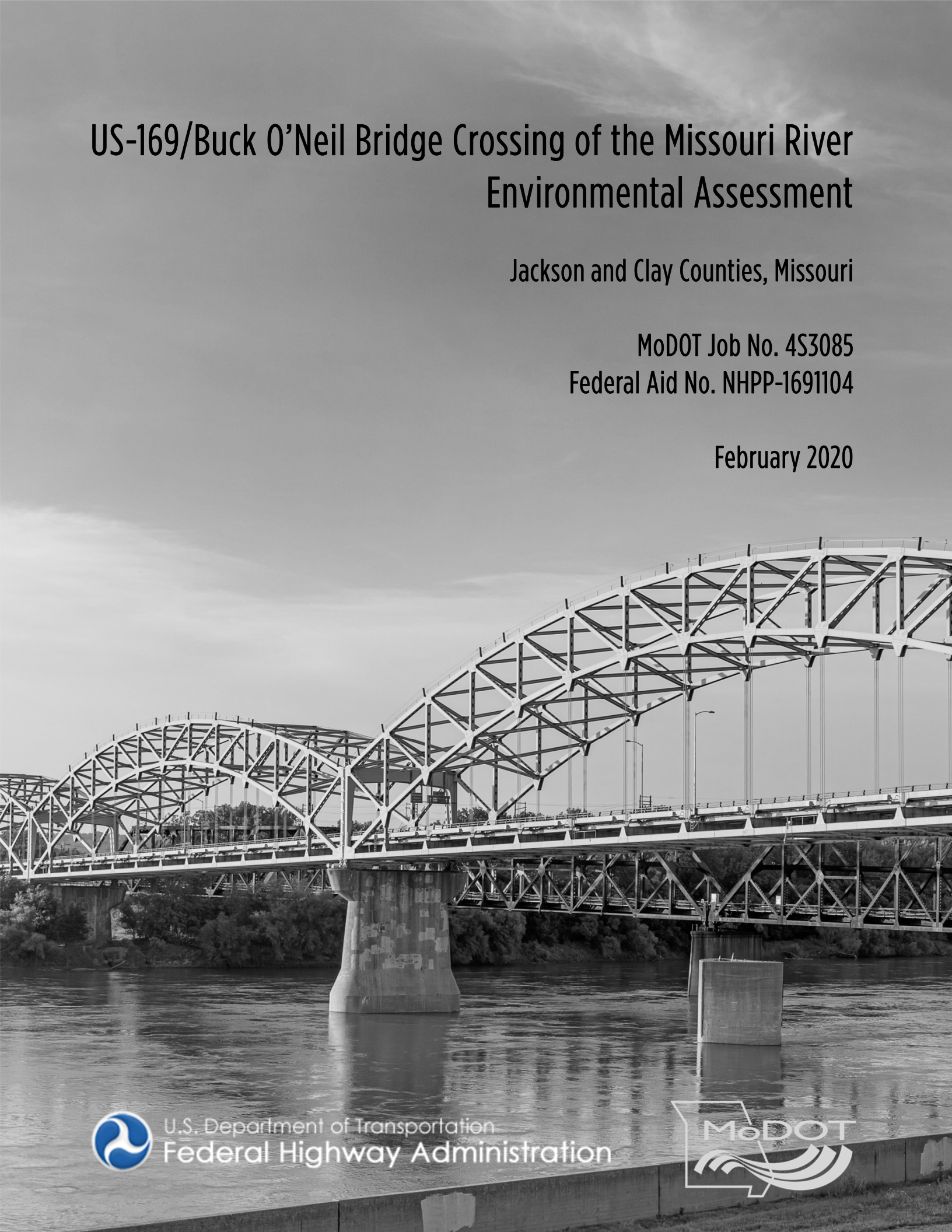
US-169/Buck O'Neil Bridge Crossing of the Missouri River
Environmental Assessment

Jackson and Clay Counties, Missouri

MoDOT Job No. 4S3085
Federal Aid No. NHPP-1691104

February 2020



U.S. Department of Transportation
Federal Highway Administration

MoDOT

US-169 / BUCK O'NEIL BRIDGE
CROSSING OF THE MISSOURI RIVER

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ENVIRONMENTAL ASSESSMENT

Submitted pursuant to 42 USC 4332(2)(c)
and 49 USC 303 by the
US Department of Transportation
Federal Highway Administration

Missouri Department of Transportation

and
COOPERATING AGENCIES
US Army Corps of Engineers
US Coast Guard
Federal Aviation Administration

02/21/2020		Program Development Team Leader
Date of Approval	FHWA	Title
02/21/20		DEPUTY DIRECTOR/CHIEF ENGINEER
Date of Approval	MoDOT	Title

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

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

Mr. Edward Hassinger
Chief Engineer
Missouri Department of Transportation
P.O. Box 270
Jefferson City, Missouri 65102
(573) 751-2803

The MoDOT signature indicates verification that the content of this document and scope of the project are accurate. The FHWA signature gives approval to distribute this information for public and agency review and comment. Such approval does not commit FHWA to approve any future grant requests to fund the preferred alternative.

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List of Abbreviations and Acronyms

Abbreviation/Acronym	Term/Phrase/Name
AADT	Annual Average Daily Traffic
ADT	Average Daily Traffic
AC	Advisory Circular
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
AIP	Airport Improvement Program
ALP	Airport Layout Plan
APE	Area of Potential Effect
ARAN	Automated Road Analyzer
ARFF	Aircraft Rescue and Firefighting
AVE	Area of Visual Effect
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
BNSF	Burlington Northern and Santa Fe Railroad
BUILD	Better Utilizing Investment to Leverage Development
CAA	Clean Air Act
CE	Categorical Exclusion
CFR	Code of Federal Regulations
CWA	Clean Water Act
dBA	A-weighted decibel
DOT	Department of Transportation
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	US Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FBO	fixed base operator
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FPH	free phase hydrocarbons
GDAP	Greater Downtown Area Plan
GHG	Greenhouse Gas Emissions
GKCCEH	Greater Kansas City Coalition to End Homelessness
GLO	General Land Office
HIP	Highway Infrastructure Program
IPaC	Information for Planning and Conservation (USFWS)

KCAD	Kansas City Aviation Department
KCATA	Kansas City Area Transportation Authority
KCI	Kansas City International Airport
KCMO	City of Kansas City, Missouri
KCPL	Kansas City Power & Light (Evergy)
KCPRD	Kansas City Parks and Recreation Department
KCRT	Kansas City River Trails, Inc.
KCSA	Kansas City Streetcar Authority
KCT	Kansas City Terminal
KDOT	Kansas Department of Transportation
kV	kilovolt
LEP	Limited English Proficiency
LF	linear feet
LOS	Level of Service
LRTP	long-range transportation plan
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Funds
MARC	Mid-America Regional Council
MBTA	Migratory Bird Treaty Act
MDC	Missouri Department of Conservation
MDNR	Missouri Department of Natural Resources
MKC	Charles B. Wheeler Downtown Airport
MoDOT	Missouri Department of Transportation
MPO	Metropolitan Planning Organization
MSAT	mobile source air toxics
MTP	metropolitan transportation plan
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act of 1969, as amended
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NOA	Notice of Availability
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
NWP	Nationwide Permit (Section 404)
OHWM	ordinary high water mark
PA	Programmatic Agreement
PEM	palustrine emergent (wetland)
PEL	Planning and Environmental Linkages Study
PFC	Passenger Facility Charge
PFO	palustrine forested (wetland)
PVC	polyvinyl chloride

R2UBH	riverine (wetland)
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RPZ	runway protection zone
SEMA	State Emergency Management Agency
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SOI	Secretary of the Interior
STBG	Surface Transportation Block Grant
STIP	Statewide Transportation Improvement Plan
SWPPP	Stormwater Pollution Prevention Plan
TA	Technical Advisory
T&WA	Transcontinental & Western Airlines
TDM	Transportation Demand Management
TERPS	Terminal Instrument Procedures
THPO	Tribal Historic Preservation Officer
TIP	Transportation Improvement Program
TMP	Transportation Management Plan
TNM	Traffic Noise Model
TSM	Transportation Systems Management
UG	Uniform Government of Wyandotte County/Kansas City, Kansas
UPRR	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USC	United States Code
USCG	United States Coast Guard
USGS	United States Geological Survey
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank
VCP	Voluntary Cleanup Program
VHT	vehicle hours traveled
VIA	Visual Impact Assessment
VMT	vehicle miles traveled
VPH	vehicles per hour

1.0 Introduction and Project Background

The Missouri Department of Transportation (MoDOT), the City of Kansas City, Missouri (KCMO), and the Federal Highway Administration (FHWA) are studying alternatives to improve the transportation infrastructure at the US-169 crossing of the Missouri River in Kansas City (see Figure 1-1). These alternatives are designed to address the condition of the existing Broadway/John Jordan 'Buck' O'Neil Memorial Bridge (Buck O'Neil Bridge) and to address access, mobility, and connectivity needs within Jackson and Clay Counties, Missouri.

The intent of the Proposed Action is to seek the most effective improvement alternative to provide a river crossing that satisfies current and future area transportation needs while minimizing impacts on the human and natural environment.

This Environmental Assessment (EA) is required in accordance with the National Environmental Policy Act (NEPA) and the guidelines outlined in Fixing America's Surface Transportation Act (P.L. 114-94; December 4, 2015), known as the FAST Act. The US-169/Buck O'Neil Bridge Crossing of the Missouri River EA will:

- Provide an overview and description of the study area
- Identify current and future needs
- Determine potential improvement alternatives to address current and future needs
- Evaluate the effects of reasonable alternatives on the human and natural environment
- Determine whether the project results in significant impacts
- Reach public and agency understanding of the proposed improvements
- Recommend a Preferred Alternative

Completion of the environmental process and issuance of a decision by the FHWA is required for the project to proceed through design and construction. This environmental document is also intended to support project decisions and permits required from other Federal agencies and to allow this project to be implemented using Federal funds.

What is NEPA?

NEPA is an environmental law that established national policy promoting the protection, maintenance, and enhancement of the environment. It established requirements for evaluating and addressing the effects a Federal project or a federally funded project may have on the human and natural environment. There are three levels of documentation under NEPA:

Environmental Assessment (EA) is prepared when the lead Federal agency is unsure if the proposed project would result in significant impacts. If during the preparation of an EA significant impacts are identified and they cannot be lessened through mitigation, the lead agency would then prepare an EIS.

Environmental Impact Statement (EIS) is prepared if the lead Federal agency knows a project would result in significant impacts even if mitigation is considered.

Categorical Exclusion (CE) is prepared based on the lead Federal agency's experience with projects of a similar scope that would not result in significant impacts. The project is considered categorically excluded from the preparation of an EA or EIS.

What is a Decision Document?

A Decision Document issued by the FHWA can take two forms:

A Finding of No Significant Impact (FONSI) is issued when environmental analyses and interagency reviews find a project to have no significant impacts on the quality of the environment. The FONSI document reflects all applicable comments and responses. The FONSI must include FHWA's selected alternative.

A Record of Decision (ROD) is typically issued upon completion of an EIS. The ROD outlines the alternatives considered during the EIS process, provides the rationale for selection of the preferred alternative, and explains why the other alternatives were not chosen.

What is a PEL?

A Planning and Environmental Linkages (PEL) Study is a collaborative and integrated approach to transportation decision-making that 1) considers environmental, community, and economic goals early in the transportation planning process, and 2) uses the information, analysis, and products developed during planning to inform the environmental review process.

The Federal Aviation Administration (FAA), the US Army Corps and Engineers (USACE), and the US Coast Guard (USCG) have accepted the invitation to participate in this environmental review process as Cooperating Agencies. See Appendix A for copies of agency correspondence.

1.1 How this project was identified

1.1.1 Beyond the Loop Planning and Envrionmental Linkages Study

In 2015, the Mid-America Regional Council (MARC), in cooperation with FHWA, MoDOT, KCMO, the Kansas Department of Transportation (KDOT), and the Unified Government of Wyandotte County/Kansas City, Kansas (UG), conducted a Planning and Environmental Linkages (PEL) study for an area that included US-169/I-70/I-35/I-29/I-670 in Jackson and Clay Counties, Missouri, and Wyandotte County, Kansas. The PEL study, completed in April 2018, identified area transportation needs, assessed existing conditions, identified anticipated problem areas, and developed and evaluated transportation improvements that could be implemented to reduce congestion, enhance connectivity, and improve safety within the PEL study area. Residents, stakeholders, neighborhood groups, and government and transportation officials provided input, which was used to identify regional transportation needs and possible implementation strategies.

The US-169 corridor from MO-9 to I-35, including the Buck O'Neil Bridge, was identified as a segment of independent utility in the PEL. As the first project corridor to advance out of the PEL, the preferred alternative ultimately identified for the US-169/Buck O'Neil Bridge Project cannot limit or interfere in the advancement of other strategies considered for implementation in the other four study corridors described in the PEL.

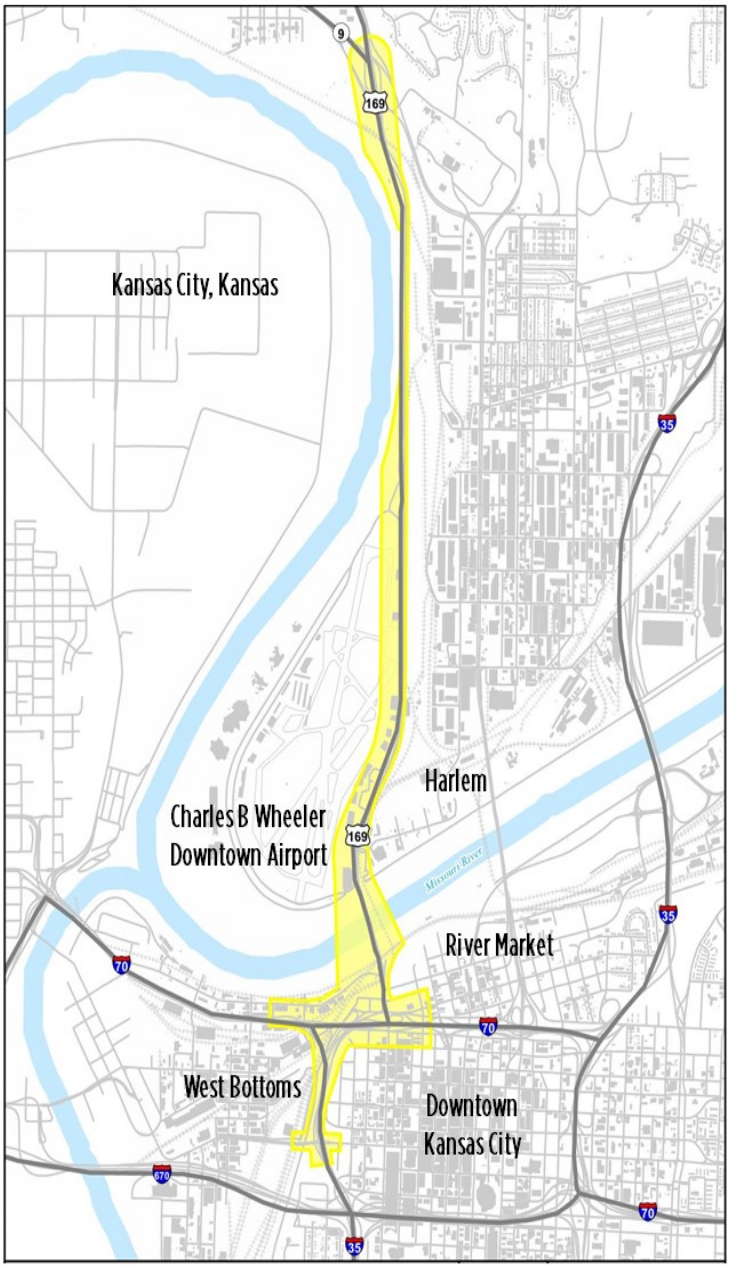


Figure 1-1: US-169/Buck O'Neil Bridge Crossing of the Missouri River Study Area

1.1.2 Buck O'Neil Bridge Inspection

While the PEL was underway, MODOT conducted a biennial inspection of the Buck O'Neil Bridge in 2015. During that inspection, MoDOT identified numerous structural deficiencies that limited the useful life of the bridge. In March 2017, MoDOT developed conceptual repair and rehabilitation scenarios to address the structural deficiencies identified during the inspection.

Four improvement scenarios were evaluated: (1) a short-term repair option, (2) a long-term rehabilitation option, (3) a "hybrid" of short-term repairs and long-term rehabilitation, and (4) a second "hybrid" that included rehabilitation and some span replacements. MoDOT also evaluated replacement in-kind of the existing bridge as a baseline condition. MoDOT adopted the recommended long-term, 30 to 40-year rehabilitation option as the preferred approach. This option would be a complete rehabilitation of the bridge including replacement of the deck at an estimated cost of $59 million. MoDOT added the recommended long-term project to their Statewide Transportation Improvement Program (STIP) in State Fiscal Year 2019.

To move forward with the long-term rehabilitation option, the existing US-169/Buck O'Neil Bridge crossing would need to be closed to all traffic for a minimum of 2 years. MoDOT received 167 comments from the public opposing the lengthy closure, especially if it did not result in construction of a new bridge. Taking the input received into consideration, MoDOT identified a short-term rehabilitation solution that would address only the most critical structural deficiencies, thereby allowing the crossing to remain partially open to traffic while the repairs were being made. The short-term rehabilitation, completed in November 2018, allowed time for completion of the PEL, the allocation of funding for improvements, and initiation of the environmental study of a potential new river crossing. The 2018 short-term rehabilitation is anticipated to extend the useful life of the bridge another 5 to 7 years, allowing for this study to be completed and an ultimate longer-term solution to be identified.

1.2 Description and Function of the Buck O'Neil Bridge, US-169, and Supporting Roadway Components within the Study Area

Buck O'Neil Bridge (A4649) is considered eligible for listing on the National Register of Historic Places (NRHP). Formerly known as the Broadway Bridge, it was opened in 1956 as a toll bridge by KCMO. In 1991, the toll was removed from the bridge, and the bridge and the US-169 designation for the section of highway over the bridge and north of the river were taken into the MoDOT transportation system.

In 2016, approximately 47,600 vehicles on average crossed the bridge daily. In addition to serving local and regional travel demands, the existing US-169/Buck O'Neil Bridge crossing supplements Missouri River crossing capacity during traffic incidents or maintenance activities on other river crossings including I-35/Kit Bond Bridge, MO-9/Heart of America Bridge, I-70/Lewis & Clark Viaduct, US 69/Fairfax, and I-635/Riverside. The age and condition of the bridge creates an ongoing need for costly maintenance and scheduled repairs. MoDOT completed a short-term repair of the bridge in 2018 to extend its useful life. The bridge requires either major rehabilitation or replacement to make the crossing viable beyond 2025. Although the bridge supports mobility across the river, the bridge lacks shoulders and off-travel way accommodations for bicycles and pedestrians.

US-169 serves as a primary link between communities north and south of the Missouri River. US-169 links MO-9 on the north to I-35 on the south (Jackson County). Beyond the intersection with MO-9, US-169 connects to I-29 (Clay County) and ultimately to I-435 (Platte County) north and east of the Kansas City International Airport. After crossing the Missouri River to the south, US-169 provides access to I-70/I-35 on the north edge of the downtown loop, and feeds traffic south on I-35 along the west edge of downtown Kansas City to connect with I-670. US-169 also provides access to the Charles B. Wheeler Downtown Airport (MKC) located just north of the river.

As it crosses the Missouri River, US-169 transitions traffic flows from north of the river, including MKC and the Harlem District, to 5th Street/Independence Avenue and the River Market District south of the river. US-169 is classified as a Freeway/Expressway north of I-70 on the Metropolitan Regional Roadway Functional Classification Map approved by the FHWA and published by the MARC. US-169 continues south from West 6th Street as Broadway Boulevard where it is classified as a Minor Arterial south of I-70. Broadway Boulevard extends south through the Kansas City Central Business District (CBD) ultimately connecting to I-670 at the south loop.

Both West 5th Street and West Independence Avenue are designated as Major Collector roadways. The existing US-169/Buck O'Neil Bridge crossing carries industrial truck traffic originating from or destined to the Harlem, West Bottoms, River Market, and the CBD including MKC and properties owned by the Port of Kansas City (PortKC). Heavy trucks make up approximately 4 percent of the traffic traveling over the Buck O'Neil Bridge but comprise nearly 18 percent of the traffic traveling along I-70 and I-35 through the study area.

2.0 Purpose and Need for the Proposed Action

2.1 Purpose and Need

The purpose and need describes the problems that need to be addressed. Improvement of the US-169/Buck O'Neil Bridge crossing of the Missouri River is proposed to address the age and condition of the existing crossing and the function of the components of the existing transportation system that support the crossing. In addition, the solutions that address the identified needs must:

- Connect **logical termini** and be of sufficient length to address environmental matters on a broad scope
- Have **independent utility** to be useable and a reasonable expenditure even if no additional transportation improvements are made
- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements

The first step in this environmental study was to identify a project-specific purpose and need for the US-169/Buck O'Neil Bridge project based on the broader needs within the downtown loop and the supporting roadway network described in the PEL. Table 2-1 outlines the purpose and need statements developed for this Proposed Action to show consistency with the PEL.

Table 2-1: Purpose and Need

US-169/Buck O'Neil Bridge Crossing of the Missouri River	Beyond the Loop Planning and Environmental Linkages Study
Purpose: *to facilitate the safe movement of people and goods along US-169 while improving mobility, connectivity, and accessibility across the Missouri River.* ***Needs:*** ▪ **Maintain infrastructure** – address the physical condition of the historic Buck O'Neil Bridge ▪ **Maintain a reliable regional transportation linkage across the Missouri River that services local and regional traffic and minimizes local traffic conflicts** ▪ **Improve the operational and safety performance of the Missouri River crossing for all transportation modes**	***Purpose:*** *…to seek the most effective approach to improving the transportation facilities in the study area, including the development of alternative strategies, which, when implemented, will meet the identified current and future needs, while balancing the interests of the various stakeholders.* ***Needs:*** • **Improve Physical Condition** – does the proposed strategy improve the condition of the Buck O'Neil Bridge, the US-169 Corridor, or the I-70 North Loop? • **Optimize System Performance** – does the proposed strategy improve regional multi-modal connectivity or improve traffic operations? • **Improve Safety and Security** – does the improvement provide for the safe operation of vehicular traffic, improve safety for bicyclists and pedestrians, or improve emergency response times and provide improved system redundancy

The following sections provide data to support each of the needs identified above for the proposed US-169/Buck O'Neil Bridge crossing of the Missouri River project.

2.1.1 NEED - Maintain Infrastructure – Address the Physical Condition of the Historic Buck O'Neil Bridge

The Buck O'Neil Bridge, as well as many of the components of the existing transportation network within the study area, are more than 50 years old requiring frequent and costly maintenance and repairs to keep them functioning. The Buck O'Neil Bridge is composed of four structures, one spanning the Missouri River, the second spanning Harlem Road, and the north and south approaches (see Table 2-2). The bridge carries four, 11-foot wide travel lanes, two in each direction. The bridge has a very narrow center raised median and no shoulders to accommodate disabled vehicles or to allow for the passage of emergency vehicles during heavy traffic periods. Bicyclists and pedestrians navigate the crossing regardless of the lack of shoulders or dedicated facilities.

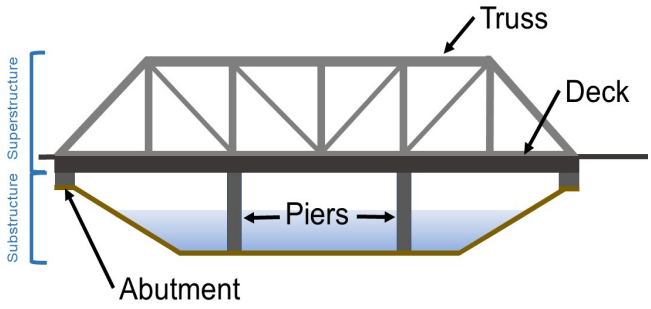
As described in Chapter 1.0, the tied-arch truss bridge (A4649) has been determined eligible for listing in the NRHP. An extensive inspection of the bridge conducted in 2015 identified significant deterioration of structural elements and indicated the deck needed to be replaced to minimize further damage to underlying structural elements caused by exposure to roadway drainage. Hanger cable retainers were missing, gusset plates and structural members exhibited pack rust, expansion joints needed to be replaced, and some fatigue cracking was evident. The entire bridge also would require repainting.

The short-term rehabilitation project, completed by MoDOT in November 2018 for $5.7 million, only addressed the most critical repairs to extend the continued function of the crossing by 5 to 7 years. By 2025, transportation officials will need to have a plan implemented to address the condition of the crossing to enable it to continue to serve traffic in the future.

What are bridge ratings?

Bridge ratings describe the physical condition of the Deck, Superstructure, and Substructure, as assigned by qualified bridge inspectors. Ratings range in number from 9 (excellent condition) to 0 (failed condition).

The **Deck** is the bridge component directly supporting wheel loads. The **Superstructure** includes the structural parts of the bridge that provide horizontal span (e.g., arch, truss, girders, etc.). The **Substructure** includes structural parts of the bridge that support the horizontal span (e.g., piers, bents, abutments, etc.).



What is bridge condition?

Bridge condition is determined by the lowest of the ratings for Deck, Superstructure, and Substructure. If the lowest rating is greater than or equal to 7, the bridge is classified as Good; if it is less than or equal to 4, the classification is Poor. Bridges rated 5 or 6 are classified as Fair.

What is pavement condition?

MoDOT collects pavement condition information using an Automated Road Analyzer (ARAN) system. Data collected includes pavement roughness, cracking, rutting for asphalt surfaces, and faulting for concrete surfaces. The data collected is compiled into different condition assessment tools to reflect how well a pavement surface rides (e.g., pavement integrity).

The condition reported in Table 2-2 provides information on how well the current pavement surface rides. Pavement with a roughness index of less than 100 is in "Good Condition"; while pavement with a roughness index equal to or greater than 100 is in "Not Good Condition." The roughness index measures the roadway profile in inches per mile.

Table 2-2 indicates the location of and describes the condition of the Buck O'Neil Bridge and several other bridges, viaducts, and roadway sections, that are also aging and in various states of disrepair in the study area. These components distribute the traffic crossing the river to local and regional destinations on both sides of the river. Certain structures may be replaced or improved as part of the implemented design solution. Some components of the existing transportation network are in better condition and would not necessarily benefit from replacement or improvement at this time. The condition and remaining service life of the structures listed may be used by decision-makers during the design-build process to determine the best expenditure of project funds.

Table 2-2: Condition of Existing and Supporting Transportation Network Components

	Component	Description	Age	Condition
1 2	Buck O'Neil Bridge	▪ Composed of 2 structures: MoDOT Bridge No. A4649 (US-169 over the Missouri River – 3-trussed arch main spans); 2,763 feet long MoDOT Bridge No. 4646 (US-169 southbound lanes over Harlem Road); 940 feet long ▪ 4 11-foot wide travel lanes, 2 in each direction ▪ No shoulders ▪ Weight restricted to 45 tons	▪ 63 years old ▪ Opened to traffic in 1956	▪ Bridge No, A4649 - Poor (based on inspection after 2018 repairs) due to superstructure condition ▪ Bridge No. A4646 - Poor (based on inspection after 2018 repairs) due to superstructure condition ▪ Partial rehabilitation completed in 2018 to address several major issues. These repairs extended the useful life of the bridges by 5-7 years.
3	US-169 Northbound Lanes over Harlem Road	▪ Composed of 2 structures: MoDOT Bridge No. A4647 and MoDOT Bridge No. A4648 ▪ 61 feet long (A4647) and 56 feet long (A4648); concrete voided slab spans ▪ Walls limit sight distance at intersection	▪ 63 years old ▪ Opened to traffic in 1956 along with the 2 structures described above	▪ Bridge No, A4647 – Fair; moderate concrete cracking and spalling throughout ▪ Bridge No. A4648 – Fair; moderate concrete cracking and spalling throughout
4	Woodswether Bridge	▪ Composed of 2 structures: KCMO Bridge No. S029B44 (over the Burlington Northern and Santa Fe Railway Company [BNSF] tracks) and KCMO Bridge No. S029B45 (over the Union Pacific Railroad Company [UP] tracks) ▪ Both steel plate girder bridges; 193 feet long (S029B44) and 500 feet long (S029B45) ▪ Weight restricted to 30 tons	▪ 68 years old ▪ Opened in 1951	▪ Bridge No. S029B44 – Poor ▪ Bridge No. S029B45 – Fair ▪ KCMO completed small rehabilitation project in 2017 to extend the useful life of the bridges pending the outcome of this project and its possible effects on the them ▪ Both bridges have heavy cracking, delamination, and exposed rebar at substructure elements
5	Broadway under Broadway Bridge	▪ Original bridge carried Broadway Boulevard over the railroad tracks. The existing bridge (KCMO Bridge No. S029B42) spans the BNSF tracks directly under the Buck O'Neil Bridge ▪ 163 feet long; steel girder spans ▪ Only supports local traffic, not a through street	▪ 66 years old ▪ Existing bridge built in 1953; replaced original structure built in the 1930s	▪ Bridge No. S029B42 – Fair: moderate concrete cracking and spalling at substructure
6	Broadway Bridge over I-70	▪ MoDOT Bridge No. L0490, carries 6 lanes of traffic ▪ 127 feet long; two-span continuous steel box girder ▪ Vertical clearance under the structures is posted at 15'-10" at the northernmost lane of I-70	▪ 31 years old ▪ Existing bridge built in 1988; replaced original bridge built in 1954	▪ Bridge No. L0490 – Fair; moderate concrete cracking and spalling at substructure
7 8 9	I-35 Ramp Bridges over I-70	▪ MoDOT Bridge Nos. A1130, A1131 and A1133 carry westbound I-70/southbound I-35 and northbound I-35/eastbound I-70 ▪ All composed of concrete box girder and voided slab spans. ▪ Each bridge carries 2 lanes of traffic within minimal shoulders ▪ Vertical clearance under the structures is posted at 15'-10" at the northernmost lane of I-70	▪ 49 years old ▪ All constructed in 1970	▪ Bridge No. A1130 – Fair; moderate concrete cracking and spalling ▪ Bridge No. A1131 - Fair; moderate concrete cracking and spalling ▪ Bridge No. A1133 - Fair; moderate concrete cracking and spalling ▪ Repairs last made to these bridges in 1992
10	I-70 Bridges over Beardsley Road	▪ MoDOT Bridge No. L0489 carries westbound and eastbound I-70 over Beardsley Road ▪ 80feet in length; steel beam single span ▪ Carries approximately 76,800 vehicles per day ▪ Vertical clearance under L0489 is posted at 15'-0"	▪ 66 years old ▪ Built in 1953 ▪ Rehabilitation in 1973 ▪ Repainted in 1994	▪ Bridge No. L0489 – Fair; large spalls and general deterioration in concrete substructure

Component Location

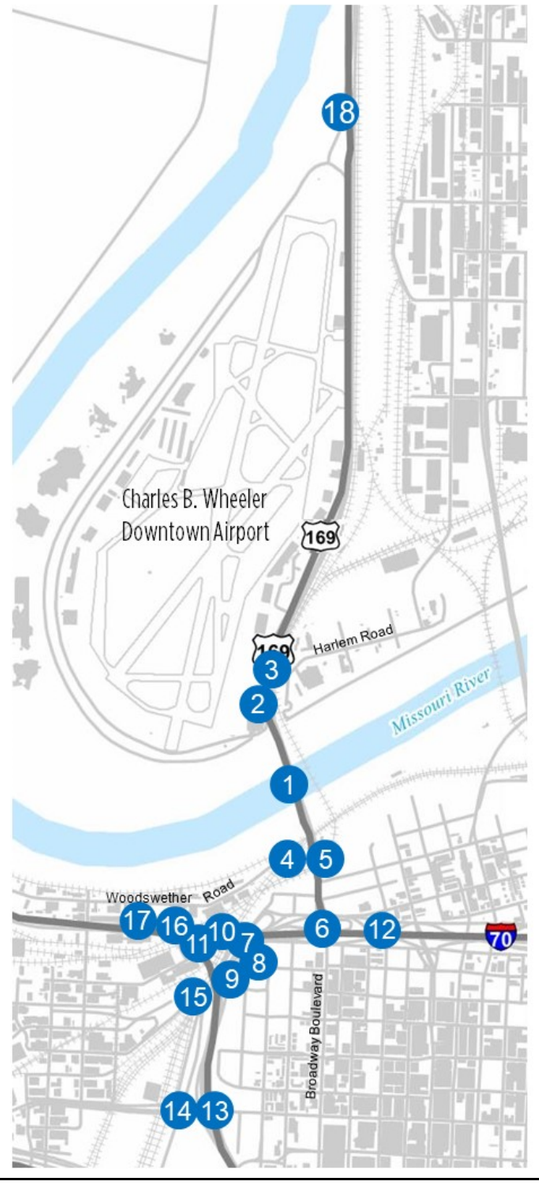


Table 2-2: Condition of Existing and Supporting Transportation Network Components (continued)

	Component	Description	Age	Condition
11	I-70 Eastbound Lanes of Lewis & Clark Viaduct	▪ MoDOT Bridge No. A5658 carries three eastbound lanes of the Lewis & Clark Viaduct through the West Bottoms from Kansas City, KS to Kansas City, MO ▪ 4,490 feet long; continuous steel girder spans; continuous prestressed concrete girder spans ▪ Carries approximately 38,900 vehicles per day	▪ 21 years old ▪ Built in 1998	▪ Bridge No. A5658 – Fair; moderate transverse deck cracking in main spans
12	Wyandotte Bridge over I-70	▪ MoDOT Bridge No. L0492 carries three lanes of Wyandotte Street over eight lanes/ramps of I-70 ▪ 225 feet long; continuous prestressed concrete girder ▪ Carries approximately 6,200 vehicles per day	▪ 65 years old ▪ Built in 1954 ▪ Rehabilitated in 1986	▪ Bridge No. L0492 – Fair; moderate spalling at concrete columns
13	12th Street Bridge over I-35	▪ MoDOT Bridge No. A8128 carries four lanes of 12th Street over four lanes of I-35 ▪ 115 feet long; continuous concrete spread box girders ▪ Carries approximately 8,400 vehicles per day ▪ Vertical clearance over northbound I-35 posted at 15'-8"; over southbound I-35 at 15'-10"	▪ Built in 2013	▪ Bridge No. A8128 - Good
14	12th Street Viaduct over Railroad	▪ KCMO Bridge No. S030B11 carries two levels of traffic between 12th Street/Beardsley Road and the West Bottoms ▪ 2,050 feet long; cast-in-place concrete spans ▪ Carries approximately 11,200 vehicles per day ▪ Weight restricted to 45 Tons	▪ 104 years old ▪ Built in 1915 ▪ Rehabilitated last in 2005	▪ Bridge No. S030B11 – Fair; upper deck superstructure and arch span heavily repaired
15	St. Louis/Union Avenue Bridge over Railroad	▪ KCMO Bridge No. S030B12 carries two lanes of traffic between Beardsley Road and the West Bottoms ▪ 110 feet long; steel girder single span ▪ 930 vehicles per day	▪ Built in 2004	▪ Bridge No. S030B12 - Good
16	I-70 Westbound Lanes of Lewis & Clark Viaduct	▪ MoDOT Bridge No. A0507 carries three westbound lanes of the Lewis & Clark Viaduct through the West Bottoms from Kansas City, MO to Kansas City, KS ▪ 4,340 feet long; continuous steel girder and floorbeam system (fracture critical); continuous prestressed concrete girder spans ▪ Carries approximately 38,000 vehicles per day ▪ Weight restricted to 50 Tons	▪ 59 years old ▪ Built in 1960 ▪ Rehabilitated in 1992 ▪ Repainted in 1994	▪ Bridge No. A0507 - Good
17	Ramps Connecting I-35 and I-70	▪ MoDOT Bridge Nos. A1128 and A1129 carry northbound I-35 to westbound I-70, and eastbound I-70 to southbound I-35, respectively ▪ 1,870 feet long (A1128) and 1,130 feet long (A1129); continuous steel plate girder and steel rolled beam spans ▪ Carries approximately 2,900 and 3,500 vehicles per day	▪ 64 years old ▪ Built in 1955 ▪ Repainted in 2000 ▪ Emergency repairs to A1129 in 2015	▪ Bridge No. A1128 – Fair; section loss at steel superstructure and substructure members ▪ Bridge No. A1129 - Fair; concrete deck spalling and expansion joint closure
18	US-169 Southbound Lanes over Airport North Access Road	▪ MoDOT Bridge No. A4645 carries US-169 southbound over access road at north end of airport ▪ 185 feet long; continuous concrete deck girder spans ▪ Carries approximately 20,500 vehicles per day	▪ 64 years old ▪ Built in 1955 ▪ Rehabilitated in 1989	▪ Bridge No. A4645 - Good

Component Location

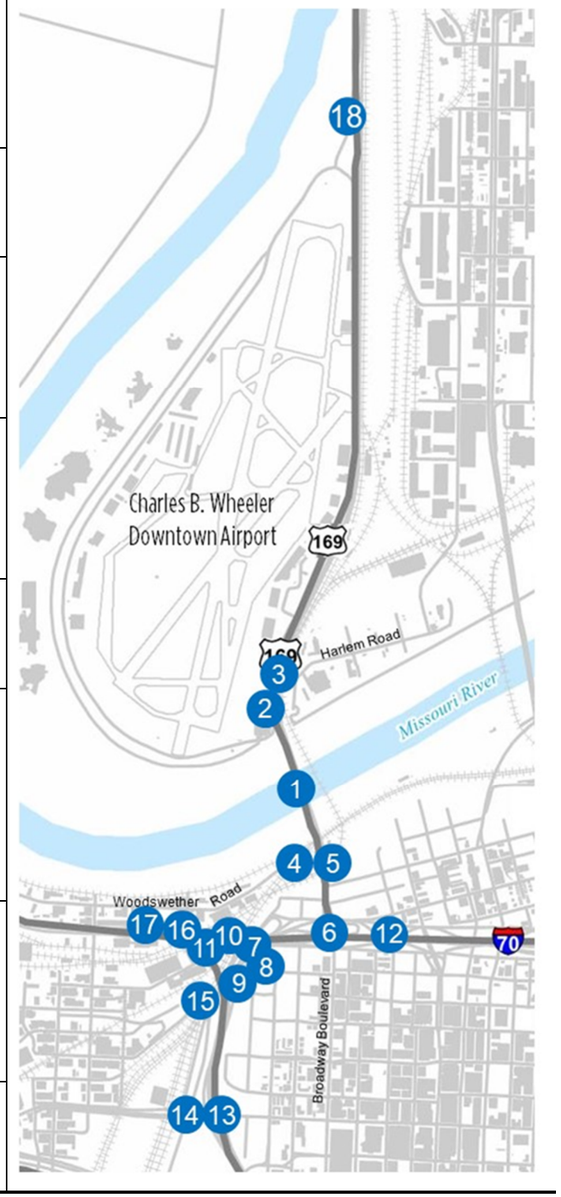


Table 2-2: Condition of Existing and Supporting Transportation Network Components (continued)

	Component	Description	Age	Condition	Component Location
A	US-169 Roadway from I-70 to MO-9	▪ Constructed in the 1950s, MoDOT has conducted routine maintenance of the facility over the past 60 years.	▪ +/- 60 years old	▪ US-169 southbound - Not Good ▪ US-169 northbound with exception of 1.88 miles from the Buck O-Neil Bridge to MO-9 – Not Good	
B	I-35/I-70 Mainlanes	▪ Constructed in the 1950s, MoDOT has conducted routine maintenance of the facility over the past 60 years.	▪ +/- 60 years old	▪ I-35 – Good, except southbound lanes through the I-70 interchange (2018) ▪ I-70 – Not Good (2018)	

2.1.2 NEED - Maintain a reliable regional transportation linkage across the Missouri River that services local and regional traffic and minimizes local traffic conflicts

The lack of travel capacity and presence of signalized intersections contribute to congestion and delay for drivers along the US-169 corridor. Existing layouts and sight distance issues at intersections contribute to congestion and travel delays particularly during peak travel periods. These same issues contribute to locations along the US-169 corridor that experience crash rates higher than those of similar roadways in the State. The existing US-169/Buck O'Neil Bridge crossing is one of nine major crossings of the Missouri River in the Kansas City area. The crossing's ability to ensure redundancy and serve as a detour route when any of the other eight bridges are partially or fully closed because of an incident or for routine repairs is hindered by these issues. Travelers on US-169 needing to access the regional roadway system to the south must travel through signalized intersections to access I-35 and I-70, particularly during peak travel periods.

Capacity and Congestion

In 2016, approximately 28,600 vehicles per day (average daily traffic = ADT) traveled northbound across the Buck O'Neil Bridge as compared to approximately 19,000 vehicles per day going southbound over the bridge. Peak hour volumes, which are the maximum number of vehicles per hour (VPH), in 2016 were approximately 2,700 VPH southbound in the morning and 3,300 VPH northbound in the evening. Peak hour volumes estimated for 2045[1] are approximately 3,100 VPH southbound in the morning and 3,900 VPH northbound in the evening.

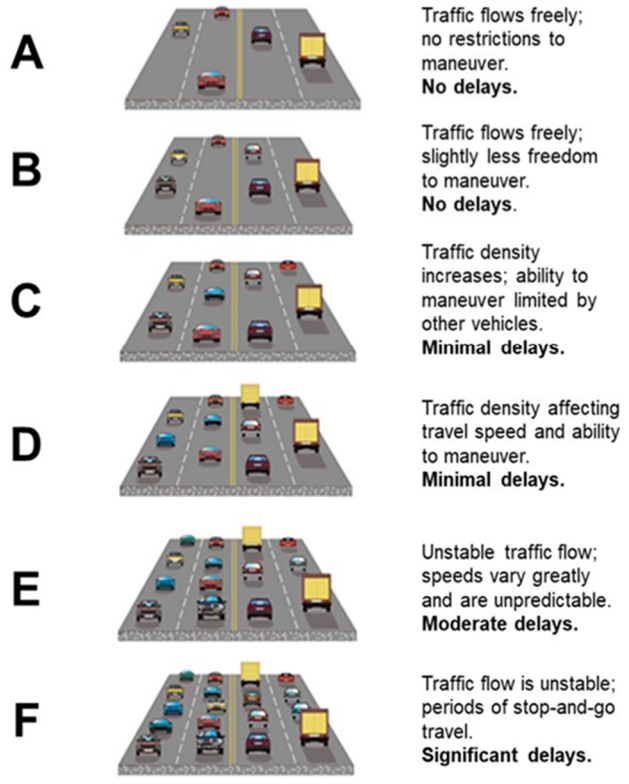
Under current conditions, travelers on US-169 experience significant delays and congestion during the morning and evening peak travel periods. The combined intersections at 5th/6th Streets and Broadway Boulevard operate today at LOS F and will continue to operate at LOS F as traffic volumes increase in the future (refer to graphic at the right). According to MoDOT's *Engineering Policy Guide*, the Peak Hour LOS goal for the 20-year traffic projection for an urban corridor should be 'E' and its Off-Peak Hour LOS should be 'D'.

The US-169 interchange with I-70 near the south end of the Buck O'Neil Bridge serves two differing purposes:

- connects US-169 traffic to the interstate system via either I-35 or I-70
- provides access to and from downtown

What is Level of Service?

Level of Service (LOS) is a measure of vehicles on the road and speed at which traffic moves along a roadway segment. LOS is expressed using a six-level, A to F, rating system.



[1] The traffic analysis and any traffic-based environmental analyses are based on MARC's 2040 Land Use and 2040 Regional Travel Demand Model. To meet the requirements of 23 U.S.C Section 109(b), traffic projections have been developed for year 2045 from growth rates using MARC's 2040 Regional Travel Demand Model. Future year 2045 was utilized because it ensures the twenty-year period is met. It is currently anticipated that construction will be complete by year 2024.

The constrained capacity of the US-169 corridor also results in:

- Excessive southbound queues from 5th Street north across the Buck O'Neil Bridge regularly exceed a mile in length
- Northbound I-35 queues, on the off-ramp to Broadway Boulevard, regularly extend well beyond the 6th Street and I-35 off-ramp gore at Washington Street
- Northbound Broadway Boulevard queues regularly extend from 5th Street south through 6th Street and into Downtown
- Westbound 5th Street queues at Broadway Boulevard regularly extend beyond the 5th Street, I-70 off-ramp merge point

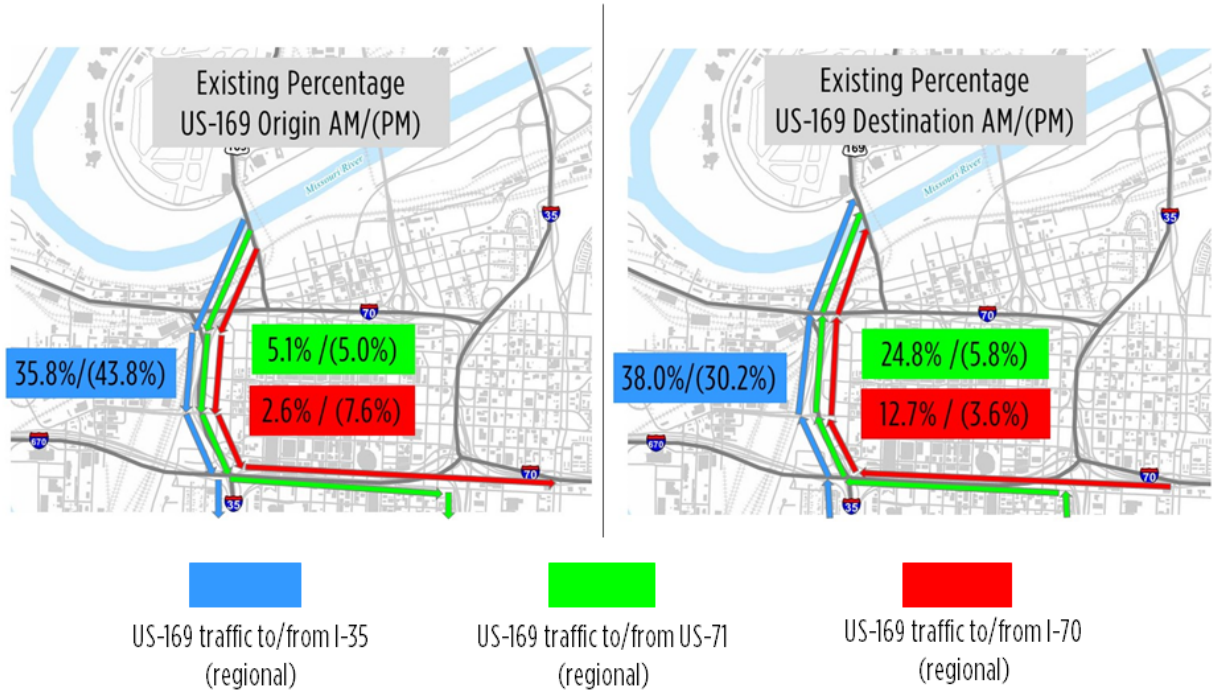
Based on the regional travel demand modeling conducted during the PEL, a significant "pent-up demand" exists for use of the I-70 interchange. If the current delays at the interchange are reduced, significant volumes of traffic will divert to this interchange from I-635, MO-9, I-35/I-29 and the east side of I-435.

Southbound US-169 traffic queues at the 5th Street intersection regularly extend across the Buck O'Neil Bridge for more than a mile in length during morning peak periods. During afternoon peak periods, northbound I-35 traffic queues on the off-ramp to Broadway Boulevard (US-169) regularly extend beyond the 6th Street/I-35 off-ramp, just south of the Buck O'Neil Bridge. Northbound Broadway Boulevard/US-169 traffic queues regularly extend from 5th Street south well into downtown during the afternoon peak periods. Westbound 5th Street traffic queues at Broadway Boulevard regularly extend beyond the 5th Street/I-70 off-ramp merge point during both the morning and afternoon peak periods.

Local and Regional Traffic Split

Based on origin and destination data collected by SkyComp, approximately half of the traffic traveling along US-169 through the study area is considered "local" or destined to/from local points in Kansas City's CBD. The other half of the traffic traveling along US-169 is considered "regional" or destined to/from points south via I-35, I-70, and US-71 or points north via MO-9 and I-29. This distribution is illustrated in Figure 2-1.

Figure 2-1: Regional and Local Traffic Distribution in the Study Area

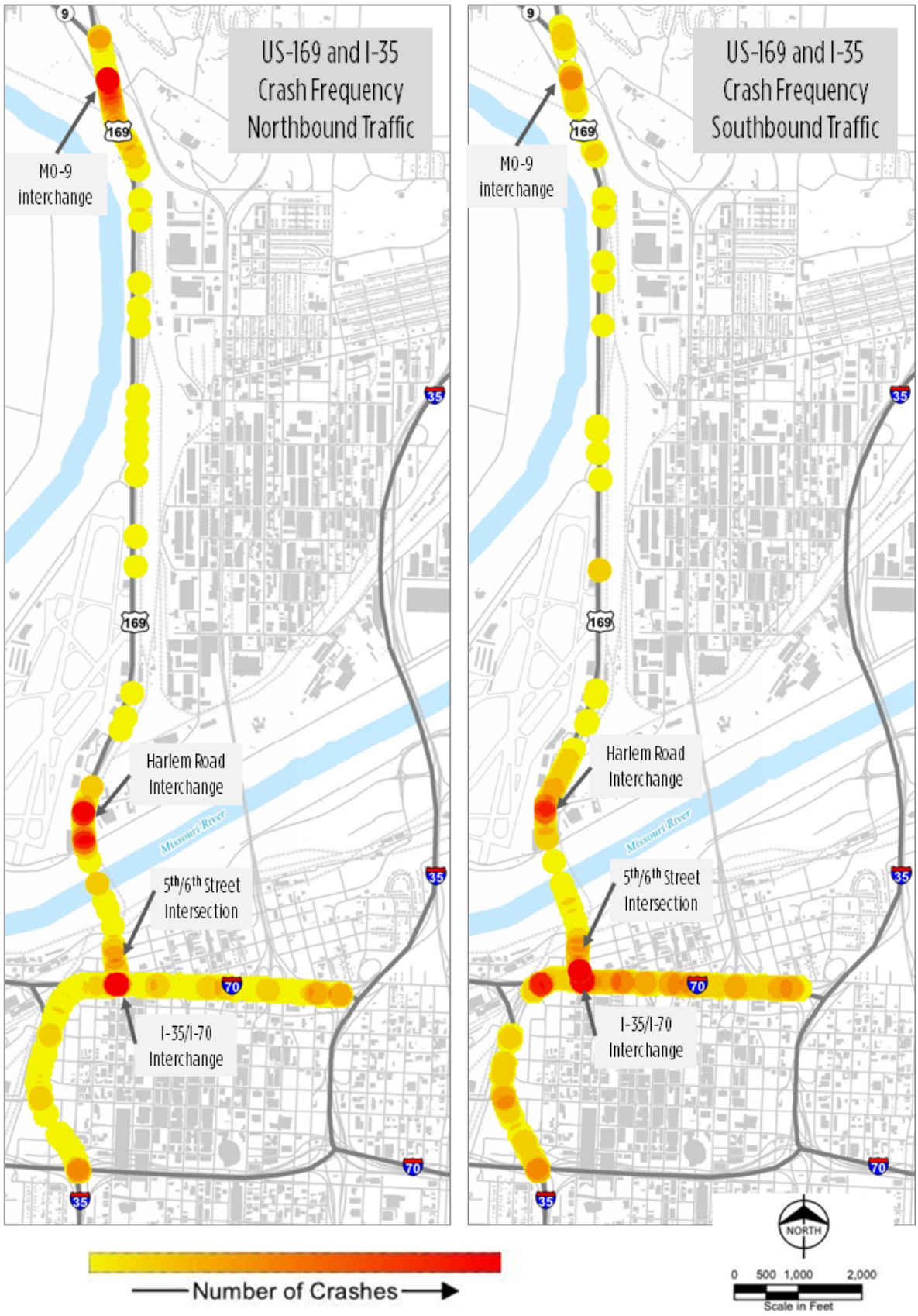


If no improvements are made to the existing crossing, the local-regional traffic split is anticipated to continue to occur into the future. However, with the forecast increase in traffic volumes using the crossing, some traffic may shift to using other roadways including the I-35/I-29 Kit Bond Bridge river crossing.

2.1.3 NEED - Improve the Operational and Safety Performance of the Missouri River Crossing for All Transportation Modes

Vehicular Safety and Crash History - The intersection layout north and south of the bridge, and the capacity of the existing crossing, contribute to lengthy traffic queues during peak travel periods, travel delays, and crashes. When crashes occur, disabled vehicles have no room to leave the travel lanes due to the lack of shoulders. Crashes within the study area occur at a more frequent rate than along other comparable Missouri freeways or other locations within the downtown Kansas City Loop. Crash rates are elevated at specific locations along the US-169 corridor including the I-35/I-70 interchange in the northwest corner of the loop, the intersection at 5th/6th Streets, the MKC/Harlem Road interchange, and the MO-9 interchange (see Figure 2-2).

Figure 2-2: Crash Frequency within the Study Area



Existing highway geometrics is one factor that contributes to the elevated number of crashes occurring within the US-169 corridor. Poor sight distance; short merge, diverge, and turning lanes; and poor lane continuity create vehicle operating conditions that are not consistent with driver expectations. These conditions lead to a higher number of crashes classified as either changing lanes or attempting to pass along US-169 and other routes within the study area. The locations of elevated crash rates depicted in Figure 2-2 are locations where the layout and function of the intersections are substandard:

- MO-9 interchange at the north end of the study area – poor roadway layout (geometry) and poor sight distance
- MKC/Harlem Road interchange – left-hand exit for northbound US-169 traffic, limited sight distance and short ramp length for southbound traffic merging onto US-169, poor sight distance at Richards Road/Harlem Road roundabout
- Intersections with West 5th and West 6th Streets - signalized intersection and short mainlanes and ramps; function together as a diamond interchange with I-70
- I-35/I-70 interchange – roadway layout

The largest proportion of crashes within the US-169 corridor are classified as rear-end crashes, accounting for more than 42 percent of the crashes reported from 2015 to 2017. Rear-end crashes are indicative of increased congestion and most frequently occur during traffic back-ups. Crash severity within the US-169 corridor is heavily weighted to property damage only. Of the 827 crashes that have occurred within the corridor over the past 3 years, 76 percent are property damage only accidents, 21 percent resulted minor injuries, and 1 percent resulted in disabling injuries. Three fatalities occurred over the 3-year period resulting from 2 crashes on southbound US-169.

Emergency Response – Intersection layouts, sight distance issues, and lack of shoulders contribute to a high number of traffic incidents along US-169 and at both ends of the Buck O'Neil Bridge (refer to Figure 2-2). During peak travel periods incidents in combination with long vehicle queues affect the reliability of the crossing to support travel and access by emergency vehicles. The US-169 crossing supports emergency vehicle access to and from police, fire, and EMS facilities on both sides of the river as well as access to MKC which serves the Federal National Disaster Medical System, Children's Mercy Hospital, and the Midwest Organ Transplant Network. Critically ill patients and medical supplies received through these services are transported by vehicle to hospitals located south of the river (e.g., Children's Mercy, St. Luke's Hospital of Kansas City, University of Kansas Medical Center). Traffic movement impeded by crashes also can affect the use of US-169 northbound, I-70 east and westbound, I-35 southbound, and I-670 westbound all primary evacuation routes for the CBD, as designated in the KCMO Local Emergency Operations Plan. These routes are part of an overall transportation system that provide lifeline services within the community and are vitally important for response and recovery operations.

Bicycle and Pedestrian Traffic –The Missouri River is a substantial barrier to bicycling in the region due to the small number of crossings. Most of the existing river crossings carry high vehicle volumes and four are classified as interstates. The US-169/Buck O'Neil Bridge crossing lacks defined shoulders or off-travelway accommodations to support the safe passage of bicyclists and pedestrians. The existing bridge's limited width and arch/deck design is difficult to modify.

KCMO's *Bike KC Master Plan (2019 Draft)* includes a future bicycle/pedestrian facility along US-169 connecting trails in the CBD, West Bottoms, and River Market areas to future trails around MKC and within the Harlem neighborhood. In MARC's 2015 *Greater Kansas City Regional Bikeway Plan,* the Buck O'Neil Bridge was given an "F" rating based on its Bicycle Level of Service because of its lack of bike lanes, shoulders or sidewalks. The Kansas City Major River Crossings Policy (approved by the MARC board on April 25, 2006) and the Regional Completed Streets Policy (approved by the MARC board on March 27, 2012) specify the need for major river crossings to accommodate bicycle and pedestrian facilities. Residential developments continue to expand on both sides of the river, increasing the potential need for bicycle and pedestrian connectivity across

the river. Kansas City River Trails Inc. maintains the Riverfront Heritage Trail, along the southside of the river, that crosses the study area both within dedicated rights-of-way and on shared-use paths within public rights-of-way. The trail is used both for transportation and recreation.

