MDNR 'other pertinent environmental activity') | Stuart L. Nelson |



No Build: There would be no impacts to parks under a no build scenario.

Build Alternatives: All of the alternatives would cross the same city owned property on the west side of the IEA. The Brown would bisect the city owned property and would impact severing the park and potentially affecting 15.1 acres of park property; Section 4(f) documentation would be required to build the Brown alternative.

The Green and Yellow (preferred) alternatives would have similar impacts to the city owned property with 4.97 and 3.90 acres respectively. Impacts to parkland for the Green and Yellow (preferred) alternatives would occur along the existing Strawn Road, south of the IEA. The Orange alternative has 0.40 acres of city owned land within the study corridor.

For the preferred alternative, the City of Columbia Parks and Recreation Department has agreed to grant an easement for the Scott Boulevard construction (Appendix A; Hood, 2011). The Scott Boulevard project could enhance the trail entrance to the park. A Programmatic Section 4(f) document for parkland or historic resources was prepared for the design and construction of the preferred alternative (Yellow) and was signed by FHWA on August 15, 2012 (Appendix B).

**Table 3- 23: Scott Boulevard and I-70 Interchange Park Impacts**

| PARKS AND RECREATION | Units | No Action | Green | Brown | Orange | Yellow (Preferred) |
|---|---|---|---|---|---|---|
| Proposed Parks Impacted | Number | 0 | 1 | 1 | 1 | 1 |
| Proposed Park Area Taken (City-Owned Property) | acres | 0 | 4.97 | 15.1 | 0.40 | 3.90 |

## 3.21 Hazardous Wastes

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR 2008). The EPA was contacted to gather information on the environmental study area. The EPA provided a list of potential sites (EPA 2008b). The EPA data was combined with the EDR data.

The search identified six hazardous waste sites (**Figure 3-7a to 3-7d; Table 3-24**) including Facility Index System (FINDS) sites, Underground Storage Tanks (UST), Leaking Underground Storage Tanks (LUST), Resource Conservation and Recovery Act-No Longer Regulated (RCRA-NLR) sites, Resource Conservation and Recovery Act-Conditionally Exempt Small Quantity Generator (RCRA-CESQG), and Emergency Response Notification System (ERNS) sites within the study area.

No build: There would be no impacts to hazardous waste sites under the no build alternative.

Build Alternatives: All six sites listed in **Table 3-24** are found in all of the alternatives (**Figure 3-7a to 3-7d)**.

| Table 3- 24: Scott Boulevard and I-70 Interchange Hazardous Waste Sites Near the Study Area | | | | |
|---|---|---|---|---|
| **Map ID[1]** | **Hazardous Waste Site Type** | **Reference Number** | **Facility** | **Address** |
| 1 | FINDS, RCRA-CESQG | 1000868776 | Sorrels Auto Parts | 4313 I-70 Drive Southwest |
| 2 | ERNS | 90164546 | Chapman Heating and Air | 1501 Chapman Lane |
| 3 | FINDS; RCRA-CESQG | 1000285359 | In Line Auto Body | 4795 I-70 Dr. SW |
| 14[2] | UST; LUST | U000749368 | Casey's General Store #1022 | 4008 W. Broadway |
| B11 | FINDS (MDNR 'other pertinent environmental activity') | 1006298769 | F. Garland Russell | Scott Boulevard 7 Sussex Drive |
| B21 | FINDS (National Compliance Database and MDNR 'other pertinent environmental activity') | 1005832478 | Stuart L. Nelson | 4221 Wales |

Notes:
1. See **Figure 3-7a-d** for location of these sites.
2. UST, LUST site 14 has been redeveloped from a Casey's General Store into a Jimmie John's Gourmet Sandwich restaurant

Two of the hazardous waste sites, Sorrels Auto Parts and Chapman Heating and Air, are large areas within the IEA. The third site located within the IEA is a smaller area located in the southwest portion adjacent to Strawn Road. Three of the sites are located near the southern connection (Casey's General Store #1022; F. Garland Russell; and Stuart L. Nelson) in an area where construction of the Scott Boulevard extension will take place.

- 1 – Sorrels Auto Parts is an RCRA-CESQG site located just south of I-70 and within the IEA.
- 2 – Chapman Heating and Air is an ERNS site located just south of I-70 and within the IEA.
- 3 – In Line Auto Body is an FINDS/RCRA-CESQG site located south of I-70 adjacent to Strawn Road and within the IEA. FINDS lists the site as an 'other pertinent environmental activity' site. The site is an MDNR site used for 303(d) purposes, monitoring for the development of a stream classification framework.
- 14 – Casey's General Store #1022 is a UST/LUST site located near the southern connection that has been redeveloped into a Jimmie John's Gourmet Sandwich restaurant.
- B11 – F. Garland Russell is a FINDS site located at Scott Boulevard and 7 Sussex Drive near the southern connection. FINDS lists the site as an 'other pertinent environmental activity' site. The site is an MDNR site used for 303(d) purposes, monitoring for the development of a stream classification framework.
- B21 – Stuart L. Nelson is a FINDS site located at 4221 Wales near the southern connection. FINDS lists the site as a (1) National Compliance Database site in regards to the Federal Insecticide, Fungicide, and Rodenticide Act and Toxic Substance Control Act; and (2) an 'other

pertinent environmental activity' site. The site is an MDNR site used for 303(d) purposes, monitoring for the development of a stream classification framework.

Construction of the preferred alternative (Yellow) interchange would require the relocation of Chapman Heating and Air and Sorrels Auto Parts. Federal and state laws and regulations do not prohibit the construction of a roadway over a hazardous waste site. However, in accordance with several federal laws, including RCRA, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA), any hazardous waste encountered during construction would require special handling and disposal to minimize risk to workers and the public at large. The project will require a Phase 2 investigation to confirm or dismiss the possibility of contamination. Phase 3 would involve determining the extent of the contamination and remediation. Phase 4 involves carrying out remediation and any long-term monitoring. Environmental remediation and mitigation was estimated as 3% of the preliminary construction costs.

The potential to encounter wastes from sites unknown to MoDOT, should always be a consideration. Any unknown sites that are found during project construction will be handled in accordance with Federal and State Laws and Regulations. If any residue is generated, all residue and associated water must be prevented from release to waterways or wetlands.

### 3.22 Construction Impacts

Constructing any of the proposed full-build alternative corridors would have some adverse impacts during the construction phase. Noise levels, fugitive dust, and erosion would temporarily increase during construction. Construction activities would also involve temporary traffic disruptions and potential safety issues. Construction activities associated with the project would include clearing and grubbing, grading, and preparing the roadway embankment; constructing temporary haul roads; borrowing and disposing waste material; excavating poor or unsuitable soils and associated disposal; constructing drainage ways and ditches and new drainage structures and bridges; finish grading; paving operations, conversion of prime farmland and vegetated area to pavement, and landscaping. Impacts to local wildlife would also occur with the reduction in available food source and wooded habitats, reducing the overall carrying capacity of the area. Measures to minimize adverse impacts during construction are discussed below. Water resources, erosion control, air quality, transportation safety, and noise are considered.

<u>Water Resources and Erosion Control</u>

- Stormwater erosion and surface water runoff would be monitored and controlled during construction, in compliance with MoDOT's Sediment and Erosion Control program, as approved by the MDNR.
- Potential water contaminants would be monitored during construction.
- All applicable federal, state, and local regulations regarding the storage and disposal of waste materials, including hazardous wastes, generated or encountered during construction would be observed by the construction contractor per contract requirements. Should any hazardous spill occur, it would be responded to in accordance with applicable regulations, and reported to regulatory authorities as required. Oil, oil filters, tires, and all other wastes would be properly disposed of as required throughout the construction period.

- The clearing of vegetation along stream channels, wetlands, and forested areas would be kept to a minimum, but where vegetation is removed, the site would be revegetated with native plant species as soon as possible.

Air Quality

- Measures would be implemented to minimize fugitive dust emissions created during construction of the proposed project. Wind barriers and the dampening of construction area soils would be used to control excessive dust emissions.
- Construction contractors would be required to comply with regulations on air pollution control. These regulations would apply to fugitive dust control and open burning of grub material.

Transportation Safety

- Measures would be taken to minimize traffic disruptions during the construction phase. Construction at road crossings would be scheduled during off-peak hours whenever possible.
- Road signs, barriers, warning devices, and protective fencing would be provided as necessary.
- Relocation of any utilities in the study area would be completed in coordination with the utility owner/operators.
- Temporary detours would be required in areas where project construction crosses an existing state or U.S. highway and/or where traffic impediments are expected.

Noise

- All construction equipment would be required to meet with all applicable local, state, and federal laws and regulations relating to noise levels permissible within and adjacent to the project construction site.
- All construction equipment would be required to have proper mufflers meeting manufacturer's specifications. Mufflers and exhaust systems would be required to be maintained in good operating condition, free from leaks and holes.

## 3.23 Secondary and Cumulative Impacts

Construction of any of the alternative project corridors would create some secondary impacts that would result indirectly from the existence and operation of the new interchange and local road. These impacts would not be the result of construction or operation, but can be expected to occur due to project-related activities.

Cumulative impacts include those that result from the proposed action as well as other projects that are linked in some manner to the proposed action. These impacts relative to the proposed action have been addressed previously and are summarized below.

### 3.23.1 Secondary Impacts

Secondary impacts resulting from the project may include urban residential and retail development near the I-70 Interchange which would facilitate the removal of woodlands, likely impact WOUS, and increase the amount of impervious land cover, resulting in decreased water quality. Secondary impacts to area resources could be moderate depending on the growth rate of the area. The area is already experiencing growth as evidenced by the new residential developments. An interchange will likely add to the growth. The

following is a list of secondary impacts that could result from construction and operation of the Scott Boulevard Project:

- Increased runoff and decreased water quality due to changes in land use and increased development on adjacent properties
- Loss of soils that are overlain by future facilities made accessible by the project
- Loss of wildlife habitat and decreased habitat value in adjacent areas that have increased residential and commercial development
- Impacts to cultural resources that may result from increased development on adjacent properties that, depending on the funding source and impacts, may not be scrutinized by a cultural investigation
- Increased use of parks and recreation areas due to more convenient access
- Changes in the local economy resulting from the development of adjacent properties

### 3.23.2 Cumulative Impacts

The purpose of the Scott Boulevard I-70 interchange and local road improvements is to provide access to I-70 to western Columbia and to ease congestion of Stadium Boulevard. Resources considered to be functionally non-renewable are considered to be most susceptible to cumulative project impacts. Resources within the study area that were reviewed include cultural resources, wetlands and other WOUS, forested areas, agricultural lands, air quality, and socioeconomic impacts.

Cumulative impacts can be difficult to identify, describe, and measure. For the purpose of analyzing the potential cumulative effects of project alternatives, the Council on Environmental Quality (CEQ) regulations governing the implementation of NEPA (40 CFR 1508.7) has been followed. CEQ defines cumulative impacts 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 (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively substantial actions taking place over a period of time."

Additional projects within the vicinity of the proposed action may have a cumulative effect on area resources. These projects include the Improve I-70 selected alternative, the Broadway extension, and the Stadium Boulevard improvements. The details of these projects are described in Section 1.3.

The Improve I-70 project would have minimal effect on resources because it added to a preexisting roadway and not constructing a new roadway through undeveloped land. Some resources such as residences, businesses, and surface water may be affected by the project, but impacts are likely to be minimal.

The Broadway Extension may have more moderate impacts to resources as this project is a new construction across developed and undeveloped areas. Resources such as farmlands, residences, businesses, surface water, park land, and important habitat may be affected. Environmental justice issues will need to be examined.

Much like the Improve I-70 project, the Stadium Boulevard improvements would have minimal effect on resources as the project will take place on an existing roadway. The majority of impacts due to this project would be on businesses. However, better infrastructure that makes travelling to places of business easier will be a long term benefit to businesses. This should outweigh any short term negative impacts due to construction.

Cumulatively these projects should enhance the traffic experience in the area and should result in safer, less congested roads. Since the improvements listed above are to existing facilities and should have minimal to moderate impact both independently and cumulatively on area resources.

## 3.24 Mitigation

The following is a discussion of mitigation for impacts resulting from the Scott Boulevard and I-70 Interchange project.

Relocations

Residents, property owners, and businesses affected by the project would be relocated following the procedures outlined in the Uniform Relocation Assistance Act of 1970, Public Law 91-646 (Federal Register 1970).

Water Quality

The project will be subject to the NPDES requirements of the CWA. An NPDES permit will be required and will limit the amount of pollutants that can leave a job site and requires the implementation of erosion controls. All construction activities will comply with the existing rules and regulations of governmental agencies having jurisdiction over wetlands and WOUS in the area. In addition, contract specifications will require implementation of best management practices to prevent petroleum products, other toxic substances, and construction debris from entering water or otherwise contaminating the riparian or stream environment. The City of Columbia has also adopted its own guidance for stream setbacks and erosion control. These measures will diminish possible impacts to water quality. Water quality and sedimentation impacts for the construction of the I-70 interchange would be controlled through the implementation of MoDOT's Sedimentation and Erosion Control Program.