Transit – The Kansas City Area Transit Authority (KCATA) maintains bus Route 229 (Boardwalk-KCI) and Route 237 (West Gladstone) that accommodate both regular and peak or midday bus service across the Buck O'Neil Bridge. The route connects to the Metro North Park & Ride at Barry Road and US-169 and the 10th Street and Main Transit Center in the CBD. Bus service is also affected by delays that occur during peak travel periods along the corridor and when crashes or other incidents occur on the bridge or along US-169.

3.0 Alternatives Considered

This chapter describes the process used to develop and screen alternatives in order to recommend a preferred alternative for implementation. The strategies identified in the *Beyond the Loop* PEL to improve the US-169 river crossing served as the starting point for development of the alternatives described in this chapter. MoDOT used a qualitative screening process to compare the initial alternatives to the Purpose and Need and established performance areas to further compare the alternatives that met the purpose and need. The screening process identified three reasonable alternatives that are carried forward for detailed evaluation as presented in Chapter 4 of this environmental document.

Alternatives carried forward in the NEPA process must connect logical termini, have independent utility, and not restrict consideration of other reasonably foreseeable transportation improvements. The effects of the alternatives as described in Chapter 4.0 extend to the planning horizon of 2040.

3.1 Overview of the Alternatives Development and Screening Process

Alternatives were developed based on the river crossing alignments advanced from the *Beyond the Loop* PEL and then screened through a multi-step process to determine which alternatives should be studied in greater detail.

The alternatives initially considered (see Section 3.2) ranged from 'do nothing' (No-Build) and major rehabilitation of the existing bridge to construction of a crossing on a new alignment that would require removal of the existing Buck O'Neil Bridge.

In order to identify the best solutions to address the transportation needs, a three-step process for screening the initial alternatives was developed. At each step in the screening process, alternatives that did not meet the screening criteria were removed from further consideration, with the rest of the alternatives advancing to the next step in the screening process. The steps in the screening process described in this chapter include:

- Step 1 – Screen the Initial Alternatives Against the Purpose and Need
- Step 2 – Screen the Initial Alternatives Against Performance Areas and Performance Criteria
- Step 3 – Scoring Based on Weighted Performance Criteria

The remainder of this chapter describes the alternatives considered from the initial range of alternatives, through the screening process, to selection of a preferred alternative.

Alternatives considered to provide an improved river crossing must:

- Connect **logical termini** and be of sufficient length to address environmental matters on a broad scope
  The logical termini for the US-169/Buck O'Neil Bridge Crossing of the Missouri River extend from MO-9 on the north to 12th Street and I-35 on the south.
- Have **independent utility** – be useable and be a reasonable expenditure even if no additional transportation improvements are made
  The reasonable alternatives considered must provide an improvement of the river crossing without requiring any other projects to be completed beyond what is included in the described alternatives.
- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements
  Implementation of a selected design solution shall not preclude the advancement of other strategies including those identified in the PEL.

SOURCE: 23 CFR 771.111

What public input was received during the PEL and this environmental study?

During both the PEL and this environmental study, the public provided input in support of a new bridge and river crossing location and providing separate roadway connections to local destinations and regional highways. The public indicated the importance of a direct connection to I-35 and preferences for connections to Broadway Boulevard and 5th/6th Streets. Accommodating bicycle/pedestrian facilities on the new crossing was also important to the public.

3.2 Initial Range of Alternatives

The initial alternatives described below, with additional detail provided in Table 3-1, were divided into three segments (North, River, and South) to assist in comparing their benefits and effects. Additional information on the development of the initial alternatives is provided in Appendix B.

No-Build Alternative – No improvements would be made to the existing river crossing and a new bridge would not be built. Only required maintenance of the crossing would occur. The repairs made during the rehabilitation completed in November 2018 only addressed the most critical issues and extended the useful life of the crossing by five to seven years.

Transportation Systems Management (TSM)/Transportation Demand Management (TDM) – The primary focus of this alternative is to make operational modifications to the existing transportation system without addressing the condition of the existing crossing. TSM approaches seek to enhance the travel capacity and operations by providing intersection or signal timing modifications, ramp metering, intersection turn restrictions, and traffic surveillance and control systems. TDM would encourage the use of other travel options (e.g., existing transit systems, non-motorized modes [bike/ped], telecommuting, and varied work and travel schedules) to reduce the number of vehicles traveling the roadway system. These measures often also help to improve traffic congestion, air quality, and the function of the overall existing transportation system. MARC's Congestion Management System Toolbox Update (2013) provides additional guidance and descriptions of these measures as they apply to the region.

Transit – Consideration is given to whether new or existing transit services (e.g., bus, streetcar, light rail, etc.) would be able to satisfy the established needs. The US-169 corridor carries a variety of traffic, including buses, linking MO-9 and I-29 to the north with I-70, I-670, and I-35 to the south. KCATA provides regular and peak/mid-day bus service along Route 237 traveling along US-169. Route 237 connects to regular and MaxBus service routes within the downtown area. The Kansas City Streetcar Authority (KCSA) manages streetcar service outside of the study area along Main Street connecting the River Market and Union Station.

Major Rehabilitation of the Existing Bridge – The rehabilitation study conducted by MoDOT in 2017 indicated that a major rehabilitation of the Buck O'Neil Bridge could extend the life of the bridge by 30 to 40 years. Major rehabilitation would include removal and replacement of the concrete deck, rehabilitation of the existing arch spans and approach spans, and other significant structural repairs. With rehabilitation, replacement or removal of the existing bridge would be required after 2055. A 5-foot wide sidewalk could be accommodated with replacement of the bridge deck. Additionally, a separate bicycle/pedestrian facility could be constructed on the outside of the arches but would be highly challenging and potentially costly. US-169 north of the river would not be improved and no changes would be made to the MKC access points. Major rehabilitation would potentially close the crossing to traffic for two years or more.

Major Rehabilitation of Only the Existing Arch Spans and Approach Spans of the Existing Bridge – This alternative would rehabilitate only the existing arch spans, the most iconic visual element of the Buck O'Neil Bridge, in conjunction with the complete replacement of the approach spans. Like the Major Rehabilitation Alternative described above, only a 5-foot wide bicycle/pedestrian facility could be added to the arch spans. Again only 30 to 40 years of service life would be gained with implementation of this alternative. The new approach spans would include a wider shared use path and would be designed for 100 years of service life. Limited geometric improvements would be made to the access points into MKC and at 5th Street and Broadway Boulevard. Major rehabilitation would potentially close the crossing to traffic for two years or more.

Major Rehabilitation of the Existing Bridge + Construct a New Bridge – A major rehabilitation of the existing bridge would be paired with construction of a new bridge adjacent to the existing bridge under this alternative. The Buck O'Neil Bridge would remain in place for 30 to 40 years following completion of the major rehabilitation as described above. The new adjacent river bridge would carry additional travel lanes and accommodate a 10-foot wide bicycle/pedestrian use path. Improvements would be made to tie the new river

bridge lanes into the regional roadway system at 5th Street and Broadway Boulevard. At the north end of the river bridges, the new bridge and the existing bridge must converge in a highly constrained area MKC and the BNSF Railroad. Additionally, improvements would be made at the existing airport access points.

Construct a New River Crossing "In-Like-and-Kind" on the Existing Alignment or an Adjacent Alignment - This alternative would remove the existing Buck O'Neil Bridge and construct a replacement river bridge "in-like-and-kind" similar in configuration to the existing river crossing. Minor improvements would be made at the MKC accesses and at 5th Street and Broadway Boulevard. A 10-foot wide bicycle/pedestrian path would be provided on the new bridge. Additional right-of-way would be needed for both the on-existing and adjacent alignment, including relocation of buildings near 3rd Street and Broadway Boulevard to accommodate the widened structure and supporting roadways. Building the new bridge on an adjacent alignment would allow the existing bridge to remain in-service during construction. Construction on the existing alignment would potentially close the crossing to traffic for two years or more. No improvements would be made north of the river.

The following build alternatives were based on the three river crossing alignments advanced from the PEL – West (Western in the PEL), Central, and Adjacent as depicted in Figure 3-1. All three build alternatives would remove the existing Buck O'Neil Bridge.

West – Build a New Crossing on an Alignment West of the Existing Crossing – A new bridge would be constructed on an alignment west of the existing bridge. North of the river, improvements would be made along US-169 between MO-9 and the new bridge to improve access to MKC. South of the river, connections would provide access to the local downtown roadway system at 5th/6th Street and flyover ramps would connect to I-35 north of 12th Street.

Central – Build a New Crossing on an Alignment Central to the Existing Crossing - A new bridge would be constructed on a 'central' alignment not as far west as the west alignment. North of the river, improvements would be made along US-169 between MO-9 and the new bridge to improve access to MKC. South of the river, connections would provide access to the local downtown roadway system at Broadway Boulevard and flyover ramps would connect to I-35 north of 12th Street.

Adjacent – Build a New Crossing on an Alignment Adjacent to the Existing Alignment - A new bridge would be constructed adjacent to the existing alignment. North of the river, improvements would be made along US-169 between MO-9 and the new bridge to improve access to MKC. South of the river, connections would provide access to the local downtown roadway system at Broadway Boulevard and flyover ramps would connect to I-35 north of 12th Street. Each initial alternative is described in more detail by study segment in Table 3-1.

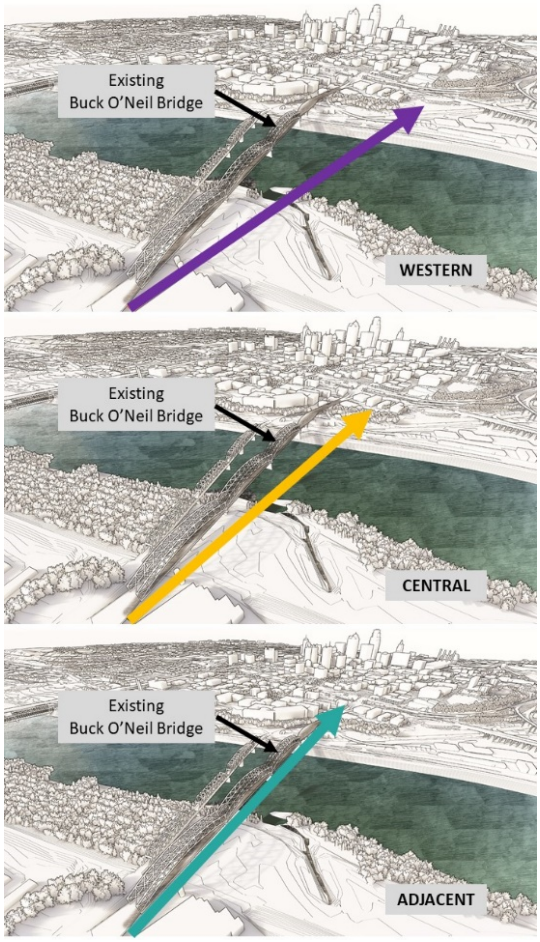


Figure 3-1: River Crossing Alignments Carried Forward from the PEL (arrow showing crossing alignment from north [left] to south [right])

Table 3-1: Initial Range of Alternatives

Initial Alternatives	Description by Study Segment			Segment Map
	North Segment	River Segment	South Segment	
No-Build	▪ No improvements to existing airport accesses ▪ Includes planned/programmed maintenance of US-169 and other roadways and structures	▪ No further rehabilitation or replacement of the bridge or approach spans ▪ Includes planned/programmed maintenance of the bridge and approach spans	▪ No construction or replacement of existing roads, structures, or ramps ▪ Includes planned/programmed maintenance of US-169 and other existing roadways and structures	
Transportation Systems Management / Transportation Demand Management	▪ Implement corridor wide appropriate strategies from MARC's Congestion Management System Toolbox Update (2013) such as: alternative work hours, telecommuting, ridesharing, guaranteed ride policies, alternate travel modes, or variable lane tolling ▪ Limited physical improvements would be made to existing roadways and structures			
Transit	▪ No physical improvements made to roadways or structures ▪ Existing transit services would continue and could be expanded			
Major Rehabilitation of the Existing Bridge	▪ Major rehabilitation of north approach spans ▪ No improvements to existing airport accesses ▪ Includes planned/programmed maintenance of US-169 and other roadways and structures	▪ Major rehabilitation of existing arch spans, beyond the repairs made in 2018; estimated to extend the useful life of the bridge for 30 to 40 years after completion ▪ Includes 5-foot wide bike/ped facility on one side of the bridge	▪ Major rehabilitation of south approach spans ▪ Includes planned/programmed maintenance of US-169 and other existing roadways and structures	
Major Rehabilitation of Only the Existing Arch Spans and Replacement of Approach Spans of the Existing Bridge	▪ Replaces north approach spans ▪ Makes minimal improvements to existing airport accesses ▪ Includes planned/programmed maintenance of US-169 and other roadways and structures	▪ Major rehabilitation of existing arch spans only, beyond the repairs made in 2018; estimated to extend the useful life of this portion of the bridge for 30 to 40 years after completion ▪ Includes 5-foot wide bike/ped facility on one side of the bridge	▪ Replaces south approach spans ▪ Makes minimal improvements to 5th/6th Street and Broadway intersections ▪ Includes planned/programmed maintenance of US-169 and other existing roadways and structures	
Major Rehabilitation of the Existing Bridge + Construct a New Bridge	▪ Major rehabilitation of north approach spans and/or construct new approach spans to carry additional travel lanes ▪ Makes minimal improvements to existing airport accesses ▪ Includes planned/programmed maintenance of US-169 and other roadways and structures	▪ Major rehabilitation of existing arch spans, beyond the repairs made in 2018; estimated to extend the useful life of the bridge for 30 to 40 years after completion ▪ Constructs new bridge adjacent to the existing bridge to carry additional travel lanes and a 10-foot wide bike/ped facility on one side of the bridge	▪ Major rehabilitation of south approach spans and/or construct new approach spans to carry additional travel lanes ▪ Makes minimal improvements to 5th/6th Street and Broadway intersections ▪ Includes planned/programmed maintenance of US-169 and other existing roadways and structures	
Construct New River Crossing "In-Like-and-Kind" on Existing Alignment or an Adjacent Alignment	▪ Constructs new north approach spans to river crossing and new spans over Harlem Road ▪ Improves existing north and center airport accesses ▪ Improves Harlem/Richards Road interchange	▪ Constructs new crossing, including a new bridge, on the existing crossing alignment ▪ Includes 10-foot wide bike/ped facility on one side of the bridge ▪ Removes existing Buck O'Neil Bridge	▪ Constructs new south approach spans to the river crossing ▪ Makes minimal improvements to 5th/6th Street and Broadway intersections ▪ Includes planned/programmed maintenance of US-169 and other roadways and structures	

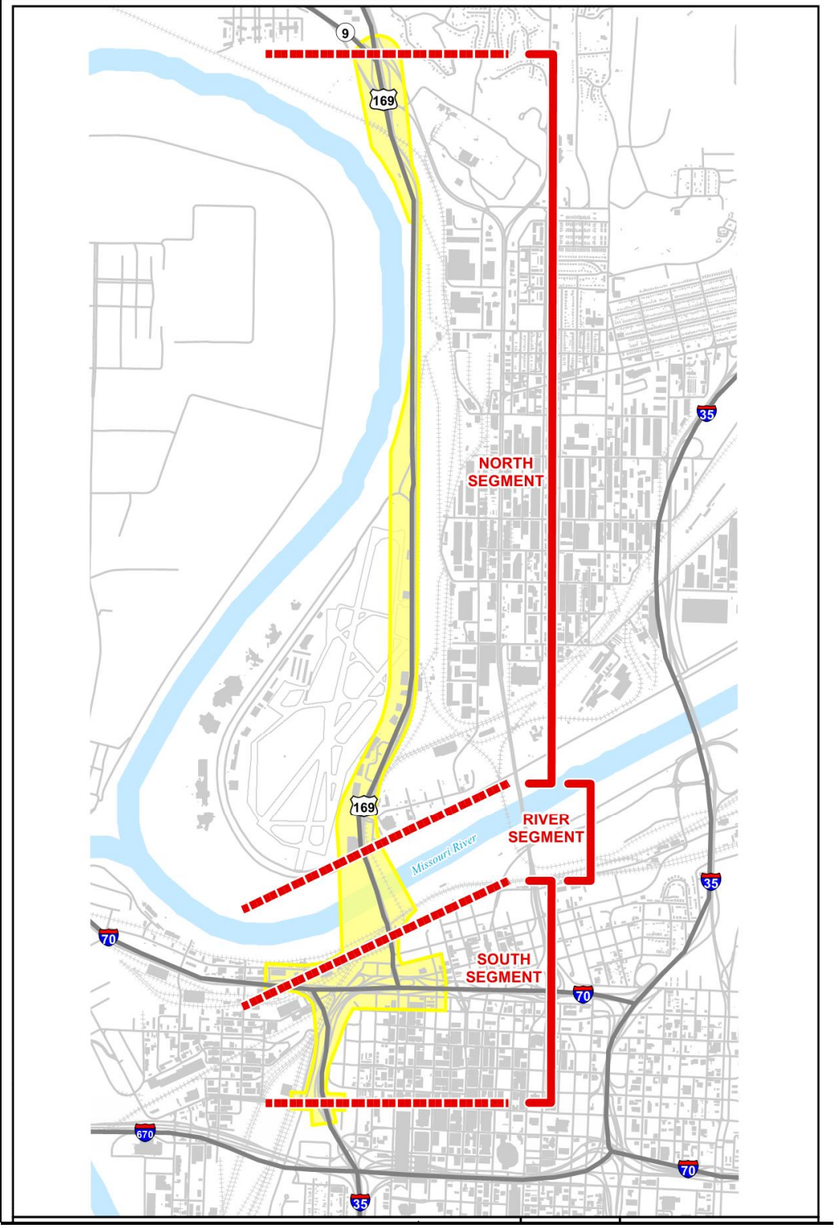
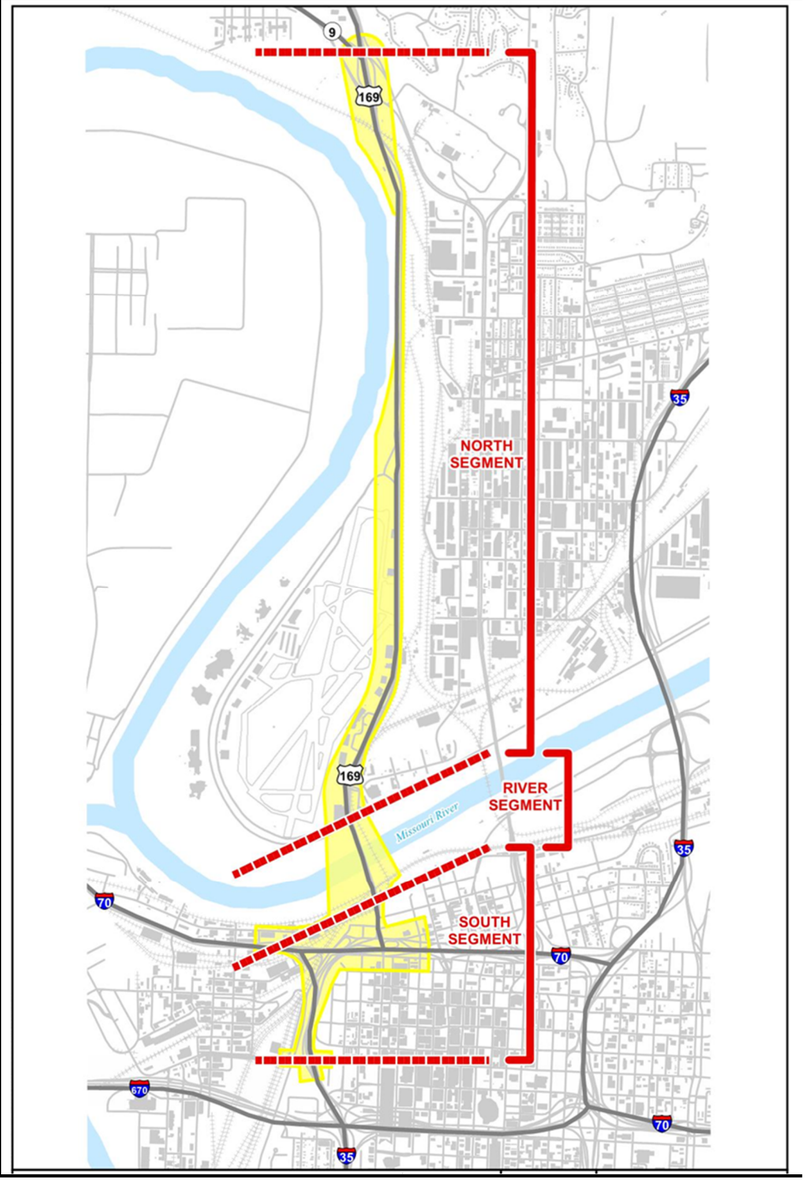


Table 3-1: Initial Range of Alternatives, continued

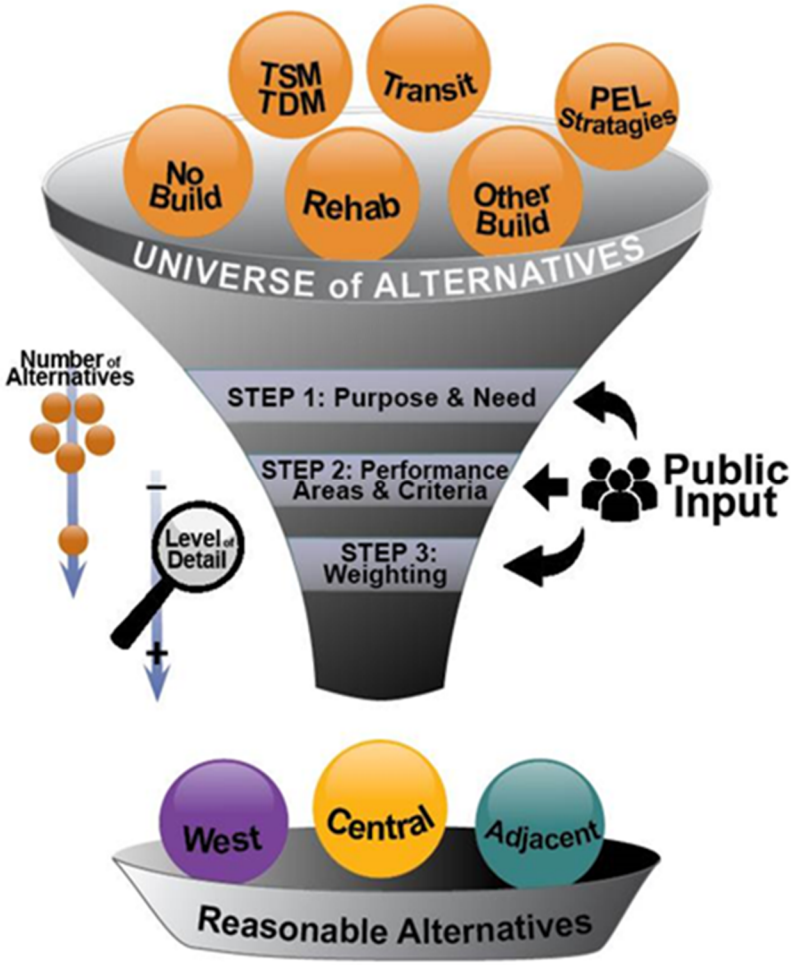
Initial Alternatives	Description by Study Segment			Segment Map
	North Segment	River Segment	South Segment	
West – Construct New River Crossing on Western Alignment	▪ Constructs new north approach spans to river crossing and new spans over Harlem Road ▪ Improves existing north and center airport accesses ▪ Improves Harlem/Richards Road interchange	▪ Constructs new crossing, on a western alignment compared to the existing US-169 river crossing ▪ Includes 10-foot wide bike/ped facility on one side of the bridge ▪ Removes existing Buck O'Neil Bridge ▪ New bridge would provide 100-year service life	▪ Constructs new south approach spans to the river crossing ▪ Constructs ramps to local street grid on a western alignment along 5th/6th Street ▪ Constructs direct connection to I-35 on a western alignment with flyover ramp structures ▪ Replaces I-35 ramp bridges over I-70 & 6th Street ▪ Replaces I-70 bridges over Beardsley Road and Railroad ▪ Reconstructs I-35 roadways and walls along bluff south of I-70 ▪ Restores/improves Broadway Boulevard at grade from 3rd Street to 5th Street ▪ Removes northbound Broadway Boulevard to westbound I-70 loop ramp ▪ May replace Woodswether Bridge	
Central – Construct New River Crossing on Central Alignment	▪ Constructs new north approach spans to river crossing and new spans over Harlem Road ▪ Improves existing north and center airport accesses ▪ Improves Harlem/Richards Road interchange	▪ Constructs new crossing, on a central alignment compared to the existing US-169 river crossing ▪ Includes 10-foot wide bike/ped facility on one side of bridge ▪ Removes existing Buck O'Neil Bridge ▪ New bridge would provide 100-year service life	▪ Constructs new south approach spans to the river crossing ▪ Constructs ramps to local street grid on an adjacent alignment along Broadway Boulevard ▪ Constructs direct connection to I-35 on a western alignment with flyover ramp structures ▪ Replaces I-35 ramp bridges over I-70 & 6th Street ▪ Reconstructs I-35 roadways and walls along bluff south of I-70 ▪ Restores/improves Broadway Boulevard at grade from 3rd Street to 4th Street; and removes Broadway Boulevard between 4th Street and 5th Street. ▪ Removes northbound Broadway to westbound I-70 loop ramp ▪ May replace Woodswether Bridge	
Adjacent – Construct New River Crossing on an Adjacent Alignment	▪ Constructs new north approach spans to river crossing and new spans over Harlem Road ▪ Improves existing north and center airport accesses ▪ Improves Harlem/Richards Road interchange	▪ Constructs new river crossing, on an alignment adjacent to the existing US-169 river crossing ▪ Includes 10-foot wide bike/ped facility on one side of the bridge ▪ Removes existing Buck O'Neil Bridge ▪ New bridge would provide 100-year service life	▪ Constructs new south approach spans to the river crossing ▪ Constructs ramps to local street grid on an adjacent alignment along Broadway Boulevard ▪ Constructs direct connection to I-35 or increases capacity through existing intersections ▪ Replaces I-35 ramp bridges over I-70 & 6th Street ▪ Reconstructs I-35 roadways and walls along bluff south of I-70 ▪ Removes Broadway Boulevard at grade from 3rd Street to 5th Street ▪ Removes northbound Broadway to westbound I-70 loop ramp ▪ May replace Woodswether Bridge	

3.3 Alternatives Screening Process

Following identification of the initial alternatives, MoDOT used a three-step screening process to determine which alternatives should be carried forward for detailed review in this environmental document. The alternatives screening process consisted of the following steps as illustrated in Figure 3-2.

- STEP 1 – Screen the Initial Alternatives Against the Purpose and Need
- STEP 2 – Screen the Initial Alternatives Against Performance Areas and Performance Criteria
- STEP 3 – Scoring Based on Weighted Performance Criteria

Figure 3-2: Alternatives Screening Process



3.4 Screening Step 1 – Screening the Alternatives Against the Purpose and Need

The initial alternatives were compared to the needs identified for the project. Figure 3-3 is the Step 1 Screening Matrix that shows this comparison. Although the No-Build Alternative does not satisfy the stated needs, it must be carried forward as part of the NEPA process as a baseline and for comparison with the effects of the build alternatives. Alternatives that fully satisfied the established needs were carried forward to the next step in the screening process.

Figure 3-3: Step 1 Screening Matrix – Screen Against Purpose and Need

NEEDS	NO BUILD	TSM / TDM	TRANSIT	MAJOR REHAB OF EXISTING BRIDGE	MAJOR REHAB ARCH SPANS + APPROACH SPANS	MAJOR REHAB OF EXISTING + CONSTRUCT NEW BRIDGE	CONSTRUCT NEW BRIDGE REPLACE IN LIKE/KIND	WEST ALTERNATIVE	CENTRAL ALTERNATIVE	ADJACENT ALTERNATIVE OPTION #1	ADJACENT ALTERNATIVE OPTION #2	ADJACENT ALTERNATIVE OPTION #3
NEED - Maintain infrastructure												
Improves service life of crossing structure	🔴	🔴	🔴	🟡	🟡	🟡	🟢	🟢	🟢	🟢	🟢	🟢
Corrects structural deficiencies	🔴	🔴	🔴	🟡	🟡	🟡	🟢	🟢	🟢	🟢	🟢	🟢
Minimizes long-term maintenance costs	🔴	🔴	🔴	🔴	🔴	🔴	🟢	🟢	🟢	🟢	🟢	🟢
NEED - Maintain reliable regional connection across the Missouri River												
Accommodates local and regional travel demand	🔴	🔴	🔴	🟡	🟡	🟡	🟡	🟢	🟢	🟢	🟢	🟢
Services access to local and regional destinations	🔴	🔴	🟡	🟡	🟡	🟡	🟡	🟢	🟢	🟢	🟢	🟢
Minimizes local traffic flow conflicts	🔴	🔴	🔴	🟡	🟡	🟡	🟡	🟢	🟢	🟡	🟡	🟢
Reduces traffic congestion	🔴	🟡	🔴	🔴	🔴	🔴	🔴	🟢	🟢	🟢	🟢	🟢
Improves travel times during peak hours	🔴	🟡	🔴	🔴	🔴	🔴	🔴	🟢	🟢	🟢	🟢	🟢
NEED - Improve operational and safety performance for all transportation modes												
Eliminates/minimizes travel and access conflicts	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🟢	🟢	🟡	🟡	🟢
Improves traffic operation over No Build condition	🔴	🟡	🔴	🟡	🟡	🟡	🟡	🟢	🟢	🟡	🟡	🟢
Eliminates/minimizes safety hot spots	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🟢	🟢	🟡	🟡	🟢
Supports modal connectivity including bike/ped	🔴	🔴	🟡	🟡	🟡	🟡	🟢	🟢	🟢	🟢	🟢	🟢
DOES ALTERNATIVE MEET PURPOSE & NEED?	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
ALTERNATIVE CARRIED FORWARD?	YES	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES

🔴 Does not meet the stated need 🟡 Partially meets the stated need 🟢 Fully meets the stated need

3.4.1 Alternatives Eliminated from Consideration Following Step 1 Screening

Following Step 1 Screening, the following alternatives were eliminated from further consideration.

3.4.1.1 Transportation Operations and Management and Transportation Demand Management

Making only modifications to how the existing transportation system functions does not address the condition of the bridge nor would it improve the river crossing. Both TSM and TDM actions were determined not to be reasonable options because they would not improve the condition of the crossing, would not provide a reliable crossing, and would not service direct connections to local and regional destinations. Telecommuting, use of non-motorized modes, and imposing varied travel schedules would not address the needs of the public that travel this corridor to access air travel (MKC and the Kansas City International Airport). For these reasons, these strategies were eliminated from further consideration.

3.4.1.2 Transit

Neither existing bus nor streetcar service can fully meet the transportation needs identified. Transit service would not address the condition of the existing river crossing and would not accommodate the volume of travelers or support connections to both local and regional destinations as indicated by the traffic modeling conducted for the study area. Neither KCATA or KCSA have plans to add or extend service to the Broadway/US-169 corridor, Transit does work in combination with other improvements to meet the needs of the traveling public but is not seen as a standalone solution to address the needs identified at this time. For these reasons, transit was eliminated from further consideration.

3.4.1.3 Major Rehabilitation of the Existing Bridge

Major rehabilitation would not satisfy the identified needs. The initial cost of more than $50 million would only extend the useful life of the crossing by 30 to 40 years, with possible replacement of the existing bridge considered at that time. To facilitate rehabilitation, the crossing would be closed to traffic for two years or more. For these reasons, major rehabilitation was eliminated from further consideration.

3.4.1.4 Major Rehabilitation of Only the Arch Spans and Approach Spans of the Existing Bridge

Rehabilitation of only the arch spans and replacement of the approach spans would not satisfy the identified needs. The initial cost of more than $60 million would only extend the useful life of the crossing by 30 to 40 years, with possible replacement of the existing bridge considered at that time. Like the Major Rehabilitation Alternative, this alternative would close the crossing to traffic for two years or more. For these reasons this alternative was eliminated from further consideration.

3.4.1.5 Major Rehabilitation of the Existing Bridge + Construct a New Bridge

Construction of a new bridge would place additional piers in the Missouri River offset from the piers supporting the existing Buck O'Neil Bridge resulting in hydraulic blockage of the river channel. The flow blockage can cause a "rise" condition in the river and make obtaining a floodplain certification from the Missouri State Emergency Management Agency (SEMA) challenging. Hydraulic mitigation measures would need to be investigated and approved by the USACE, which could include excavating along the river channel in the proximity of the crossing to provide additional flood storage. To construct new piers in-line with the existing piers and possibly avoid or minimize hydraulic blockage and the need for mitigation, a longer bridge span would be needed, adding cost to the overall project.

The cost associated with major rehabilitation of the existing bridge would only extend the useful life of the existing bridge by 30 to 40 years, with possible replacement of the existing bridge considered at that time. Combined with the cost of a new bridge and the potential hydraulic impacts, this alternative was eliminated from further consideration.

3.4.1.6 Construct New River Crossing "In-Like-and-Kind" on or Adjacent to Existing Alignment

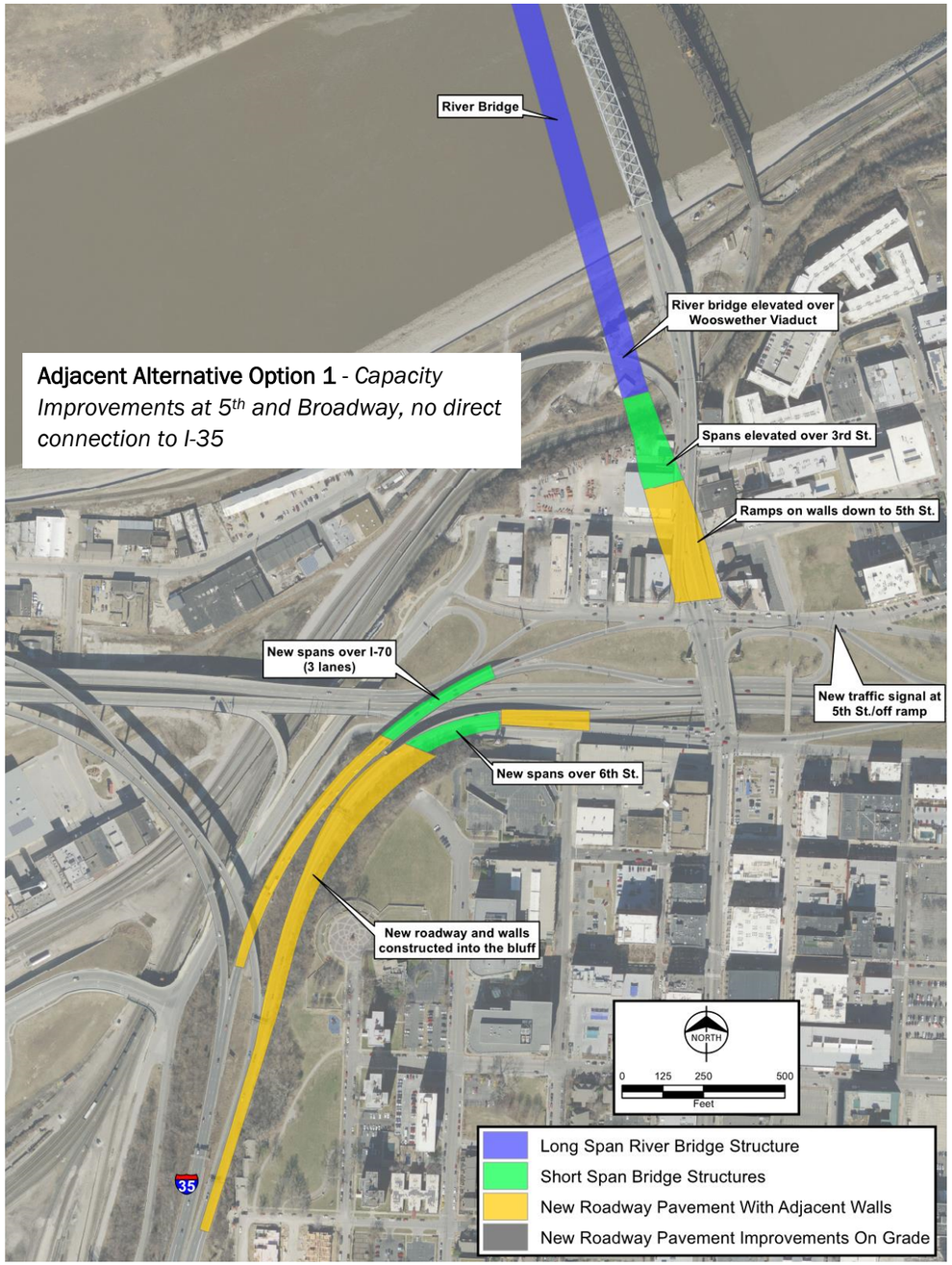
A new bridge constructed on either alignment would only accommodate the same number of lanes as the existing bridge and provide no additional roadway capacity at the 5th/6th Street intersections or along the northwest corner of the loop. Neither congestion nor mobility would be improved over existing conditions. Construction on either alignment would potentially close the crossing to traffic for two years or more. For these reasons this alternative was eliminated from further consideration.

3.5 Modification of the Adjacent Alternative

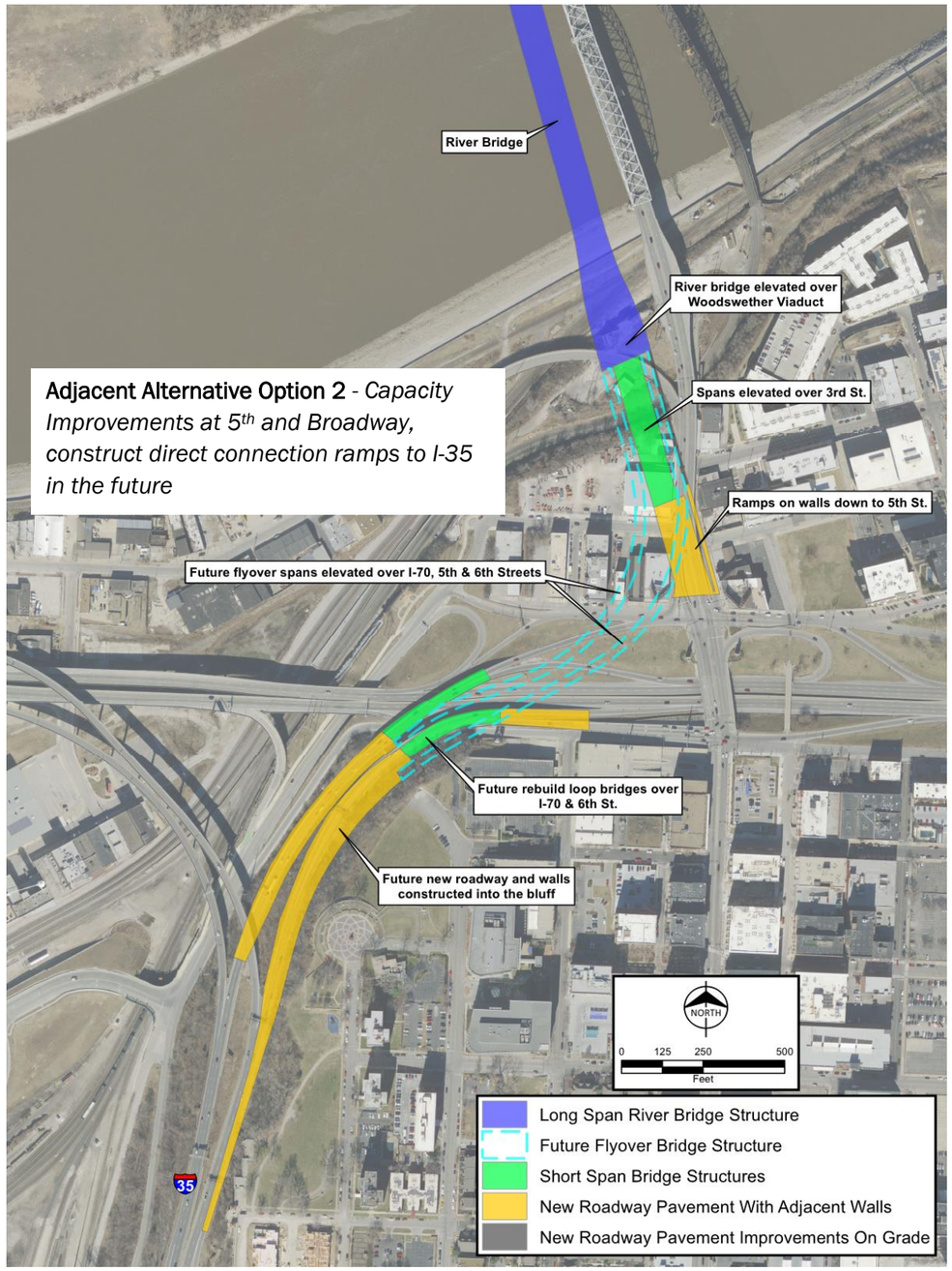
Following completion of Step 1 Screening, MoDOT decided to look at additional layout options under the Adjacent Alternative to address traffic operations and possibly reduce construction costs. After the February 2019 public meeting, MoDOT conducted additional traffic modeling that indicated the build alternatives with direct connect flyovers to I-35 could experience similar delay and congestion during peak travel hours as a build alternative without direct connect flyovers to I-35. Based on these findings, MoDOT developed and evaluated two additional design options under the Adjacent Alternative shown in Figure 3-4.

- Adjacent Alternative – Option 1 – *Capacity Improvements at 5th and Broadway, no direct connection to I-35*: This option would provide an expanded multi-lane at-grade intersection at 5th and Broadway but would not provide direct connect ramps to I-35. In place of the flyover ramps, additional through-travel and turn lanes would be added at the intersection of 5th /6th Streets and Broadway to allow more vehicles to pass through. Separation of local and regional traffic is not served by this layout so travelers would use existing at-grade intersections, roadways, and ramps to connect to I-35 and the local street system as they do today.
- Adjacent Alternative Option 2 - *Capacity Improvements at 5th and Broadway, direct connection ramps to I-35 in the future*: Option 2 included the same multi-lane intersection improvements as Option 1, but the initial design would need to accommodate construction of direct connect ramps to I-35 at some point in the future.

Figure 3-4: Adjacent Alternative Options 1 and 2



Adjacent Alternative Option 1 - *Capacity Improvements at 5th and Broadway, no direct connection to I-35*



Adjacent Alternative Option 2 - *Capacity Improvements at 5th and Broadway, construct direct connection ramps to I-35 in the future*

The original Adjacent Alternative separating local and regional traffic with ramps to Broadway Boulevard and direct connect ramps to I-35 became 'Adjacent Alternative - Option 3'. Options 1 and 2 were also screened against the purpose and need and found to satisfy the needs to a somewhat lesser degree than Adjacent Alternative Option 3 as shown in Figure 3-5. All three options under the Adjacent Alternative were carried into Step 2 of the screening process and were shared with the public along with the West, Central, and No-Build Alternative during an online meeting from August 15 to September 6, 2019.

Figure 3-5: Adjacent Alternative Options 1, 2, and 3 Screened Against Purpose and Need

NEEDS	ADJACENT ALTERNATIVE OPTION #1 (at-grade intersection, no direct connect to I-35)	ADJACENT ALTERNATIVE OPTION #2 (at-grade intersection with future direct connect to I-35)	ADJACENT ALTERNATIVE OPTION #3 (direct connect to I-35)
NEED – Maintain infrastructure			
Improves service life of crossing structure	🟢	🟢	🟢
Corrects structural deficiencies	🟢	🟢	🟢
Minimizes long-term maintenance costs	🟢	🟢	🟢
NEED – Maintain reliable regional connection across the Missouri River			
Accommodates local and regional travel demand	🟢	🟢	🟢
Services access to local and regional destinations	🟢	🟢	🟢
Minimizes local traffic flow conflicts	🟡	🟡	🟢
Reduces traffic congestion	🟢	🟢	🟢
Improves travel times during peak hours	🟢	🟢	🟢
NEED – Improve operational and safety performance for all transportation modes			
Eliminates/minimizes travel and access conflicts	🟡	🟡	🟢
Improves traffic operation over No Build condition	🟡	🟡	🟢
Eliminates/minimizes safety hot spots	🟡	🟡	🟢
Supports modal connectivity including bike/ped	🟢	🟢	🟢
DOES ALTERNATIVE MEET PURPOSE & NEED?	**YES**	**YES**	**YES**
ALTERNATIVE TO BE CARRIED FORWARD?	**YES**	**YES**	**YES**

🔴 Does not meet the stated need 🟡 Partially meets the stated need 🟢 Fully meets the stated need

3.6 Screening Step 2 – Screen the Initial Alternatives Against Performance Areas and Performance Criteria

The three build alternatives – West, Central, and Adjacent (options 1, 2, and 3) advanced to Step 2 Screening where each was compared to a suite of performance areas. Qualitative and quantitative criteria were established under each performance area. Only certain criteria were used in the screening matrix. The full list of performance criteria is included in Appendix B of this document. The results of Step 2 Screening are shown in Figure 3-6.

Performance Areas or Measures - The Moving Ahead for Progress in the 21st Century Act (MAP-21; P.L. 112-141, passed July 6, 2012) established an approach for highway investment, where states and metropolitan planning agencies shall work to measure, manage, and improve upon the conditions and performance of transportation assets. The Fixing America's Surface Transportation Act (FAST ACT; P.L.114-94, passed December 4, 2015) carried forward the use of performance measures to establish and track targets related to the areas of safety, infrastructure condition, congestion reduction, system reliability, freight movement, environmental sustainability, and project delivery. For this project, performance areas (the same as performance measures) were established collaboratively by MoDOT and KCMO to use in evaluating alternatives as they were developed and to select alternatives to be carried forward through the environmental review process into the following design and implementation phases.

This project is to be implemented through a design-build process, which allows design-build teams to submit proposed designs and construction methods based on those evaluated in this study. The submitted design packages may include changes to make the project function better, cost less, and be constructed under a shorter timeframe. MoDOT and KCMO will incorporate the performance areas and supporting criteria established for this project into the review of the design packages to guide design changes during implementation.

The performance areas established for this project are defined as follows:

- **Infrastructure** - provide desired bridge and roadway lifespans and minimize long-term maintenance
- **Mobility** - improve travel times, reduce congestion, and accommodate future travel demand
- **Accessibility** - improve local and regional roadway connections, accommodate alternate travel modes, facilitate river navigation
- **Safety** - reduce traffic queues during peak travel, reduce crash severity, safely accommodate bicycle and pedestrian traffic
- **Environment** - minimize new right-of-way acquisition, minimize effects on public spaces and historic resources, and manage environmental risks during construction
- **Constructability** - accelerate construction timeline, minimize facility closures, manage construction costs and risks

These performance areas were described in the initial public meeting conducted on February 6, 2019. Additional information on performance areas is provided in Appendix B.

For the Step 2 screening process two additional performance areas were added to the matrix - costs (e.g., construction, right-of-way acquisition, and relocation) and public input.

Scoring under Step 2 screening involved assigning a weight to the criteria under each performance area on a scale of 1 (lowest) to 3 (highest), shown in the WEIGHT column in Figure 3-6. Each performance area and criteria was then assigned a color similar to those used in Step1: Green = fully satisfies the criteria (value of 3); Yellow – partially satisfies the criteria (value of 2), and Red = does not satisfy the criteria (value of 1).

Figure 3-6: Step 2 Screening Matrix – Screening Against Performance Areas and Criteria

PERFORMANCE AREAS	CRITERIA (QUALITATIVE OR QUANTITATIVE)	NO BUILD	WEST ALTERNATIVE	CENTRAL ALTERNATIVE	ADJACENT ALTERNATIVE OPTION #1	ADJACENT ALTERNATIVE OPTION #2	ADJACENT ALTERNATIVE OPTION #3	WEIGHT
INFRASTRUCTURE								
New bridge area	square feet	🟡	🟡	🟡	🟢	🟢	🟡	2
Bridge removal area	square feet	🔴	🟡	🟡	🟡	🟡	🟡	1
Potential to improve/provide desired geometry	QUALITATIVE	🔴	🟡	🟢	🟡	🟡	🟢	3
MOBILITY								
Accommodates local and regional travel demand	peak hour delay (hours)	🔴	🟡	🟡	🟡	🟡	🟡	3
Improves regional traffic congestion during peak hours	average travel speed (mph)	🔴	🟢	🟢	🟢	🟢	🟢	2
Improves regional travel times during peak hours	travel times (minutes)	🔴	🟢	🟢	🟢	🟢	🟢	2
Improves local travel times during peak hours	travel times (minutes)	🔴	🟢	🟢	🟢	🟢	🟢	2
ACCESSIBILITY								
Supports connections to local street grid	QUALITATIVE	🔴	🟢	🟡	🟡	🟡	🟡	2
Improve bicycle/pedestrian accommodations	QUALITATIVE	🔴	🟢	🟢	🟡	🟡	🟢	3
Ease of implementation of other PEL strategies	QUALITATIVE	🔴	🟢	🟢	🔴	🟡	🟢	3
SAFETY								
Reduce crash rates and severity of crashes	QUALITATIVE	🔴	🔴	🟡	🔴	🔴	🟡	2
Minimizes local traffic flow conflicts	number of confilict points	🔴	🟡	🟢	🔴	🔴	🟢	3
Improve/implement safety strategies	QUALITATIVE	🔴	🟡	🟡	🟡	🟡	🟡	2
ENVIRONMENT								
Support neighborhood connectivity and visual character	QUALITATIVE	🟢	🟢	🟡	🔴	🔴	🔴	2
Minimize ROW impacts	#s of residences, businesses, billboards	🟢	🟡	🔴	🟡	🟡	🔴	2
Minimize impacts to adjacent properties and users	QUALITATIVE	🟢	🔴	🟡	🟡	🟡	🟡	2
Minimize impacts to cultural and natural resources	QUALITATIVE	🟢	🟡	🟡	🟡	🟡	🟡	3
Minimize effects on public spaces, parks, and trails	QUALITATIVE	🟢	🟡	🟡	🟡	🟡	🟡	3
Manage environmental risks (hazardous materials, noise, air quality)	QUALITATIVE	🟢	🟡	🟡	🟡	🟡	🟡	1
CONSTRUCTABILITY								
Minimize risk over or adjacent to railroads	QUALITATIVE	🟢	🔴	🟡	🟡	🟡	🟡	2
Minimizes airspace obstructions during construction	QUALITATIVE	🟢	🔴	🟡	🟢	🟢	🟢	2
Minimize impacts/relocation of utilities	QUALITATIVE	🟢	🟡	🟡	🟡	🟡	🟡	3
Minimize closure of US-169 during construction	QUALITATIVE	🟢	🟢	🟡	🟡	🟡	🟡	2
Minimize closure of I-35 and I-70 during construction	QUALITATIVE	🟢	🔴	🟡	🟡	🟡	🟡	2
Flexibility of potential solutions	QUALITATIVE	🔴	🟡	🟢	🟡	🟡	🟡	3
COST								
Minimize construction costs, timeline, and risks	dollars	🟡	🟡	🟡	🟢	🟢	🟡	3
Minimize acquisition and relocation costs	dollars	🟢	🟡	🔴	🟡	🟡	🟡	1
PUBLIC INPUT								
"Meets my needs" (online public mtg Aug-Sep-2019)	# responses ranking 4 or 5	🔴	🟢	🟢	🔴	🔴	🟡	3

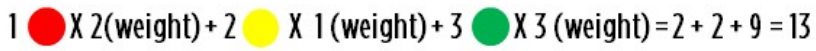
Figure 3-6: Step 2 Screening Matrix – Screening Against Performance Areas and Criteria (continued)

PERFORMANCE AREAS	SCORING CRITERIA DESCRIPTION
INFRASTRUCTURE	
New bridge area	NEW RIVER BRIDGE ONLY = GREEN NEW RIVER BRIDGE + FLYOVERS = YELLOW
Bridge removal area	ALL REMOVE EXISTING BUCK O'NEIL BRIDGE + APPROACH SPANS
Potential to improve/provide desired geometry	QUALITTATIVE
MOBILITY	
Accommodates local and regional travel demand	ALL ASSUMED TO HAVE SIMILAR PEAK HOUR DELAY W/IMPROVEMENT OVER NO BUILD
Improves regional traffic congestion during peak hours	ALL IMPROVE CONGESTION COMPARED TO NO BUILD
Improves regional travel times during peak hours	ALL IMPROVE REGIONAL TRAVEL TIMES COMPARED TO NO BUILD
Improves local travel times during peak hours	ALL IMPROVE LOCAL TRAVEL TIMES COMPARIED TO NO BUILD
ACCESSIBILITY	
Supports connections to local street grid	WEST RESTORES LOCAL GRID = GREEN; REST PROVIDE SIMILAR LIMITED IMPROVEMENTS = YELLOW
Improve bicycle/pedestrian accommodations	NO DIRECT CONNECT W/ADJACENT CREATES WIDER INTERSECTION, IMPEDED PEDESTRIAN/BICYCLE TRAFFIC = YELLOW
Ease of implementation of other PEL strategies	QUALITATIVE
SAFETY	
Reduce crash rates and severity of crashes	QUALITATIVE
Minimizes local traffic flow conflicts	DIRECT CONNECTS REDUCE TRAFFIC VOLUMES AT $5^{TH}/6^{TH}$ INTERSECTION = GREEN
Improve/implement safety strategies	QUALITATIVE
ENVIRONMENT	
Support neighborhood connectivity and visual character	WEST AT EDGE OF RIVER MARKET = GREEN, ADJACENT WIDENS BROADWAY AS NEIGHBORHOOD BARRIER = RED
Minimize ROW impacts	#S OF RESIDENCES, BUSINESSES, BILLBOARDS
Minimize impacts to adjacent properties and users	WEST REMOVES ACCESS ALONG $5^{TH}/6^{TH}$ STREETS, REST
Minimize impacts to cultural and natural resources	REMOVE EXISTING NRHP-ELIGIBLE BRIDGE AND SIMILAR EFFECTS TO OTHER NRHP-ELIGIBLE SITES; EXISTING BRIDGE REMAINS = GREEN
Minimize effects on public spaces, parks, and trails	ALL HAVE SIMILAR EFFECTS ON WEST TEARACE PARK BLUFF AND RIVERFRONT TRAIL
Manage environmental risks (hazardous materials, noise, air quality)	ASSUME ALL RELATIVELY SIMILAR
CONSTRUCTABILITY	
Minimize risk over or adjacent to railroads	WEST CLOSER TO RAIL LINE PINCH POINT REQUIRING LONGER BRIDGE SPAN, ALL OTHERS SIMILAR
Minimizes airspace obstructions during construction	WEST ALTERNATIVE CLOSER TO AIRSPACE BOUNDARY; ADJACENT FARTHER AWAY FROM AIRSPACE BOUNDARY
Minimize impacts/relocation of utilities	ALL APPROXIMATELY THE SAME
Minimize closure of US-169 during construction	WEST MINIMIZES CLOSURE OF US-179, REST HAVE SIMILAR ROAD CLOSURES
Minimize closure of I-35 and I-70 during construction	WEST REQUIRES COLSIRE OF I-70, REST HAVE SIMILAR ROAD CLOSURES
Flexibility of potential solutions	WIDER CENTER SEGMENT PROVIDES MORE ALIGNMENT FLEXIBILITY
COST	
Minimize construction costs, timeline, and risks	Dollars - <$200m = GREEN, $200m-$250m = YELLOW, >$250m = RED
Minimize acquisition and relocation costs	DOLLARS
PUBLIC INPUT	
"Meets my needs" (online public mtg Aug-Sep-2019)	# of RESPONSES - >700 = GREEN, 200-700 = YELLOW, <200 = RED

3.7 Screening Step 3 – Scoring Based on Weighted Criteria

As shown in the far right column of the step 2 matrix (Figure 3-6), a weight was assigned to each criteria under a performance area - 1 (least value or importance), 2 (moderate value or importance), or 3 (most value or importance). The weight was multiplied by the value associated with how well the alternative satisfied the criteria – RED (doesn't satisfy the criteria) = 1, Yellow (partially satisfies the criteria) = 2, and GREEN (fully satisfies the criteria) = 3. The criteria values were then totaled within each performance area. The scores within each performance area were then totaled to develop a final alternative score. All performance areas were weighted equally in determining the final score depicted in the Step 3 Screening Matrix shown in Figure 3-7.

Example of the scoring process:



3.7.1 Alternatives Eliminated from Consideration Following Step 3 Screening

3.7.1.1 Adjacent Alternative Options 1 and 2

The multi-lane at-grade intersection proposed at 5th Street and Broadway Boulevard didn't reduce crash rates or improve local traffic flow conflicts. Neither option would service access to local and regional destinations, a concept not supported by the public during either public meeting conducted for the project. Additional concerns were raised about the function of the proposed multi-lane intersection and the ability to provide timely egress by bicyclists/pedestrians. In addition, the widened intersection would potentially result in additional business relocations and increased visual/indirect effects on historic properties present south of the river. During the online public meeting conducted from August 15 through September 6, 2019, these two alternatives received the least favorable comments from the public. For these reasons the Adjacent Alternative Option 1 and Adjacent Alternative Option 2 were eliminated from further consideration.