Waters of the U.S.

A USACE Section 404 Permit will be required for impacts to tributaries and wetlands (crossing of Harmony Creek and tributaries). Avoidance and minimization of the resources will be completed where possible. The project could be authorized under a Nationwide Permit 14 (Linear Transportation Crossings), but may need an Individual permit. Mitigation is typically required for impacts greater than 0.10 acre.

City-owned property may be a suitable mitigation site for project stream and wetland impacts. If needed, a compensatory mitigation plan would be developed in cooperation with USACE. The plan would be based on an assessment of actual projected loss of wetland and stream area and function and would be in compliance with FHWA no-net-loss policy.

Threatened and Endangered Species

Avoidance, minimization, and mitigation measures may be required by the USFWS and/or MDC for impacts to protected species or their habitat. These measures may include the following:

- Minimal tree removal in the floodplain and riparian corridors
- Survey of forested riparian areas for potential Indiana bat roost trees
- If removal of potential roost trees is required, tree removal will be avoided during the maternity period (April 1 – October 31)
- Mitigation measures may include reforestation of floodplains and riparian corridors

Floodplains

A permit from the City of Columbia and/or Boone County as well as SEMA would be required for these areas prior to commencement of any construction activities (SEMA 2008). Crossings would be designed consistent with SEMA, City of Columbia, and Boone County floodplain and management goals and objectives. Regulatory floodway development permits require a no-rise certification and a statement that the proposed work would not increase the water elevations in the regulatory floodway. During the design of the preferred alternative (Yellow), the crossings of all base floodplains will be designed and constructed in compliance with applicable floodplain regulations, including Executive Order 11988. There will be no increases in base flood elevations attributable to implementation of these roadway improvements. During the design process, a detailed hydraulic analysis of the flows and water surface elevations will be made in accordance with the requirements of FEMA and the U.S. Army Corps of Engineers. This analysis will ensure the absence of any encroachments upon regulatory floodways as well as avoid any adverse impacts. The proposed action conforms to applicable state of Missouri and local floodplain protection standards. During the design process, further coordination will be conducted with SEMA and/or the local floodplain authority.

Historic and Cultural Resources

Archaeological sites will be avoided to the extent practicable or else be evaluated for significance under NRHP criteria. Currently, there are no properties which are eligible for the NRHP under Criteria A, B or C. Cultural resources that are within the final project area and cannot be avoided would be evaluated for their eligibility to the NRHP. If required, the nature of mitigation to any adverse impacts to significant resources would be determined in consultation with the SHPO and other interested parties at a future date.

Hazardous Wastes

Federal and state laws and regulations do not prohibit the construction of a roadway over a hazardous waste site. However, in accordance with several federal laws, including RCRA, CERCLA, and the SARA, any hazardous waste encountered during construction would require special handling and disposal to minimize risk to workers and the public at large. The project will require a Phase 2 investigation to confirm or dismiss the possibility of contamination. Phase 3 would involve determining the extent of the contamination and remediation. Phase 4 involves carrying out remediation and any long-term monitoring.

# 4.0 CONSULTATION AND COORDINATION

Throughout the development of this EA, steps have been taken to provide and solicit information from federal, state, and local officials, as well as the general public. This chapter provides a summary of the outreach and consultation activities conducted during the compliance process.

## 4.1 Agency Coordination

A series of agency solicitation letters were forwarded to resource agencies regarding the placement of the interchange and local road alternative in the study area (Appendix A). Solicitation letters included a request for comments from the following agencies.

- Federal Emergency Management Agency (Floodway/Floodplain)
- Missouri Department of Natural Resources (Water Quality/Cultural Resources)
- Missouri Department of Conservation (Threatened and Endangered Species)
- Natural Resource Conservation Service (Prime & Statewide Important Farmland)
- State Emergency Management Agency (Floodway/Floodplain)
- United States Army Corps of Engineers (Wetlands and Waters of the U.S.)
- United States Environmental Protection Agency (Hazardous Materials)
- United States Fish and Wildlife Service (Threatened and Endangered Species)

The City of Columbia, as the project sponsor, hosted a resource agency scoping meeting.

November 13, 2008 Resource Agency Scoping Meeting: Attendees included MDNR, MDC, EPA, USACE, MoDOT, FHWA, Boone County, City of Columbia, and consultants. The City/consultant team presented a project overview, project goals and environmental constraints/opportunities in the project area. A framework and project schedule for the EA was reviewed. After the meeting a tour of the project area was provided.

## 4.2 Public Involvement

An open house public meeting was held from 4:00 to 8:00 PM on June 22, 2009 at the Activity and Recreation Center, 1 South 7th Street in Columbia, Missouri. Notices of the public open house were provided via the Columbia Tribune, a newsletter that was sent to approximately 500 households (including property owners potentially impacted by the alternatives and those within or near the study area), and the posting of the newsletter on the City of Columbia's website. The notice provided an overview and background of the project, the purpose of and need for action, issues and impact topics, and information on the planning process and methods for commenting.

Approximately 100 people attended the meeting. At the open house, four ten-minute Power Point presentations were given to provide a general overview of the study. This presentation was subsequently posted on the City of Columbia's website after the meeting. Exhibits were displayed and project personnel were available for questions from the public as well as for alternative development brainstorming.

As a result of the newsletter and public open house, 44 comments were received and documented (of which 29 were provided via the comment form or email). In general, public comments were in favor of an additional interchange west of Stadium Boulevard. Nearly 80% of those who submitted comments were residents or business owners within the study area. Approximately 62% indicated a need for the

interchange, only 7% indicated that they did not feel there was a need, and 31% did not indicate a preference. Some common concerns relayed were: (1) the impact of the proposed extension of Scott Boulevard on the Christian Fellowship School (specifically its playground); (2) the chronic flooding of Strawn Road; and (3) the need to minimize the disruption to existing residents/homes/businesses.

Several news stories related to this project have been published in the *Columbia Tribune* and the *Columbia Missourian*. Based on open house comments and other input (such as public blogs), there appears to be a general consensus among the public that this project is warranted. No public controversies are expected.

### 4.3 Coordination with Other Studies

Although not a required component of the Improve I-70 project, the Improve I-70 studies acknowledged the benefits of a future I-70 Interchange at Scott Boulevard. Because the Improve I-70 and Scott Boulevard Interchange projects are so intertwined, the project teams collaborated extensively to ensure compatibility of the two projects. Members of the Improve I-70 team served on the Scott Boulevard AJR Core Team and participated in the development of alternatives and study recommendations. The following are key collaboration factors.

Location of Scott Boulevard Interchange: The US Highway 40 and Stadium Boulevard interchanges are approximately 3.2 miles apart. The recommended Scott Boulevard interchange location falls approximately midway between these interchanges with 1.6 miles to each adjacent interchange. This is adequate distance to provide for freeway merging and weaving. The proposed Fairview ramps are directional ramps serving movements to and from the east on I-70. These directional ramps would provide 1.3 miles of separation from the proposed Scott Boulevard interchange. If these ramps are constructed they would provide for adequate distance for freeway merging and weaving. Thus, the recommended Scott Boulevard interchange location provides for adequate separation between the proposed Scott Boulevard interchange and all proposed improvements to Stadium Boulevard.

Structure Length: The Improve I-70 plans call for two truck-only lanes and three general purpose lanes in each direction through the Scott Boulevard interchange study area. Accordingly, the Scott Boulevard overpass will be designed to span the entire ten-lane section of the future freeway. Additionally, ramp tie-ins from the Scott Boulevard interchange will be designed to ultimately fit the proposed I-70 ten-lane section. Temporary tie-ins to the existing four-lane freeway will be designed in the event that the Scott Boulevard interchange is constructed before Improve I-70 plans are put into place.

Continuous Outer Roads: Improve I-70 plans call for continuous outer roads through the Scott Boulevard interchange study area to achieve system redundancy in the event of incidents on I-70. This will be accomplished by maintaining the existing outer roads and constructing bridges over Perche Creek that parallel I-70. The preferred alternative (Yellow) maintains continuous outer roads both north and south of I-70 with Improve I-70 tie-in points on both sides of the study area.

# 5.0 REFERENCES

Archaeological Research Center of St. Louis, Inc., 2008. Archival Review of the Proposed Scott Boulevard Study Area. City of Columbia, Boone County, MO. November.

Archaeological Research Center of St. Louis, Inc. 2011. Archaeological and Architectural Surveys of the Proposed Scott Boulevard Expansion, City of Columbia, Boone County, Missouri. June.

Center for Applied Research and Environmental Systems (CARES). 2008. Boone County USGS 24k digital hypsography. Accessed online on November 11 at: http://ims.missouri.edu/moims2008/.

City of Columbia. 2008a. Code of Ordinances. Chapter 12A: Land Preservation. Article III: Tree Preservation and Landscaping Requirements. Section 12A-49. Accessed online on October 28 at: http://www.gocolumbiamo.com/Council/Code_of_Ordinances_PDF/chapter_12A.pdf.

City of Columbia. 2008b. Code of Ordinances. Chapter 29: Zoning. Section 29-22: District F-1, Floodplain Overlay District. Accessed online on December 1 at: http://www.gocolumbiamo.com/Council/Code_of_Ordinances_PDF/chapter_29/22.html.

City of Columbia. 2008c. List of Neighborhood Associations and Contacts November 2008. Accessed online on November 19 at: http://www.gocolumbiamo.com/Public_Comm/Neighborhood_Associations/documents/NAContactList.pdf.

Columbia Area Transportation Study Organization. 2007. CATSO 2025 Transportation Plan.

Crawford, Bunte, Brammeier. 2003. Corridor Study of Stadium Boulevard in Columbia, Missouri. Prepared for the Missouri Department of Transportation, the City of Columbia, and the Kroenke Group.

Crawford, Bunte, Brammeier. 2010. Scott Boulevard and I-70 Access Justification Report and Environmental Assessment, City of Columbia, Missouri.

Elkin, Skip. 2008. Record of Telephone Conversation Regarding Status of Boone County Parks and Recreation Facilities Located in the Scott Blvd. Environmental Study Area. From Skip Elkin, District II Commissioner, Boone County Board of Parks Commission. To Laura Totten, Senior Ecologist, AEI. December 4.

Environmental Data Resources, Inc. (EDR) 2008. The EDR Radius Map Report with Geocheck. Scott Blvd. Columbia, Mo. Inquiry number: 2358341.1s. November 10.

Evenson, Kathy. 2009. Record of Telephone Conversation Regarding Conversion of CRP/WRP Lands. From Kathy Evenson, Farm Service Agency, Jackson County. To Laura Totten, Senior Ecologist, AEI. January 13.

Executive Order No. 11988 42 CFR 26951 (1977). Accessed online on December 3 at: www.archives.gov/federal-register/codification/executive-order/11988.html.

Executive Order No.12898 59 CFR 7629 (1994). Accessed online on December 3 at: www.hud.gov/offices/fheo/FHLaws/EXO12898.cfm.

Federal Register. 2001. Highways, Federal Highway Administration, Department of Transportation, Procedures for abatement of highway traffic noise and construction noise, 23 CFR 772.

Federal Register. 1970. Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, 49 CFR 24.

Homes.com. 2012. Columbia, MO Real Estate Listings. Accessed online March 8 at: http://www.homes.com/Real_Estate/MO/City/COLUMBIA/

Huddleston, Sheila. 2008. Record of Telephone Conversation Regarding Status of FEMA Buyout Properties Located in the Scott Blvd. Environmental Study Area. From Sheila Huddleston, State Hazard Mitigation Office. To Chris Thomas, Ecologist, AEI. December 10.

McNabb, Jim. 2008. Record of Telephone Conversation Regarding Status of FEMA Buyout Properties Located in the Scott Blvd. Environmental Study Area. From Jim McNabb, Boone County Emergency Management Director. To Chris Thomas, Ecologist, AEI. December 10.

Missouri Department of Conservation (MDC), 2011a. "Missouri Species and Communities of Conservation Concern Checklist." January.

Missouri Department of Conservation (MDC). 2011b. The Missouri Natural Heritage Database. Accessed online October 30 at: http://mdc.mo.gov/cgi-bin/heritage/.

Missouri Department of Conservation (MDC). 2008. Heritage Review Report. October 24.

Missouri Department of Conservation (MDC). 2011c. Management Recommendations for Construction: Projects Affecting Missouri Karst Habitat. Accessed online October 30 at: http://mdc.mo.gov/nathis/caves/manag_construc.htm.

Missouri Department of Natural Resources (MDNR). 2008a. Mines, Occurrences, Prospects, 2006. Accessed November 26 at: http://ims.missouri.edu/moims/LayerNotes/geology/mine_occ_pro_06.html.