Figure 3-7: Step 3 Screening Matrix – Screening Against Performance Areas and Criteria

PERFORMANCE AREAS	NO BUILD		WEST ALTERNATIVE (direct connect to I-35)		CENTRAL ALTERNATIVE (direct connect to I-35)		ADJACENT ALTERNATIVE OPTION #1 (at-grade intersection, no direct connect to I-35)		ADJACENT ALTERNATIVE OPTION #2 (at-grade intersection w/future direct connect to I-35)		ADJACENT ALTERNATIVE OPTION #3 (direct connect to I-35)	
	Performance area color score	Performance area numerical score	Performance area color score	Performance area numerical score	Performance area color score	Performance area numerical score	Performance area color score	Performance area numerical score	Performance area color score	Performance area numerical score	Performance area color score	Performance area numerical score
INFRASTRUCTURE	🔴	8	🟡	12	🟢	15	🟢	14	🟢	14	🟢	15
MOBILITY	🔴	9	🟢	24	🟢	24	🟢	24	🟢	24	🟢	24
ACCESSIBILITY	🔴	8	🟢	24	🟢	22	🟡	13	🟡	16	🟢	22
SAFETY	🔴	7	🟡	12	🟢	17	🔴	9	🔴	9	🟢	17
ENVIRONMENT	🟢	39	🟡	26	🟡	24	🟡	24	🟡	24	🟡	22
CONSTRUCTABILITY	🟢	36	🔴	24	🟡	31	🟡	30	🟡	30	🟡	30
COST	🟡	9	🟡	8	🟡	7	🟢	11	🟢	11	🟡	8
PUBLIC INPUT	🔴	3	🟢	9	🟢	9	🔴	3	🔴	3	🟡	6
FINAL NUMERICAL SCORE:	119		139		149		128		131		144	
ALTERNATIVE TO BE CARRIED FORWARD?	YES		YES		YES		NO		NO		YES	

🔴 Low Score 🟡 Medium Score 🟢 High Score

3.8 Reasonable Alternatives Carried Forword for Further Study

Although the No-Build Alternative, described in Table 3-2 below does not satisfy the stated needs, it is carried forward for comparison with the build alternatives. The reasonable alternatives being carried forward for further study are described in Table 3-3, Table 3-4, and Table 3-5. In addition to the improvements associated with the West, Central, and Adjacent (Option 3) Alternatives that are listed in the table, the anticipated footprint of each alternative is also depicted.

Table 3-2: No-Build Alternative

NO-BUILD ALTERNATIVE		
	NO-BUILD ALTERNATIVE INCLUDES:	**NO-BUILD ALTERNATIVE DOES NOT:**
North Segment	▪ Only scheduled maintenance of US-169 and the existing airport accesses	▪ Improve function of existing airport accesses ▪ Improve US-169 north of the river
River Segment	▪ Only scheduled maintenance to the existing Buck O'Neil Bridge	▪ Remove the existing Buck O'Neil Bridge (remain in service until at least 2025) ▪ Impact Hannibal 2 Bridge ▪ Provide bike/ped accommodations
South Segment	▪ Only planned improvement (none identified) and maintenance projects to existing roadways and structures	▪ Construct new bridges, roadways, or walls ▪ Require acquisition of new ROW or taking of buildings

Appendix B provides additional detail on the alternatives' development and screening process. Layouts of the alternatives considered are provided along with variations in how ramps and intersections could be implemented particularly in the south segment. The options considered for the north segment, providing access to MKC, are also provided in Appendix B as well as in Chapter 5.0 (Federal Aviation Environmental Evaluation).

Table 3-3: Reasonable Alternatives Carried Forward for Further Study – West Alternative

WEST ALTERNATIVE – Ramps to 5th & 6th Streets, Direct Connection Ramps to I-35		
	WEST ALTERNATIVE INCLUDES:	**WEST ALTERNATIVE DOES NOT:**
North Segment	▪ Change airport property boundary and update Airport Layout Plan ▪ North Airport Access improvements – Build new SB access to airport from US-169 and new SB access to US-169 from airport. Place fill on landward side of levee and construct new roadways. Construction will occur within Runway Protection Zone. ▪ Middle/South Airport Access Improvements Option 1 – Build new NB off ramp and NB on ramp to US-169 at Harlem Road. Elevated spans over floodwall, Richards Road and Harlem Road. Improve SB off and SB on at-grade access (right-in, right-out) at north end of terminal building. ▪ Impacts to airport parking ▪ Bike/ped accommodations – barrier-separated 10-ft wide shared use path on one side of the bridge with access at Harlem Road ▪ Temporary encroachment into airspace during construction ▪ Staged construction near end of north arch span near the Transcontinental & Western (T&WA) Building ▪ Impacts to Levee Critical Area landward of floodwall	▪ Modify or expand US-169 to MO-9 north of the existing north airport access ▪ Replace US-169 SB lanes over Airport North Access Road (A4645) ▪ Permanently encroach into airspace ▪ Encroach into RR ROW ▪ Impact RR Bridges over Harlem Road ▪ Impact T&WA Building (NRHP-eligible resource HDA-5, see Chapter 4.0) ▪ Permanently disrupt perimeter road system around airport (Richards Road/Lou Holland Drive)
River Segment	▪ Construction of new river bridge – west alignment, 25-degree skew to river (approx.) ▪ Removal of existing Buck O'Neil Bridge and approach spans (A4646 and A4646) and Harlem Road Overpass (A4647 and A4648) (NRHP-eligible resources OT-20 and HDA-1) ▪ Bike/ped accommodations – barrier-separated 10-foot wide shared use path, one side of the new bridge ▪ Relocation of overhead electric transmission lines ▪ Impacts to Levee Critical Area on north and south side of river ▪ Impacts to wetlands on north side of river ▪ Acquisition of easements over 2 active RR tracks (UPRR and BNSF) and acquisition of idle RR parcels (KCT, other unknown)	▪ Impact 2nd Hannibal Bridge (NRHP-eligible resource OT-21, see Chapter 4.0) ▪ Impact RR tracks and facilities ▪ Improve or replace the Woodswether Viaduct (S029B44 and S029B45) and the Broadway-under-Broadway Bridge (S029B42) ▪ Impact the floodwall on north and south side of river

Table 3-3 continued

WEST ALTERNATIVE – Ramps to 5th & 6th Streets, Direct Connection Ramps to I-35		
	WEST ALTERNATIVE INCLUDES:	**WEST ALTERNATIVE DOES NOT:**
South Segment	▪ Flyover ramps providing direct connection to I-35 to/from US-169 ▪ New elevated bridge spans to south of 3rd St, new roadway on walls to 5th Street ▪ New SB connection to downtown via Beardsley Road and 6th Street ▪ New NB connection from downtown via Broadway Boulevard and 5th Street ▪ Replacement of I-35 ramp bridge over I-70 and 6th Street ▪ Reconstruction of I-35 roadway and walls along bluff south of I-70 ▪ Reconstruction of I-70 WB & I-70 EB bridges over Beardsley Road ▪ New I-70 EB ramp bridge to Beardsley Road at 6th Street ▪ Bike/ped accommodations –connection of shared use path to 5th Street ▪ Removal of NB Broadway Boulevard to WB I-70 loop ramp ▪ Removal of NB Beardsley Road to WB I-70 loop ramp ▪ Replace NB I-35 bridge to WB I-70 (A1128 and A1129) ▪ Restoration/improvement of at-grade street grid at Woodswether Road; 3rd, 4th, and 5th & Broadway Boulevard ▪ Loss of on-street parking along 5th Street west of Broadway ▪ Roadway improvements and limited access along 5th Street & 6th Street west of Broadway Boulevard ▪ Roadway modifications along Beardsley Rd; construction of new access to 6th Street under I-70 ▪ New signalized intersections at Beardsley & 5th Street and at Beardsley Road & 6th Street ▪ Encroachment into bluff face below West Terrace Park with roadway and walls ▪ Temporary closures along I-35/I-70 loop during construction ▪ Temporary closures along I-70 WB & I-70 EB during construction ▪ Temporary closures along US-169/Broadway during construction ▪ Impacts MARC parking garage	▪ Add travel lanes along I-35 or I-70 (only ramp improvements) ▪ Reconstruct the Broadway over I-70 bridge ▪ Improve I-35 south of 12th Street ▪ Impact Colonial Patterns Building or its property (NRHP-eligible resource OT-7, see Chapter 4.0)

Table 3-4: Reasonable Alternatives Carried Forward for Further Study – Central Alternative

CENTRAL ALTERNATIVE – Ramps to Broadway Boulevard, Direct Connection Ramps to I-35

	CENTRAL ALTERNATIVE INCLUDES:	CENTRAL ALTERNATIVE DOES NOT:
North Segment	▪ Same as West Alternative	▪ Same as West Alternative
River Segment	▪ Construction of new river bridge – center alignment, 15-degree skew to river (approx.) ▪ Removal of existing Buck O'Neil Bridge and approach spans (A4646 and A4646) and Harlem Road Overpass (A4647 and A4648) (NRHP-eligible resources OT-20 and HDA-1) ▪ Bike/ped accommodations – barrier-separated 10-foot wide shared use path on one side of the new bridge ▪ Relocation of overhead electric transmission lines ▪ Impacts to Levee Critical Area on north and south side of river ▪ Impacts to wetlands on north side of river ▪ Acquisition of easements over 2 active RR tracks (UP and BNSF) and acquisition of idle RR parcels (KCT, other unknown)	▪ Impact 2nd Hannibal Bridge (NRHP-eligible resource OT-21, see Chapter 4.0) ▪ Impact RR tracks and facilities ▪ Improve or replace the Woodswether Viaduct (S029B44 and S029B45) and the Broadway-under-Broadway Bridge (S029B42) ▪ Impact the floodwall on north and south side of river
South Segment	▪ Flyover ramps providing direct connection to I-35 to/from US-169 ▪ New elevated bridge spans to south of 3rd St, new roadway on walls to 5th Street, modified intersection at 5th & Broadway Boulevard ▪ Replacement of I-35 ramp bridge over I-70 and 6th Street ▪ Reconstruction of I-35 roadway and walls along bluff south of I-70 ▪ Bike/ped accommodations – connection of shared use path to 5th Street & Broadway Boulevard ▪ Removal of NB Broadway to WB I-70 loop ramp ▪ Replace NB I-35 bridge to WB I-70 (A1128 and A1129) ▪ Improvement of 3rd Street from east of Broadway Boulevard to connect w/Beardsley Road ▪ Improvement of at-grade connections at Woodswether Road & 3rd Street, and at Broadway between 3rd & 4th Street ▪ Removal of Broadway Boulevard from 4th Street to 5th Street ▪ Encroachment into bluff face below West Terrace Park with roadway and walls ▪ Temporary closures along I-35/I-70 loop during construction ▪ Temporary closures along US-169/Broadway Boulevard during construction	▪ Add travel lanes along I-35 or I-70 (only ramp improvements) ▪ Reconstruct the Broadway over I-70 bridge ▪ Improve I-35 south of 12th Street ▪ Impact Colonial Patterns Building or its property (NRHP-eligible resource OT-7, see Chapter 4.0)

Table 3-5: Reasonable Alternatives Carried Forward for Further Study – Adjacent Alternative

ADJACENT ALTERNATIVE– OPTION 3 – Ramps to Broadway Boulevard, Direct Connection Ramps to I-35		
	ADJACENT ALTERNATIVE INCLUDES:	**ADJACENT ALTERNATIVE DOES NOT:**
North Segment	▪ Same as West Alternative	▪ Same as West Alternative
River Segment	▪ Construction of new river bridge – adjacent alignment, 10-degree skew to river (approx.) ▪ Removal of existing Buck O'Neil Bridge and approach spans (A4646 and A4646) and Harlem Road Overpass (A4647 and A4648) (NRHP-eligible resources OT-20 and HDA-1) ▪ Bike/ped accommodations – barrier-separated 10-foot wide shared use path on one side of the new bridge ▪ Relocation of overhead electric transmission lines ▪ Impacts to Levee Critical Area on north and south side of river ▪ Impacts to wetlands on north side of river ▪ Acquisition of easements over 2 active RR tracks (UP and BNSF) and acquisition of idle RR parcels (KCT, other unknown)	▪ Impact 2nd Hannibal Bridge (NRHP-eligible resource OT-21, see Chapter 4.0) ▪ Impact RR tracks and facilities ▪ Improve or replace the Woodswether Viaduct (S029B44 and S029B45) and the Broadway-under-Broadway Bridge (S029B42) ▪ Impact the floodwall on north and south side of river
South Segment	▪ Flyover ramps providing direct connection to I-35 to/from US-169 ▪ New elevated bridge spans to south of 3rd St, new roadway on walls to 5th Street, modified intersection at 5th & Broadway Boulevard ▪ Replacement of I-35 ramp bridge over I-70 and 6th Street (A1130, A1131, A1133) ▪ Reconstruction of I-35 roadway and walls along bluff south of I-70 ▪ Bike/ped accommodations – connection of shared use path to 5th Street & Broadway Boulevard ▪ Removal of NB Broadway Boulevard to WB I-70 loop ramp ▪ Replace NB I-35 bridge to WB I-70 (A1128 and A1129) ▪ Improvement of 3rd Street from east of Broadway Boulevard to connect w/Beardsley Road ▪ Improvement of at-grade connection at Woodswether Road & 3rd Street ▪ Removal of Broadway Boulevard from 3rd to 5th Street ▪ Roadway improvements along 5th Street east/west of Broadway Boulevard ▪ Roadway improvements along 6th Street east/west of Broadway Boulevard ▪ Encroachment into bluff face below West Terrace Park with roadway and walls ▪ Temporary closures along I-35/I-70 loop during construction ▪ Temporary closures along US-169/Broadway Boulevard during construction	▪ Add travel lanes along I-35 or I-70 (only ramp improvements) ▪ Reconstruct the Broadway over I-70 bridge (L0490) ▪ Improve I-35 south of 12th Street ▪ Impact Colonial Patterns Building or its property (NRHP-eligible resource OT-7, see Chapter 4.0)

Figure 3-8: West Alternative

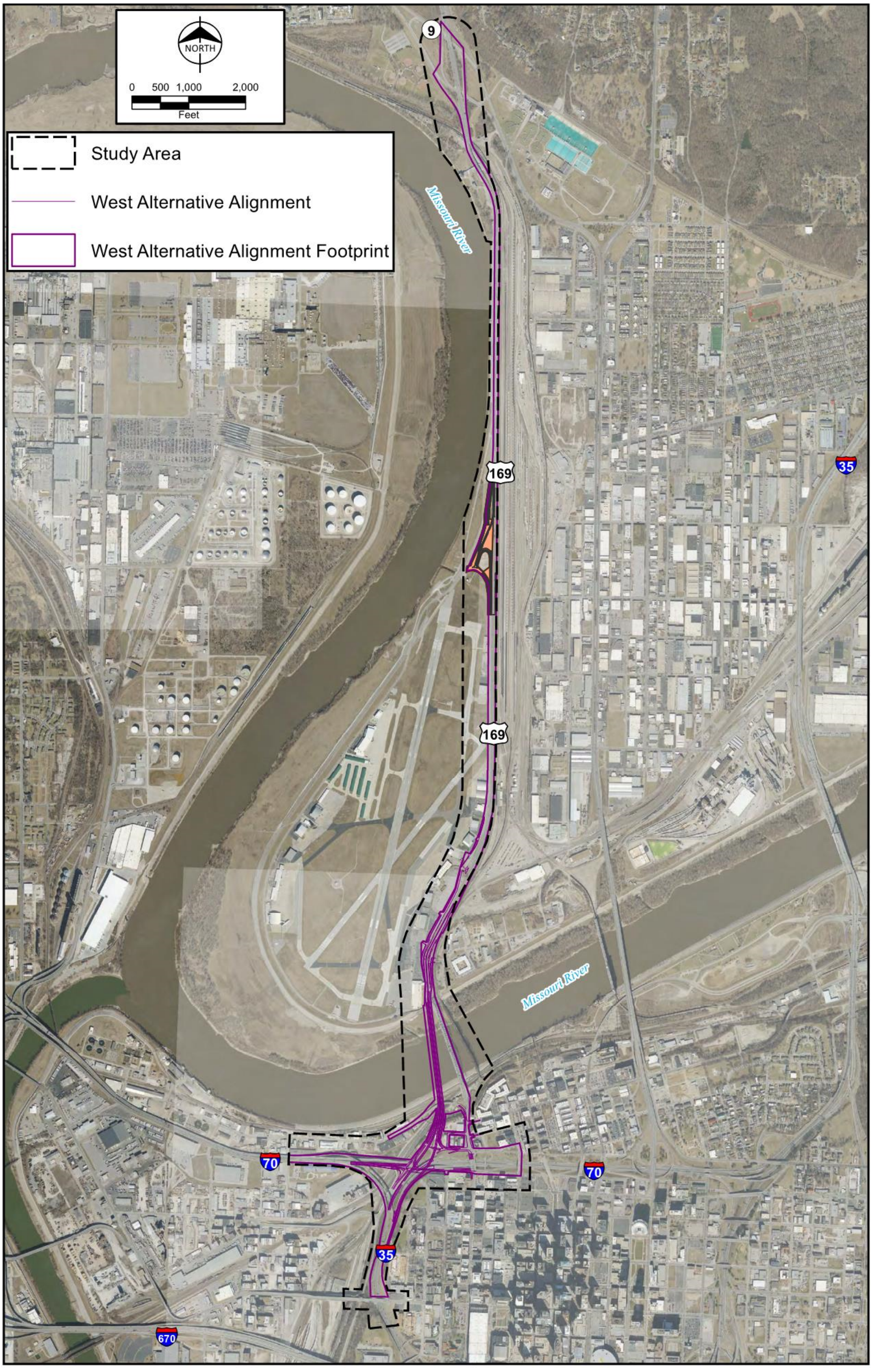


Figure 3-9: Central Alternative

Figure 3-10: Adjacent Alternative

3.9 Preferred Alternative – CENTRAL ALTERNATIVE

3.9.1 Central Alternative

Based on the results of the screening process, the Central Alternative is recommended as the preferred alternative. The Central Alternative:

- Improves travel times for regional traffic over No-Build conditions. Detailed analytical models for peak hour traffic (in 2020 and 2040) indicate that regional travel times would be reduced for commuters using the new river crossing, particularly in the AM peak hour. In 2040, travel time in the AM peak from US-169 at MO-9 southbound to I-35 at 20th Street would be reduced by roughly two minutes compared to the No-Build Alternative
- Reduces traffic volume on local streets and minimizes the number of conflict points at intersections. The anticipated traffic volume in the AM peak hour through the intersection of 5th Street and Broadway Boulevard would be reduced by 30 percent over the No-Build Alternative.
- Provides desired flyover and downtown ramp geometries that are less likely to require design exceptions. A 45 mph design speed can be achieved on the flyover ramps included in the Central Alternative.
- Provides maximum flexibility in developing implementation solutions
- Has public support

FHWA, MoDOT, and KCMO are considering using a Design-Build process, rather than the Design-Bid-Build process, to yield a transportation solution to address the needs identified. This type of project delivery allows a single contractor to perform both the design and construction of a project at the same time to ultimately deliver the project faster and more efficiently. Given the streamlining nature of Design-Build delivery, the early identification of risks is critical to its successful implementation. The NEPA process facilitates early coordination, outreach and resource evaluation, thereby enabling identification of potential risks associated with the improvements as early as possible in project development.

Design–Build contrasts with the more traditional Design–Bid–Build project delivery approach where the successful contractor provides the best bid for a specific design developed by the design engineer. During Design-Build, the alignment and location of roadway and ramps and the layout of intersections may differ from what is presented in this document. Changes in the project will be evaluated in comparison to the impacts described in this document and may require additional studies or coordination with FHWA and outside agencies to obtain necessary permits based on the proposed design.

Figure 3-11 illustrates the proposed configuration of the south segment of the Central Alternative. For comparison with the Central Alternative, Figure 3-12 and Figure 3-13 illustrate the bridge alignments and south segment improvements of the West and Adjacent Alternatives, respectively, assessed in this document.

Figure 3-11: Preferred Alternative – Central Alternative, Bridge Alignment, and South Segment Improvements

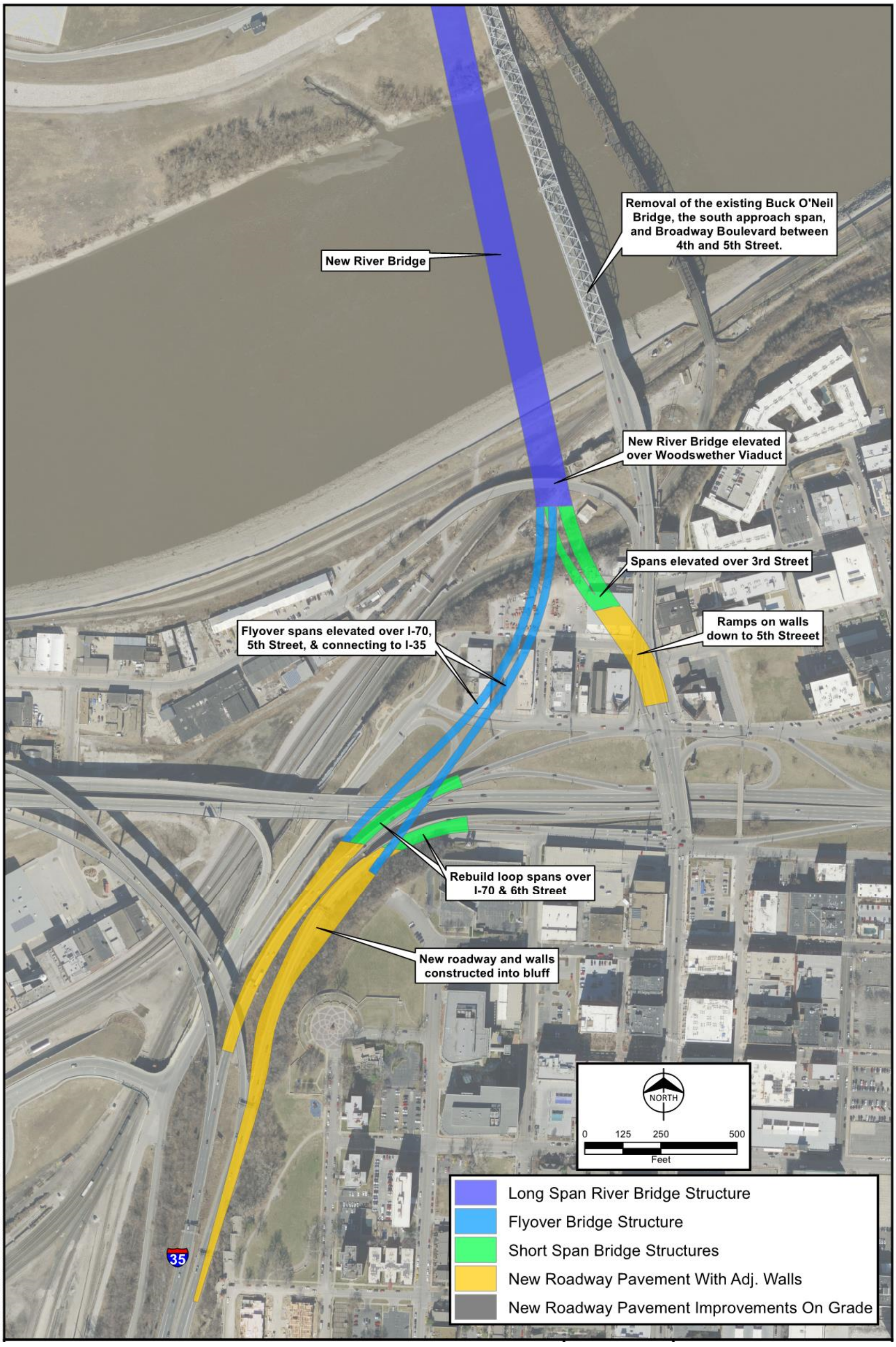


Figure 3-12: West Alternative –Bridge Alignment and South Segment Improvements

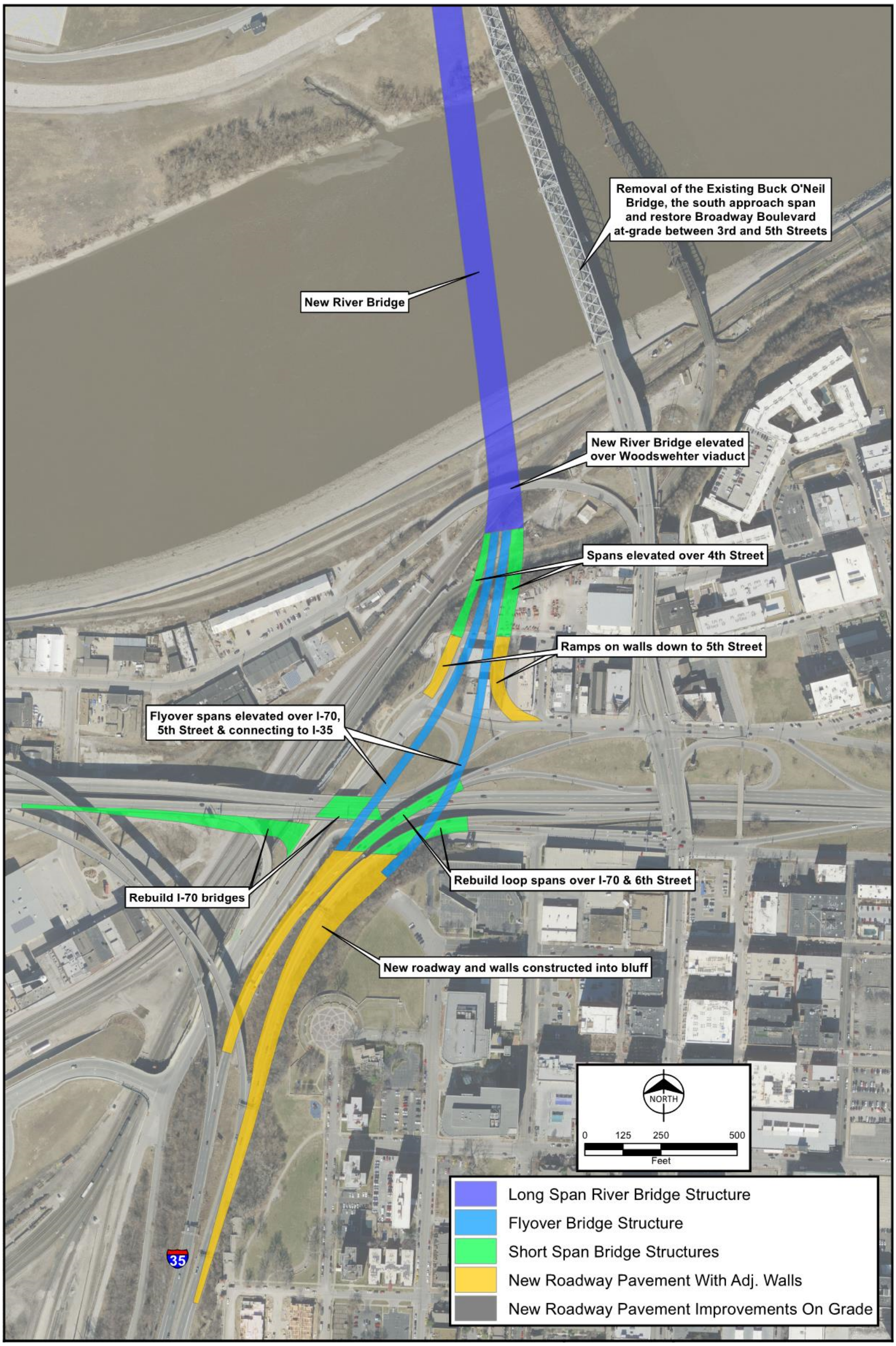
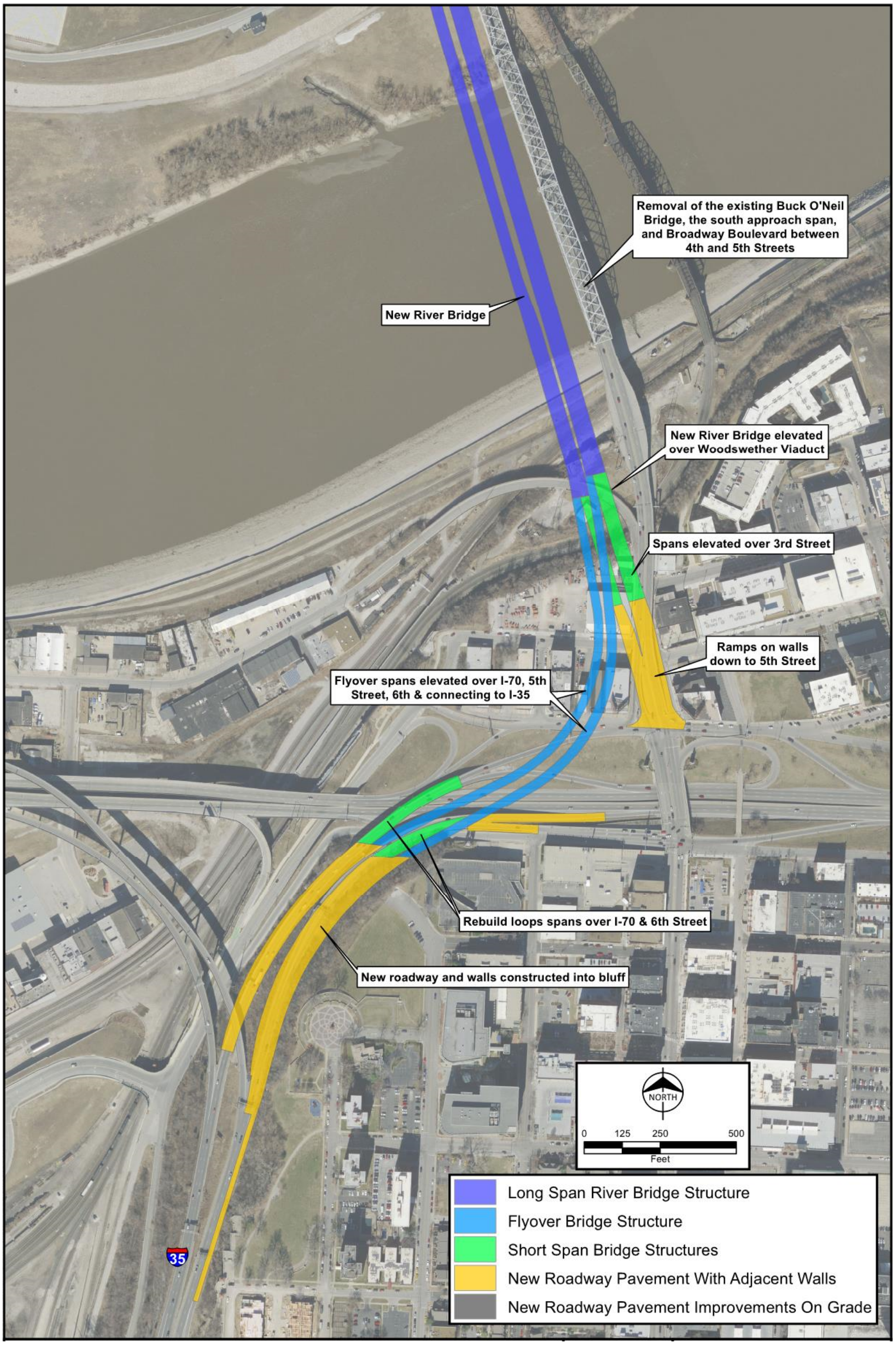


Figure 3-13: Adjacent Alternative –Bridge Alignment and South Segment Improvements



3.10 Funding and Programming

The FHWA requires that prior to its issuance of an environmental decision for a Proposed Action, the subsequent phase(s) of the project (e.g., final design, right-of-way acquisition, or construction) must be accounted for in a fiscally-constrained plan such as the Missouri STIP, and MARC's Transportation Improvement Program (TIP). These plans must include sufficient financial information to demonstrate that the projects contained in them can be implemented using committed, available, or reasonably available Federal, state, local, and private revenues, with the assurance that the federally supported transportation system is being adequately operated and maintained.

The KCMO and MoDOT partnered to fund the US-169/Buck O'Neil Bridge project with a mix of Federal, State, and local funds from several sources. KCMO applied for a Federal Better Utilizing Investments to Leverage Development (BUILD) grant, that was awarded to MoDOT in 2018. MoDOT used a mix of Federal and State funds to support 50 percent of the project costs. MoDOT used statewide funds set aside for major bridges and interstates to provide an additional $10 million. Nearly $40 million were provided through regular construction and right-of-way funds allocated to the MoDOT Kansas City District. In addition to these funding sources, the Governor and Missouri legislature provided additional funding for MoDOT through the Governor's Bridge Program. These funds freed $60.6 million in construction and right-of-way funding that were directed to the Buck O'Neil Bridge project.

KCMO joined with several communities north of the Missouri River to request Federal Surface Transportation Block Grant (STBG) funds from MARC for the project. In response to this request, MARC awarded $34.9 million in STBG funds and $5.08 million in HIP/Omnibus funds for this project. KCMO passed a bond initiative, which provided $72.5 million dollars for construction and engineering for the project. Table 3-6 summarizes these funding sources.

Table 3-6: Funding Sources for the US-169/Buck O'Neil Bridge Project

Missouri Highway and Transportation Commission			
Source	**Federal Funds**	**Local Match**	**Total**
BUILD GRANT	$12,500,000	*	$12,500,000
Statewide Interstate and Major Bridge	$8,000,000	$2,000,000	$10,000,000
DISTRICT STIP FUNDS	$32,000,000	$7,900,000	$39,900,000
STIP Funds Available due to Governor's Focus on Bridge Program	$50,080,000	$12,520,000	$62,600,000
MHTC Total	**$102,580,000**	**$22,420,000**	**$125,000,000**
City of Kansas City, Missouri			
Source	**Federal Funds**	**Local Match**	**Total**
BUILD GRANT	$12,500,000	*	$12,500,000
STBG	$34,918,000	$8,729,500	$43,647,500
HIP/Omnibus Funds	$5,081,000	$1,270,500	$6,352,500
Kansas City Funds	NA	$62,500,000	$62,500,000
KCMO Total	**$52,500,000**	**$72,500,000**	**$125,000,000**
PROJECT TOTAL	**$155,080,000**	**$94,920,000**	**$250,000,000**

* The BUILD Grant requires that a minimum of $81,690,000 in local funding be provided for this project.

The US-169/Buck O'Neil Bridge project was first added to the STIP as a scoping job in 2014 and updated to a construction project in 2016. Originally, the project was planned to be a major rehabilitation project that would keep the bridge in service for another 20 to 30 years. However, when the STIP was published, MoDOT received over 160 comments. At that point, MoDOT began working with partners to review project community goals and objectives to determine the most appropriate project to address the transportation needs.

The TIP is a detailed list of projects to be implemented in the next four to five years and is developed for the metropolitan transportation planning process in accordance with Federal regulations (CFR §450.324). The US-169/Buck O'Neil Bridge project will be included in the TIP in March 2020. In general, the TIP is incorporated into a Metropolitan Transportation Plan (MTP) by reference, and therefore, upon adoption by a Metropolitan Planning Organization (MPO) (e.g., MARC), the MTP shall include all projects in the most recently approved TIP as well as any future TIP amendments approved before the next MTP update.

Transportation Outlook 2040 is the MTP for the greater Kansas City region. A major component of the MTP is a list of regionally important projects to improve the transportation of people and goods (highway, transit, etc.). This federally required project listing is intended to help the region identify and prioritize future transportation investments based on goals, strategies and estimated financial resources. The projects in Transportation Outlook 2040 were developed, prioritized, and ultimately selected through a comprehensive and coordinated process involving the general public, regional transportation stakeholders and MARC planning committees.

Federal planning regulations (CFR §450.322) state that "For the purpose of developing the metropolitan transportation plan, the MPO, public transportation operator(s), and State shall cooperatively develop estimates of funds that will be available to support metropolitan transportation plan implementation." The regulations also indicate "for illustrative purposes, the financial plan may (but is not required to) include additional projects that would be included in the adopted transportation plan if additional resources beyond those identified in the financial plan were to become available." Transportation Outlook 2040 includes "constrained" and "unconstrained" project lists. The constrained projects are those where available funding has been identified. Unconstrained projects are those that would be included in the MTP if additional resources beyond those identified in the constrained list are identified. According to Transportation Outlook 2040, the US-169/Buck O'Neil Bridge Project is referenced as:

- Constrained - #2025 (MoDOT) Broadway Bridge Replacements, Phase 1; 2021-2030; $140M
- Unconstrained - #3006 (MoDOT) Broadway Bridge Replacements, Phase 2; 2021-2030 – operational improvements from I-35/I-70 interchange to Richards Road; $60M

The Missouri Highways and Transportation Commission approved a Design-Build Project for the US-169/Buck O'Neil Bridge corridor. As presented in Table 3-6 above, the project is estimated to cost approximately $250 million including design and right-of-way costs. All actions and elements of this project will be included under one Design-Build contract. The actual construction phasing and implementation of the project components will be determined during the Design-Build process.

4.0 How the Proposed Project Would Affect the Environment

This chapter describes the existing social, economic, and environmental conditions in the US-169/Buck O'Neil Bridge Crossing of the Missouri River study area. This chapter also presents the anticipated effects (direct and indirect) of three reasonable alternatives on existing resources and features.

The description of the existing conditions serves as a baseline for evaluating the probable beneficial and adverse social, economic, and environmental effects of the No-Build Alternative and three build alternatives – West, Central, and Adjacent.

The resources present within the study area and defined Alternatives Corridor (Figure 4-1) are described in the following sections as well as the effects the Proposed Action would have on them. The features within the footprint of each build alternative are shown in Figure 4-2 (north segment – all build alternatives), Figure 4-3 (West alternative river and south segment), Figure 4-4 Central Alternative (river and south segment), and Figure 4-5 Adjacent Alternative (river and south segment).

The ***study area*** (dashed black line on Figure 4-1) is the area defined initially for data collection and development of alternatives.

The ***Alternatives Corridor*** (solid black line on Figure 4-1) is the area of focused assessment and comparison of the build alternatives. It encompasses the combined anticipated footprint of all three build alternatives to provide the most flexibility in supporting potential design changes that may occur during design-build implementation of the project. The effects of each build alternative are presented in this chapter.

The ***project vicinity*** is also mentioned in this chapter and refers to the general area around and including the study area. The project vicinity includes downtown KCMO, the West Bottoms, River Market, Harlem, MKC, the Missouri River, and portions of Jackson and Clay Counties.

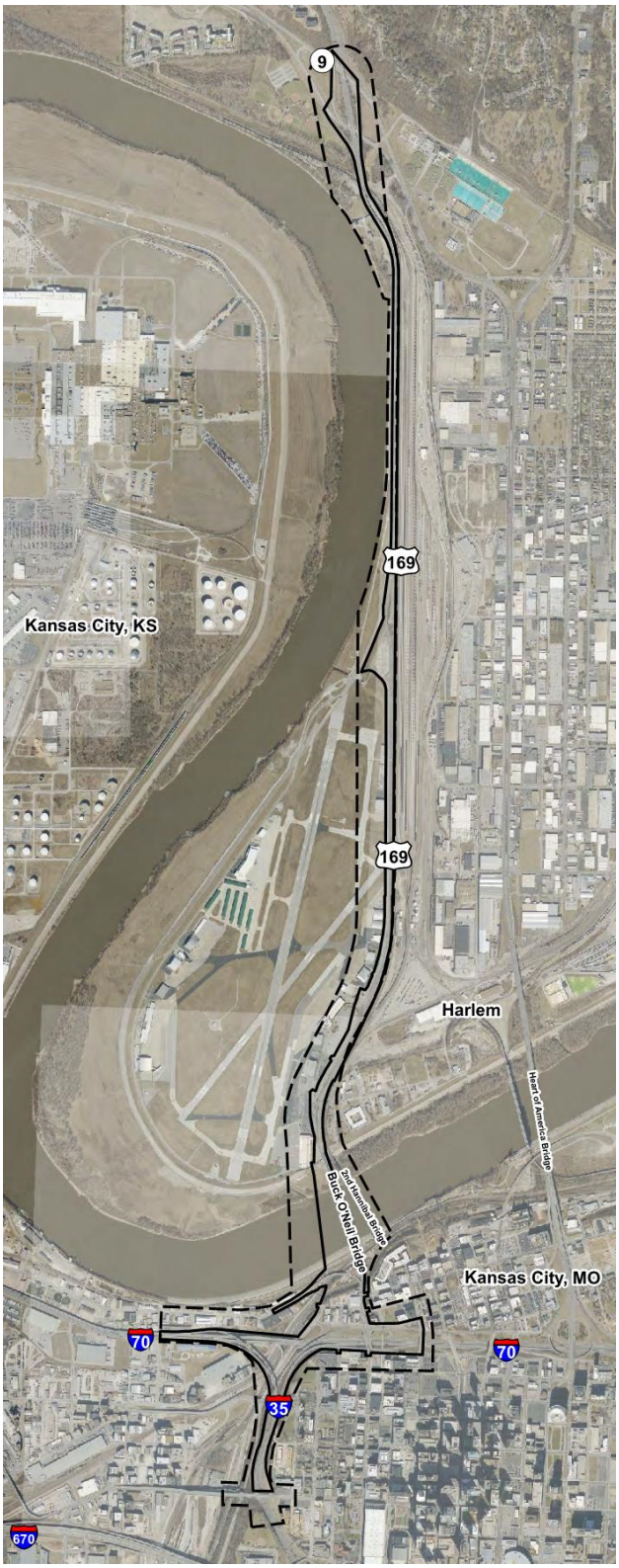


Figure 4-1: Study Area and Alternatives Corridor

Figure 4-2: North Segment Features - All Build Alternatives-

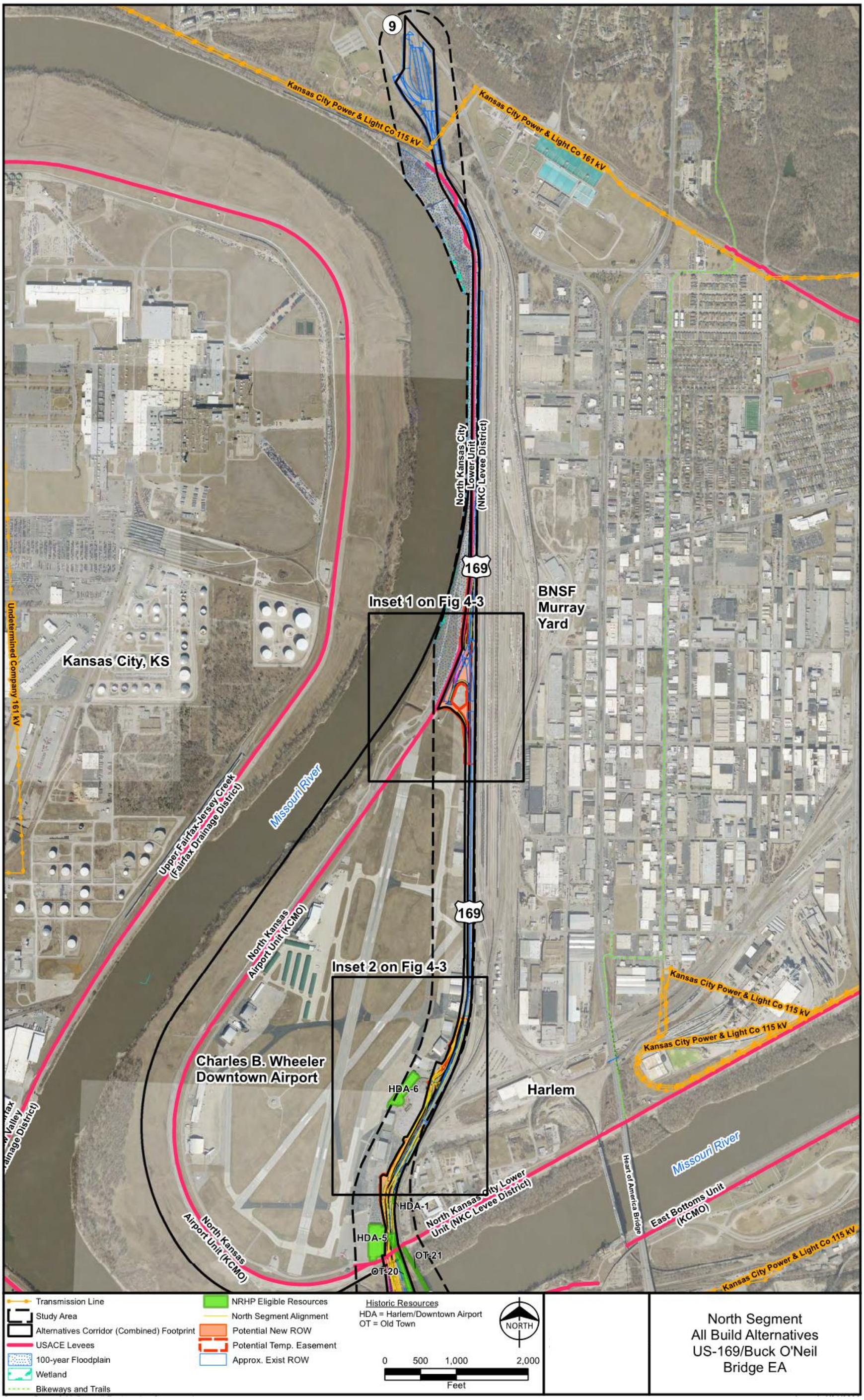


Figure 4-3: North Segment Features - Airport Access Improvement Details–

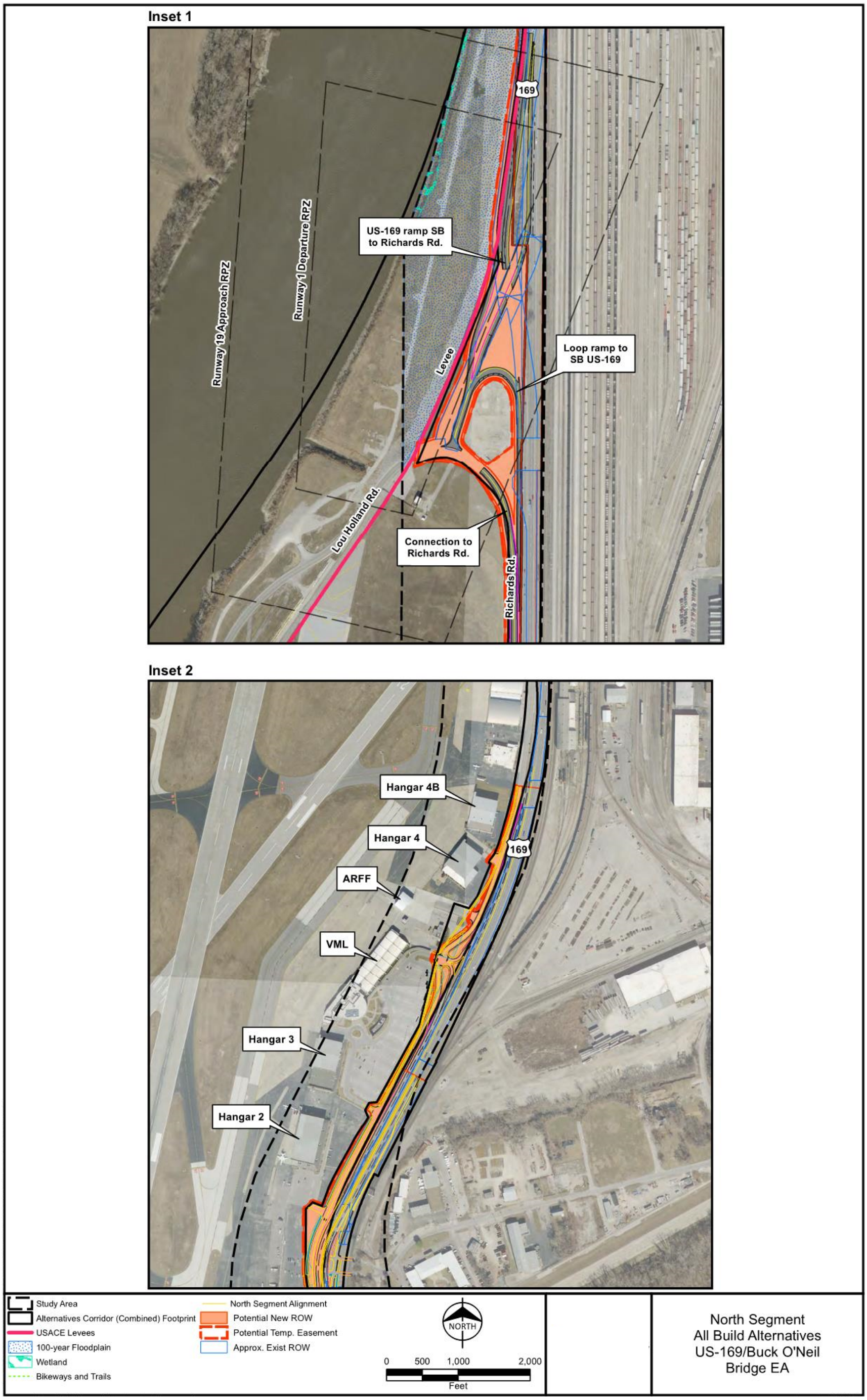


Figure 4-4: West Alternative Features – River and South Segments

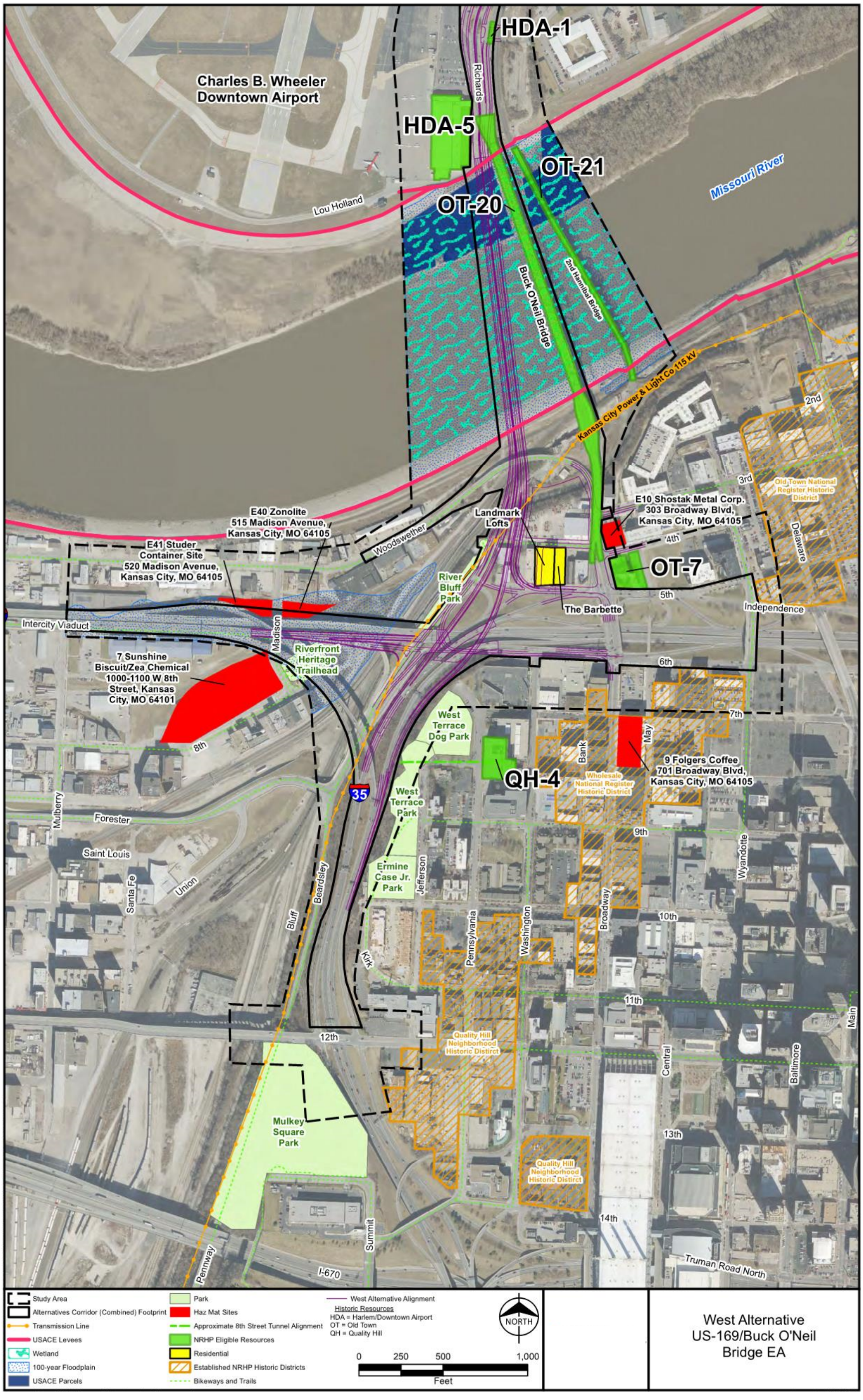
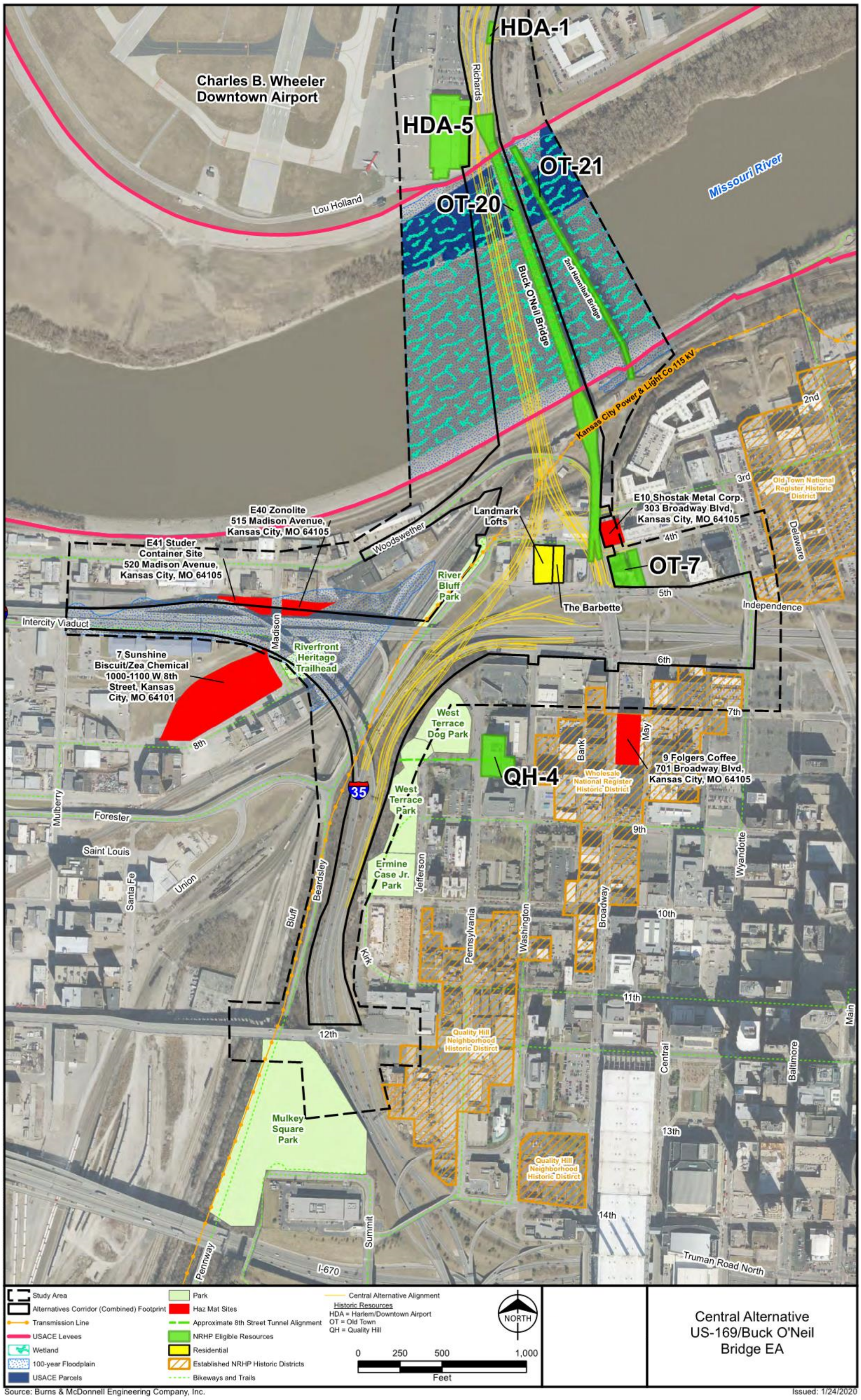


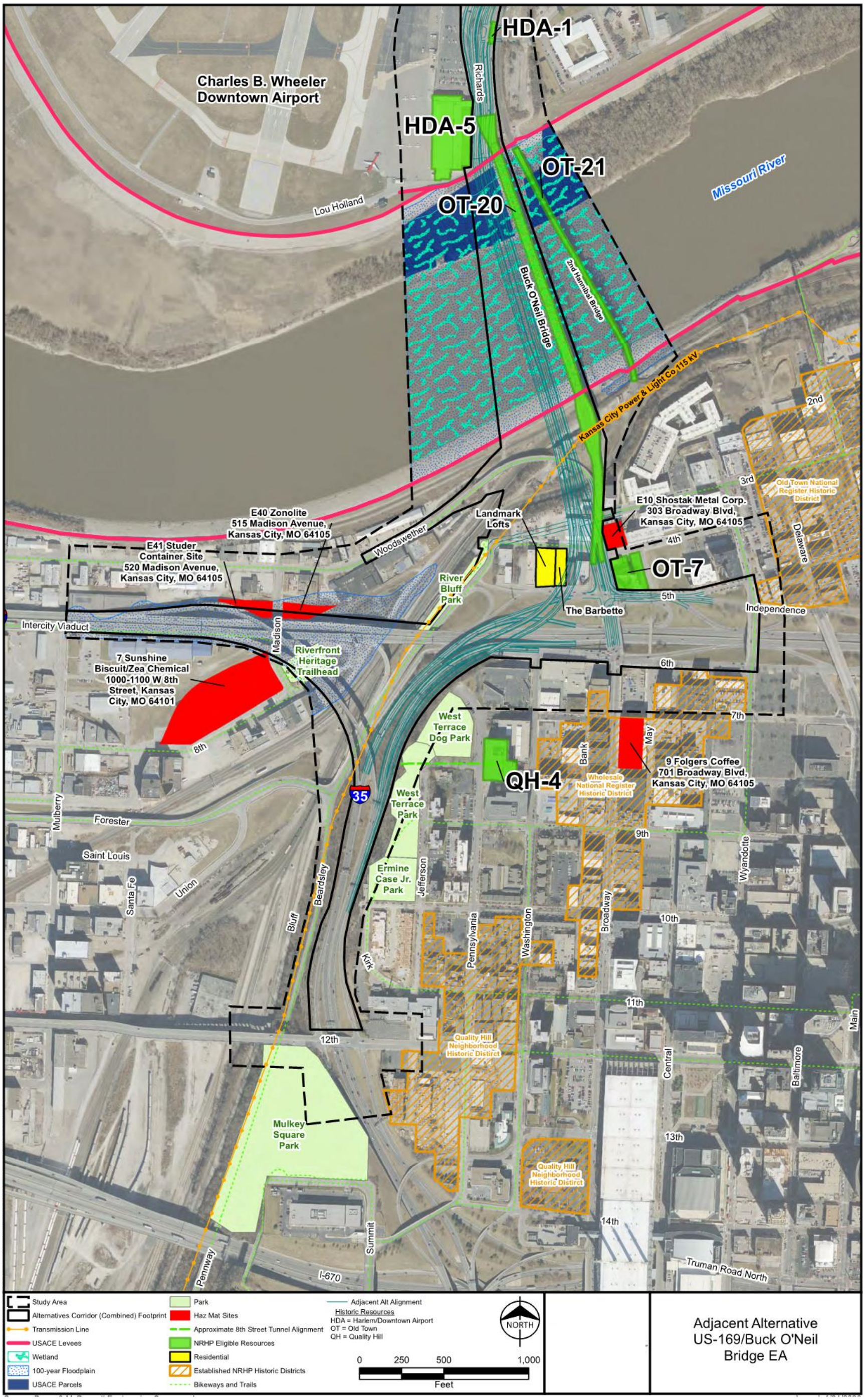
Figure 4-5: Central Alternative Features – River and South Segments



Source: Burns & McDonnell Engineering Company, Inc.

Issued: 1/24/2020

Figure 4-6: Adjacent Alternative Features – River and South Segments



4.1 Resources Not Affected

The resources described in Table 4-1 are either not present within the study area or the permanent and temporary effects of the proposed improvements on them would be negligible.

Table 4-1: Resource Categories Where No Effects Would Occur

Resource Category	Analysis of Effect
Climate or Resilience	Construction activity associated with the Proposed Action would result in increased fossil fuel combustion from the operation of vehicles and heavy equipment in the study area. Reductions in greenhouse gas emissions (GHG) can be achieved during construction by implementing practices such as engine idle time restrictions and properly maintaining equipment. At this time, the FHWA has not established a significance threshold for GHG emissions.
Coastal Barriers, Coast Zones, and Wild and Scenic Rivers	The Kansas City metropolitan area is not located within any designated coastal zones, coastal management areas, or coastal barrier areas. The Missouri River is not classified as a national wild and scenic river.
Farmland	The study area is in urban developed portions of Jackson and Clay Counties, Missouri and extends across the Missouri River. The area is committed to development which therefore exempts the Proposed Action from further coordination under the Farmland Protection Policy Act.

4.2 Project Effects and Mitigation

The following sections describe the features and resources present in the study area and the anticipated effects of the No-Build Alternative and three build alternatives (West, Central, and Adjacent) on them.

4.2.1 Air Quality

Air quality for transportation projects is typically reviewed in two areas - compliance with the National Ambient Air Quality Standards (NAAQS) established under the Clean Air Act (CAA), and consideration of increases or decreases in the emission of mobile source air toxics (MSAT) based on the type and magnitude of the improvements proposed. Compliance or "conformity" with the NAAQS, as required under the CAA, ensures that federally funded or approved transportation plans, programs, and projects conform to the air quality objectives established in State Implementation Plans (SIPs). Conformity requirements apply in areas that either do not meet or previously have not met the NAAQS for ozone, carbon monoxide, particulate matter, or nitrogen dioxide. The MSAT analysis can be qualitative or quantitative and focuses on diesel particulate matter (diesel PM) in addition to eight other compounds considered as national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors.[2]

Conformity - The Federal government established the NAAQS to protect public health, safety, and welfare from known or anticipated effects of six criteria pollutants: carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulfur dioxide, and lead. The State of Missouri has established additional criteria for hydrogen sulfide and sulfuric acid. Emissions from vehicles can include carbon monoxide, particulate matter, and nitrogen dioxide and contribute to the formation of ozone. MARC is responsible for implementing conformity regulations in nonattainment and maintenance areas within its jurisdiction. MoDOT has this responsibility in areas of the state not covered by MPOs.

[2] FHWA considers the following as priority mobile air toxics: diesel PM, benzene, formaldehyde, butadiene, naphthalene, acrolein, acetaldehyde, ethylbenzene, and ploycyclics. https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/;accessed November 6, 2019.

According to the MARC TIP approved November 1, 2019, the Kansas City region is currently an attainment/unclassifiable area for all transportation-related criteria pollutants.[3] According to the US Environmental Protection Agency (EPA) Green Book as of October 31, 2019, Jackson County, Missouri is classified as non-attainment for sulfur dioxide; and Clay County, Missouri is in attainment for all criteria pollutants.[4]

In June 2010, the EPA established a new 1-hour primary sulfur dioxide standard of 75 parts-per-billion, replacing two previous primary standards. Although EPA has revoked the 1971 primary sulfur dioxide standard, Missouri's approved SIP elements developed for these previous standards remain in effect until the State submits revisions to those SIP elements and EPA approves them. In September 2018, the Missouri Air Conservation Commission adopted a revision to a SIP element originally developed to address the 1971 sulfur dioxide standard, which included switches to cleaner-burning fuels at the Kansas City Power & Light Lake Road facility in St. Joseph, Missouri, as stipulated in the 2015 Administrative Order of Consent.[5]

The metropolitan and statewide planning regulations that govern development of a long-range transportation plan (LRTP)[6] or MTP and the TIP require that sufficient detail be provided for regionally significant roadway projects and fixed-guideway transit projects to support an air quality analyses. MARC has analyzed the projects in both documents as a group to determine that their project air quality impacts are lower than the budgeted amount to ensure that the region's air quality is not adversely affected by mobile-source pollution. This analysis indicated that regional mobile source emissions of volatile organic compounds and nitrogen oxides remain below the levels budgeted in the SIP, while accounting for the roadway capacity projects listed in the LRTP planned to be operational by 2040. Phase 1 and Phase 2 projects to replace the existing Buck O'Neil Bridge and make operational improvements within the corridor (projects #2025 and #3006, respectively) are included in the current MARC LRTP, *Transportation Outlook 2040*.

Planning and Air Quality

MPOs, like MARC, and state departments of transportation (DOTs), like MoDOT, work together to ensure that current and future transportation projects improve rather than degrade regional air quality. The following documents are developed by these agencies to support transportation project implementation and funding decisions.

State Implementation Plan (SIP)
A plan containing legally enforceable rules and regulations prepared by the state (Missouri Department of Natural Resources [MDNR]) and approved by the EPA. The SIP is designed to achieve better air quality by attaining, making progress toward attaining, or maintaining the NAAQS

Transportation Improvement Program (TIP)
A prioritized list of transportation projects covering a period of 4 to 5 years that is developed and formally adopted by the MPO as part of the metropolitan transportation planning process. Projects eligible for Federal funding under Title 23 USC and Title 49 USC Chapter 53 must be on a TIP before FHWA issues their environmental approval. The TIP can be amended by the MPO monthly or on a quarterly basis, depending on MPO.

Metropolitan Transportation Plan (MTP)
The MTP is a vision document spanning a 20- to 25-year planning horizon providing a policy framework for the investment of anticipated Federal, state, and local funds based on regional needs, goals, and objectives. The MTP serves as the foundation for development of the TIP. The MTP can be amended by the MPO on a quarterly basis.

Jackson and Clay Counties do not violate the NAAQS for ozone, carbon monoxide, particulate matter, and nitrogen dioxide. Therefore, the conformity requirements of 40 CFR Part 93 do not apply to this project. No transportation conformity analysis is required.

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3 *Transportation Improvement Program, 2020-2024*; MARC November 1, 2019.

4 US Environmental Protection Agency Green Book; https://www3.epa.gov/airquality/greenbook/anayo_mo.html; accessed November 6, 2019. The 8-hour Ozone (1997) standard was revoked on April 6, 2015.

5 Missouri Department of Natural Resources. KCPL-Lake Road (formerly St. Joseph Light and Power) Sulfur Dioxide Attainment Plan Revision; November 2, 2018.

6 The existing LRTP, *Transportation Outlook 2040*, includes projects developed, prioritized, and ultimately selected through a comprehensive and coordinated process involving the general public, regional transportation stakeholders, and MARC planning committees. MARC is currently receiving input to develop the next LRTP for the region, *Connected KC 2050 Regional Transportation Plan*.

Mobile Source Air Toxics – A qualitative MSAT analysis[7] was conducted based on the type and magnitude of the proposed improvements. This decision was based on:

- The proposed project would improve highway operations without substantially adding new capacity including minor roadway widening, construction of new interchanges, and replacement of signalized intersections on surface streets.
- The 2040 annual average daily traffic (AADT) volume for the corridor is projected at 48,000 under the No-Build condition and 57,000 under the build condition, both values well below the quantitative MSAT analysis threshold of 140,000 to 150,000 AADT.

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*.[8]

For each alternative evaluated in this EA, the amount of MSAT emitted would be highly dependent on both the vehicle miles traveled (VMT) and vehicle hours traveled (VHT), assuming that other variables such as fleet mix are the same for each alternative. As the VMT and VHT of all build alternatives are similar, it is estimated that MSAT levels will also be similar. However, because the VMT and VHT estimated for the No-Build Alternative are lower and higher, respectively, than for any of the build alternatives, higher levels of MSAT are also expected under the No-Build than for any of the build alternatives (see Table 4-2). The general observation is that although fewer vehicles are processed under the No-Build Alternative versus the build alternatives, each vehicle is experiencing more congestion and spending more time on the road (VHT) creating more emissions.

Table 4-2: 2015 and 2045 Network-Wide Vehicle Performance Metrics

Network Results	Volume Processed		Speed		VMT		VHT	
	AM	PM	AM Avg (mph)	PM Avg (mph)	AM (veh-mi)	PM (veh-mi)	AM (veh-hr)	PM (veh-hr)
Existing (2016)	39,838	41,096	42	39	111,560	116,245	2,661	2,968
2025 No-Build	40,479	41,927	39	34	113,827	117,451	2,894	3,478
2025 Build Central	42,794	44,161	39	37	121,908	127,483	3,099	3,435
2025 Build Adjacent	42,773	44,143	39	37	121,985	127,540	3,107	3,450
2025 Build West	42,860	43,990	39	36	122,341	127,358	3,127	3,594
2045 No-Build	43,820	36,386	35	21	120,471	99,558	3,475	5,866
2045 Build Central	43,695	43,645	35	30	124,216	127,463	3,602	4,321
2045 Build Adjacent	43,647	43,563	34	30	123,959	127,310	3,618	4,343
2045 Build West	43,756	43,640	34	29	124,072	127,688	3,664	4,567

SOURCE: Conceptual Access Justification Report, Interstate 35 / Interstate 70 Access Modification; US-169/Buck O'Neil Bridge Missouri River Crossing; Burns & McDonnell, January 6, 2020 ,

VMT – vehicle miles traveled; VHT – vehicle hours of travel

System-wide performance measures were used to compare traffic impacts between all reasonable build scenarios, System-wide metrics were assessed for each respective peak hour. Assessing the total number of vehicles processed aids in determining whether the reasonable build alternative adequately processes input vehicles in comparison to being held off-model due to queuing. All year 2025 reasonable build alternatives showed the roadway network servicing increased traffic volumes projected due to diversion from added capacity. The traffic analysis and any traffic-based environmental analyses are based on MARC's 2040 Land Use and 2040 Regional Travel Demand Model. To meet the requirements of 23 USC Section 109(b), traffic projections have been developed for year 2045 from growth rates using MARC's 2040 Regional Travel Demand Model. Future year 2045 was utilized because it ensures the twenty-year period is met. It is currently anticipated that construction will be complete by year 2024

7 *Updated Interim Guidance on Mobile Source Air Toxics Analysis in NEPA Documents*; FHWA. October 18, 2016.

8 www.fhwa,dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_sources_air_toxics/ msatemissions.cfm m

In addition, because the estimated VMT under each of the build alternatives are nearly the same, varying by less than 0.5 percent, no appreciable difference in overall MSAT emissions among the various build alternatives is expected. However, the build alternatives would carry approximately five percent greater volume in opening year projections than under the No-Build Alternative due to volume attraction to the new crossing/Buck O'Neil Bridge from other river crossings.

Under each alternative localized areas may exist where VMT would increase, and other areas where VMT would decrease. Therefore, it is possible that localized increases and decreases in MSAT emissions may occur. The localized increases in MSAT emissions would likely be most pronounced along the new roadway sections constructed, such as the I-35 flyover ramp connections to US-169 that are included in all build alternatives. However, even if these increases do occur, they too will substantially reduce in the future due to implementation of EPA's vehicle and fuel regulations.

Incomplete or Unavailable Information Regarding Specific MSAT Health Effects - In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA continues to assess the effects on human health of exposures and risks posed by air pollutants. Methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process builds on model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives.

Considerable uncertainties are associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. The nation also lacks consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

4.2.2 Bicycle and Pedestrian Facilities

Pursuant to FHWA Policy on Pedestrian and Bicycle Accommodations and Projects (23 CFR 652.5), an inventory of existing bicycle routes and pedestrian walkways was conducted within the study area. The Riverfront Heritage Trail, managed by Kansas City River Trails, Inc. (KCRT), a Missouri not-for-profit corporation, is the most prominent trail feature crossing the study area (Figure 4-7). The trail connects destinations in both Missouri and Kansas and is used for recreational and transportation purposes. The Riverfront Heritage Trail travels along Beardsley Road, west of I-35 within the study area. Additional trails and marked bike routes (along Beardsley, Woodswether Viaduct, and 3rd and 4th Streets) also cross the study area (Figure 4-8).

Figure 4-7: Riverfront Heritage Trail

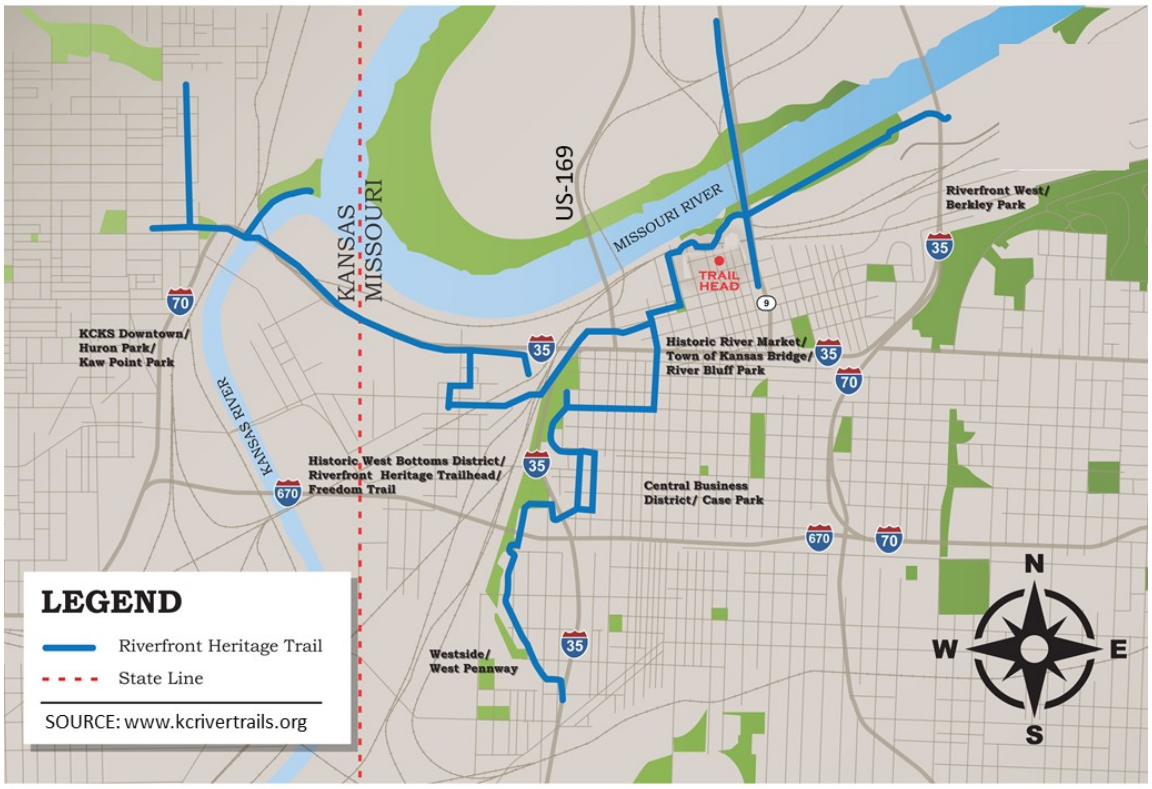
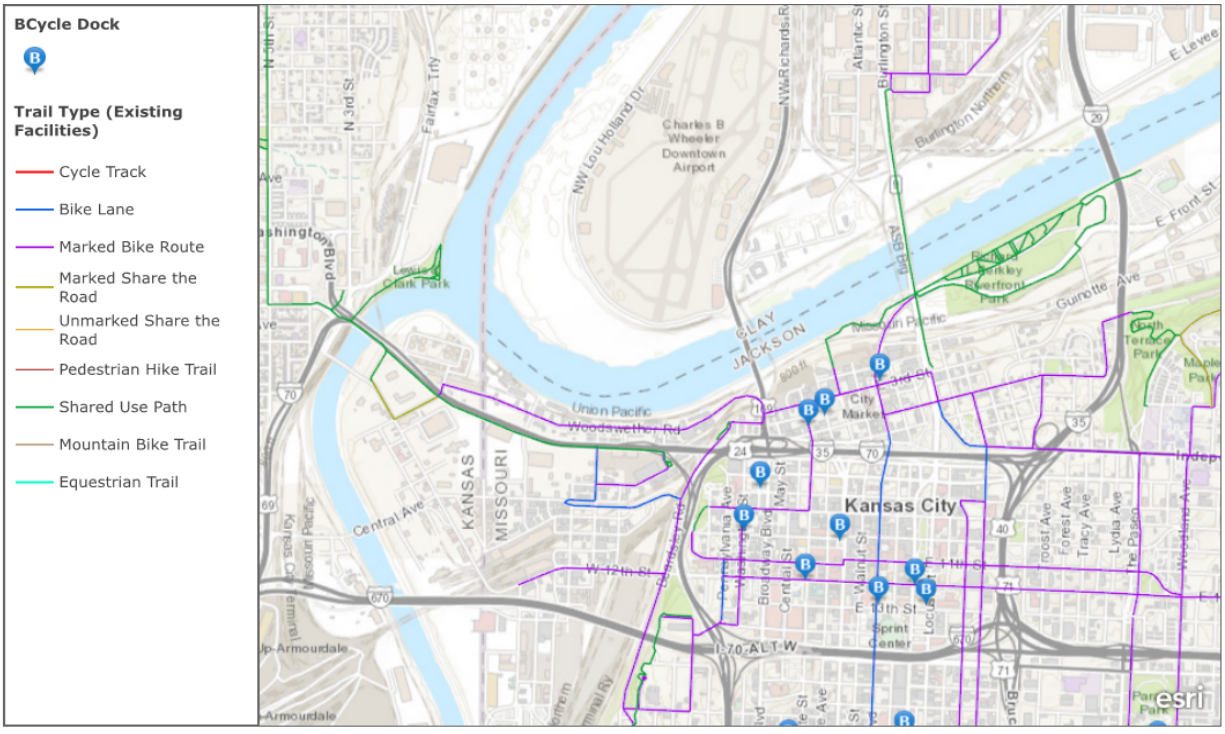


Figure 4-8: Kansas City Regional Trails and Bikeways in the Study Study Area and Vicinity



SOURCE: MARC, 2019

KCMO's *Bike KC Master Plan (2019 Draft)* includes a future bicycle/pedestrian facility along US-169 connecting trails in the KCMO central business district, West Bottoms, and River Market areas to future trails around MKC and within the Harlem neighborhood. The Kansas City Major River Crossings Policy (approved by the MARC board on April 25, 2006) and the Regional Complete Streets Policy (approved by the MARC board on March 27, 2012) specify the need for major river crossings to accommodate bicycle and pedestrian facilities.

4.2.2.1 No-Build Alternative

The design of the existing tied-arch bridge makes adding in-travel-way or off-travel-way bicycle/pedestrian structures difficult and costly. No facilities would be constructed to accommodate bicycle/pedestrian access across the river at this location. Connectivity with existing and planned shared-use facilities would not be provided.

4.2.2.2 Build Alternatives

All three build alternatives would include a dedicated and barrier-protected off-travelway bicycle/pedestrian facility along one side of the new crossing. Connectivity to existing walkways south of the river and to Richards Road north of the river would be provided off each bridge approach span. MoDOT will continue to coordinate the layout and location of the off-travelway bicycle/pedestrian facility with stakeholders through the design-build process.

South of the river, all build alternatives would cause temporary and permanent impacts to existing segments of the Riverfront Heritage Trail located along Beardsley Road and sections of 3rd and 4th Streets. Trail connectivity would be restored after completion of the project for all build alternatives. The Central and Adjacent Alternatives allow for continuity of the trail under the new bridge along a reconfigured 3rd Street to Beardsley Road. The West Alternative allows for continuity of the trail under the new bridge along a trail extension from 4th Street to Beardsley Road.

During construction, the trail will need to be temporarily closed in the vicinity of active work along Broadway, 3rd and 4th Streets and Beardsley Road. A possible trail detour during construction would travel from Wyandotte to 5th Street to Beardsley Road.

Impacts to the trail and planning for closures and detours will be coordinated by MoDOT with KCRT who manages the trail and associated trailheads. Because KCRT is a private, not-for-profit organization and not a public entity, the Riverfront Heritage Trail does not meet the definition of a resource that is provided protection under Section 4(f) of the DOT Act.

4.2.3 Biological Resources – Natural Habitats, Threatened/Endangered Species, Invasive Species

The Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.) attempts to ensure that proposed activities do not jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of species habitat. As provided in the ESA, the Fish and Wildlife Coordination Act, as amended, also applies to projects that affect water resources. The US Fish and Wildlife Service (USFWS) administers both acts.

The study area encompasses an urban built-up environment with limited natural vegetation. Areas that could support terrestrial species and habitats are limited to highway rights-of-way, small areas along both banks of the Missouri River, and the bluff and park areas south of the I-70 Loop. The Missouri River supports a variety of aquatic species. No rare or critical habitats are documented within or adjacent to the study area. Table 4-3 indicates the Federal and State listed species for the study area.

Table 4-3: Protected Species Potentially Occuring Within the Study Area

Common Name	Scientific Name)	Federal Listing
Indiana bat	*Myotis sodalis*	E
Gray bat	*Myotis grisescens*	E
Northern long-eared bat	*Myotis septentrionalis*	T
Pallid sturgeon	*Scaphirynchus albus*	E

E = Endangered, T = Threatened, NL = No Listed

SOURCE: USFWS IPac Database, October 16, 2019.

Indiana, gray, and northern long-eared bats - Indiana and northern long-eared bats winter in caves and spend summer in forested areas of the state while gray bats are cave obligate species year-round. Review of the Missouri Department of Conservation (MDC) Heritage Database (March 2019) and the 2019 Missouri Speleological Survey cave information indicated no records of these species or caves near the study area. During the spring, summer, and fall, Indiana and northern long-eared bats forage and roost in upland forests and along woodland stream corridors where snags and tree species with exfoliating bark are present. Gray bats roost in caves and abandoned mines year-round.

Pallid Sturgeon - Pallid sturgeon are mainly bottom feeders extracting their food consisting of small fishes and invertebrates from river bottoms. They are mainly found within the Missouri and Mississippi Rivers with their preferred habitats being areas with firm sand substrates and strong currents within the main river channel. Pallid sturgeon prefer a diversity of water depths and velocities. A spur dike on the north bank of the Missouri River extends into the channel west of the Buck O'Neil Bridge creating an area of slow water velocity and sand deposition directly behind the spur dike. Pier 2 of the Buck O'Neil Bridge is directly downstream of the tip of this spur dike. Pier 1 is located on the south bank outside of the channel thalweg (the center of the main navigation channel).

On October 9, 2019, MoDOT and Burns & McDonnell biologists evaluated forested areas within the study area to determine the presence of suitable bat habitat. The forested area north of the river consisted of cottonwood (*Populus deltoides*), white mulberry (*Morus alba*), and black willow (*Salix nigra*). Forested areas south of the river mainly consisted of elm (*Ulmus* spp.), tree of heaven (*Ailanthus altissima*), Amur honeysuckle (*Lonicera maackii*), and sumac (*Rhus* spp.). Very limited shrubby growth exists along the lower portion of the river bluff adjacent to I-35. Common species along the bluff include amur honeysuckle, tree of heaven, sumac, and variety of woody vines (greenbriar, *Smilax* spp.; poison ivy, *Toxicodenron radicans;* and wild grape, *Vitus* spp.). Mature upland forest growth occupies the upper edge of the bluff and extends into West Terrace and Ermine Case Jr. Parks. No suitable bat habitat was observed within any of the parcels to be potentially cleared for the project. No signs of bat usage of the Buck O'Neil Bridge and other bridges intended for replacement or repair as part of this project were observed (MoDOT, 2019).

USGS telemetry data (2008 records) and capture records from the MDC Natural Heritage Database (Updated March 2019) reveal that pallid sturgeon have been found within 277 feet upstream and 165 feet downstream of the Buck O'Neil Bridge. These data indicate that pallid sturgeon at least move through the area (see Appendix C: Biological Resources). No backwaters, tributaries, or other smaller or slower flowing waters adjoin or flow into the Missouri River within or adjacent to the study area. High flow velocities, sediment loads, and relatively little fluctuation in the river level, except during flood and drought events, are common for this reach of the Missouri River. Debris and river bottom contour changes around the existing bridge piers may provide suitable seasonal habitat for several fish species. A large scour hole was previously identified at Pier 2 of the Buck O'Neil Bridge and is scheduled to be filled in during the spring of 2020. This work was included in the 2018 bridge rehabilitation project but was delayed due to prolonged high water conditions. Additionally, two records for sturgeon chub, a Species of Conservation Concern in Missouri, exist within 0.28 miles upstream and 0.37 miles downstream of the project location.

Bald eagles are no longer listed as protected under the ESA; however, they are protected under the Bald and Golden Eagle Protection Act (BGEPA) (16 USC 668) and the Migratory Bird Treaty Act (MBTA) (16 USC 703). Bald eagles often prefer mature trees near large water bodies for foraging, roosting, and nesting. They also migrate along major rivers including the Missouri. No known active, alternate, or inactive bald eagle nests occur within or near the study area. The project vicinity is not a winter feeding and sheltering congregation area for wintering bald eagles and the study area is not currently a nesting location for this species.

Most bird species in the United States are protected by the MBTA which prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. Bird species, such as the barn swallow (*Hirundo rustica*) may nest on Buck O'Neil Bridge or under other bridges and structures within the study area that may be removed or repaired as part of this project. The general restricted nesting season, applicable to barn swallows, is April 1 to July 31; however, birds could be nesting before or after this period as a result of individual variations and weather triggers for migration and nesting.

Because of the developed nature of the study area, terrestrial wildlife is not relatively abundant except for resident and seasonal migratory bird species. Various waterfowl and other migratory species may use the river and associated riparian habitats on a seasonal basis. Most common wildlife species are tolerant of human activity and have adapted to living in developed areas.

4.2.3.1 No-Build Alternative

The No-Build Alternative would not affect protected species or their habitats. Prior to conducting further repairs to the Buck O'Neil Bridge or the possible removal of the bridge after 2025, additional coordination with USFWS regarding in-water construction effects on the pallid sturgeon may be required. A survey of the bridge would also be conducted to determine if the bridge is being used by bats or migratory birds prior to doing any future structural repairs.

4.2.3.2 Build Alternatives

Based on the Alternative Corridor that represents the footprint for all three build alternatives combined, a total of approximately 5.7 acres of forest habitat could be removed to support construction of the proposed improvements. Areas along the bluff and adjacent to either levee would repopulate overtime with woody and herbaceous species. Human activity and noise generated during construction would temporarily displace resident wildlife and fish during construction. Existing upland, riparian, and river habitats in the vicinity of the study area would be able to accommodate displaced fish and wildlife. Vegetation to be cleared along the bluff would be minimized to that necessary for construction of the flyover ramps and will not extend to the bluff edge or into the park properties located on top of the bluff.

MoDOT determined the proposed project will have "no effect" on the three bat species. On November 4, 2019, the USFWS concurred with the finding of "may affect but not likely to adversely affect" for the pallid sturgeon (see Appendix C). No seasonal restrictions have been placed on in-water construction activity or tree clearing.

Prior to demolition of the Buck O'Neil Bridge and other bridges or ramp structures replaced as part of this project, MoDOT will conduct surveys to determine if bird species protected under the MBTA are nesting in or on the structure(s). If active nests are present, demolition activities would be postponed until after the young have fledged.

MoDOT will require removal of existing bridge pier and foundation materials in accordance with accepted construction methods and best management practices (BMPs). The contractor will be required to haul away all debris and sediments removed from the river bottom and disposed of at an upland location or return the sediments to the river (depending on the condition included in the Section 404 permit). The new bridge foundations and piers would be constructed following similar methods. Over time, the new bridge piers would most likely provide in-water habitats similar to those around the existing bridge piers. The continued and long-term use of de-icing compounds on the new bridge would not adversely affect the quality or use of aquatic habitats within or adjacent to the Alternatives Corridor.

4.2.3.3 Mitigation of Effects on Biological Resources

MoDOT will conduct surveys to determine if bird species protected under the MBTA are nesting in or on structures to be removed prior to demolition. If active nests are present, demolition activities would not be allowed to begin until the young have fledged from the nests.

Seeding, planting, and mulching of disturbed areas and implementation of BMPs following MoDOT construction specifications will minimize the potential colonization of cleared areas by invasive species.

4.2.4 Community Effects – Socioeconomics, Environmental Justice, Limited English Proficiency, Title VI, Emergency Services

Data from the US Census Bureau 2000 Census, 2010 Census, American Community Survey (ACS) data for 2017 and 2013 to 2017 5-year estimates, and MARC population projections were obtained to characterize demographic trends in the study area.

The study area and Alternatives Corridor extend across portions of Kansas City dominated by industrial and commercial uses with limited residential development. Demographic data for the residential population within the four census tracts (i.e., 11, 152, 157, and 221) that intersect the study area are shown on Figure 4-9.

4.2.4.1 Demographic Trends

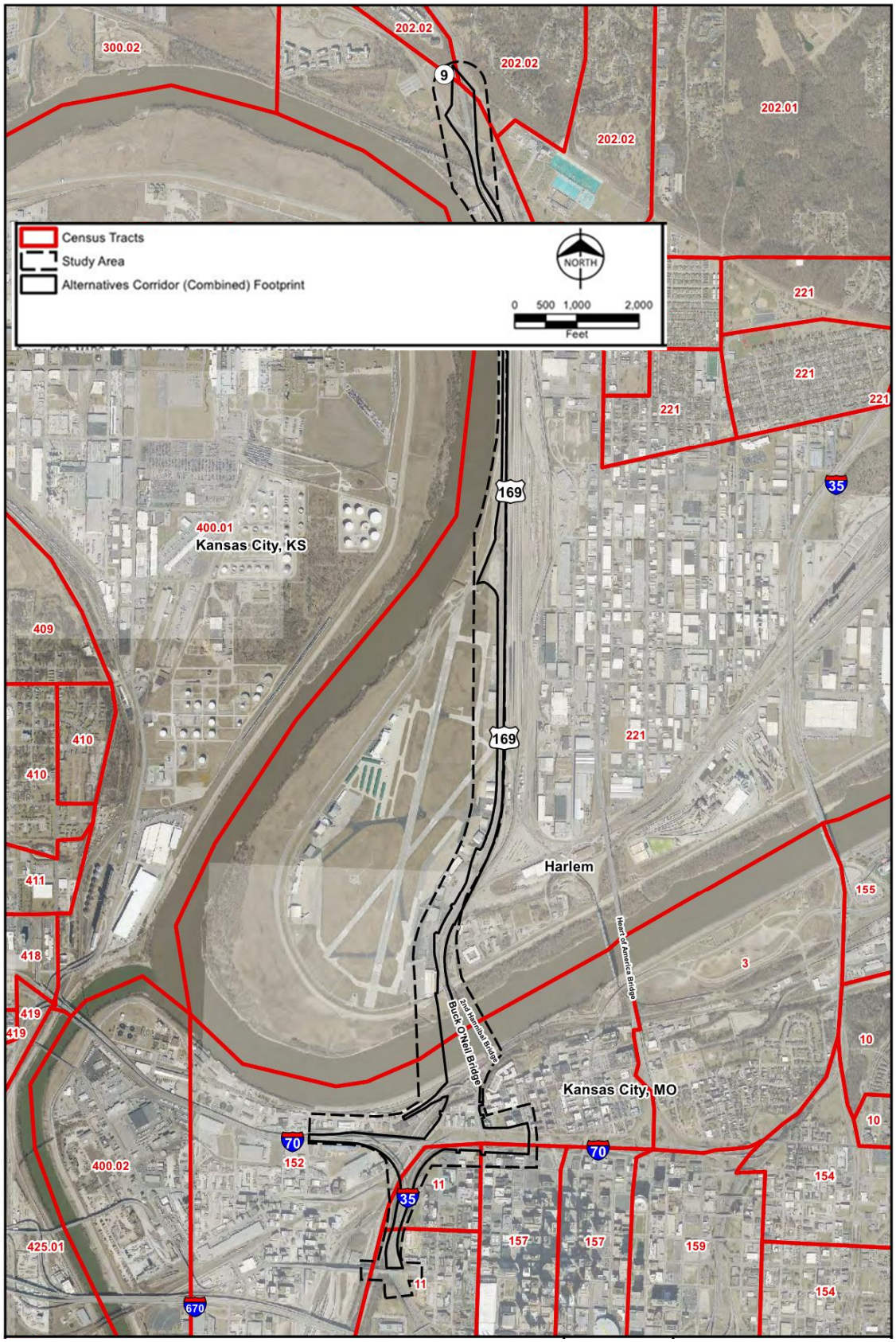
Between 2000 and 2017, the population of Missouri and KCMO grew at a similar rate of over 9 percent (see Table 4-4). The Kansas City Metropolitan Area grew at a faster rate over the same 17-year period, at almost 20 percent. Over this same time, population change in the project area census tracts varied greatly from a loss of 11 percent to growth of 375 percent. The growth of available housing in Census Tracts 152 and 157 contributed to the large percentage increases since 2000.

Table 4-4: Population

Area	2000	2010	2017	% Change 2000-2017	Over 65 (2017)	% Over 65 (2017)
Missouri	5,595,211	5,988,927	6,113,532	+9.3%	1,010,269	16.5%
Kansas City Metro Area	1,776,062	2,035,334	2,126,945	+19.8%	305,702	14.4%
City of North Kansas City, MO	4,714	4,208	4,371	-7.3%	647	14.8%
Clay County, MO	184,006	221,939	242,874	+32.0%	34,012	14.0%
Census Tract 221*	4,883	4,283	4,545	-6.9%	647	14.2%
City of Kansas City, MO (KCMO)	441,545	459,787	488,825	+10.7%	62,303	12.7%
Jackson County, MO	654,880	674,158	698,895	+6.7%	101,594	14.5%
Census Tract 11*	1,901	1,709	1,679	-11.7%	184	11.0%
Census Tract 152*	936	1,727	2,290	+144.6%	44	1.9%
Census Tract 157*	586	1,886	2,784	+375.1%	72	2.6%

Source: U.S. Census Bureau, 2000; U.S. Census Bureau, 2010, ACS Profile Reports 2017 and 2013-17
*2013-2017 ACS 5-Year Estimate, which provides an estimate for 2017

Figure 4-9: Census Tracts That Intersect the Study Area



According to MARC's population projections, growth across the study area is expected through 2040 (Table 4-5). Several of the census tracts in Jackson County which include the River Market area and downtown KCMO are expected to grow by nearly double to almost triple the number of residents during this period. Census Tract 221 in Clay County is projected to see the most moderate growth by 2040.

Table 4-5: Population Change Across the Study Area by 2040

Area	2010	2040	% Change 2010-2040
Census Tract 221 (Clay)	4,283	5,843	+36.4%
Census Tract 11 (Jackson)	1,709	2,869	+67.9%
Census Tract 152 (Jackson)	1,727	5,745	+232.7%
Census Tract 157 (Jackson)	1,886	5,465	+189.8%
Total	15,430	30,423	+97.2 (average)

Source: U.S. Census Bureau, 2010, * 2040 Data based on MARC population projections

4.2.4.2 Race and Ethnicity

The racial and ethnic makeup of the census tracts intersecting the study area is presented in Table 4-6 based on the US Census Bureau, 2017 and 2013 to 17 ACS 5-Year Estimates. Census Tract 11, which is located south of the Missouri River in KCMO, reflects a minority population of over 32 percent, similar to that of Jackson County as a whole which is almost 34 percent minority. KCMO has a minority population of around 40 percent while the rest of the areas fall well below the minority population percentage of the Kansas City Metropolitan area.

Table 4-6: Race and Ethnicity

Area	Total Population	White Alone	Black or African American	American Indian	Asian	Native Hawaiian Pacific Islander	Hispanic	Total Minority[1]
Missouri	6,113,532	82.0%	11.4%	0.4%	2.0%	0.1%	4.2%	18.0%
Kansas City Metro Area	2,126,945	78.0%	12.4%	0.5%	2.9%	0.1%	9.1%	22.0%
City of North Kansas City, MO	4,371	78.5%	6.7%	0.0%	6.8%	0.0%	8.9%	21.5%
Clay County, MO	242,874	84.9%	5.9%	0.4%	2.4%	0.0%	6.9%	15.1%
Census Tract 221*	4,545	79.0%	6.8%	0.0%	6.6%	0.0%	8.6%	21.0%
City of Kansas City, MO	488,825	60.0%	28.5%	0.6%	3.2%	0.1%	9.4%	40.0%
Jackson County, MO	698,895	66.1%	23.4%	0.4%	2.0%	0.3%	9.2%	33.9%
Census Tract 11*	1,679	67.7%	22.3%	0.0%	1.3%	1.2%	9.0%	32.3%
Census Tract 152*	2,290	81.0%	12.9%	0.1%	4.5%	0.0%	4.1%	19.0%
Census Tract 157*	2,784	76.7%	13.3%	0.8%	2.9%	0.9%	8.2%	23.3%

Note: [1] "Total Minority" is calculated by subtracting White Alone from the total population.
Source: ACS Profile Report for 2017, *2013-17 ACS 5-year Estimate which provides an estimate for 2017

4.2.4.3 English Language Proficiency

Executive Order (EO) 13166, *Improving Access to Services with Persons with Limited English Proficiency*, signed in 2000, requires Federal agencies to examine the services they provide, identify any need for services to those with Limited English Proficiency (LEP), and develop and implement a system to provide meaningful

access to those with LEP. During the census process, persons that identify themselves as speaking English less than "very well" are considered having LEP. Table 4-7 reflects the population over five years of age and the percentage of those individuals that speak English only as well as those with LEP. KCMO and North Kansas City, as well as Census Tracts 221 (61 percent) and 11 (7.3 percent), have a higher percentage of the population with LEP than the overall metropolitan area.

Like all travelers through the study area, LEP populations living in and around the study area would experience temporary changes in access to the local and regional roadway system. No LEP populations would be directly affected by the Proposed Action. MoDOT would provide material translation and other accommodations during public involvement opportunities associated with the construction phase of the project.

Table 4-7: English Language Proficiency

Area	Population over 5 years of age	English-only speaking	Speaks English less than "very well"
Missouri	5,702,159	94.0%	2.1%
Kansas City Metro Area	1,949,097	90.1%	4.0%
City of North Kansas City, MO	4,220	89.8%	6.4%
Clay County, MO	227,523	93.5%	2.8%
Census Tract 221	4,394	90.2%	6.1%
City of Kansas City, MO	443,764	88.0%	5.1%
Jackson County, MO	641,819	90.6%	3.7%
Census Tract 11	1,565	85.3%	7.3%
Census Tract 152	2,228	91.1%	2.2%
Census Tract 157	2,757	93.0%	2.5%

Source: 2013-17 ACS 5-year Estimate which provides an estimate for 2017

4.2.4.4 Income and Employment

KCMO and Census Tract 11 are the only areas with a higher unemployment percentage than the State percentage of 4.6 percent. Median household income values vary across the study area from a high of $70,508 in Census Tract 157 (downtown KCMO) to a low of $35,563 in Census Tract 11 (Quality Hill neighborhood). Census Tract 11 has the highest reported population living below the poverty level at 21.1 percent, compared to the state value of 13.4 percent (Table 4-8).

Table 4-8: Economic Indicators

Area	Civilian Labor Force	Percent Civilian Unemployed	Median Household Income	Percent of Population Living Below poverty
Missouri	3,061,464	4.6%	$53,578	13.4%
Kansas City Metro Area	1,130,916	4.0%	$63,404	10.0%
City of North Kansas City, MO	2,817	1.9%	$42,329	11.0%
Clay County, MO	134,113	4.4%	$66,938	7.4%
Census Tract 221	2,991	1.8%	$47,455	12.3%
City of Kansas City, MO	268,138	5.2%	$51,330	15.5%
Jackson County, MO	366,123	4.5%	$52,552	13.7%
Census Tract 11	1.299	9.3%	$35,563	21.1%
Census Tract 152	1,480	4.2%	$63,475	10.2%
Census Tract 157	2,536	2.2%	$70,508	7.0%

Source: ACS Profile Report for 2017, *2013-2017 ACS 5-Year Estimate which provides an estimate for 2017

4.2.4.5 Homeless Population

Parts of the study area are known to harbor homeless populations. Data were collected from agencies that provide services to those individuals including from the Greater Kansas City Coalition to End Homelessness (GKCCEH); the KCMO Police Department's Crisis Intervention Team website; and websites for various agencies that work with the homeless population across the metro. A phone interview conducted with reStart, a non-profit organization that provides housing and support for all homeless populations, discussed their outreach program and experience with notifying homeless populations of the need to move from a specific location.

Homelessness data are not available down to the level of the study area. Available data is based on a point-in-time and was collected in aggregate for Kansas City/Jackson County Continuum of Care, coordinated by the Homeless Services Coalition of Greater Kansas City. Table 4-9 identifies the total households and persons in various levels of shelter and unsheltered situations on January 24, 2018. The total number of unsheltered persons in the identified area was 285 at the time of the 2018 survey.

Table 4-9: Total Households and Persons, Sheltered and Unsheltered

Area	Sheltered			Unsheltered	Total
	Emergency	Transitional	Safe Haven		
Total Number of Households	773	198	13	257	1,241
Total Number of Persons	997	354	13	285	1,649
Number of Children (under age 18)	204	149	0	5	358
Number of Persons (over age 24)	68	48	0	11	127

Source: Greater Kansas City Coalition to End Homelessness, 2018.

Note: Safe Havens are a form of supportive housing serving hard-to-reach homeless persons with severe mental illness who come primarily from the streets and have been unable or unwilling to participate in housing or supportive services.

4.2.4.6 Civil Rights and Environmental Justice

Title VI of the 1964 Civil Rights Act prohibits discrimination based on race, color, and national origin in programs and activities receiving Federal financial assistance. It seeks to ensure that all groups and individuals have the right to access and participate in the transportation decision-making process.

Issued in 1994, EO 12898, *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations*, *directs Federal agencies to take the appropriate action and necessary steps to identify and address disproportionately high and adverse effects of Federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law.* The U.S. Department of Transportation Environmental Justice Order and FHWA's Environmental Justice Order 6640.23 are to:

Environmental Justice – how do you define minority and low income populations?

Minority population — Any identifiable minority group(s) who live in a geographic proximity. This includes people who are Black/African-American, Hispanic or Latino, Asian American, American Indian and Alaskan Native, and Native Hawaiian and other Pacific Islander.

Low-income population — People with median household incomes are at or below the U.S. Department of Health and Human Services (HHS) poverty guidelines.

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority and low-income populations.
- Ensure full and fair treatment of all people and their involvement in the transportation decision-making process regardless of race, color, national origin, age, or income.
- Prevent the denial of, reduction in, or significant delay in benefits received by minority and low-income populations.

MARC completed an environmental justice analysis to evaluate the proximity of minority and low-income populations to Federal investment at a regional scale. The areas shown in Figure 4-10depict census tracts in

which the percent minority population in the tract is greater than the percent minority population of the overall MPO area (27 percent, based on MARC's Environmental Justice Analysis, 2016 to 2020), and/or in which more than 20 percent of households are in poverty.

Figure 4-10 illustrates that Census Tract 11, within the southeastern portion of the study area which includes I-35 and the area east of I-35 (West Terrace and Ermine Case Jr. Parks) and south of I-70, is an environmental justice community. No residences are located within the study area/Alternatives Corridor that overlaps Census Tract 11.

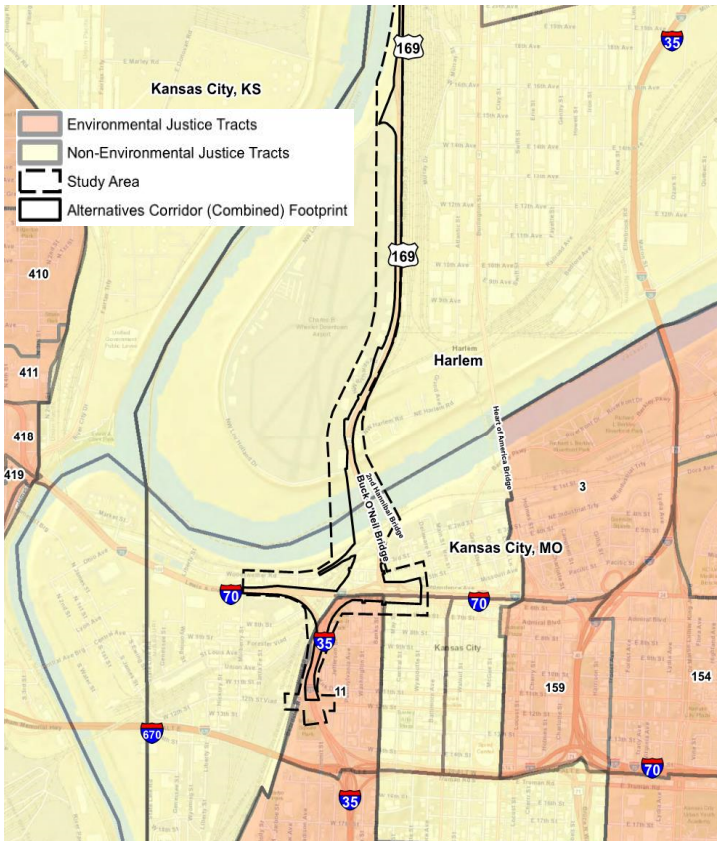


Figure 4-10: Environmental Justice Populations
(based on MARC's Environmental Justice Analysis, 2016 to 2020)

4.2.4.7 Public Facilities and Emergency Services

MKC is the largest public facility in the study area, located on 695 acres north of the river and west of US-169. MKC is used by Children's Mercy Hospital and the Midwest Organ Transplant Network to support the transport of tissues, organs, and critically ill patients to health facilities south of the river, including Children's Mercy Hospital, St. Luke's Medical Center, and the University of Kansas Medical Center via US-169 and other regional highways.

The Kansas City Fire Department has operated the aircraft rescue and firefighting (ARFF) station at MKC since 2015. ARFF personnel respond to incidents at the airport and can be supported by other emergency service providers located south of the river when needed. Fire, police, and emergency medical services (EMS) rely on US-169 to access the airport and to respond to other regional emergencies. Access to emergency services both north and south of the Missouri River is important to both residents and businesses. Besides the ARFF, no other first responders or emergency providers have facilities within the study area.

4.2.4.8 Community Cohesion

The Missouri River has always been a physical barrier within KCMO. Although an important regional conduit, the US-169/Broadway Extension corridor has also been a physical and visual barrier between the River Market and the rest of downtown KCMO. Except for Broadway Boulevard south of I-70, the US-169/Broadway Extension corridor lacks facilities to safely support bicycle and pedestrian travel. Rapid redevelopment within the River Market, downtown KCMO, and the Quality Hill neighborhood is steadily introducing more people to areas that lack connectivity to retail and business centers, education, and health services. Employers and residents on both sides of the Missouri River rely on businesses and services on the opposite side of the river. With few river crossings across the community, the US-169 crossing is an important transportation conduit that supports the economic viability of the metropolitan area.

4.2.4.9 No-Build Alternative

No construction would occur; the US-169 corridor would continue to connect areas north and south of the river. Traffic congestion and delays would continue to increase, and the highway would still be barrier to connecting neighborhoods on both sides of the river. Neighborhoods in the area would be affected in the event the US-

169/Buck O'Neil Bridge crossing becomes closed to traffic due to its deteriorated condition after 2025, or during a major rehabilitation. No public facilities or emergency access would be affected unless the crossing closes.

4.2.4.10 Build Alternatives

Environmental Justice - Census Tract 11 has been identified as the sole environmental justice tract within the study area. The footprint of each build alternative is limited to the area necessary to construct the proposed improvements, which in relation to Census Tract 11 would follow the existing I-35, I-70, and Broadway Boulevard rights-of-way. Residences within Census Tract 11 are located away from these primary roadways. No residences are included within the portion of the Alternatives Corridor and individual build alternative footprints that overlap Census Tract 11. No minority or low-income populations have been identified that would be adversely or disproportionately affected by the proposed project. Therefore, in accordance with EO 12898 and FHWA Order 6640.23, no further environmental justice analysis is required.

Community Cohesion - A new and improved crossing would improve access to business and services on both sides of the river while improving travel times for commuters, commercial transporters, and emergency responders. A new crossing and bridge structure would provide wider travel lanes and shoulders to enhance access by emergency services by improving travel efficiency and reliability at this river crossing. The wider roadway would provide space for disabled vehicles and enough room to maintain traffic flow around most traffic incidents. Although minor short-term delays and temporary disruptions in travel patterns and travel time would occur during construction, the long-term benefits of a new bridge would far outweigh short-term impacts.

The West Alternative would have the greatest effect on community cohesion by eliminating the existing US-169 roadway barrier and moving the river crossing to the west. This shift would open additional area between the river and I-70 for redevelopment. The western alignment would add distance for those bicyclists and pedestrians using the shared path to cross the river and remove businesses within the River Market and West Bottoms.

The Central Alternative would also open area between the river and I-70 but would also remove several businesses within the River Market. The shared use path associated with the Central Alternative would be accessible to more users due to its proximity to downtown, the River Market, and the West Bottoms.

The Adjacent Alternative would still serve as a barrier between downtown neighborhoods due to its proximity to the existing US-169 crossing. The Adjacent Alternative would also remove businesses within the River Market.

Income and Employment - Construction of any of the build alternatives would create construction-related jobs. Positive economic effects may be realized during the construction period due to the expenditure of public funds within the study area. This includes direct income for construction workers which would be expended for goods and services within the area. Local materials suppliers would benefit from providing goods to the construction contractor for the project. The level at which these positive impacts would occur is determined to a great degree by the contractor, based upon the extent that local labor and materials are used in the construction project.

LEP - Opportunities for public engagement have occurred and will continue to occur throughout the life of this project. If special populations are identified, specific accommodations, such as translations services or additional outreach will be utilized.

Homeless Population - MoDOT will work with KCMO, the KCMO Police Department's Crisis Intervention Team, GKCCEH, and other agencies that work with area homeless populations to relocate unsheltered persons living in the study area to accommodate construction.

4.2.5 Floodplains, Floodways, and FEMA Buyout Properties

Floodplains are low-lying, flat or nearly flat areas of land adjacent to rivers, streams, and other water courses, that are periodically inundated with water due to natural events (depicted in Figure 4-11). A 100-year flood is defined as a flood which has a one percent chance of being equaled or exceeded in magnitude in any given year. The 100-year (base) floodplain is any area that would be covered by water during a 100-year flood event.

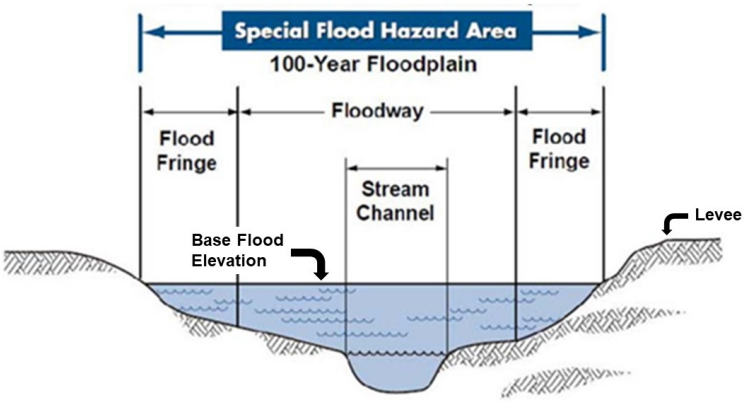


Figure 4-11: Floodplains and Floodways

A regulatory floodway is defined as the channel of a stream plus the adjacent area that will be inundated with water during a 100-year flood event and must remain free of encroachment to avoid increasing the base flood elevation during a 100-year flood event. The Federal Emergency Management Agency (FEMA) under their National Flood Insurance Program (NFIP) prepares Flood Insurance Rate Maps (FIRM) for areas prone to flooding. These maps are used to identify special flood hazard areas and to determine the limits of the 100-year (base) floodplain and the extent of possible floodplain encroachment.

FEMA has mandated that projects can cause "no rise" in the flow within the regulatory floodway. Within the study area, the regulatory floodway extends to levee systems on both sides of the river, requiring a "no rise" condition for improvements between the levee systems. Based on review of FEMA map panel 29095C0252G (effective 01/2017), the base (100-year) flood elevation within the study area is 750 feet.

In Missouri, the State Emergency Management Agency (SEMA) issues a floodplain development permit for any project administered by the State of Missouri. This permit requires a "no-rise" certificate based on hydraulic analysis of the proposed impacts to the regulatory floodway.

EO 11988, *Floodplain Management*, directs Federal agencies to take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health, and welfare, and restore and preserve the natural and beneficial values served by floodplains. Federal agencies are to provide public notice of Proposed Actions in floodplains and make a finding that there is no practicable alternative before taking action that would encroach on a 100-year floodplain. USDOT Order 5650.2, *Floodplain Management and Protection*, outlines the DOT policies and procedures for implementing EO 11988. An Only Practicable Alternative Finding in response to EO 11988 would be included in the decision document published by the FHWA.

What are the natural and beneficial values of floodplains?

In natural systems, floodplains provide several important functions:

- Create wildlife habitat
- Provide temporary storage of flood water
- Recharge and protect groundwater
- Prevent heavy erosion caused by fast moving water
- Support vegetative buffers to filter contaminants
- Accommodate natural movement of stream flows

Floodplains store excess water during floods and slow down the speed of the of flowing water which protects areas farther downstream. Slower water velocities help reduce erosion and allow sediments in the water to settle, often providing nutrients to fertile floodplains.