Missouri Department of Natural Resources (MDNR). 2008b. 2006 Sink Holes. Accessed November 26 at: http://ims.missouri.edu/moims/LayerNotes/geology/sinkareas2006.html.

Missouri Department of Natural Resources (MDNR). 2002. Generalized Geologic Map of Missouri.

National Park Service. 1974.

Natural Resources Conservation Service (NRCS). 2008. Agency comments received from Roger Hansen, State Conservationist, in response to agency solicitation letter. November 12.

Saitta, Steve. 2011. Record of Email Regarding Status of City of Columbia Parks and Recreation Facilities Located in the Scott Blvd. Environmental Study Area. From Steve Saitta, Superintendent, Park Development Division, City of Columbia. To Christopher Thomas, Ecologist, The Louis Berger Group, Inc. February 4

State of Missouri Emergency Management Agency (SEMA). 2008. Agency comments received from Jason Schneider, Floodplain Management Engineer, in response to agency solicitation letter. October 29.

Strange, Kathy. 2008. Record of Telephone Conversation Regarding FEMA Buyout Properties. From Kathy Strange, Regional Training Manager, FEMA. To Chris Thomas, Ecologist, AEI. October 31.

The Louis Berger Group. 2011a. Scott Boulevard AJR/EA Business and Residential Impacts Technical Memorandum. July 1.

The Louis Berger Group. 2011b. Scott Boulevard AJR/EA Jurisdictional Waters of the U.S. Technical Memorandum. July 1.

The Louis Berger Group. 2011c. Scott Boulevard AJR/EA Noise Analysis Technical Memorandum. July 1.

Transportation Research Board. 2002. Highway Capacity Manual.

U.S. Army Corps of Engineers (USACE). 2008. Agency comments received from Kenny Pointer, Regulatory Project Manager, in response to agency solicitation letter. October 30.

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2008. National Cooperative Soil Survey, Web Soil Survey, Accessed online November 4th at: http://websoilsurvey.nrcs.usda.gov/app/.

U.S. Department of the Interior (USDOI). 2008. Huntsdale, Missouri, Quadrangle. National Wetlands Inventory Map. Accessed October 24 at: http://wetlandsfws.er.usgs.gov/wtlnds/viewer.htm.

U.S. Department of Transportation (USDOT). 1966. Department of Transportation Act (DOT Act) of 1966 – Special Provision 4(f). (DOT Act, 49 USC 1653 and 303(c) accessed online November 6 at http://www.nps.gov/history/local-law/fhpl_dotact.pdf.

U.S. Environmental Protection Agency (USEPA). 2008a. Safe Drinking Water Act. Accessed November 24 at: http://www.epa.gov/cgi-bin/epaprintonly.cgi.

U.S. Environmental Protection Agency. 2008b. Map of hazardous waste, NPDES, and public wells located in or near the Scott Blvd. environmental study area received from Joe Cothern. November13.

U.S. Fish and Wildlife Service (USFWS). 2008. Agency comments received from Charles Scott, Field Supervisor, in response to agency solicitation letter. November 4.

U.S. Geological Survey. 1985. Huntsdale, Missouri, Quadrangle. 7.5-Minute Topographic Series.

# APPENDIX A: AGENCY SOLICITATION LETTERS AND AGENCY COMMENTS

# AGENCY SOLICITATION LETTERS

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™

October 24, 2008

Missouri NRCS State Office
Roger Hansen, State Conservationist
Parkade Center, Suite 250
601 Business Loop
70 West
Columbia, MO 65203-2546

Re: Scott Boulevard Access Justification Report/Environmental Assessment; Columbia, Missouri; Adaptive Ecosystems Project # 2008-118

Dear Mr. Hansen:

The City of Columbia, Missouri, is initiating a study to determine the feasibility and location of a new interchange at I-70 in a 1.2 mile area just east of Perche Creek. As a part of this project, Scott Boulevard would be extended from its current terminus at Broadway north through the proposed interchange at I-70 to a new terminus at a new intersection with Route E (see attached **Figure 1**). The City of Columbia hosted a scoping meeting with the Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) and has determined that this project will require the completion of an Access Justification Report (AJR) and an Environmental Assessment (EA).

The purpose of this letter is to initiate coordination with your agency regarding the Scott Boulevard AJR/EA project. The project components will include:

- The location and layout for a proposed Scott Boulevard/I-70 interchange
- An alignment for an extension of Scott Boulevard north from its current terminus at Broadway to the proposed I-70 interchange
- An alignment for an extension of Scott Boulevard from the proposed I-70 interchange north to a new intersection with Route E
- The preparation of an AJR for the preferred interchange concept
- The preparation of an EA to obtain the National Environmental Policy Act (NEPA) clearance required for FHWA to approve the AJR

Goals and objectives of the AJR/EA will be to identify alternative roadway alignments and interchange concepts and to evaluate these alignments and concepts based on critical factors such as ability to attract traffic, maintenance of proper interchange spacing along I-70, connections to the regional arterial system, topography, land use, various environmental factors, and engineering design constraints.

The "interchange" screening area will consist of a roughly 500-foot-wide corridor in a 1.2 mile area just east of Perche Creek. The Scott Boulevard Extension (local road) screening will consist of an area roughly bounded as follows (see **Figure 1**):

- North – Route E
- South – West Broadway
- East – Silvey Street
- West – Scott Boulevard (extended north)/North Strawn Road

We encourage your agency to comment on design considerations and potential impacts that construction may have on regulated resources under your jurisdiction. We will be contacting you to determine your availability for an agency scoping meeting tentatively scheduled for the first week of November 2008. If you have any questions or require additional information, please contact me at (816) 966-8199/ext. 101, or by email at sparker@adaptiveecosystems.com.

Sincerely,

Stephen W. Parker, Project Manager
Adaptive Ecosystems, Inc.

Enclosure

Cc: Resource Agencies:
Mark Frazier – USACE
Ward Lenz – USACE
Charlie Scott – USFWS
Joe Cothern - USEPA
Dick Hainje – FEMA
Doyle Brown – MDC
Dru Buntin – MDNR
Randy Scrivner – SEMA

Project Team:
David Nichols – City of Columbia
Scott Bitterman – City of Columbia
David Mink – Boone County
Thaddeus Yonke – Boone County
Michael Dusenberg – MoDOT
Matt Myers – MoDOT
Richard Moore – MoDOT
Peggy Casey – FHWA
Shawn Leight – Crawford, Bunte, Brammeier
Herb Bailey – Bartlett & West
Bob Gilbert – Bartlett & West

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™

October 24, 2008

Missouri Department of Natural Resources
Dru Buntin, Director of Government Affairs
P.O. Box 176
Jefferson City, MO 65102-0176

Re: Scott Boulevard Access Justification Report/Environmental Assessment;
Columbia, Missouri; Adaptive Ecosystems Project # 2008-118

Dear Mr. Buntin:

The City of Columbia, Missouri, is initiating a study to determine the feasibility and location of a new interchange at I-70 in a 1.2 mile area just east of Perche Creek. As a part of this project, Scott Boulevard would be extended from its current terminus at Broadway north through the proposed interchange at I-70 to a new terminus at a new intersection with Route E (see attached **Figure 1**). The City of Columbia hosted a scoping meeting with the Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) and has determined that this project will require the completion of an Access Justification Report (AJR) and an Environmental Assessment (EA).

The purpose of this letter is to initiate coordination with your agency regarding the Scott Boulevard AJR/EA project. The project components will include:

- The location and layout for a proposed Scott Boulevard/I-70 interchange
- An alignment for an extension of Scott Boulevard north from its current terminus at Broadway to the proposed I-70 interchange
- An alignment for an extension of Scott Boulevard from the proposed I-70 interchange north to a new intersection with Route E
- The preparation of an AJR for the preferred interchange concept
- The preparation of an EA to obtain the National Environmental Policy Act (NEPA) clearance required for FHWA to approve the AJR

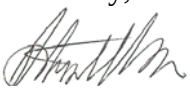
Goals and objectives of the AJR/EA will be to identify alternative roadway alignments and interchange concepts and to evaluate these alignments and concepts based on critical factors such as ability to attract traffic, maintenance of proper interchange spacing along I-70, connections to the regional arterial system, topography, land use, various environmental factors, and engineering design constraints.

The "interchange" screening area will consist of a roughly 500-foot-wide corridor in a 1.2 mile area just east of Perche Creek. The Scott Boulevard Extension (local road) screening will consist of an area roughly bounded as follows (see **Figure 1**):

- North – Route E
- South – West Broadway
- East – Silvey Street
- West – Scott Boulevard (extended north)/North Strawn Road

We encourage your agency to comment on design considerations and potential impacts that construction may have on regulated resources under your jurisdiction. We will be contacting you to determine your availability for an agency scoping meeting tentatively scheduled for the first week of November 2008. If you have any questions or require additional information, please contact me at (816) 966-8199/ext. 101, or by email at sparker@adaptiveecosystems.com.

Sincerely,



Stephen W. Parker, Project Manager
Adaptive Ecosystems, Inc.

Enclosure

Cc: Resource Agencies:
Mark Frazier – USACE
Ward Lenz – USACE
Charlie Scott – USFWS
Joe Cothern - USEPA
Dick Hainje – FEMA
Doyle Brown – MDC
Roger Hansen – NRCS
Randy Scrivner – SEMA

Project Team:
David Nichols – City of Columbia
Scott Bitterman – City of Columbia
David Mink – Boone County
Thaddeus Yonke – Boone County
Michael Dusenberg – MoDOT
Matt Myers – MoDOT
Richard Moore – MoDOT
Peggy Casey – FHWA
Shawn Leight – Crawford, Bunte, Brammeier
Herb Bailey – Bartlett & West
Bob Gilbert – Bartlett & West

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™

October 24, 2008

U.S. Army Corps of Engineers
Kansas City District
Mark Frazier, Assistant Branch Chief
700 Federal Building
601 E. 12th Street
ATTN: OD-R, Room 706
Kansas City, MO 64106

Re: Scott Boulevard Access Justification Report/Environmental Assessment;
Columbia, Missouri; Adaptive Ecosystems Project # 2008-118

Dear Mr. Frazier:

The City of Columbia, Missouri, is initiating a study to determine the feasibility and location of a new interchange at I-70 in a 1.2 mile area just east of Perche Creek. As a part of this project, Scott Boulevard would be extended from its current terminus at Broadway north through the proposed interchange at I-70 to a new terminus at a new intersection with Route E (see attached **Figure 1**). The City of Columbia hosted a scoping meeting with the Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) and has determined that this project will require the completion of an Access Justification Report (AJR) and an Environmental Assessment (EA).

The purpose of this letter is to initiate coordination with your agency regarding the Scott Boulevard AJR/EA project. The project components will include:

- The location and layout for a proposed Scott Boulevard/I-70 interchange
- An alignment for an extension of Scott Boulevard north from its current terminus at Broadway to the proposed I-70 interchange
- An alignment for an extension of Scott Boulevard from the proposed I-70 interchange north to a new intersection with Route E
- The preparation of an AJR for the preferred interchange concept
- The preparation of an EA to obtain the National Environmental Policy Act (NEPA) clearance required for FHWA to approve the AJR

Goals and objectives of the AJR/EA will be to identify alternative roadway alignments and interchange concepts and to evaluate these alignments and concepts based on critical factors such as ability to attract traffic, maintenance of proper interchange spacing along I-70, connections to the regional arterial system, topography, land use, various environmental factors, and engineering design constraints.

The "interchange" screening area will consist of a roughly 500-foot-wide corridor in a 1.2 mile area just east of Perche Creek. The Scott Boulevard Extension (local road) screening will consist of an area roughly bounded as follows (see **Figure 1**):

- North – Route E
- South – West Broadway
- East – Silvey Street
- West – Scott Boulevard (extended north)/North Strawn Road

We encourage your agency to comment on design considerations and potential impacts that construction may have on regulated resources under your jurisdiction. We will be contacting you to determine your availability for an agency scoping meeting tentatively scheduled for the first week of November 2008. If you have any questions or require additional information, please contact me at (816) 966-8199/ext. 101, or by email at sparker@adaptiveecosystems.com.

Sincerely,

Stephen W. Parker, Project Manager
Adaptive Ecosystems, Inc.