23 CFR 650A, *Bridges, Structures, and Hydraulics*, prescribes FHWA policies to avoid significant encroachments on floodplains and to minimize impacts of highway agency actions which adversely affect base floodplains The FHWA's floodplain encroachment policy requires avoidance of longitudinal encroachments wherever practicable. If longitudinal floodplain encroachments cannot be avoided, the degree of encroachment should be minimized to the extent practicable. Bridges over major waterways are typically configured to span

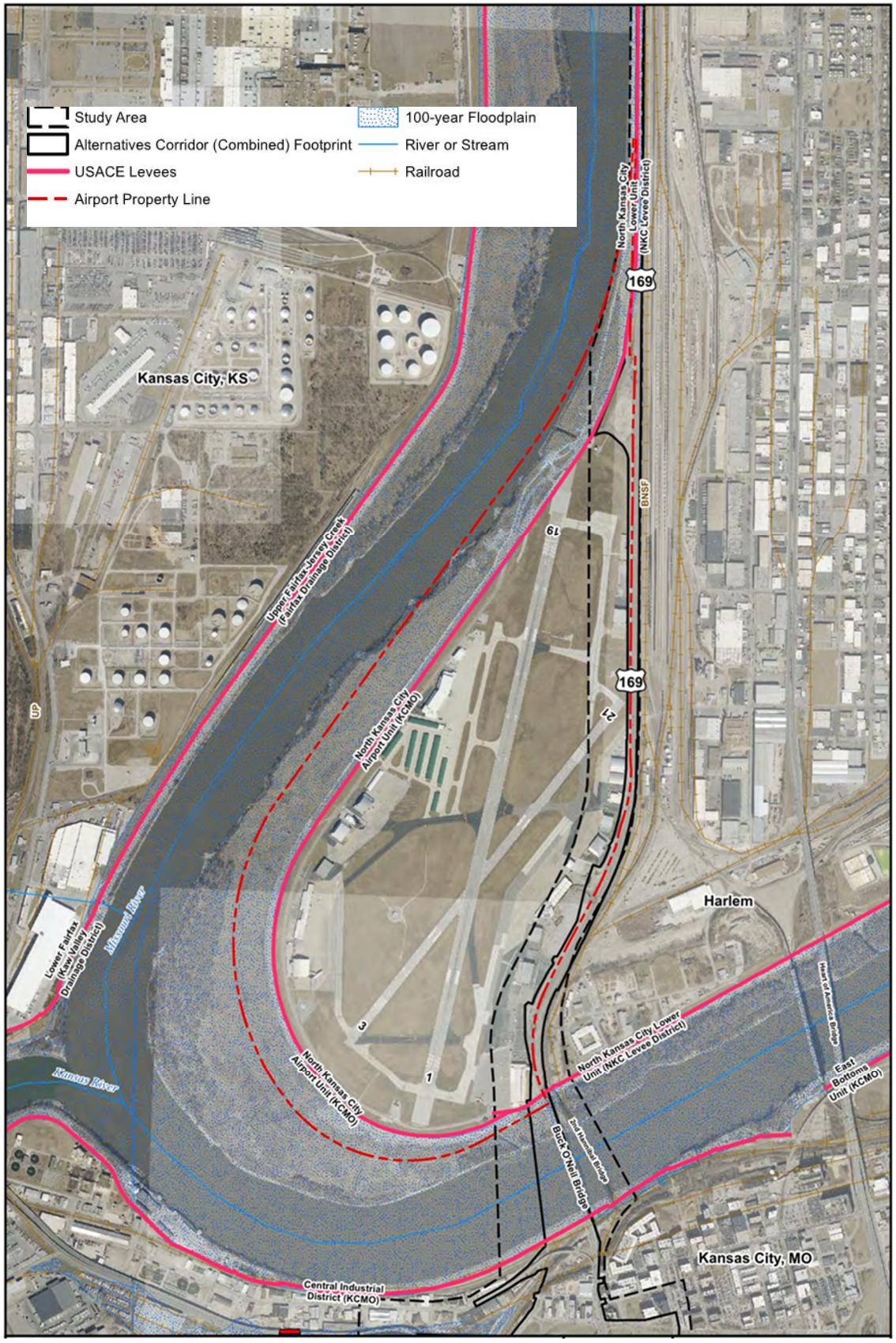
as much as the floodplain as possible to provide "no rise" in the water surface elevation and to minimize impacts to the floodplain.

Within the study area and alternative corridor, the 100-year floodplain special flood hazard area is bounded by the Missouri River levees. A small area of 100-year floodplain is also mapped along I-70 west of I-35 within the northeast corner of the West Bottoms. This area is occupied by industrial and commercial properties; no primary residences are located within either area mapped as 100-year floodplain. Therefore, no FEMA buyout properties occur within the study area and Alternatives Corridor.

Levees - The Kansas City levee systems are owned and operated by non-Federal sponsors (Figure 4-12). Within the study area, the levee system along the north bank (around MKC and under the north approach span of the Buck O'Neil Bridge) is maintained by KCMO. This levee segment abuts levee segments maintained by the North Kansas City Levee District to the north of the airport and east of the 2nd Hannibal Bridge. The levee system along the south bank of the river (under the south approach span of the Buck O'Neil Bridge and protecting downtown Kansas City), is managed by KCMO. The USACE inspects the levee systems annually and provides technical support when requested by the levee sponsor. The levee systems within the study area provide 500-year flood protection, meaning that the likelihood of a flood overtopping the levee in any given year has been estimated at 0.2 percent (one chance in 500).

Modifications to levee structures should be avoided. Both levee systems include components such as drainage systems and pressure relief wells that are critical to the flood protection provided, and conflicts with these components should be minimized. In addition to the levee system itself, improvements proposed in the vicinity of the levee system must be reviewed and approved by the levee manager and the USACE. The project impacts are assessed to ensure that the levee systems are not compromised and that no increase in flood risk exists.

Figure 4-12: Levees in the Vicinity of the Alternatives Corridor



The levee manager and the USACE review and approve potential impacts to the levee systems following 33 USC 408 (Section 408) guidelines. USACE-owns the land along the north bank of the river and riverward of the levee system. Initial dialogue with USACE indicates that a temporary easement in the area may be obtained for construction purposes.

The KCMO Water Service Department manages the water intake plant north of MKC near the intersection of US-169 and MO-9. Except for areas of limited riparian habitat present at the south end of the airport and along the south bank of the river, the area riverward of both levees is relatively void of vegetation.

4.2.5.1 No-Build Alternative

The No-Build Alternative would have no effect on the existing levee system nor would it require the placement of new bridge piers or fill materials within the floodplain. No critical areas riverward or landward of the levees would be altered. The No-Build Alternative would have no effect on long-term or beneficial floodplain values. If a solution to address the condition of the existing crossing is identified that requires removal of the existing bridge piers and foundations at some point in the future, coordination with the KCMO, the levee manager, the USACE, and the USCG will be required.

4.2.5.2 Build Alternatives

To maintain US-169 connectivity over the Missouri River, all three alternatives would replace the existing bridge, removing the existing piers and foundations within the floodplain and floodway. New piers will be constructed within the floodplain and floodway. No fill materials will be permanently placed within the floodplain or floodway. A hydraulic analysis will be required to document that the new bridge will result in "no rise" to the water surface elevation within the regulatory floodway. MoDOT will also obtain a floodplain development permit from SEMA prior to initiating construction.

Error! Reference source not found. summarizes the effects of each build alternative on the mapped floodplain and floodway.

Table 4-10: 100-Year Floodplain and Regulatory Floodway Effects

Alternative	100-Year Floodplain/Floodway (linear feet)	Floodway (acres)
No-Build	0	0
West Alternative	1,580	14.4
Central Alternative	1,530	12.4
Adjacent Alternative	1,490	10.6

NOTE: The 100-year floodplain and regulatory floodway have the same limits within the study area and the Alternatives Corridor.

All three build alternatives would also remove the existing piers and foundations within critical areas near the levee systems and new piers will be constructed within these areas. Direct impacts to the levee systems will be avoided. Section 408 approval for impacts to areas near the levee systems will be obtained from the levee manager and USACE prior to the start of construction. The improvements proposed at the north airport access would shift the alignment of the southbound ramp from US-169 to Richards Road/Lou Holland Drive towards the landward area of the levee bordering the airport to lengthen the stopping distance. The placement of fill and construction of new pavement in this area is needed to accommodate the roadway shift.

4.2.5.3 Mitigation for Effects on Floodplains, Floodways, and Flood Control Structures

During construction the size and duration of temporary obstructions to be constructed within the floodplains and floodway can be minimized by effective construction sequencing and construction methodology. Coordination among USACE, KCMO, MoDOT, FAA, and KCAD will be continued to identify appropriate design standards and address any potential impacts to the levee system.

As described in Section 4.2.14 (Construction Phase Impacts and Mitigation), several techniques may be used during construction that would potentially temporarily affect river flows including the use of cofferdams for pier removal and construction, construction and use of a temporary bulkhead or causeway from either bank, or construction of temporary bents (piers) in the river. Each proposed technique will be evaluated in terms of hydraulic impacts prior to obtaining any required permits for their use.

Pier construction in the vicinity of the levee system would likely require contingency for emergency backfill in the event of flood conditions. In addition, impacts to critical elements of the levee system such as the landward drainage system or relief wells should be minimized. Excavated construction in the vicinity of the levee would require strict backfill measures to restore the system to its original condition.

Construction access may be permitted from existing levee road(s); however, because of the steep incline up and over the levee, additional material may be required to safely haul equipment used for construction. Additional material placed against the levee would be placed to avoid compromising the integrity of the levee system and will require review and approval by the levee manager and the USACE.

Construction staging areas may be proposed on the riverward, or more likely, the landward side of either levee system. Any staging area used would not disturb the elements of the levee system, and the area would be restored to its original condition after use as a staging area.

4.2.6 Hazardous Materials, Solid Wastes, and Pollution Control

Potential Hazardous Material Sites - A database search, field reconnaissance, and review of historical aerial photographs/topographic maps and data collected during the PEL were conducted to identify documented and potential hazardous material/waste sites and to evaluate the likelihood of soil or groundwater contamination within the study area and Alternatives Corridor. Additional search results are provided in Appendix E.

The study area encompasses a section of Kansas City with a long history of multiple commercial and industrial uses. Many current and former businesses/industries are of environmental concern because of (1) documented environmental contamination, and (2) the length of time they have been engaged in activities that may have used hazardous materials or produced hazardous wastes especially during periods when little or no regulation of their use or disposal existed. In addition, the hydrogeologic regime of the study area is dynamic, due to the proximity of the river and the underlying geological, soil, and hydrologic conditions. Changes in direction of groundwater flow, quality, and composition are common. The nature of the hydrogeologic regime increases the opportunity for contaminants to enter the soil and groundwater under the study area that were generated by incidents involving hazardous materials beyond the study area limits.

Using the information obtained from database searches, a limited “windshield” survey was conducted to verify selected site locations judged to have moderate to high potential for environmental contamination and to identify potential sites of concern that may not have been revealed in the database search. Properties were not accessed but observed from public rights-of-way. No interviews were conducted with owners or operators during the reconnaissance survey.

The results of the database search, historical reviews, and field reconnaissance were prioritized as to the likelihood of soil or groundwater contamination being present within the study area. The following priority classes were assigned to each potential site:

- "None-to-Low" – No indication that the proposed project would impact the site based on review of available database information. It is possible that potential contaminants could have been generated or handled on the site; however, all information indicates the potential impact to a build alternative would be minimal. These sites include things such as Resource Conservation and Recovery Act (RCRA) small quantity generators or underground storage tanks (UST) sites for which releases of hazardous constituents have not been documented.

- "**Low-to-Moderate**" – Sites include any former or current operations identified as large quantity hazardous waste generators. Locations where releases of hazardous materials or petroleum products have been reported, and remediation has been completed are included. These sites include leaking UST sites that have been listed in the database as closed following completion of remediation.
- "**Moderate-to-High**" – A review of available information indicates that known soil or groundwater contamination is present and that the site is either undergoing remediation or continued groundwater monitoring. Additional sites may include unmappable sites in proximity of the Alternatives Corridor listed in the database search. Further assessment would be required if a "Moderate-to-High" priority site is affected by a build alternative to determine the actual presence or levels of contamination, the contaminated medium (e.g., soil, groundwater), and the need for mitigation/remediation. Actual physical assessment would not begin until during the design-build process during property acquisition negotiations.

Numerous sites were identified within the study area and used to screen the reasonable alternatives. Fifty sites were identified in government database searches as being potentially affected by the reasonable alternatives, except for the No-Build Alternative. Five of the 50 sites were identified as having a "Moderate-to-High" potential for contamination in the study area and are described in Table 4-11 and shown on Figure 4-13

In addition to sites and properties with potential contamination, the existing Buck O'Neil Bridge could contain lead-based paint or asbestos-containing materials that need to be identified and assessed to determine proper disposal prior to removal of the structure.

Solid Waste Sites – No solid waste management sites (e.g. recycling facilities, landfills, etc.) are present within the study area. Solid wastes are generally collected and disposed of by regional solid waste contractors that dispose of the waste materials at regional solid waste landfills. The closest solid waste landfill to the study area is the Johnson County Municipal Solid Waste Landfill located at Holiday Drive and I-435 in Shawnee, Kansas. The closest construction/demolition landfill facility to the study area is the Olathe Construction/Demolition Landfill (APAC Kansas, Inc.) at 159th Street and I-35 in Johnson County, Kansas.

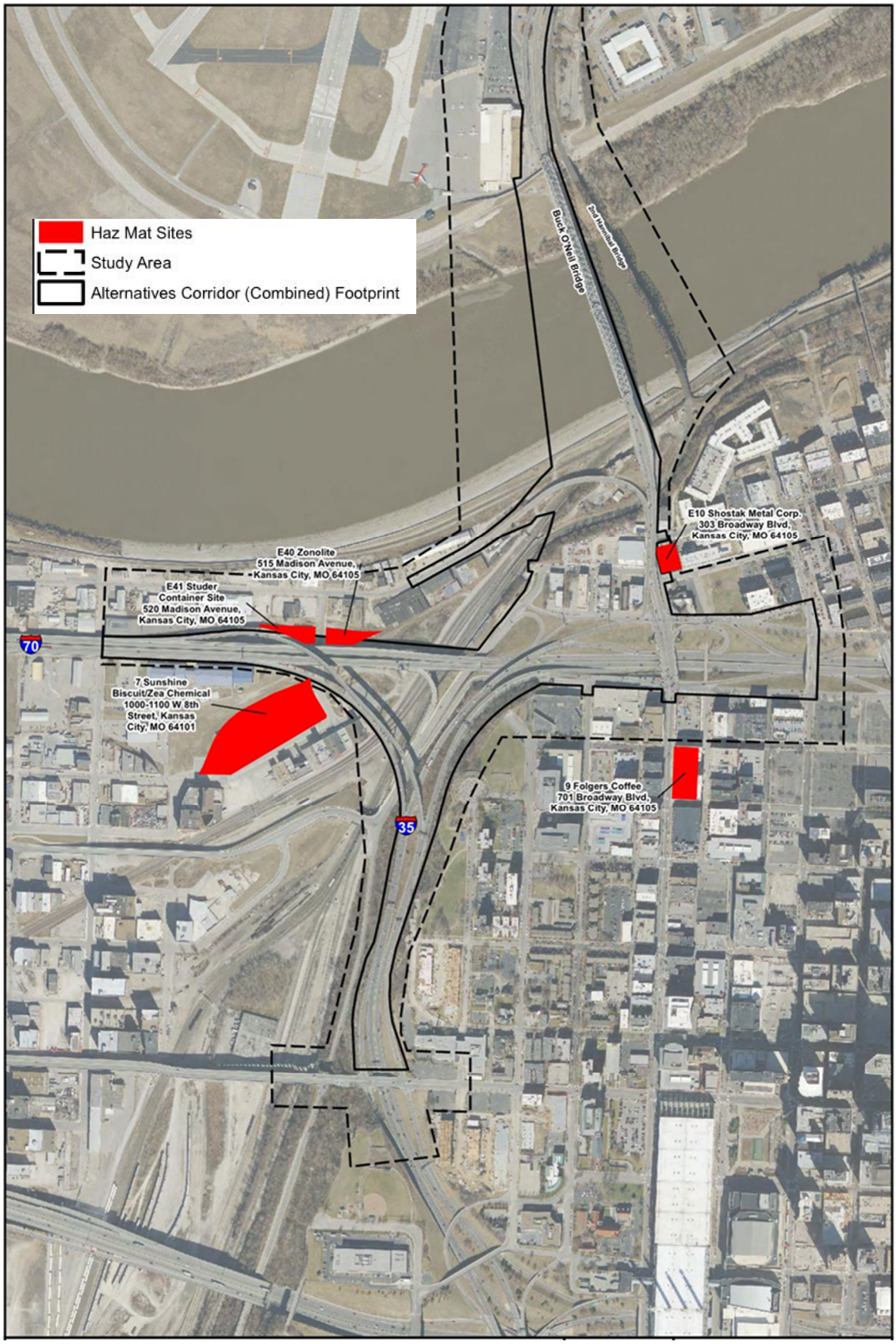
Table 4-11: Potential "Moderate-to-High" Hazardous Material Sites in the Alternatives Corridor

Site # (Figure 4-4)	Property Name and Address	Status/Federal or State Program List	Description	Build Alternative Affected
7	Sunshine Biscuit /Zea Chemical 1000-1100 W 8th Street	Long-term Stewardship	A long-term stewardship site consisting of 2 parcels - the former Sunshine Biscuit Bakery at 1100 W 8th Street and the Zea Chemical Building at 1000 W 8th Street. After a major fire in 1998, site assessments of the property revealed the existence of asbestos containing building debris and underground petroleum tanks with contaminated soil and groundwater. Remedial actions were taken to address the asbestos and petroleum contamination. The MDNR determined the remedial actions taken were adequate to decrease the identified contamination levels acceptable for commercial/industrial use. Unrestricted use cleanup standards were not attained, and contaminants remain beneath soil caps in certain areas of the site; thus, a Restrictive Covenant was placed on the property Chain of Title for future management of the site. A Soil Management Plan was included in the Restrictive Covenant to guide future use of the site and ensure that exposure control measures are maintained.	West
9	Folgers Coffee 701 Broadway	Active Hazardous Substance Investigation and Cleanup Site / Former UST NFA Letter Issued Prior to 2004	This property consists of 2 tracts of land commonly addressed as the 600 and 700 block of Broadway and is currently operated as the Roaster's Block apartment complex. Historically Tract 1 was used as a filling station and has documented petroleum contamination that if the parking lot stays in place the contaminant levels can be maintained at a non-residential level. Tract 2 is occupied by an apartment building containing asbestos, lead paint, and groundwater contaminated with Light Non-Aqueous Phase Liquid (likely petroleum-based). An Environmental Covenant has been placed on this property.	West, Central, Adjacent
E10	Shostak Metal Corp. 303 Broadway	Lead Smelter, SEMS, FINDS	This Superfund site was discovered in 2017 by the EPA and is still undergoing a Preliminary Assessment by the EPA. Additional information for this site is limited.	West, Central, Adjacent
E40	Zonolite 515 Madison Ave.	RCRA-NLR, SEMS	This Superfund site was historically occupied by the Kansas City Terminal Railway, a large quantity generator of hazardous waste. The site was discovered in 2000 by the EPA, with a Preliminary Assessment conducted in 2001. Based on EPA's investigations, the site was archived as a Superfund site, but that doesn't mean that contamination may not necessarily be present.	West
E41	Studer Container Site 520 Madison Ave.	RCRA-NLR, SEMS, LEAD SMELTERS, ICIS, FINDS, ECHO	This Superfund site was occupied by a small quantity hazardous waste generator that was the subject of several hazardous waste enforcement actions. The site was the subject of an EPA assessment and removal action in 2012.	West

SOURCE: Appendix E – Hazardous Materials; EDR Radius Report, March 27, 2019.

ECHO=Enforcement and Compliance History Online (EPA), FINDS=Facility Index System ICIS=Integrated Compliance Information System, NFA=No Further Action, SEMS=Superfund Enterprise Management System, RCRA-NLR= Resource Conservation and Recovery Act, No Longer Regulated

Figure 4-13: Potential "Moderate-to-High" Hazardous Material Sites in the Alternatives Corridor



4.2.6.1 No-Build Alternative

Under the No-Build Alternative, the existing bridge and associated roadways would be left in place. Only routine maintenance and repair of the Buck O'Neil Bridge and connecting roadways would occur. No widening of the bridge, no improvement of roadway or bridge profiles, and no major bridge rehabilitation would take place, thereby resulting in no disturbance. The No-Build Alternative would have no effect on the identified hazardous waste sites.

4.2.6.2 Build Alternatves

Of the 50 sites identified in the study area (classified as "Moderate-to-High", "Low-to-Moderate", and "None-to-Low" probability of contamination), the Central and Adjacent Alternatives would potentially affect 42 sites and the West Alternative would potentially affect 46 sites; including the five "Moderate-to-High" sites described in Table 4-11. One of the "None-to-Low" categorized sites is the former Airport Fuel Farm at the north end of MKC. In 2015, after numerous years of sampling, no free phase hydrocarbons (FPH) were present in any of the monitoring wells (see Section 5.5.5 for more information on the Airport Fuel Farm). Improvements proposed at the north airport access would be constructed in this area. Coordination with FAA, KCAD, KCMO, and MDNR is required to resolve any effects on the monitoring wells installed at this site.

Burns & McDonnell made Freedom of Information Act and Sunshine Law requests to review EPA and MDNR files regarding the "Moderate-to-High" potential hazardous materials sites. Although an expeditious review was requested, the information has not yet been made available as of the date of this document. Once access to these files is obtained and the files are reviewed the findings will be reported.

If the acquisition of right-of-way from properties of environmental concern cannot be avoided, MoDOT may conduct additional sampling and testing of soils within the proposed footprint of the selected build alternative to determine the level of contamination and if any remediation is required. Remediation or "clean-up" may be required to bring contamination levels within the soil (or groundwater) to levels acceptable to the MDNR for proper site closure and follow-on use as public right-of-way.

All structures, including the Buck O'Neil Bridge and any other bridges that may be removed, will be evaluated to determine if lead paint, asbestos containing materials, or other potentially hazardous materials are present prior to demolition. Painted structures will be tested, and removal of the suspect paint or other coverings will be determined on a case-by-case basis prior to demolition and disposed of in accordance with applicable State and Federal regulations. No paint will be removed from Buck O'Neil Bridge before demolition.

Potential asbestos containing materials will be evaluated by a licensed Asbestos Building Inspector. Asbestos-containing materials, depending on their condition and quantity, will be removed and disposed of in accordance with applicable procedures and regulations. Following inspection, regardless of whether asbestos is present or not, and Asbestos Demolition Notification will be made to the MDNR no fewer than 10 working days prior to beginning removal or demolition. If regulated amounts of asbestos are present, an Asbestos Project Notification will also be submitted, and an Asbestos Post-Notification will be filed after the work is completed. If abatement is necessary, a certified contractor Supervisor will be present during the abatement and a licensed asbestos contractor will perform the abatement. Reports from these hazardous material inspections will be included in the construction bid information package.

4.2.6.3 Mitigation for Hazardous Materials, Solid Wastes, and Pollution Control

Hazardous Materials - The preferred mitigation measure for these sites is avoidance. However, if these sites cannot be avoided, and contamination is proven to be present, MoDOT would negotiate cleanup responsibility with the current owner. Negotiations with the current owner and any investigative or remedial activities would be coordinated with the MDNR's Hazardous Waste Management Program and would comply with all EPA requirements. If any hazardous waste sites are encountered during the construction process, they would be dealt with in accordance with appropriate State and Federal regulations.

Regardless of the build alternative selected, a qualified environmental contractor should be used to excavate areas of potential contamination within the project footprint. This process would allow any contamination encountered to be characterized, removed, treated, and buried or contained following applicable regulations prior to initiating roadway construction. The level of impact to a potentially contaminated site will depend on the type and amount of excavation and the final design of bridge footings and foundations or roadway embankment. The worst-case scenario would be where excavation takes place in areas of known contamination or where contamination is indicated by soil odor or color. Such excavated soil would need to be sampled and disposed of off-site. At this time, the type of construction and mitigation warranted in the future has not been determined and the type of remediation, if required, will be determined at that time.

Construction activities can also generate hazardous materials in the form of diesel fuels, oils, and lubricants used in the maintenance and operation of construction equipment. All fuels and materials would be stored according to local and state regulations. Industry-accepted BMPs would be implemented during construction to minimize spills and other unauthorized releases of hazardous materials.

If any additional regulated solid or hazardous wastes are found during construction activities, the MoDOT Project Director will direct the contractor to cease work at the suspect site. The Project Director will contact the appropriate environmental specialist to discuss options for remediation. The environmental specialist, the Project Director, and the contractor will develop a plan for sampling, remediation, and continuation of project construction. Independent consulting, analytical, and remediation services will be contracted if necessary. The MDNR or the EPA will be contacted for coordination and approval of required activities.

Coordination among MoDOT, KCAD, KCMO, and MDNR is required if the monitoring well locations within the former Airport Fuel Farm cannot be avoided. Proposed changes in grade in the vicinity of the wells may require that the flush-mount well completion be raised or lowered accordingly.

Solid Waste - The design-build contractor will provide all necessary information for the disposal of construction wastes to the appropriate landfill operator, including any required testing of materials and completion of forms required by the MDNR. Construction debris could be disposed of at the solid waste and construction/demolition landfills identified above. At this time, it is anticipated that these facilities would have the available capacity to accommodate the anticipated waste stream.

Pollution Prevention - Construction activities would result in short-term and temporary effects on surface water quality by increasing the amount of suspended sediments in runoff flowing to receiving waters. Contractors would be responsible for obtaining all land disturbance and construction-related stormwater discharge permits. Stormwater discharges associated with disturbances in exceedance of one acre would require authorization under the Missouri State Operating Permit for construction or land disturbance activities, effective February 8, 2017, under the National Pollution Discharge Elimination System (NPDES) permitting program administered by the MDNR. Preparation of a Stormwater Pollution Prevention Plan (SWPPP) indicating the BMPs (e.g., silt fencing, silt socks, erosion-control blankets, hay bales, etc.) to be implemented to manage stormwater discharges will be developed in association with obtaining the NPDES authorization.

4.2.7 Historical, Architectural, Archaeological, and Cultural Resources

Cultural resources are the physical remains of human activity. They can include archaeological sites, architectural resources, and objects that show evidence of previous human activity. Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and the implementing regulations, 36 CFR 800, require Federal agencies to consider the effect that an undertaking would have on historic properties before it spends money or issues a permit or license for a project. The NHPA defines historic properties as any prehistoric or historic districts, sites, buildings, structures, or objects that are eligible for or already listed in the NRHP. The Federal agency must involve the State Historic Preservation Office (SHPO),the Advisory Council on Historic Preservation (ACHP), and other consulting parties an opportunity to participate in the Section 106 process.

The NHPA mandates that Federal agencies perform the following actions:

- **Initiate the Section 106 process** through agency coordination with the SHPO and/or appropriate Tribal Historic Preservation Offices (THPOs). The agency should also plan to involve the public and to identify other potential consulting parties. For this project, FHWA initiated Section 106 consultation with the Missouri SHPO, 10 potentially interested tribes, and several local, and regional, and national preservation groups that have expressed interest in other MoDOT projects in Kansas City. The ACHP, the Miami Tribe of Oklahoma, KCMO, the Kansas City Landmarks Commission, and the Downtown Neighborhood Association accepted the invitation to participate in consultation. Copies of relevant correspondence is included in Appendix F.
- **Identify historic properties** that may be affected by the project, including those either listed in the NRHP or determined through a consensus process to be eligible for listing in the NRHP.
- **Assess adverse effects to historic properties** including the nature and extent of the expected effects on the qualities of the property that resulted in its listing in the NRHP or the determination that it is eligible for listing in the NRHP.
- **Resolve adverse effects to historic properties** by considering measures to avoid, minimize, or mitigate those effects. Adverse effects for this undertaking will be resolved through the execution and fulfillment of a Programmatic Agreement (PA) signed by the ACHP, FHWA, the Missouri SHPO, and the Missouri Highway and Transportation Commission (see Appendix F).

MoDOT, on behalf of the FHWA, initiated consultation under Section 106 of the NHPA for the Proposed Action in October 2018. An area of potential effect (APE) was defined along US-169 between MO-9 on the north and 12th Street at I-35 on the south (Figure 4-14). MoDOT conducted background studies and resource surveys to identify previously recorded archaeological and historic resources and architectural resources that may be eligible for listing in the NRHP.

Historic-age Maritime Resources – Based on sources from the General Land Office (GLO), the United States Geological Service (USGS), and the USACE, eight steamboat wrecks have been documented along the stretch of the Missouri River that extends around MKC and through downtown KCMO listed in Table 4-12. Presumed as approximate locations from these sources due to the historic migration of the river channel, these areas could contain the remnants of those or other undocumented wrecks.

Adverse Effects

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

Area of Potential Effects (APE)

The APE is the geographic area where a project may, directly or indirectly, cause changes in the character or use of any historic properties that may be present. The APE is influenced by the scale and nature of the project.

Different kinds of effects have different APEs – an APE for archaeological resources usually correlates the actual areas of disturbance and architectural resources APE may include resources not directly affected by located near or adjacent to the area being disturbed.

For this proposed project, the APE has been defined to encompass the combined reasonable alternatives identified in the EA, including new right-of-way and permanent and temporary easements. The archaeological APE will be further refined for the preferred alternative to include all new right-of-way and permanent and temporary easements specific to it.

During consultation regarding expansion of the APE to include visual impacts, the consulting parties indicated that Kansas City is not river-focused and that views toward the river are not generally significant. Therefore, an additional APE for views to and from the river was not developed.

Figure 4-14: Area of Potential Effect

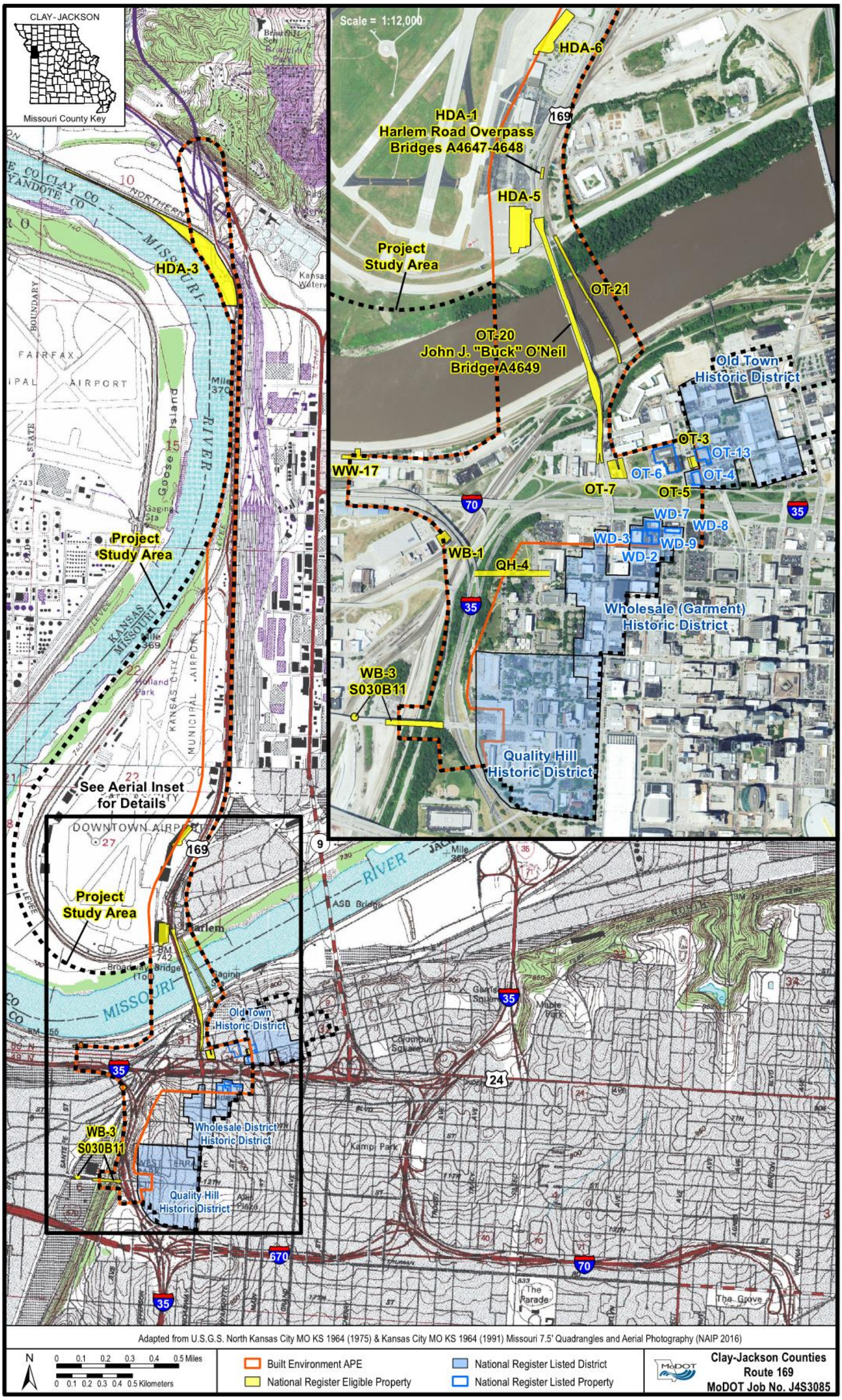


Table 4-12: Reported Steamboat Wrecks in the Project Vicinity

Name (# recorded locations near the Alternatives Corridor)	Reported River Mile	Closest Reported Distance from Alternatives Corridor
Bennett (1)	370.8	188.7 feet
Fire Canoe (2)	369.9	468.6 feet
Bennet (2)	368.9	1,594.8 feet
S.C. Pomeroy (1)	366.4	371.5 feet
Annie Lewis (1)	366.4	Intersecting
Pilot (1)	366.3	Intersecting
Joseph Kinney (1)	366.3	Intersecting
Mike Bauer (1)	366	519 feet

Architectural Resources – The study area was divided into seven neighborhoods in which NRHP-listed and potentially NRHP-eligible resources were surveyed (Figure 4-15). A total of 118 architectural resources were documented within the architectural APE for the Proposed Action; 12 were contributing resources within two NRHP-listed districts (the Wholesale/ Garment District and the Old Town Historic District), and 1 individually-listed resource (Richards & Conover Hardware Company Building, OT-6). Thirteen additional buildings and structures were recommended as eligible for listing in the NRHP. The 26 NRHP-listed, eligible, and recommended eligible properties are described in **Error! Reference source not found.**. The Missouri SHPO concurred with these NRHP eligibility determinations on October 4, 2019 (Appendix F).

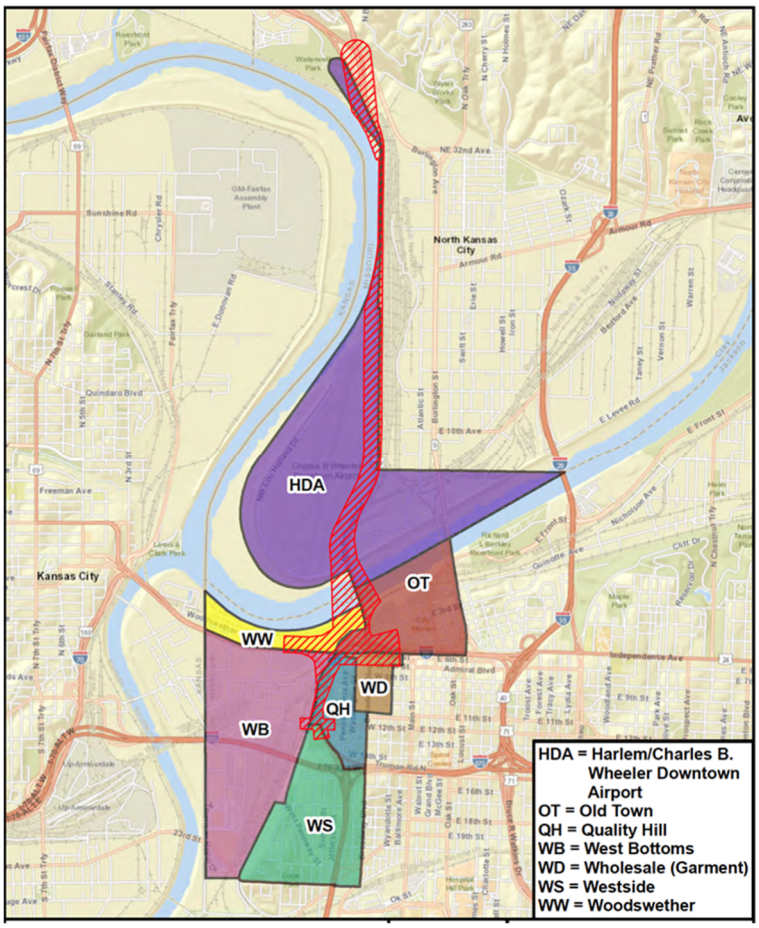


Figure 4-15: Architectural Resource Survey Neighborhoods

Archaeological Resources – Twenty previous archaeological surveys intersect the archaeological APE. Site 23JA422, was the former site of the Town of Kansas and represented a major port for steamboat landing in the mid-1800s, a railroad hub, and an outfitting location for westward bound wagon trains. Since the town's abandonment in the late nineteenth century, no significant development in the site area has occurred. Intact features or deposits associated with the original nineteenth century occupation could still exist within the site boundaries, and the site may be eligible for NRHP inclusion (see Appendix F).

Table 4-13: NRHP-listed and Eligible Resources in the Study Area

Resource ID Number	Resource Name	Address	Approximate Construction Date	NRHP Eligibility Status	NRHP Criteria	Areas of Significance	Period of Significance
OT-4	Ackerman-Quigley Litho Company Building	115 W. 5th St.	1905	Listed: Contributing to the Old Town NRHP Historic District	Criteria A and C	Commerce and Architecture	1839-1928 (district)
OT-6	Richards & Conover Hardware Company	200 W. 5th St.	1902-03	Listed: Individually	Criterion A	Commerce	1902-1948
OT-13	Tootle, Hanna and Leach Dry Goods Company Building	412 Delaware St.	c. 1869	Listed: Contributing to the Old Town NRHP Historic District	Criteria A and C	Commerce and Architecture	1839-1928 (district)
OT-14	McCord & Nave Grocery	416 Delaware St.	c. 1869	Listed: Contributing to the Old Town NRHP Historic District	Criteria A and C	Commerce and Architecture	1839-1928 (district)
WD-1	McPike Drug Company Building Annex	306 W. 7th S	1917	Listed: Contributing to the Wholesale NRHP District	Criteria A and C	Commerce, Industry, and Architecture	1874-1931 (district)
WD-2	McPike Drug Company Building	312 W. 7th St.	1904-05	Listed: Contributing to the Wholesale NRHP District	Criteria A and C	Commerce, Industry, and Architecture	1874-1931 (district)
WD-3	Kansas City Paper House	318 W. 7th St.	1916	Listed: Contributing to the Wholesale NRHP District	Criteria A and C	Commerce, Industry, and Architecture	1874-1931 (district)
WD-5	Montgomery Ward & Co./Isaacs and Company	626 Broadway Blvd.	1902	Listed: Contributing to the Wholesale NRHP District	Criteria A and C	Commerce, Industry, and Architecture	1874-1931 (district)
WD-6	Reicher & Sons/A.I. Robinson & Sons	628 Broadway Blvd.	1904	Listed: Contributing to the Wholesale NRHP District	Criteria A and C	Commerce, Industry, and Architecture	1874-1931 (district)
WD-7	Missouri Interstate Paper Company	600 Central St.	1909	Listed: Contributing to the Wholesale NRHP District	Criteria A and C	Commerce, Industry, and Architecture	1874-1931 (district)
WD-8	Barton Brothers Shoe Company Building	609 Central St.	1895-96	Listed: Contributing to the Wholesale NRHP District	Criteria A and C	Commerce, Industry, and Architecture	1874-1931 (district)
WD-9	Burnham-Hanna-Munger Dry Good Company	612 Central St.	1892	Listed: Contributing to the Wholesale NRHP District	Criteria A and C	Commerce, Industry, and Architecture	1874-1931 (district)
WD-10	Builders and Traders Exchange Company Building	616 Central	1889	Listed: Contributing to the Wholesale NRHP District	Criteria A and C	Commerce, Industry, and Architecture	1874-1931 (district)
WW-17	Santa Fe Pumping Plant	1200 Woodswether Rd.	c. 1913	Eligible: Individually	Criteria A and C	Conservation and Engineering	1913-1969
OT-3	114-118 W. 5th St	114-118 W. 5th St	1906-07	Eligible: Old Town NRHP District Expansion	Criteria A and C	Commerce and Architecture	1839-1928 (district)

Table 4-13: NRHP-listed and Eligible Resources in the Study Area, continued

Resource ID Number	Resource Name	Address	Approximate Construction Date	NRHP Eligibility Status	NRHP Criteria	Areas of Significance	Period of Significance
OT-5	120-122 W. 5th St	120-122 W. 5th St	1907	Eligible: Old Town NHRP District Expansion	Criteria A and C	Commerce and Architecture	1839-1928 (district)
OT-7	Colonial Patterns Company	340 W. 5th St.	1911, 1921-27, 1940	Eligible	Criteria A and C	Commerce and Architecture	1911-1940
OT-20	The Broadway (Buck O'Neil) Bridge (Bridges A4649 & A4646))	MO 169 across the Missouri River	1954-56	Eligible	Criteria A and C	Community Planning and Engineering	1955-1969
OT-21	2nd Hannibal Bridge	BNSF Railroad tracks over the Missouri River	1917	Eligible	Criteria A and C	Transportation and Engineering	1917-1969
WB-1	Thorn, Hunkins & Company Warehouse	931 W. 8th St.	1886	Eligible	Criteria A and C	Commerce and Architecture	1886-1969
WB-3	The 12th Street Trafficway Viaduct	From east bluffs to Hickory St.	1915	Eligible	Criteria A and C	Transportation and Engineering	1887, 1903-1904
QH-4	Eighth Street Tunnels	From Washington St. to the west bluffs	1888, 1904	Eligible	Criterion C	Engineering	1888-1956
HDA-1	Harlem Road Overpass (Bridge A4647 & A4648)	N. Broadway Fwy./NW Harlem Rd.	1956	Eligible	Criteria A and C	Transportation and Engineering	1956-1969
HDA-3	The Kansas City, Missouri, Water Intake Plant	3200 N. Broadway Fwy.	1924-27, 1953	Eligible	Criteria A and C	Industry	1927-1968
HDA-5	Transcontinental and Western Airlines (T&WA)	10 NW Richards Rd.	1931, 1942	Eligible	Criteria A and C	Transportation	1931-1972
HDA-6	The Municipal Airport Terminal Facility	250-300 NW Richards Rd.	1962	Eligible	Criteria A and C	Transportation and Architecture	1962-1969

Tribal/Cultural Resources – No traditional cultural properties or properties of tribal significance have been identified within or adjacent to the study area or within the APE. The Miami Tribe of Oklahoma has requested to consult under Section 106 (November 14, 2018) as any discoveries may lend information on the Tribe's passage through the project area in the mid-late 1800s.

4.2.7.1 No-Build Alternative

Under the No-Build Alternative, the Buck O'Neil Bridge (OT-20) and Harlem Road Overpass (HDA-1) would remain in place. No construction would occur and none of the other NRHP-listed or NRHP-eligible resources described in Table 4-13 would be affected.

4.2.7.2 Build Alternatives

Historic-age Maritime Resources – The portion of the Alternatives Corridor and APE that overlay the modern Missouri River channel and in areas that historically contained the Missouri River channel has potential for maritime resources. Further archival research into these wrecks could help to determine whether testing in these areas is warranted. However, it may be necessary to conduct remote sensing surveys to determine the presence or absence of potential sites resources.

Architectural Resources - All build alternatives would require removal of the Buck O'Neil Bridge (OT-20) and the Harlem Road Overpass (HDA-1) resulting in an adverse effect under Section 106. As listed in Table 4-14 and illustrated in Figure 4-16, implementation of the build alternatives would result in No Adverse Effect to the other five resources within the Alternatives Corridor and APE – Colonial Patterns (OT-7), the Second Hannibal Bridge (OT-21), Eighth Street Tunnels (QH-4), the T&WA Building (HDA-5), and the Municipal Airport Terminal Facility (HDA-6). The Missouri SHPO concurred with the effect determinations on January 27, 2020 (included in Appendix F).

Archaeological Resources – As the final design is determined, additional archival research and testing may be warranted to determine if sites are present particularly in areas of higher probability for near surface and deeply buried artifacts such as the area of the former Town of Kansas (Site 23JA422). The area encompassed by the Alternatives Corridor and APE has negligible potential for surface or near surface prehistoric resources because of modern and historic period surface impacts and lateral migration of the Missouri River during the historic era. However, deeply buried historic-age and prehistoric resources may exist in the alluvial landform of North Kansas City. These landforms were actively aggrading during the late Quaternary period, and any sites on those landforms that were not destroyed by river migration would have been buried by flood deposits. In areas that have not been subsequently impacted by development, deeply buried sites may be present. These areas are confined to the areas north of the Missouri River. In North Kansas City, deeply buried historic-age archaeological resources may exist in the area west of the Town of Harlem. These deposits could be underlain by prehistoric resources.

Tribal/Cultural Resources –No properties of tribal interest have been identified within the APE. As the project design is completed MoDOT/FHWA will continue coordination with the Miami Tribe of Oklahoma with regards to any background research or survey findings.

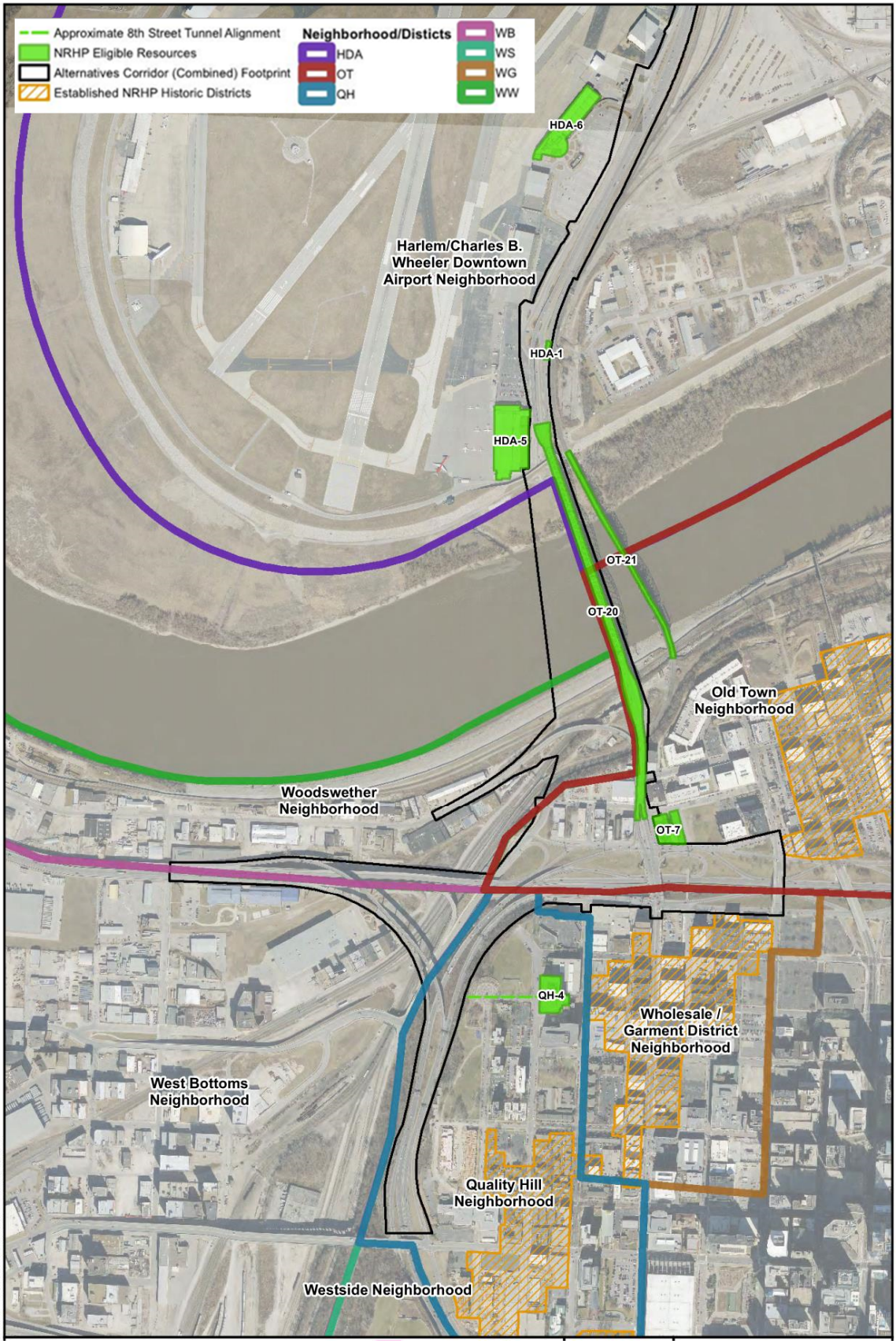
Table 4-14: Effects of the Alternatives Considered on the NRHP-Listed and Eligible Resources in the Alternatives Corridor (shown in Figure 4-2)

Resource ID Number	Resource Name	Resource Photo	Description	Effects of the Alternatives Considered			
				No-Build	West	Central	Adjacent
OT-7	Colonial Patterns Company		Sitting at the corner of Broadway Boulevard and 5th Street just west of the NRHP-listed Old Town Historic District, this 3-story brick and stone building with Classical Revival elements, dates to 1921-1927. Occupants included undertaker suppliers, paper storage, furnace supplies, and wholesale paper merchants. Colonial Patterns, a maker of ready-made patterns for embroidery and other needle crafts, has occupied the space since 1985.	No Effect	No Adverse Effect	No Adverse Effect – the construction footprint should not extend onto the property in vicinity of resource. No significant elevation changes should occur that would affect the setting or viewshed of the resource. Mitigative measures are outlined in the PA.	
OT-20	The Broadway (Buck O'Neil) Bridge (Bridges A4649 & A4646))		Constructed in 1955, the Broadway (Buck O'Neil) Bridge cost approximately $13 million with funds obtained from the sale of revenue bonds authorized by the Kansas City, Missouri city council. This bridge replaced the traffic deck of the Second Hannibal Bridge, located directly to the east. The bridge operated as a toll facility until 1991 when the toll plazas were removed, and ownership of the bridge was transferred to MoDOT. The bridge, 2,674 feet long, features three steel through tied arch spans with wire cable hangers, four concrete cantilever abutments, four concrete column piers with wingwalls, five steel column bents, and six concrete column piers.	No Effect	Adverse Effect - The bridge will be removed. Mitigative measures are outlined in the PA and impacts will be assessed in a Programmatic Section 4(f) evaluation.		
OT-21	Second Hannibal Bridge		The Second Hannibal Bridge (originally known as the Chicago, Burlington & Quincy Bridge), opened on April 6, 1917 replacing the first Hannibal Bridge (was constructed 1867-1869). The Baltimore through truss bridge was originally designed as a double-track, two-deck, swing railroad bridge. The bridge features (from north to south) one 75' deck girder span, two 330' truss spans, one 450' draw span, one 120' deck girder span, one 90' through girder span, and one 65' thru girder span. The vehicular deck of the bridge was abandoned in 1956 with the opening of the new Broadway Bridge.	No Effect	No Adverse Effect -Removal of the Broadway Bridge would not adversely affect its integrity or any of the characteristics that qualify it for NRHP inclusion.		
QH-4	Eighth Street Tunnels		This resource is composed of two tunnels, the upper tunnel constructed in 1887. The original ceiling was 18 feet tall and constructed as a three-quarter brick arch with a 26-foot arch ring and approximately 21-foot span and batter walls below the spring line. The tunnel accommodated two lines of track to transport freight between businesses in the West Bottoms and Downtown Kansas City. In 1903 to 1904, a second tunnel was dug under the original tunnel in order to provide a more manageable grade for the operation of streetcar. The newer tunnel cut into the bottom of the upper tunnel eventually causing the upper tunnel to be closed. The lower tunnel, constructed of concrete, extended from an open cut just west of Broadway to its western portal along the river bluff. The lower tunnel was opened on April 4, 1914. Streetcar service in the tunnel stopped in 1956. The eastern portion of the lower tunnel was filled and covered after 1956. Construction of I-35 in the 1960s required that a portion of the lower tunnel be removed and filled, and the remaining portion of both tunnels capped.	No Effect	No Adverse Effect - None of the build alternatives considered would directly affect any of the property's character-defining features. Measures to avoid and minimize potential effects during construction are outlined in the PA.		

Table 4-14: Effects of the Alternatives Considered on the NRHP-Listed and Eligible Resources in the Alternatives Corridor (shown in Figure 4-2), continued

Resource ID Number	Resource Name	Resource Photo	Description	Effects of the Alternatives Considered			
				No-Build	West	Central	Adjacent
HDA-1	Harlem Road Overpass (Bridges A4647 & A4648)		The Harlem Road Overpass was built in 1956 concurrently with the Buck O'Neil (Broadway) Bridge. Along with the Broadway Bridge, the Harlem Road Overpass is in included in the superhighway design, which became popular in the mid twentieth century. Designed by HNTB, Kansas City, the Harlem Road Overpass was engineered to fit around existing roads and railway. It provides access to the Broadway Bridge, access to Harlem, and shares a system of abutment walls that support two tracks of the BNSF Railroad.	No Effect	Adverse Effect – The overpass will be removed. Mitigative measures are outlined in the PA and impacts will be assessed in a Programmatic Section 4(f) evaluation.		
HDA-5	Transcontinental and Western Airlines (T&WA)		T&WA was one of the nation's earliest aviation firms. T&WA was a progressive company that helped to forge an airline industry during an era of the nation's romance with flight. The decade of the 1930s proved to be significant for the company as many commercial aviation firsts covering everything from aircraft design to flight operations occurred at 10 Richards Road. The building was constructed in 1931; with an addition to the east façade constructed in 1942. TWA conducted pioneering testing of high-altitude flights, which lead to pressurized commercial aircraft capable of flying above bad weather, not below or through. Following TWA Airlines move to the new Kansas City International airport, Richard King purchased this building in 1973. In February 1982, King sold the property to Executive Beechcraft Inc.	No Effect	No Adverse Effect - Though right-of way would be required from the associated parcel (downtown airport), the building would not be directly affected. Coordination during design is required to avoid physical impacts to the structure. Mitigative measures such as vibration monitoring during construction due to the proximity of pier/foundation removal and new pier/foundation construction may be required.		
HDA-6	The Municipal Airport Terminal Facility		Constructed in 1962 this Modern-styled terminal is closely associated with the ongoing history and significance of TWA in Kansas City and is a representative example of Modern Industrial architecture. Designed by Cooper, Robison & Carlson, with Kenneth W. Fik, architect and Stanley C. Palmer, public works engineer with the City of Kansas City, this Modern terminal was chosen from three or four alternative designs proposed in 1957. A two-story curved unit, originally housing a restaurant for the terminal, features tinted insulating glass set above curved metal storefronts. One-story terminal wings are placed on either side of the central two-story unit. A prominent curved concrete canopy with reinforced concrete columns is placed to the east of the north terminal wing.	No Effect	No Adverse Effect - Though right-of-way would be required from the associated parcel (downtown airport), the building would not be directly affected.		

Figure 4-16: NRHP-Listed and Eligible Resources in the Alternatives Corridor



4.2.7.5 Mitigation for Adverse Effects Under Section 106

MoDOT continues to lead the Section 106 consultation process for this Proposed Action. To support implementation of the project through design-build, a draft PA has been developed to address potential adverse effects by defining mitigation measures for known effects, including documentation of the Buck O'Neil Bridge, and potential unforeseen or post-review discoveries. Signatories to the PA will be the ACHP, FHWA, Missouri SHPO, and the Missouri Highways and Transportation Commission. The PA must be executed before FHWA can finalize the decision document. As part of the mitigation process, MoDOT also marketed the Buck O'Neil Bridge to encourage relocation and reuse of all or part of the bridge. The PA is included in Appendix F.

Development and execution of the PA is appropriate for this project because a full determination of how this undertaking may affect historic properties cannot be made until a final design is developed by MoDOT through the Design- Build process.

The PA outlines the following commitments regarding archaeological resources. Overall, the FHWA commits to:

- ensure that an adequate archaeological survey is conducted for the direct effects APE where it is determined that the proposed project could affect archaeological sites,
- consult with the SHPO, appropriate Indian Tribes, and other interested parties, regarding evaluation of adverse effects on archaeological resources identified as eligible for the NRHP
- develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize, or mitigate project adverse effects on NRHP-eligible archaeological sites
- develop procedures for the processing, analysis, and curation of collected materials in accordance with the Council's *Section 106 Archaeology Guidance*, the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*, and currently accepted standards for the analysis and curation of archaeological remains.

Regarding effects to non-archaeological resources, the PA specifies MoDOT or its contractor will retain a professional who meets the *Secretary of the Interior (SOI) Standard*s in Architectural History to confirm that effects findings made for built environment resources during the NEPA process remain valid during the Design-Build process. If effects findings change, MoDOT, on behalf of FHWA, shall contact the consulting parties to inform them of the resource, the change in effect, and what is causing the change. Furthermore, FHWA and MoDOT shall consult with the SHPO and consulting parties to resolve any adverse effects.

Documentation of the Buck O'Neil Bridge and Harlem Road Overpass to Level I standards of the *Levels of Bridge Documentation (State Level) For Section 106 Mitigation of Adverse Effect* (Documentation Standards) is included in the PA along with development of materials about the bridges including an interpretive panel, a traveling exhibit, and Story Maps. MoDOT will coordinate with Science City to determine the feasibility of expanding existing programs or exhibits on transportation in the Kansas City area to include these materials describing the Buck O'Neil Bridge.

Though no other architectural resources are currently anticipated to experience adverse effects, the PA outlines potential mitigation measures if adverse effects are identified during the construction process and cannot be avoided.

4.2.8 Section 4(f) and Section 6(f) Properties

Section 4(f) of the DOT Act of 1966 was designed to preserve the natural beauty of the countryside, public park and recreation lands, wildlife and waterfowl refuges, and historic sites. A Section 4(f) eligible property must be publicly owned, except for historic sites, which could be either public or privately owned. Federally-funded DOT actions cannot use Section 4(f) properties unless no feasible and prudent alternative to such use exists and the project includes all possible planning to minimize harm.

"Use" under Section 4(f) can occur in four ways:

- Permanent Use – property is acquired from the resource for transportation purposes (e.g., to improve US-169)
- Temporary Occupancy – when the 4(f) property in whole or in part is required for transportation project construction-related activities
- Constructive Use – not incorporation of land from the resource but impacts of the project could result in substantial impairment of the activities, features, or attributes that qualify the resource for Section 4(f) protection

The Section 4(f) properties within the Alternatives Corridor include:

- Buck O'Neil Bridge (historic resource OT-20)
- Harlem Road Overpass (historic resource HD-1)
- Second Hannibal Bridge (OT-21)
- T&WA Building (historic resource HDA-5)
- Municipal Airport Terminal Facility (historic resource HDA-6)
- Colonial Patterns (historic resource OT-7)
- Eighth Street Tunnels (historic resource QH-4)
- West Terrace Park
- Ermine Case Jr. Park

The Riverfront Heritage Trail, Riverfront Heritage Trailhead, and River Bluff Park (Canoe Park) are owned/managed by the KCRT. The KCRT is a not-for-profit organization and does not meet the definition of a "public" entity under the provisions of Section 4(f). Therefore, these properties are not provided protection under Section 4(f). Mulkey Park, located south of 12th Street and west of I-35, is in the study area but is not within the Alternatives Corridor and will not be affected by any of the build alternatives. All improvements constructed along I-35 will terminate north of 12th Street.

Section 6(f) resources are properties that have been purchased or improved with money from the Land and Water Conservation Fund (LWCF) managed by the US Department of the Interior (DOI). KCRT received LWCF funds for unspecified improvements along the Riverfront Heritage Trail. No other properties receiving LWCF monies have been identified within the study area.

How can FHWA approve the use of a Section 4(f) resource when no feasible or prudent alternative to its use exists?

- *de minimis* impact determination – after taking into account any measures to minimize harm (such as avoidance, minimization, mitigation or enhancement), the project would result in either no adverse effects or no historic properties affected, or determination that the project would not adversely affect the activities, features, or attributes qualifying the park, recreation area, or refuge for protection under Section 4(f).
- Applying a Programmatic Section 4(f) Evaluation - developed by the FHWA based on experience with many projects that have a common fact pattern from a Section 4(f) perspective. Through applying a specific set of criteria, based upon common experience that includes project type, degree of use and impact, the evaluation of avoidance alternatives is standardized and simplified.
- Preparing an Individual Section 4(f) Evaluation- prepared when the project results in the use of Section 4(f) that exceed de minimis impacts and when a Programmatic 4(f) cannot be applied to the situation.

SOURCE: FHWA *Section 4(f) Policy Paper*, July 20, 2012

4.2.8.1 No-Build Alternative

No right-of-way acquisition would occur so the No-Build Alternative would result in no impacts to or uses of Section 4(f) or Section 6(f) resources.

4.2.8.2 Build Alternatives

Table 4-15 summarizes the determination of use of Section 4(f) resources under the build alternatives in comparison to the effects of the project on these resources under Section 106.

Table 4-15: Comparision of Project Effects Under Section 4(f) and Section 106 for the Build Alternatives

Resource Name	Section 4(f) Determination, anticipated	Section 106 Determination
Buck O'Neil Bridge (OT-20)	Use – FHWA Programmatic Section 4(f) required	Adverse Effect
Harlem Road Overpass (HDA-1)	Use – FHWA Programmatic Section 4(f) required	Adverse Effect
Second Hannibal Bridge (OT-21)	No use – the resource is located outside of the Alternatives Corridor	No Adverse Effect
T&WA Building (HDA-5)	*de minimis* – property to be acquired from airport but no adverse effect on the activities, features, or attributes that qualify the building for protection under 4(f)	No Adverse Effect
Municipal Airport Terminal Facility (HDA-6)	*de minimis* – property to be acquired from airport but no adverse effect on the activities, features, or attributes that qualify the building for protection under 4(f)	No Adverse Effect
Colonial Patterns (OT 7)	No use – no property to be acquired and no use of the building	No Adverse Effect
Eighth Street Tunnels (QH-4)	*de minimis* – property to be acquired from KCPRD (tunnel is located under the KCPRD land) but no adverse effect on the activities, features, or attributes that qualify the tunnels for protection under 4(f)	No Adverse Effect
West Terrace Park	*de minimis* – property to be acquired from KCPRD; but no adverse effect on the activities, features, or attributes that qualify the park for protection under 4(f)	Not applicable – not considered a historic resource
Ermine Case Jr. Park	*de minimis* – property to be acquired from KCPRD; but no adverse effect on the activities, features, or attributes that qualify the park for protection under 4(f)	Not applicable – not considered a historic resource

Removal of the Buck O'Neil Bridge and the Harlem Road Overpass result in a use under Section 4(f). The FHWA's Use of Historic Bridges Programmatic Section 4(f) is being applied to address the "use" of these historic resources. The Programmatic 4(f) is included in Appendix F.

Property from MKC will be acquired to improve US-169, relocated Richards Road, and make improvements to the north and central accesses to the airport. Although property will be acquired from the airport, the activities, features, and attributes that make the T&WA Building and the Terminal Building eligible for protection under Section 4(f) will not be adversely affected. Property will also be acquired from the bluff along I-35 where the Eighth Street Tunnels are located to accommodate construction of the direct connect ramps to and from I-35. FHWA made a determination of *de minimis* impacts for these three resources. This determination has been made based on satisfaction of the following criteria:

- The Section 106 process resulted in the determination of "No Adverse Effect" with the concurrence of the SHPO received on January 27, 2020;
- The SHPO and ACHP participated in the Section 106 consultation and have been informed of FHWA's intent to make a de minimis impact determination based on their written concurrence in the Section 106 determination; and
- FHWA has considered the views of any consulting parties in the Section 106 consultation.

Property from the bluff along I-35 below West Terrace and Ermine Case Jr Parks will be acquired from the KCPRD to accommodate construction of the direct connect ramps to and from I-35. Although property will be acquired from these resources, the activities, features, and attributes that make them eligible for protection under Section 4(f) will not be affected. FHWA anticipates a determination of *de minimi*s impacts for these two resources. This determination has been made based on satisfaction of the following criteria:

- The transportation use of the Section 4(f) resources, together with any impact avoidance, minimization, and mitigation or enhancement measures incorporated into the project does not adversely affect the activities, features, and attributes that qualify the resources for protection under Section 4(f);
- The public has been afforded the opportunity to review and comment on the effects of the project on the protected activities, features, and attributes of the Section 4(f) resources; and
- The officials with jurisdiction over the properties are informed of FHWA intent to make the de minimis impact determination based on their written concurrence that the project will not adversely affect the activities, features, and attributes that qualify these resources for protection under Section 4(f).

All build alternatives would require construction in proximity to River Bluff Park, managed by the KCRT. No direct impacts are anticipated (e.g., placement of embankment or structures) within the property. Depending on the alignment developed, ramps or elevated roadways may be constructed directly over or in proximity of the property possibly shading the area.

Sections of the Riverfront Heritage Trail would be relocated to provide system connectivity as part of the roadway improvements proposed south of the river. Permanent road closures and realignments of sections of Broadway Boulevard and 3rd/4th Streets would include replacement sections of the trail. During construction sections of the trail may be closed temporarily to accommodate construction activities and detours may be planned to move pedestrians/bicyclists safely away from any active construction site.

4.2.8.3 Mitigation for Impacts to Section 4(f) and Section 6(f) Properties

As described in Section 4.2.8.5, a PA is being developed to address adverse effects under Section 106 to the Buck O'Neil Bridge and Harlem Road Overpass. Ongoing coordination with KCPRD may identify additional property-specific mitigation that may be required. During the design-build process, MoDOT will work with the contractor to minimize to the extent practicable the amount of right-of-way acquired and clearing to occur along the bluff face below the two parks. Clearing of the mature trees at the top of the bluff will be avoided. Construction-related impacts, including the temporary and short term effects of noise, vibration, and dust, would be monitored by the contractor.

MoDOT and KCMO will continue to coordinate with KCRT regarding potential effects and temporary closures of the Riverfront Heritage Trail, the Riverfront Heritage Trailhead, and River Bluff Park during construction.

4.2.9 Land Use and Zoning

Current land use within and adjacent to the study area consists of industrial and commercial development, as illustrated in Figure 4-17. The narrow north segment of the study area is bounded by the Missouri River and MKC on the west and the BNSF Murray Yard on the east. Dedicated by Charles Lindbergh as the New Richards Field in 1927, ***Charles B. Wheeler Downtown Airport*** was the first airport in Kansas City. It occupies 695 acres north of the Missouri River and supports corporate and recreational aviation uses. The ***Harlem*** neighborhood, a mix of industrial and residential uses, sits just north of the river and east of MKC. These areas, including Harlem, are zoned for manufacturing uses (M1-5) by KCMO.

South of the river, the ***River Market*** (a cohesive mix of commercial, office, and residential uses) bounds the study area east of Broadway Boulevard. Several buildings support mixed-use with commercial and retail spaces on the ground floor and residences above. Many of the former industrial buildings scattered throughout the neighborhood have been converted to residential lofts. Portions of the River Market are zoned for manufacturing (M3-5) and as an Urban Redevelopment District (UR) closer to Broadway Boulevard.

The ***West Bottoms*** grew around the advent of the railroad and stockyards. Due to flooding in the early 20th century, certain types of development were curtailed but agriculture, meat packing, freight, and industrial investments continued to grow. This area remains home to light industrial and commercial businesses and is becoming a popular destination for shopping and entertainment. Most of the West Bottoms is zoned for Manufacturing (M3-5) with blocks zoned for Urban Redevelopment (UR). The ***Quality Hill*** neighborhood occupies the top of the river bluff overlooking the Missouri River. The neighborhood includes residences, large businesses, retail, entertainment venues, and two cathedrals. Most of Quality Hill is zoned for Urban Redevelopment (UR) with pockets of Downtown Mixed Use (DX).

Existing Land Use Plans and Policies

Beyond the Loop PEL **Study c**onducted by MARC, in cooperation with FHWA, MoDOT, KCMO, KDOT, and the UG and completed in April 2018, identified area transportation needs and developed and evaluated transportation improvements that could be implemented to reduce congestion, enhance connectivity, and improve safety along sections of US-169/I-70/I-35/I- 29/I- 670 in Jackson and Clay Counties Missouri, and Wyandotte County Kansas.

Greater Downtown Area Plan (GDAP) – Kansas City, MO focused on removing barriers and improving neighborhood connectivity while addressing access and capacity concerns with relation to US-169 and connections to I-35, Broadway, and the North Loop. The GDAP identified the River Market Area and Riverfront as mixed use areas - intended to accommodate office, commercial, manufacturing, light industrial, public, institutional and residential development with lower densities than the Downtown Core.

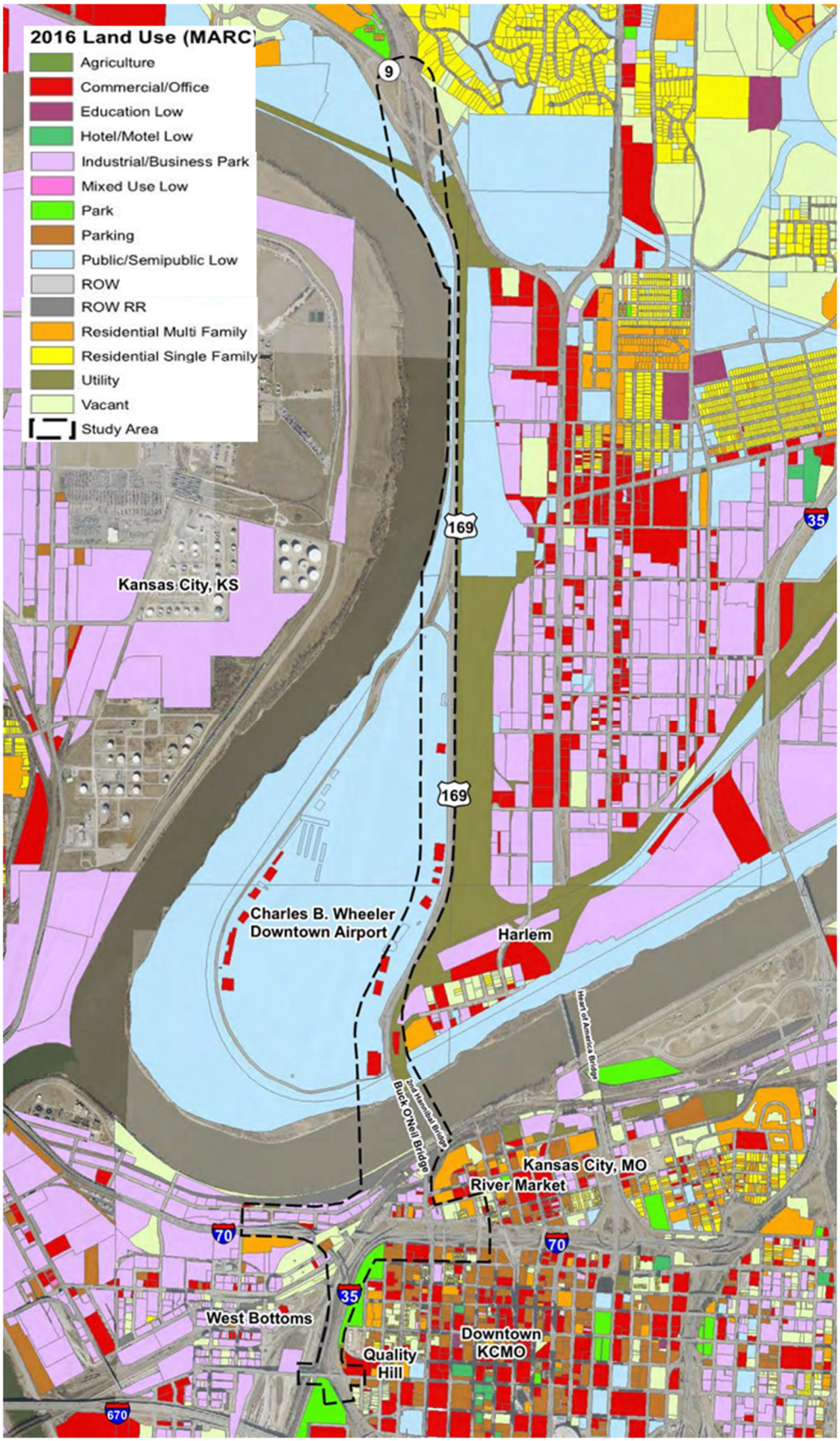
Downtown Loop Master Plan was developed as part of the I-29/I-35 Paseo Bridge Corridor EIS in early 2005 and laid out a long-term conceptual improvement plan for the freeway and ramp systems that comprise the CBD Downtown Loop. Included concepts intended to improve the overall safety and efficiency of the Downtown Loop's operation, while supporting KCMO's land use and development goals. The Plan balanced the travel desires of both commuters who access Downtown and the regional travelers passing through. The study resulted in a conceptual plan for freeway through lanes, ingress and egress ramps, associated auxiliary lanes, and local roadway modifications.

MetroGreen (MARC) provides an outline for a metropolitan trail system connecting urban and rural green corridors throughout seven counties in the Kansas City region. It promotes non-motorized travel options and expands non-motorized routes through additional trails and off-road corridors, linking homes, schools, and workplaces. The large-scale system would provide interconnected corridors that span 1,144 miles through Leavenworth, Johnson, and Wyandotte counties in Kansas and Clay, Cass, Jackson, and Platte counties in Missouri.

Smart Moves 3.0 (MARC) is the Kansas City region's 20-year plan for transit and mobility. The plan envisions efficient, high-ridership transit service linking mobility hubs where riders can transfer from fixed route to fixed route or connect with other services to get where they need to go. The plan recognizes that efficient transit thrives on density.

Transportation Outlook 2040 (MARC) is the metropolitan transportation plan for Greater Kansas City that envisions a safe, balanced, regional, multimodal transportation system that coordinates with land-use planning, supports equitable access to opportunities, and protects the environment. Plan goals include improved safety and security; ensuring transportation systems are maintained in good condition; and managing existing systems to achieve reliable and efficient performance and maximize the value of investments. MARC is currently updating the LRTP – *Connected KC 2050* - that will identify needs and set a budget for Federal transportation funds that the metro area expects to receive over the next 30 years.

Figure 4-17: Existing Land Use in the Study Area and Project Vicinity



The zoning classifications[9] common in and near the study include:

M Manufacturing (all sub-categories) is primarily intended to accommodate manufacturing, warehousing, wholesale, and industrial uses. The regulations are intended to promote the economic viability of manufacturing and industrial uses; encourage employment growth; and limit the encroachment of unplanned residential and other nonindustrial development into industrial areas.

UR Urban Redevelopment District promotes development and redevelopment of underdeveloped and blighted sections of the city and to accommodate flexibility in design to help ensure realization of the stated purposes of an approved plan for redevelopment. UR districts are further intended to promote the following objectives: a more efficient and effective relationship among land use activities; preservation and enhancement of natural, cultural and architectural resources and features; enhancement of redevelopment areas to accommodate effective redevelopment; and seamless and compatible integration of redevelopment projects into the development patterns that exist or that are planned to exist within the subject area.

DX Downtown Mixed-Use District is primarily intended to accommodate office, commercial, custom manufacturing, public, institutional, and residential development, generally at lower intensities than in the Downtown Core (DC) district. The DX district promotes a mix of land uses both horizontally (i.e., adjacent to one another) and vertically (i.e., within the same building).

The study area includes three park areas: West Terrace Park, Ermine Case Jr. Park, and River Bluff Park, as well as segments of the Riverfront Heritage Trail and trailheads. Approximately 4,426 linear feet of Riverfront Heritage Trail lies within the study area across a combination of park property, designated right-of-way, and within public streets. Effects on these resources are discussed in more detail in Sections 4.2.9.1 and 4.2.9.2.

The future land use plan for the study area supports current development trends. Properties becoming available within the River Market and West Bottoms are being developed into mixed-use supporting combinations of office/retail and residential uses.

4.2.9.1 No-Build Alternative

No changes in land use or zoning would occur under the No-Build Alternative. Existing neighborhood boundaries and development patterns would most likely remain the same. Indirectly, the No-Build Alternative could hinder access between areas north and south of the river due to increasing congestion and resulting travel times. Therefore, the No-Build Alternative would not be fully compatible with current approved transportation and land use plans.

4.2.9.2 Build Alternatives

All three build alternatives would cause a substantial change in current land uses or zoning classifications of properties within or adjacent to the Alternatives Corridor. The proposed improvements would remain access controlled, supporting connectivity to local roadway networks that feed redeveloping areas of the River Market, downtown KCMO, and the West Bottoms. All build alternatives would improve access to MKC at the cost of permanently displacing approximately 64 parking spaces associated with the terminal area (VML, Hangar 2, Signature Flight Support, and the ARFF). Refer to Table 5-2 in Chapter 5.0 for additional detail on the anticipated parking displacements at the airport. Aviation-related land uses at MKC would not be affected by the proposed improvements.

4.2.9.3 Mitigation for Effects on Land Use

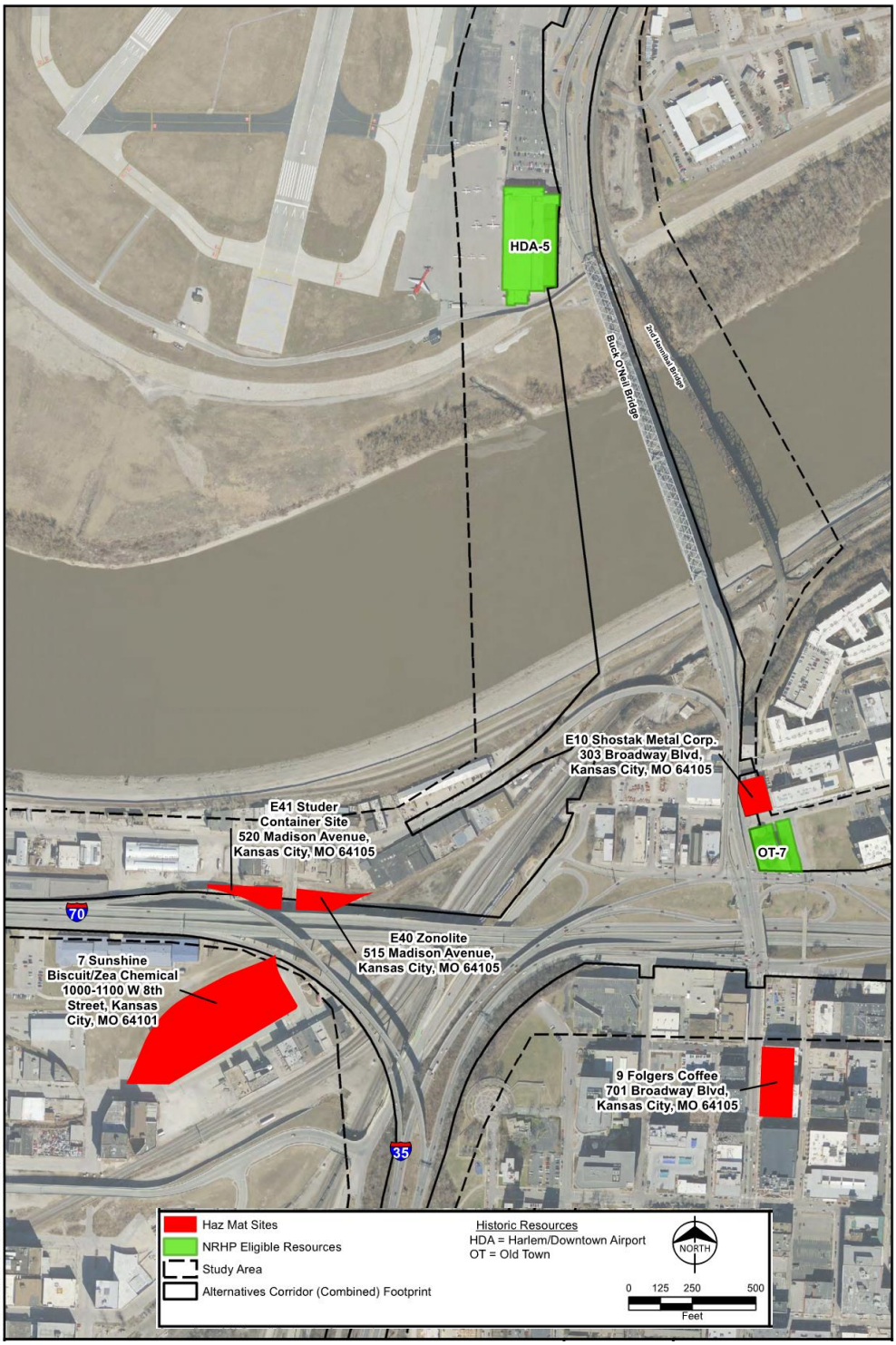
Residential relocations should be avoided. As the design-build process advances, changes in the alignment and profile of new roadways may change, possibly reducing the direct effects on some properties. Each parcel affected would be addressed on a case-by-case basis to determine how the proposed design changes may

[9] KCMO Zoning & Development Code: https://library.municode.com/mo/kansas_city/codes/zoning_and_development_code?nodeId=ZODECOKAMI_100_SERIESBAZODI_88-120OFBUCODI

affect access, parking, visibility, and other factors that may affect the continued use of the property for that purpose.

Several properties have been identified for avoidance during continued development of the project. These properties represent a variety of land uses and each has been evaluated within its respective section of this document. These properties are shown in Figure 4-18.

Figure 4-18: Properties to be Avoided



4.2.10 Right-of-Way and Displacements

4.2.10.1 No-Build Alternative

The No-Build Alternative would not require additional right-of-way or displace any businesses or residences.

4.2.10.2 Build Alternatives

Land would be acquired for construction of the proposed improvements and would include properties adjacent to existing State and city-owned roadways and properties currently occupied by businesses. As the design-build process advances, design changes may be made to determine whether a total acquisition (i.e. the entire tract, parcel or lot is acquired for right-of-way) or a partial acquisition (i.e. only a portion of the tract, parcel or lot is acquired for right-of-way leaving a habitable residence or viable commercial business – primary structure not acquired) is necessary for the properties identified in Table 4-16. The businesses identified in Table 4-16 are presumed to be total acquisitions because either the primary structure is affected, or the property's access or parking may be so diminished that it would cause the business to close.

MoDOT notified both residents and businesses within the study area of the proposed project prior to each public information meeting. MoDOT, working with KCMO, will continue to work with businesses that may be displaced by the project to find suitable replacement property or facilities within the general area. They will also work with businesses to determine if there are any special requirements for relocation and to address the concerns of employees. All property acquisitions will follow the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act and MoDOT's Relocation Assistance and Payment Program. If residential relocations would occur, the amount of multi-family residential development occurring in the River Market, West Bottoms, and Quality Hill neighborhoods should provide suitable and comparable housing similar to that present within the Alternatives Corridor.

Acquisition of land from MKC requires the FAA to formally release land currently in airport/aviation use to surface transportation use. The FAA will rely on the information contained in this document, particularly Chapter 5.0, to support their decision. When the design-build team has finalized the design within the North Segment, the final amount and layout of land needed from the airport will be determined and the required legal descriptions, boundary surveys, and appraisals can be completed to finalize the Federal land release process. In addition, MoDOT will need to obtain an easement from the USACE to place new bridge piers within the area riverward of the levee along the north bank of the Missouri River.

A 115 kilovolt (kV) overhead transmission line owned by Kansas City Power & Light (KCPL) (now Evergy) south of the river would need to be relocated or raised to accommodate the new river crossing and the required vertical clearance needed for the new ramps connecting to downtown and I-35. MoDOT will continue to coordinate with KCPL to relocate this line. Several other utilities (e.g., water, sewer, natural gas, telephone/fiber optic, and underground electric, etc.) will need to be avoided or relocated to accommodate construction. MoDOT and KCMO will continue to coordinate with these utility providers to avoid or relocate the utilities.

The primary power source for MKC is located under the north approach to the Buck O'Neil Bridge. This utility will not be relocated. As design-build progresses, plans will need to be developed to keep this facility in place and maintain continuous service to the airport throughout construction. MoDOT, KCMO, KCAD, and FAA will continue coordination to address this issue.

Several billboards dot the skyline across the study area. Billboards located on top of buildings acquired for the project would also be acquired. KCMO would work with billboard owners to determine a suitable site to relocate each billboard.

Table 4-16: Effects of the Build Alternatives on Land Use

Attribute or Resource	Build Alternatives		
	West	Central	Adjacent
Residential Properties[1] affected (number)	0	0	1 (The Barbette)
Commercial/Industrial Properties	Lee Matthews Fluid & Co. Cogent Fluids/Lee Matthews Offices and Escape Room	Boxes & More Lee Matthews Fluid & Co. Midwest Technology Corp (MTC) Cogent Fluids/Lee Matthews Offices and Escape Room Unknown light industrial (300 Broadway Blvd.)	Boxes & More Lee Matthews Fluid & Co. The Barbette Midwest Technology Corp (MTC) Unknown light industrial (300 Broadway Blvd.)
West Terrace/Ermine Cas Jr. Park[2] (acres)	1.23 acres	1.23 acres	1.23 acres
River Bluff Park[3] (acres)	0.46 acres	0.40 acres	0 acres
Riverfront Heritage Trail (linear feet)[4]	1,922 linear feet within the footprint	1,525 linear feet the footprint	1,543 linear feet within the footprint
Downtown Airport – area removed from aviation use	11.3 acres	11.3 acres	11.3 acres

NOTES:

1 - Landmark Lofts will be avoided by all improvements; one residence is located upstairs of The Barbette

2 - The impact shown is to the bluff face below the parks needed to accommodate construction of the I-35 flyover ramps. No land will be taken from the active portions of both parks located on top of the bluff.

3 – No right-of-way is needed from River Bluff Park, but new elevated roadways may be constructed that span the property.

4 – Length of trail within the respective alternative footprint along public streets, within designated right-of-way, and within other public lands.

Land from the bluff below West Terrace/Ermine Case Jr. Parks would be obtained from the Kansas City Parks and Recreation Department (KCPRD). The KCPRD process for releasing land involves submittal of a formal resolution to the Park Board, followed by approval from the KCMO City Council, and then is voted on by Kansas City residents. Coordination is ongoing between MoDOT and KCPRD. KCRT, a Missouri not-for-profit organization owns the parcel referred to as River Bluff Park ("Canoe Park") located on Beardsley Road at 5th Street. No direct impact to the property is anticipated but new elevated roadways may be constructed over the property.

4.2.11 Traffic Noise

MoDOT's Noise Policy, developed in accordance with the requirements of FHWA's Noise Standard at 23 Code of Federal Regulations (CFR) Part 772, requires that potential noise effects be considered for Type I projects. Type I projects involve construction of highways on new location, the physical alteration of an existing highway, or the addition of through-travel lanes, auxiliary lanes, or relocation of interchanges or ramps. A substantial horizontal change occurs when the project halves the distance between the traffic noise source and the receptor under the future build condition compared to the existing condition. A substantial vertical change results when shielding (e.g., another building) is removed that exposes the line-of-sight between the traffic noise source and the receiver.

The noise analysis was conducted using FHWA's Traffic Noise Model (TNM) version 2.5 in accordance with 23 CFR 772 and complies with the MoDOT Engineering Policy Guide 127.13 (MoDOT Noise Policy) dated June 21, 2019. The FHWA has determined Noise Abatement Criteria (NAC) for different land use categories. Noise-sensitive receivers include, but are not limited to, residences, daycare centers, hospitals, libraries, parks, places of worship, and schools (classified under NAC Categories B and C described at the right). Areas dominated by industrial and commercial uses, rail yards, and utilities are typically not affected by changes in noise and are classified under NAC Category F.

As a Type I project, sensitive noise receivers were identified within the study area. Multi-family residences (e.g., apartments and condominiums) and West Terrace and Ermine Case Jr. Parks were identified as sensitive receivers. Figure 4-19 depicts the locations of the receivers.

Noise Abatement Criteria (NAC)

Activity Category	Sound Level*	Types of Uses
A	57 dBA	Lands on which serenity and quiet are of extraordinary significance and where preservation of those qualities is essential if the area is to continue its intended purpose.
B	67 dBA	Exterior areas of single and multi-family residences
C	67 dBA	Exterior areas of non-residential use areas – parks, sport complexes, cemeteries, schools, etc.
D	52 dBA	Interior areas of auditoriums, daycare centers, churches, hospitals, libraries, etc.
E	72 dBA	Exterior aeras of developed land less sensitive to traffic noise – hotels, offices, restaurants, etc.
F	N/A	Lands not sensitive to traffic noise - agricultural, airports, industrial, manufacturing, warehousing, rail yards, utilities, etc.
G	N/A	Undeveloped lands

* sound levels are measured in A-weighted decibels (dBA). Leq is the equivalent steady state sound level at a given time

How are noise impacts determined?

Impacts occur when the modeled noise level approaches or exceeds the NAC for the representative land use category. As an example, for an apartment located on the first floor, if the noise level modeled equals 66 dBA, it is considered to 'approach' the NAC for a residence (NAC B) of 67 dBA. If the modeled noise level of the same apartment equals 69 dBA then it is said to 'exceed' the NAC for a residential use.

A project is considered to have an impact on a receiver if the modeled noise level approaches or exceeds the NAC for that land use category or exceeds the existing noise level by 15 dBA or more.

Abatement (measures to reduce or mitigate traffic noise impacts) is considered when impacts occur. Abatement typically includes consideration of constructing a noise barrier (e.g., noise wall) between the traffic noise source and the affected receiver. Barriers must be shown to benefit receptors (provide a minimum 7 dBA reduction in noise level) and be reasonable and feasible from an engineering, installation, construction, and safety perspective.

Figure 4-19: Sensitive Noise Receivers in the Study Area

Following MoDOT Noise Policy, noise validation measurements were taken in two locations within the study area to calibrate the noise model. Receiver locations are representative of existing receivers or groups of receivers. For this project, those receivers represent the outdoor spaces associated with residences and public parks/recreation areas that would fall under Categories B and C, respectively, of the NAC. The model used to determine potential noise impacts was 'built' based on the existing roadway network, built landscape, and the topographic features of the study area.

The proposed alignment of each build alternative, including anticipated heights of structures above ground level, were also entered into the model. To determine noise levels, existing (2016) annual daily traffic (ADT) and future (2040) ADT traffic volumes were input into the models developed for the No-Build (do nothing) Alternative and build alternatives, The noise levels generated by the number of vehicles anticipated to be carried by the alternatives in 2040 was compared to the 2016 existing conditions. Table 4-17 summarizes the results of the noise levels modeled at the receivers under the No-Build and build alternatives. A detailed list of impacted receivers at each receiver site can be found in Appendix H.

Table 4-18- summarizes the number of dwelling units affected at each receiver site. Impacted receiver sites are highlighted in blue.

Table 4-17: Noise Modeling Results

Receiver	Receiver Name	Modeled Noise Levels				
		No-Build		West[3]	Central[4]	Adjacent
		2016[1]	2040[2]	2040	2040	2040
R-1	B&W Investment Properties	64.1	64.4	65.8	64.9	65.2
R-2	Market Station Apartments	64.8	66.5	63.0	63.6	64.6
R-3	Market Station Apartments Common Area	63.4	65.2	58. 2	60.5	61.8
R-4	River Market West Apartments, North Bldg.	68.3	70.1	65.6	67.9	68.5
R-5	River Market West Apartments, West Bldg.	69.5	71.4	66.2	70.1	69.9
R-6	Conover Place Condos	69.3	70.1	69.7	70.1	70.5
R-7	Richards & Conover Lofts	62.7	63.3	63.0	63.9	62.7
R-8	DeLofts	64.8	65.3	65.1	65.2	64.8
R-9	Skyline Real Estate	56.6	57.3	56.9	57.5	56.6
R-10	O'Reilly Investments	63.4	64.9	64.7	64.8	64.7
R-11	West Terrace Park	63.4	64.0	65.2	65.0	64.7
R-12	Ermine Case Jr. Park	64.1	64.1	64.7	64.4	64.6
R-13	Ermine Case Jr. Park	62.0	61.9	62.7	61.9	62.7
R-14	Ermine Case Jr. Park	73.6	73.8	75.0	73.6	74.7
R-15	Trailhead	68.2	67.9	67.9	68.0	68.4
R-16	Quality Hill Apartments	54.2	54.3	55.9	55.3	55.1
R-17	JVM Apex Apartments	69.8	70.0	70.9	69.8	70.4
R-18	Summit on Quality Hill	72.3	72.5	73.5	73.5	72.7
R-19	Trailhead	66.5	66.9	70.5	68.1	67.1
R-20	Mulkey Park	54.2	66.3	55.2	54.9	54.9
R-21	Roaster Block Apartments	64.9	66.3	66.1	66.2	66.1
R-22	Under Construction (apartments)	71.1	72.5	71.3	72.0	72.9

SOURCE:
1 – Noise Study Existing Conditions Memo, August 2, 2019
2 – Noise Study – 2040 No-Build Conditions Results, October 23, 2019
3 – Noise Study – 2040 West Build Condition Results, November 25, 2019
4 – Noise Study – 2040 Central Build Conditions Results, November 6, 2019
5 – Noise Study – 2040 Adjacent Build Conditions Memo, December 6, 2019

Table 4-18: Number of Dwelling Units Impacted Per Receiver Site

TNM Modeled Condition	Number of Dwelling Units Impacted Per Receiver Site (1-11)										
	R-1	R-2	R-3	R-4	R-5	R-6	R-7	R-8	R-9	R-10	R-11
2016 Existing (baseline)	0	0	0	13	19	15	0	0	0	0	0
2040 No-Build	0	3	0	17	30	16	0	0	0	0	0
2040 West Alternative	0	0	0	0	2	14	0	0	0	0	0
2040 Central Alternative PREFERRED	0	0	0	10	24	22	0	0	0	0	0
2040 Adjacent Alternative	0	0	0	13	27	15	0	0	0	0	0
TNM Modeled Condition	Number of Dwelling Units Impacted Per Receiver Site (12-22)										
	R-12	R-13	R-14	R-15	R-16	R-17	R-18	R-19	R-20	R-21	R-22
2016 Existing (baseline)	0	0	1	1	0	11	30	1	0	0	37
2040 No-Build	0	0	1	1	1	21	30	1	0	1	67
2040 West Alternative	0	0	1	1	0	26	30	2	0	1	37
2040 Central Alternative PREFERRED	0	0	1	1	0	26	30	2	0	1	44
2040 Adjacent Alternative	0	0	1	1	0	23	30	1	0	1	46

SOURCE: US-169 Corridor (Buck O'Neil Bridge) over the Missouri River Draft Technical Noise Assessment; Garver. December 16. 2019.

4.2.11.1 No-Build Alternative

Under existing conditions (baseline) using 2016 traffic data, 9 receivers (a total of 128 dwelling units) approach, meet or exceed the NAC B for residential land uses. Because traffic volumes would increase in the future (2040), under the No-Build Alternative 12 receivers (a total of 189 dwelling units) would approach or exceed the 67 dBA Leq(h) thresholds for NAC Category B or C, respectively. None of the receivers would experience a substantial increase of 15 dBA or more. No abatement would be considered.

4.2.11.2 Build Alternatives

The build alternatives considered would move the river crossing west of the existing crossing alignment, placing a greater distance between the roadway and the receivers present within the River Market. New roadways, most of them elevated, would be constructed through the area south of the river, including the direct connect ramps to I-35 along the river bluff. In addition to shifting the roadway alignment, traffic volumes would increase across the new roadway network. Based on the data presented in Tables 4-17 and 4-18, the build alternatives would result in the following noise impacts:

- West Alternative – 9 receivers (a total of 114 dwelling units) would approach or exceed the NAC Category B or C
- Central Alternative – 10 receivers (a total of 161 dwelling units) would approach or exceed the Category B or C
- Adjacent Alternative – 10 receivers (a total of 158 dwelling units) would approach or exceed the Category B or C

None of the build alternatives would result in a substantial increase of 15 dBA or more.

4.2.11.3 Mitigation of Traffic Noise

In accordance with MoDOT Noise Policy, a noise barrier analysis was only conducted for the Central Alternative (Preferred Alternative). Noise mitigation would take the form of a barrier or wall constructed between the traffic

noise source (e.g., roadway or ramp) and the impacted receiver (e.g., apartment building). Construction of a noise barrier in the form of a free-standing sound wall is the most appropriate form of noise abatement measure for the US-169/Buck O'Neil Bridge project due to the limited availability of right-of-way. In addition to providing a minimum noise level reduction of 7 dBA per receiver, a proposed noise barrier must meet the following "feasibility" and "reasonableness" criteria.

"Feasibility" is the ability to provide abatement in a location considering the acoustic and engineering limitations of the site. Acoustic feasibility refers to noise abatement measure(s) ability to achieve the minimum noise reduction at impacted receptors. MoDOT requires at least a 5 dBA insertion loss for a minimum of 2 first-row, impacted receivers for noise abatement to be considered feasible. Engineering feasibility refers primarily to physical constraints and other constructability constraints, such as topography, access, drainage, safety, maintenance, and presence of other noise sources. In general, if these factors are too extreme or cannot be accommodated in providing the minimum noise reduction, noise abatement will be deemed infeasible. For reasons of safety (primarily wind load and clear space concerns), a noise wall's height is limited to 20 feet. The wall height criterion alone cannot be used to consider noise abatement infeasible.

"Reasonableness" involves the following the mandatory criteria that must be met.

1. Viewpoints of owners and residents of the benefitted receptors will be obtained. These will usually be obtained by ballot through mailings or at a public forum;
2. Noise abatement measures shall not exceed 1,300 square feet per benefitted receptor, in the case of noise walls. Where noise walls are not options, other noise abatement techniques may be considered, but cannot exceed $46,000 per benefitted receptor. In order to ensure that the noise abatement parameters remain current, the wall area limit and cost per benefited receptor shall be recalculated at an interval not to exceed every five years. The updated values may not be used to analyze noise abatement calculations from previous years. MoDOT does not allow cost averaging; and
3. Noise abatement measures must provide a minimum reduction of 7 dBA for 100 percent of benefitted, first-row receptors.

Noise abatement in the form of free-standing noise walls were considered for impacted receivers modeled in the Central Alternative (Table 4-17). Barrier analyses were conducted for receivers R-6 (Conover Place Condominiums) and R-22 (a new apartment/condominium development currently under construction by Planned Industrial Expansion Authority of KC). The receivers at these locations included first row, first-floor impacted receivers where abatement factors considered in determining feasibility and reasonableness of abatement were consistent with MoDOT noise policy. The feasibility criteria of achieving a 5dB insertion loss for two first row, first-floor, impacted receivers was not met for either receiver location.

Based on the results of the barrier analysis conducted for the Central Alternative, noise abatement is not warranted for this project. In terms of feasibility, engineering factors associated with the locations of proposed noise barriers made them unfeasible. In most instances noise barriers would need to be constructed along an elevated roadway structure, along an existing retaining wall, or near a roadway intersection to provide the required sound attenuation. Because walls are not feasible, the installation of a noise barrier at these locations would result in obstructed views, safety issues at intersections, drainage concerns, and additional costs. No views of property owners or residents were obtained during this evaluation.

The impacted receivers identified in Table 4-19 were not evaluated through a barrier analysis as a result of feasibility review factors such as second row determinations, elevated balconies, drainage, utilities, and sight distance/safety concerns that would prove noise walls as infeasible. Factors determining barrier evaluation are also provided for each of these sites.

Table 4-19: Impacted Receivers - Abatement Determined Not Feasible

Receiver Location (# of Impacted Receivers)	Receiver Name	Feasibility Determination
R-4 (10)	River Market West (north building)	▪ Considered 2nd row receivers
R-5 (24)	River Market West (south building)	▪ Considered 2nd row receivers
R-14 (1)	Ermine Case Jr. Park (Overlook)	▪ Constructability atop existing rock bluffs ▪ Additional impacts to the park would occur
R-15 (1)	"Caboose" Park Trailhead	▪ Available right-of-way ▪ Inability to mitigate for impacts for the entire trail system and due to access constraints
R-17 (26)	JVM Apex Apartments	▪ Constructability atop existing rock bluffs ▪ Additional impacts to the park would occur ▪ No ground floor impacts
R-19 (1)	Riverfront Trail Head	▪ Available right-of-way ▪ Inability to mitigate for impacts for the entire trail system and due to access constraints
R-21 (1)	O'Reilly Investments/Roaster Block Apartments	▪ Considered 2nd row receivers ▪ No ground floor impacts

These preliminary noise abatement conditions were determined based on preliminary design, which can change during the design-build process. Modifications to the cross-sections, alignment, design speeds, and changes in roadway or ramp grades may alter abatement conditions. As identified in the MoDOT Noise Policy, *"Final decisions regarding the construction of noise barriers are made during the final design process. If design changes have occurred and a new noise policy has been approved since the original noise analysis, with FHWA approval the new policy is to be used for the new analysis and final decision."*

4.2.12 Visual Resources and Effects

The FHWA Technical Advisory T6640.8A (TA) indicates that whenever the potential for visual impacts exists from a proposed transportation project, the environmental study should identify the potential visual effects to adjacent land uses as well as measures to avoid, minimize, or mitigate these potential visual effects.

A Visual Impact Assessment (VIA), based on the FHWA *Guidelines for the Visual Impact Assessment of Highway Projects* (January 2015) was conducted to:

- Determine the Area of Visual Effect (AVE) – determined by physical constraints of the environment and the physiological limits of human sight. For this project the AVE includes foreground views (approximately 0.25 to 0.5 mile of the viewer) and middle ground views (within 1 to 2 miles of the viewer). The study area was also divided into two landscape groups – north of the river and downtown including the river.
- Analyze the Landscape Character and Experience
- Predict Baseline Impacts
- Identify Mitigation Options

The potential effects of the proposed improvements were identified by considering the elements of compatibility, sensitivity, and degree. In this urban setting, the foreground view dominates and from some vantage points, may be the only view due to buildings or other obstacles blocking more distant views.

Visual Impact Assessment (VIA)

The VIA process analyzes the landscape character of the study area to determine the type and degree of visual effect for various viewers, such as roadway user, tourists, and residents. It assesses the visual character and visual quality of the landscape, and then considers how typical viewers may respond to what they see around them. This assessment uses a professional observational approach that involves using projections about the visual preferences of viewers from certain locations.

The VIA addresses beneficial as well as adverse effects of a project on the surrounding landscape. Determining visual quality is influenced by a person's background and former experiences which make everyone's experience of visual quality a unique, human perception of what constitutes a pleasing landscape, and what constitutes an unpleasant view.

An individual viewing an existing scene has a range of possible responses that are inherent to all humans. The FHWA VIA Guidelines recognize three types of visual resources:

- Natural environment: includes air, land, water, vegetation, and animal life.
- Cultural environment: this consists of buildings, structures, transportation infrastructure, other built features, art.
- Project environment: includes the alignment, profile, type, size, pavement type, signs, enhancements, other elements of the bridge and roadway

Impacts are defined under the following categories:

- Compatibility – ability of the environment to absorb the project into its visual character.
- Sensitivity – ability of viewers to see and be affected by the changed setting.
- Degree – beneficial, adverse, or neutral change to visual quality.

4.2.12.1 No-Build Alternative

No construction would occur under the No-Build Alternative. The Buck O'Neil Bridge would remain, and no other improvements would be constructed. Therefore, the No-Build Alternative would have no effect on the visual attributes of the study area.

- Compatibility – The No-Build Alternative will result in changes and is considered compatible with the surrounding environment.
- Sensitivity – The viewers will not experience a changed setting and are therefore insensitive to effects.
- Degree – The visual quality will remain unchanged and therefore would result in no adverse effect.

4.2.12.2 West Alternative

This alternative is the farthest west of the existing bridge and moves the alignment to the west edge of downtown KCMO. It provides a direct connection to I-35 and would have flyover ramps over I-70 near the West Terrace/Ermine Case Jr. Parks and the Lewis & Clark historic marker within the park. (Figure 4-20).

- Compatibility – The existing built environment could absorb the changes to the surrounding environment as a result of the West Alternative while maintaining a compatible visual character. The West Alternative is considered compatible with the surrounding environment.
- Sensitivity – Viewers would experience a changed setting with the new bridge and associated ramps in a new location. The new bridge style is anticipated to lack tall vertical elements like the existing bridge to provide a profile compatible with FAA airspace clearance requirements. Viewers could have a negative sensitivity to the high flyover ramps on the west edge of downtown and near the West Terrace/Ermine Case Jr. Parks, and the loss of the view of an iconic bridge. However, this alternative moves the alignment away from downtown (compared to the other alternatives), acquiring the fewest buildings. Additionally, this alternative would open new dynamic views of the Missouri River for travelers using the new bridge. Viewers in some high-rise downtown buildings could experience new views of the Missouri River once the existing Buck O'Neil Bridge is removed, creating a beneficial visual impact. The West Alternative is considered a neutral impact to sensitivity.
- Degree – On the north side of the river, the visual quality would remain similar to existing conditions. On the downtown side of the river, some of the high flyover ramps could result in an altered view of the Missouri River from West Terrace/Ermine Case Jr. Park. However, the location of the new bridge would allow some new open views of the river from Broadway Boulevard and other vantage points in the downtown area which would be a positive visual experience for some downtown viewers. The West Alternative is considered to have a neutral change on visual quality.

Figure 4-20: Views Associated with the West Alternative

View from West Terrace/Ermine Case Jr. Park looking north towards the future flyover ramps

View looking northeast at Buck O'Neil Bridge from Woodswether Road in the approximate location of the West Alternative

4.2.12.3 Central Alternative

The Central Alternative is located farther to the west and upstream from the existing bridge than the Adjacent Alternative. This alternative would have ramps to Broadway Boulevard and a direct connection to I-35. The Landmark Lofts building would essentially be in a direct line with the new bridge from a visual standpoint and at the center of the ramps diverging from the bridge (Figure 4-21). Although many of the buildings adjacent to Landmark Lofts would be acquired with this alternative, Landmark Lofts would not be acquired.

- Compatibility – The existing built environment could absorb the changes to the surrounding environment as a result of the Central Alternative while maintaining a compatible visual character. The Central Alternative is considered compatible with the surrounding environment.
- Sensitivity – The viewers would experience a changed setting with the new bridge and associated ramps in a new location. The new bridge style is anticipated to lack tall vertical elements like the existing bridge to provide a profile compatible with FAA airspace clearance requirements. Viewers could have a negative sensitivity to the elevated ramps through downtown, the loss of the view of an iconic bridge and the loss of up to seven downtown buildings. The Central Alternative is considered a negative impact to sensitivity.
- Degree – On the north side of the river the visual quality would remain similar to existing conditions. On the downtown side of the river, some of the elevated ramps could result in the lost view of the Missouri River. The location of the new bridge would create a different and possible negative visual quality for some viewers from the downtown. The Central Alternative is considered to result in a negative change to visual quality.

Figure 4-21: Views Associated with the Central Alternative

View looking north from top of the Mid-America Regional Council parking garage near 6th and Broadway Boulevard

View looking west from the West Terrace/Ermine Case Jr. Park near the Lewis & Clark historic marker

4.2.12.4 Adjacent Alternative

This alternative would construct the new bridge adjacent to and west of the existing Buck O'Neil Bridge. The Adjacent Alternative would have ramps to Broadway Boulevard in addition to ramps connecting directly to I-35. The bridge would connect to Broadway Boulevard in a similar location as the existing bridge. Ramps would pass very close to Landmark Lofts, a multi-story residential building, altering the viewshed of residents (Figure 4-22).

- Compatibility – The existing built environment could absorb the changes to the surrounding environment as a result of the Adjacent Alternative while maintaining a compatible visual character. The Adjacent Alternative is considered compatible with the surrounding environment.
- Sensitivity – Viewers would experience a changed setting with the new bridge, approaches, and associated ramps in a slightly new location. The new bridge style is anticipated to lack tall vertical elements like the existing bridge to provide a profile compatible with FAA airspace clearance requirements. Some viewers could have a negative sensitivity to the elevated ramps through

downtown, the multi-lane wide intersection at 5th and Broadway, and the loss of the view of an iconic bridge. The Adjacent Alternative is considered a negative impact to sensitivity.

- Degree – The visual quality would remain similar to what it is currently north of the river. South of the river, new elevated ramps could result in lost views of the Missouri River. The Adjacent Alternative is considered to have a neutral change to visual quality.

Figure 4-22: Views Associated with the Adjacent Alternative

View looking north from Broadway Boulevard and 7th Street

View looking north from Washington Street

4.2.12.5 Mitigation of Visual Effects

As final bridge and roadway design plans are developed, MoDOT may consider baseline aesthetic applications that enhance the project design but that also represent a minimal cost to the project, can be reasonably maintained, and do not compromise safety. MoDOT would coordinate with appropriate stakeholders to identify applications that would blend with the character of the area and reflect the natural and cultural values of the community and neighborhoods served by the bridge.

Decorative bridge features and finishes, pedestrian railings, aesthetic lighting, paving, and other potential elements and amenities may be considered by MoDOT in cooperation with other project sponsors. These design elements could also be used to further distinguish the bicycle/pedestrian shared use facility planned along the new bridge. These types of aesthetic applications would require funding and/or maintenance support from stakeholders and would require development of an agreement between stakeholders and MoDOT.

4.2.13 Water Resources – Wetlands, Waters of the US, and Water Quality

Wetlands and Waters of the U.S. – Wetlands serve a variety of beneficial uses such as floodwater retention, groundwater recharge, and providing essential fish and wildlife habitat. EO 11990, *Wetlands Protection*, established a "no net loss policy" requiring Federal agencies to avoid destruction or modification of wetlands unless no practicable alternatives exist, and all practicable measures to minimize harm to wetlands have been implemented. Missouri's EO 96-03 calls for similar wetland protection at the state level. An Only Practicable Alternative Finding in response to EO 11990 would be included in the decision document published by the FHWA.

Section 404 of the Clean Water Act (CWA) authorizes the USACE to regulate impacts to wetlands and waters of the U.S. through a permitting process. Waters of the U.S. is an inclusive term that covers streams, rivers, wetlands, and other aquatic sites that are under the USACE's jurisdiction. If permanent impacts to wetlands are greater than one-tenth of an acre, mitigation is generally required as a part of Section 404 permit.

Wetlands are defined by the USACE and EPA as those areas that are inundated or saturated by surface or groundwater at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wetlands within the study area are classified as follows based on hydrology, location in the landscape, and dominant vegetation:

Palustrine emergent wetlands (PEM) primarily consist of herbaceous, grass-like, plants

Palustrine forested wetlands (PFO) are typically dominated by tree species. Palustrine forested wetlands would be typical of the wooded areas within the Missouri River floodplain.

Riverine system (R2UBH) includes perennial rivers with and open channel with an unconsolidated bottom, and permanently flooded with a well-defined floodplain.

The National Wetland Inventory (NWI) mapping for the study area, soil survey information for Jackson and Clay Counties, and aerial photographs were reviewed to identify potential wetland habitats. Based on the data reviewed, three types of wetlands are present within the study area riverward and landward of the levees – palustrine emergent (PEM), palustrine forested (PFO), and riverine (R2UBH). According to the Natural Resources Conservation Service (NRCS) soil survey, areas within the floodplain are underlain by Gilliam silt loam, 0-2 percent slopes, occasionally flooded and classified as hydric. Based on NWI mapping for the project vicinity, approximately 21.2 acres of PFO1A are along the north bank of the Missouri River, east of the Buck O'Neil Bridge. Approximately 178 acres of PEM1A wetlands are along the north bank of the river west of the Buck O'Neil Bridge. No field delineations have been conducted within the Alternatives Corridor.

Missouri River - The only and most prominent water resource in the study area, the Missouri River is classified as "perennial" which means it maintains permanent flow during drought conditions (MO River Water Quality Standards – 10 CSR 20–7.031). The determination of the jurisdictional limit of a river or stream is based upon the presence of an Ordinary High Water Mark (OHWM). The OHWM for a river or stream is usually determined through examination of recent physical evidence of surface flow within the channel. The OHWM is visible on both banks of the Missouri River, marked by flow lines and debris.

Navigable Waterways - The Missouri River is classified as a navigable waterway. The USCG regulates and maintains traffic within the navigational channel of the river, which is located along south bank within the study area. The USACE has the responsibility of physically maintaining the Missouri River for navigation and provides a navigable channel 9 feet deep and 300 feet wide. The USACE is responsible for dredging, structure maintenance (i.e., weirs, damns, etc.), and flood management. The USACE also works with local levee districts to manage river flows during flood events (see Section 4.2.5 for a discussion of the levee system). Modification of the Missouri River to facilitate navigation has been a Federal responsibility since 1884, but serious efforts to stabilize the banks and deepen the channel did not begin until the establishment of a channel 6 feet deep and 200 feet wide as authorized by Congress in 1912. The authorized dimension of the navigation channel was increased to the current depth of 9 feet and width of 300 feet in 1945.

In 2018, the latest year of reporting, more than 4,380,000 tons of commodities were barged up and down the Missouri River between Kansas City and the confluence with the Mississippi River at St. Louis. In the same

year, nearly 390,000 tons of commodities were moved up and down the river between Omaha and Kansas City. Aggregates (e.g., sand, gravel, cement and concrete), petroleum and chemical products (e.g., asphalt, tar/pitch, and fertilizers), and farm products made up most of the commodities transported by river. Typical tow sizes on the Missouri River are 4 to 7 barges between Omaha and Kansas City and 9 to 12 barges below Kansas City.[10]

Between Kansas City and the mouth of the Missouri River, the total trips in both directions ranged from 23,800 to 76,600 per year for all vessel types between 2014 and 2018. Approximately 9,000 of the trips per year were by vessels with a 6 to 9 foot draft. Total tonnage ranged from 4,200,000 to 4,800,000 tons during that same period. Comparatively during the same period (2014 to 2018), the total trips in both directions between Omaha and Kansas City ranged from 1,600 to 3,500 per year for all vessel types. Vessels with a 6 to 9 foot draft accounted for approximately 10 percent of the trips. Total tonnage transported ranged from 320,000 to 590,000 tons during that period.[11] No forecast of future vessel traffic has been identified.