Enclosure

Cc: Resource Agencies:
Ward Lenz – USACE
Charlie Scott – USFWS
Joe Cothern – USEPA
Dick Hainje – FEMA
Doyle Brown – MDC
Dru Buntin – MDNR
Roger Hansen – NRCS
Randy Scrivner – SEMA

Project Team:
David Nichols – City of Columbia
Scott Bitterman – City of Columbia
David Mink – Boone County
Thaddeus Yonke – Boone County
Michael Dusenberg – MoDOT
Matt Myers – MoDOT
Richard Moore – MoDOT
Peggy Casey – FHWA
Shawn Leight – Crawford, Bunte, Brammeier
Herb Bailey – Bartlett & West
Bob Gilbert – Bartlett & West

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™

October 24, 2008

U.S. Army Corps of Engineers - Kansas City District
Missouri State Regulatory Office
Ward Lenz
221 Bolivar Street
Suite 103
Jefferson City, MO 65101

Re: Scott Boulevard Access Justification Report/Environmental Assessment; Columbia, Missouri; Adaptive Ecosystems Project # 2008-118

Dear Mr. Lenz:

The City of Columbia, Missouri, is initiating a study to determine the feasibility and location of a new interchange at I-70 in a 1.2 mile area just east of Perche Creek. As a part of this project, Scott Boulevard would be extended from its current terminus at Broadway north through the proposed interchange at I-70 to a new terminus at a new intersection with Route E (see attached **Figure 1**). The City of Columbia hosted a scoping meeting with the Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) and has determined that this project will require the completion of an Access Justification Report (AJR) and an Environmental Assessment (EA).

The purpose of this letter is to initiate coordination with your agency regarding the Scott Boulevard AJR/EA project. The project components will include:

- The location and layout for a proposed Scott Boulevard/I-70 interchange
- An alignment for an extension of Scott Boulevard north from its current terminus at Broadway to the proposed I-70 interchange
- An alignment for an extension of Scott Boulevard from the proposed I-70 interchange north to a new intersection with Route E
- The preparation of an AJR for the preferred interchange concept
- The preparation of an EA to obtain the National Environmental Policy Act (NEPA) clearance required for FHWA to approve the AJR

Goals and objectives of the AJR/EA will be to identify alternative roadway alignments and interchange concepts and to evaluate these alignments and concepts based on critical factors such as ability to attract traffic, maintenance of proper interchange spacing along I-70, connections to the regional arterial system, topography, land use, various environmental factors, and engineering design constraints.

The "interchange" screening area will consist of a roughly 500-foot-wide corridor in a 1.2 mile area just east of Perche Creek. The Scott Boulevard Extension (local road) screening will consist of an area roughly bounded as follows (see **Figure 1**):

- North – Route E
- South – West Broadway
- East – Silvey Street
- West – Scott Boulevard (extended north)/North Strawn Road

We encourage your agency to comment on design considerations and potential impacts that construction may have on regulated resources under your jurisdiction. We will be contacting you to determine your availability for an agency scoping meeting tentatively scheduled for the first week of November 2008. If you have any questions or require additional information, please contact me at (816) 966-8199/ext. 101, or by email at sparker@adaptiveecosystems.com.

Sincerely,

Stephen W. Parker, Project Manager
Adaptive Ecosystems, Inc.

Enclosure

Cc: Resource Agencies:
Mark Frazier – USACE
Charlie Scott – USFWS
Joe Cothern – USEPA
Dick Hainje – FEMA
Doyle Brown – MDC
Dru Buntin – MDNR
Roger Hansen – NRCS
Randy Scrivner – SEMA

Project Team:
David Nichols – City of Columbia
Scott Bitterman – City of Columbia
David Mink – Boone County
Thaddeus Yonke – Boone County
Michael Dusenberg – MoDOT
Matt Myers – MoDOT
Richard Moore – MoDOT
Peggy Casey – FHWA
Shawn Leight – Crawford, Bunte, Brammeier
Herb Bailey – Bartlett & West
Bob Gilbert – Bartlett & West

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™

October 24, 2008

U.S. Fish and Wildlife Service
Missouri Field Office
Charlie Scott, Field Supervisor
101 Park Deville Drive
Suite A
Columbia, MO 65203-0057

Re: Scott Boulevard Access Justification Report/Environmental Assessment; Columbia, Missouri; Adaptive Ecosystems Project # 2008-118

Dear Mr. Scott:

The City of Columbia, Missouri, is initiating a study to determine the feasibility and location of a new interchange at I-70 in a 1.2 mile area just east of Perche Creek. As a part of this project, Scott Boulevard would be extended from its current terminus at Broadway north through the proposed interchange at I-70 to a new terminus at a new intersection with Route E (see attached **Figure 1**). The City of Columbia hosted a scoping meeting with the Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) and has determined that this project will require the completion of an Access Justification Report (AJR) and an Environmental Assessment (EA).

The purpose of this letter is to initiate coordination with your agency regarding the Scott Boulevard AJR/EA project. The project components will include:

- The location and layout for a proposed Scott Boulevard/I-70 interchange
- An alignment for an extension of Scott Boulevard north from its current terminus at Broadway to the proposed I-70 interchange
- An alignment for an extension of Scott Boulevard from the proposed I-70 interchange north to a new intersection with Route E
- The preparation of an AJR for the preferred interchange concept
- The preparation of an EA to obtain the National Environmental Policy Act (NEPA) clearance required for FHWA to approve the AJR

Goals and objectives of the AJR/EA will be to identify alternative roadway alignments and interchange concepts and to evaluate these alignments and concepts based on critical factors such as ability to attract traffic, maintenance of proper interchange spacing along I-70, connections to the regional arterial system, topography, land use, various environmental factors, and engineering design constraints.

The "interchange" screening area will consist of a roughly 500-foot-wide corridor in a 1.2 mile area just east of Perche Creek. The Scott Boulevard Extension (local road) screening will consist of an area roughly bounded as follows (see **Figure 1**):

- North – Route E
- South – West Broadway
- East – Silvey Street
- West – Scott Boulevard (extended north)/North Strawn Road

We encourage your agency to comment on design considerations and potential impacts that construction may have on regulated resources under your jurisdiction. We will be contacting you to determine your availability for an agency scoping meeting tentatively scheduled for the first week of November 2008. If you have any questions or require additional information, please contact me at (816) 966-8199/ext. 101, or by email at sparker@adaptiveecosystems.com.

Sincerely,

Stephen W. Parker, Project Manager
Adaptive Ecosystems, Inc.

Enclosure

Cc: Resource Agencies:
Mark Frazier – USACE
Ward Lenz – USACE
Joe Cothern – USEPA
Dick Hainje – FEMA
Doyle Brown – MDC
Dru Buntin – MDNR
Roger Hansen – NRCS
Randy Scrivner – SEMA

Project Team:
David Nichols – City of Columbia
Scott Bitterman – City of Columbia
David Mink – Boone County
Thaddeus Yonke – Boone County
Michael Dusenberg – MoDOT
Matt Myers – MoDOT
Richard Moore – MoDOT
Peggy Casey – FHWA
Shawn Leight – Crawford, Bunte, Brammeier
Herb Bailey – Bartlett & West
Bob Gilbert – Bartlett & West

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™

October 24, 2008

Missouri Department of Conservation
Doyle Brown, Policy Coordinator
P.O. Box 180
Jefferson City, MO 65102-0180

Re: Scott Boulevard Access Justification Report/Environmental Assessment;
Columbia, Missouri; Adaptive Ecosystems Project # 2008-118

Dear Mr. Brown:

The City of Columbia, Missouri, is initiating a study to determine the feasibility and location of a new interchange at I-70 in a 1.2 mile area just east of Perche Creek. As a part of this project, Scott Boulevard would be extended from its current terminus at Broadway north through the proposed interchange at I-70 to a new terminus at a new intersection with Route E (see attached **Figure 1**). The City of Columbia hosted a scoping meeting with the Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) and has determined that this project will require the completion of an Access Justification Report (AJR) and an Environmental Assessment (EA).

The purpose of this letter is to initiate coordination with your agency regarding the Scott Boulevard AJR/EA project. The project components will include:

- The location and layout for a proposed Scott Boulevard/I-70 interchange
- An alignment for an extension of Scott Boulevard north from its current terminus at Broadway to the proposed I-70 interchange
- An alignment for an extension of Scott Boulevard from the proposed I-70 interchange north to a new intersection with Route E
- The preparation of an AJR for the preferred interchange concept
- The preparation of an EA to obtain the National Environmental Policy Act (NEPA) clearance required for FHWA to approve the AJR

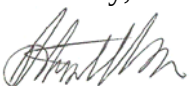
Goals and objectives of the AJR/EA will be to identify alternative roadway alignments and interchange concepts and to evaluate these alignments and concepts based on critical factors such as ability to attract traffic, maintenance of proper interchange spacing along I-70, connections to the regional arterial system, topography, land use, various environmental factors, and engineering design constraints.

The "interchange" screening area will consist of a roughly 500-foot-wide corridor in a 1.2 mile area just east of Perche Creek. The Scott Boulevard Extension (local road) screening will consist of an area roughly bounded as follows (see **Figure 1**):

- North – Route E
- South – West Broadway
- East – Silvey Street
- West – Scott Boulevard (extended north)/North Strawn Road

We encourage your agency to comment on design considerations and potential impacts that construction may have on regulated resources under your jurisdiction. We will be contacting you to determine your availability for an agency scoping meeting tentatively scheduled for the first week of November 2008. If you have any questions or require additional information, please contact me at (816) 966-8199/ext. 101, or by email at sparker@adaptiveecosystems.com.

Sincerely,



Stephen W. Parker, Project Manager
Adaptive Ecosystems, Inc.

Enclosure

Cc: Resource Agencies:
Mark Frazier – USACE
Ward Lenz – USACE
Charlie Scott – USFWS
Joe Cothern - USEPA
Dick Hainje – FEMA
Dru Buntin – MDNR
Roger Hansen – NRCS
Randy Scrivner – SEMA

Project Team:
David Nichols – City of Columbia
Scott Bitterman – City of Columbia
David Mink – Boone County
Thaddeus Yonke – Boone County
Michael Dusenberg – MoDOT
Matt Myers – MoDOT
Richard Moore – MoDOT
Peggy Casey – FHWA
Shawn Leight – Crawford, Bunte, Brammeier
Herb Bailey – Bartlett & West
Bob Gilbert – Bartlett & West

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™

October 24, 2008

Federal Emergency Management Agency
Region VII
Dick Hainje
9221 Ward Parkway
Suite 300
Kansas City, MO 64114-3372

Re: Scott Boulevard Access Justification Report/Environmental Assessment; Columbia, Missouri; Adaptive Ecosystems Project # 2008-118

Dear Mr. Hainje:

The City of Columbia, Missouri, is initiating a study to determine the feasibility and location of a new interchange at I-70 in a 1.2 mile area just east of Perche Creek. As a part of this project, Scott Boulevard would be extended from its current terminus at Broadway north through the proposed interchange at I-70 to a new terminus at a new intersection with Route E (see attached **Figure 1**). The City of Columbia hosted a scoping meeting with the Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) and has determined that this project will require the completion of an Access Justification Report (AJR) and an Environmental Assessment (EA).

The purpose of this letter is to initiate coordination with your agency regarding the Scott Boulevard AJR/EA project. The project components will include:

- The location and layout for a proposed Scott Boulevard/I-70 interchange
- An alignment for an extension of Scott Boulevard north from its current terminus at Broadway to the proposed I-70 interchange
- An alignment for an extension of Scott Boulevard from the proposed I-70 interchange north to a new intersection with Route E
- The preparation of an AJR for the preferred interchange concept
- The preparation of an EA to obtain the National Environmental Policy Act (NEPA) clearance required for FHWA to approve the AJR

Goals and objectives of the AJR/EA will be to identify alternative roadway alignments and interchange concepts and to evaluate these alignments and concepts based on critical factors such as ability to attract traffic, maintenance of proper interchange spacing along I-70, connections to the regional arterial system, topography, land use, various environmental factors, and engineering design constraints.

The "interchange" screening area will consist of a roughly 500-foot-wide corridor in a 1.2 mile area just east of Perche Creek. The Scott Boulevard Extension (local road) screening will consist of an area roughly bounded as follows (see **Figure 1**):

- North – Route E
- South – West Broadway
- East – Silvey Street
- West – Scott Boulevard (extended north)/North Strawn Road

We encourage your agency to comment on design considerations and potential impacts that construction may have on regulated resources under your jurisdiction. We will be contacting you to determine your availability for an agency scoping meeting tentatively scheduled for the first week of November 2008. If you have any questions or require additional information, please contact me at (816) 966-8199/ext. 101, or by email at sparker@adaptiveecosystems.com.

Sincerely,

Stephen W. Parker, Project Manager
Adaptive Ecosystems, Inc.