In additional to commercial traffic, the river is used by recreational boats and other watercraft. Recreational use (particularly fishing) occurs throughout the course of the Missouri River. Construction of a new bridge and removal of an existing bridge within navigable waterways requires a permit issued by the USCG under Section 9 of the Rivers and Harbors Act and the General Bridge Act of 1946.[12] Under a Section 9 Permit only the absolute minimum amount of temporary obstruction to the navigation channel is allowed with no permanent impacts to the navigational channel.

Rivers and Harbors Act vs General Bridge Act - Although a USCG Bridge Permit is often referred to as a Section 9 permit (because years ago bridges were approved under Section 9 of the Rivers and Harbors Act of 1899), the primary authority relied on by the USCG now for issuance of such permits is the General Bridge Act of 1946.

This Act requires USCG approval to construct a new bridge or reconstruct or modify an existing bridge over navigable waters of the United States. The purpose of the act is to preserve the public right of navigation and prevent interference with interstate and foreign commerce.

USCG policy is to protect the freedom of navigation and the quality of the environment, meeting the "reasonable needs" both of navigation and land traffic.

Ponds - No ponds or permanent water impoundments were identified within the study area.

Surface Water Quality - Water quality is defined for a body of water by comparing the physical, chemical, and biological characteristics of the water with a set of standards. The EPA sets water quality standards based on what the water is being used for. Under Section 303(d) of the Federal CWA, each state is required to identify waters not meeting water quality standards and for which adequate water pollution controls have not been required. Water quality standards protect beneficial uses of water such as whole body contact (e.g., swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock, and wildlife. The Missouri River is listed on the EPA-approved Missouri 2018 303(d) List as an impaired waterbody.[13] The entire waterbody is classified as impaired primarily due to levels of *E. coli* from multiple municipal point source and nonpoint source discharges, which affects river use for secondary contact and whole body recreation.

Section 402 of the CWA provides for the regulation of pollutant discharges into waters of the U.S. The EPA has authorized states to issue permits under the NPDES program provided for under Section 402. For this project, the MDNR would be responsible for regulating pollution discharges resulting from construction activities within the study area through issuance of NPDES permits. Water quality is also regulated at the state level under Section 401 of the CWA. Water quality certifications are issued in conjunction with Section 404 Permits issued by the USACE for the placement of dredged or fill materials in wetlands and waters of the United States.

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10 *USACE Institute for Water Resources, Waterborne Commerce Statistics Center;* https://www.iwr.usace.army.mil/About/Technical-Centers/WCSC-Waterborne-Commerce-Statistics-Center/; *Ports and Waterways - Webtool*)

11 *Ibid.*

12 Section 9, Rivers and Harbors Act of 1899, 33 USC 401; Bridge Act of 1906, 33 USC 491 et seq.; General Bridge Act of 1946, 33 USC 525 et seq.; and Federal Aid Highway Act of 1987, Section 123(b), 23 USC 144(h).

13 https://dnr.mo.gov/env/wpp/waterquality/303d/docs/2018-303d-list-epa-approved-08-30-2019-attachments.pdf

Groundwater Quality - The study area crosses an unconfined alluvial aquifer located along the Missouri River. The Missouri River floodplain is underlain by deposits of clay, silt, sand, gravel, cobbles, and boulders. These deposits lie atop shale, limestone, and sandstone bedrock that form the alluvial aquifer. Within the study area and project vicinity, groundwater generally flows towards the Missouri River, but in some areas variable gradients are present. Many Missouri municipalities depend on the alluvial aquifers found along the Missouri River for their drinking water supply. Based on information reviewed for the study area, groundwater contamination may be present within the Alternatives Corridor based on past land uses (see Section 4.2.7 for descriptions of potential hazardous material sites). No public water supply wells occur within the study area. The KCMO Water Service Department manages the water intake plant north of MKC near the intersection of US-169 and MO-9 just outside of the study area.

4.2.13.1 No-Build Alternative

Wetlands/Waters of U.S. – In the short term, no construction would occur, and no fill or dredged materials would be placed into wetlands or waters of the United States. In the future if the Buck O'Neil Bridge is removed, demolition methods could involve construction of temporary causeways, the use of mats or gravel to obtain access to the bank or mooring of equipment in or near the navigational channel in order to remove the piers and foundations. Sediments removed from the river would either be placed on a barge and transported to an upland disposal location or placed back in the channel depending on the requirements of the Section 404 permit. Areas along the bank determined to be jurisdictional wetlands would need to be restored following bridge removal.

Navigable Waterways – Prior to removal of the Buck O'Neil Bridge after 2025, continued operation of the existing river crossing would not affect river navigation. During this period, no Section 9 permit would be needed. The USACE would continue to maintain the navigation channel and in-river structures and assist with management of existing flood control levees.

Water Quality - Existing water quality conditions would continue under the No-Build Alternative. Road and bridge maintenance would continue, resulting in periodic and short-term decreases in local surface water quality as the result of paving or surface-grinding activities and the application of roadway deicing compounds during severe winter weather. These pollutants would be carried in storm water runoff from the bridge and adjacent roadway network, resulting in a potential short-term increase in pollutant load to the river. Continued use of the existing bridge and roadway network would not change the potential for traffic incidents that could result in the accidental release of chemicals or petroleum products potentially affecting water quality.

Eventual closure of the crossing and removal of the bridge would result in temporary increases in turbidity and sedimentation within the Missouri River at the time the bridge is removed. Several permits would be required to facilitate removal of the bridge as noted under the build alternatives described below.

4.2.13.2 Build Alternatives

Wetlands/Waters of U.S. – Table 4-20 summarizes the potential wetland acreage mapped within the footprint of each Build Alternative.

Table 4-20: Effects of the Build alternatives on Wetlands and Waters of the United States

NWI Classification	Wetland Type and Location	West Alternative	Central Alternative	Adjacent Alternative
PFO1A	Palustrine forested, located along north bank east of the Buck O'Neil Bridge	0.49 acre	0.50 acre	0.48 acre
PEM1A	Palustrine emergent, located along the north bank west of the Buck O'Neil Bridge	2.32 acres	2.23 acres	1.98 acres
R2UBH	Riverine, within the Missouri River channel	9.50 acres	7.92 acres	6.42 acres

SOURCE: Burns & McDonnell, November 2019.

MoDOT will complete field delineations and obtain jurisdictional determinations through coordination with the USACE Kansas City District once a project footprint is defined by the design-build team. This information will be used to obtain a Section 404 permit for construction of the proposed improvements.

Navigable Waterways – The new bridge would not affect current or forecast future river traffic because the USCG will require that a new bridge meet or exceed a horizontal clearance of 400 feet measured perpendicular to the channel. The navigation channel is designated along the south bank through the study area. The contractor's bridge erection scheme and falsework (i.e., framing to support the construction of the bridge piers and foundations, which is removed once construction is complete) would need to provide adequate horizontal clearance within the navigational channel span to allow for safe passage of river traffic during construction. Temporary cofferdams or erection falsework are subject to approval by the USCG prior to the start of construction. Construction impacts are further discussed in Section 4.2.15.

All build alternatives would require demolition of the existing bridge, with the potential to temporarily affect river users and river-based commerce by blocking the navigational channel for a short period. It is anticipated that the existing spans would be dropped into the river and then salvaged (unless other arrangements are made as part of the mitigation commitments under Section 106 to reuse all or a portion of the bridge). Demolition of the bridge could occur during, or following construction of the new bridge, depending on the alignment selected and the proposed method of construction. Demolition activities may be timed to occur outside the navigation season (March 28 to November 27 for Kansas City, Missouri). If the bridge is demolished during the navigation season, commercial use of the river in the vicinity of the bridge would be slowed but use of the navigation channel could only be restricted for a 24-hour period while the navigation span is dropped and salvaged. Because the USCG would monitor the demolition on-site to provide a safe environment during the process, the demolition operation is anticipated to have a minimal effect on commercial river traffic.

Recreational use of the river near the crossing may be reduced during certain construction and demolition activities. Neither commercial nor recreational use of the river in the vicinity of the new crossing would be impeded once construction is completed.

Water Quality – Storm water runoff during bridge demolition and construction would temporarily affect local surface water quality and would be relatively short-term due to the nature of the construction process. Construction at the river's edge may introduce sediment into the Missouri River. Over time, increased amounts of sediment can damage the river ecosystem by lowering oxygen levels and covering food sources and fish spawning areas. Soil and rock washed away around bridge piers can change the river bottom, affecting species that use the bottom for food or habitat. Pollution- control measures including BMPs, would be implemented and maintained by the contractor for the duration of construction to minimize the amount of sediment-laden runoff flowing directly to the river. Additional BMPs would be implemented to minimize the transfer of other pollutants such as concrete washout, paint, used oil, pesticides, solvents, or other debris in storm water that could potentially harm or kill fish and wildlife, degrade aquatic habitat, and affect drinking water quality.

No groundwater contamination is anticipated as a result of construction activities. Accidental spills of fuels or hazardous chemicals could occur during construction. The contractor will be required to minimize the potential for spills and accidental releases through development and implementation of spill prevention plans and responding quickly to spills when they occur.

All build alternatives would increase storm water runoff after construction as the area of impermeable pavement (i.e., additional roadway pavement, longer bridge structure, bicycle/pedestrian facilities) would increase. No change would occur in the methods or compounds used to deice bridge and roadway surfaces within the study area once the project is completed. Use of these chemicals takes place primarily during wet seasons when the precipitation acts to reduce their concentration.

4.2.13.3 Mitigation for Effects on Water Resources

The recommended mitigation action for all Section 404 Permits is avoidance. However, if total avoidance is not practicable, compensatory mitigation may be required. Disturbance within jurisdictional wetland areas would be minimized to the extent needed to construct the bridge foundations and piers. The use of temporary causeways or mats for construction equipment to access pier locations will be vetted by the Design-Build contractor. The contractor will be required to restore disturbed areas with suitable wetland vegetation types or purchase off-site mitigation credits depending on the magnitude of the actual impacts of the proposed improvements and the Section 404 permit conditions. During the Section 404 Permit process, MoDOT will coordinate directly with the USACE, the EPA, and the MDNR to determine the appropriate mitigation for any unavoidable impacts to jurisdictional wetlands, including use of in-lieu fee programs or purchase into a mitigation bank.

To protect water quality and reduce impacts during and after completion, construction of the new bridge shall be completed in conformance with Missouri State Operating Permit for Construction or Land Disturbance Activities, effective February 8, 2017; under the NPDES permitting program administered by the MDNR. MoDOT will require the contractor to implement BMPs to prevent erosion and provide sediment and storm water management during construction. These measures are described in Section 4.2.14. In accordance with the requirements of the NPDES program, the contractor will be required to develop a project-specific SWPPP to describe the BMPs to be implemented during construction. The SWPPP would include MDNR-approved components to reduce suspended solids, turbidity, and downstream sedimentation that may degrade water quality and adversely impact aquatic life.

4.2.14 Construction Phase Impacts and Mitigation

Construction-phase impacts are typically temporary and relatively short-term, ending when construction is complete. They typically result directly from construction activities such as clearing and grubbing, demolition, grading, equipment operation, building (e.g., pouring concrete, welding, assembling, etc.), and transporting and storing materials.

4.2.14.1 No-Build Alternative

No construction would occur under the No-Build Alternative. However, over time, the type and frequency of maintenance would increase to keep the aging bridge in service. The repairs completed in 2018 have extended its useful life to 2025. Bridges of this age have the potential for increased maintenance activities and unexpected repairs that could temporarily close the bridge and hinder traffic flow in the short-term. Even continued, routine upkeep and rehabilitation could result in more traffic delays over the next few years in comparison to those associated with constructing a new bridge. Short-term impacts such as noise, dust, and pollutant discharges from maintenance activities associated with the No-Build Alternative would be mitigated in a similar manner to those for the build alternatives, as described below.

4.2.14.2 Build Alternatives

All build alternatives would result in short-term and temporary impacts due to construction activities. These would include increases in noise, dust, and pollutants discharged by construction equipment. It would also include impacts to motorized and non-motorized traffic, and to businesses in the area in terms of circulation and temporary impacts caused by access modifications and detours.

In the North Segment, all three Build alternatives have similar construction impacts: proximity to BNSF embankment, proximity to T&WA Building/Signature Flight Support, airspace restrictions (e.g., height restrictions imposed on cranes and other construction equipment and activities in relation to defined approach and departure surfaces at the airport), and maintenance of access to MKC.

For the River Segment, the alignment of the West Alternative is closest to the airspace surfaces of concern to the FAA, which would lend itself to a greater incidence of temporary encroachments with construction equipment into the airspace surfaces. The alignments of the Central and Adjacent Alternatives are farther away

from the airspace surfaces. Continued coordination among the FAA, MoDOT, KCAD, and the Design-Build contractor will be required to resolve the airspace encroachment issues and obtain an FAA 7460 Permit (submittal of FAA Form 7460-1, Notice of Proposed Construction or Alteration) for temporary airspace obstructions.

In the South Segment, all three build alternatives have similar construction impacts in terms of property access and modification of travel patterns for abutting neighborhoods and connecting roadways proximity to the River Market neighborhood and its travel patterns and access. The Central and Adjacent Alternatives would require temporary closures of I-35/I-70 and along US-169/Broadway Boulevard to accommodate construction. The West Alternative would also require temporary closures along I-35/I-70 and US-169/Broadway and would also require temporary closures along I-70 westbound and eastbound and Beardsley Road during construction due to additional ramp and bridge replacements. Table 3-3, Table 3-4, and Table 3-5 provide a list of the improvements proposed and structures affected under each build alternative.

Traffic Control/Detours

Regardless of the Build Option selected, the bridge could be closed in order to expedite construction. Constructing a new bridge would have some impact on local traffic in the immediate area as the contractor's personnel work around the project site. Additional traffic would be generated by delivery of materials to the project site. Vehicles bringing materials in and out would add to the existing traffic. As the Design-Build process advances decisions will be made regarding construction phasing, temporary roadway closures, and detour routes. Full closure of the US-169 river crossing could be considered if it would benefit the constriction process. Such a closure would require all traffic to use adjacent river crossings at the Christopher S. Bond Bridge, the Heart of America Bridge and the Fairfax Bridge. In addition, access to the airport from south of the river would be hindered by a lengthy detour.

Partial closures of the river crossing and other roadways could provide flexibility in implementing the project, such as occurred during the during the 2018 Buck O'Neil Bridge rehabilitation project. The northbound lanes of US-169 remained open to traffic but the southbound lanes across the bridge were closed to traffic for six months. A single lane of southbound US-169 remained open south of MO-9 to allow access to the airport. All traffic using this lane exited at the Richards Road.

A Transportation Management Plan (TMP) would be developed during the Design-Build process to support implementation of the project. Th TMP would define a set of coordinated traffic management strategies to manage work zone impacts. The TMP would include strategies for managing, conducting active public information and outreach, scheduling high-impact work for hours of off-peak traffic, installing temporary traffic control devices, and possibly enlisting the help of law enforcement for additional traffic control, if necessary.

Temporary detours and local roadway closures would be necessary to facilitate construction of the approach roadways and to make connections to the existing roadway network. Because several alternate routes exist in the vicinity of the project, maintaining access during construction could be accommodated with minimal disruption. Traffic along US-169 could be rerouted to MO-9 and I-29/I-35 to the east and to US-69 to the west to cross the Missouri River. Using MO-9 as an alternate route would add 0.6 miles and three minutes travel time for trips between US-169/I-29 and downtown at 6th & Broadway depending on the origin/destination and time of day. Similarly, a detour to I-29/I-35 would add 2.2 miles and two minutes. To the west, a detour along I-635, Fairfax Trafficway and I-70 would add 3.5 miles and seven minutes.

The extent of the closures that would limit traffic on the existing bridges would be established during final design and described in the TMP. Factors that would affect the ability to maintain traffic during construction include the ultimate alignment of the new bridge, approach roadway connections, pier locations and configurations, and logistics related to utility relocations.

If the construction sequencing for a new bridge makes it feasible to maintain the existing bridge as open to traffic, several possibilities exist for its use to carry traffic. Depending on when the bridge is removed, the

northbound or southbound traffic could be left open during all bridge construction and would not be disrupted until the roadway work conflicted with existing clear zones. An alternative to this could maintain both directions of traffic on the bridge with one lane in each direction. This would require building sections of temporary roadway or "shooflies" so that the existing roadway ties into the bridge for northbound and southbound traffic.

MoDOT deploys proactive communications to the public through a variety of tools including web-based applications, intelligent transportation systems applications, and other conventional media outlets. MoDOT also publishes construction-related news releases and information on its web site at www.modot.org for those who have Internet access. Work zone impacts and issues would vary through the different stages of construction, making these timely announcements a valuable part of the TMP.

Air Quality

Air quality concerns associated with bridge construction typically arise from the operation of construction equipment such as barges and cranes. Similarly, equipment such as bulldozers, haul trucks, and pavers are used in the construction of the roadway approach to the bridge.

These types of equipment use diesel engines that emit exhaust similar to the emissions from commercial river barges and over-the-road trucks. The level of contaminants in the exhaust can vary greatly depending on the condition of the equipment, thus making it important to keep equipment in good operating condition. Emissions from construction equipment would be controlled in accordance with emission standards prescribed under state and Federal regulations.

Materials resulting from clearing and grubbing, demolition, or other operations (except materials to be retained) would be removed from the project site and disposed of by a licensed contractor at a construction landfill. No open burning of trees, brush, or other waste would be permitted. The contractor may harvest any marketable timber, use mulched timber for erosion control, and compost excess mulch. Man-made waste must be hauled to a licensed landfill. Rock removed may be crushed and used as aggregate base. Rock would only be used if it meets MoDOT specifications. Temporary batch plants and rock crushers may be constructed within the project area to facilitate construction. The contractor will be responsible for obtaining all permits and regulatory approvals to locate and operate such facilities in accordance with MoDOT specifications and regulations and Federal OSHA standards.

Under dry conditions, heavy traffic or strong winds can cause dust from the soil itself to become airborne (fugitive dust), resulting in air quality impacts. Contractors will be required to control fugitive dust to keep it from leaving the project limits. Watering the ground or using dust-retarding chemicals and washing vehicles prior to leaving the construction site may be used to reduce the generation and transport of fugitive dust. All methods must comply with applicable Federal, State, and local laws and regulations.

Noise

One the most noticeable types of noise generated during construction would be during the installation of steel piles, which require the use of a pile driver. The noise from driving piles would be heard along the river adjacent to the bridge. Pile-driving activity would be relatively short in duration, lasting days or weeks until the work is completed, and would not occur at night. Noise could also be expected from the operation of equipment such as cranes, bulldozers, front-end loaders, scrapers, and other typical earth-moving equipment. To reduce the impacts of construction noise, MoDOT would include special provisions in the construction contract requiring that all contractors comply with all applicable local, State, and Federal laws and regulations relating to noise levels permissible within and adjacent to the project construction site. Construction equipment would be required to have noise-reducing mufflers in accordance with the equipment manufacturer's specifications.

Use of explosives could be expected for demolition of the trusses and bridge piers and possibly for the removal of rock in the bluff area. These blasts would be expected to be limited in number and would be scheduled for daytime occurrence to avoid disrupting residential night-time quiet. The contractor will be responsible for

obtaining all necessary permits and complying with applicable mitigation measures outlined in the Section 106 PA.

Water Quality

Preventing water quality impacts on a major bridge project presents some slightly different challenges than a road construction project. Controlling erosion during construction of the roadway approaches is certainly important but work in the Missouri River itself must be given special attention. Bridge construction uses barges and when the water level drops too low, the area adjacent to the work platform may be dredged to maintain access for the barges. Any dredged material would be disposed of in an upland location off MoDOT right-of-way or returned to the channel depending on the requirements outlined in the Section 404 permit. The contractor will implement all necessary measures to control turbidity.

The MDNR regulates the control of runoff from land disturbance and issues a permit for the work to MoDOT, not to the contractor. Erosion control measures must be put in place before land clearing begins. MoDOT's Pollution Prevention Plan provides for temporary erosion and sediment control measures that would be included within construction contract specifications. Careful refueling practices would limit spills of gasoline and diesel fuels. Oil spills can be minimized by frequent checks of construction equipment. At a minimum, the following measures would be included in the SWPPP:

- Locate and protect all temporary storage facilities for petroleum products, other fuels, and chemicals to prevent accidental spills from entering the streams within the project vicinity. Clean-up any such spills that occur within 1,640 feet (500 m) of any stream within 24 hours of the spill to prevent the possibility of pollution due to runoff.
- Avoid disposing of cement sweepings, washings, concrete wash water from concrete trucks, and other concrete mixing equipment, treatment chemicals, or grouting and bonding materials into streams, wetlands, or into any location where water runoff will wash pollutants into streams or wetlands.
- Reseed all areas within the project limits denuded of vegetation as a result of construction activities.
- Protect wetlands in the project vicinity from activities that may result in draining or filling them.
- Per project permits, excavate, dredge, and fill in the watercourses in a manner that will minimize increases in suspended solids and turbidity.
- Immediately remove and properly dispose of all debris during every phase of the project in order to prevent the accumulation of unsightly, deleterious, and toxic material in or near area waterbodies.
- Avoid disposing of any construction debris or waste material below the OHWM of any waterbody or at any location where the material could be introduced into the water or an adjacent wetland because of run-off, flood, wind, or other natural forces.

Impacts to Floodplains/Floodways and the Existing Levee System

Several construction techniques could be used that would affect the navigation channel and the levee systems. Temporary measures used for the construction of a Missouri River bridge of this type may include the following:

- Cofferdam construction may be proposed for pier foundations in the river channel. Cofferdams are generally constructed using steel sheet piling, and then excavated and dewatered to allow for concrete construction in dry conditions. Cofferdams are removed after completion of pier construction. Alternately, large-diameter drilled shafts may be used for the pier foundations. These are constructed using steel pipe casings that allow for reinforced concrete construction under water.
- A temporary causeway may be proposed towards the river channel from either bank. Causeway construction is often used when piers are required in shallow conditions near the bank, making barge operation difficult. Causeway construction cannot impede river navigation.

- Temporary supports such as pile bents may be proposed in the navigation channel to support girder erection in stages. Close coordination with the USCG would be required.
- Pier construction in the vicinity of the levee system would likely require contingency for emergency backfill in the event of flood conditions. In addition, impacts to critical elements of the levee system such as the landward drainage system or relief wells should be minimized. Excavated construction in the vicinity of the levee would require strict backfill measures to restore the system to its original condition.
- Construction access may be permitted on the levee road(s); however, because of the steep incline up and over the levee, additional material may be required to safely haul equipment used for construction. Additional material placed against the levee would be placed to avoid compromising the integrity of the levee system.
- Construction staging areas may be proposed on the riverward, or more likely, the landward side of either levee. Any staging area used in the vicinity of a seepage berm would not disturb the impervious blanket, and the area would be restored to its original condition after use as a staging area.

Visual Effects

During construction of any of the build alternatives, both views of and from the facility would be temporarily degraded due to construction activities such as earth moving, roadway, and bridge demolition, and roadway and bridge construction. The duration and the severity of these temporary visual impacts would vary depending on the alternative selected.

Railroad Coordination

The Union Pacific Railroad and the Burlington Northern and Santa Fe Railway pass under the existing bridge on the south side of the river. MoDOT will coordinate with the railroads to work around their train schedule. Construction of bridge piers nearby would require flaggers during construction operations. All flagging costs would be borne by MoDOT. To avoid interrupting train traffic, the bridge contractor would coordinate with the railroad to schedule setting girders and handling other materials over the railroad tracks. It is not anticipated that rail traffic would be affected by construction, although railroad company flagmen would be on-site whenever active construction on or over railroad right-of-way occurs.

Utilities

The study area contains numerous utilities including electrical distribution, electrical transmission, highway and street lighting, private and public communication facilities, gas, sanitary sewer, storm sewer, and water. Some of the more significant utilities include KCPL (Evergy), which has a 115-kV transmission line and a 13.2-kV distribution line running parallel to and near the south bank of the river. In addition, KC Water has multiple large-diameter pipes running under the study area. Depending on the existing easement agreements, any associated costs of relocation could be borne by the utility owners. If utilities sited on dedicated easements are relocated, the cost of relocation would be a direct project cost.

Several utilities are located within and along US-169 that serve MKC. The power supply for the airport facility is located underneath the existing Buck O'Neil Bridge near Richards Road. Fiber-optic lines connecting downtown and the Kansas City International Airport also cross the study area.

Borrow and Waste Sites

All suitable materials removed during excavation will be used as far as practicable in the formation of bridge and roadway embankments, subgrade, shoulders, and other locations requiring fill as directed on the construction plans. No excavated materials will be wasted without permission, and when such material is to be wasted, it will be placed so that it would present a neat appearance and not be injurious to abutting property. The construction plans may designate certain materials to be excavated and stockpiled for a specific purpose or for future use. It is the contractor's responsibility to make use of all available suitable excavation material within the limits of the project.

All waste and borrow areas would be identified by the contractor. The use of borrow pits or waste areas, other than shown on the construction plans or designated by the Field Engineer, may be approved, provided the material and area are both satisfactory. The contractor will furnish the Field Engineer a copy of the agreement with the landowner for use of the property as a borrow or waste area. The agreement will contain stipulations about temporary seeding and water pollution control to be implemented during construction. Approval of borrow or waste sites is also contingent upon receiving appropriate wildlife and archaeological clearances.

In the event the contractor's excavation operation encounters remains of a prehistoric site or artifacts of historical and/or archaeological significance, all construction activities will be temporarily discontinued. The Field Engineer will contact the MoDOT Design Division Environmental Section to determine the disposition of the discovered artifacts. When directed by the Field Engineer, the contractor will excavate the site in such a manner as to preserve the artifacts encountered and the archaeologist or his/her representative will remove the artifacts for delivery to the custody of the proper State authority.

4.2.15 Indirect Effects and Cumulative Impacts

4.2.15.1 Indirect Effects

Indirect effects are caused by implementation of a project but occur later in time or are outside of the project boundaries (e.g., changes to surface water flow to wetlands, or development of a gas station near a new highway interchange).

The proposed project is consistent with current comprehensive, land use, and transportation plans. It would support many of the transportation goals identified for Kansas City as well as the region. Improved access, connectivity, and mobility would support ongoing air quality attainment status for the area and support economic development by getting commuters, freight haulers, and emergency responders to their destinations more efficiently. Redevelopment within the River Market, West Bottoms, and downtown KCMO would continue as parcels would be opened within the footprint of the existing bridge and connecting roadway once removed and would be supported by improved access and mobility provided by the crossing improvements.

4.2.15.2 Cumulative Effects

The Council on Environmental Quality defines cumulative impacts (40 CFR 1508.7) 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* .The following projects/actions beyond that scoped under this Proposed Action are considered to represent the past, present, and reasonably foreseeable (funded, permitted, or approved for construction) future actions related to this project. The PEL study area, larger than the study area defined for this project, was used to determine the geographic scope of cumulative effects in support of the local and regional connectivity the Proposed Action would provide. The timeframe for cumulative effects is the planning horizon of 2040.

Past and Present Actions

- US 69 (Fairfax and Platte Purchase Bridges) Improvements (2015)
- Kit Bond Bridge
- KCMO Streetcar – Initial, Riverfront Extension, South Extension (2012-ongoing)
- Rehab Heart of America Bridge (MO-9) over Missouri River (2009)
- Rehab bridge over Charlotte St. (2014)
- Rehab I-35 NB Bridge (2014)
- 12th Street Bridge Improvements (2013)
- Broadway at I-35/I-70 interchange and ramp improvements, removal of RR bridge over I-35/I-70 (2015)

- River Market Developments

Reasonably Foreseeable Future Actions

- I-70 Corridor Improvements Downtown Loop to Jackson/Benton Curves (2024)
- CST Baltimore Avenue Bridge Replacement (A0817) (2021)
- Bridge Rehab at I-70 (A1128) (2021)
- Heart of America Bridge (MO-9) Rehab over Missouri River (future)
- I-29 bridges rehabilitation – over Dora St and 14th Avenue (L0788 and L0789) (future)
- Additional PEL strategies (future)

The following descriptions include resource categories where an unavoidable effect would result from implementation of the Proposed Action. If an action does not directly affect a resource such as wetlands, the effects of the project would not contribute to an incremental or cumulative effect to wetlands over time. The resource categories not described below are either not present within the study area or the effects of the Proposed Action have been determined to be negligible.

Air Quality – Implementation of the Proposed Action in combination with the past, present, and future actions would support the region's goal of maintaining attainment with the NAAQs. Reduced congestion and improvements in travel times provided by these improvements would improve overall mobility in the region while the continued introduction and use of more hybrid and electric vehicles and the continued improvement of fuel formulas as mandated by EPA would support long-term attainment.

Biological and Water Resources - Placing new bridge piers in the river could contribute to cumulative negative effects on the habitat of some species of fish that live in the Missouri River; but these effects are anticipated to be minimal. Through implementation of MoDOT's Pollution Prevention Plan on applicable projects and adherence to State and Federal water quality standards, the effect on surface water quality, especially in the Missouri River would be minimized. Given the existing Missouri River natural sediment load and contributions from agricultural runoff, river dredging, and other developments, the sediment contribution from this and future projects is expected to be minimal. Effective implementation of BMPs should afford adequate protection to sensitive aquatic resources in the Missouri River and minimize this and other projects' contribution to any potentially negative cumulative impacts associated with sedimentation.

The loss of riparian habitat in the study area caused by this project in addition to past, present, and future actions is minimal. Much of the PEL study area is in urban development and the Missouri River corridor is highly armored to protect the function of the levee system. Because of the very limited and relatively low-quality habitats present within the PEL study area and efforts under every project to minimize impacts, their loss would not contribute to the overall degradation or fragmentation of habitats within the region. Much of the on-going and planned development is occurring in areas already disturbed and dedicated for development and is not contributing to habitat loss. The floodplains in the vicinity of the project are also occupied by levees which limit the types of vegetation communities managed in these areas to maintain the integrity and function of the levee system. Cumulative effects on riparian communities, wetlands, and floodplains are not considered to be substantial.

Historic Bridges - Many of the bridges along the Missouri River were constructed during the 1920s through the 1950s. These bridges were designed with truss structures to allow the lengthy spans needed to bridge the navigation channel. Due to the ages of these bridges and their individual significance, many have been listed or are eligible for listing on the NRHP. However, many bridges that have been listed have numerous structural deficiencies and do not meet current design standards. The higher volume of traffic, as well as the heavier loads that trucks carry today, far exceed the loads for which these bridges were designed. In addition, the aging steel structures may need substantial repairs to prolong functional life. Most truss bridges were built with narrow travel lanes and without shoulders. Modern traffic requirements call for wider lanes, separation

between opposing traffic, and shoulders to accommodate disabled vehicles. Widening an existing truss bridge is typically not economically feasible. For these reasons, many Missouri River bridges are being replaced.

Bridges are also limited in the ways that they can be adaptively reused. Larger bridges are more difficult to adapt for reuse. It is often prohibitively expensive to repair or rehabilitate a bridge for non-vehicular use or to move to another location. Therefore, the aging Missouri River bridges, like Buck O'Neil, are likely to be demolished. The continued removal or replacement of these bridges (including past projects – I-35 [Kit Bond Bridge], US 69 [Fairfax /Platte Purchase Bridge]) would lead to a cumulative effect to a category of cultural resource. Overall, no significant cumulative effects are anticipated as a result of implementation of the proposed project.

Visual Resources – The project and PEL study areas cover a variety of views focused on the Missouri River and surrounding landscape. Over the past several years, prominent additions to the visual landscape have occurred – construction of the Kit Bond Bridge, numerous retail and apartment/condominium complexes in the River Market and West Bottoms, and other redevelopment projects in the KCMO downtown and along I-35. The proposed project would remove a visual icon in terms of the Buck O'Neil Bridge. Due to its proximity to MKC, the style of the replacement structure will be limited in terms of vertical design elements to avoid becoming permanent obstructions to operations at the airport. The visual character of the River Market, West Bottoms, and downtown KCMO have also changed over time. Because of the position and elevation of the levee along both sides of the river, views from ground level of the river are very limited. The character of the prominent view from West Terrace Park and the Lewis and Clark monument over the West Bottoms and towards the confluence of Kansas and Missouri Rivers and north towards Briarcliff will be changed with the removal of the Buck O'Neil Bridge.

5.0 Federal Aviation Administration Environmental Evaluation

At the request of the FAA, this chapter has been assembled to facilitate FAA's independent environmental review of actions associated with the North Segment of the proposed project that MKC. This chapter provides detailed descriptions of the layout options considered for improvement of the existing airport access points and improvement of US-169 adjacent to MKC. As noted in Chapter 3.0 of this EA, a single design solution that includes modification of the existing airport access points, is proposed within the North Segment of the build alternatives under consideration. The effects of these proposed improvements on the airport property are discussed here, and are also included in the presentation of the overall effects of each complete build alternative (West, Central, and Adjacent) described in Chapter 4.0 of this EA.

In addition to satisfying the requirements of NEPA and CEQ NEPA implementation regulations, this chapter was prepared following the guidance in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4B, *National Environmental Policy Act Implementing Instructions for Airport Actions*.

Under Section 8-2 of FAA Order 1050.1F, FAA may adopt, in whole or in part, another Federal agency's draft or final EA, the EA portion of another agency's EA/FONSI, or EIS in accordance with 40 CFR 1506.3 of the CEQ Regulations Implementing NEPA, if certain criteria are met. The responsible FAA official must determine, based on an independent evaluation, that the document, or portion(s) thereof, to be adopted: (1) adequately address(es) the relevant FAA action(s); and (2) meet(s) the applicable standards (i.e., for an EA or EIS) in the CEQ Regulations and FAA Order 1050.1F.

5.1 Proposed Action and Federal Action

5.1.1 Proposed Action

The Proposed Action, sponsored by FHWA, MoDOT, and KCMO, is to provide the most effective improvement alternative to maintain the crossing of US-169 over the Missouri River that satisfies current and future area transportation needs while minimizing impacts on the human and natural environment. The alternatives under consideration address the condition of the existing Buck O'Neil Bridge as well as access, mobility, and connectivity needs along US-169 within portions of Jackson and Clay Counties, Missouri.

5.1.2 Federal Action

The FAA will take the following actions as appropriate to authorize implementation of the Proposed Action as it affects airport property:

- Unconditional approval of the Airport Layout Plan (ALP) to depict the proposed improvements pursuant to 49 USC §§ 40103(b) and 47107(a)(16).
- Approval of an airport sponsor's request for release of property pursuant to FAA Order 5190.6, FAA Airport Compliance Manual (49 USC Chapter 471) permitting the sale and disposal of airport property or change in land use from aeronautical to non-aeronautical.
- Determinations under 49 USC 47106 and 47107 relating to the eligibility of the Proposed Action for federal funding under the Airport Improvement Program (AIP) and/or determinations under 49 USC 40117, as implemented by 14 CFR 158.25, to impose and use passenger facility charges (PFCs).

- Determination under 49 USC § 44502(b) that the airport development is reasonably necessary for use in air commerce or in the interests of national defense.
- Approval of a Construction Safety and Phasing Plan to maintain aviation and airfield safety during construction pursuant to FAA Advisory Circular (AC) 150/5370-2F, Operational Safety on Airports During Construction (14 CFR Part 139 [49 USC § 44706]).
- Approval of changes to the airport certification manual pursuant to 14 CFR Part 139 (49 USC § 44706).
- Determinations, through the aeronautical study process, under 14 CFR Part 77, regarding obstructions to navigable airspace (49 USC Section 40103 (b) and 40113).

5.2 Charles B. Wheeler Downtown Airport (MKC)

Dedicated by Charles Lindbergh as the New Richards Field in 1927, Charles B. Wheeler Downtown Airport (MKC) was the first airport in Kansas City. MKC occupies 695 acres north of the Missouri River and downtown Kansas City. The facility and its control tower are open 24 hours a day. Fixed-base operators (FBOs) service 170 based aircraft[14], as well as itinerant and charter aircraft, offering fuel, full maintenance, aircraft rentals and sales, and flight training. The airport, operated by the Kansas City Aviation Department (KCAD) provides 24-hour security, snow removal, receives USDA support to mitigate wildlife hazards, and maintains a US Customs facility.

A previous major airport tenant was Trans World Airlines (TWA), originally formed as Transcontinental & Western Air (T&WA) in 1930, headquartered in Kansas City. In 1942, TWA constructed the large building at the south end of the airport, now occupied by Signature Flight Support. After commercial aviation service was transferred to the new Kansas City International Airport (MCI) in 1972, MKC maintained its role as a corporate and recreational airport. Two buildings on MKC, located within the study area of the proposed project have been determined NRHP-eligible - the former T&WA Building (now Signature Flight Support) and the former Municipal Airport Terminal constructed in 1957 (now VML).

MKC is accessible from US-169 and Richards Road as illustrated in Figure 5-1. Richards Road (managed by KCMO) parallels the airport property and is separated from US-169 (managed by MoDOT) by a concrete barrier. The three existing MKC access points are described as:

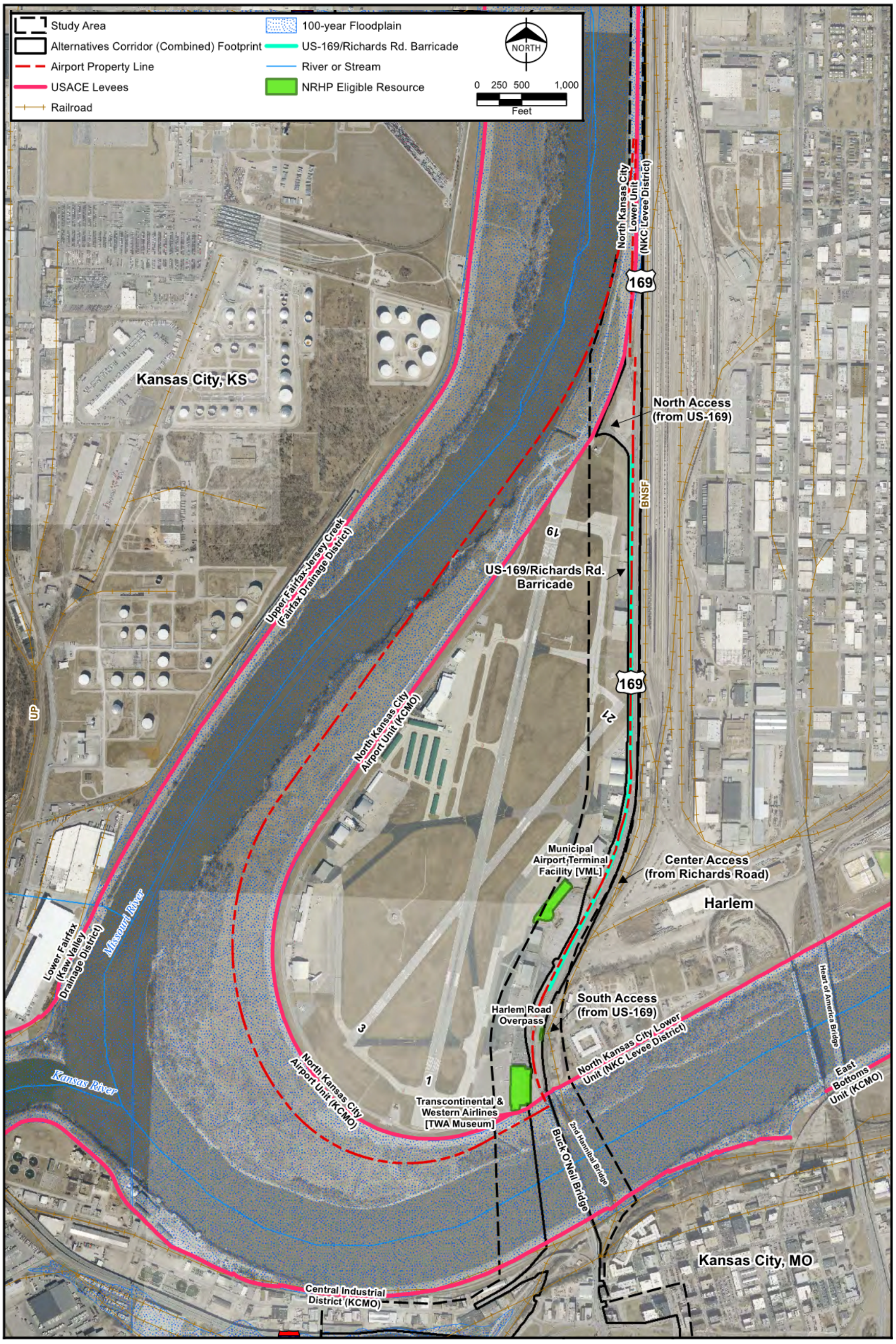
- North Access – southbound and northbound ramps connect to US-169 at the north end of the airport
- Center Access - referred to as the southbound “right-in, right-out” along Richards Road
- South/Harlem Access – at Harlem Road connecting to Richards Road, ramps provide northbound access into the airport and northbound and southbound access leaving the airport near the north end of the Buck O’Neil Bridge

5.3 Alternatives Considered

The following section describes the options considered within the North Segment of the build alternatives under consideration. The North Segment extends roughly from the levee along the north bank of the Missouri River to the intersection of US-169 an MO-9, the northern terminus of the Proposed Action. The North Segment spans the section of US-169 that borders MKC on the east and the three existing airport access points.

[14] 164 fixed-wing based aircraft and 6 based helicopters; FAA Airport Master Record

Figure 5-1: Charles B. Wheeler Downtown Airport (MKC) and Vicinity



5.3.1 No-Build Alternative

No improvements would be made to the existing US-169 crossing of the Missouri River and a new bridge would not be built. No improvements would be made to the existing access points into MKC from US-169. Only required maintenance along US-169, including of the existing Buck O'Neil Bridge, and along Richards Road would occur. Repairs to the Buck O'Neil Bridge made during the rehabilitation completed in November 2018 only addressed the most critical issues and extended the useful life of the river crossing by five to seven years. By 2025, transportation officials will need to have a plan implemented to address the condition of the existing river crossing (e.g., major rehabilitation, reconstruction, or replacement) to enable the crossing to continue to serve vehicular traffic and maintain route connectivity.

5.3.2 Build Alternatives

Three build alternatives are under consideration as identified in Section 3.7 of this EA. The West, Central, and Adjacent Alternatives include the same proposed improvements within the North Segment. The following options were studied to improve access to MKC via the three existing airport access points. Options to improve US-169 within the North Segment are constrained by the location of MKC on the west, the BNSF corridor on the east, and the limited room available at the south end of MKC adjacent to the T&WA Building/Signature Flight Support.

5.3.2.1 Improvements at the South/Harlem Road and Central Airport Access Points

Four options were studied to improve access at the south/Harlem Road and central access points. These options are illustrated on Figure 5-2 through Figure 5-5 on the following pages.

Improved South/Harlem Road-Central Interchange – A new interchange would be constructed to combine the south/Harlem Road and central access points near Hangar 2 (Figure 5-2). The option would improve access into the terminal area (VML and Hangar 3) and minimize parking displacements at the terminal and at Hangar 4. However, the right-of-way needed for the interchange (elevated roadways) and ramp access displaced all parking and the fenced airside security area in front of Hangar 2. For these reasons this option was removed from further consideration.

Improved Central Interchange – A new interchange would be constructed near the Aircraft Rescue and Fire Fighting (ARFF) and Hangar 4 (Figure 5-3). The option minimized the displacement of parking at the terminal (VML and Hangar 3) but substantially reduced the number of parking spaces at Hangar 4 and at the remaining hangars to the north of Hangar 4. The right-of-way needed for the interchange (elevated roadways) and ramp access severely encroached into the parking for Hangar 4 and cutoff access to the Hangar 4 loading dock. This option did not include improvements at the south/Harlem Road access. For these reasons this option was removed from further consideration.

Improved Central Interchange with One-Way Outer Roads – A new interchange would be constructed including a slip ramp and elevated span near Hangars 4 and 4B (Figure 5-4). Although this option minimized parking displacements and the overall amount of airport property that would be converted to highway right-of-way, improvements would extend north of Hangars 5A and 5B encroaching into restricted airside areas. For these reasons this option was removed from further consideration.

Central and South/Harlem Access Improvements – To minimize parking displacements and the amount of airport property to be released from airport use to highway right-of-way, improvements to both the central and south/Harlem Road access points were considered to improve access and circulation.

At the south/Harlem Road access point, a new interchange at Harlem Road would allow traffic northbound on US-169 to access the airport and allow traffic from the airport to access US-169 northbound. A flyover ramp from I-35 to US-169 would provide direct access to the airport by northbound traffic. Flyover traffic entering US-169 from a left entrance would have adequate distance to change lanes to exit at Harlem Road to access the airport. Bicycle/pedestrian access would be provided to the airport via a barrier-separated shared use

Figure 5-2: Improved South/Harlem-Central Interchange

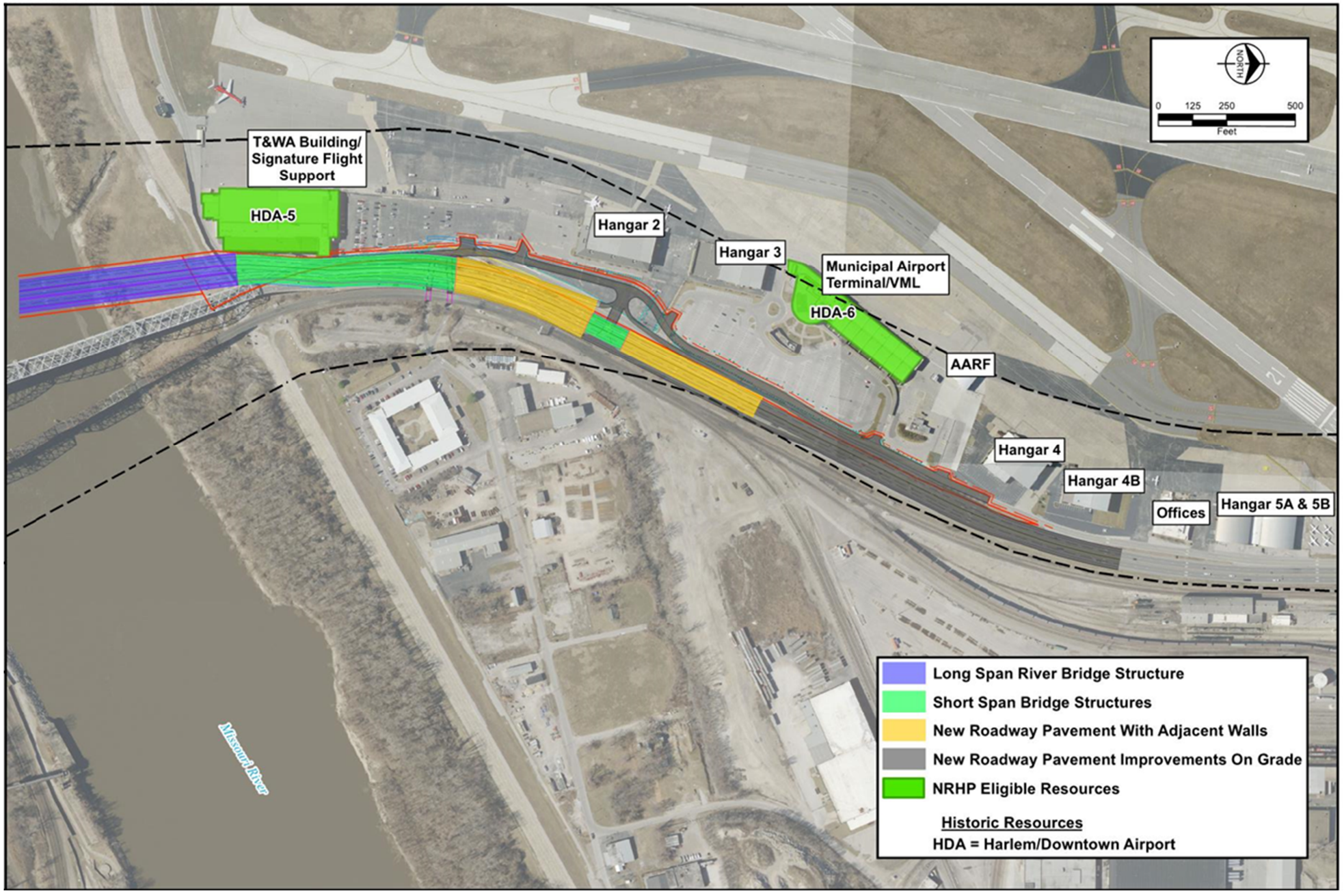


Figure 5-3: Improved Central Interchange

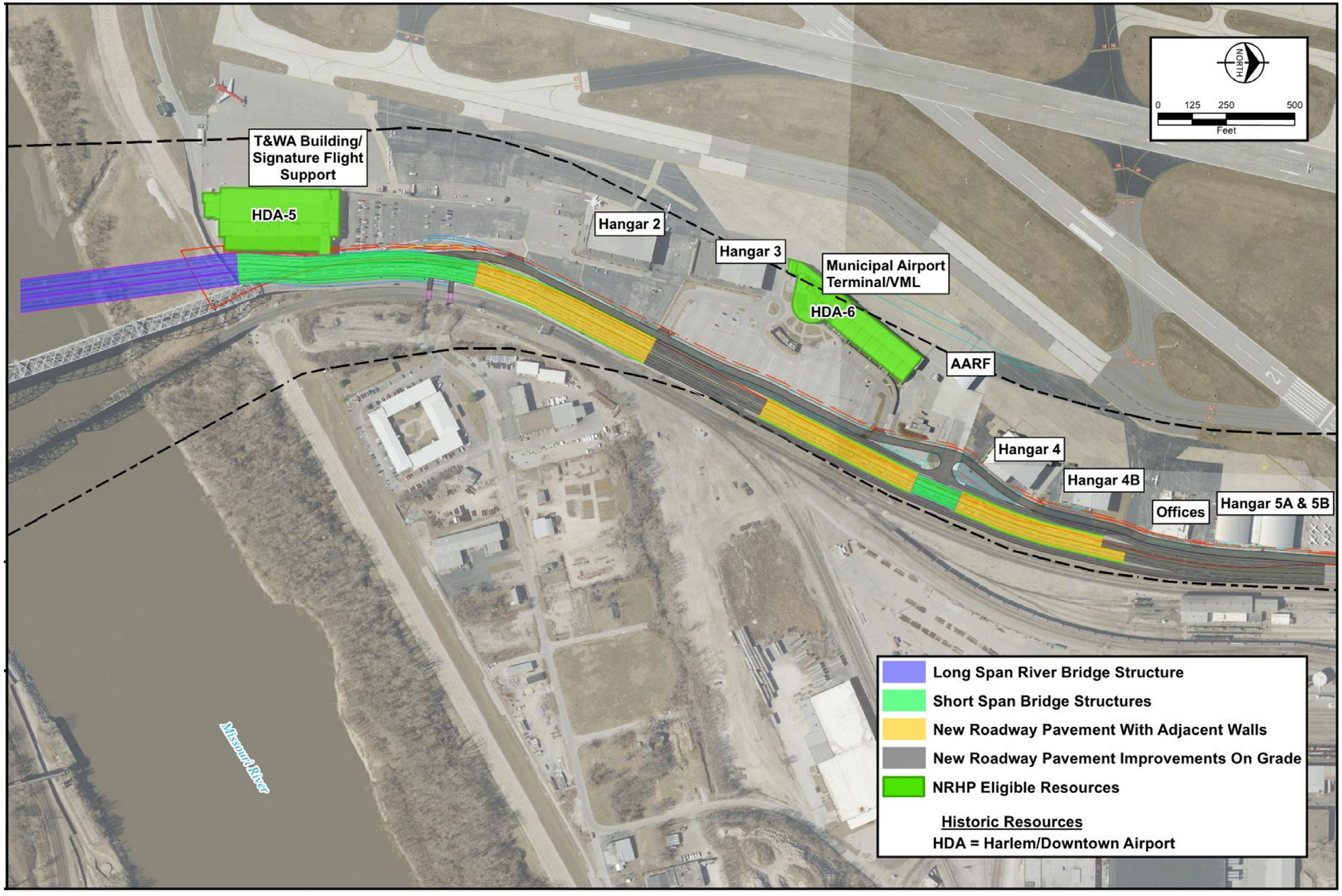


Figure 5-4: Improved Central Interchange with One-Way Outer Roads

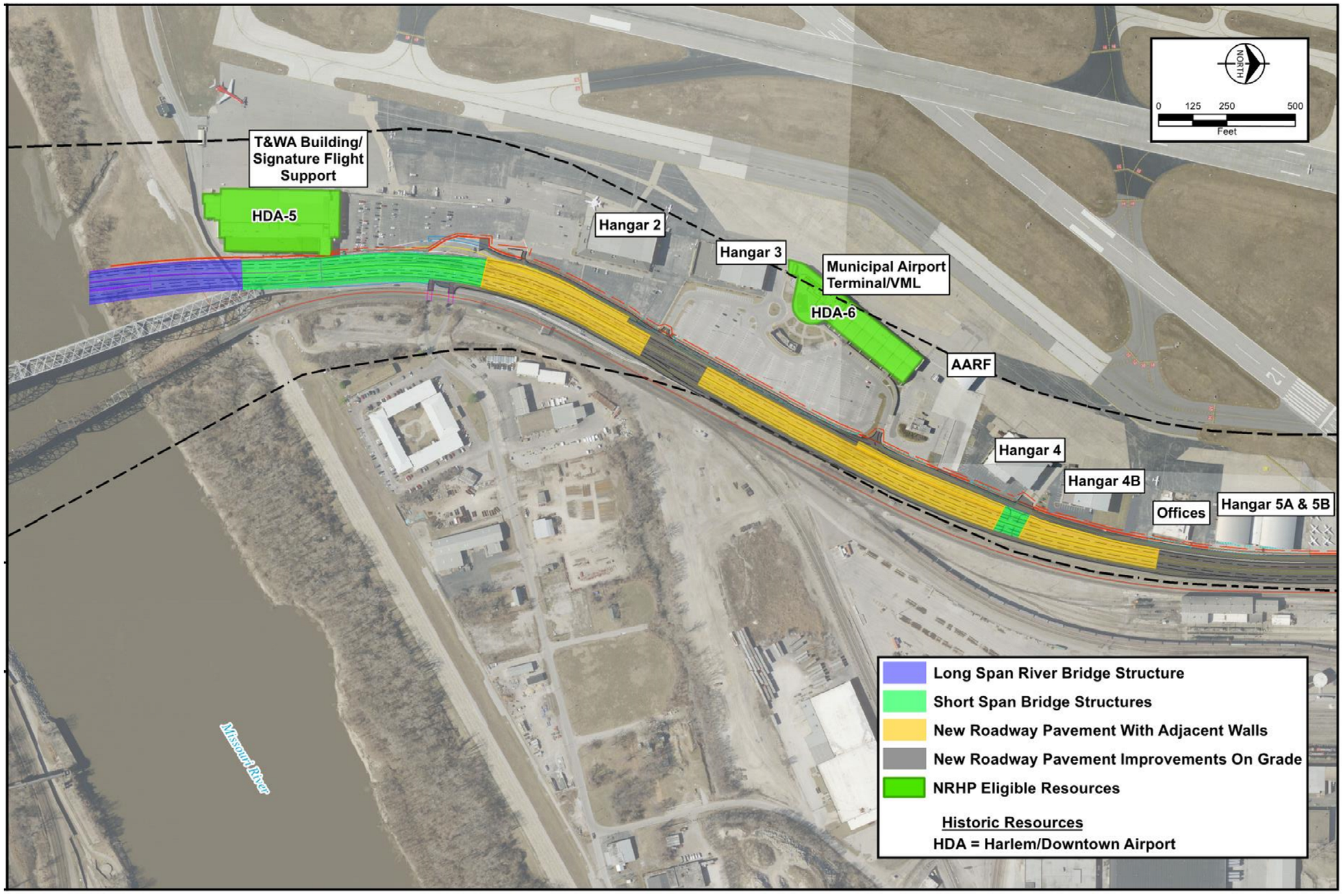
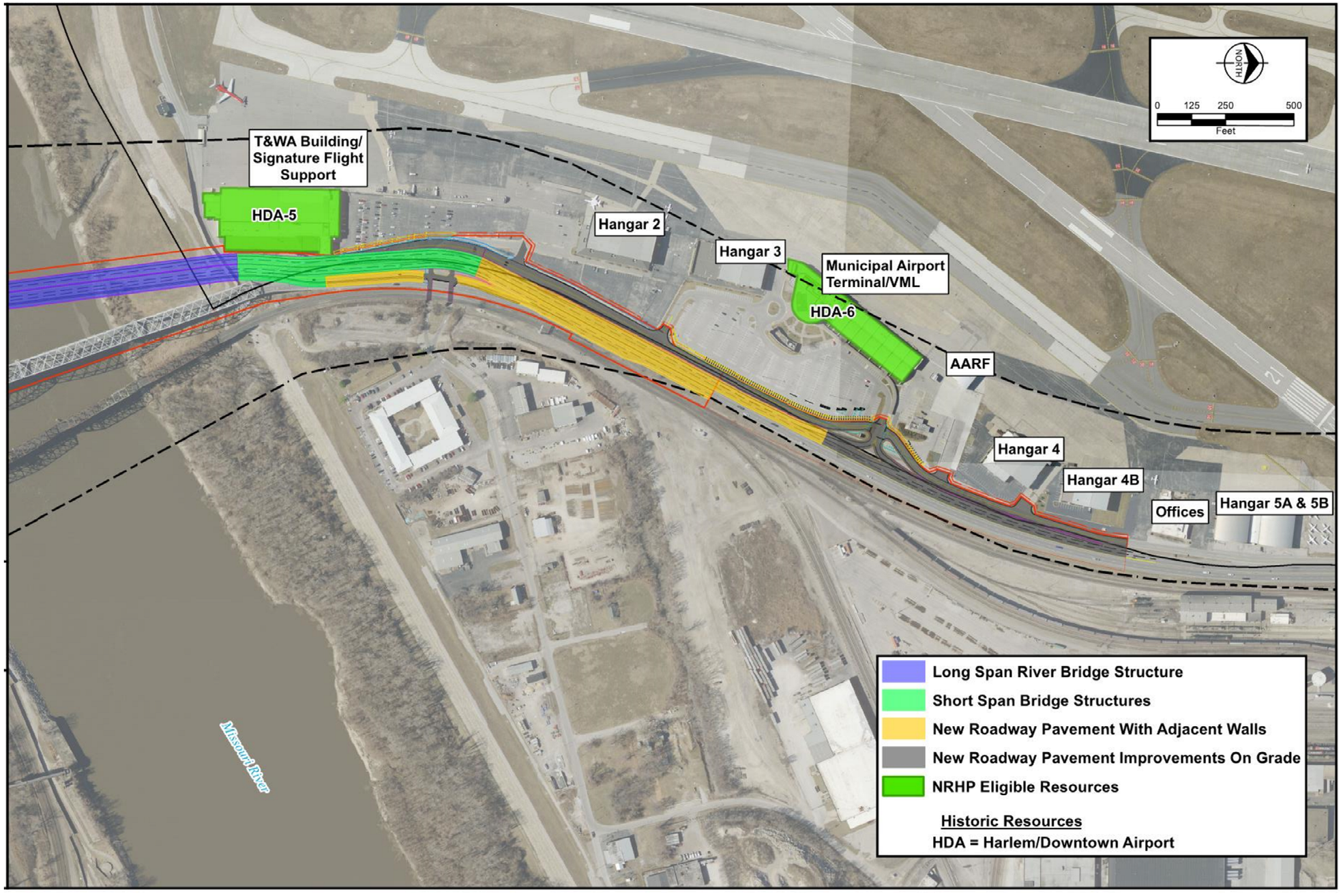


Figure 5-5: Central and South/Harlem Road Access Improvements – Selected Design Solution



path from the north end of the new river bridge, under US-169 at Harlem, and along Richards Road (Figure 5-5). The elevated US-169 spans over Harlem Road (MoDOT bridges A4647 and A4648) are in fair condition and the southbound US-169 bridge (MoDOT A4646) is in poor condition. All three structures would be replaced. The railroad spans over Harlem Road owned by BNSF would remain in place.