Enclosure

Cc: Resource Agencies:
Mark Frazier – USACE
Ward Lenz – USACE
Charlie Scott – USFWS
Joe Cothern - USEPA
Doyle Brown – MDC
Dru Buntin – MDNR
Roger Hansen – NRCS
Randy Scrivner – SEMA

Project Team:
David Nichols – City of Columbia
Scott Bitterman – City of Columbia
David Mink – Boone County
Thaddeus Yonke – Boone County
Michael Dusenberg – MoDOT
Matt Myers – MoDOT
Richard Moore – MoDOT
Peggy Casey – FHWA
Shawn Leight – Crawford, Bunte, Brammeier
Herb Bailey – Bartlett & West
Bob Gilbert – Bartlett & West

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™

October 24, 2008

State Emergency Management Agency
Randy Scrivner, LRMFM Branch Chief
P.O. Box 116
Jefferson City, MO 65102

Re: Scott Boulevard Access Justification Report/Environmental Assessment; Columbia, Missouri; Adaptive Ecosystems Project # 2008-118

Dear Mr. Scrivner:

The City of Columbia, Missouri, is initiating a study to determine the feasibility and location of a new interchange at I-70 in a 1.2 mile area just east of Perche Creek. As a part of this project, Scott Boulevard would be extended from its current terminus at Broadway north through the proposed interchange at I-70 to a new terminus at a new intersection with Route E (see attached **Figure 1**). The City of Columbia hosted a scoping meeting with the Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) and has determined that this project will require the completion of an Access Justification Report (AJR) and an Environmental Assessment (EA).

The purpose of this letter is to initiate coordination with your agency regarding the Scott Boulevard AJR/EA project. The project components will include:

- The location and layout for a proposed Scott Boulevard/I-70 interchange
- An alignment for an extension of Scott Boulevard north from its current terminus at Broadway to the proposed I-70 interchange
- An alignment for an extension of Scott Boulevard from the proposed I-70 interchange north to a new intersection with Route E
- The preparation of an AJR for the preferred interchange concept
- The preparation of an EA to obtain the National Environmental Policy Act (NEPA) clearance required for FHWA to approve the AJR

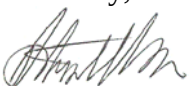
Goals and objectives of the AJR/EA will be to identify alternative roadway alignments and interchange concepts and to evaluate these alignments and concepts based on critical factors such as ability to attract traffic, maintenance of proper interchange spacing along I-70, connections to the regional arterial system, topography, land use, various environmental factors, and engineering design constraints.

The "interchange" screening area will consist of a roughly 500-foot-wide corridor in a 1.2 mile area just east of Perche Creek. The Scott Boulevard Extension (local road) screening will consist of an area roughly bounded as follows (see **Figure 1**):

- North – Route E
- South – West Broadway
- East – Silvey Street
- West – Scott Boulevard (extended north)/North Strawn Road

We encourage your agency to comment on design considerations and potential impacts that construction may have on regulated resources under your jurisdiction. We will be contacting you to determine your availability for an agency scoping meeting tentatively scheduled for the first week of November 2008. If you have any questions or require additional information, please contact me at (816) 966-8199/ext. 101, or by email at sparker@adaptiveecosystems.com.

Sincerely,



Stephen W. Parker, Project Manager
Adaptive Ecosystems, Inc.

Enclosure

Cc: Resource Agencies:
Mark Frazier – USACE
Ward Lenz – USACE
Charlie Scott – USFWS
Joe Cothern - USEPA
Dick Hainje – FEMA
Doyle Brown – MDC
Dru Buntin – MDNR
Roger Hansen – NRCS

Project Team:
David Nichols – City of Columbia
Scott Bitterman – City of Columbia
David Mink – Boone County
Thaddeus Yonke – Boone County
Michael Dusenberg – MoDOT
Matt Myers – MoDOT
Richard Moore – MoDOT
Peggy Casey – FHWA
Shawn Leight – Crawford, Bunte, Brammeier
Herb Bailey – Bartlett & West
Bob Gilbert – Bartlett & West

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION™

October 24, 2008

U.S. Environmental Protection Agency
Joe Cothern
901 N. 5th Street
ENSV/IO
Kansas City, KS 66101

Re: Scott Boulevard Access Justification Report/Environmental Assessment;
Columbia, Missouri; Adaptive Ecosystems Project # 2008-118

Dear Mr. Cothern:

The City of Columbia, Missouri, is initiating a study to determine the feasibility and location of a new interchange at I-70 in a 1.2 mile area just east of Perche Creek. As a part of this project, Scott Boulevard would be extended from its current terminus at Broadway north through the proposed interchange at I-70 to a new terminus at a new intersection with Route E (see attached **Figure 1**). The City of Columbia hosted a scoping meeting with the Missouri Department of Transportation (MoDOT) and the Federal Highway Administration (FHWA) and has determined that this project will require the completion of an Access Justification Report (AJR) and an Environmental Assessment (EA).

The purpose of this letter is to initiate coordination with your agency regarding the Scott Boulevard AJR/EA project. The project components will include:

- The location and layout for a proposed Scott Boulevard/I-70 interchange
- An alignment for an extension of Scott Boulevard north from its current terminus at Broadway to the proposed I-70 interchange
- An alignment for an extension of Scott Boulevard from the proposed I-70 interchange north to a new intersection with Route E
- The preparation of an AJR for the preferred interchange concept
- The preparation of an EA to obtain the National Environmental Policy Act (NEPA) clearance required for FHWA to approve the AJR

Goals and objectives of the AJR/EA will be to identify alternative roadway alignments and interchange concepts and to evaluate these alignments and concepts based on critical factors such as ability to attract traffic, maintenance of proper interchange spacing along I-70, connections to the regional arterial system, topography, land use, various environmental factors, and engineering design constraints.

The "interchange" screening area will consist of a roughly 500-foot-wide corridor in a 1.2 mile area just east of Perche Creek. The Scott Boulevard Extension (local road) screening will consist of an area roughly bounded as follows (see **Figure 1**):

- North – Route E
- South – West Broadway
- East – Silvey Street
- West – Scott Boulevard (extended north)/North Strawn Road

We encourage your agency to comment on design considerations and potential impacts that construction may have on regulated resources under your jurisdiction. We will be contacting you to determine your availability for an agency scoping meeting tentatively scheduled for the first week of November 2008. If you have any questions or require additional information, please contact me at (816) 966-8199/ext. 101, or by email at sparker@adaptiveecosystems.com.

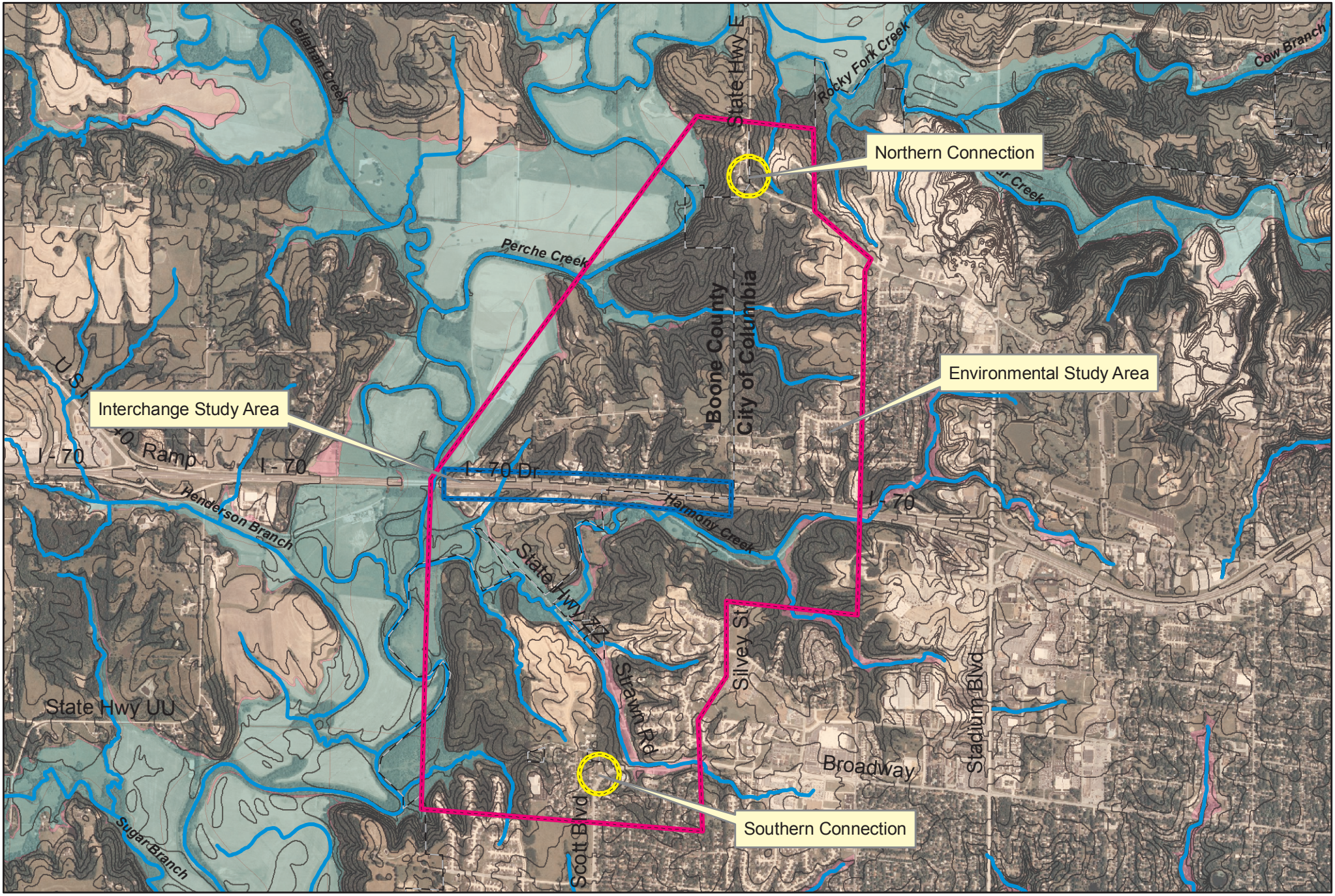
Sincerely,

Stephen W. Parker, Project Manager
Adaptive Ecosystems, Inc.

Enclosure

Cc: Resource Agencies:
Mark Frazier – USACE
Ward Lenz – USACE
Charlie Scott – USFWS
Dick Hainje – FEMA
Doyle Brown – MDC
Dru Buntin – MDNR
Roger Hansen – NRCS
Randy Scrivner – SEMA

Project Team:
David Nichols – City of Columbia
Scott Bitterman – City of Columbia
David Mink – Boone County
Thaddeus Yonke – Boone County
Michael Dusenberg – MoDOT
Matt Myers – MoDOT
Richard Moore – MoDOT
Peggy Casey – FHWA
Shawn Leight – Crawford, Bunte, Brammeier
Herb Bailey – Bartlett & West
Bob Gilbert – Bartlett & West




Streams
Contours
100-year Floodplain
500-year Floodplain
Columbia City Limits
Connection Point
Interchange Study Area
Environmental Study Area

**FIGURE 1**
**SCOTT BOULEVARD AJR/EA**
Project Boundaries
(2007 NAIP aerial photography)

N
0 650 1,300 2,600
Feet

ADAPTIVE ECOSYSTEMS, INC.
A NATURAL SOLUTION
CBB Crawford, Bunte, Brammeier
Traffic and Transportation Engineers
BARTLETT & WEST
SERVICE. THE BARTLETT & WEST WAY.

O:\2008 Projects\2008-118 Scott Boulevard AJR-EA\MapData\AgencyLetter_Fig1_boundary_20081016

Adaptive Ecosystems, Inc. Project No. 2008-118

# AGENCY COMMENTS

# CITY OF COLUMBIA, MISSOURI

PUBLIC WORKS DEPARTMENT

March 27, 2012

Judith Deel, Compliance Coordinator
State Historic Preservation Office
P.O. Box 176
Jefferson City, MO 65102

**Re: Archaeological and Architectural Survey**
**Proposed Scott Boulevard and I-70 Interchange Project**
**Columbia, Missouri**

Dear Ms. Deel:

Please find enclosed a copy of the Draft Archaeological and Architectural Survey Report for the City of Columbia, Missouri proposed Scott Boulevard and I-70 Interchange improvement project for your review and comment. This document is provided to fulfill the requirements of the National Environmental Policy Act of 1969, as amended and Section 106 of the National Historic Preservation Act, as amended. The June 2011 report documents the Architectural and Archaeological field study.

Please review the enclosed information and contact me if you require additional information or have any questions regarding this submission. We look forward to hearing from you soon and thank you for your support and cooperation.

Sincerely,

Scott Bitterman

Scott Bitterman, P.E.
Supervising Engineer/ Traffic

701 E. Broadway • P.O. Box 6015 • Columbia, Missouri 65205-6015
(573) 874-7250 • FAX (573) 874-7132 • TTY (573) 874-7251 • www.GoColumbiaMo.com

THE Louis Berger Group, INC.
4050 Pennsylvania Avenue, Suite 121, Kansas City, MO 64111
Tel (816) 398-8578 Fax (816) 561-1666 www.louisberger.com

March 29, 2012

Judith Deel, Compliance Coordinator
State Historic Preservation Office
P.O. Box 176
Jefferson City, MO 65102

**Re: Archival Review of the Proposed Scott Boulevard Study Area, City of Columbia, Boone County, Missouri**
**Proposed Scott Boulevard and I-70 Interchange Project**
**Columbia, Missouri**

Dear Ms. Deel:

The package delivered to you from Scott Bitterman with the City of Columbia, Missouri dated March 27, 2012 did not include the Archival Review for the project. Please find enclosed a copy of the Archival Review of the Proposed Scott Boulevard Study Area, City of Columbia, Boone County, Missouri for the proposed Scott Boulevard and I-70 Interchange improvement project for your review and comment. This document is provided to fulfill the requirements of the National Environmental Policy Act of 1969, as amended and Section 106 of the National Historic Preservation Act, as amended.

Please review the enclosed information and contact me if you require additional information or have any questions regarding this submission. We look forward to hearing from you soon and thank you for your support and cooperation.

Sincerely,

Laura A. Totten

**Laura Totten/Senior Ecologist**

Enclosures
Cc: S. Bitterman, City of Columbia, Missouri
S. Leight, CBB

United States Department of Agriculture

USDA

NRCS Natural Resources Conservation Service

601 Business Loop 70 West, Columbia, MO 65203

November 12, 2008

Stephen W. Parker, Project Manager
Adaptive Ecosystems, Inc.
801 Main Street, Suite 103
Grandview, MO 64030

RE: Scott Boulevard Access Justification Report/Environmental Assessment; Columbia, Missouri; Adaptive Ecosystems Project #2008-118.

Mr. Parker:

As requested, we have reviewed the proposed project to add a "new interchange at I-70 in a 1.2 mile area just east of Perche Creek." We offer the following information for consideration:

1. Background Information – In 1981, the U.S. Congress passed the Farmland Protection Policy Act (FPPA) which directs USDA through NRCS to provide technical assistance to Federal agencies, and State and local governments or organizations that desire to develop programs or policies to limit the conversion of productive farmlands to non-agricultural uses.
2. The Goal of FPPA is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of important farmland to nonagricultural uses.
3. Review of the Proposed Project-Based on the initial description of the project, a farmland conversion impact rating will be needed. We will be happy to complete our portion of the rating as soon as location decisions have been made. We understand that there will be land disturbance activities, but see no significant impacts to prime or statewide important farmland in this area.
4. Other Considerations-Our agency works with USDA program participants to minimize project impacts to wetlands. The U.S. Army Corps of Engineers (COE) regulates activities in all wetlands under the provisions of the Clean Water Act. This project may require a permit from the COE.

If you have any questions, please free to call Clayton E. Lee, State Soil Scientist (573) 876-0907.

Sincerely,

Roger A. Hansen
State Conservationist

cc: Karen D. Brinkman, AC, NRCS, Palmyra, Missouri
Robert T. Hagedorn, DC, NRCS, Columbia, Missouri

United States Department of Agriculture

USDA

NRCS Natural Resources Conservation Service

6465 Highway 168, Suite B, Palmyra, MO 63461-9604

June 18, 2010

Christopher Thomas
The Louis Berger Group, Inc.
4050 Pennsylvania Ave. Suite 121
Kansas City, MO 64111

Dear Mr. Thomas,

Attached is a Farmland Conversion Impact Rating (form AD-1006) for the proposed Scott Blvd project in Boone County, Missouri. After you complete the form, please return one copy for our records.

The Farmland Protection Policy Act (FPPA) does not apply to the area within the city limits of Columbia. The attached ratings are for the areas outside The Columbia city limits where the FPPA does apply.

Please note that if the Total Points (Parts V & VI) in Part VII exceeds 160, alternative sites should be considered. Two alternatives are required if the score is between 160-220, and three alternatives are required if the score is over 220.

If you have any questions, please call me (573) 769-3512 ext. 133.

Sincerely,

Scott Larsen
Area Resource Soil Scientist

Attachment

cc: Robert Hagedorn, DC, NRCS, Columbia, MO

U.S. Department of Agriculture

# FARMLAND CONVERSION IMPACT RATING

| | |
|---|---|
| **PART I** *(To be completed by Federal Agency)* | Date Of Land Evaluation Request 5/15/09 |
| Name Of Project Scott Blvd. | Federal Agency Involved FHWA |
| Proposed Land Use Transportation | County And State Boone County, Missouri |
| **PART II** *(To be completed by NRCS)* | Date Request Received By NRCS |

| | | | |
|---|---|---|---|
| Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply -- do not complete additional parts of this form).* Yes ☑ No ☐ | | Acres Irrigated | Average Farm Size 196 |
| Major Crop(s) Corn and Soybeans | Farmable Land In Govt. Jurisdiction Acres: 436828 % 99 | Amount Of Farmland As Defined in FPPA Acres: 342366 % 77 | |
| Name Of Land Evaluation System Used LESA | Name Of Local Site Assessment System | Date Land Evaluation Returned By NRCS 6/18/10 | |

| **PART III** *(To be completed by Federal Agency)* | Alternative Site Rating Green | Brown | Orange | Yellow |
|---|---|---|---|---|
| A. Total Acres To Be Converted Directly | 88.0 | 120.0 | 102.0 | 97.0 |
| B. Total Acres To Be Converted Indirectly | | | | |
| C. Total Acres In Site | 88.0 | 120.0 | 102.0 | 97.0 |
| **PART IV** *(To be completed by NRCS)* Land Evaluation Information | | | | |
| A. Total Acres Prime And Unique Farmland | 5.6 | 3.3 | 6.7 | 4.1 |
| B. Total Acres Statewide And Local Important Farmland | 41.0 | 45.5 | 45.5 | 38.7 |
| C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted | 0.0 | 0.0 | 0.0 | 0.0 |
| D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value | 71,146.0 | 71,146.0 | 71,146.0 | 71,146.0 |
| **PART V** *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)* | 94 | 94 | 94 | 95 |

| **PART VI** *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)* | Maximum Points | | | | |
|---|---|---|---|---|---|
| 1. Area In Nonurban Use | | 14 | 14 | 14 | 14 |
| 2. Perimeter In Nonurban Use | | 5 | 5 | 5 | 5 |
| 3. Percent Of Site Being Farmed | | 0 | 0 | 0 | 0 |
| 4. Protection Provided By State And Local Government | | 20 | 20 | 20 | 20 |
| 5. Distance From Urban Builtup Area | | 5 | 5 | 5 | 5 |
| 6. Distance To Urban Support Services | | 0 | 0 | 0 | 0 |
| 7. Size Of Present Farm Unit Compared To Average | | 0 | 0 | 0 | 0 |
| 8. Creation Of Nonfarmable Farmland | | 0 | 0 | 0 | 0 |
| 9. Availability Of Farm Support Services | | 5 | 5 | 5 | 5 |
| 10. On-Farm Investments | | 0 | 0 | 0 | 0 |
| 11. Effects Of Conversion On Farm Support Services | | 0 | 0 | 0 | 0 |
| 12. Compatibility With Existing Agricultural Use | | 10 | 10 | 10 | 10 |
| TOTAL SITE ASSESSMENT POINTS | 160 | 59 | 59 | 59 | 59 |
| **PART VII** *(To be completed by Federal Agency)* | | | | | |
| Relative Value Of Farmland *(From Part V)* | 100 | 94 | 94 | 94 | 95 |
| Total Site Assessment *(From Part VI above or a local site assessment)* | 160 | 59 | 59 | 59 | 59 |
| TOTAL POINTS *(Total of above 2 lines)* | 260 | 153 | 153 | 153 | 154 |

| | | |
|---|---|---|
| Site Selected: Yellow | Date Of Selection | Was A Local Site Assessment Used? Yes ☐ No ☒ |

Reason For Selection:

*(See Instructions on reverse side)*

This form was electronically produced by National Production Services Staff

Clear Form

Form AD-1006 (10-83)

DEPARTMENT OF THE ARMY
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
STATE REGULATORY PROGRAM OFFICE - MISSOURI
221 BOLIVAR STREET, SUITE 103
JEFFERSON CITY, MISSOURI 65101

October 30, 2008

REPLY TO
ATTENTION OF:

Missouri State Regulatory Office
(2008-01954)

Adaptive Ecosystems, Inc.
Attn: Steve Parker
801 Main Street, Suite 103
Grandview, MO 64030

Dear Mr. Parker:

This is in response to your letter dated October 24, 2008, regarding the upcoming Environmental Assessment and Access Justification Report for a potential project by the City of Columbia, Missouri to extend Scott Boulevard to the north, including a potential new interchange at I-70.

There is currently a Supplemental Environmental Impact Statement underway by the Federal Highway Administration and the Missouri Department of Transportation that involves the interchange study area identified on Figure 1 attached to your October 24, 2008 letter.

As you are aware, any proposed fill activities within jurisdictional waters of the U.S. (including streams and wetlands) require authorization from the Corps of Engineers under Section 404 of the Clean Water Act. We recommend that avoidance and minimization of impacts to waters of the U.S. be addressed in the Environmental Assessment. If you have any questions concerning this matter, please feel free to write or call me at 816-389-3833.

Sincerely,

Kenny Pointer
Regulatory Project Manager
Missouri State Regulatory Office

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Columbia Ecological Services Field Office
101 Park DeVille Drive, Suite A
Columbia, Missouri 65203-0057
Phone: (573) 234-2132 Fax: (573) 234-2181

November 4, 2008

Stephen W. Parker, Project Manager
Adaptive Ecosystems, Inc.
801 Main Street, Suite 103
Grandview, Missouri 64030

Dear Mr. Parker:

This is in response to your October 24, 2008, letter pertaining to the proposed Scott Boulevard Access Justification Report/Environmental Assessment. The City of Columbia, Missouri is initiating a study to determine the feasibility of a new interchange at I-70 near Perche Creek. The proposal also involves extending Scott Boulevard north to I-70 and a new interchange from Route E south to I-70.

Based on our review, no federally listed threatened or endangered species occur in the proposed project area. Floodplain, wetland, and riparian areas associated with the Perche Creek watershed provide the highest quality fish and wildlife habitat in the project area. We recommend that the project alignments be designed to avoid impacts to these sensitive environmental areas. If these areas can be avoided, the Fish and Wildlife Service has no objections to the proposed project.

We appreciate the opportunity to review this action. Due to higher priority actions and a reduced biological staff, we will not be able to participate in your scoping process. Please contact me if you have any questions or need additional assistance.

Sincerely,

Charles M. Scott
Field Supervisor

O:\STAFF Folders\Scott\ScottBlvd.AdaptiveMgmt.11-4-08.doc

Missouri Department of Conservation
Policy Coordination Unit
P. O. Box 180
Jefferson City, MO 65102
Prepared by: Shannon Cave
shannon.cave@mdc.mo.gov
573-522-4115X3250

# Heritage Review Report



To: ltotten@adaptiveecosystems.com
Laura Totten
Adaptive Ecosystems, Inc.
801 Main Street, Suite 103
Grandview, MO 64030

| | |
|---|---|
| Project type: | Road improvement planning |
| Location/Scope: | Map provided<br>S 32 &33 T49N R19W and S4, 5, 8, 9, 16 & 17 or T48N R13W |
| County: | Boone |
| Query received: | October 24, 2008 |

*Authenticity may be confirmed by Policy Coordination Unit, Missouri Department of Conservation, 573-522-4115.*

***This NATURAL HERITAGE REVIEW is not a site clearance letter. Rather, it indicates whether or not public lands and sensitive resources are known to be located close to and potentially affected by the proposed project.***

*FEDERAL LIST species/habitats are protected under the Federal Endangered Species Act.* ***Consult with the U.S. Fish and Wildlife Service*** *(101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; 573-234-2132). STATE ENDANGERED species are listed in and protected under the Wildlife Code of Missouri (3CSR10-4.111).*

## Records of federal-listed or state-listed (endangered) species or critical habitats near the project site:

There are **no records of concern** in Sections 31 to 34 of T49N R13W and Sections 3 to10 and 15 to 18 of T48N R13W. Perche Creek does have some species tracked for their rarity (but not listed and without regulatory implications). Federally listed gray bats, Indiana bats and bald eagles could well be using the creek and its banks in this reach, as they have been recorded elsewhere in on Perche Creek.