Improvements to the central access include construction of a longer deceleration lane for southbound access to MKC from US-169 and a longer acceleration lane for southbound access to US-169 from MKC. The deceleration/acceleration lanes would be added to the two southbound lanes of US-169. The location of the existing right-in/right-out access is shifted slightly to the south to improve the connection to Richards Road. This scheme was selected by KCAD because it minimized parking displacements and the amount of airport property to be released from airport use to highway right-of-way. Richards Road would remain barrier-separated from US-169 near the central access.

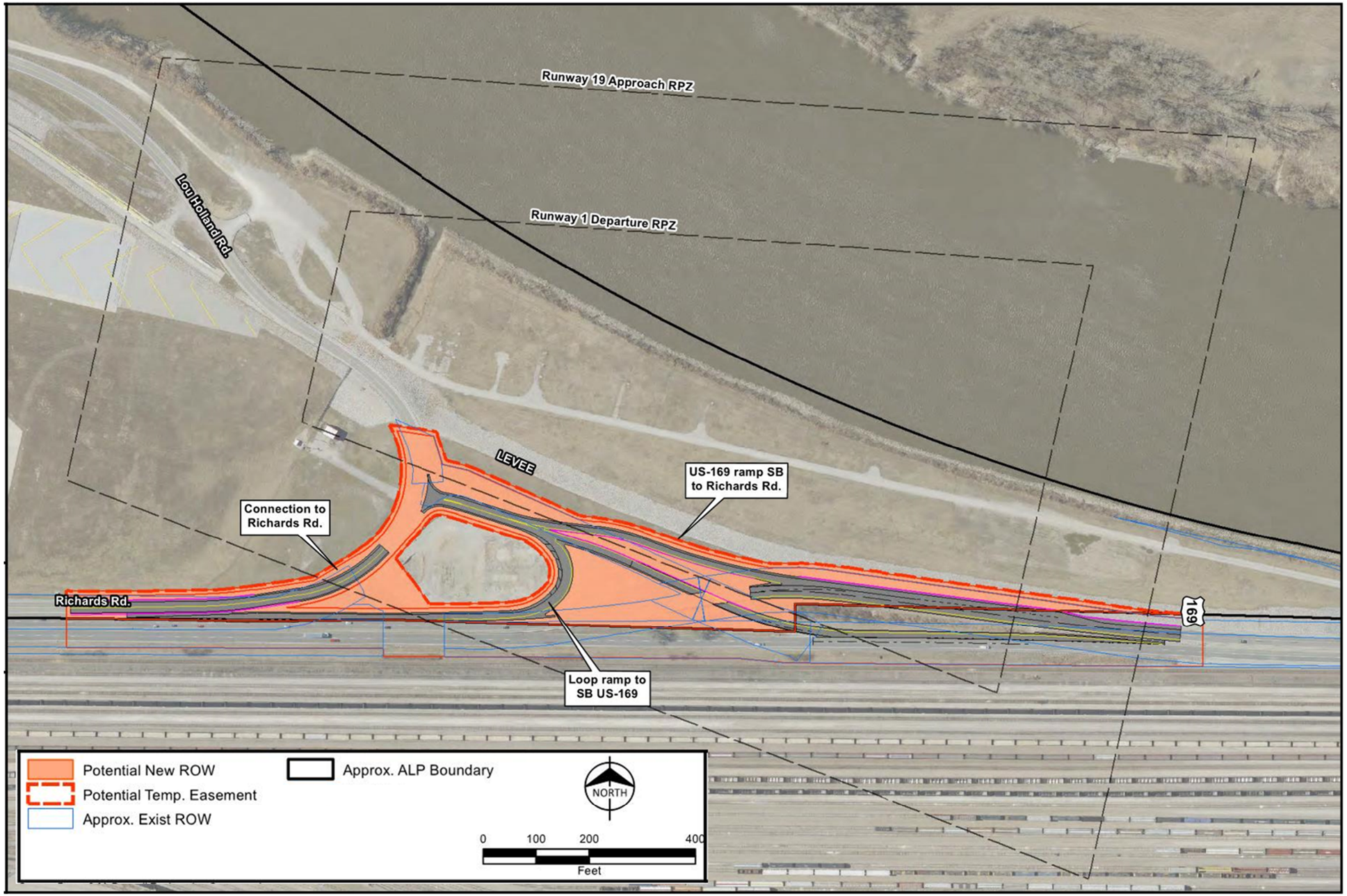
This option is carried forward as the selected design solution for the south/Harlem Road and central airport access points within the North Segment of the build alternatives under consideration.

5.3.2.2 Improvements at the North MKC Access

The north end of MKC is a highly constrained area, bounded on the west by a levee and on the east by US-169 and the BNSF railroad. At this location MKC is only accessible by southbound US-169 traffic via a ramp to the intersection of Richards Road and Lou Holland Road. Access northbound from MKC to northbound US-169 is provided by a ramp that travels under the southbound lanes of US-169. The bridge (MoDOT A4645) carrying US-169 southbound at this location is in relatively good condition and would not be replaced under this option. The proposed improvements carried forward for further study at the north access include relocation and lengthening of the existing southbound ramp from US-169 into the airport and construction of a new loop ramp to allow traffic from MKC to directly access southbound US-169 as shown in Figure 5-6. Richards Road would remain barrier separated from US-169.

This option is carried forward as the selected design solution for the north airport access point within the North Segment of the build alternatives under consideration.

Figure 5-6: Improvements at the North MKC Access - Selected Design Solution



5.4 Resources Not Affected on the Downtown Airport

The following resources are either not present on MKC or the permanent effects of the proposed improvements would be negligible. Temporary and short-term minor impacts would occur under some categories during construction.

Table 5-1: Resource Categories Where No Effects Would Occur

Resource Category	Analysis of Effect
Climate	Construction activity associated with the Proposed Action would result in increased fossil fuel combustion from the operation of vehicles and heavy equipment in the vicinity of MKC. Reductions in greenhouse gas emissions (GHG) can be achieved during construction by implementing practices such as engine idle time restrictions and properly maintaining equipment. At this time, the FAA has not established a significance threshold for GHG emissions.
Coastal Barriers, Coast Zones, and Wild and Scenic Rivers	There are no designated coastal zones, coastal management areas, or coastal barrier areas within the state of Missouri. The Missouri River is not classified as a national wild and scenic river.
Farmland	MKC is in an urban developed area that does not support agricultural uses, therefore coordination under the Farmland Protection Policy Act does not apply.
Noise and Compatible Land Use	No changes would occur in the airfield, approach/departure procedures, or the type and number of aircraft using MKC. No changes would occur in the current noise contour. The proposed access and transportation corridor improvements are compatible with land uses on and adjacent to MKC. Land would be released from airport uses to provide right-of-way for the proposed access and highway improvements, as described in Section 5.5.6.
Water Resources – Wetlands, Waters of the US, and Water Quality	No wetlands or waters of the US are located on-airport or within the area proposed for improvement. No fill would be placed with wetlands or waters considered jurisdictional under Section 404 of the Clean Water Act; therefore, no Section 404 permit, nationwide or individual. would be required. For improvements on MKC Improvements proposed on MKC would result in "no net loss" of wetlands in compliance with EO 11990, No drinking water intake wells are located on MKC. No Outstanding National Resource Waters or Exceptional State Waters are located on or adjacent to MKC. The Missouri River is included on the Section 303(d) list of impaired waters in Missouri, primarily due to levels of *E. coli* from multiple municipal point source and nonpoint source discharges. During construction BMPs would be implemented to manage stormwater runoff on-airport. No retainage of stormwater on-airport would be allowed to avoid attracting wildlife. Several monitoring wells are located at the north end of MKC associated with ongoing groundwater sampling for the former Airport Fuel Farm, discussed in Section 5.5.4.

5.5 Resources Present on MKC, Project Effects, and Mitigation

The following sections describe the features and resources present on-airport and the anticipated effects of the No-Build Alternative and implementation of the selected design solution within the North Segment of the three highway build alternatives under consideration.

Direct impacts, as defined by 40 CFR § 1508.8(a), CEQ Regulations, are caused by the Proposed Action and occur at the same time and place. Indirect impacts per 40 CFR § 1508.8(b) are caused by the Proposed Action and are later in time or farther removed in distance but are still reasonably foreseeable. Cumulative impacts per 40 CFR § 1508.7 are the impacts on the environment which results from the incremental impact of the Proposed 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 significant actions taking place over a period of time.

5.5.1 Air Quality

The Clean Air Act, including the 1990 Amendments, (CAA) provides for the establishment of standards and programs to evaluate, achieve, and maintain acceptable air quality in the United States. Under the CAA, the EPA established a set of NAAQS for six 'criteria' pollutants determined to be potentially harmful to human health and welfare. As described in Section 4.2.1, the six criteria pollutants include carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulfur dioxide, and lead. Clay County where MKC is located is in attainment for all criteria pollutants.5.5.1.1 No-Build Alternative

Clay County, where MKC is located, is in attainment area for all criteria pollutants. No changes in aircraft activity or fleet mix would occur at MKC under the No-Build Alternative. Ongoing operations at MKC would not affect ongoing attainment for the region.

5.5.1.2 Build Alternatives – North Segment

The Proposed Action is intended to reduce vehicular traffic congestion and improve travel times within the US-169 corridor adjacent to the airport and would not change aircraft activity or fleet mix at MKC. In the design year (2040) the build alternatives would reduce mobile source air toxics (MSAT) emissions in the vicinity of MKC by providing direct connections to regional roadways that would reduce congestion (see Section 4.2.1). Jackson and Clay Counties do not violate the NAAQS for ozone, carbon monoxide, particulate matter, and nitrogen dioxide. Therefore, the conformity requirements of 40 CFR Part 93 do not apply to this project. The Proposed Action would not cause pollutant concentrations to exceed one or more of the NAAQS for the time periods analyzed. Fugitive dust and equipment emissions would increase during construction, but these effects would be localized, short-term, and temporary. BMPs would be implemented during construction to reduce construction-related air quality issues.

Impacts to air quality are not anticipated to be significant.

5.5.2 Biological Resources

Both landside and airside areas of MKC are well kept, minimizing the colonization of areas by plant communities that could support resident and migratory wildlife. Limited riparian habitat is located along the Missouri River at the south end of the airport. MKC is in an area where three federally listed bat species could occur – Indiana bat, gray bat, and the northern long-eared bat. The federally listed pallid sturgeon is found within the Missouri River adjacent to MKC. No federally designated critical habitats have been identified within the study area. MKC also has a Wildlife Hazard Assessment/Management Plan (2011) to guide management of wildlife hazards on-airport.

5.5.2.1 No-Build Alternative

No changes in land cover or grounds maintenance practices would change at MKC.

5.5.2.2 Build Alternatives – North Segment

In addition to the limited riparian habitat along the Missouri River at the south end of MKC, lawn areas and landscaping are present that would potentially support migratory birds. The MBTA prohibits the take of migratory birds and their eggs, young, or active nests. Nest surveys would be conducted in areas where vegetation would be disturbed prior to initiating clearing or construction in compliance with the MBTA. If occupied nests are found, the vegetation would not be removed until the young fledge. Therefore, the Proposed Action is not likely to affect migratory birds. Implementation of the proposed improvements would not affect the ongoing management of wildlife hazards at MKC.

The BGEPA prohibits unauthorized take of bald or golden eagles. Bald eagles winter in Missouri and may roost in mature trees along the Missouri River. No nests have been recorded in the vicinity of MKC. No impacts to bald eagles are anticipated.

On October 9, 2019, areas of potential bat habitat within the anticipated footprint of the Proposed Action, including the riparian area at the south end of MKC, were reviewed by MoDOT biologists. No areas within the footprint of the Proposed Action were determined to contain suitable bat habitat. In consultation with USFWS, MoDOT has recommended that in-water construction related to the new river crossing (adjacent to MKC) may affect but is not likely to adversely affect the pallid sturgeon. Concurrence from USFWS on effects to the pallid sturgeon is pending (see Appendix C). USFWS also concurred with a no effect determination for all three bat species. Therefore, the Proposed Action will not jeopardize the continued existence of these species and would not destroy or modify federally designated critical habitat. No further consultation with the USFWS is required.

Impacts to biological resources are not anticipated to be significant.

5.5.3 Community Effects - Socioeconomics, Environmentla Justice, Title VI, Limited English Proficiency, Bicycle/Pedestrian Facilities, Children's Environmental Health and Safety Risks, and Emergency Services

5.5.3.1 No-Build Alternative

No construction or improvements would occur, so existing airport conditions would remain.

5.5.3.2 Build Alternatives – North Segment

Socioeconomics –MKC serves as a major economic hub for Kansas City and the region. FBOs service based, itinerant, and charter aircraft, offering fuel, full maintenance, aircraft rentals and sales, and flight training. None of the businesses on-airport would be displaced or relocated. Off-airport businesses supporting the airport as well as airport employees and users would experience improved access to the airport once the proposed improvements are completed. No jobs at MKC would be displaced by the project and no substantial change would occur in the community tax base.

Environmental Justice, Title VI, and Limited English Proficiency - No low-income, minority, disabled, elderly populations, or persons with LEP reside on-airport, therefore, no further assessment is warranted under EOs 12898 and 13166, and Title VI of the Civil Rights Act of 1964.

Bicycle/Pedestrian Facilities – No established bicycle or pedestrian facilities are designated on or adjacent to MKC. Although neither MARC nor KCMO have designated Richards Road as part of an official bicycle/pedestrian trail system, the facility is used by numerous people every day for biking and walking/running. To maintain connectivity with downtown Kansas City, a designated bicycle/pedestrian shared use path would be constructed across the new river crossing and along US-169 to the south/Harlem Road airport access, then under improved US-169 to relocated Richards Road, then south along Richards Road terminating near the central airport access. While bicycle and pedestrian access to the airport is a worthwhile goal, bicycle and pedestrian paths on-airport property should be subordinate to the mission of the airport, in case the airport would need to reconfigure their constrained airside footprint and displace the bicycle and pedestrian paths to accommodate aeronautical needs.

Children's Environmental Health and Safety Risks – No schools, daycare facilities, health care, facilities, or churches are located on airport; therefore, no disproportionate health or safety risks would be posed on children.

Emergency Services - The ARFF would not be affected. Improvements at the central access would accommodate emergency equipment ingress/egress at MKC and access would be maintained during all phases of construction.

5.5.4 Floodplains and Floodways

MKC is protected from the Missouri River by a flood control levee maintained by KCMO. The 100-year FEMA floodplain is mapped on the riverward side of the levee and does not encroach onto the airport. The USACE inspects the levee systems annually and provides technical support when requested by the levee sponsor. The KCMO Water Service Department manages the water intake plant north of MKC near the intersection of US-

169 and MO-9. Except for the limited riparian habitat present at the south end of the airport, the area riverward of the levee is relatively void of riparian vegetation.

5.5.4.1 No-Build Alternative

No changes to the levee or levee maintenance would occur.

5.5.4.2 Build Alternatives – North Segment

The improvements proposed at the North Access would not encroach into the floodplain. At the North Access, the alignment of the southbound ramp from US-169 to Richards Road/Lou Holland Drive would be shifted towards the landward area of the levee to lengthen the stopping distance. The placement of fill and construction of new pavement in this area is needed to accommodate the roadway shift. Continued coordination among MoDOT, FAA, KCAD, USACE, and KCMO will be conducted to identify appropriate design standards and address any potential impacts to the levee system during the design-build process. The proposed improvements at the airport would not cause a notable adverse effect on natural or beneficial floodplain values.

Impacts to floodplains and floodways are not anticipated to be significant.

5.5.5 Hazardous Materials, Solid Wastes, and Pollution Prevention

Several above-ground fuel storage tanks are associated with the airfield. Several of the FBOs store a variety of petroleum products, lubricants, surface and aircraft deicing compounds, batteries, paints, and solvents used in aircraft maintenance. Commercial disposal companies are contracted by KCAD and individual businesses to collect and dispose of solid wastes, used oil, and other wastes at off-site licensed disposal facilities.

The former Airport Fuel Farm, located at the north end of MKC between the levee and US-169 in the vicinity of the North Access, was previously leased from KCAD by Executive Beechcraft. The above-ground storage tanks associated with this site were removed in 2012. A preliminary site assessment initiated in 1995 revealed evidence of elevated concentrations of petroleum hydrocarbons in groundwater sample, later identified as jet fuel. In 1996 the MDNR indicated the site would not be regulated by the Leaking Underground Storage Tank (LUST) Unit within MDNR because no discernable evidence of a UST release was documented. Although the site may have been eligible for entry into the Voluntary Cleanup Program (VCP) of MDNR, participation in the VCP was not mandatory and was not pursued. MDNR also indicated that cleanup of contamination at the site was mandated by Missouri Revised Statute 260.500-550 and recommended the initiation of free phase hydrocarbon (FPH) recovery as soon as possible. (Appendix E).

KCAD installed 12 groundwater monitoring wells within the site and conducted annual monitoring events from 2003 through 2011. Quarterly sampling occurred from 2014 through November 2015. At the time sampling was completed in 2015, no FPH was present in any of the monitoring wells. KCAD continues to maintain the monitoring well network on the site; except for monitoring well #4 which was previously damaged and since abandoned in accordance with MDNR Well Construction Rules.

5.5.5.1 No-Build Alternative

No changes in existing airport and aircraft operations would occur. Generated wastes would continue to be collected and disposed of at licensed waste facilities. No changes would occur at the North Access and no impacts would occur to the existing monitoring well system.

5.5.5.2 Build Alternatives – North Segment

Hazardous Materials and Solid Waste - None of the airport operations or FBO support services or facilities would be affected. The design-build contractor will provide all necessary information for the disposal of construction wastes to the appropriate landfill operator, including any required testing of materials and completion of forms required by the MDNR. Construction debris could be disposed of at the Johnson County Municipal Solid Waste Landfill located at Holiday Drive and I-435 in Shawnee, Kansas, or at other

construction/demolition landfill facilities located across the metropolitan area, including the Olathe Construction/Demolition Landfill (APAC Kansas, Inc.) at 159th Street and I-35 in Johnson County, Kansas. At this time, it is anticipated that these facilities have the available capacity to accommodate the anticipated waste stream. Construction activities may uncover contaminated soils or other unrecorded and buried wastes that need to be disposed of in accordance with applicable Federal regulations. Construction activities can also generate hazardous materials in the form of diesel fuels, oils, and lubricants used in the maintenance and operation of construction equipment. All fuels and materials would be stored according to local and State regulations. Industry-accepted BMPs would be implemented during construction to minimize spills and other unauthorized releases of hazardous materials.

The monitoring well locations would be surveyed and considered in the ongoing design development. Coordination among MoDOT, KCAD, KCMO, and MDNR is required if the wells cannot be avoided. Proposed changes in grade in the vicinity of the wells may require that the flush-mount well completion be raised or lowered accordingly.

Pollution Prevention - Construction activities would result in short-term and temporary effects on surface water quality by increasing the amount of suspended sediments in runoff flowing to receiving waters. Contractors would be responsible for obtaining all land disturbance and construction-related stormwater discharge permits. Stormwater discharges associated with disturbances in exceedance of one acre would require authorization under the Missouri State Operating Permit for Construction or Land Disturbance Activities, effective February 8, 2017; under the NPDES permitting program administered by the MDNR. Preparation of a SWPPP indicating the BMPs (e.g., silt fencing, silt socks, erosion control blankets, hay bales, etc.) to be implemented to manage stormwater discharges will be developed in association with obtaining the NPDES authorization.

The Proposed Action would not violate applicable Federal, State, tribal, or local regulations regarding hazardous materials or solid waste management; nor would it produce appreciably different types of hazardous or solid wastes or quantities that would exceed local disposal capacity. The Proposed Action would not adversely affect human health and the environment. Impacts to hazardous materials, solid wastes, and pollution prevention are not anticipated to be significant.

5.5.6 Historical, Architectural, Archaeological, and Cultural Resources

MoDOT, on behalf of the FHWA, initiated consultation under Section 106 of the NHPA for the Proposed Action in October 2018. An APE was defined for direct effects along US-169 between MO-9 on the north to 12th Street and I-35 on the south that included potential new right-of-way and permanent and temporary easements. The APE will be further defined as the footprint for the Preferred Alternative is further developed during the Design-Build process. Input from consulting parties indicated that Kansas City is not river-focused and that views toward the river are not generally significant. Therefore, an additional APE for views to and from the river was not developed. (see Section 4.2.8 and Appendix F). A portion of MKC adjacent to US-169 is included in the APE.

Archaeological Resources – A previous archaeological survey (HA-25, Appendix F) was conducted along the eastern edge of MKC in 1998 associated with installation of a telecommunications line; nothing of significance was recorded. North of the river, there is a potential for deeply buried historic-age archaeological resources west of the town of Harlem (vicinity of US-169 and MKC). These deposits could be underlain by prehistoric resources.

Historic-age Maritime Resources - As many as eight steamboat wrecks have been documented along the stretch of the Missouri River that forms the airport's western and southern boundaries (Figure AA-3 in Appendix F). It is possible that these areas could contain the remnants of those or other undocumented wrecks. One is 'mapped' near the southern edge of the airport.

Architectural Resources – A total of 118 architectural resources were documented within the architectural APE for the Proposed Action. Two resources on MKC were recommended as NRHP-eligible - the T&WA Building,

resource number HDA-5 (now Signature Flight Support), and the former Municipal Airport Terminal Facility, resource number HDA-6 (now referred to as VML). The Missouri SHPO concurred with these NRHP eligibility determinations on October 4, 2019 (see Appendix F). Both resources are NRHP-eligible under Criterion A in the area of Transportation.

Tribal/Cultural Resources – The Miami Tribe of Oklahoma has requested to consult under Section 106 (November 14, 2018). No specific sites have been identified. The proposed airport access locations are entirely within airport property and existing highway rights-of-way and would not significantly or uniquely affect tribal lands or their traditional cultural properties. Therefore, the Proposed Action is not anticipated to adversely affect any known tribal archaeological, historical, or sacred sites.

5.5.6.1 No-Build Alternative

Neither NRHP-eligible resource at MKC would be affected. As each is privately owned, future alterations to either building could occur. The Buck O'Neil Bridge and Harlem Road Overpass would not be removed.

5.5.6.2 Build Alternatives – North Segment

Both NRHP-eligible resources (the T&WA Building/Signature Flight Support {HDA-5] and the Municipal Terminal Building/VML [HDA-6]) would lose parking due to the proposed alignment shift of Richards Road and changes in the layout of the main airport access. Both resources would be subject to noise, vibration, fugitive dust, and temporary modifications in access and parking layout that would occur during construction. These effects would be temporary and short-term. No direct physical effects would occur to either resource. Based on this assessment, a recommendation of No Adverse Effect was made for both resources on December 30, 2019. The Missouri SHPO concurred with the No Adverse Effect determination for these two airport resources on January 27, 2020 (Appendix F). Options under consideration for the alignment of the new bridge crossing over the Missouri River would place the new bridge structure closer to the T&WA Building/Signature Flight Support than the existing bridge. Direct effects to the T&WA building will be avoided.

Removal of the Buck O'Neil Bridge (OT-20) and the Harlem Road Overpass (HDA-1), both determined NRHP-eligible and adjacent to the airport, would result in an adverse effect under Section 106. Adverse effects under Section 106 will be resolved through the execution and fulfillment of a PA. The PA addresses adverse effects by defining mitigation measures for known effects as well as potential post-review discoveries. The ACHP, FHWA, Missouri SHPO, and the Missouri Highways and Transportation Commission are signatories to the PA.

Impacts to historical, architectural, archaeological, and cultural resources are not anticipated to be significant.

5.5.7 Department of Transportation Act, Section 4(f)

Section 4(f) of the DOT Act of 1966 was designed to preserve the natural beauty of the countryside, public park and recreation lands, wildlife and waterfowl refuges, and historic sites. A Section 4(f) eligible property must be publicly owned, except for historic sites, which could be either public or privately owned. Federally-funded DOT actions cannot use Section 4(f) properties unless no feasible and prudent alternative exists to such use and the project includes all possible planning to minimize harm.

Two historic resources on-airport - the T&WA Building/Signature Flight Support (HDA-5) and the Municipal Airport Terminal/VML (HDA-6) – qualify for protection under Section 4(f). Two additional resources adjacent to the airport – the Buck O'Neil Bridge (OT-20) and its companion approach structure, the Harlem Road Overpass (HDA-1) – also qualify for protection under Section 4(f) (see Section 4.2.8).

5.5.7.1 No-Build Alternative

No changes to the airport accesses or construction along US-169 would occur that would result in a use of resources protected under Section 4(f) of the DOT Act.

5.5.7.2 Build Alternatives – North Segment

The T&WA Building/Signature Flight Support and the Municipal Airport Terminal/VML are both located within the terminal area west of US-169 and Richards Road. Although right-of-way is needed from the airport to improve US-169, relocate Richards Road, and improve the airport accesses, use of the airport property for transportation purposes will not adversely affect the activities, features, and attributes that make the T&WA Building/Signature Flight Support and the Municipal Airport Terminal/VML eligible for protection under Section 4(f).

FHWA and FAA anticipate a determination of *de minimis* impacts for the T&WA Building/Signature Flight Support and the Municipal Airport Terminal/VML because a minimal amount of property would be acquired from the airport but the Proposed Action would not physically affect either resource. This determination has been made based on satisfaction of the following criteria:

- The Section 106 process resulted in the determination of "No Adverse Effect" with the concurrence of the Missouri SHPO received January 27, 2020;
- The SHPO and ACHP participated in the Section 106 consultation and have been informed of FHWA's/FAA's intent to make a *de minimis* impact determination based on their written concurrence in the Section 106 determination; and
- FHWA has considered the views of any consulting parties in the Section 106 consultation. The PA for the project was developed in consideration of input received from the consulting parties.

The proposed improvements require removal of the Buck O'Neil Bridge and the Harlem Road Overpass resulting in a 'use' of these resources under Section 4(f). The FHWA Programmatic Section 4(f) for Use of Historic Bridges is being applied for removal of these two structures adjacent to MKC.

5.5.8 Land Use (Existing and Planned), Right-of-Way, and Displacements

MKC, located in Kansas City, Clay County, Missouri, is comprised of airside and landside areas that support various aviation-related activities. The Missouri River bounds the airport on the north, west, and south while the US-169 corridor bounds it on the east. A flood control levee operated by KCMO separates MKC from the river. No schools, churches, residences, hospitals, or parks are located on or adjacent to the airport. No changes in future land uses are proposed on or adjacent to MKC.

5.5.8.1 No-Build Alternative

No changes in existing or planned land uses would occur. No right-of-way improvements would be made requiring the release of airport property from airport uses. No buildings, businesses, fixed based operators, other service providers, or on-airport improvements would be displaced.

5.5.8.2 Build Alternatives – North Segment

Construction of the new river crossing would be in proximity to imaginary surfaces associated with the approach and departure surfaces at the runway ends (see Figure 5-7). Airspace is governed by 14 CFR Part 77 and Terminal Instrument Procedures (TERPS), and obstacles would not be constructed that will negatively impact visual and instrument flight procedures to the runway ends. Coordination during the design-build process will continue to evaluate and resolve potential obstructions and to complete review of a Form 7460 request regarding any construction or alteration that might affect navigable airspace, including permanent bridge structures, signage and lighting, and temporary construction activities and equipment use.

Figure 5-7: Airspace Imaginary Surfaces at the south end of MKC Showing All Build Alternatives – West, Central, and Adjacent

The North Access is located within the runway protection zone (RPZ) for approaches to Runway 19 and the RPZ for departures from Runway 1. The function of the RPZ is to protect people and property on the ground. When feasible, roadways should be located outside of an RPZ. Given the constraints of the Missouri River and the BNSF railyard at the North Access, it is not practicable to relocate the subject roadways out of the RPZ. With the proposed improvements, the vertical profile of US-169 would not change in this location. The profile of the southbound ramp from US-169 towards Richards Road/Lou Holland Drive would change slightly as the ramp is shifted towards the landside area of the levee to add length and improve stopping distances for exiting vehicles. The new loop ramp providing access to southbound US-169 and the improved ramp to southbound Richards Road would be completed on fill. Coordination among MoDOT, FAA, KCAD, and KCMO is required during the ongoing design development process to minimize safety area encroachments and vertical obstructions with the RPZ in accordance with FAA Advisory Circular 150/5300-13, *Airport Design*.

No residences, schools, places of worship, hospitals, or public facilities are present on-airport; no displacements would occur.

Impacts to existing and planned land uses are not anticipated to be significant.

Several vehicle parking areas exist within the landside area of MKC associated with the former terminal/VML and most hangars and other support services. Table 5-2 summarizes the number of available parking spaces and those displaced both temporarily to accommodate construction activities and permanently once construction is complete.

Table 5-2: Summary of Permanent Parking and Perimeter Fence Displacements

Airport Building	Number of Existing Parking Stalls	Number of Parking Stalls Removed		Area of Parking Pavement Removed (SF)	Length of Perimeter Fence Relocated (LF)	Length of Guardrail Relocated (LF)[a]
		Temp	Perm			
Signature Flight Support, Hangar 2, & TWA Museum	288	39	25	10,586	0	0
Hangar 3	89			0	0	0
VML	580	115	20	8,046	0	0
ARFF	93	28	19	6,906		97
Hangar 4	63			0	161	266
Hangar 4B	22			0	389	254
Offices (KCAD)	88			0		0
Hangars 5A & 5B	23			0	0	0
Totals	**1,246**	**182**	**64**	**25,538**	**550**	**617**

[a] areas of guardrail along the western edge of Richards Road
Source: Burns & McDonnell, 2019

No-Buildings, businesses, fixed based operators, or other service providers would be displaced.

Based on the level of preliminary engineering competed to date for the selected design solutions shown in Figure 5-5 and Figure 5-6, approximately 11.3 acres of permanent right-of-way and approximately 13 acres of temporary easement would be needed from MKC to accommodate the proposed improvements.[15] As the design-build process progresses, these estimates would be further refined based on design changes. The location and design of security fencing and guardrail to be replaced will be coordinated among MoDOT, KCMO, KCAD, and FAA. The information contained in this disclosure document and the follow-on environmental decision documents issued by FHWA and FAA will be used to support a Federal land release required to release land currently used for airport operations to highway right-of-way for the purpose of this highway

[15] Based on Exhibit A – Airport Property Map (January 2009) for the Charles B. Wheeler Downtown Airport

improvement project. The land release is required in compliance FAA Order 5190.6B, *FAA Airport Compliance Manual*.[16]

Right-of-way impacts and displacements are not anticipated to be significant.

5.5.9 Natural Resources and Energy Supply

Several utilities are located within and along US-169 that serve MKC. The power supply for the airport facility is located underneath the existing Buck O'Neil Bridge near Richards Road. Fiber-optic lines connecting MKC and Kansas City International Airport also cross the study area.

5.5.9.1 No-Build Alternative

Current aviation operations and maintenance activities would be maintained at MKC. No notable increases in the use of fossil fuels, other energy sources, or additional natural resources would be anticipated with continued operations at MKC.

5.5.9.2 Build Alternatives – North Segment

Various materials (e.g., wood, concrete, asphalt, sand/aggregate, steel, aluminum, polyvinyl chloride (PVC), glass, wire, fuels, etc.) would be used to construct the proposed improvements. These materials are readily available in the region and can be transported to the site by various means. Existing utilities (e.g., water, natural gas, electricity, fiber optic, etc.) located in or near the construction areas would be relocated before construction would proceed. Construction activity would increase the energy demand in comparison to the levels consumed under the No-Build Alternative but would not create an energy supply shortage. Extensive coordination is required among all project partners including utility providers during design development and construction to maintain utility service to MKC.

Impacts to natural resources and energy supply are not anticipated to be significant.

5.5.10 Visual Effects and Light Emissions

In accordance with FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*, the sponsor of an airport development project shall "consider the extent to which any lighting associated with an airport action will create an annoyance among people in the vicinity of the installation." It is also prudent to consider whether lighting associated with a proposed project might confuse or interfere with the vision of the air traffic controller's directing aircraft for arrival at an airport, or the vision of the pilots on approach to an airport runway.

5.5.10.1 No-Build Alternative

No changes would occur to the US-169 corridor adjacent to MKC. The airport would remain developed as it is today, accommodating both landside and airside activities. No changing in existing lighting (parking, building, airfield, approach) would occur.

5.5.10.2 Build Alternatives – North Segment

MKC sits on a relatively flat floodplain along the Missouri River just north of downtown KCMO. The visual character of MKC would not change with implementation of the proposed improvements. New retaining walls would be constructed near the south end of MKC to support the new river crossing and the interchange improvements at the south/Harlem and central airport access points. Along US-169 and relocated Richards Road and within landside parking areas, lighting type and location would be determined during the design-build process in coordination with KCAD and FAA to ensure that any proposed lighting does not interfere with airport or aircraft operations. Lighting and signage associated with the Proposed Action would not affect the visual character of the area nor would it obstruct views of important resources, landmarks, or entrances on-airport. No changes would be made to existing airfield or approach lighting systems. Improvement at the North Access

[16] FAA Order 5190.6B, FAA Airport Compliance Manual, Chapter 22, FAA; September 30, 2009.

would occur landward of the levee and would not affect the runway approach lights, the Runway 1 localizer antenna, or encroach into the localizer critical area. Lighting on the new river bridge and associated with off-airport improvements under the Proposed Action would be coordinated with FAA during the design-build process.

Visual effects and light emissions are not anticipated to be significant.

5.6 Effects and Mitigation Summary

This chapter has presented the potential effects of the proposed improvements on airport property. No significant adverse effects (short or long term) are expected on airport resources from construction or operation of the Proposed Action. Table 5-3 summarizes the anticipated effects and any required mitigation.

Table 5-3: Summary of Effects at MKC and Required Mitigation

Resource Category	Build alternatives (all provide the same improvements)		No-Build Alternative	
	Impacts	Mitigation Required	Impact	Mitigation Required
Air Quality	No impact	None required	None	None
Biological Resources	Project impacts not anticipated to be significant.	None required	None	None
Climate	No impact	None required	None	None
Coastal Resources	None present	None required	None	None
Community Effects - Socioeconomics, EJ, Title VI, LEP, Bicycle/Pedestrian Facilities, Children's Environmental Health and Safety Risks, and Emergency Services	None present	None required	None	None
Department of Transportation Act, Section 4(f)	*De minimis* impacts to the two NRHP-eligible resources located on-airport; neither would be directly affected	None required	None	None
Farmland	Not applicable	None required	None	None
Hazardous Materials, Solid Wastes, and Pollution Prevention	Project impacts not anticipated to be significant.	Former Airport Fuel Farm – avoid existing monitoring wells within North Access area	None	None
Historical, Architectural, Archaeological, and Cultural Resources	Two NRHP-eligible resources are located on-airport; neither would be directly affected; No Adverse Effect determination under Section 106	Minimize indirect and temporary effects of construction activities. Implement PA with FHWA, ACHP, MoDOT, and SHPO	None	None
Land Use, Right-of-Way, and Displacements	Project impacts not anticipated to be significant.	Coordination w/KCAD and FAA required to minimize elevation increases within the Runway 1 departure RPZ and the Runway 19 approach RPZ. The function of the RPZ is to protect people and property on the ground, which is why it is desirable to clear the RPZ. The airspace is governed by 14 CFR Part 77 and TERPS, and obstacles should not be constructed that will negatively impact visual and instrument flight procedures to the runway ends, e.g., both approach and departure airspace surfaces.	None	None
Natural Resources and Energy Supply	Increase in use of construction materials, utility use (gas, water, electricity); not significant	On-airport utilities will be relocated as needed to accommodate the proposed improvements.	None	None
Noise and Compatible Land Use	No impact	None required	None	None
Visual Effects and Light Emissions	Project impacts not anticipated to be significant.	Shielded or low-intensity lighting to be used in parking lots, and roadways to avoid effects on air traffic controllers and pilots approaching airport.	None	None
Water Resources	No surface waters or wetlands present. Stormwater management during construction.	Contractor to obtain NPDES permit and implement SWPPP during construction	None	None

5.7 Cumulative Impact Analysis

The Council on Environmental Quality defines cumulative impacts (40 CFR 1508.7) 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* . Section 4.2.15.2 summarizes the anticipated cumulative effects of the Proposed Action when considered in combination several past, current, and reasonably foreseeable future action within the study area used for the previous PEL. The PEL study area, larger than the study area defined for this project, was used to determine the geographic scope of cumulative effects in support of the local and regional connectivity the Proposed Action would provide. The timeframe for cumulative effects is the planning horizon of 2040.

The limited area affected by the improvements proposed at MKC limits the scope and magnitude of both direct and related cumulative effects that could occur on-airport.

6.0 Comments and Coordination

The US-169/Buck O'Neil Bridge environmental study was initiated by FHWA, MoDOT, and KCMO in August 2018. Both NEPA and the Fixing America's Surface Transportation Act (FAST Act) require opportunities for the public as well as Federal, State, and local governmental agencies to comment and provide information about proposed Federal-aid projects.

6.1 Major Coordination Milestones

The following major coordination milestones were achieved during this environmental study. These efforts engaged agency representatives, stakeholders, and the public by sharing project information and providing a platform for them to provide input into the decision-making process (Table 6-1).

Table 6-1 Major Coordination Milestones

August 20, 2018	MoDOT issued Notice to Proceed for the Environmental Study
September 12, 2018	Agency Scoping Letter Distribution
September 18, 2018	Tribal notifications and invitations to participate in Section 106 consultation
September 25, 2018	Press Release published to initiate environmental study
October 1, 2018	Agency Scoping Meeting
October 16, 2018	Cooperating Agency invitations extended to FAA, USACE, and USCG
November 8, 2018	MoDOT extended invitations to potential Section 106 Consulting Parties
November 20, 2018	USCG accepts Cooperating Agency Invitation
December 20, 2018	USACE accepts Cooperating Agency Invitation
February 12, 2019	Public Meeting #1 -Open House – Needs and Options Considered from the PEL
March 27, 2019	MoDOT/KCMO presentation to Greater Kansas City Chamber of Commerce
March 29, 2019	MoDOT/KCMO identified 3 Build Alternatives for detailed study
April 19, 2019	Initial Coordination Meeting with KCAD and FAA (Charles B. Wheeler Downtown Airport)
April 25, 2019	MoDOT/KCMO presentation to Kansas City Parks & Recreation Department Development Review Committee
May 14, 2019	ACHP invited to participate in Section 106 Consultation
May 30, 2019	ACHP accepted invitation to consult under Section 106
June 10, 2019	Section 106 Consulting Parties Meeting #1 – Process Overview and Purpose & Need
August 5, 2019	MoDOT/KCMO presentation to Northland Chamber
August 8, 2019	Section 106 Consulting Parties Meeting #2 – Alternatives Under Consideration and Historic Resource Eligibility
August 15-September 3, 2019	Public Meeting #2 - On-Line - Reasonable Alternatives
August 27, 2019	Section 106 Consulting Parties Meeting #3 – Preliminary Effects Assessment and Mitigation Brainstorming
August 28, 2019	Discussion of Build Alternatives Effects on Airport Property
August 29, 2019	MoDOT/KCMO presentation to Kansas City Parks & Recreation Department Development Review Committee
September 4, 2019	MoDOT/KCMO presentation to Kansas City River Trails, Inc.
November 11, 2019	KCMO presentation to Historical West Bottoms Association
November 14, 2019	FAA accepts Cooperating Agency Invitation
November 19, 2019	Section 106 Programmatic Agreement Resolution Meeting – FHWA, MoDOT, SHPO
February/March 2020	Public Hearing (anticipated)

6.1.1 Initiation of the Study Process and Agency Scoping

MoDOT issued a press release on September 25, 2018, announcing the beginning of the US-169/Buck O'Neil Bridge Crossing of the Missouri River Environmental Study. The press release noted the study would build on information compiled during the PEL to further evaluate options to improve or possibly replace the US--169 crossing. The press release is included in Appendix J.

An agency scoping meeting was held at MARC on October 1, 2018. Ten agencies were represented at the meeting. The presentation described the transition of the study from PEL to the NEPA process, outlined the study area, and described the issues associated with the existing US-169 crossing of the Missouri River. An overview of the purpose and need was presented along with the initial alternatives being carried forward from the PEL. Copies of the agency scoping presentation and sign-in sheets are included in Appendix A.

6.1.2 Public Information Meetings

Two public meetings were held during the study process:

Public Meeting #1 – Open House to Review the Needs and Options Considered from the PEL

The public open house meeting was conducted at MARC on February 12, 2019 (the meeting date was moved from February 7, 2019, due to inclement weather). The open house session was held from 4PM to 6PM and provided the public and other interested parties with a forum to understand the transportation needs identified in the study area and the process underway to develop and screen alternatives; explore the areas under consideration for improvement; discuss potential effects on properties and access to the local and regional roadway system; and obtain information regarding the historic Buck O'Neil Bridge and steps being taken during the study to comply with Section 106 and Section 4(f) processes. Forty-six people signed in at the open house. Attendees were asked to complete a survey either on paper or via a weblink. A total of 249 responses were received to the survey. Based on the information provided at the open house and the responses received to the survey, the public:

- Highly prefers direct connections from US-169 to I-35 and from US-169 to downtown. When asked "On a scale of 1 to 10, do you prefer a direct connection to I-35?" (10 being a high preference), nearly 70 percent of all respondents indicated an 8, 9 or 10. More than 55 percent of the responses indicated the same preference for a direct connection to downtown. As a result, all three initial Build Alternatives included direct connect ramps to I-35 and downtown Kansas City. An option without direct connect ramps to I-35 was retained for further evaluation as an option under the Adjacent Alternative.
- Supports removal of the existing Buck O'Neil Bridge. 35 percent of respondents indicated a strong preference to remove the existing bridge while 23 percent of respondents preferred to keep the existing bridge. The remaining 42 percent fell between these two preferences indicating less concern with either removing or keeping the bridge. The build alternatives include removal of the existing Buck O'Neil Bridge. MoDOT advertised the bridge for adaptive reuse allowing an organization to take and use a portion of the bridge or the entire bridge for another purpose. No groups or individuals have stepped forward.
- Very supportive of bicycle/pedestrian accommodations being included as part of the new river crossing. When asked "On a scale of 1 to 10, how supportive are you of bicycle and pedestrian accommodations?" (10 being very supportive), more than 70 percent% of responses indicated an 8, 9 or 10. In addition, many of the written comments included references to the need for these accommodations. MoDOT intends to provide a barrier-separated shared use path on the new river crossing connecting users on both sides of the river.

Input received during the open house was considered in the ongoing refinement of alternatives to address the stated transportation needs. Copies of the sign-in sheets, displays, survey, and the survey results are included in Appendix J.

Public Meeting #2 – Online Meeting to Present the Reasonable Alternatives

An online public meeting was conducted from August 15, 2019 through September 3, 2019, to share information on the reasonable alternatives under consideration. The presentation was voice narrated and reinforced the transportation needs previously identified, outlined the screening process used to identify the reasonable alternatives, and described in detail the intent of the three reasonable (build) alternatives (West, Central, and Adjacent with three options) and the No Build Alternative for comparison. The next steps in the study process were also described. A total of 1,072 responses were received to the online survey that accompanied the online public meeting. The displays, script of the narration, and survey results are included in Appendix J.

The responses confirmed that most respondents thought a direct connection to I-35 from US-169 was very important. Other responses indicated:

- The West and Central Alternatives met most respondent's transportation needs – these alternatives were carried forward for detailed study.
- The Adjacent Alternative did not most of respondent's transportation needs; especially Option 1 which did not provide direct connections to I-35 – MoDOT eliminated Options 1 and 2 under the Adjacent Alternative from further consideration following the meeting. Adjacent Alternative Option 3 that provided direct connections to I-35 was carried forward for detailed study.
- Respondents would like to see the view from West Terrace and Ermine Case Jr. Parks protected – 30 percent of respondents indicated no preference regarding views, but a larger number of respondents indicated the importance of protecting the views. Right-of-way potentially needed from the parks will be minimized to the extent practical as the final project design is developed.

Survey responses were provided from a wide range of zip codes across a multi-county region (map provided in Appendix J). The downtown and River Market areas and the US-169/I-29 corridor north of the river were well-represented in the responses. Input received from the online meeting was considered in the screening of the reasonable alternatives and in identifying a preferred alternative. Copies of the online survey results are included in Appendix J.

6.1.3 Stakeholder Meetings

Section 106 Consulting Parties

As described in Section 4.2.7 of this EA, MoDOT on behalf of FHWA, initiated coordination with the Missouri SHPO; 10 potentially interested Native American tribes; and several local, regional, and national preservation groups that have expressed interest in other MoDOT projects in Kansas City as Consulting Parties under Section 106 of the NHPA. The ACHP, the Miami Tribe of Oklahoma, KCMO, the Kansas City Landmarks Commission, and the Downtown Neighborhood Association accepted the invitation to participate in consultation. The Consulting Parties were met with three times during the study process: (1) to obtain background on the Section 106 process and learn about the purpose and need for the Proposed Action, (2) to learn about the alternatives under consideration and the NRHP-eligibility of the historic properties possibly affected by the Proposed Action through a tour through the study area, and (3) to learn about the possible effects of the alternatives under consideration on NRHP-eligible and NRHP-listed properties and to provide input on mitigation measures considered in development of a Programmatic Agreement. Copies of information shared with the Consulting Parties is included in Appendix F.

Charles B. Wheeler Downtown Airport, FAA, and the Kansas City Aviation Department

MoDOT and KCAD conducted several meetings with MKC tenants (Atlantic Aviation; Hangars 3, 4B, and 5A; Signature Flight Support; VMLY&R, the Kansas City Fire Department) to review and receive comments on the access modification options under consideration. Based on feedback from KCAD and tenants, MoDOT modified the options considered to improve the main airport access by minimizing the amount of right-of-way needed,

reduced the number of parking spaces permanently removed, and by sliding the improvements to the south to avoid encroachments into Hangars 4, 5A, and 5B.

Kansas City Parks and Recreation Department

MoDOT and KCMO made presentations to the KCPRD to review the potential effects of the alternatives under consideration on West Terrace and Ermine Case Jr. Parks. KCPRD has agreed that the effects of the Proposed Action on West Terrace and Ermine Case Jr. Parks would be minimal and would result in a *de minimis* effect under Section 4(f) of the DOT Act.

Additional Stakeholders

MoDOT and KCMO also met with several other local and regional stakeholders during the study process presenting materials from the public meetings. Issues similar to those raised in the survey comments from the public meetings were discussed in these forums, primarily direct connections to I-35 and bicycle and pedestrian accommodations. Stakeholder groups participating in these discussions included:

- Greater Kansas City Chamber of Commerce
- Northland Chamber
- Historical West Bottoms Association
- Kansas City River Trails, Inc.

6.1.4 Public Review of the EA and Public Hearing

MoDOT published a Notice of Availability (NOA) of the EA and Notice of Public Hearing to be conducted on March 10, 2020. The public hearing will be conducted in an open house format to provide information on the study process and the preferred alternative. MoDOT staff will be in attendance to receive input and address questions. The public comment period on the EA extends through March 25, 2020.

Paper copies of the EA are available for review at the following locations:

- MoDOT, 600 NE Colbern Road, Lee's Summit MO 64086
- MARC, 700 Broadway Boulevard, Kansas City MO 64105
- Kansas City Central Library, 14 West 10th Street, Kansas City MO 64105
- Kansas City Missouri City Hall, 414 E 12th Street, Kansas City MO 64106

Comments on the EA can be submitted by mail or via the online link and must be submitted by March 25, 2020 to be included in the project record.

Mail: Comments may be sent to Gerri Doyle, MoDOT Kansas City District, 600 NE Colbern Road, Kansas City MO 64085

7.1 Proposed Project Commitments

The following is a compiled list of MoDOT's and KCMO's proposed project commitments. MoDOT and KCMO will implement all project and regulatory commitments. Federal authorization for construction will not be granted until the necessary regulatory obligations have been satisfactorily completed.

Table 7-1: Project Commitments

Commitment Code	Commitment	Responsible Parties
BUILD Grant Commitments		
B-1	A new, wider bridge.	MoDOT
B-2	Separated facilities for pedestrian and bicyclists.	MoDOT
B-3	A direct connection between US-169 and I-35.	MoDOT
B-4	Construction substantial completion and open to traffic by December 1, 2024.	MoDOT
B-5	Construction final acceptance by May 1, 2025.	MoDOT
General Commitments		
C-1	Commitments are not subject to change without written approval from FHWA.	ALL
C-2	Implement all stipulations agreed upon in the Programmatic Agreement among the FHWA, MoDOT, Missouri SHPO, and the ACHP to address potential adverse effects to the Buck O'Neil Bridge, Harlem Road Overpass, and other NRHP-Eligible resources potentially affected by the Proposed Action.	MoDOT
C-3	Acquire all properties needed for this project in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 as amended (Uniform Act; 42 USC 4601), and other regulations and policies as appropriate.	MoDOT and KCMO
C-4	The amount and layout of land needed from the downtown airport will be finalized and the required legal descriptions, boundary surveys, and appraisals will be completed for the FAA land release process.	MoDOT and KCMO
C-5	Minimize to the extent practicable the amount of right-of-way acquired and clearing to occur along the bluff face below the West Terrace Park and Ermine Case Jr. Park	MoDOT and KCMO
C-6	Coordinate temporary and permanent impacts to the Riverfront Heritage Trail with KCRT who manages the trail and associated trailheads. Trail connectivity will be restored at the completion of the project.	MoDOT and KCMO
C-7	Coordinate with agencies that work with area homeless populations to relocate unsheltered persons living in areas impacted by the project.	MoDOT and KCMO
C-8	Complete wetland/waters of the US field delineations and obtain jurisdictional determinations through coordination with the USACE Kansas City District.	MoDOT
C-9	Implement Stormwater Pollution Prevention Plan to prevent or minimize adverse impacts within and adjacent to the project area.	MoDOT
C-10	Evaluate the project area during the design phase to identify whether suitable roost trees for Indiana bats are present and would need to be removed for construction.	MoDOT
C-11	Conduct surveys to determine if protected bird species are nesting in or on structures to be removed prior to demolition. If active nests are present,	MoDOT

	demolition activities would not be allowed to begin until the young have fledged from the nests.	
C-12	The bridge erection scheme would need to provide adequate clearance within the navigational channel span to allow for safe passage of river traffic during construction and are subject to approval by the USCG.	MoDOT
C-13	Conduct a hydraulic analysis during final design to document that the new bridge will result in "no rise" in the flow within the regulatory floodway.	MoDOT
C-14	Improvements proposed near levee systems must be reviewed and approved by the levee owner and in close coordination with the USACE.	MoDOT
C-15	Evaluate potential airspace encroachment issues and obtain FAA 7460 Permits for temporary airspace obstructions.	MoDOT and KCMO
C-16	Coordinate with FAA, MoDOT, KCAD, KCMO, and MDNR if the monitoring well locations within the former Airport Fuel Farm cannot be avoided.	MoDOT
C-17	In the event contaminated soils are encountered during construction, sampling and categorization, removal, and disposal in accordance with applicable regulations would be required.	MoDOT
C-18	Store all fuels and materials used during construction according to local and state regulations. Methods would be implemented to minimize spills and other unauthorized releases of hazardous materials.	MoDOT
C-19	Provide all necessary information for the disposal of construction wastes to the appropriate landfill operator, including any required testing of materials and completion of forms required by the MDNR.	MoDOT
C-20	If an excavation operation encounters remains of a prehistoric site or artifacts of historical and/or archaeological significance, all construction activities shall be temporarily discontinued and MoDOT's Design Division Environmental Section shall be contacted.	MoDOT
C-21	Develop a Transportation Management Plan to lay out a set of coordinated traffic management strategies to manage the work zone impacts.	MoDOT and KCMO
C-22	Coordinate with all utility providers for utilities that will need to be relocated to accommodate construction or for which plans will need to be developed to maintain continuous service during construction.	MoDOT and KCMO
C-23	Consider aesthetic applications that enhance the project design but that also represent a minimal cost to the project, can be reasonably maintained, and do not compromise safety. Coordinate with stakeholders to identify applications that would blend with the character of the area and reflect the natural and cultural values of the community and neighborhoods served by the bridge.	MoDOT and KCMO
C-24	Provide Miami Tribe of Oklahoma relevant Section 106 information as study process continues.	MoDOT

7.2 Permits Required for Construction

The following permits and approvals will be required for construction of the proposed project:

Section 404 Permit and Section 401 Water Quality Certification under the Clean Water Act – A Section 404 Permit from the USACE and Section 401 Water Quality Certification from MDNR will be required to authorize placement of fill materials within jurisdictional wetlands and the Missouri River. Through coordination with the USACE, it is anticipated that a Nationwide Permit (NWP) #15 (U.S. Coast Guard-Approved Bridges) will be issued to authorize construction of the bridge, and a NWP #14 (Linear Transportation Projects) will be issued to authorize construction on the roadway approaches. Issuance of the Section 404 permits by the USACE is contingent on obtaining water quality certification issued under Section 401 of the Clean Water Act from the MDNR.

Section 9 Permit under the Rivers and Harbors Act and General Bridge Act – A Section 9 Permit from the USCG is required to remove the existing bridges and to construct a new bridge over navigable waters of the United States.

Section 402 of the Clean Water Act – Authorization for the discharge of stormwater from construction activities is required in Missouri in compliance with the National Pollutant Discharge Elimination System (NPDES) requirements of Section 402. An application for a Land Disturbance Permit would need to be filed with the MDNR to request authorization under the Missouri State Operating Permit (reissued November 1, 2019). Missouri requires development of a SWPPP in conjunction with the permit authorization. Once construction is complete, a Notice of Termination will be submitted to the MDNR.

"No-Rise" Certification; SEMA - "No-Rise" Certification for construction within a flood hazard area.

Kansas City, Missouri:

- Land Disturbance Permit
- Demolition Permit

Jackson and Clay Counties, Missouri:

- Land Disturbance Permit

Levee Owner Approvals – KCMO will coordinate closely with the USACE to review and comment on proposed construction activity in the vicinity of the levee systems. Approvals for this work will be obtained prior to initiating construction. In addition, the contractor will need approval from the levee districts to use the levee roads for construction access.

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