*Heritage records were identified at some date and at a more or less precise location. This report includes information about records near but not necessarily on the project site. Animals move and, over time, so do plant communities. To say "there is a record" does not mean the species/habitat is still there. To say that "there is no record" does not mean the project will not encounter something not recorded. On-site verification is the responsibility of the project. Incorporating information from Heritage records into plans can help reduce adverse impacts to sensitive natural resources. However, these records only provide one reference and other information (e.g. wetland or soils maps, on-site inspections or surveys) should be considered. Compare biological and habitat needs of records listed to planned project activities to avoid or minimize impacts. More information may be found at www.mdc.mo.gov/nathis/endangered/ and mdc4.mdc.mo.gov/applications/mofwis/mofwis_search1.aspx.*

## Recommendations related to this project or site (not to specific heritage records):

- The project area is in region with known karst geologic features (e.g. caves, springs, and sinkholes, all characterized by subterranean water movement). Few karst features are recorded in heritage records, and ones not noted here may be encountered at the project site or affected by the project. Cave fauna (many of which are species of conservation concern) are influenced by changes to water quality, so check your project site for any karst features and make every effort to protect groundwater in the project area. See http://mdc.mo.gov/8452 for best management information.
- Indiana bats (*myotis sodalis,*federally and state listed "endangered") hibernate during winter months, in caves primarily in the southern half of Missouri. They spend summer months, primarily north of the Missouri River, roosting and raising young under the bark of trees in riparian forests and upland forests near perennial streams. During project activities, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor Indiana bats, especially from September to April. If large trees with loose bark need to be removed by your project, that should be done between October and March. Additional information to incorporate in planning documents is available at http://mdc.mo.gov/110.Streams in the area should be protected from soil erosion, water pollution and in-stream activities that modify or diminish aquatic habitats.
- Gray bats (*myotis grisescens*, federally and state listed "endangered") are likely to occur in the

project area, as they forage over streams, rivers, and reservoirs in this part of Missouri. Avoid entry or disturbance of any cave inhabited by gray bats and when possible retain forest vegetation along the stream and from the gray bat cave opening to the stream. See http://mdc.mo.gov/104 for best management recommendations.

- Road projects typically change the plants and animals that live on the right-of-way or in the vicinity. Road construction is a concern to local, state and federal regulatory agencies which may require permits or practices that protect public interests including fish and wildlife resources. Minimize erosion and sedimentation/runoff to nearby streams and lakes by carefully adhering to any "Clean Water Permit" conditions; and include design elements to manage stormwater so that present water discharge rates from the site to streams during heavy rain events are not increased. Revegetate disturbed areas to minimize erosion using native plant species compatible with the local landscape and wildlife needs. Avoid aggressive exotic perennials such as crownvetch and sericea lespedeza.
- Streams in the area should be protected from soil erosion, water pollution and in-stream activities that modify or diminish aquatic habitats. Best management recommendations relating to streams and rivers may be found at http://mdc.mo.gov/8452.
- Invasive exotic species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment, so inspect and clean equipment thoroughly before moving between project sites. Especially important at this time is the zebra mussel, known in the Missouri and Mississippi Rivers and Lake of the Ozarks, but missing from many inland streams and most lakes.
  - Remove any mud, soil, trash, plants or animals before leaving any water body or work area.
  - Before leaving a project site, drain water from boats and machinery (that has operated in the water), checking motor cavities, live-well, bilge and transom wells, tracks, buckets, and any other water reservoirs.
  - When possible, wash and rinse equipment thoroughly with hard spray or HOT (104° F or more) water, like that found at a do-it-yourself carwash and dry in the hot sun before using again. Please help prevent the spread of invasive species by inspecting and cleaning equipment thoroughly before moving between project sites.

*These recommendations are ones project managers might prudently consider based on a general understanding of species needs and landscape conditions. Heritage records largely reflect only sites visited by specialists in the last 30 years. This means that many privately owned tracts could host remnants of species once but no longer common.*

***Project managers can pre-screen heritage review requests at* tinyurl.com/heritagereview. *A "Level 1 response" will result in a printable document that will make further submission to MDC or USFWS unnecessary.***

Matt Blunt
Governor

STATE OF MISSOURI

Ronald M. Reynolds
Director

EMERGENCY MANAGEMENT AGENCY

DEPARTMENT OF PUBLIC SAFETY
PO Box 116, Jefferson City, Missouri 65102
Phone: 573/526-9100 Fax: 573/634-7966
E-mail: mosema@sema.dps.mo.gov

October 29, 2008

Stephen Parker
Adaptive Ecosystem
801 Main St. Suite 103
Grandview, MO 64030

**Re: Scott Boulevard Access Justification Report/Environmental Assessment.**

Dear Mr. Parker:

The City of Columbia and Boone County are participant communities in the National Flood Insurance Program (NFIP). Any development associated with this project located within a special flood hazard area (SFHA), as identified by the Federal Emergency Management Agency (FEMA), must meet the requirements of The City of Columbia or Boone Counties Floodplain Management Ordnance. This permit must be obtained prior to the commencement of any construction/development activities.

The State of Missouri is a participant in the NFIP but only has permitting authority over state owned projects and developments as defined in Executive Order 98-03.

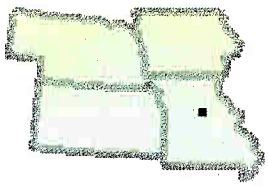
If the proposed development is also located within a regulatory floodway, a "No-Rise" Certificate and statement as to the effects of possible flooding, is required before the development can be permitted. This analysis must be performed by a licensed engineer and to current FEMA standards.

If you have any questions concerning this letter, please feel free to contact me a (573) 526-9119 or jason.schneider@sema.dps.mo.gov.

Sincerely,

Jason Schneider
Floodplain Management Engineer

# Scott Boulevard/I-70

- Missouri Cleanup Sites
- Missouri Schools
- Missouri Petro Tanks
- Missouri LUST
- Missouri CAFO
- AFS - Major
- AFS - Minor
- RCRA TSD
- RCRA LQG
- R7 Superfund Polygons
- Superfund NPL
- Superfund
- TRIS
- NPDES - Major
- NPDES - Minor
- PWS Wells
- PWS Intakes
- HQ NPL Polygons

EPA

REGION 7

ENSV Division

Missouri
Department
of Transportation

MoDOT

Kevin Keith, Director

105 West Capitol Avenue
P.O. Box 270
Jefferson City, MO 65102
(573) 751-2551
Fax (573) 751-6555
www.modot.org

March 4, 2011

Colonel Anthony J. Hoffman, PMP
District Engineer
U.S. Army Corps of Engineers
Kansas City District
700 Federal Office Building
601 East 12th Street
Kansas City, MO 64106

Dear Colonel Hoffman:

Re: Design, Environmental Section
Scott Boulevard Environmental Assessment
Columbia, Missouri
Cooperating Agency Request

The Federal Highway Administration (FHWA) in cooperation with the Missouri Department of Transportation (MoDOT) is working with the City of Columbia and Boone County to initiate an Environmental Assessment (EA) for proposed interchange at I-70 and local road extension in the vicinity of Scott Boulevard in Columbia, Missouri. Since the project will cross Harmony Creek and its tributaries and will require a Section 404 permit, and because your agency has jurisdiction over such permits, we are requesting the U.S. Army Corps of Engineers (USACE) to be a cooperating agency.

The environmental study area is roughly bounded by Perche Creek to the west, the proposed northern terminus of Scott Boulevard Route E to the north, a south/north running line approximately aligned with Sunflower Street to the east, and an area encompassing the intersection of Scott Boulevard and Broadway to the south. An Interchange Clearance Area (ICA) was identified early in the screening process. The ICA includes the outer limits of all of the interchange/outer road alternatives (Figure 1). Conceptual interchange configurations have been proposed for each alternative. Unknown engineering or other constraints may require a change in where the interchange is located. It is not unusual for interchange configurations to change in the design phase after National Environmental Policy Act (NEPA) approval. The ICA was identified and will be cleared by NEPA to allow for variations in design. This will streamline the NEPA clearance process if a design modification is required.

The project components include:

- The location and layout for a proposed Scott Boulevard/I-70 interchange
- An alignment for an extension of Scott Boulevard north from its current terminus at Broadway to the proposed I-70 interchange
- An alignment for an extension of Scott Boulevard from the proposed I-70 interchange north to a new intersection with Route E
- The preparation of an EA to obtain NEPA clearance

Goals and objectives of the EA are to identify alternative roadway alignments and interchange concepts and to evaluate these alignments and concepts based on critical factors such as ability to attract traffic, maintenance of proper interchange spacing along I-70, connections to the regional arterial system, topography, land use, various environmental factors, and engineering design constraints.

On November 13, 2007, Kenny Pointer attended a resource agency scoping meeting for the project. In the spring of 2009 a public meeting was held to provide preliminary study alternatives to the public. Your agency's involvement should include those areas under its jurisdiction and expertise, with no direct writing or analysis expected for preparation of the EA. We will take the following actions to maximize interagency cooperation:

1) Invite you to coordination meetings;

2) Consult with you on any relevant technical studies the project requires;

3) Provide you with project information, including study results;

4) Encourage you to use the above documents to express your agency's views on subjects within its jurisdiction or expertise; and

5) Include information in the project environmental documents that your agency needs to discharge its NEPA responsibilities and satisfy the requirements of the Section 404 (b)(1) guidelines and any other requirements regarding jurisdictional approvals, permits, licenses, and/or clearances.

The USACE has the right to expect that the EA will enable you to discharge your jurisdictional responsibilities. Likewise, you have the obligation to tell us if, at any point in the process, your agency's needs are not being met. We expect that at the end of the process the EA will satisfy your NEPA requirements including those related to project alternatives, environmental consequences, and mitigation. Further, we intend to utilize the EA and any subsequent decision-making document as the basis for any permit applications.

We look forward to your response to this request and your role as a cooperating agency on this project. We anticipate providing you a preliminary Draft EA for your review in the Spring/Summer of 2011.

If you have any questions or would like to discuss in more detail the project or our agencies; respective roles and responsibilities during the preparation of the EA, please contact Mr. Kevin Ward, FHWA, 3220 W. Edgewood, Suite H, Jefferson City, MO 65109, or telephone (573) 636-7104.

Sincerely,

David B. Nichols, P.E.
Director of Program Delivery

cc: Kevin Ward-FHWA
Dion Knipp-D5
Richard Moore-de
Gayle Unruh-de

CITY OF COLUMBIA, MISSOURI
PARKS AND RECREATION DEPARTMENT



February 23, 2011

Columbia Public Works Department
Mr. John Glascock, Director
PO Box 6015
Columbia MO 65205-6015

Dear Mr. Glascock,

The City of Columbia Parks & Recreation Department supports the yellow alternative for the Scott Boulevard and I-70 Environmental Assessment.

The roadway construction limits would not disrupt any future plans for the park. An easement for roadway construction will be identified.

The Scott Boulevard project could enhance the planned trail entrance into the park by the grade separation created by the potential new bridge over Harmony Creek.

In closing, the Parks and Recreation Department looks forward to working with Public Works engineers on this project and future development of the park.

Sincerely,

Michael J. Hood

Michael J. Hood, Director
Columbia Parks and Recreation Department

Missouri
Department
of Transportation

MoDOT

105 West Capitol Avenue
P.O. Box 270
Jefferson City, MO 65102
(573) 751-2551
Fax (573) 751-6555
www.modot.org

**Pete K. Rahn, Director**

**TO:** Kevin Ward
Division Administrator
Federal Highway Administrator

**CC:** Jason Vanderfeltz - 5

**FROM:** Kevin McHugh
Senior Environmental Specialist-de

**DATE:** July 9, 2010

**SUBJECT:** Section 4(f) Compliance-Preliminary Draft EA
Environmental Studies
Scott Boulevard and I-70, Boone County
Programmatic Section 4(f), City of Columbia, City-owned Park

The City of Columbia, Missouri, and Boone County, Missouri, are planning a proposed interchange to improve access to the area south of I-70 between Perche Creek and Stadium Boulevard, one of the region's key growth areas. To help alleviate congestion at Stadium Boulevard and to provide the much-needed I-70 access to western and southern Columbia, a new freeway interchange at an extended Scott Boulevard is proposed. On June 26, 2008 it was determined that an Environmental Assessment (EA) would be needed for the project. An Access Justification Report (AJR) is being prepared as a parallel effort with the EA. Four alternatives have been considered; Brown, Green, Yellow (the preferred) and Orange (Attachment A).

The property of interest under Section 4(f) is city-owned land was recently acquired and is a proposed future park (Attachment B). The city-owned land is approximately 128 acres which includes the flooplains and confluence of Harmony Creek and Perche Creek as well as forested bluffs overlooking the creeks south of I-70 near the proposed interchange location. In addition, the proposed Perche Creek Trail Phase I-MKT to I-70 would traverse the property. The city does not have a current plan for the park.

This evaluation is based on preliminary construction design, the acreages are approximate and more or less easement may be needed to complete construction. The proposed project will require a temporary easement of 0.43 acre for ease of construction. The temporary easement is within a larger permanent easement (new right-of-way) of 0.64 acre. Direct construction impacts to park property will be approximately 0.15 acre. The park land would be impacted by the proposed Scott Boulevard extension (preferred-Yellow alternative) south of the I-70 interchange and by the construction of the proposed interchange exit ramp south of I-170.

Currently there are no amenities in the park. There is no Land and Water Conservation Fund involvement in this proposed park. The area of new right of way and temporary easement does not have any recreational improvements. The city is supportive of the project as impacts to the park are minor and the project will provide pedestrian access to the eastern perimeter of the park if sidewalks are incorporated into the Scott Road Extension.

No avoidance alternatives are feasible and prudent. Four alternatives were considered for the Scott Boulevard and I-70 Interchange project; Brown (construction impacts = 4.71 acres), Green (construction impacts = 0.56 acre); Yellow-the preferred (construction impacts = 0.15 acre) and Orange (construction impacts = <0.01 acre). The Yellow alternative was selected as the preferred because it fully utilizes existing right-of-way and is consistent with city planning. The Orange alternative has the least impact to the park proper, but would require relocating the proposed Scott Boulevard extension from the existing Strawn Road right-of–way and the acquisition of new right-of-way. The proposed taking from the parcel owned by the City of Columbia, Missouri is appropriately addressed as a programmatic Section 4(f) evaluation because the total impact of encroachment upon the property (permanent easement plus construction impacts = 0.79 acre) represents less than ten percent of the park. The maximum amount that can be acquired under a programmatic Section 4(f) from the City of Columbia is 12.8 acres.

We request your concurrence that Section 4(f) does not apply to the 0.27 acre of temporary construction easement within the 0.64 acre of permanent easement (new right of way) and the 0.15 acre of construction impacts because this occupancy will:

1) Not result in any temporary or permanent adverse change to the activities, features, or attributes which are important to the purposes or functions that qualify the resource for protection under Section 4(f), and

2) Include only a minor amount of land.

We request your concurrence that there is no feasible or prudent alternative to the proposed use of 0.79 acre from the parcel owned by the Parks and Recreation Commission of the City of Jefferson, Missouri.

Attachments


(2007 NAIP aerial photography)

**DEPARTMENT OF THE ARMY**
KANSAS CITY DISTRICT, CORPS OF ENGINEERS
STATE REGULATORY PROGRAM OFFICE MISSOURI
221 BOLIVAR STREET, SUITE 103
JEFFERSON CITY, MISSOURI 65101

REPLY TO
ATTENTION OF:

June 22, 2012

Missouri State Regulatory Office
(NWK-2008-01954)

City of Columbia
701 East Broadway
PO Box 6015
Columbia, MO 65205-6015

Dear Madam/Sirs:

This letter is in response to your May 29, 2012, request that the Department of the Army (DA), Corps of Engineers (Corps), participate in the review of the final Scott Boulevard and I-70 Environmental Assessment (EA), for construction of a new access road that will improve access to the area south of I-70 between Perche Creek and Stadium Boulevard, in Columbia, Boone County, Missouri. The final EA study area falls within the Corps, Kansas City District, regulatory program boundary and a DA permit will be required prior to starting the described work in waters of the United States. Moreover, our office was not given the opportunity to comment on the draft EA and is now providing comments on the final EA.

The Corps of Engineers (Corps) has jurisdiction over all waters of the United States. Discharges of dredged or fill material in waters of the United States, including wetlands, require prior authorization from the Corps under Section 404 of the Clean Water Act (33 U.S.C. 1344). The implementing regulation for this Act is found at 33 C.F.R. 320-332. Our preliminary regulatory determination is that that the study area described in the final EA encompasses waters of the United States. We will complete a jurisdictional determination for the project and provide you with a jurisdictional appeal form when you request a DA permit for the project.

Our preliminary determination is that the purpose and need for the project, identified in Section 1.0 of the EA serves as the basis for the 404 (b) (1) alternative analysis. However, although we agree with the strategy described in the EA to evaluate the alternatives considered, the EA does not demonstrate that the selected alternative constitutes the least environmentally damaging practicable alternatives without an evaluation of each stream that will be impacted (crossed) by the project. Section 3.13, Jurisdictional Waters of the U.S., and Section 3.13.2, Wetlands, only references the total amount of linear feet (stream) and acres (wetlands) that will be impacted. Area impacts should be determined for each stream or wetland by calculating length by width of the impact segment.

Based on our review of the final EA, we are providing the following comment:

1. NEPA and Section 404 (b) (1) alternative analyses are not completed by use of the wetland identification procedures described in the EA. An onsite wetland delineation report must be prepared and submitted to the Corps for verification during/after land acquisitions. Minimization and avoidance of impacts to wetlands and other waters of the United States, within the recommended alternative corridor must be considered during project design. Additionally, our office will conduct a site visit to determine the appropriate amount of impacts to streams and wetlands.

If you have any questions concerning our comments to this Final EA, please feel free to write me or call James Reenan at (816) 389-3832.

Sincerely,

Shelly Carter
Missouri State Program Manager
Kansas City District

# CITY OF COLUMBIA, MISSOURI

PUBLIC WORKS DEPARTMENT

August 16, 2012

Shelly Carter, Missouri State Program Manager
US Army Corps of Engineers
221 Bolivar Street, Suite 103
Jefferson City, MO 65101

**Re: Scott Boulevard and I-70 Interchange Environmental Assessment**
**Proposed Scott Boulevard and I-70 Interchange Project**
**Columbia, Missouri**

Dear Ms. Carter:

The City of Columbia appreciates the interest and comments provided by the Kansas City District, Corps of Engineers in its review of the Final Environmental Assessment (EA) prepared in support of the proposed Scott Boulevard and I-70 Interchange project in the City of Columbia, Boone County, Missouri.

The City of Columbia acknowledges the jurisdiction of the U.S. Army Corps of Engineers over all waters of the United States and that discharges of dredged or fill material in waters of the United States requires prior authorization and a Department of Army permit prior to construction on the portion of the proposed facility which is within the Corps' regulatory jurisdiction. From experience successfully permitting other transportation projects, the City of Columbia has acquired a thorough understanding of Clean Water Act, Section 404(b)(1) guidelines and will work to ensure that its permit application for the proposed project complies with such guidelines.

Selection of the Preferred Alternative considers operational, safety, accessibility, environmental and other factors in the analysis and decision-making process. The Yellow Alternative represents the best balance of all such factors although it has slightly greater wetland impacts than two of the other alternatives but has the least linear feet of tributary.

During the final design of the project and prior to construction, a formal wetland delineation will be completed and a report provided to the Kansas City District, Corps of Engineers that will include acreages and linear feet of jurisdictional waters occurring on the selected alternative project site requesting a jurisdictional determination.

The City of Columbia appreciates the comments, guidance and advice provided by the Department of the Army, Kansas City District, Corps of Engineers in its review of the EA. If you have any questions or require additional information, please contact Scott Bitterman of my staff at (573) 874-7649, or by email at sabitter@GoColumbiaMo.com.

Sincerely,

David Nichols, P.E.
Assistant Director of Public Works

701 E. Broadway • P.O. Box 6015 • Columbia, Missouri 65205-6015
(573) 874-7250 • FAX (573) 874-7132 • TTY (573) 874-7251 • www.GoColumbiaMo.com

# APPENDIX B: PROGRAMMATIC 4(f)

MoDOT

105 West Capitol Avenue
P.O. Box 270
Jefferson City, Missouri 65102

**Missouri Department of Transportation**
*Kevin Keith, Director*

573.751.2551
Fax: 573.751.6555
1.888.ASK MODOT (275.6636)

**TO:** Kevin Ward
*Division Administrator*
Federal Highway Administration

**CC:** Scott Bitterman, City of Columbia, MO
Laura Totten, The Louis Berger Group, Inc.
Shawn Leight, CBB
Herb Bailey, Bartlett and West, Inc.


Digitally signed by Peggy J. Casey
DN: cn=Peggy J. Casey, o=FHWA, ou=Missouri Division, email=peggy.casey@dot.gov, c=US
Date: 2012.08.15 13:15:22 -05'00'

**FROM:** Richard Moore
Environmental Compliance Manager

**DATE:** August 9, 2012

**SUBJECT:** Environmental Studies
Scott Boulevard and I-70, City of Columbia, Boone County
Extension of Scott Boulevard and Construction of I-70 Interchange
Programmatic Section 4(f) Evaluation

The City of Columbia, Missouri, and Boone County, Missouri, are planning to improve access to the area south of I-70 between Perche Creek and Stadium Boulevard, one of the region's key growth areas. Stadium Boulevard is the current access to I-70 for western Columbia, and currently operates at or over capacity. To help alleviate congestion at Stadium Boulevard and to provide the much-needed I-70 access to western and southern Columbia, a new freeway interchange at an extended Scott Boulevard is proposed.

The Stadium Boulevard corridor in the vicinity of I-70 is already operating at capacity and is unstable. This condition is exacerbated by the close signal spacing on Stadium Boulevard near I-70. Daily fluctuations along the Stadium Boulevard corridor result in congested yet flowing conditions on light traffic days to gridlock on heavier days. Continuous vehicular backups can develop on Stadium Boulevard between I-70 and Broadway, constraining nearly all intersections.

MO Route E provides connectivity to the rural areas north of I-70, to the City of Columbia, and to I-70. While traffic volume along Stadium Boulevard decreases north of I-70 on MO Route E there is potential for future residential developments in the vicinity of the northern city limits.

The property of interest under Section 4(f) is city-owned land which was recently acquired and is a proposed future park (Attachment A). The city-owned land is approximately 128 acres which includes the floodplains and confluence of Harmony Creek and Perche Creek as

well as forested bluffs overlooking the creeks south of I-70 near the proposed interchange location. In addition, the proposed Perche Creek Trail Phase I-MKT to I-70 would traverse the property. The city does not have a current plan for the park. For the preferred alternative (Yellow), the City of Columbia Parks and Recreation Department has agreed to grant an easement for the Scott Boulevard construction (Attachment C).

This evaluation is based on preliminary construction design, the acreages are approximate and more or less easement may be needed to complete construction (Attachment B). The proposed project will require a temporary easement of 0.43 acre for ease of construction. The temporary easement is within a larger permanent easement (new right-of-way) of 0.64 acre. Direct construction impacts to park property will be approximately 0.15 acre. The park land would be impacted by the proposed Scott Boulevard extension (preferred-Yellow alternative) south of the I-70 interchange and by the construction of the proposed interchange exit ramp south of I-170.

Currently there are no amenities in the park. There is no Land and Water Conservation Fund involvement in this proposed park. The area of new right of way and temporary easement does not have any recreational improvements. The city is supportive of the project as impacts to the park are minor and the project will provide pedestrian access to the eastern perimeter of the park.

No avoidance alternatives are feasible and prudent. Based on engineering and environmental analysis and input received from partner agencies and the public informational open house, four reasonable alternatives were developed for this project. Some of the critical issues influencing the location for a new interchange are the ability to attract traffic, interchange spacing along I-70, connections to the regional arterial system, and topography, land use, and environmental factors.

The no-build alternative does not address the purpose and need of the project and the increased traffic volumes on Stadium Drive and the limited access to I-70 for southwestern Columbia. The Brown alternative has the longest corridor length and would require the most right-of-way while impacting the most preliminary platted lots, 4(f) properties, protected habitat, and stream in addition to being the most expensive. The Orange, Yellow, and Green alternatives have similar costs, environmental impacts, and benefits. However, the Yellow and Green alternatives both occur along the existing Strawn Road alignment for which two developments have dedicated land for a future Scott Boulevard extension. Both alternatives also raise the elevation of the existing Strawn Road alleviating existing flooding issues and allow for better outer road connections and intersection spacing. Total project costs range from approximately $68 million for each of the Green and Yellow (preferred) alternatives to $85.5 million for the Brown alternative including construction, right-of-way, utility relocation, and environmental remediation/mitigation costs.

The Yellow Alternative was selected as the Preferred Alternative due to the following considerations:

- The Yellow alternative provides for better spacing between the interchange ramp terminals and the outer road intersection on the north side of I-70.
- The Yellow alternative provides for slightly shorter travel distance for commuters.
- The Yellow alternative does not require widening of the I-70/Perche Creek bridges. The Green alternative would require the widening of these bridges to accommodate acceleration and deceleration lanes. This makes the Yellow alternative easier to construct with less impact to the traveling public.

This makes the Yellow alternative (preferred) easier to construct with less of an impact to the traveling public. In addition, construction of the Yellow alternative (preferred) on the existing Strawn Road right-of-way is consistent with City of Columbia planning efforts.

The total impact of encroachment upon the property from the Yellow alternative (permanent easement plus construction impacts = 0.79 acre) represents less than ten percent of the park acreage. The maximum amount that can be acquired under a programmatic Section 4(f) from the City of Columbia is 12.8 acres.

We request your concurrence that there is no feasible or prudent alternative to the proposed use of 0.79 acre from the parcel owned by the Parks and Recreation Commission of the City of Columbia, Missouri and that the proposed taking from the parcel owned by the City of Columbia, Missouri is appropriately addressed as a programmatic Section 4(f) evaluation.

Attachments